

SOUTHERN CALIFORNIA EDISON TRANSMISSION AND DISTRIBUTION

Underground Structures Standards (UGS)

2021 FOURTH QUARTER ISSUE

October 29, 2021

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Underground Structures Standards (UGS)

Revision Summary

2021 Fourth Quarter Issue

Effective Date: October 29, 2021

Overview

The main purpose of this revision summary is to describe new revisions to this manual. (Some or all of the information may have been previously communicated to field personnel by other means.)

[Table 1](#) lists the revisions. Clickable page/sheet numbers link directly to individual revisions or the first of a series of revisions.

[Table 2](#) defines four types of revisions: (1) Admin (Administrative), (2) Technical, (3) New, and (4) Pilot.

Note: *Admin and Technical revisions to existing standards or existing Pilot projects are identified with change bars | in the left margin. New standards (as well as new pilot projects) do not receive change bars. Editorial revisions, such as corrections to spelling, do not receive change bars.*

A [Getting Help](#) section provides contact information.

Table 1: Revisions

Standard	Sheet	Description	Type
HP 210	3	Table HP 210-2: Removed "For Reference Only" categorization for 3' x 5' x 4' Standard and Intercept (P) Type pull boxes.	Admin
SS 541	1	Corrected title for Figure SS 541-2.	Admin
SS 587	2	Added note to clarify the grounding details for 5' x 10'-6" x 7' PME Tub-Style concrete enclosure.	Admin

Table 2: Revision Types

Type	Definition
Admin	Administrative revisions do not significantly affect design, construction, maintenance or operation of the electrical distribution, substation, and transmission systems. They do not require Standards Review Team (SRT) or management approval; however, they have been approved by other organizations, as appropriate. They may include updates to material codes, updates to references, updates to standards for clarity, or deletions of outdated information.
Technical	Technical revisions are engineering changes to existing standards. They affect the design, construction, maintenance or operation of the electrical distribution, substation, and transmission systems. They require SRT and management approval.
New	Refers to a new standard. New technical standards require SRT and management approval.
Pilot	A <i>Pilot</i> is an in-field evaluation of a piece of equipment or work method, with the intention of approving for standardized use. Pilot standards will have a PILOT watermark so that they are easily identified throughout this manual.

Getting Help

Technical Issues

If you have any comments, corrections, questions, or suggestions concerning manual revisions, please contact one of the following individuals at the numbers provided, or click on the name to send an email:

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Russell Ragsdale

Director of Asset & Engineering Strategy

Division Index

Section	Tab
Division Index	Division Index
Table of Contents	TOC
General InformationGI
Conduits	CD
Handholes and Pull Boxes	HP
Manholes	MH
Vaults	VA
Surface or Semi-Buried Structures	SS
Frames and Covers	FC
Accessories	AC
Miscellaneous	MC

Approved by:	Division Index	DI
Effective Date:	10-26-2012	Sheet 1
		UGS

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Table of Contents

Standard	Title
GI 001	General Specifications for Underground Structures
GI 001.1	General Specifications
GI 010	Specifications for Joint Construction
GI 010.1	Specifications for Joint Construction
GI 020	General Specifications for Concrete and Reinforced Concrete
GI 020.1	General Specifications for Concrete and Reinforced Concrete
GI 025	Steel Shape Dimensions
GI 025.1	Steel Shape Dimensions
GI 030	Specification for Precast Reinforced Concrete Structures
GI 030.1	Specification for the Structural Design and Manufacturing of Precast Reinforced Concrete Structures
GI 030.2	Setting Cover Depths for Tunnel/Tub Style Vaults and Manholes
GI 031	Acceptance Criteria for the Installation of New Precast Vaults and Manholes
GI 031.1	Acceptance Criteria for the Installation of New Precast Vaults and Manholes
GI 035	Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)
GI 035.1	Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)
GI 040	General Specifications for Pull Rope and Pull Tape
GI 040.1	General Specifications for Pull Rope and Pull Tape
GI 045	General Specifications for Plowing Cable
GI 045.1	General Specifications for Plowing Cable
GI 050	Specification for Abandoning Substructures
GI 050.1	Specification for Abandoning Substructures
CD 100	Conduit Installation Standards
CD 100.1	Conduit Installation Standards
CD 101	Conduit Bank and Terminal Requirements
CD 101.1	Conduit Bank and Terminal Requirements

Approved by:	Table of Contents	TOC
Effective Date:		Sheet i
10-30-2020		UGS

Standard	Title
CD 110	Conduits and Fittings
CD 110.1	Conduits
CD 110.2	Fittings
CD 111	"Y" Fittings
CD 111.1	"Y" Fittings
CD 112	Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings
CD 112.1	Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings
CD 115	Manufacturer's Requirements
CD 115.1	Approved Manufacturers for Plastic Conduit
CD 115.2	Requirements for Semi-Rigid PVC Plastic Conduit
CD 115.3	Manufacturer's Minimum Inspection and Testing Requirements for Semi-Rigid PVC EB/DB Conduits
CD 120	Conduit Bank Requirements
CD 120.1	Conduit Bank Requirements
CD 120.2	Residential Conduit Bank Requirements
CD 120.3	Conduit Bank Requirements for CIC
CD 121	Conduit Bank Requirements – Installation in a Bore
CD 121.1	Conduit Bank Requirements – Installation in a Bore
CD 121.2	Conduit Spacers
CD 122	Conduit Beam Reinforcement
CD 122.1	Conduit Beam Reinforcement
CD 125	Directional Boring Installation Standards
CD 125.1	Directional Boring Installation Standards
CD 130	Standard Conduit Entrance Details
CD 130.1	Standard Conduit Entrance Details
CD 131	Standard and Special Conduit Entrances
CD 131.1	Standard and Special Conduit Entrances
CD 132	Conduit Entrances to Pull Boxes

TOC	Table of Contents	Approved by: <i>RR</i>
		Effective Date: 10-30-2020

Standard	Title
CD 132.1	Conduit Entrances to Pull Boxes
CD 133	Corner Conduit Entrance Details — Manhole or Vault
CD 133.1	Corner Conduit Entrance Details — Manhole or Vault
CD 134	Conduit Terminators
CD 134.1	Conduit Terminators
CD 135	Typical Installation of Precast Pull Box in Main Line Conduit
CD 135.1	Typical Installation of Precast Pull Box in Main Line Conduit
CD 140	Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger
CD 140.1	Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger
CD 141	Conduit Recess Layout — Precast Concrete Vaults — 7' x 10', 8' x 10', and Larger
CD 141.1	Conduit Terminators
CD 142	Conduit Terminators for Precast Tunnel Vaults
CD 142.1	Conduit Terminators for Precast Tunnel Vaults
CD 144	Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned
CD 144.1	Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned
CD 146	Intercepting Existing Conduit Runs
CD 146.1	Intercepting Existing Conduit Runs
CD 148	Capping Main Line Conduit
CD 148.1	Capping Main Line Conduit
CD 150	Service Lateral Terminations
CD 150.1	Service Lateral Terminations
CD 160	Pole Riser Bend Standard Location
CD 160.1	Pole Riser Bend Standard Location
CD 161	Pole Riser Bend for Risers on Kicker Blocks
CD 161.1	Pole Riser Bend for Risers on Kicker Blocks
CD 162	Neutral Wire Riser Installation for Four-Wire Systems
CD 162.1	Neutral Riser Wire Installation for Four-Wire Systems

Approved by:	Table of Contents	TOC
Effective Date:		Sheet iii
10-30-2020		UGS

Standard	Title
CD 163	Communication Conduit and Riser Bend Installation
CD 163.1	Communication Conduit and Riser Bend Installation
CD 164	Specification for Abandoning Conduit and Risers
CD 164.1	Specification for Abandoning Conduit and Risers
CD 166	Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends
CD 166.1	Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends
CD 170	Riser Bend Installation at Wall or Pad
CD 170.1	Riser Bend Installation at Wall or Pad
CD 172	Underground Risers in Substation
CD 172.1	Underground Risers in Substation
CD 175	Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard
CD 175.1	Typical Conduit and Riser Bend Installation for Service to One Streetlight Standard
CD 175.2	Typical Conduit and Riser Bend Installation for Handhole through Service to Streetlight Standards
CD 175.3	Typical Conduit and Riser Bend Installation Loop through Service to Streetlight Standards
CD 177	Riser Conduit Lower Terminal (Anchor for Cable Support)
CD 177.1	Riser Conduit Lower Terminal (Anchor for Cable Support)
CD 180	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures
CD 180.1	Blank Conduit Plugs
CD 180.2	Conduit Plug and Riser Cap
CD 190	Supports for Conduits on Bridges
CD 190.1	Exterior Supports — General Fabrication and Installation Guide
CD 191	Expansion Joint for Plastic Conduit
CD 191.1	Expansion Joint for Plastic Conduit
CD 192	Expansion Joint for HDG Conduit on Bridges
CD 192.1	Expansion Joint for HDG Conduit on Bridges
CD 197	Conduit Mandrels — Type I and Type III
CD 197.1	Conduit Mandrels — Type I and Type III

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet iv	Effective Date: 10-30-2020
UGS		

Standard	Title
HP 200	Handhole Requirements
HP 200.1	Handhole Requirements
HP 200.2	Handhole Requirements — Replacement Boxes
HP 205	Typical Handhole Installation
HP 205.1	Typical Handhole Installation
HP 210	Pull Box Requirements
HP 210.1	Pull Box Requirements
HP 215	Pull Box 2' x 3' Precast Concrete (For Reference Only)
HP 215.1	Pull Box 2' x 3' Precast Concrete (For Reference Only)
HP 220	Pull Box 2-1/2' x 4' Precast Concrete
HP 220.1	Pull Box 2-1/2' x 4' Precast Concrete
HP 225	Pull Box 3' x 5' Precast Concrete
HP 225.1	Pull Box 3' x 5' Precast Concrete
HP 228	Pull Box 4' x 6'- 6" Precast Concrete
HP 228.1	Pull Box 4' x 6'- 6" Precast Concrete
HP 230	Poured Concrete Pull Boxes — Construction Details
HP 230.1	Poured Concrete Pull Boxes — Construction Details
MH 300	Manholes Requirements
MH 300.1	Manholes Requirements
MH 310	Precast Tub-Type Manholes
MH 310.1	Precast Tub-Type Manholes
MH 318	Precast Manhole Neck Detail
MH 318.1	Precast Manhole Neck Detail
MH 319	Manhole Neck, Frame, Cover, and Restraint Detail
MH 319.1	Manhole Neck Detail
MH 319.2	Precast Manhole - Restraint Installation Detail
MH 319.3	General and Key Notes
MH 320	4' x 6' x 7' Manhole — Traffic Loading

Approved by:	Table of Contents	TOC
Effective Date:		Sheet v
10-30-2020		UGS

Standard	Title
MH 320.1	4' x 6' x 7' Manhole — Traffic Loading
MH 325	4' x 8' x 7' Manhole — Traffic Loading
MH 325.1	4' x 8' x 7' Manhole — Traffic Loading
MH 330	6' x 8' x 7' Manhole — Traffic Loading
MH 330.1	6' x 8' x 7' Manhole — Traffic Loading
MH 335	7' x 7' x 7' Manhole — Traffic Loading
MH 335.1	7' x 7' x 7' Manhole — Traffic Loading
MH 340	6' x 10' x 7' Manhole — Traffic — Heavy Loading
MH 340.1	6' x 10' x 7' Manhole — Traffic — Heavy Loading
MH 350	Manhole Neck Details — 27" Opening
MH 350.1	Manhole Neck Details — 27" Opening
VA 400	Vault Requirements
VA 400.1	Vault Requirements
VA 410	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High
VA 410.1	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High
VA 410.2	Precast Tub-Type Vaults
VA 410.3	Precast Tub-Type Vaults with Cover Restraints
VA 410.4	General and Key Notes
VA 411	Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High
VA 411.1	Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High
VA 411.2	Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High with Cover Restraint
VA 411.3	General and Key Notes
VA 430	Vault — Traffic Loading — 4' x 8' x 7'
VA 430.1	Vault — Traffic Loading — 4' x 8' x 7' — Roof
VA 430.2	Vault — Traffic Loading — 4' x 8' x 7' — Walls
VA 430.3	Vault — Traffic Loading — 4' x 8' x 7' — Floor

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet vi	Effective Date: 10-30-2020
UGS		


Standard	Title
VA 432	6' x 8' x 7' Vault — Traffic — Normal Loading
VA 432.1	6' x 8' x 7' Vault — Traffic — Normal Loading
VA 434	6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading
VA 434.1	6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading
VA 436	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"
VA 436.1	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Roof
VA 436.2	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Walls
VA 436.3	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Floor
VA 438	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"
VA 438.1	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof
VA 438.2	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Sides
VA 438.3	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Floor
VA 440	Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4"
VA 440.1	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof
VA 440.2	Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Walls
VA 440.3	Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Floor
VA 442	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4"
VA 442.1	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Roof
VA 442.2	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Walls
VA 442.3	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Floor
VA 444	8' x 22' x 12' Vault — Traffic — Normal Loading
VA 444.1	8' x 22' x 12' Vault — Traffic — Normal Loading
VA 446	5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading
VA 446.1	5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading
VA 446.2	Alternate Roof Plan for VA 446 (Not Optional)
VA 448	Vault — Traffic Loading — 8' x 24' x 9'-4"
VA 448.1	Vault — Traffic Loading — 8' x 24' x 9'-4" — Roof
VA 448.2	Vault — Traffic Loading — 8' x 24' x 9'-4" — Floor
VA 448.3	Vault — Traffic Loading — 8' x 24' x 9'-4" — Walls

Approved by:	Table of Contents	TOC
Effective Date:		Sheet vii
10-30-2020		UGS

Standard	Title
VA 450	Vault (Traffic) — 8' x 26' x 9'-4"
VA 450.1	Vault (Traffic) — 8' x 26' x 9'-4"
VA 460	5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 460.1	5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 462	5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 462.1	5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 464	5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 464.1	5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 466	8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading
VA 466.1	8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading
VA 470	Neck Vault Details
VA 470.1	Neck Vault Details
SS 500	Slab Box and Pad Requirements
SS 500.1	Slab Box and Pad Requirements for Pad-Mounted Single-Phase and Three-Phase Equipment
SS 502	Equipment Poured Pad (Typical)
SS 502.1	Shows Equipment Poured Pad (Typical)
SS 503	Pad for Surface-Mounted Voltage Regulator Poured in Field
SS 503.1	Pad for Surface-Mounted Regulator Poured in Field
SS 503.2	Berm for Surface-Mounted Voltage Regulator Poured in Field
SS 503.3	Grounding for Surface-Mounted Voltage Regulator Poured in Field
SS 504	Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)
SS 504.1	Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)
SS 505	38" x 43" Non-Concrete Box Pad for Single-Phase Transformers
SS 505.1	Non-Concrete Box Pad for Single-Phase Transformers
SS 506	Polymer Concrete Pad for Surface-Mounted Transformers, PME-1, and PME-2
SS 506.1	Polymer Concrete Pad for Surface-Mounted Single-Phase Transformers

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet viii	Effective Date: 10-30-2020
UGS		


Standard	Title
SS 507	Polymer Concrete Pad for PME-1
SS 507.1	Polymer Concrete Pad for PME-1
SS 508	Bart Pad Structure
SS 508.1	60" x 72" x 22" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 500 kVA)
SS 508.2	72" x 114" x 22" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 1,500 kVA)
SS 508.3	72" x 114" x 30" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 2,500 kVA)
SS 510	Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter
SS 510.1	Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter
SS 515	Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear
SS 515.1	Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear
SS 520	Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction
SS 520.1	Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction
SS 522	Pad for Underground Switch Capacitor Control Pedestal
SS 522.1	Pad for Underground Switch Capacitor Control Pedestal
SS 530	6' x 8'-6" and 8' x 10' Slab Box for Pad-Mounted Transformer, VFI-4, and RAR
SS 530.1	6' x 8'-6" x 6" and 8' x 10' x 6" Slab Box for Pad-Mounted Transformer, VFI-4, and RAR
SS 533	Slab Box — Pad-Mounted Transformers
SS 533.1	Slab Box for Pad-Mounted Transformers — 75 kVA–1,000 kVA 3Ø
SS 535	10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators
SS 535.1	10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators
SS 535.2	Shows Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators
SS 535.3	Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage

Approved by: 	Table of Contents	TOC
Effective Date: 10-30-2020		Sheet ix
		UGS


Standard	Title
	Regulators — Box Section
SS 536	Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box
SS 536.1	Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box for 2-Way Pad-Mounted SF6 Switch
SS 537	Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box
SS 537.1	Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box for 2-Way, 3-Way, and 4-Way, G&W Pad-Mounted RAM and RAG Gas Switches
SS 538	Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box
SS 538.1	Precast Concrete Equipment Slab Box — 8' x 10' x 8" Pad with 4' x 7' x 3'-6" Box for 2-Way, 3-Way, and 4-Way Pad-Mounted RAG Gas Switches, VFI 9, VFI 12, Bypass Switch, and 33 kV Primary Metering Cabinet
SS 539	10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches
SS 539.1	10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches
SS 540	Structure for PME-3, PME-4, and PME-5
SS 540.1	Structure for PME-3, PME-4, and PME-5
SS 541	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II
SS 541.1	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I for 4-, 5-, and 6-Way Gas
SS 541.2	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type II for PME-6 through PME-12 Switchgears
SS 542	Unistrut/Chain Link Enclosure
SS 542.1	Unistrut/Chain Link Enclosure
SS 544	Masonry Enclosure
SS 544.1	Masonry Enclosure
SS 546	Concrete Type Enclosure
SS 546.1	Concrete Type Enclosure
SS 548	Unistrut/Chain Link Enclosure Cover (Removable)
SS 548.1	Unistrut/Chain Link Enclosure Cover (Removable)

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet X	Effective Date: 10-30-2020
UGS		


Standard	Title
SS 549	Chain Link Fence (Surface Mounted Equipment)
SS 549.1	Chain Link Fence (Surface Mounted Equipment)
SS 549.2	Chain Link Fence Safety Signs
SS 560	Subsurface Structure Requirements
SS 560.1	Subsurface Structure Requirements
SS 562	Concrete Enclosure 4' x 4' x 4'
SS 562.1	For Use with following BURD Switches — Switched Only – 2W-3 Pole, 3W-3 Pole — Switched and Fused – 2W-2 Pole, 2W-3 Pole
SS 563	Concrete Enclosure — 36" Inner Diameter x 36" — SAP 10117680
SS 563.1	For Use with following BURD Switches — Switched Only – 2W-1 Pole, 2W-2 Pole 3W-1 Pole, 3W-2 Pole — Switched and Fused – 2W-1 Pole
SS 564	Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'
SS 564.1	Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'
SS 565	Subsurface Equipment Enclosure — 4' x 7' x 7'
SS 565.1	Subsurface Equipment Enclosure — 4' x 7' x 7' — (4' x 7' x 4')
SS 566	Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7'
SS 566.1	Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7' — (5' x 8'-1/2" x 4')
SS 568	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'
SS 568.1	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'
SS 568.2	Top Slab/Cover with Removable Beams
SS 568.3	Cover Frame/Gasket Insert Detail
SS 568.4	Gasket Plan View for Precast Surface Operable Parkway Enclosure
SS 568.5	List of Materials for Precast Surface Operable Parkway Enclosure
SS 575	Transformer Enclosure — 3' x 6' Concrete — BURD
SS 575.1	Concrete Enclosure for 4-Wire BURD Transformers for Use in Rocky Areas Only (3' x 6')
SS 575.2	Replacement Part for Steel Tamper Vent: Underground Retrofit Shield (URS)
SS 577	Transformer Enclosure — 3'-6" x 6' Concrete — BURD
SS 577.1	Concrete Enclosure for 3-Wire BURD Transformers for Use in Rocky Areas Only (3'-6" x 6') (SAP 10117686)

Approved by: 	Table of Contents	TOC
Effective Date: 10-30-2020		Sheet xi
		UGS

Standard	Title
SS 577.2	Replacement Part for Steel Tamper Vent: Polyethylene Underground Retrofit Shield (PURS)
SS 580	Transformer Housing — Semi-Buried — 4' x 4' x 4'
SS 580.1	Transformer Housing — Semi-Buried — 4' x 4' x 4'
SS 580.2	Hood Details
SS 580.3	Cover Details
SS 585	3Ø Subsurface Transformer Enclosure
SS 585.1	3Ø Subsurface Transformer Enclosure
SS 586	PMH Concrete Enclosure
SS 586.1	PMH Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'
SS 586.2	Moisture Barrier Plates
SS 587	PME Concrete Enclosure
SS 587.1	PME Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'
SS 590	Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'
SS 590.1	Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'
SS 590.2	Top Section for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 590.3	Base for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 590.4	Detail Information for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 590.5	List of Materials for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 591	Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box
SS 591.1	Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box for PME-3, PME-4, and PME-5 Switchgear
SS 592	Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box
SS 592.1	Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box for PMH-4 Switchgear
SS 593	PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"
SS 593.1	PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"
SS 599	Perimeter Walls for Pad-Mounted Equipment and Underground Structures
SS 599.1	Perimeter Walls for Pad-Mounted Equipment and Underground Structures

TOC	Table of Contents	Approved by: 
	Sheet xii	Effective Date: 10-30-2020
UGS		


Standard	Title
SS 600	Protection Wall
SS 600.1	Protection Wall for Replacement of Single-Phase, Mini-Pad-Mounted Transformers
SS 602	Landscaping Around Pad-Mounted Equipment
SS 602.1	Landscaping Around Pad-Mounted Equipment
FC 600	Handhole Covers
FC 600.1	Replacement Handhole Covers
FC 601	24" x 36" Steel Pull Box Cover — Light Traffic
FC 601.1	Fabricated 24" x 36" Steel Pull Box Cover for Light Traffic Installations
FC 602	24" x 36" Steel Pull Box Cover — Parkway
FC 602.1	24" x 36" Steel Pull Box Cover — Parkway
FC 603	24" x 36" Steel Pull Box Frame
FC 603.1	24" x 36" Steel Pull Box Frame for Cover FC 601 (Steel: Light-traffic) — FC 618 (RPM Parkway)
FC 606	30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)
FC 606.1	30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)
FC 607	30" x 48" Steel Pull Box Cover — Parkway
FC 607.1	30" x 48" Steel Pull Box Cover — Parkway
FC 608	30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)
FC 608.1	30" x 48" Steel Pull Box Frame
FC 612	36" x 60" Steel Pull Box Cover — Light Traffic (Two Piece)
FC 612.1	Fabricated 36" x 60" Steel Pull Box Cover for Light Traffic Installations (Two Piece)
FC 613	36" x 60" Steel Pull Box Cover — Parkway (Two Piece)
FC 613.1	36" x 60" Steel Pull Box Cover — Parkway (Two Piece)
FC 614	36" x 60" Steel Pull Box Frame for Covers UGS 612 (Steel Light — Traffic) — FC 618 (RPM Parkway)
FC 614.1	36" x 60" Steel Pull Box Frame

Approved by: 	Table of Contents	TOC
Effective Date: 10-30-2020		Sheet xiii
		UGS

Standard	Title
FC 615	36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic
FC 615.1	36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic
FC 616	48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic
FC 616.1	48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic
FC 618	Polymer Concrete (RPM) Pull Box Covers — Parkway
FC 618.1	Polymer Concrete (RPM) Pull Box Covers — Parkway
FC 619	Pull Box Cover and Frame: Manufacturers' and SAP Numbers
FC 619.1	Pull Box Cover and Frame: Manufacturers' and SAP Numbers
FC 620	27" and 30" Round Manhole Cover and Ring
FC 620.1	27" and 30" Round Manhole Cover and Ring
FC 621	30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading
FC 621.1	30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading
FC 622	30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading
FC 622.1	30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading
FC 623P	30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading
FC 623P.1	30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading
FC 625	Concrete-Filled Manhole Cover
FC 625.1	Concrete-Filled Manhole Cover
FC 627	30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading
FC 627.1	30" Round Swiveloc Manhole Cover – Ductile Iron — HS-20 Loading
FC 627.2	Manhole Frames - Gray Iron — HS-20 Loading
FC 627.3	Vault Frame – Ductile Iron — HS-20 Loading
FC 630	Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault
FC 630.1	Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault
FC 631	Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault
FC 631.1	Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet xiv	Effective Date: 10-30-2020
UGS		

Standard	Title
FC 632	Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault
FC 632.1	Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault
FC 640	48" Square Precast Concrete (Traffic-Type) Vault Cover
FC 640.1	48" Square Precast Concrete (Traffic-Type) Vault Cover
FC 641	48" x 60" Precast Concrete Vault Cover (Traffic-Type)
FC 641.1	48" x 60" Precast Concrete Vault Cover (Traffic-Type)
FC 642	5" x 8" Two Piece — Vault Cover (Traffic-Type)
FC 642.1	5" x 8" Two Piece — Vault Cover (Traffic-Type)
FC 643	6' x 8' Two Piece — Vault Cover — H-20 Loading
FC 643.1	6' x 8' Two Piece — Vault Cover — H-20 Loading
FC 644	5'-6" x 8'-0" Vault Frame — Traffic
FC 644.1	5'-6" x 8'-0" Vault Frame — Traffic
FC 650	Slab Cover Details — Pouring and Framing
FC 650.1	Slab Cover Details — Pouring and Framing
FC 655	5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault
FC 655.1	5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault
FC 660	4' x 5' Precast Concrete Vault Cover (Traffic Type)
FC 660.1	4' x 5' Precast Concrete Vault Cover (Traffic Type)
FC 661	4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame
FC 661.1	4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame
FC 670	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation
FC 670.1	Existing Vault – Type 1 Installation
FC 670.2	Existing Vault – Type 2 Installation
FC 670.3	Existing Vault – Type 3 Installation
FC 670.4	Existing Vault – Type 4 Installation
FC 670.5	Existing Vault – Type 5 Installation
FC 670.6	Existing Vault – Type 6 Installation

Approved by: 	Table of Contents	TOC
Effective Date: 10-30-2020		Sheet XV
		UGS

Standard	Title
FC 670.7	Existing Vault – Type 7 Installation
FC 670.8	Existing Vault – Type 8 Installation
FC 670.9	Existing Vault – Type 9 Installation
FC 670.10	Existing Vault – Type 10 Installation
FC 670.11	Existing Manhole – Type 1 Installation
FC 670.12	Existing Manhole – Type 2 Installation
FC 670.13	Existing Manhole Type 3 Installation
FC 670.14	Existing Manhole – Type 4 Installation
FC 670.15	Existing Manhole – Type 5 Installation
FC 670.16	Existing Manhole – Type 6 Installation
FC 670.17	Existing Manhole – Type 7 Installation
FC 670.18	Details
FC 670.19	General Notes
FC 680	Replacement of Deteriorated Concrete Vault Covers
FC 680.1	Replacement of Deteriorated Concrete Vault Covers
FC 690P	Vault and Manhole Lid Tethers
FC 690P.1	Vault and Manhole Lid Tethers
AC 700	Ground Rod — Ground Wires
AC 700.1	Ground Rod — Ground Wires
AC 701	Ground Rod Installation for Pad-Mounted Transformers and Capacitors
AC 701.1	Ground Rod Installation for Pad-Mounted Transformers and Capacitors
AC 702	Riser Bend Grounding
AC 702.1	Riser Bend Grounding
AC 703	Grounding Materials — Ground Rod and Clamps
AC 703.1	Grounding Materials — Ground Rod and Clamps
AC 710	Sump Details for Poured-in-Field Substructures
AC 710.1	Sump Details for Poured-in-Field Substructures
AC 711	Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults
AC 711.1	Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet xvi	Effective Date: 10-30-2020
UGS		

Standard	Title
AC 712	Sump Discharge Outlet for Underground Vaults
AC 712.1	Sump Discharge Outlet for Underground Vaults
AC 720	Coil Insert — Standard Installation for Precast and Poured-in-Place Structures
AC 720.1	Single-Threaded Coil Insert
AC 720.2	Double-Threaded Coil Insert
AC 722	Inserts Opposite Conduit Banks
AC 722.1	Inserts Opposite Conduit Banks
AC 723	Insert Schedule for Pull Boxes
AC 723.1	Insert Schedule for Pull Boxes
AC 725	Insert Installation Detail for Vaults
AC 725.1	Insert Installation Detail for Vaults
AC 727	Pull Box Insert Repair
AC 727.1	Pull Box Insert Repair
AC 729	Pull Iron for Pull Boxes
AC 729.1	Pull Iron for Pull Boxes
AC 731	Support for Ground Bus
AC 731.1	Support for Ground Bus Using Ground Anchor Bracket (Preferred Method)
AC 731.2	Support for Ground Bus Using J Bolt (Alternate Method)
AC 733	Cable Pulling Attachments
AC 733.1	Cable Pulling Attachments
AC 740	Ladder Installation for Manholes
AC 740.1	Ladder Installation for Manholes
AC 742	Ladder for Vaults and Manholes (Edison SAP 10117761)
AC 742.1	Ladder for Vaults and Manholes
AC 742.2	Ladder Installation for Vaults
AC 750	Standpipe Vent Placement
AC 750.1	Standpipe Vent Placement
AC 751	Vent Locations on Vault and Manhole Walls

Approved by:	Table of Contents	TOC
Effective Date:		Sheet xvii
10-30-2020		UGS

Standard	Title
AC 751.1	Vent Locations on Vault and Manhole Walls
AC 752	Polyethylene Standpipe Vents
AC 752.1	Polyethylene Standpipe Vents
AC 753	PVC Standpipe Vents — 8 Inches and 10 Inches
AC 753.1	PVC Standpipe Vents — 8 Inches and 10 Inches
AC 754	Steel Standpipe Vent — 18 Inches
AC 754.1	Steel Standpipe Vent — 18 Inches
AC 756	Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches
AC 756.1	Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches
AC 758	Standpipe Vent Installation
AC 758.1	Standpipe Vent Installation
AC 758.2	PVC Standpipe Vent Installation
AC 758.3	Polyethylene Standpipe Vent Installation
AC 759	Wall Stand Vent Detail and Installation
AC 759.1	Wall Stand Vent Detail and Installation
AC 760	Installation of a Ground Wire in a Vent
AC 760.1	Installation of a Ground Wire in a PVC Vent
AC 760.2	Installation of a Ground Wire in a Polyethylene Standpipe Vent
AC 765	Flush Vent Grates and Frames
AC 765.1	Flush Vent Grates and Frames
AC 765.2	Flush Vent Installation
AC 765.3	Flush Vent Installation with Trash Pit
AC 765.4	Flush Vault Roof Vents
MC 800	Substation Power Cable Trench
MC 800.1	Substation Power Cable Trench — Precast (Preferred) or Poured (Non-Traffic)
MC 805	Distribution Power Cable Trench
MC 805.1	Distribution Power Cable Trench — Poured (Non-Traffic)
MC 810	Cold Joints (Approved for Use at Contractor's Request)

TOC	Table of Contents	Approved by: <i>RR</i>
	Sheet xviii	Effective Date: 10-30-2020
UGS		

Standard	Title
MC 810.1	Cold Joints (Approved for Use at Contractor's Request)
MC 820	Joining Old and New Structures
MC 820.1	Joining Old and New Structures
MC 830	Protective Barrier for Underground Distribution Structures
MC 830.1	Protective Barrier for Underground Distribution Structures
MC 840	Wheelchair Ramps
MC 840.1	Wheelchair Ramps
MC 850	Structure Offsets for Joint Construction
MC 850.1	Structure Offsets for Joint Construction
MC 860	Inspection Criteria for Concrete Vaults, Manholes, and Covers
MC 860.1	Inspection Criteria for Concrete Vaults, Manholes, and Covers
MC 870	Removable Curb for 4' x 5' Vault Covers and Manhole Covers
MC 870.1	Removable Curb for 4' x 5' Vault Covers and Manhole Covers
MC 870.2	Removable Curbing (Steel Cover Plates)
MC 880	Repair Specifications for Concrete Pad Structures
MC 880.1	Repair Specifications for Concrete Pad Structures
MC 890	Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers
MC 890.1	Electrolier Foundation Detail
MC 890.2	Marbelite Nostalgic Electrolier Foundation Detail
MC 890.3	Electrolier Foundation Requirements

Approved by: <i>RR</i>	Table of Contents	TOC
Effective Date: 10-30-2020		Sheet xix
		UGS

General Information Table of Contents

Standard	Title
GI 001	General Specifications for Underground Structures
GI 001.1	General Specifications
GI 010	Specifications for Joint Construction
GI 010.1	Specifications for Joint Construction
GI 020	General Specifications for Concrete and Reinforced Concrete
GI 020.1	General Specifications for Concrete and Reinforced Concrete
GI 025	Steel Shape Dimensions
GI 025.1	Steel Shape Dimensions
GI 030	Specification for Precast Reinforced Concrete Structures
GI 030.1	Specification for the Structural Design and Manufacturing of Precast Reinforced Concrete Structures
GI 030.2	Setting Cover Depths for Tunnel/Tub Style Vaults and Manholes
GI 031	Acceptance Criteria for the Installation of New Precast Vaults and Manholes
GI 031.1	Acceptance Criteria for the Installation of New Precast Vaults and Manholes
GI 035	Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)
GI 035.1	Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)
GI 040	General Specifications for Pull Rope and Pull Tape
GI 040.1	General Specifications for Pull Rope and Pull Tape
GI 045	General Specifications for Plowing Cable
GI 045.1	General Specifications for Plowing Cable
GI 050	Specification for Abandoning Substructures
GI 050.1	Specification for Abandoning Substructures

Approved by: <i>ajf</i>	General Information Table of Contents	GI	
Effective Date: 01-25-2019		Sheet	i
		UGS	

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GI 001 General Specifications for Underground Structures

Scope GI 001.1 General Specifications

1.0 General Agreement

The Master Agreement entered into between the contractor and the Company will form the basis for all work performed, and the specifications, requirements, and conditions described herein are in addition thereto and will also be a part of the basis for all work performed and will apply in the manner set forth herein unless otherwise modified or described in the working drawings or in the agreement for a specific installation.

2.0 Working Drawings

2.1 Quantity and Type of Structures and Facilities

Each working drawing will indicate the structures and facilities to be installed both by type and quantity. Charges to the Company for work performed will be subject to adjustment, as agreed upon in each instance between the contractor and an authorized representative of the Company whenever modification is made in either the type or quantity of such structures or facilities.

2.2 Location of Structures and Facilities

Each working drawing will also indicate the preferred location of structures and facilities to be installed. Deviations in such preferred locations may be made as agreed upon between the contractor and an authorized representative of the Company. Adjustments in charges to the company based upon such deviations will be limited to those for changes in type and quantity of structures and facilities as set forth in above, provided, however, that this restriction will not apply to deviations made solely for the convenience of the Company.

2.3 Obstructions in the Vicinity

Each working drawing will also indicate, to the extent known by the Company, the approximate plan of obstructions in the vicinity. It will be the contractor's responsibility solely and entirely to determine the actual location of all obstructions, whether known to the Company or not by means of test holes and otherwise as may be necessary or advisable.

3.0 Structures and Accessories

3.1 Structure Requirements and Drawings

Each structure or facility installed will be in accordance with, and will include accessories or meet other requirements as set forth in, the reference page listed below. The current revision, as of date of working drawing, of each structure drawing, accessory drawing, or other reference drawing, is the only one applicable; use of a previously-issued drawing is contingent upon such drawing still being the current revision.

3.2 Vaults

Each vault will be in conformance with requirements given in [VA 400](#).

Approved by: <i>ajf</i>	General Specifications for Underground Structures	GI 001	
Effective Date: 01-25-2019	What's Changed?	Sheet 1 of 3	
		UGS	

3.3 Manholes

Each manhole will be in conformance with requirements given in [MH 300](#).

3.4 Pull Boxes

Each pull box will be in conformance with requirements given in [HP 210](#).

3.5 Handholes

Each handhole will be in conformance with requirements given in [HP 200](#).

3.6 Slab Boxes

Each slab box will be in conformance with requirements given in [SS 530](#).

3.7 Conduit Banks

Each conduit bank and terminal will be in conformance with requirements given in [CD 100](#).

3.8 Subsurface Structure

Each subsurface structure will be in conformance with requirements given in [SS 560](#).

4.0 Material Furnished by the Contractor

The following materials are furnished by the contractor (without cost to the Company) for installation in accordance with Company specifications.

- Ground rods, clamps, and wire
- Ground connectors for HDG grounding

5.0 Material Furnished by the Company

The Company will only furnish copper wire for buried neutral in trenches. This material is furnished by the Company without cost to the contractor for installation in accordance with Company specifications, and will be made available at the individual Service Centers.

6.0 Referenced Specifications

The following specifications when referenced in this specification are part of this specification. Unless otherwise stated, references are to the latest revision. This specification will stand in case of conflicts unless otherwise noted in a specific section.


- Standard Specification for Public Works Construction—referenced as “Greenbook” in this specification
- American Society for Testing Materials (ASTM)

7.0 Cover Bolts

Apply silicone grease to cover bolts before installation to minimize removal difficulties.

8.0 Warning Signs and Company Identification

Warning signs indicating high voltage shall be installed on an interior surface, or barrier if present, inside the entrance of vaults, manholes, handholes, pad-mounted transformer compartments, and other above-ground enclosures containing exposed live parts above 750 V. Such warning signs shall also be

GI 001	General Specifications for Underground Structures	Approved by: 
Sheet 2 of 3	What's Changed?	Effective Date:
UGS		01-25-2019


installed on an exterior surface of all such pad-mounted transformer compartments and other above-ground enclosures. Such signs shall be clearly visible to a person in position to open any such access door, other opening, or barrier.

9.0 Excavation

Prior to excavating, the California One Call Law requires any person planning to conduct any excavation shall contact Underground Service Alert, at least two working days (48 hours), but not more than 14 calendar days, prior to commencing that excavation. Dial 811 for Underground Service Alert.

10.0 Saw Cutting of Precast Concrete Structures

Saw cutting of any precast structure (in field or at the precaster's yard) is not permitted unless approved in advance by Underground Structures Engineering.

Approved by: 	General Specifications for Underground Structures	GI 001
Effective Date: 01-25-2019	What's Changed? Section 10.0: Saw Cutting of Precast Concrete Structures was added to inform the user that saw cutting is not permitted.	Sheet 3 of 3 UGS

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GI 010 Specifications for Joint Construction

Scope GI 010.1 Specifications for Joint Construction

1.0 General

The specifications of each party will be complied with, for their respective portions of construction jointly entered into, except as otherwise detailed on working drawings or as provided for in the agreement for the work being done.

2.0 Working Drawings


Working drawings will indicate the structures and facilities to be installed both by type and quantity. Modifications will be made only as authorized by the respective party or parties concerned.

3.0 Divisions of Cost

Costs will be proportioned as agreed upon in each instance, except as otherwise provided for; changes, adjustments, and similar matters will be in accordance with established practice between the contractor and each respective party.

4.0 Service Laterals

The contractor will mark location of all service laterals at time of installation.

Approved by: 	Specifications for Joint Construction	GI 010
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1 UGS

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GI 020 General Specifications for Concrete and Reinforced Concrete

Scope GI 020.1 General Specifications for Concrete and Reinforced Concrete

1.0 Materials

1.1 Portland Cement

Cement used will be Portland Cement in accordance with ASTM Designation: C 150, as last adopted or revised. Type II low alkali, or Type V, low alkali Portland cement will be used unless otherwise specified by the Company.

1.2 Concrete Aggregates

- A. Aggregates will conform to ASTM Designation: C 33 (as last adopted or revised) with respect to general characteristics, soundness, and freedom from deleterious material. Aggregate source will have a petrographic analysis less than one year old on file at the batch plant. Petrographic analysis will be per ASTM C295. If indicated, further tests per ASTM C289 or C586 should be performed.
- B. Fine aggregates will be well graded and washed natural sand without shale, alkali, mica, coated grains, or soft or flaky particles. The fine aggregate will conform to requirements of Section 200-1.5 of the Greenbook for Portland Cement concrete.
- C. Coarse aggregates will be clean, sound gravel, well graded in sizes. Coarse aggregate will conform to Section 200-1.4 of the Greenbook for the maximum size of the mix.

1.3 Water

Water used in mixing concrete will be clean, clear, potable, and free of materials likely to be harmful to the concrete.

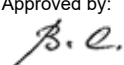
1.4 Metal Reinforcement

- A. Reinforcing bars will be a deformed type and will conform to ASTM A615 Grade 40 or Grade 60 billet steel. Steel will be accurately bent, placed, tied, and supported in accordance with the requirements of Manual of Standard Practice of the Concrete Reinforcing Steel Institute (CRSI).
- B. Welded wire fabric will conform to ASTM A185 or A497.

1.5 Admixtures

Calcium chloride will not be used. Liquid admixtures meeting the requirements of ASTM C494, Type B, D, F, or G may be used in the mix in accordance with the manufacturers recommendations. Class F flyash meeting the requirements of ASTM C618 may be used in amounts of between 20% and 25% of total cementitious weight.

All concrete mixes for the utility boxes shall contain 4.0 gallons of calcium nitrite corrosion inhibitor per cubic yard of concrete, conforming to ASTM C494, Type C or Type S, Calcium Nitrite based with a solids content of 30%. The corrosion inhibitor shall be added in accordance with the manufacturer's instructions and/or recommendations.

Approved by: 	General Specifications for Concrete and Reinforced Concrete	GI 020
Effective Date: 01-31-2014	What's Changed? The range for flyash was updated from 10 to 15% to 20 to 25%. A new paragraph regarding calcium nitrite was added.	Sheet 1 of 8 UGS

1.6 Ready Mixed Concrete

Ready mixed concrete will conform to ASTM Designation: C94-44 as last adopted or revised. There will be furnished with each load, a legible certificate describing the mix, identifying the materials used, and stating the quantity of additional water, if any, which may be added to the mix to bring it to the specified water-cement ratio. Edison inspector is to check mix receipt prior to pour of all poured-in-place structures.

2.0 Concrete Designs

2.1 Measurements

- A. Measurements are to be determined at a temperature of 70° F. When the ambient differs, the values will be corrected to 70° F.
- B. Water content is the gross amount of water in the mix, including surface water contained on the aggregate.
- C. See Section [2.4 \(Sheet 4\)](#) for Slump Measurements.
- D. Deviations in specifications require variations in the design and are limited to those detailed in Section [2.3 \(Sheet 3\)](#), Variations Required for Deviations.

GI 020	General Specifications for Concrete and Reinforced Concrete	Approved by: <i>B. C.</i>
Sheet 2 of 8	What's Changed?	Effective Date:
UGS		01-31-2014

2.2 Mix Designs

Table GI 020–1: Concrete and Reinforced Concrete Mix Designs

Mix Designation	SCE UG 4000	SCE UG 4001	SCE UG 4002
Water/Cement Ratio	0.45 ± .05	0.45 ± .05	0.45 ± .05
Minimum Cement Content			
Sacks per Cubic Yard	5.5	6.3	6.0
Maximum Size Coarse Aggregate	1-1/2"	1-1/2"	3/4"
Aggregate Gradation Class ^{a/}	B	C	–
% Passing Sieve Size			
2"	100		
1-1/2"	95–100	100	
1"	80–96	95–100	100
3/8"	64–80	77–93	95–100
3/8"	40–52	50–70	70–88
No. 4	35–45	39–51	40–53
No. 8	28–38	31–41	31–43
No. 16	21–31	22–32	22–34
No. 30	10–20	12–22	14–24
No. 50	3–9	3–9	4–10
No. 100	0–3	0–3	0–3
No. 200	0–2	0–2	0–2
Allowable Slump-Inches ^{b/}			
Maximum	3	5	3
Minimum	2	3	2
Strength Requirements (psi at 28 days)	3,000	3,000	3,000
Compaction Method	Vibrator	Hand	Vibrator

^{a/} Per Greenbook 201-1.3.2


^{b/} Slump measured before addition of water reducing admixtures

2.3 Variations Required for Deviations

A. Angular Coarse Aggregate

1. Angular coarse aggregate may be used in a mixture designed for vibrator compaction provided.
 - Fine aggregate percentage of total aggregate, by absolute volume, is increased 5%.
 - Cement content is increased 0.7 sack per cubic yard and the water-cement ratio is kept within the specified.
2. Angular coarse aggregate may be used in mixtures designed for hand compaction without increase in cement content provided that the fine aggregate percentage of total aggregate, by absolute volume, is increased 5%.

Approved by:



General Specifications for Concrete and Reinforced Concrete

GI 020

Sheet 3 of 8

Effective Date:

01-31-2014

What's Changed?

UGS

B. Grading of Aggregates

1. No variation allowed in grading of fine aggregates without special authorization.
2. The “well graded” characteristics of both fine and coarse aggregates will be such as to yield a smooth, plastic, cohesive mass of wet concrete when the water content and slump are within specified limits. Cement content will be increased as necessary to obtain this result whenever the aggregate grading used does not produce such results.

C. Slump

Slump may be increased to a maximum of four inches provided that the cement content is increased at the rate of 1/3 sack of cement per cubic yard of concrete for each inch or fraction beyond the maximum slump specified and provided the required water-cement ratio is maintained. Higher slump values will be achieved by use of water reducing admixtures when required to ease placement and consolidation.

D. Water-Cement Ratio

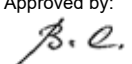
No deviations except slabs on grade may have a water-cement ratio of 0.50 and minimum cement content of five sacks per cubic yard.

E. Hand-Compaction

Concrete will not be hand-compacted unless directed by SCE. Concrete requiring hand-compaction will utilize water reducing admixtures.

2.4 Slump Measurements

- A. Slump is to be determined in accordance with ASTM Designation: C143-39 or the latest revision thereof.
- B. Slump is to be determined at 70° F. When measurements are made at any other temperature the slump value used will be that measured after correcting as follows:
 1. At high temperatures, add to the measurement obtained at the rate of 3/8 inch for each 10° F, but not more than 3/4 inch total correction.
 2. At lower temperatures, subtract from the measurement obtained at the rate of 1/2 inch for each 10° F below 70° F. See Section 2.12 (Sheet 7) regarding extreme temperatures.
- C. Edison inspector may take slump tests prior to pour.
- D. Slump measurements are prior to addition of water reducing admixtures.

GI 020	General Specifications for Concrete and Reinforced Concrete	Approved by: 
Sheet 4 of 8	What's Changed?	Effective Date: 01-31-2014
UGS		

2.5 Application of Designs

- A. For structures with wall thickness of five inches or more:
 - SCE UG #4000—Floors, decks, and slabs
 - SCE UG #4001—Floors, decks, and walls
- B. For structures with wall thickness less than five inches:
 - SCE UG #4002
- C. For conduit envelopes:
 - see [CD 100](#).

2.6 Forms and Supports

- A. Forms will be smooth and in accordance with Greenbook Section 303–1.3, surface (if wood forms) treated with oil, well braced, and must be tight enough to prevent any leakage of mortar. They will hold the concrete in such manner that the finished structure conforms to the shape and dimensions specified. Tape or other impervious membrane covering will be used as necessary to obtain tight form joints.
- B. Earth surfaces, where used as forms, will be covered with a tough impervious membrane such as sisal kraft or a similar material. No such covering is required under floors except where the earth is porous and very dry or where ground water is present. Pours against earth surfaces will be allowed provided earth is dampened well prior to pour to avoid earth from removing moisture in concrete mix.
- C. Supports resting on the earth, and to become a part of the finished structure, will be precast concrete equal to that in the structure.
- D. Supports bearing on forms, and to become a part of the finished structure, will be iron or steel in appropriate shapes.
- E. Duct separators will be precast concrete or a suitable inorganic material, either ceramic or pressed, to serve the purpose.

2.7 Placing Reinforcement

- A. Metal surfaces will be clean and free of rust, scale, or other coatings such as might reduce bonding of the concrete.
- B. Reinforcement will be securely tied and in place before any concrete is poured in the structure except under the following conditions:
 - 1. Where cold joints are specified or allowable.

Approved by:	General Specifications for Concrete and Reinforced Concrete	GI 020
Effective Date:	What's Changed?	Sheet 5 of 8
01-31-2014		UGS

2. Roof sections having been assembled and placed may be removed as an entire section, temporarily, if this is feasible.

C. Tolerances for steel clearance and spacing:

1. Clearances of three inches or less will not be reduced but may be increased by one-half inch. Other clearances may vary one-half inch either way.
2. Location of reinforcing elements may vary up to two inches from that specified provided clearances are maintained and provided clear separation between adjacent parallel pieces, of less than two inches, is not reduced.

- D. Steel spacing pieces, chairs or similar supporting devices, will be used as necessary to assure conformance of steel locations specified within the allowed tolerance.

2.8 Preparation of Cold Joints

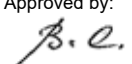
- A. The concrete surface to be joined will be clean and free of loose material.
- B. Sika seal or other specified material will be applied to form a sealing membrane.

2.9 Placing Concrete

- A. Concrete will be handled from mixer to place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients. It will be placed in such manner as to avoid any appreciable flowing after the final depositing.
- B. The placement will be continuous and at such rate that cold joints do not develop excepting where cold joints are specified or optional. Where cold joints occur, an approved bonding agent will be used.
- C. Steel and forms will be kept clean and free of concrete until covered with the pour.
- D. Platforms, drop chutes, sheeting and similar devices must be used as necessary to prevent segregation.
- E. Unless deposited by tremie or pipe (6 inches minimum diameter) concrete for vault and manhole walls will first be deposited at roof level, then shoveled and dropped carefully straight down in such manner that segregation does not occur.

2.10 Compaction

- A. Vibration compaction will be used with each design so specifying. Such compaction will be done with an approved, internal type, mechanical vibrator having a speed not less than 4,500 Revolutions-Per-Minute (RPM), operated and moved continuously by an experienced operator and augmented by rod tamping as necessary. Successive layers not more than 24 inches deep

GI 020	General Specifications for Concrete and Reinforced Concrete	Approved by: 
Sheet 6 of 8	What's Changed?	Effective Date: 01-31-2014
UGS		

will be placed and well compacted before placing each following layer. The vibrator will be inserted at about 18-inch intervals, will penetrate each layer completely and will penetrate a preceding layer at least 12 inches.

- B. Hand compaction will be used with each design so specifying. Such compaction will be done with tamping rods being worked continuously through the wet mass as placed. Successive layers of not more than 12 inches will be placed and well compacted before placing each following layer. Tamping rods will be used at the rate of one for each two yards per hour maximum rate of pouring. At least one man-hour of tamping will be performed in each two yards of concrete poured in vaults and manholes. At least one man-hour of tamping will be performed in each four yards poured for conduit bank envelopes or pull boxes.
- C. Compaction in the specified manner and at the required rate will be performed in all concrete poured. This includes floors and roofs of structures as well as walls and includes pads and conduit bank envelopes.

2.11 Surface Finishes

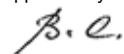
- A. Rock pockets and other imperfections on exposed surfaces will be patched and troweled to match the surrounding surface.
- B. Floors will be given a float or broom finish to provide a uniform but slightly rough surface.
- C. When a finish course is poured on concrete which has set, it will be at least two inches thick and in addition to the specified floor thickness.

2.12 Protection while Pouring and Curing

- A. Concrete will be placed with the temperature of the mix between 40° F and 90° F.
- B. When the ambient air temperature is below 40° F the concrete will be held to a temperature between 60° F and 90° F until set. Concrete will not be placed during freezing temperatures without special authorization.
- C. Protection will be provided as necessary to guard against freezing, premature drying, and any other conditions likely to be injurious to the concrete, until the specified strength is developed.
- D. Concrete will be cured in accordance with Greenbook Section 303-1.10. Curing will be continued for at least seven days except that this time may be reduced as authorized by the Company when "high early strength" cement is specified.

2.13 Removal of Forms

- A. Supporting forms will be left in place until the concrete has developed sufficient strength to be self-supporting without damage to itself. Outside shoring may be removed after 24 hours.

Approved by: 	General Specifications for Concrete and Reinforced Concrete	GI 020
Effective Date: 01-31-2014	What's Changed?	Sheet 7 of 8 UGS

B. The following are the minimum periods during which forms will be left in place when Type II cement is used and curing conditions are favorable:

1. 100 hours for roof supports
2. 100 hours for wall supports where the soil is not self-supporting
3. 75 hours for wall supports where the soil is self-supporting

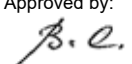
2.14 Purpose of Specification

The foregoing specifications are designed to produce a durable concrete with more than the specified minimum strength. The values and procedures specified are guides to be followed to obtain the required results and do not preclude in any manner such additional measures as may be necessary or advisable to secure such results, regardless of the results of any tests which may be made.

2.15 Rejected Installations

An installation may be rejected when:

- A. Samples taken while pouring, or core samples taken within three months thereafter, fail to meet the required strength.
- B. The specified concrete thickness has not been met in the structure.
- C. It is found that concrete has not been properly consolidated resulting in a porous structure.
- D. The water-to-cement ratio of the concrete is in excess of that specified regardless of strength or other tests made.
- E. Concrete has been poured with insufficient concrete cover over the reinforcing steel.
- F. Other requirements of this specification or other referenced specifications have not been met resulting in a structure which cannot take specified loads, may deteriorate, or which (for water-resistant structures) cannot keep water out.

GI 020	General Specifications for Concrete and Reinforced Concrete	Approved by: 
Sheet 8 of 8	What's Changed?	Effective Date: 01-31-2014
UGS		

GI 025 Steel Shape Dimensions

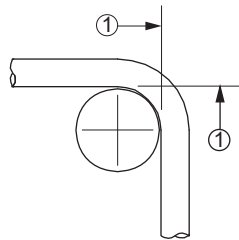
Scope GI 025.1 Steel Shape Dimensions

In general, inside and inside-to-inside dimensions will be shown. Multiple dimensions to a bend of less than 90 degrees in a piece will all be based upon one designated point on the inner surface of such bend. The diagrams illustrate the manner in which most common details will be dimensioned. These practices are applicable where this sheet is used as reference unless details are shown in some other manner.

1.0 Right Angle Bends

Show dimension to point of tangency extended as indicated by Dimension #1, [Figure GI 025-1 \(Sheet 1\)](#).

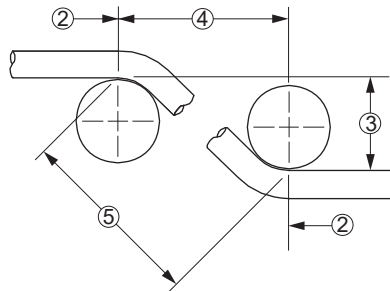
Figure GI 025-1: Steel Shape Dimensions — Right Angle Bends



2.0 Bends Less than 90°


Show dimension to point of tangency as indicated by Dimension #2, [Figure GI 025-2 \(Sheet 1\)](#).

Figure GI 025-2: Steel Shape Dimensions — Right Angle Bends



3.0 Offsets with Parallel Members

- 3.1 Show offset between points of tangency extended as indicated by Dimension #3, [Figure GI 025-2 \(Sheet 1\)](#).
- 3.2 Show run between perpendiculars to points of tangency as indicated by Dimension #4, [Figure GI 025-2 \(Sheet 1\)](#).
- 3.3 Omit Dimension #5.

Approved by: 	Steel Shape Dimensions	GI 025
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2 UGS

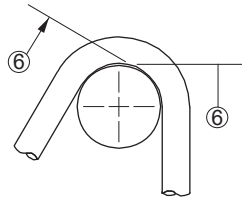
4.0 Offsets with Non-parallel Members


- 4.1 Show run as distance between perpendiculars, to direction of dimension, which pass through the points of tangency. This dimension will be similar to #4 in [Figure GI 025-2 \(Sheet 1\)](#) except one perpendicular will not pass through the center of a shaping pin.
- 4.2 Show diagonal dimension as indicated by Dimension #5, [Figure GI 025-2 \(Sheet 1\)](#).
- 4.3 Omit Dimension #3.

5.0 Bends More than 90°

Show dimension to perpendicular tangent to far face of shaping pin as indicated by Dimension #6, [Figure GI 025-3 \(Sheet 2\)](#).

Figure GI 025-3: Steel Shape Dimensions — Bends Less Than 90°



GI 025	Steel Shape Dimensions	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 01-26-2007
UGS		

GI 030 Specification for Precast Reinforced Concrete Structures

Scope GI 030.1 Specification for the Structural Design and Manufacturing of Precast Reinforced Concrete Structures

1.0 General

- 1.1 This specification outlines the minimum requirements for precast reinforced concrete vaults, manholes, slab boxes, pullboxes, and other wet cast precast structures. The structures will also conform to all applicable UGS standards and the requirements for the appropriate regulatory agencies.
- 1.2 A copy of design calculations and drawings approved by a civil engineer registered in California will be submitted for review and approval.
- 1.3 Exceptions to this specification will be made only with written authorization from SCE.
- 1.4 Vaults and manholes will be designed and constructed to be water tight.
- 1.5 Structure sizes, openings, recesses, and other accessories will conform to VA 400 (for vaults) and MH 300 (for manholes), HP 210 (for pullboxes) and SS 500 (for slab boxes and other subsurface structures).
- 1.6 All submittals for review and approval will be made to the Customer Service Engineering section of the Southern California Edison Company.
- 1.7 The structures will be warranted for one year against design and manufacturing defects including those resulting from poor workmanship and materials.
- 1.8 The structure design of precaster's vaults and manholes will be approved by Los Angeles County Department of Public Works, Design Division, Bridge Section.
- 1.9 All metal lifting devices cast into the internal or external surfaces of vaults or manholes by the precaster for handling or setting purposes will be hot-dipped galvanized or made from stainless steel.

2.0 Structural Design

- 2.1 Structural design will conform to the latest edition of the Standard Specifications for Highway Bridges as adopted by the American Association of State Highway and Transportation Officials (AASHTO) and ASTM C 857, the Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
- 2.2 The following loading assumptions are for vaults and manholes in general use on the SCE system. Designs for specific loading conditions may be submitted on an individual basis.
 - A. The design vehicle loads will be HS-20; traffic can approach the structure from any direction.
 - B. A 30% increase of design live load will be used for impact loading.
 - C. There will be a minimum of 24 inches of cover measured from the flow line of the gutter. See notes in [Scope GI 030.2 \(Sheet 6\)](#).

Approved by:	Specification for Precast Reinforced Concrete Structures	GI 030
Effective Date:	What's Changed?	Sheet 1 of 6
01-31-2014		UGS

D. Structures will be designed for vertical and lateral soil pressure based on the conditions found in the field and considering the rigidity of the structure. However, the minimum lateral soil pressures that may be used are 35 pounds per cubic foot (pcf) equivalent fluid pressure above the water table and 80 pcf equivalent fluid pressure below the water table.

E. The groundwater table will be assumed to be three feet below the finished surface.

2.3 The load factor method of design will be used.

2.4 Fatigue stress limits will be applied to traffic loads in accordance with section 1.5.38 of the ASSHTO specifications.

2.5 All vault and manhole walls, floors, and ceilings will have a minimum thickness of five inches.

3.0 Reinforced Concrete

3.1 Criteria for Normal Weight Concrete

A. Aggregates will meet the requirements of ASTM C 33. A certificate of compliance will be submitted by the aggregate producer. A petrographic analysis of aggregate will be submitted at least yearly, and with each change of aggregate source.

B. Concrete mix designs will be approved by a civil engineer registered in California, and will be submitted to SCE for review and approval.

C. ASTM C 150, Type II low alkali, or Type V low alkali cement will be used.

D. Class F flyash meeting the requirements of ASTM C 618 will be used. The recommended amount of flyash will not be less than 20% or more than 25% of the total cementitious weight (cement and flyash).

E. The minimum compressive strength of concrete will not be less than 4,500 pounds per square inch (psi) in 28 days as determined by the American Society for Testing Materials (ASTM) method C 39-72 Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens. Test specimens will be cured as per ASTM C 31. Slabs on grade may have 3000 psi concrete at 28 days.

F. The maximum water-cement or water-cementitious ratio will be 0.45.

G. Liquid admixtures meeting the requirement of ASTM C 494, type B, D, F, or G may be used in the mix in accordance with manufacturer's recommendations. No other admixtures will be used unless otherwise approved by SCE.

All concrete mixes for the utility boxes shall contain 4.0 gallons of calcium nitrite corrosion inhibitor per cubic yard of concrete, conforming to ASTM C494, Type C or Type S, Calcium Nitrite based with a solids content of 30%. The corrosion inhibitor shall be added in accordance with the manufacturer's instructions and/or recommendations.

GI 030	Specification for Precast Reinforced Concrete Structures	Approved by: <i>B. C.</i>
Sheet 2 of 6	What's Changed? The range for flyash was updated from 10 to 15% to 20 to 25%. A new paragraph regarding calcium nitrite was added.	Effective Date:
UGS		01-31-2014

- H. No additives containing calcium chloride or any other material that will produce corrosive ions will be used in the concrete. All additives will be submitted to SCE for approval prior to use.
- I. The concrete finish will be free of rock pockets and honeycombed areas. The interior walls and ceilings and exterior surfaces exposed to view will be smooth. The exterior surface below grade will be dense and uniform, but a slight roughness is not objectionable. Floors will have a form finish. Air holes over 3/8 inch deep will be patched.
- J. The concrete will be cured per the AASHTO specifications. Other methods may be acceptable if approved by SCE in writing.

3.2 Lightweight Concrete

Lightweight concrete is not approved for use in the manufacturing of any SCE structure.

3.3 Concrete Protection for Reinforcement

- A. The concrete protection (cover) for reinforcement will be 1-1/2 inches minimum for main reinforcing bars and 1 inch minimum for stirrups and ties, except at joints where there can be 1 inch minimum cover for main bars from concrete surfaces that will be treated with a waterproofing material.
- B. The cover to diameter of bar ratio will be a minimum of 2.0.
- C. The concrete cover will be measured from the surface of the concrete to the outside surface of the bar.

3.4 Reinforcing Steel

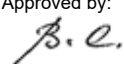
- A. Reinforcing steel will conform to the AASHTO specifications.
- B. Reinforcing steel will be accurately bent and placed and firmly tied.
- C. Reinforcing steel will be adequately supported in place by use of plastic or stainless steel chairs, or concrete blocks manufactured from concrete conforming to Section 3.1 (Sheet 2) of this specification. If concrete blocks are used, the tie wires will have a minimum cover of 3/4 inch.
- D. Welding of reinforcing steel will conform to the Structural Welding Code, Reinforcing Steel (AWS D1.4-79) of the American Welding Society.

4.0 Identification

All structures will be identified with manufacturer's name, date of manufacture, and nominal size or identifying number permanently attached to an interior surface of each precast concrete section.

5.0 Quality Control and In-Plant Inspection

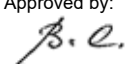
- 5.1 The supplier will have a quality control program including testing and inspection to ensure the quality of the product.

Approved by: 	Specification for Precast Reinforced Concrete Structures	GI 030
Effective Date: 01-31-2014	What's Changed?	Sheet 3 of 6 UGS

- 5.2 Precasters will submit a quality control plan for the Company's approval. Any proposed changes to the precaster's existing quality control plan will be submitted to Edison for review and approval before implementation. This plan will include 1) controlling concrete components (cement, aggregate, and water), 2) testing of concrete, 3) controlling concrete mixing, 4) controlling concrete placement and form stripping, 5) inspecting rebar, 6) controlling bending and placing of rebar, 7) inspection of the finished product, and 8) documenting and filing of test and inspection results.
- 5.3 In-Plant inspection by SCE
 - A. Vaults and manholes will be identified through all phases of construction as one that is to be used by Edison.
 - B. Edison inspectors will have access and assistance in inspecting the work. Inspectors will not be required to give prior notice of inspections.
- 5.4 The acceptance criteria for precast concrete vaults and manholes is given in [GI 031](#).
- 5.5 Variations and dimensional tolerances will be those specified in the latest ASTM C858, the Standard Specification for Underground Precast concrete Utility Structures, except that concrete cover over reinforcing steel will not be less than specified in Section 3.4 ([Sheet 3](#)) of this specification.

6.0 Installation

- 6.1 No precast structure will be shipped to the jobsite before the concrete has attained its full design strength.
- 6.2 The SCE inspector will be notified by the installing contractor 48 hours prior to the field installation of vaults and manholes.
- 6.3 Excavation and Rock Base
 - A. All excavations will be in accordance with safe construction practices.
 - B. Excavations for vaults and manholes will be of a depth to provide the minimum/maximum setting cover depths over the outside top of the structure roof as specified in notes in [Scope GI 030.2 \(Sheet 6\)](#).
 - C. A 6-inch minimum thickness of crushed aggregate, 3/8" x 3/4" crusher run rock, mechanically compacted will be placed below the vaults and manholes and extend to the sides of the excavation. Pullboxes will have 6 inches of compacted rock, 3/8" x 3/4", as a base to assure uniform pressure distribution.
 - D. The bottom of the excavation will be free of standing water.
 - E. There will be a minimum of 6 inches clearance from the outside perimeter of the structure walls to all side surfaces of the excavation.

GI 030	Specification for Precast Reinforced Concrete Structures	Approved by: 
Sheet 4 of 6	What's Changed?	Effective Date: 01-31-2014
UGS		

6.4 Backfill around and over the structure will be with a minimum of one sack per yard sand cement slurry, 1-1/2 sacks per yard for Cal Trans jobs. The surface elevation of the backfill slurry will not vary more than one foot around the perimeter of the structure as it is being placed.

6.5 Instructions

- A. If the manufacturer does not erect the structure, he will forward installation instructions and recommendations to the installing contractor.
- B. The contractor will install the structures in accordance with the manufacturer's instructions and recommendations.

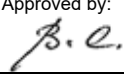
6.6 Joints

- A. All joints will be waterproofed using methods and sealing materials that have been specified by SCE. Changes to approved methods and materials will be submitted to SCE 90 days prior to use.
- B. Prime paint all joint surfaces of tunnel vaults prior to delivery to insure that approved joint sealing material will be retained in joint during structure installation.
- C. For tunnel type structures use mechanical or air wrenches per precast concrete supplier instruction, retightening after backfill.
- D. Joint sealing materials will be placed on each flat surface of the joint. Approved joint sealing material will be a minimum of 1-1/4-inch diameter. Approved joint sealants, General Sealant #5, RUB'R-NEK T-L-M, or equivalent.
- E. Vault/Manhole necking joints will have a 1/4 inch coat of bonding adhesive applied on the outside surface of the joint, after being adjusted to grade and before backfilling. The bond adhesive will extend two inches above and below each joint. (May be applied inside the structure when adjusting grade on existing vaults and manholes.)

UBA-18	2-88-1
ASTC Polymers	Saf-T-Co Supply
3207 W. Warner Avenue	1300 E. Normandy Place
Santa Ana, CA 92704	Santa Ana, CA 92705
(714) 966-2893	(714) 547-9975

6.7 Separation and Reinstallation of Structures

- A. Caution must be taken when it becomes necessary to remove a precast vault or manhole section after it has been set in place with joint sealants.
- B. When attempting to separate and/or lift structure sections, the individual section weight can greatly increase due to the adhesion of the joint sealant to the adjacent section. This increased weight can exceed the design limits of the precaster's cast-in-place lifting devices.
- C. Contact the precast manufacturers for recommended methods of separating the individual sections.

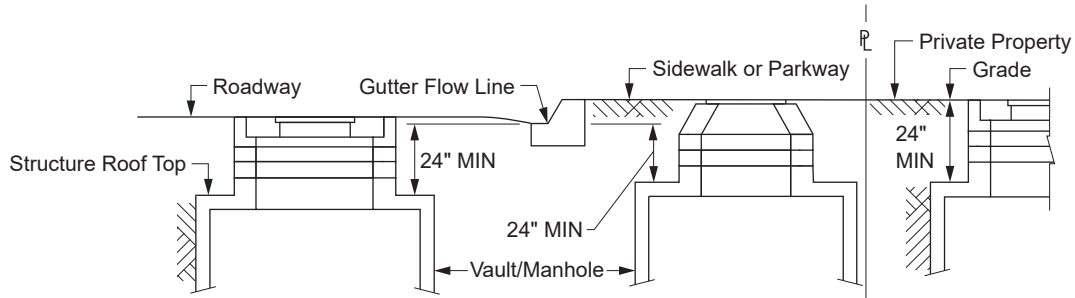
Approved by: 	Specification for Precast Reinforced Concrete Structures	GI 030
Effective Date: 01-31-2014	What's Changed?	Sheet 5 of 6
		UGS

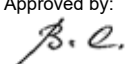
Scope GI 030.2 Setting Cover Depths for Tunnel/Tub Style Vaults and Manholes

Note(s):

1. Minimum setting cover depths for tunnel and tub style vaults and manholes installed in roadway or sidewalk/parkway locations is 24 inches. This dimension is taken from the gutter flow line to the outside top of the structure roof. Vaults or manholes placed in private property will have a minimum setting depth of 24 inches from grade to the outside top of the structure roof.
2. Maximum place cover depth is 48 inches, measured from grade to top outside surface of structure roof. If structure cover depths over 48 inches are required, contact the Division Underground Planning Supervisor.
3. The listed structure minimum/maximum setting cover depths are to Edison's requirements. Local governmental agencies may require greater cover depths than stated.

Figure GI 030-1: Setting Cover Depths for Tunnel/Tub Style Vaults and Manholes



GI 030 Sheet 6 of 6 UGS	Specification for Precast Reinforced Concrete Structures	Approved by: 
	What's Changed?	Effective Date: 01-31-2014

GI 031 Acceptance Criteria for the Installation of New Precast Vaults and Manholes

Scope GI 031.1 Acceptance Criteria for the Installation of New Precast Vaults and Manholes

1.0 Purpose

To set criteria for acceptability and repair of new precast concrete vaults and manholes from manufacture through the warranty period.

2.0 General

- 2.1 All repairs referred to in this criteria will be performed by the manufacturer in his yard and the supplier^{1/} in the field.
- 2.2 Repairs will be performed in accordance with SCE's [MC 860](#).
- 2.3 These procedures assume an adequate design is used per good, standard engineering practices, with sound materials and good workmanship conforming to the design. This criteria will not limit SCE's recourses if the above assumptions are not met.
- 2.4 Supplier will provide a one (1) year warranty on all repairs and patches.
- 2.5 The supplier will not be held responsible for damage that can be determined to be caused by unusual conditions outside of his control.


3.0 Actions While in Manufacturer's Yard

- 3.1 Neck, Covers, Roofs, Walls, and Floor Slabs.
 - A. Cracks .012 inch or wider will be repaired.
 - B. Any spalled concrete .375 inch deep or greater or exposed rebar will be repaired.
- 3.2 Major defects or multiple patches can be cause for rejection.

4.0 Actions from Delivery through the Warranty Period

- 4.1 Cover
 - A. The supplier will replace the cover if cracks develop, regardless of size, that run from one edge to another edge or to the manhole opening, or appears to go through the concrete or through a ladder insert.
 - B. The supplier will replace the cover if a crack .062 inch wide or greater develops.
 - C. All other cracks and concrete spalls .375 inch deep or greater will be repaired by the supplier.

^{1/} The supplier is the installing contractor.

Approved by: 	Acceptance Criteria for the Installation of New Precast Vaults and Manholes	GI 031
Effective Date: 10-26-2012	What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.	Sheet 1 of 2 UGS

4.2 Roofs, Walls, and Floor Slabs

- A. Cracks .012 inch wide or greater will be repaired.
- B. Concrete spalls .375 inch deep or greater or exposed rebar will be repaired.
- C. SCE's Engineering Department will determine the remedial action to be taken by the supplier for cracks .125 inch wide or greater, or extensive smaller cracking.

4.3 Water intrusion due to structure quality problems, or improper installation, can be cause for rejection.

GI 031	Acceptance Criteria for the Installation of New Precast Vaults and Manholes	Approved by: <i>PHH</i>
Sheet 2 of 2	What's Changed?	Effective Date:
UGS		10-26-2012

GI 035 Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)

Scope GI 035.1 Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)

Figure GI 035-1: Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)

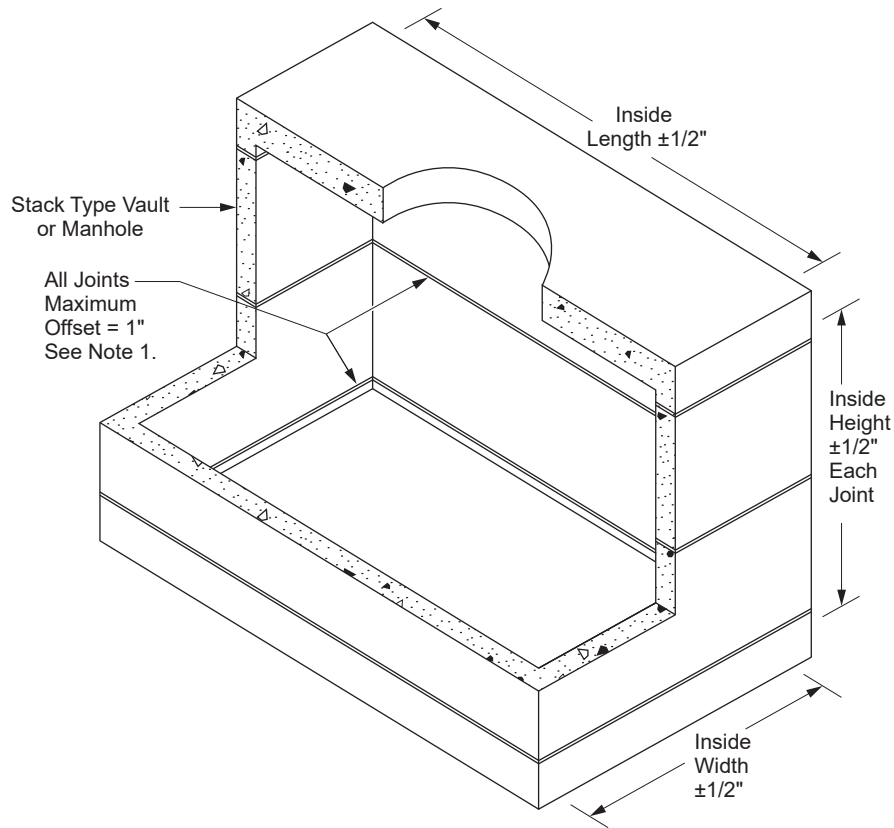



Figure GI 035-1.1

Approved by: 	Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)	GI 035
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2 UGS

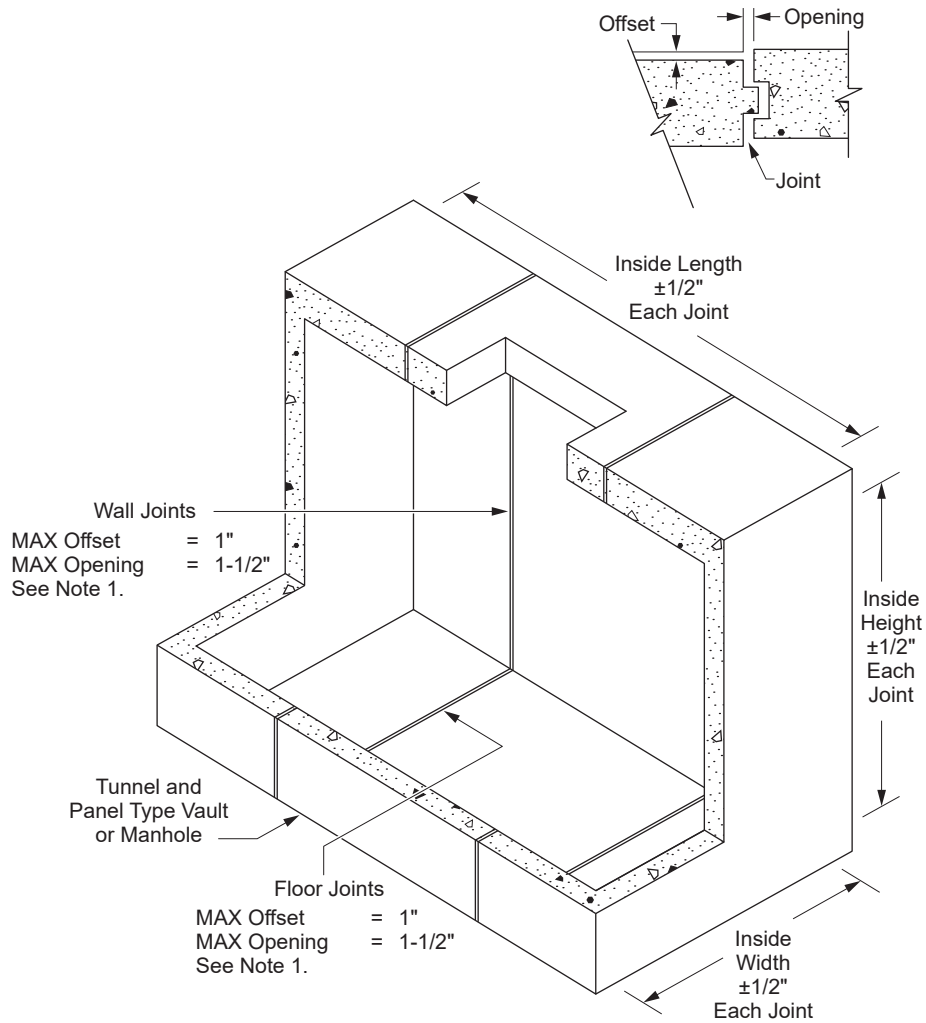


Figure GI 035-1.2

Note(s):

1. Openings between 1/2 inch and 1-1/2 inches and offsets between 1/2 inch and 1 inch will be feathered and grouted to an acceptable tolerance. Any values over these stated require the structure to be reset or replaced.
2. Due to manufacturing processes the top and bottom sections (stack type) and end sections (tunnel type) have an acceptable 1/2 inch per foot taper.
3. Corner tolerance on panel type structures is $90^\circ \pm 1^\circ$.
4. Bowing, in or out, in excess of 1/2 inch on any surface is not acceptable.
5. Tolerance on Unistrut or equal is $\pm 1/8$ inch center to center.
6. Any grouting of joints will be done after backfill and compaction, and after the sealant has been allowed to completely compress.
7. All repair and replacement is to discretion of Company.

GI 035

Maximum Allowable Tolerances for Installed Precast Vaults and Manholes (Inside Joint Surfaces)

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

01-26-2007

GI 040 General Specifications for Pull Rope and Pull Tape

Scope GI 040.1 General Specifications for Pull Rope and Pull Tape

1.0 General Description

These specifications cover the minimum requirements for pull ropes and pull tapes to be installed in the Southern California Edison Company's conduit systems. The pull rope and tape are generally provided and installed by company contractors, but may be installed by others. The rope or tape will be used by the Company to pull "bull" lines into the conduit system during the installation of electrical distribution cable.

2.0 Material

Pull ropes will be manufactured from a polypropylene material. The rope may be either braided or twisted. The pull rope may be single-strand or three-strand, but not two strand. Pull tapes will be manufactured from a woven polyester.

The rope and tape must maintain its strength and flexibility when exposed to water and corrosive conditions over extended periods of time.

3.0 Size and Strength

For conduit runs, pull ropes will have a minimum diameter of 3/8 inch and a minimum average tensile strength of 3,000 lb. A contrasting tracer color (one or more yarns in a single strand) may be included to identify the manufacturer. Use a minimum of 3/8 inch diameter pull rope regardless of conduit run lengths.

Pull tape shall be used for conduit sizes smaller than 4 inches, and will be approximately 3/4-inches wide with a 2,500 lb tensile breaking strength. The tape will include accurate sequential footage markings for measuring conduit run length. Pull rope is required in conduit sizes of 4", 5", and 6". Where the conduit is stubbed out to be picked up later, the pull tape must be secured outside the stub end of the conduit per [UGS CD 148](#), Note 5.

4.0 Reel and Spool Marking


All reels and spools will be clearly marked to show manufacturer and size in inches. The standard Edison pull tape reel size is 1,500 feet (SAP 10148986).

5.0 Suppliers

- Maydwell & Hartzell
- General Electric Supply
- The Shamrock Company (714) 547-4422

6.0 Pull Tape Manufacturers

- Neptco
- Redback

Approved by: 	General Specifications for Pull Rope and Pull Tape	GI 040
Effective Date: 10-23-2015	What's Changed? Minimum size for pull rope will be 3/8 inch diameter regardless of conduit run length.	Sheet 1 of 1 UGS

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GI 045 General Specifications for Plowing Cable

Scope GI 045.1 General Specifications for Plowing Cable

These general specifications are intended as a guide to minimum requirements for installing direct buried cable by the plow method. All specific requirements shown on working drawings, governmental permits, and all applicable city, county, and state ordinances will also be complied with.


Reference to Company in this specification will mean the Southern California Edison Company; reference to contractor will mean the organization performing the specified work.

1.0 Contractor Responsibilities

- 1.1 The contractor will furnish all equipment, labor, tools, and supervision necessary to place the cable.
- 1.2 Any damage to substructures, equipment, or plant which is caused by the contractor will be repaired by and at contractor's expense and to the satisfaction of the Company.
- 1.3 Any settling or washout of the trench area due to improper cable installation within one year of acceptance of work will be repaired by and at the contractor's expense and to the satisfaction of the Company.
- 1.4 The contractor will transport Company furnished material as referenced on the working drawing from the designated storage area to the job site. The contractor will be responsible for the safe keeping of all cable, reels, and all other material after leaving the storage area. Following completion of work, all reels and excess material not installed are to be returned to the storage area.

2.0 Construction Requirements

- 2.1 Installation of the cable will generally be from the higher elevation to the lower elevation when terrain is mountainous.
- 2.2 Cable will be installed to 36 inches minimum depth. Minimum cover at water crossings (specified on the working drawings) will be 60 inches. At those locations, sand bagging to a height of two feet above grade will extend the full width of the watercrossing.
- 2.3 Cable route will be pre-ripped to minimum cable depth and in the same direction as the cable is to be installed.
- 2.4 Cable route that cannot be ripped will be trenched prior to plowing to permit continuous cable installation.
- 2.5 All cable will be installed in the same trench with the initial plow pass.
- 2.6 Water deflection berms (dikes) consisting of sand bags will be installed at 60° to the trench on all slopes at intervals not to exceed ten feet vertical difference in elevation or as directed by the Company. Berms or dikes will extend beyond the trench area sufficiently to prevent water flowing back into the trench. Trench plugs, consisting of stabilized earth (one part cement to ten parts earth) in burlap sacks, will be installed at locations specified on the working drawings. Plugs will extend the full depth of the cable trench.

Approved by: 	General Specifications for Plowing Cable	GI 045	
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 3	UGS

When applicable, water deflection berms will also meet or exceed all local ordinances or other requirements of local governing agencies.


- 2.7 Marker posts are to be installed 30 inches above grade at angle points in route, at both sides of each road crossing, and otherwise at intervals not to exceed 500 feet. Posts and signs will be furnished by the Company.
- 2.8 A trench will be provided at splicing points to permit make up of splices. Unless specified otherwise, an 8" x 36" x 36" deep concrete splice box will be installed at each splice point. Splice boxes will be buried 6 to 12 inches with a 3-inch diameter, 5-foot length HDG pipe marker placed 5 feet to the side and 30 inches above grade at each box. Each marker will be identified on the side facing the box with the words "Splice Box, 5 Feet" stamped into the pipe.
- 2.9 Excavations, not to exceed five per mile, may be required by the Company to determine depth and bedding of the cable.
- 2.10 Upon completion of plowing, excavation, and backfill, the ground surface will be restored to a condition as least as good as it was previous to start of work. All applicable local compaction requirements will be met. If required by permit, the route will be replanted or seeded.

3.0 Plow Requirements


- 3.1 Plows will have sufficient drawbar pull to install cables in one pass (after ripping). Raising and lowering the feed shoe to by-pass rock or other obstacles will not be permitted.
- 3.2 Plow will accommodate a minimum of two reels with maximum diameters of 78 inches, maximum widths of 54 inches and an approximate weight of 3,000 lb each. A third reel, when required, may be towed on a separate reel dolly.
- 3.3 Cable will not be permitted to pass over stationary guides, rollers, or sheaves which will permit a bend radius of less than 15 times the cable diameter.
- 3.4 Cable will be fed into the ground in a manner to prevent stress upon the cable.
- 3.5 Cable reels will have a tension governing device to pay out cable evenly (without tension). A reel tender operator may be substituted.
- 3.6 Cable will be protected from damage at all times. Guards will be provided over engine exhausts and the feed shoe fabricated such that the cable will not bear or "ride" upon rock or other obstructions.

4.0 Company Responsibilities

- 4.1 The Company will furnish all necessary permits.
- 4.2 The Company will furnish materials as specified on working drawings at the designated storage areas.
- 4.3 The Company will perform all cable splicing and testing.

GI 045	General Specifications for Plowing Cable	Approved by: 
Sheet 2 of 3	What's Changed?	Effective Date: 01-26-2007
UGS		

- 4.4 The Company will inspect work in progress. The contractor is responsible for informing the Company 24 hours in advance of any cable installation. Final acceptance will be based on electrical tests of cable performed by the Company.

Approved by: 	General Specifications for Plowing Cable	GI 045
Effective Date: 01-26-2007	What's Changed?	Sheet 3 of 3 UGS

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GI 050 Specification for Abandoning Substructures

Scope GI 050.1 Specification for Abandoning Substructures


1.0 Substructures

- 1.1 All portions of the substructure within four feet of grade will be removed, unless otherwise specified.
- 1.2 Sufficient holes will be knocked through the floor to allow satisfactory drainage of the fill material.
- 1.3 The substructure will be filled completely with sand or other material acceptable to the inspector.
- 1.4 Vents will be cut off a minimum of one foot below ground level and filled. When filling is not practical, the vent will be capped.



NOTE

Some abandoned materials may be reusable. Consult the Underground Construction Manager for status of covers, grates, and so on. Any plant to be abandoned will be called out on the working drawing.


Approved by: 	Specification for Abandoning Substructures	GI 050
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1 UGS

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Conduits

Table of Contents


Standard	Title
CD 100	Conduit Installation Standards
CD 100.1	Conduit Installation Standards
CD 101	Conduit Bank and Terminal Requirements
CD 101.1	Conduit Bank and Terminal Requirements
CD 110	Conduits and Fittings
CD 110.1	Conduits
CD 110.2	Fittings
CD 111	"Y" Fittings
CD 111.1	"Y" Fittings
CD 112	Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings
CD 112.1	Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings
CD 115	Manufacturer's Requirements
CD 115.1	Approved Manufacturers for Plastic Conduit
CD 115.2	Requirements for Semi-Rigid PVC Plastic Conduit
CD 115.3	Manufacturer's Minimum Inspection and Testing Requirements for Semi-Rigid PVC EB/DB Conduits
CD 120	Conduit Bank Requirements
CD 120.1	Conduit Bank Requirements
CD 120.2	Residential Conduit Bank Requirements
CD 120.3	Conduit Bank Requirements for CIC
CD 121	Conduit Bank Requirements – Installation in a Bore
CD 121.1	Conduit Bank Requirements – Installation in a Bore
CD 121.2	Conduit Spacers
CD 122	Conduit Beam Reinforcement
CD 122.1	Conduit Beam Reinforcement

Approved by: 	Conduits Table of Contents	CD
Effective Date: 04-30-2021		Sheet i
		UGS

Standard	Title
CD 125	Directional Boring Installation Standards
CD 125.1	Directional Boring Installation Standards
CD 130	Standard Conduit Entrance Details
CD 130.1	Standard Conduit Entrance Details
CD 131	Standard and Special Conduit Entrances
CD 131.1	Standard and Special Conduit Entrances
CD 132	Conduit Entrances to Pull Boxes
CD 132.1	Conduit Entrances to Pull Boxes
CD 133	Corner Conduit Entrance Details — Manhole or Vault
CD 133.1	Corner Conduit Entrance Details — Manhole or Vault
CD 134	Conduit Terminators
CD 134.1	Conduit Terminators
CD 135	Typical Installation of Precast Pull Box in Main Line Conduit
CD 135.1	Typical Installation of Precast Pull Box in Main Line Conduit
CD 140	Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger
CD 140.1	Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger
CD 141	Conduit Recess Layout — Precast Concrete Vaults — 7' x 10', 8' x 10', and Larger
CD 141.1	Conduit Terminators
CD 142	Conduit Terminators for Precast Tunnel Vaults
CD 142.1	Conduit Terminators for Precast Tunnel Vaults
CD 144	Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned
CD 144.1	Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned
CD 146	Intercepting Existing Conduit Runs
CD 146.1	Intercepting Existing Conduit Runs
CD 148	Capping Main Line Conduit
CD 148.1	Capping Main Line Conduit

CD	Conduits Table of Contents	Approved by: <i>RR</i>
	Sheet ii	Effective Date: 04-30-2021
UGS		

Standard	Title
CD 150	Service Lateral Terminations
CD 150.1	Service Lateral Terminations
CD 160	Pole Riser Bend Standard Location
CD 160.1	Pole Riser Bend Standard Location
CD 161	Pole Riser Bend for Risers on Kicker Blocks
CD 161.1	Pole Riser Bend for Risers on Kicker Blocks
CD 162	Neutral Wire Riser Installation for Four-Wire Systems
CD 162.1	Neutral Riser Wire Installation for Four-Wire Systems
CD 163	Communication Conduit and Riser Bend Installation
CD 163.1	Communication Conduit and Riser Bend Installation
CD 164	Specification for Abandoning Conduit and Risers
CD 164.1	Specification for Abandoning Conduit and Risers
CD 166	Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends
CD 166.1	Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends
CD 170	Riser Bend Installation at Wall or Pad
CD 170.1	Riser Bend Installation at Wall or Pad
CD 172	Underground Risers in Substation
CD 172.1	Underground Risers in Substation
CD 175	Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard
CD 175.1	Typical Conduit and Riser Bend Installation for Service to One Streetlight Standard
CD 175.2	Typical Conduit and Riser Bend Installation for Handhole through Service to Streetlight Standards
CD 175.3	Typical Conduit and Riser Bend Installation Loop through Service to Streetlight Standards
CD 177	Riser Conduit Lower Terminal (Anchor for Cable Support)
CD 177.1	Riser Conduit Lower Terminal (Anchor for Cable Support)
CD 180	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures
CD 180.1	Blank Conduit Plugs
CD 180.2	Conduit Plug and Riser Cap

Approved by: 	Conduits Table of Contents	CD
Effective Date: 04-30-2021		Sheet iii
		UGS

Standard	Title
CD 190	Supports for Conduits on Bridges
CD 190.1	Exterior Supports — General Fabrication and Installation Guide
CD 191	Expansion Joint for Plastic Conduit
CD 191.1	Expansion Joint for Plastic Conduit
CD 192	Expansion Joint for HDG Conduit on Bridges
CD 192.1	Expansion Joint for HDG Conduit on Bridges
CD 197	Conduit Mandrels — Type I and Type III
CD 197.1	Conduit Mandrels — Type I and Type III

CD	Conduits Table of Contents	Approved by: <i>RR</i>
Sheet iv		Effective Date: 04-30-2021
UGS		

CD 100 Conduit Installation Standards

Scope CD 100.1 Conduit Installation Standards

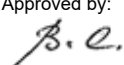
The following standards cover the methods to be used in performing the work essential to the installation of conduit for the Southern California Edison Company. Reference to Company herein will be interpreted as the Southern California Edison Company, and reference to Contractor will be interpreted as the organization or party performing the specified construction.

1.0 Conduit

- 1.1 Conduit will consist of one of the types specified in [CD 110](#) or a Company approved equal. In known water or subsidence areas, semi-rigid plastic conduit will be used.
- 1.2 All rigid conduit will be carefully aligned and laid to a uniform grade as specified on the plan or profile of working drawings. A slight degree of snaking will be permitted with flexible and semirigid plastic conduit.
- 1.3 A minimum conduit coverage of 30 inches will be maintained unless otherwise specified.
- 1.4 When conduit is located in streets drained by gutters, cover is to be determined from flow line of gutter.
- 1.5 No conduit will be installed that is cracked, damaged, or contains any roughness that would injure the cable jacket.
- 1.6 All questionable conduit to be installed will be tested for passage of mandrel prior to installation. Any conduit not permitting passage of mandrel will be rejected.
- 1.7 All conduit banks requiring concrete encasement will be adequately held in place to prevent floating during installation. Edison inspectors will approve conduit construction prior to placing concrete.
- 1.8 General
 - A. All joints on semirigid plastic and rigid PVC conduits will be made with solvent cement in accordance with manufacturer's recommendations and [CD 112](#). A watertight seal is required at all joints.
 - B. When directional boring, a locking watertight joint may be used and does not require solvent cement. Joint will be made per manufacturing installation instructions.
 - C. Conduit supplier is to provide up-to-date joining instructions with conduit delivery.
 - D. Edison inspector is to verify type and date of solvent cement prior to application of semirigid plastic and rigid PVC conduit.

2.0 Conduit Entrances, Terminations, and Connections

- 2.1 Conduit will be terminated in substructures as follows:
 - A. Flush with face of recesses including reduced conduit sizes with cast in terminators, [CD 142](#);

Approved by: 	Conduit Installation Standards	CD 100	
Effective Date: 10-23-2015	What's Changed?	Sheet 1 of 9	
		UGS	

B. With end bells if terminated other than in a recess [CD 134](#) (Exception: Floorless structures.);

C. End bells may be omitted on conduit connecting substructures less than 10 feet apart.

2.2 Metal conduit will be terminated in substructures with galvanized conduit bushings unless otherwise specified.

2.3 Care must be taken to maintain roundness of conduit at terminations.

2.4 Grout conduit at outside wall. Encase per [CD 112](#).

2.5 Edison inspector is to be present during installation of all conduit entrances and terminations.

2.6 All terminations will be in end walls of structures. Side wall terminations and core drilling are not permitted except where no alternative exists and with SCE approval.

3.0 Excavation

3.1 Excavation will be fully protected against hazard to the public and will be braced to prevent caving. Proper protective measures will be used where excessive caving is encountered or where protection is required for adjacent structures or roads. The requirements of the California State Construction Safety Orders and OSHA will be complied with.

3.2 The Company reserves the right to specify when protective measures for excavation must be employed.

3.3 Contractor will provide walkways and/or roadways around and over excavations to safely accommodate traffic, both along streets and into adjacent buildings. Such structures will conform with existing local regulations.

3.4 Trench subgrades will be brought to a uniform grade. Subgrade of spongy, unstable, or other unsuitable material will be removed and replaced with suitable bedding material.

3.5 Where rocks are encountered during excavation, they will be removed to 0.6 inches below the trench bottom and the conduit structure laid on a bed of compacted sand.

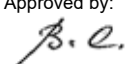
3.6 Special care will be taken to prevent damage to existing buried structures and facilities. Contractors will assume responsibility for proper notification and restitution to interested parties in the event of damage to existing structures.

4.0 Buried Neutral Wire, Bond Wire, and Ground Wire

4.1 Neutral wire is required in conduit banks as specified in DDS-2.

4.2 Any ground wire required will be supplied by the contractor.

4.3 On joint construction with telephone, a bond wire may be required between telephone and Edison substructures. (Consult working drawings.) Install bond wire in conduit bank, bring through recess, and attach to grounding bar at substructure floor.

CD 100 Sheet 2 of 9 UGS	Conduit Installation Standards	Approved by: 
	What's Changed?	Effective Date: 10-23-2015

4.4 Telephone company to furnish No. 6 solid-tinned copper-bond wire and clamp when required.

5.0 Mechanical Protection

5.1 Concrete encasement or semi-encasement, as specified, is required on all rigid and semirigid conduit (except Hot Dip Galvanized [HDG] and schedule 80 PVC). Encasement will be per [CD 120](#). DB-type conduit with no encasement may be installed only where specified on the working drawings. Extreme care must be taken to prevent conduit collapse when installing DB and EB type conduit.

5.2 Conduits

- A. Full concrete encasement, when specified, will have a minimum concrete coverage of three inches on top, bottom, and sides of the conduit.
- B. Concrete semi-encasement, when specified, will have a minimum of concrete coverage of three inches on top and sides of the conduit.

5.3 No concrete cap or encasement of any type will be poured without prior notice to the Company Inspector.

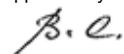
5.4 Concrete for conduit bank protection may have the following minimum proportions:

- A. Water content sufficient to give a minimum slump of two inches and maximum of four inches;
- B. Aggregate content of a maximum of 40 percent sand by weight and a coarse aggregate of 3/8-inch maximum size;
- C. Cement content will be a minimum of 190 pounds per cubic yard.;
- D. Compaction may be by any suitable means that assures elimination of voids and does not damage the conduit;
- E. Water reducing admixture ASTM C494 Type A will be used to increase the workability of the concrete. Admixtures with calcium chloride are not acceptable. Admixtures will be applied per manufacturer recommendations.;
- F. Artificial color is not required.

6.0 Backfill

6.1 Conduit Bedding

- A. Bedding will be defined as that material supporting, surrounding, and extending to one foot (305 mm) above the facility.

Approved by: 	Conduit Installation Standards	CD 100
Effective Date: 10-23-2015	What's Changed?	Sheet 3 of 9 UGS

- B. Where mechanical protection is not used, bedding material will be clean sand, pea gravel, or native free-draining granular material having a sand equivalent of not less than 30 or having a coefficient of permeability greater than 1.4 inches/hour.^{1/} Clean sand may be jetted where permitted.
- C. Where concrete protection of conduit is used, six inches of well-dampened earth will be placed over concrete protection in the trench two hours after the concrete is poured. Backfilling of the trench excavation may then be completed.
- D. Conduit bedding will meet the requirements of Section 5.0 (Sheet 3).

6.2 Backfill — General

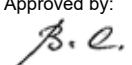
- A. Backfill will be considered as starting one foot (305 mm) above the pipe or conduit, or at the top of concrete bedding over the pipe or conduit. All material below this point will be considered bedding.
- B. All backfill will be placed as specified in Section 6.3 (Sheet 4) and compaction requirements will be in accordance with Section 6.4 (Sheet 5).
- C. Rocks greater than six inches (152 mm) in any dimension will not be permitted in backfill placed between one foot (305 mm) above the top of any pipe or conduit and one foot (305 mm) below pavement subgrade.
- D. Rocks greater than two and one-half inches (64 mm) in any dimension will not be permitted in backfill placed within one foot (305 mm) of the pavement subgrade.
- E. The native material obtained from project excavations may be used as backfill provided that all organic material, rubbish, debris, and other objectionable material are first removed. Backfill soil will be approved by the governing agency.

6.3 Mechanically Compacted Backfill^{2/}

- A. Backfill will be mechanically compacted by means of tamping rollers, vibrating rollers, stompers (impact-type pavement breakers), wackers, or other hand-held mechanical tampers.
- B. Prior to mechanically compacting backfill, determine proper moisture content of soil. Optimum moisture in all soil types is desirable for obtaining required compaction.
- C. Material for mechanically compacted backfill will be placed in horizontal layers of thickness or lifts, which, prior to compaction, will not exceed the thickness specified below for the various types of equipment.
 - 1. Hand-directed mechanical tampers and walk-behind vibratory plates — maximum uncompacted lift thickness of four inches (102 mm).

^{1/} Standard Specifications for Public Works Construction, 1997 Edition (*Greenbook*), Subsection 306-1.2.1

^{2/} *Greenbook*, Section 306-1.3

CD 100	Conduit Installation Standards	Approved by: 
Sheet 4 of 9	What's Changed?	Effective Date: 10-23-2015
UGS		

- 2. Rolling equipment, including sheepsfoot (both vibratory and nonvibratory), grid, smooth-wheel (nonvibratory), pneumatic-tired and segmented wheels — maximum uncompacted lift thickness of one foot (305 mm).
 - 3. Impact, free-fall, or stomping equipment — maximum uncompacted lift thickness of three feet (914 mm).
 - D. Mechanically compacted backfill will be moistened or dried as necessary to obtain optimum moisture level (plus or minus two percent). Each layer will be evenly spread and compacted until the specified relative compaction has been attained.
 - E. Method of measuring relative compaction and any test requirements will be in accordance with agency permit requirements.
- 6.4 Backfill Compaction Requirements^{3/}

Backfill will be densified to the following minimum relative compaction. See [Figure CD 100-1 \(Sheet 8\)](#).

A. 85% Relative Compaction:

- 1. Between subgrade and the upper three feet (914 mm), measured from the pavement surface (or finished grade where there is no pavement);
- 2. Outside the traveled roadway, shoulders, and other paved areas;
- 3. Under sidewalks.

B. 90% Relative Compaction:

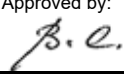
- 1. In upper three feet (914 millimeters), measured from the pavement surface (or finished grade where there is no pavement), within the existing or future traveled roadway, shoulders, and other paved areas (or areas to receive pavement);
- 2. Within engineered embankments;
- 3. Where lateral support for existing or proposed structures.

C. 95% Relative Compaction:

- 1. Within State Highways;
- 2. Where pavement is placed directly on the compacted backfill, the top six inches (152 mm) immediately under the pavement will meet this requirement.^{4/}

^{3/} Greenbook, Subsection 306-1.3.4

^{4/} Greenbook, Subsection 301-1.3

Approved by: 	Conduit Installation Standards	CD 100
Effective Date: 10-23-2015	What's Changed?	Sheet 5 of 9
		UGS

6.5 Sand Slurry Backfill

All trenches 10 inches or less in width and other trenches when directed by SCE or as required by agency permit and as required elsewhere in this specification will be backfilled using sand slurry with a minimum one sack per cubic yard of cement.^{5/} California Department of Transportation jobs requiring sand slurry backfill will have minimum 1-1/2 sacks per cubic yard of cement.

6.6 Base

- A. Base material will be reconstructed to the same dimensions (thickness, and so forth) and with the same or equivalent materials used in the original work.
- B. Where the original thickness is six inches (152 mm) or less, the base material may be compacted in one layer. Where the original thickness is more than six inches (152 mm), the base material will be compacted in two or more lifts of approximately equal thickness and the maximum compacted thickness of any one layer will not exceed six inches (152 mm).
- C. The relative compaction of each layer of compacted base material will not be less than 95 percent.^{6/}

7.0 Pavement Resurfacing

7.1 Temporary Resurfacing^{7/}

- A. Unless permanent pavement is placed immediately, temporary pavement will be placed immediately after backfilling. Temporary bituminous resurfacing two inches (51 mm) thick will be placed and maintained wherever excavation is made through pavement or driveways. In sidewalk areas, the temporary resurfacing will be at least one inch (25 mm) thick; in all other areas it will be at least two inches (51 mm) thick. At major intersections and other critical locations a greater thickness may be required.
- B. Placement of permanent resurfacing will be performed within two weeks after the placement of temporary resurfacing unless otherwise specified by the governing civil agency.

7.2 Permanent Resurfacing — General^{8/}

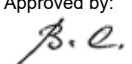
All surface pavement damaged or removed as a result of the excavation work will be reconstructed to the same dimensions, except for pavement thickness below, and with the same type material used in the original work. Resurfacing will be one inch (25 mm) greater in thickness than existing pavement.

^{5/} Greenbook, Mix 100-E-100 per Substation 201-1.1.2

^{6/} Greenbook, Subsection 301-2.3

^{7/} Greenbook, Subsection 306-1.5.1

^{8/} Greenbook, Subsection 302-5.6.2, 306-1.5.2

CD 100	Conduit Installation Standards	Approved by: 
Sheet 6 of 9	What's Changed?	Effective Date: 10-23-2015
UGS		

7.3 Asphalt Pavement

- A. Edges of the surface surrounding a patch repair must be free of water, foreign material, or dust. The prepared edges should be tack coated to ensure a bond between them and the patch material. Enough time should be allowed for the emulsion to “break” and most of the water to dry out before the patch-mix is placed.
- B. Asphalt pavement will be compacted to a density of 95 percent. To ensure a good surface seal along the cut (joint) line, a four-inch (102 mm) wide band of emulsion will be applied over the joint at the surface level, covered with a light coating of sand.
- C. Upon completion, the pavement will be true to grade and cross section. When a ten-foot (3.05 m) straightedge is laid on the finished surface parallel to the centerline of the excavation, the surface will not vary from the edge of the straightedge more than 1/8" (3.17 mm).

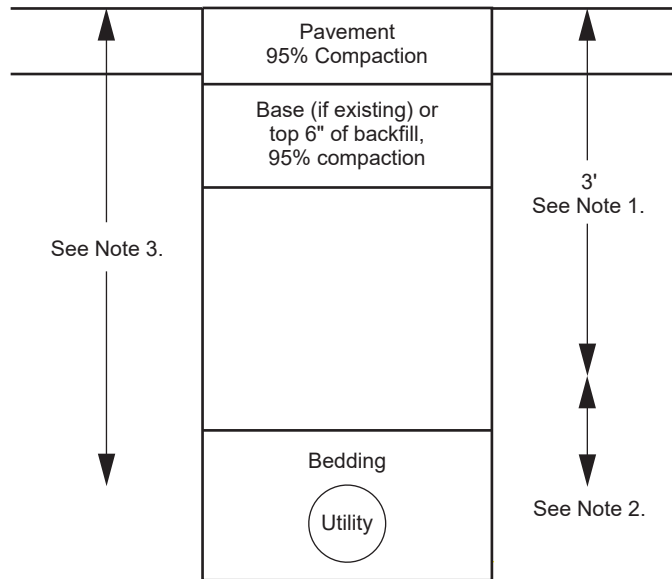
7.4 Concrete Pavement

- A. Concrete will be reconstructed with the same type of material used in the original work or approved substitute. Concrete will be placed on a subgrade sufficiently dampened to ensure that no moisture will be absorbed from the fresh concrete.
- B. Immediately after being mixed, the concrete will be deposited on the subgrade to the required depth over the entire width of the section.
- C. The concrete surface will be finished true to grade and cross section. Upon completion, the surface will be free of any unevenness greater than 1/8" (3.17 mm) when checked with a ten-foot (3.05 m) straightedge placed on the surface of the pavement.^{9/}

^{9/} Greenbook, Subsection 302-6.4.1

Approved by: 	Conduit Installation Standards	CD 100
Effective Date: 10-23-2015	What's Changed?	Sheet 7 of 9 UGS

Figure CD 100–1: Backfill Minimum Relative Compaction



Note(s):

1. Upper three-foot zone — backfill material will be minimum 90% relative compaction, per Section 6.4 (Sheet 5).
2. Below 3' to utility — backfill material will be minimum 85% relative compaction, per Section 6.4 (Sheet 5).
3. The overall cover (depth), utility clearances, and construction are governed by the California Public Utilities Commission.

8.0 Mandrelling, Cleaning, and Pullrope Installation

- 8.1 All mandrelling must be done in the presence of the Company Inspector.
- 8.2 A mandrel will be pulled through each conduit upon completion of the duct bank and compaction of the trench backfill.
- 8.3 The mandrel must be sized to the smallest inside conduit diameter for a straight or riser conduit run.
- 8.4 All cement, sand, and foreign matter will be removed. If obstructions are found that cannot be removed by cleaners so as to pass the specified mandrel, the conduit will be removed and relaid at the Contractor's expense.
- 8.5 Conduits will have a minimum of 3/8-inch diameter polypropylene pull rope, with a minimum breaking strength of 3,000 pounds (GI 040). The pull rope will be left in each conduit. Another option besides the use of ropes for conduits smaller than 4 inches is pull tape approximately 3/4" wide with a 2,500 lb tensile breaking strength. (See GI 040.) A three-foot length of rope or tape will be left projecting from the conduit at each substructure, and securely tied there. Where the approved conduit plug is used (CD 180), the rope or tape will be securely tied to it.
- 8.6 All pull rope and pull tape will be new. Used ropes and tapes are not acceptable.

CD 100

Conduit Installation Standards

Approved by:

B. C.

Sheet 8 of 9

What's Changed? Section 8.5 was modified to change minimum pull rope diameter to be 3/8-inch. Added clarification to Figure CD 100-1.

Effective Date:

10-23-2015

UGS

9.0 Railroad Crossings

9.1 All conduit within railroad rights-of-way must have a minimum of four feet of cover from bottom of rail.

9.2 When specified on the working drawing, the following is required:

- A. HDG conduit (or steel casing) when under the rail bed;
- B. Full concrete encasement ([CD 120](#)) on conduit not under the rail bed;
- C. Installation of marker signs (furnished by Edison) at designated locations;
- D. Installation of a marker tape (Alarmoline, Cat. No. AL-6100-YE) directly above conduit, one foot below grade. (Supplier: Maydwell & Hartzell, Inc., 6400 Corvette Street, Los Angeles, CA 90040.)

Approved by: 	Conduit Installation Standards	CD 100
Effective Date: 10-23-2015	What's Changed?	Sheet 9 of 9 UGS


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CD 101 Conduit Bank and Terminal Requirements

Scope CD 101.1 Conduit Bank and Terminal Requirements

Each conduit installation will be in conformance with the requirements set forth in the drawings, specifications, schedules, and tabulations referred to below.

1. Concrete in accordance with [CD 100](#)
2. Concrete envelope, complete or partial, in accordance with [CD 120](#)
3. Conduit material in accordance with [CD 110](#)
4. Conduit entrance into underground structure to be in accordance with [CD 100](#), [CD 130](#), [CD 131](#), [CD 132](#), and [CD 133](#)
5. Conduit stub-outs in main line trench in accordance with [CD 148](#)
6. Service lateral stub-outs in accordance with [CD 150](#)
7. Riser end of riser conduits in accordance with [CD 161](#), [CD 160](#), [CD 162](#), [CD 163](#), [CD 170](#), or [CD 172](#)
8. Vault, manhole, and pull box terminals of pole riser conduits in accordance with [CD 177](#), when so noted on working drawings
9. Conduit alignment in accordance with [CD 100](#)
10. Conduit depth in accordance with [CD 100](#)

Approved by: 	Conduit Bank and Terminal Requirements	CD 101
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1 UGS

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CD 110 Conduits and Fittings

Scope CD 110.1 Conduits

1.0 Conduits

1.1 Unless otherwise specified on the working drawing, all of the below listed conduit types are approved for use on the Edison system.

Table CD 110-1: SCE Approved Conduit Types

Conduit	Type	Application	
		Concrete Encasing	Direct Buried
Semi-Rigid Plastic (PVC)	EB-20, EB-35	X	—
Semi-Rigid Plastic (PVC)	DB-60, DB-100, DB-120	X	X
Rigid Plastic (PVC)	Schedule 40-80	X	X
Hot-Dipped Galvanized Steel ^{a/}	Standard	X	X

^{a/} Includes intermediate metal conduit (IMC).

1.2 All conduit will be installed per [CD 100](#) and will be watertight. In known water or subsidence areas, semi-rigid plastic conduit will be used.

1.3 The correct cements as recommended by the manufacturer will be used on each plastic conduit type so as to obtain a watertight connection.

1.4 Horizontal Bends and Sweeps

A. The difference between bends and sweeps is determined by their radii. Minimum radius for all bends is 36" and the maximum radius for all bends is 60". The radius of each bend is determined by conduit size, as follows:


- 36" for conduit 3" in diameter and smaller
- 48" for conduit 4" and 5" in diameter
- 60" for conduit 6" in diameter

The minimum radius for all sweeps of all size conduits is 12-1/2'. For single-phase residential cable runs, bends may be used for primary horizontal turns.

B. Bends and sweeps for EB and DB conduit will be made from semi-rigid DB-60, DB-100, or DB-120 conduit. Bends and sweeps made from DB-60 conduit are intended for use with EB-20 and EB-35 conduit. Bends and sweeps made from DB-100 or DB-120 conduit are intended for use with DB-60, DB-100, and DB-120 conduit.

1.5 Short lengths of conduit, properly coupled, may be used in rigid conduit installations to form sweeps of a radius not normally supplied by manufacturers. The maximum deflection per length of conduit will be:

- 1/2" for lengths 2-1/2' and shorter
- 1" for lengths over 2-1/2'

Approved by: 	Conduits and Fittings	CD 110
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 3
		UGS


- 1.6 All plastic (PVC) conduit must be manufactured by an Edison approved manufacturer (see [CD 115](#)) and comply to Edison requirements.
- 1.7 EB-20 semi-rigid PVC conduit is preferred and should be utilized for standard installations requiring encasement. EB-35 PVC conduit can be installed in lieu of EB-20 conduit at the contractor's discretion.
- 1.8 For direct buried installations, DB-60 conduit may be used for all sizes smaller than four inches. DB-100 or DB-120 conduit is required when four-, five-, or six-inch conduit is installed.

CD 110		Conduits and Fittings	Approved by: <i>PHH</i>
Sheet 2 of 3		What's Changed?	Effective Date: 01-26-2007
UGS			

Scope CD 110.2 Fittings

1.0 Fittings

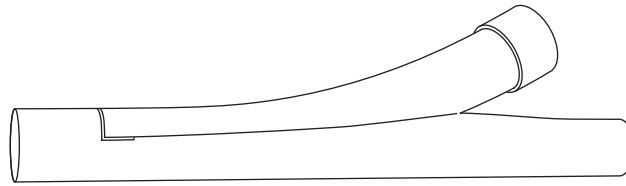
- 1.1 All couplings, adapters, segments, end bells, and so forth will be standard types recommended by the manufacturer or a Company-approved equal.
- 1.2 The couplings, sweeps, and other fittings are to be made of the same material as the conduit.
- 1.3 Offset couplings are not approved.
- 1.4 The spigot end of all fittings (segments, sweeps, bends, and so forth) will be chamfered at $45^\circ \pm 15^\circ$ on the inside surface in order to make a smooth transition when installed into EB and DB conduit.
- 1.5 Name or trademark of fitting manufacturer will be placed on the outside surface of all fittings with 1/4" minimum size letters.

Approved by: 	Conduits and Fittings	CD 110
Effective Date: 01-26-2007	What's Changed?	Sheet 3 of 3 UGS

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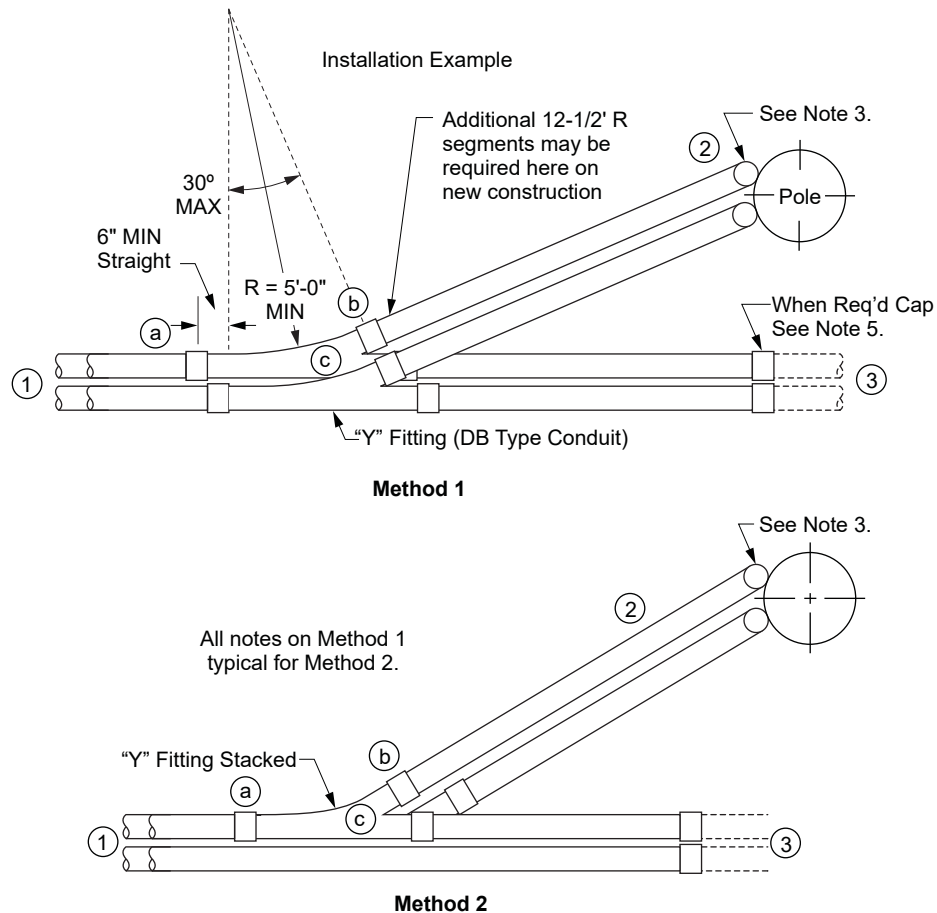
CD 111 "Y" Fittings
Scope CD 111.1 "Y" Fittings

Figure CD 111-1: "Y" Fittings



"Y" fittings are available in two types — the one-piece "Y" (for new installations) and the split "Y" (for existing installations). Install "Y" fittings only when called out on the working drawing.

Figure CD 111-2: "Y" Fittings — Installation Example



1.0 New Installations

When installing one-piece "Y" fittings, mandrel all conduits and install approved pull ropes or pull tapes in conduit from "1" to "2."


Approved by:	"Y" Fittings	CD 111
Effective Date:	What's Changed?	Sheet 1 of 2
01-26-2007		UGS

2.0 Existing Installations

When installing split "Y" fittings, carefully remove existing conduit (see Notes) from "a" to "b." Tie approved pull rope to cables at "c" and extend to "3." Place split "Y" around cables, cement couplings to existing conduits and tape "Y" sides with duct tape. Encase in concrete for watertightness. Pull tape may not be used if it is tied to a pull rope or another length of pull tape.

Note(s):

1. Notify division office prior to working on or near Edison conduits containing energized cables.
2. "Method 1" or "Method 2" will be called out on working drawings.
3. See [CD 160](#) and [CD 161](#) for pole riser bend locations.
4. Approved Manufacturers: Armorcast Products, Carlton Products Corp., Vimar, Inc., R. W. Johnson, Inc.
5. Per [CD 148](#).

CD 111	"Y" Fittings	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 01-26-2007
UGS		

CD 112 Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings

Scope CD 112.1 Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings

All plastic conduit and fittings to be joined should be exposed to the same temperature conditions for a reasonable length of time before assembly.

1.0 Solvent Welding

Make certain that all foreign matter has been wiped from both the conduit and fitting (at joint). The conduit should not be inserted over halfway into the fitting to make a good interference solvent weld. Inspect cement container for proper check date. Cement over 12 months old should not be used. PVC solvent cement (SAP 10064261) and (SAP 10064150) for a pint and quart, respectively) shall only be used to make a PVC-PVC connection, while ABS-PVC solvent cement (SAP 10064107) and (SAP 10064108), P and QT) shall be used to make an ABS-PVC connection. For inspecting purposes, the ABS-PVC solvent cement is turquoise in color. A primer (SAP 10063037) and (SAP 10113448), P and QT) must be used for both applications per the manufacturer's instructions. The primer can be used for both PVC-PVC and ABS-PVC connections but shall only be applied to the PVC (see manufacturer's instructions).

Apply a liberal and uniform coat of cement to the mating zone of the fitting and conduit. It must be emphasized that most joint failures are caused by dry joints where an insufficient coating of solvent cement is applied, or when solvent cement has evaporated due to high temperature conditions. Work fast! Slip conduit straight into the fitting with a slight twist until it bottoms. Hold the joint for 15 seconds (one minute in extreme cold weather) so that the conduit does not push out of the fitting. Do not twist or drive pipe after insertion is complete. The joined members will be cured for five minutes or more before they are handled. (In cold or damp weather, this interval should be increased to allow for the slower evaporation of the solvent.) Minimum trench widths may be utilized by assembling conduit above ground (allowing for weld cure period) and lowering the preassembled conduit bank into the trench.

Be sure to wipe off the excess solvent that is left on the outer shoulder of the fitting. Care should be exercised to prevent excess solvent from being forced into the fitting at the inside shoulder of the conduit. Plastic bristle brushes should not be used. (The solvent will dissolve the bristles.) A large brush should be used with the maximum size permitted to be the width of the fitting socket.

Cans of solvent should be kept covered and away from excess heat and flames when not in use. Quart cans are generally the largest practical size to use since the solvent dries rapidly. Use only solvent cement as furnished or recommended by the conduit manufacturer. Solvent cement thinner may not be used for thinning cement which has thickened.

2.0 Cutting Conduit

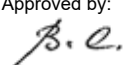
Use a hacksaw to cut conduit that is less than two inches in diameter. The conduit must be cut straight and cleaned of burrs.

3.0 Bends and Sweeps

In cases where a joint is made with the union under stress due to misalignment, bends, or other factors, the joint must be held rigid in such a manner as to relieve the stress on the joint until the conduit is backfilled or encased.

4.0 General Conduit Bank Requirements

For general information and conduit bank requirements, see [CD 100](#) and [CD 120](#).

Approved by: 	Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings	CD 112
Effective Date: 10-24-2014	What's Changed? SAP Numbers added.	Sheet 1 of 2 UGS

5.0 Expansion and Contraction

Due to conduit bank requirements of plastic conduit (1-1/2 inches per 100 feet for every 20°F change in temperature), the following precautions should be taken:

1. Allow extra conduit lengths at each tie-in for contraction and expansion.
2. Backfill from center of trench both ways or from one tie-in point toward the other end of the trench.
3. Conduit may be cut to correct length for tie-in after backfill is complete and contraction (or expansion) has stabilized. All conduit tie-ins entering manhole, vault, or pull box walls will be grouted into place and concrete encased for a distance of 12 to 15 inches outside the walls.

6.0 Handling

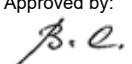
To minimize accidental mechanical damage, conduit should not be left exposed in an open trench longer than is absolutely necessary. In transporting long lengths of conduit, provision should be made to support the full length to avoid damage due to excess overhang.

Conduit that is to be stored in excess of two weeks prior to installation will be protected from the sun. Protection may consist of tarps or other opaque coverings.

Conduits will not be stocked in excess of 42 inches for storage if storage is to exceed two weeks' duration.

7.0 Inspection

All plastic conduit will be tested by the Southern California Edison Company. Underground inspectors will pick up random samples (five-foot lengths) of conduit from Edison jobs. Conduit found to be defective will not be acceptable per [CD 110](#).

CD 112 Sheet 2 of 2 UGS	Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings	Approved by: 
	What's Changed?	Effective Date: 10-24-2014

CD 115 Manufacturer's Requirements

Scope CD 115.1 Approved Manufacturers for Plastic Conduit

Listed below are the approved manufacturers of plastic conduit and fittings acceptable for use on the Edison system.

1.0 Rigid PVC Conduit

1.1 Approved manufacturers of rigid (Sch. 40 and Sch. 80) PVC conduit, as purchased under Edison Material Standard No. 215 are:


- A. Cantex Inc.
- B. Prime Conduit
- C. JM Manufacturing
- D. Heritage Plastics

1.2 Approved manufacturers of fittings for this conduit are:

- A. Armorcast
- B. Cantex Inc.
- C. Prime Conduit
- D. Kraloy
- E. JM Manufacturing
- F. Cal Am Manufacturing
- G. Heritage Plastics

2.0 Semi-Rigid PVC Conduit

2.1 All sizes of EB-20, EB-35, DB-60, DB-100, and DB-120 will conform to ASTM F512-89a

Approved by: 	Manufacturer's Requirements	CD 115
Effective Date: 10-23-2015	What's Changed? Section 1.2 updated for clarity.	Sheet 1 of 4 UGS



2.2 Approved manufacturers of these underground semi-rigid PVC conduits are:

- A. Cantex Inc^{1/}
- B. Prime Conduit
- C. JM Manufacturing
- D. Heritage Plastics

2.3 Approved manufacturers of fittings for this conduit are:

- A. Cantex Inc.
- B. Prime Conduit
- C. JM Manufacturing
- D. Heritage Plastics

2.4 Approved fabricators of underground rigid and semi-rigid PVC conduits and fittings are:

- A. SAF-T-CO Supply Inc.
- B. TVC Communications

^{1/} Approved with 500,000 psi PVC material EB-20, EB-35, DB-60, DB-100, and DB-120.

CD 115	Manufacturer's Requirements	Approved by: <i>B. C.</i>
Sheet 2 of 4	What's Changed? Section 2.4 was added for approved fabricators of underground rigid and semi-rigid PVC conduits.	Effective Date:
UGS		10-23-2015

Scope CD 115.2 Requirements for Semi-Rigid PVC Plastic Conduit

1.0 General

- 1.1 EB-20 and EB-35 (concrete encased burial) conduit will be manufactured in conformance to ASTM F512-89a.
- 1.2 DB-60, DB-100, and DB-120 (direct burial without concrete encasement) conduit will be manufactured in conformance to ASTM F512-89a.
- 1.3 Reworked PVC materials will conform to the requirements of ASTM F512-89a, Section 5.2 and in addition are limited to a maximum of 15%.

2.0 Conduit Color

All semi-rigid PVC conduit will be gray in color.

3.0 Conduit Marking

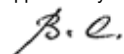
- 3.1 All conduit will be clearly marked with the manufacturer's name, PVC cell classification, size, type of conduit, the manufacturer's minimum wall thickness, code or control number, actual manufacture date, and the designation "ASTM F512" at intervals of 1.5 meters (5 feet) or less. Any additional markings deemed necessary by the manufacturer is permitted.

Example: (MFG's NAME) PVC 12254-A-4" DB 100 MIN. WALL 140 (MFG's CONTROL NO.) (MFG. DATE/CODE) ASTM F512 (The marking sequence may vary.)

- 3.2 Semi-rigid PVC conduit from 2-inch through 6-inch sizes will have a circumferential mark placed on the spigot end of each conduit length, per the dimensions and requirements of Section 12.5 of ASTM F512-89a.

4.0 Quality Control

- 4.1 Approved semi-rigid PVC plastic conduit manufacturers will establish and maintain an inspection and testing program per the requirements of [Scope CD 115.3 \(Sheet 4\)](#). The program will be submitted to the Customer Service Department Engineering section of the Southern California Edison Company for approval. Manufacturers who fail to establish and maintain an SCE-approved Quality Control Program cannot furnish PVC conduit to any SCE projects.

Approved by: 	Manufacturer's Requirements	CD 115
Effective Date: 10-23-2015	What's Changed?	Sheet 3 of 4 UGS

Scope CD 115.3 Manufacturer's Minimum Inspection and Testing Requirements for Semi-Rigid PVC EB/DB Conduits

1.0 Dimensional Inspections and Frequencies

1.1 Spigot End

- A. Wall thickness — one every two hours, each line
- B. Outside diameter — one every two hours, each line
- C. Out of round — one every two hours, each line
- D. Chamfer and marking (visual) — one every two hours, each line

1.2 Bell End

- A. Entrance diameter — one every two hours, each line
- B. Bottom diameter — one every two hours, each line
- C. Socket depth — one every two hours, each line
- D. Out of round — one every two hours, each line
- E. Bell centered (visual) — one every two hours, each line

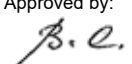
2.0 Testing Requirements

2.1 Physical Tests and Frequencies

- A. Conduit stiffness — one test within the first two hours of each shift, each line
- B. Conduit impact resistance — one test within the first two hours of each shift, each line

Note(s):

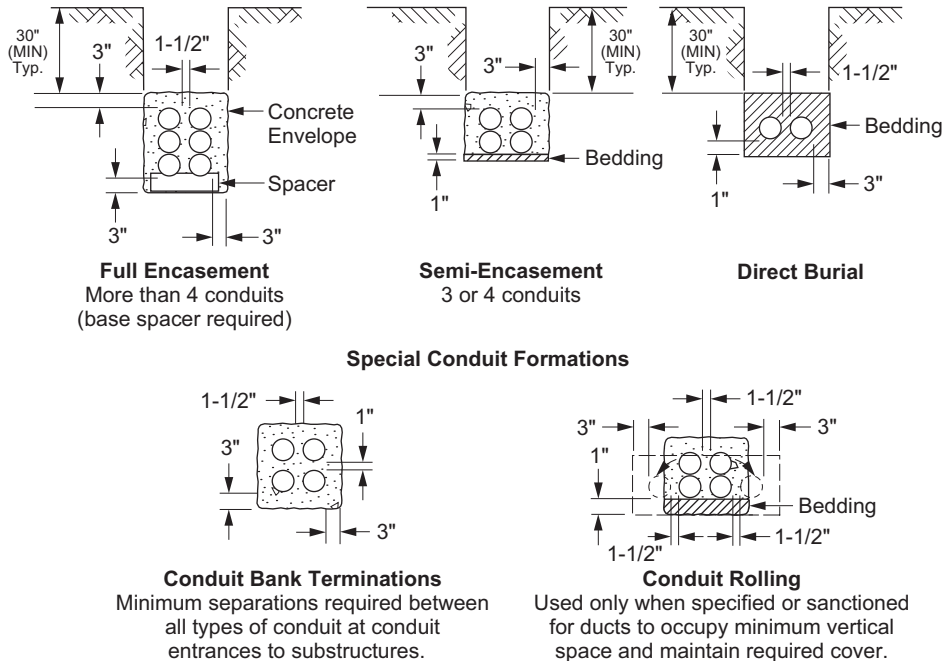
1. All inspections and tests will be performed per the requirements of ASTM F512-89a and the Underground Structures Book standards and will include the supporting documentation.
2. Documentation will be maintained by the manufacturer for a period of two years and will be available for review by SCE auditors.
3. Manufacturers' inspection and test documentation will be maintained by date of product manufacture. Each package will contain as a minimum the following:
 - a. The actual date of manufacture
 - b. The type of conduit
 - c. The wall thickness
 - d. The material utilized in manufacture with appropriate certifications
 - e. Applicable process quality control records documenting:
 - Dimensional inspections and frequencies
 - Testing requirements
 - A statement of compliance to all codes and standards
4. The SCE customer service representative will be notified by telephone at least 48 hours prior to the start of any SCE product manufacture. The absence of the SCE representative will not influence production schedules.

CD 115	Manufacturer's Requirements	Approved by: 
Sheet 4 of 4	What's Changed?	Effective Date: 10-23-2015
UGS		

CD 120 Conduit Bank Requirements

Scope CD 120.1 Conduit Bank Requirements

Figure CD 120-1: Typical Conduit Bank Sections (Mainline and Commercial/Industrial)



Note(s):

1. Spacing and concrete coverage as shown is minimum.
2. Spacers, when required, will be as recommended by the conduit manufacturer and approved by the company and will be placed at the intervals shown in [Table CD 120-1 \(Sheet 1\)](#). Vertical spacers and base spacers will be manufactured from rigid noncompressable-type materials. Use temporary means to maintain horizontal conduit spacing at these intervals until backfill bedding or encasement is placed.

Table CD 120-1: Horizontal Conduit Spacing Intervals

Conduit Size	2"	3"	3-1/2"	4"	5"	6"
Spacing with Encasement	10'	10'			10'	
Spacing with Nonencasement	10'	8'			6'	

3. Base spacers are required on all banks of more than four conduits.
4. The conduit will be of an approved make and manufacture as set forth in standards [CD 115](#).
5. Types:
 - a. "EB" (Type I) for encased and semi-cased installations
 - b. "DB" (Type II) for direct burial
 - c. "Sch. 40" Rigid PVC for inside bore casings
6. For general conduit bank, concrete, and trenching requirements, see [CD 100](#).
7. Install bare copper neutral wire only when specified on working drawing. For mainline applications (including 4-wire taplines) when the neutral is present on an overhead structure that feeds a primary riser, the neutral shall be continuous to the first underground structure. A bare copper neutral wire, as specified on the working drawing, shall be placed, and fully encased in concrete, at the lower region of the duct bank, preferably in-between conduits.
8. Concrete encasement will be kept uniform. Excessive amounts of concrete will be avoided.
9. Bedding will be in accordance with [CD 100](#).

Approved by:

RR

Conduit Bank Requirements

CD 120

Sheet 1 of 3

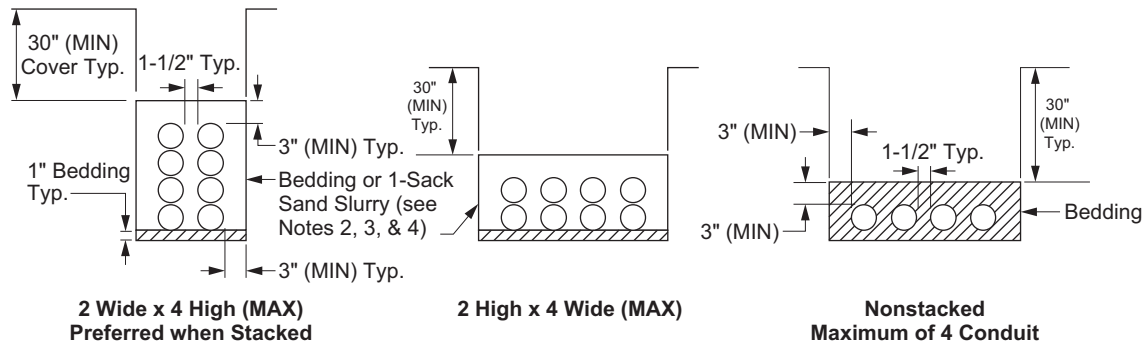
Effective Date:
04-30-2021

What's Changed? A minimum buried depth of 30-inches has been added to Figure CD 120-1 for clarity.

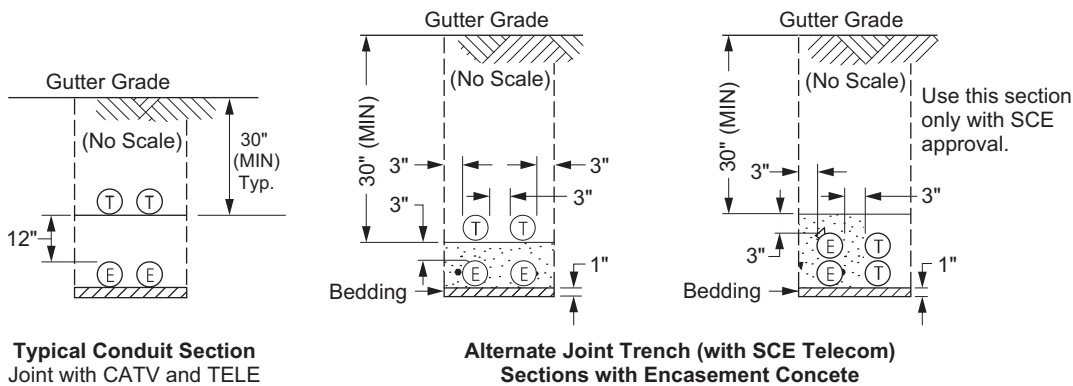
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Scope CD 120.2 Residential Conduit Bank Requirements

Figure CD 120-2: Typical Conduit Bank Sections (Residential Only)



Typical Joint Trench Sections



Note(s):

1. Conduit sections should have no more than eight SCE conduits, and no conduit should be surrounded on four sides by other conduits.
2. Any conduit section with stacked conduit must be backfilled with bedding (See Note 4) or one-sack sand slurry. (Standard Specifications for Public Works Construction Section 201-1.1.2 Mix 100-E-100.)
3. Two-sack concrete encasement per CD 100 will be used in joint trench in order to reduce telecom conduit clearances to three inches minimum per the above joint trench sections. One-sack sand slurry is not a substitute for encasement concrete.
4. Bedding material will be clean sand or pea gravel. Native materials meeting the requirements of CD 100 are only permitted for the nonstacked configuration and are not permitted to bed pads and risers at boxes.
5. Conduit will be type "DB" per CD 110 and will be of approved manufacture per CD 115. Type EB is permitted when encasement concrete is used.
6. Where both residential and nonresidential conduit are in the same trench, the requirements of Scope CD 120.1 shall apply.
7. Scope CD 120.1, Sheet 1 may be used for residential construction.
8. Use temporary supports every eight feet to maintain horizontal conduit alignment. Remove after concrete is placed.

CD 120

Conduit Bank Requirements

Approved by:

RR

Sheet 2 of 3

What's Changed? References in Note 6 and Note 7 were updated for clarity.

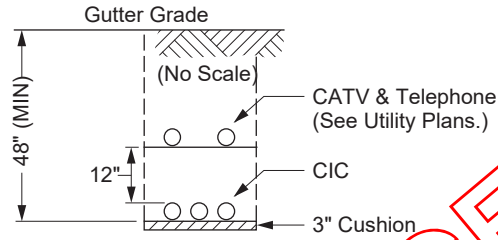
Effective Date:

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04-30-2021

Scope CD 120.3 Conduit Bank Requirements for CIC


Figure CD 120-3: Typical CIC Trench Section (Residential Only)



Note(s):

1. Conductor-in-Conduit (CIC) will be placed on level bed prepared to be rock and debris free. Where native soils are hard or rocky, trench will be over excavated and imported noncohesive sand placed three inches deep for bedding.
2. Native soils capable of passing through a 1/2-inch mesh screen are considered rock free. Rock-free native soil may be used for backfill. Materials that will not uniformly fill around the CIC are also unacceptable. When native soil is unacceptable, imported non-cohesive sand will be used for backfill and will cover the CIC a minimum of six inches.

FOR REFERENCE ONLY

Approved by: 	Conduit Bank Requirements	CD 120
Effective Date: 04-30-2021	What's Changed?	Sheet 3 of 3 UGS

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CD 121 Conduit Bank Requirements – Installation in a Bore

Scope CD 121.1 Conduit Bank Requirements – Installation in a Bore

Figure CD 121–1: Conduit Bank Requirements – Installation in a Bore

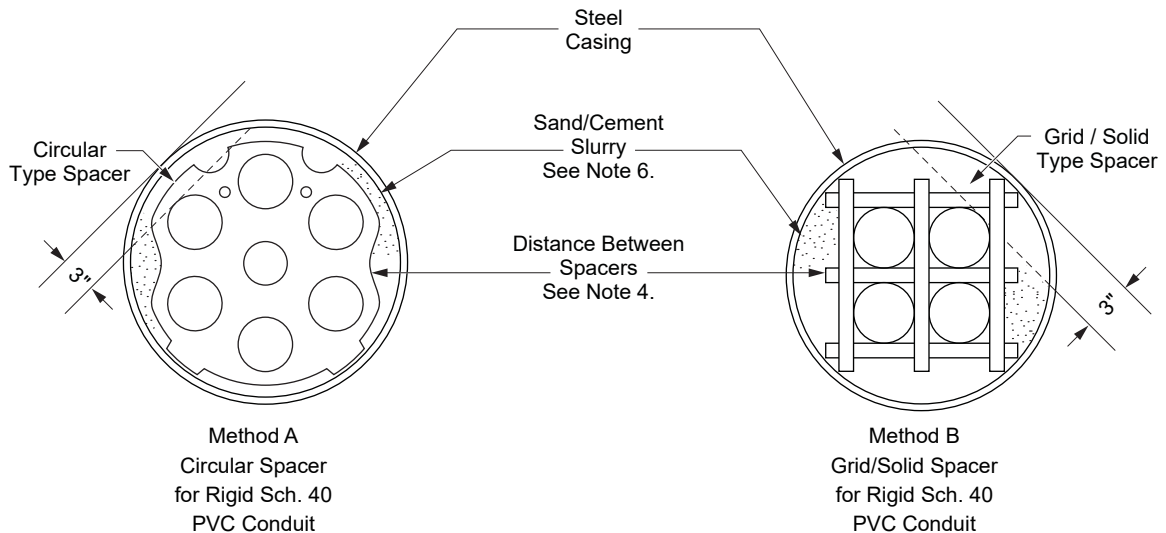


Table CD 121–1: Conduit Bank Requirements – Installation in a Bore

Method	No. of 5" Conduits	Recommended Casing Size	Method	No. of 5" Conduits	Recommended Casing Size
—	—	—	B	4	20" O.D.
A	6	22" O.D.	B	6	28" O.D.
A	8	28" O.D.	B	8	32" O.D.
—	—	—	B	10	38" O.D.
—	—	—	B	12	44" O.D.

Note(s):

1. Installation will be made by machine boring or by jacking. Sluicing and jetting with water is not permitted. A limited use of water for lubrication of drills may be permitted, however, by special arrangement with local governing inspection authorities.
2. A new steel casing will normally be used. Used casing, which shows little or no deterioration, may be used if judged satisfactory by a Company inspector. The minimum allowable casing thickness is 1/4". State highway construction requires a 1/4" wall thickness if under 30" in diameter; a 3/8" wall thickness for diameters up to 48" and a 1/2" thickness for diameters 42" and greater. The type of construction should govern the wall thickness.
3. Conduits installed in the casing as in "Method A" or "Method B" above will be rigid Sch. 40 PVC. See [CD 120](#) and [CD 110](#).
4. Spacers will be of the type and design as approved by the Company. Spacers will be installed and maintained in a vertical position, and the distance between spacers will be limited to a maximum of five feet [CD 121](#).
5. The installation of foreign utilities in Edison bore casings is not permitted.
6. Conduits will maintain the same position entering and leaving the casing. After the conduits are in place, a sand/cement slurry (minimum of six sacks of cement per cubic yard) will be used to fill all voids.
7. When specified on working drawing, contractor will install insulated copper neutral wire in casing.
8. The California Division of Industrial Safety, Mining, and Tunneling Unit will be notified by Edison and an Underground Classification Permit be issued prior to the installation of any bore casing 30" in diameter or larger.

Approved by:

RR

Conduit Bank Requirements – Installation in a Bore

CD 121

Sheet 1 of 3

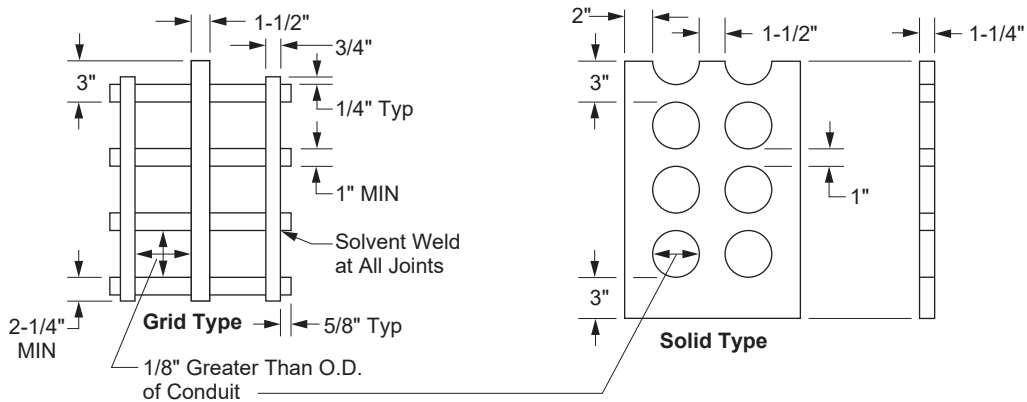
Effective Date:
04-30-2021

What's Changed?

UGS

Scope CD 121.2 Conduit Spacers

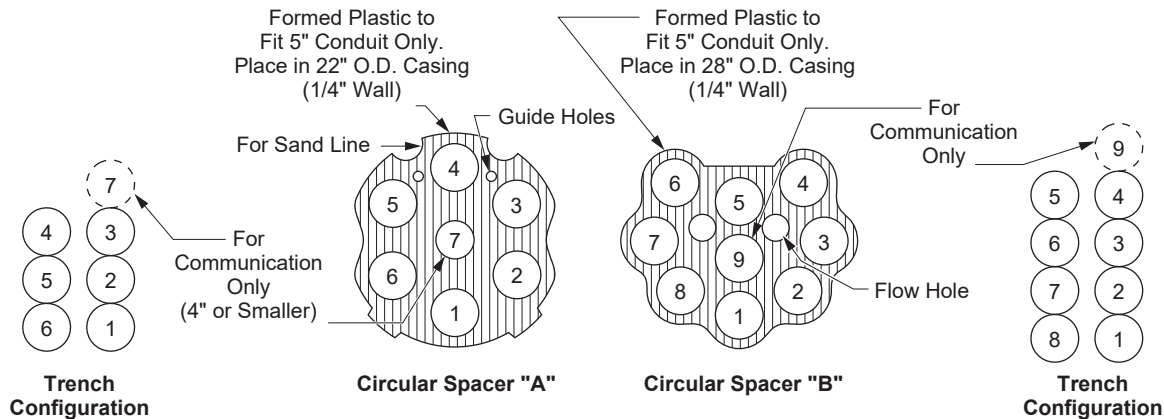
Figure CD 121-2: Conduit Spacers



Note(s):

1. Material
 - a. Grid-type spacer to be fabricated of plastic conduit with a minimum wall thickness of 0.09 inches.
 - b. Solid-type spacer to be formed of polyurethane with a minimum density of 4 lb/ft³.
2. Tiers may be added or deleted as required. Clearance as shown must be maintained between conduits.
3. For full encasement, a three-inch minimum clearance between the trench bottom and the lower tier of ducts will be maintained. See CD 120. To meet this requirement, the grid-type spacer must be set upon a base of such thickness to provide three inches of clearance.

Figure CD 121-3: Circular Spacers "A" and "B"




Note(s):

1. Spacer "A" may be used in bore casings when a 6- or 7-way conduit bank is planned. Spacer "B" may be used in bore casings when an 8- or 9-way conduit bank is planned. All clearances are designed into the units.
2. Use the above guide for changing from vertical to circular configuration. Normally, ten-foot conduit lengths are used in this transition. Support of this length conduit during transition will not be needed.
3. The spacers must not be allowed to rotate in the casing.
4. Conduit (Sch. 40-type plastic) will maintain the same position entering and leaving the casing.
5. Other boring requirements are shown on CD 121.
6. The approved manufacturers and suppliers of the above spacers are:

Table CD 121-2: Conduit Spacers – Approved Manufacturers and Suppliers

Mfr. Underground Devices, Inc.
 420 Academy Dr
 Northbrook, IL 60062
 (847) 205-9000

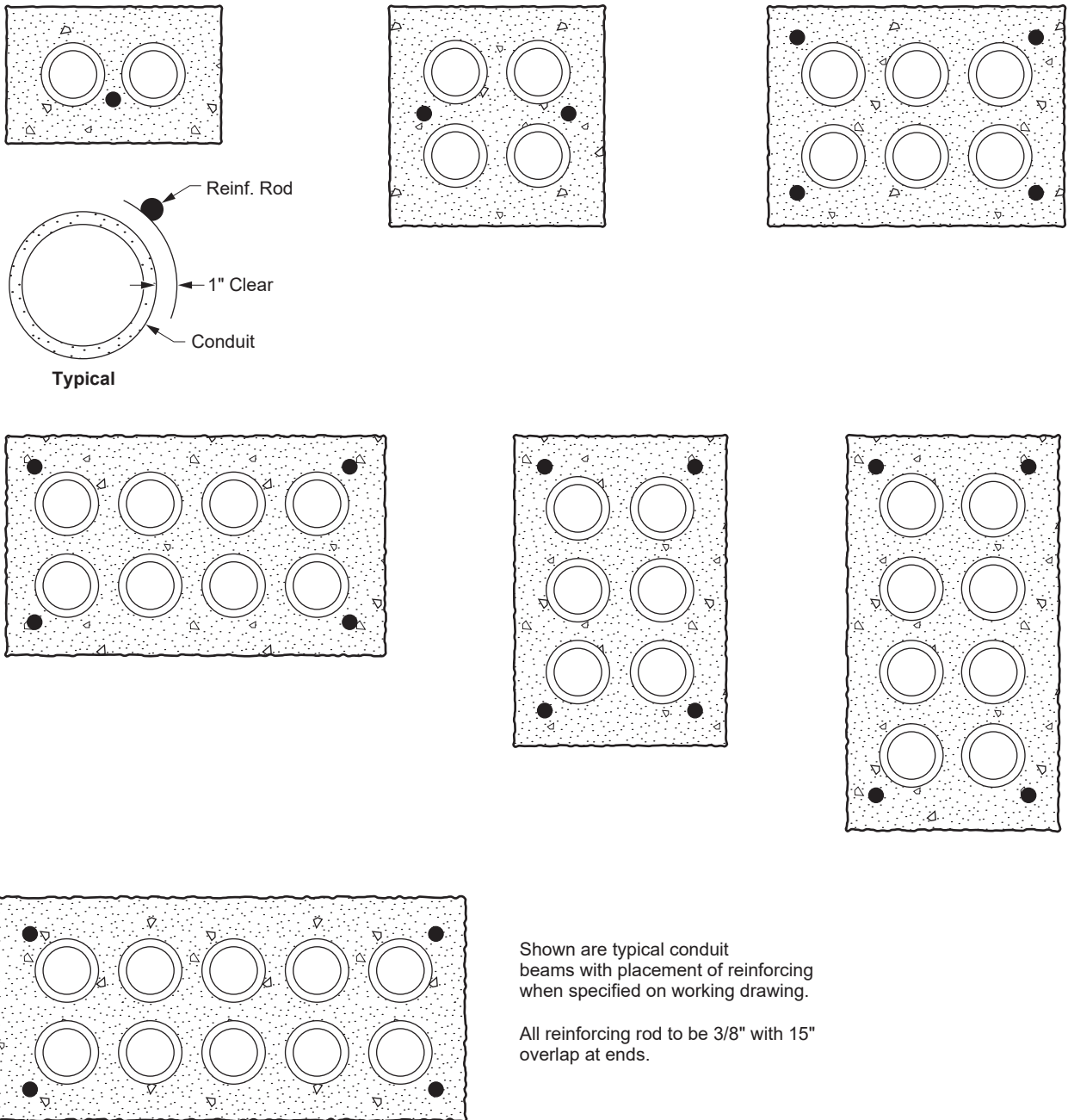
Suppliers Armorcast Products Company
 13230 Satcoy Street
 North Hollywood, CA 91605

Approved by: 	Conduit Bank Requirements – Installation in a Bore	CD 121
Effective Date: 04-30-2021	What's Changed? The approved manufacturer information has been updated.	Sheet 3 of 3 UGS

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CD 122 Conduit Beam Reinforcement
Scope CD 122.1 Conduit Beam Reinforcement

Figure CD 122-1: Conduit Beam Reinforcement



Approved by:
PhH

Conduit Beam Reinforcement

CD 122

Effective Date: **What's Changed?**
01-26-2007

Sheet 1 of 1

UGS

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CD 125 Directional Boring Installation Standards

Scope CD 125.1 Directional Boring Installation Standards

1.0 General

These standards are intended as a minimum requirement for installing conduit by directional boring, tunneling, jacking, or plowing. All specific requirements shown on working drawings, governmental permits, and all applicable cities, counties, and state ordinances shall also be in compliance. References to contractor signify the organization performing the specified work.

Horizontal directional boring is a form of trenchless technology. The equipment and procedures are intended to minimize surface damage, restoration requirements, and disruption of vehicular and maritime traffic with little or no interruption of other existing lines or services.

If a cable system is to be installed by boring and the soil and surface loading conditions are such that solid material in the region may damage the cable, then the cable shall be adequately protected.

The location of structures in the path of the projected cable route shall, as far as practical, be determined prior to trenching, boring, tunneling, jacking, or plowing operation.

2.0 Duct Systems

Open trenching, tunneling, boring, jacking, plowing, either singularly or in combination, are among the recognized methods of installing duct systems.

3.0 Contractor Responsibilities Performing Directional Boring

- 3.1 Prior to performing directional boring, call Underground Service Alert (USA) 48 hours before boring at 811.
- 3.2 The contractor will furnish all equipment, labor, tools, supervision, and approved duct (See CD 115) required when installing the duct system.
- 3.3 Damage to sub structures, equipment, or plant caused by the contractor will be repaired by contractor at their expense to the satisfaction of SCE.
- 3.4 Settling or washout of trench or bore pit areas within one year of acceptance of work will be repaired at contractor's expense and to the satisfaction of SCE.
- 3.5 The contractor is responsible for informing SCE of any deviation to working drawings.
- 3.6 The contractor must gain permission from the Region Underground Civil Construction Manager before any deviation to the working drawings can commence.
- 3.7 The Contractor is responsible for informing SCE 24 Hours in advance prior to any Bore Installation.
- 3.8 The Contractor shall place conduit at the proper depth and in line with what would be a trench line. This shall be accomplished by either a locator with depth readings or potholing at 10 feet minimum.

Approved by: 	Directional Boring Installation Standards	CD 125
Effective Date: 07-27-2018	What's Changed?	Sheet 1 of 3 UGS

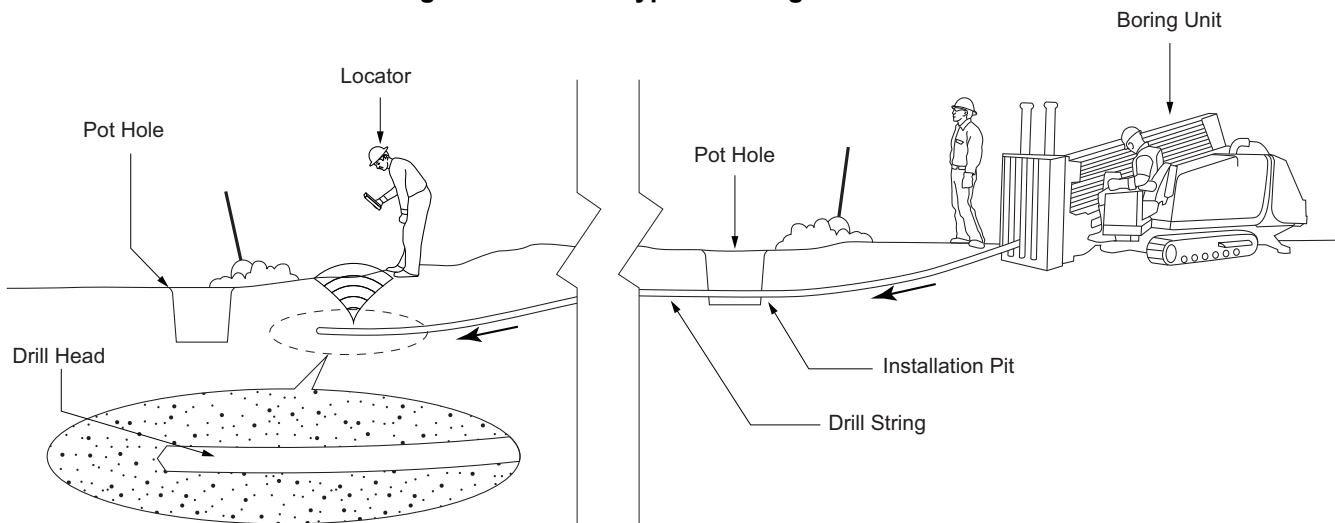
4.0 Construction Requirements for Directional Boring

- 4.1 Only approved Schedule 40 locking directional bore conduit (Bore Guard or equivalent) or Long Bell Length Conduit approved by SCE Engineering (see CD 100) will be installed.
- 4.2 Installation of the duct system will generally be from an Installation pit and a Receiving pit.
- 4.3 Install conduit at a minimum of 30 inches in depth (60 inches maximum). Minimum cover at water crossings (specified on the working drawing) will be 60 inches. A locator following along the direction of the bore will ensure the depth requirement is met.
- 4.4 A maximum of 2 conduits will be allowed to be installed by directional boring, tunneling, and jacking. For installations requiring more than 2 conduits refer to CD 120.

5.0 Directional Boring Construction Closeout

Upon completion of directional boring, tunneling, and jacking, the ground surface will be restored to its previous condition prior to the start of work. All applicable local compaction requirements shall be met. If required by permit, the installation and receiving pits shall be replanted or seeded.


Figure CD 125-1: Typical Boring Installation



6.0 SCE Responsibilities – Directional Boring

6.1 SCE will inspect work in progress.

6.2 Final Acceptance will be based on the inspection performed by SCE.

Approved by: 	Directional Boring Installation Standards	CD 125
Effective Date: 07-27-2018	What's Changed?	Sheet 3 of 3 UGS

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CD 130 Standard Conduit Entrance Details
Scope CD 130.1 Standard Conduit Entrance Details

Figure CD 130-1: Standard Conduit Entrance Details

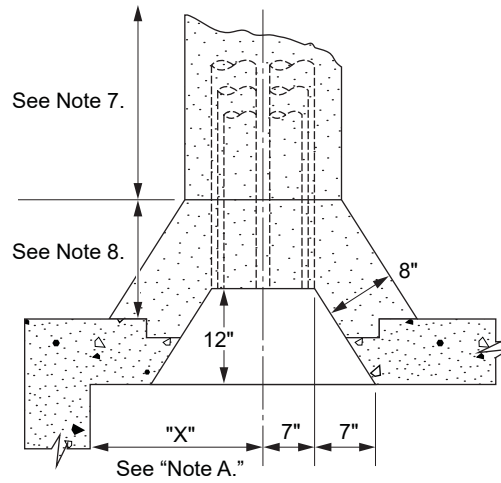


Figure CD 130-1.1: Plan Section

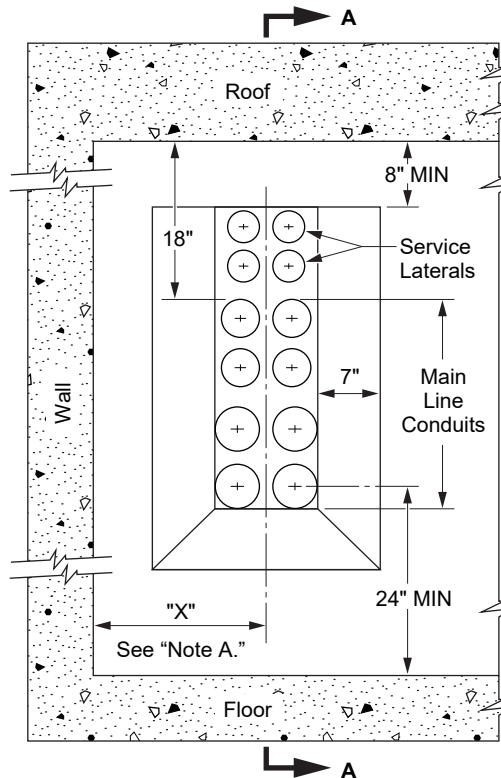



Figure CD 130-1.2: Elevation

Approved by: 	Standard Conduit Entrance Details	CD 130
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2 UGS

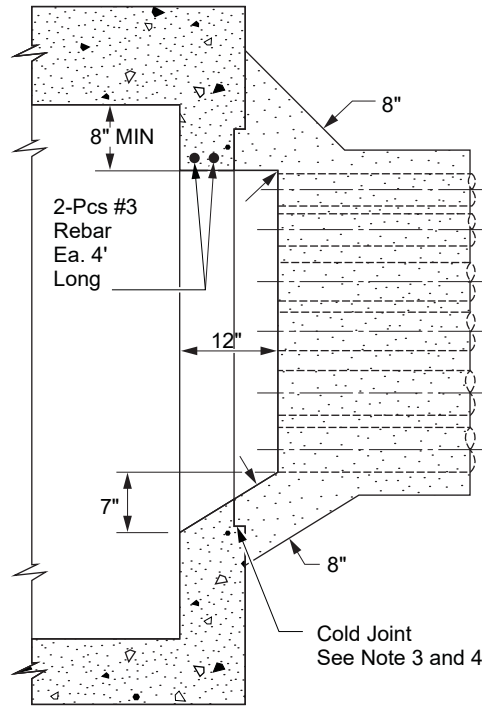


Figure CD 130-1.3: Section A-A

For corner entrance, see [CD 133](#).

For entrances adjacent to 45° angle corners, see [CD 133](#).

For pull box entrances, see [CD 132](#).

Note(s):

New Construction

1. Move steel to clear openings. Move vertical steel to sides of opening. Cut horizontal steel and bend ends back into window and/or conduit envelope.
2. See working drawings for number, location, special arrangement of conduit, and so on.
3. Cast keyway approx. 4" wide and 2" deep in outer wall around conduit entrances when cold joint is used.
4. Seal cold joints between structure walls and conduit bank envelope using 2 coats of "Sika-Seal" (1 gal) black liquid or equivalent bonding agent.
5. If a hole needs to be drilled, it should be drilled below the conduit and properly grouted after installation of the BC Neutral. See [CD 120](#).

Old Construction

6. At interceptions, bevel edges of old concrete in wall and conduit bank. Cold joint same as Note 4. Finish recess smooth.
7. See [CD 100](#) for concrete requirements.
8. See [GI 020](#) for concrete requirements.

"Note A"

Dimension "X" is normally (unless otherwise specified on working drawings) as follows:

Manholes:

- On end walls — 24"
- On side walls — 7"

Vaults:

- On side and end walls — 14"

CD 130

Standard Conduit Entrance Details

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

01-26-2007

CD 131 Standard and Special Conduit Entrances

Scope CD 131.1 Standard and Special Conduit Entrances

Special Recess

To be used in all 4" x 4" manholes. May be used elsewhere only when specified on working drawings.

Standard Conduit Entrance

For conduit adjacent to 45° angle corners.

Figure CD 131-1: Standard and Special Conduit Entrances

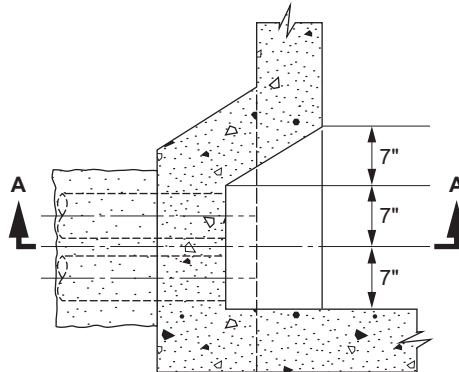


Figure CD 131-1.1: Plan Section

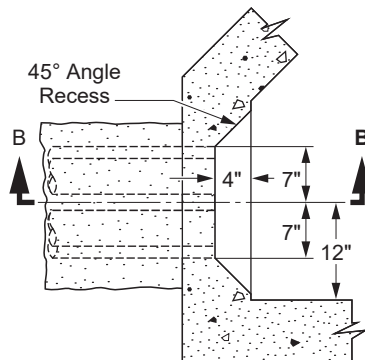


Figure CD 131-1.2: Plan Section

Approved by:

PhH

Standard and Special Conduit Entrances

CD 131

Sheet 1 of 3

Effective Date:

01-26-2007

What's Changed?

UGS

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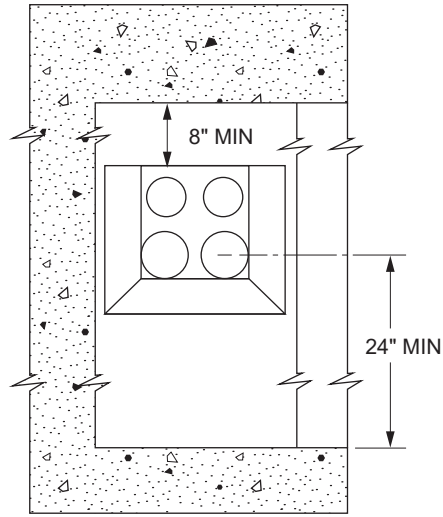


Figure CD 131-1.3: Elevation

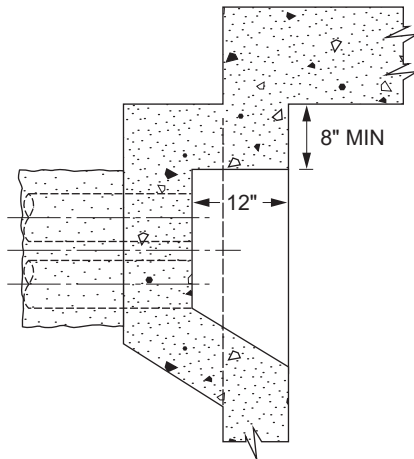


Figure CD 131-1.4: Section A-A

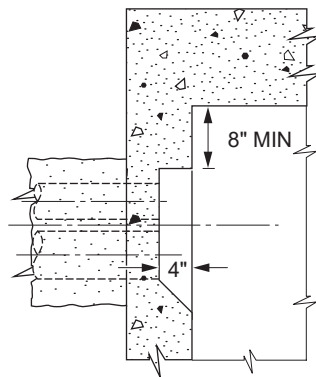


Figure CD 131-1.5: Section B-B

CD 131

Standard and Special Conduit Entrances

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

01-26-2007

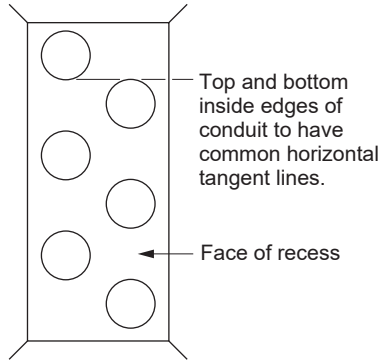


Figure CD 131-1.6: Staggered Conduit Entrance (Not Optional) — Use only when specified on working drawings.

Note(s):

1. Move steel to clear openings. Move vertical steel to sides of opening. Cut horizontal steel and bend ends back into window and/or conduit envelope.
2. See working drawings for number, location, special arrangement of conduit, and so on.
3. Old construction: At interceptions, bevel edges of old concrete in wall and/or conduit bank and seal joint between structure using 2 coats of "sikaseal" (1 gal) black liquid, or equivalent bonding agent, finish recess smooth.
4. If a hole needs to be drilled, it should be drilled below the conduit and properly grouted after installation of the BC Neutral. See [CD 120](#).

Approved by: <i>PHH</i>	Standard and Special Conduit Entrances	CD 131
Effective Date: 01-26-2007	What's Changed?	Sheet 3 of 3
		UGS

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CD 132 Conduit Entrances to Pull Boxes
Scope CD 132.1 Conduit Entrances to Pull Boxes

Figure CD 132-1: Conduit Entrances to Pull Boxes — Typical Conduit Entrances for Deep Recess Pull Boxes

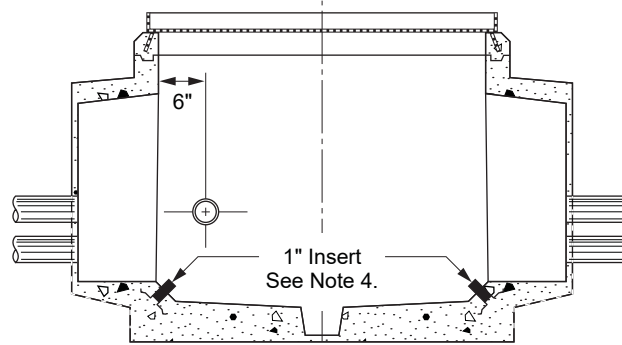


Figure CD 132-1.1: Cut Away Section

Where laterals are indicated in side walls, end bells to be used. See Note 3.

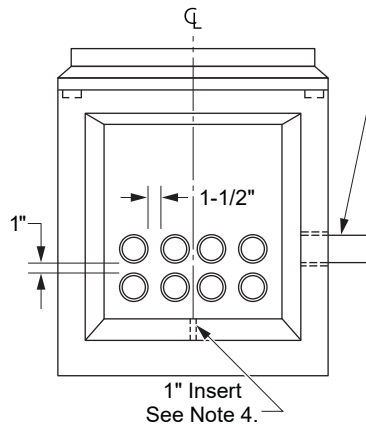


Figure CD 132-1.2: End Elevation

Note(s):

1. Where H.D.G. conduit is used, tape end of pipe to fit inside of end bell.
2. Conduit will enter and leave pull boxes in line and parallel to floor.
3. End bells to be of transite, PVC, or ABS for all types of conduit.
4. Inserts to be "Richmond coil type" or pull iron per [AC 729](#).


Approved by: 	Conduit Entrances to Pull Boxes	CD 132
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2 UGS

Figure CD 132-2: Conduit Entrances to Pull Boxes — Conduit Entrances for Special Use

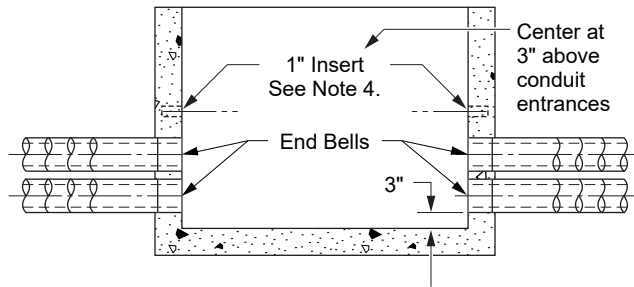


Figure CD 132-2.1: Cut Away Section

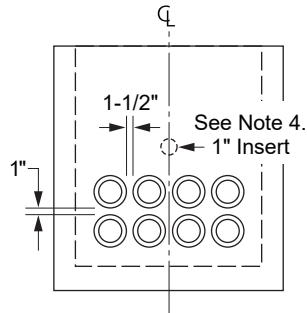


Figure CD 132-2.2: End Elevation

Note(s):

1. Permission for use is required.

CD 132

Conduit Entrances to Pull Boxes

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

01-26-2007

CD 133 Corner Conduit Entrance Details — Manhole or Vault

Scope CD 133.1 Corner Conduit Entrance Details — Manhole or Vault

Figure CD 133-1: Corner Conduit Entrance Details — Manhole or Vault

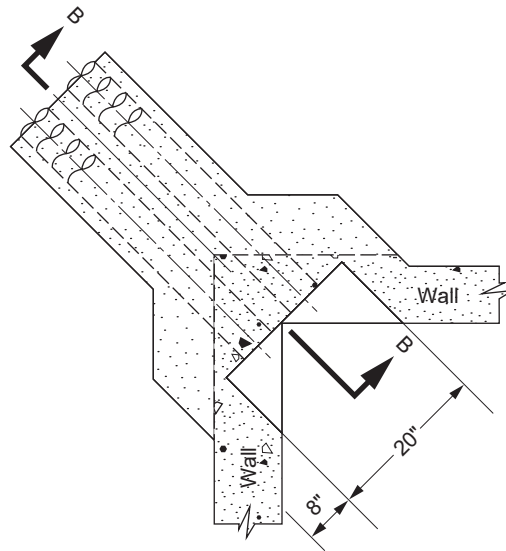


Figure CD 133-1.1: Section A-A — Corner Conduit Entrance when Conduit are Cast in Walls at Time of Vault Construction

Note(s):

1. Corner conduit entrance when conduit are cast in walls at time of vault construction.

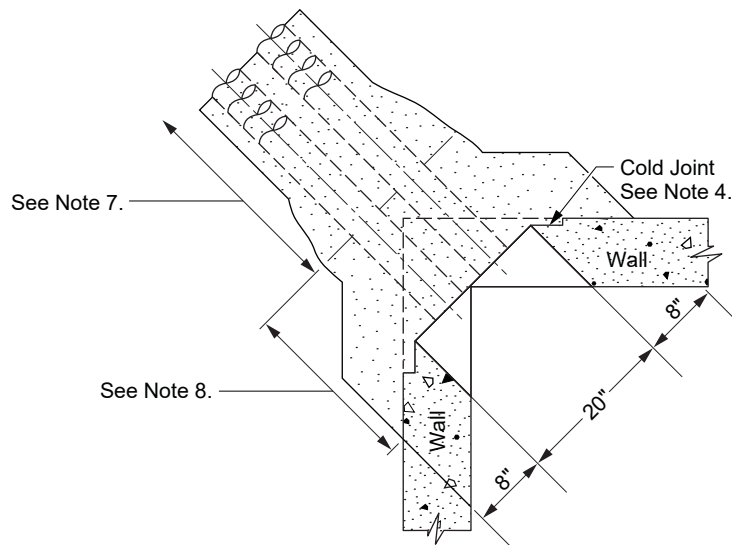



Figure CD 133-1.2: Section A-A — Corner Conduit Entrance when Window is Left at Time of Vault Construction

Note(s):

1. Leave window through corner to clear outside ducts by 4" all around. Concrete in window and around ducts. Finish recess face flush with conduit ends.

Approved by: 	Corner Conduit Entrance Details — Manhole or Vault	CD 133
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2 UGS

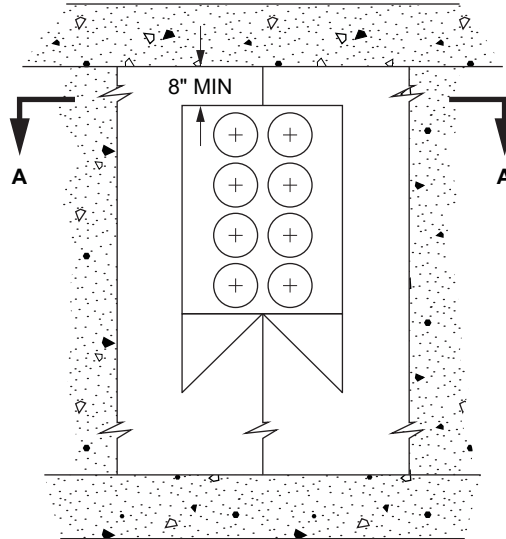


Figure CD 133-1.3: Elevation

Note(s):

1. Finish bottom shelf with 45° slope or leave 8" clear below bottom duct and finish with a level shelf.

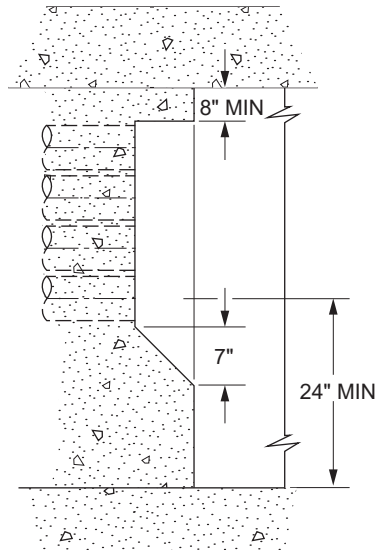


Figure CD 133-1.4: Section B-B

Note(s):

1. Move steel to clear opening. Move vertical steel to sides of opening. Cut horizontal steel, turn ends back into recess or conduit bank encasement.
2. See working drawings for number, locations, and special arrangements of conduits, and so forth.
3. Cast keyway approximately four inches wide by two inches deep in outer wall around conduit entrances when cold joint is used.
4. Seal cold joints between structure walls and conduit bank envelope. Using two coats "Sikaseal" (one gallon) black liquid, or equivalent bonding agent.
5. At interceptions, bevel edges of old concrete in wall and conduit bank.
6. See CD 132 for pull box conduit entrances.
7. See CD 100 for concrete requirements.
8. See GI 020 for concrete requirements.

CD 133

Corner Conduit Entrance Details — Manhole or Vault

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

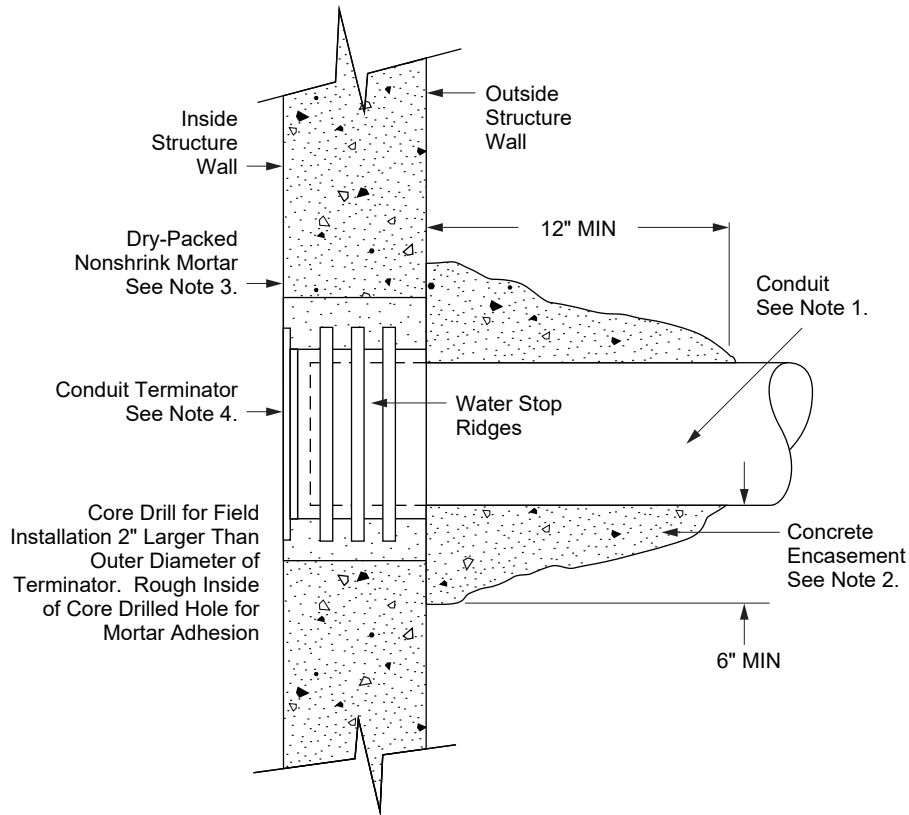
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01-26-2007

CD 134 Conduit Terminators

Scope CD 134.1 Conduit Terminators

Figure CD 134-1: Conduit Terminators



Note(s):

1. Conduit will be terminated into substructure with conduit terminators.
2. Conduit termination at wall will be concrete encased to the minimum dimensions shown on the drawing [CD 112](#). For concrete encasement mix, see [CD 100](#).
3. Face of terminator will be placed flush with inside surface of structure and sealed in position with a dry packed nonshrinkable mortar mix.
4. Conduit terminator to be made of PVC or ABS plastic. They will be provided with a minimum of three outer water stop ridges, minimum 3/8" high positioned between the ends, as shown on the drawing.
5. Terminator may be obtained from:
 - a. Manufacturers/Suppliers:
Jensen Precast
14221 San Bernardino Ave.
Fontana, CA 92335
 - b. Manufacturers/Suppliers:
Oldcastle Infrastructure
10650 Hemlock Ave.
Fontana, CA 92337

Approved by:

RR

Conduit Terminators

CD 134

Sheet 1 of 1

Effective Date:
04-24-2020

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

UGS

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CD 135 Typical Installation of Precast Pull Box in Main Line Conduit
Scope CD 135.1 Typical Installation of Precast Pull Box in Main Line Conduit

Figure CD 135-1: Typical Installation of Precast Pull Box in Main Line Conduit

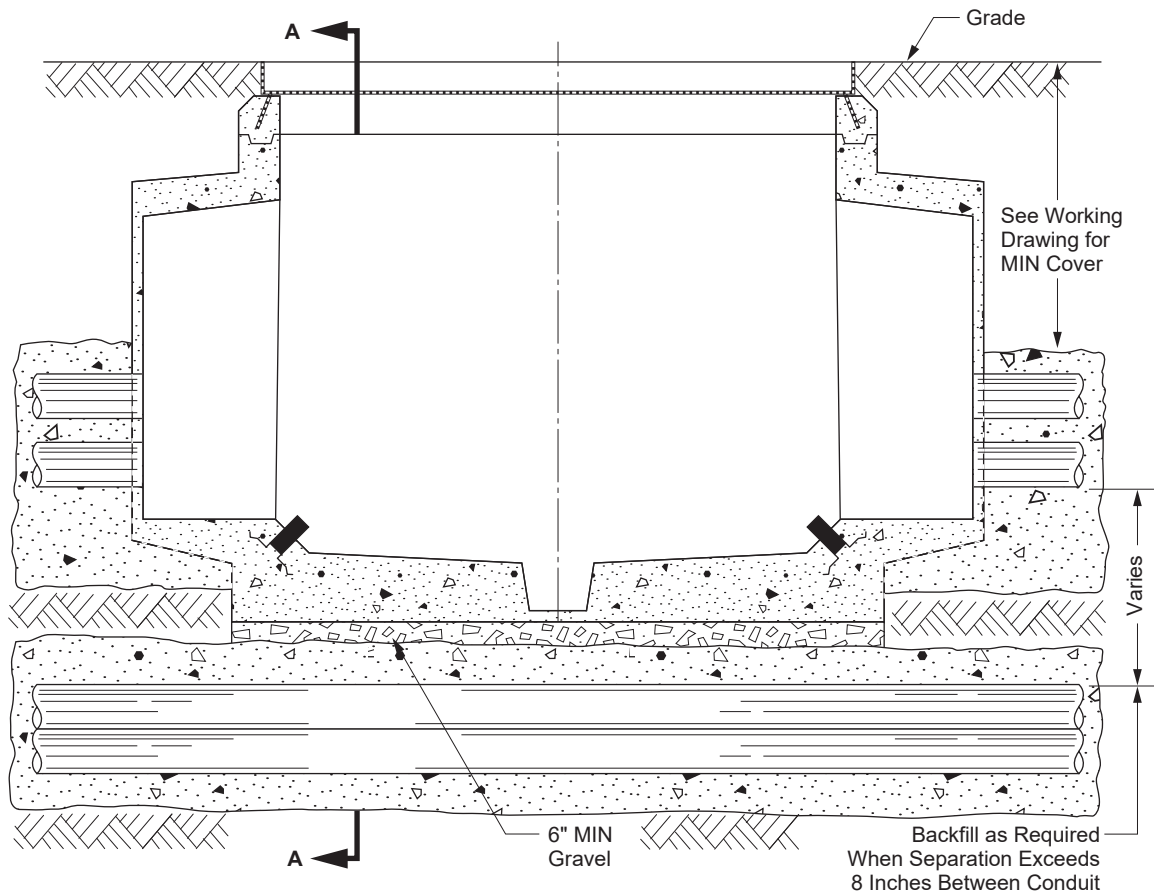



Figure CD 135-1.1: Side Elevation

Approved by: 	Typical Installation of Precast Pull Box in Main Line Conduit	CD 135
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2 UGS

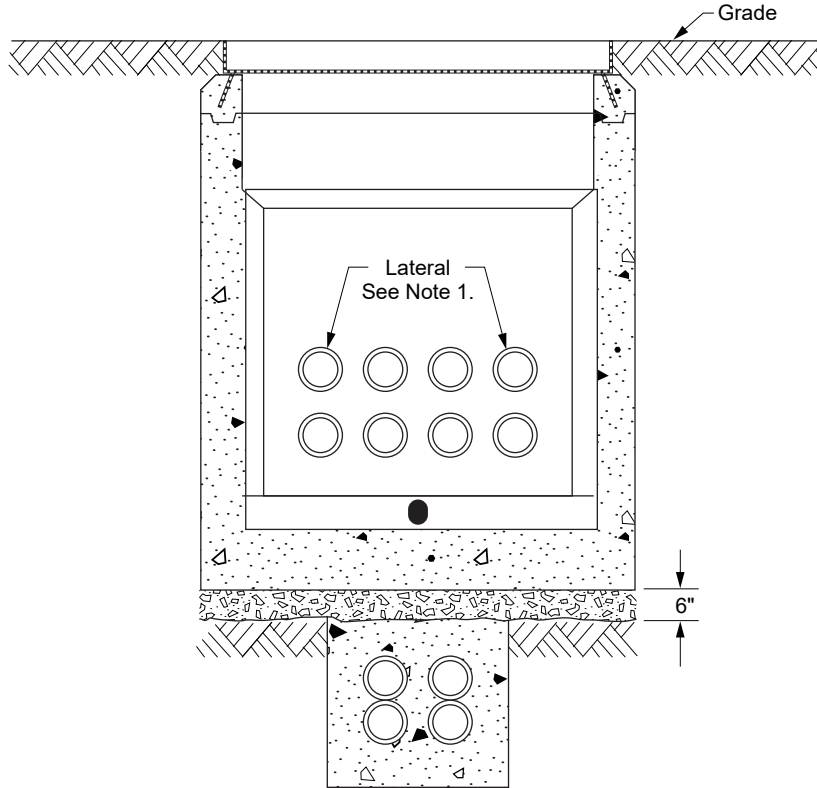


Figure CD 135-1.2: Section A-A

Note(s):

1. Ducts can be 4 wide in 2-1/2' x 4' and 3' x 5' pull boxes only.

CD 135

Sheet 2 of 2

UGS

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Typical Installation of Precast Pull Box in Main Line Conduit

What's Changed?

Approved by:

PHH

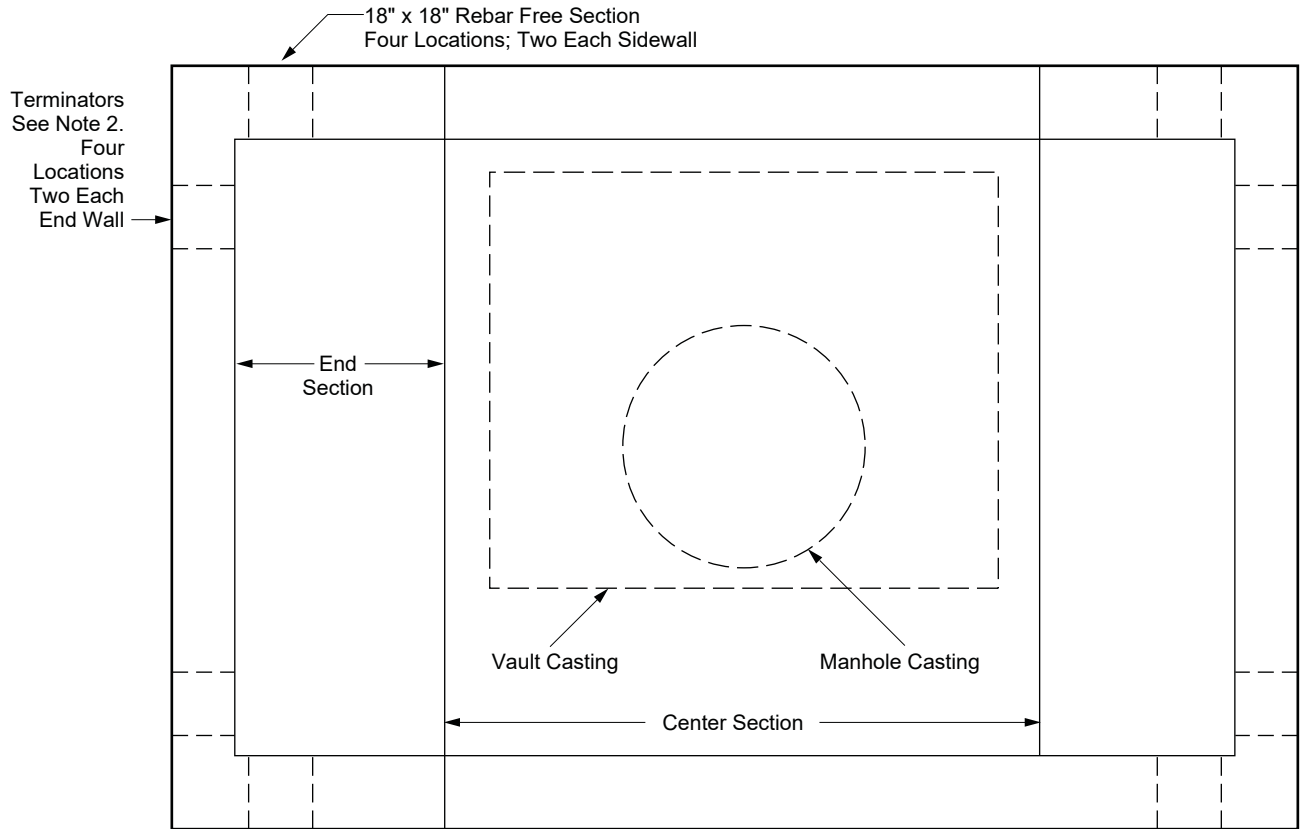
Effective Date:

01-26-2007

CD 140 Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger

Scope CD 140.1 Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger

Figure CD 140-1: Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger



Note(s):

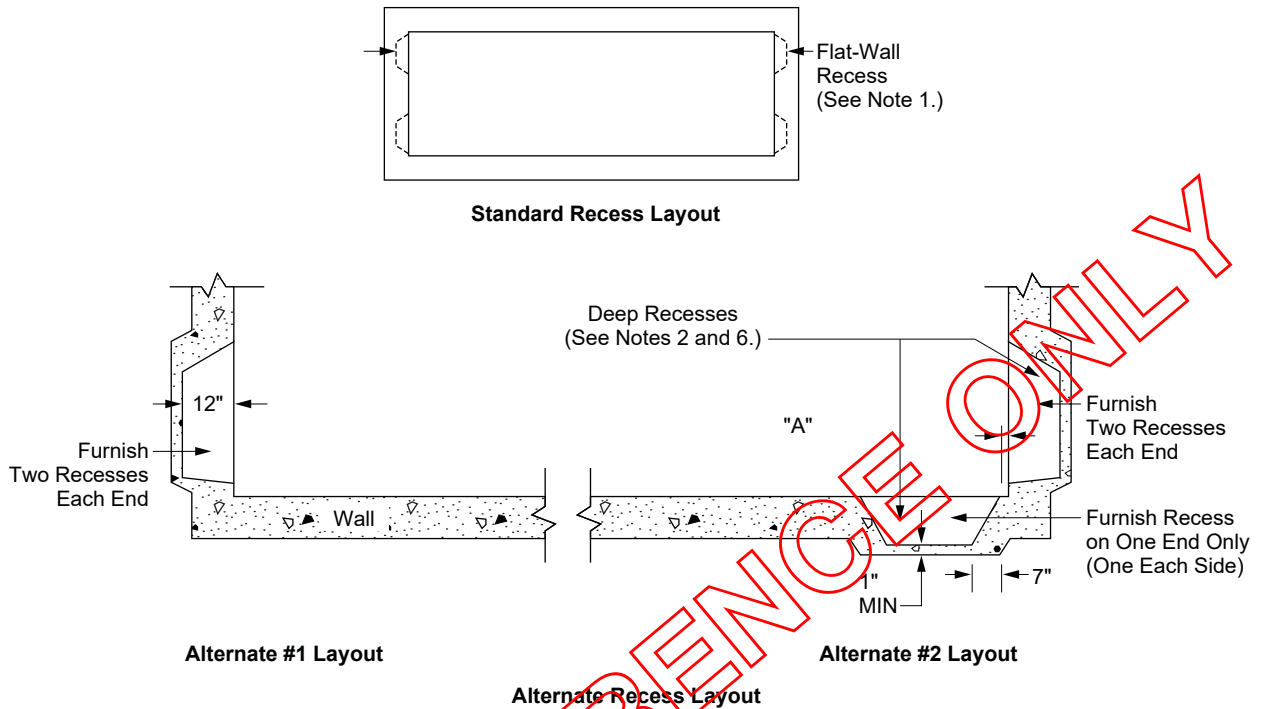
1. With SCE Company approval, small variations in design may be allowed precasters in order to accommodate individual methods of manufacturing.
2. See [CD 142](#).

Approved by: <i>PHH</i>	Standard Conduit Location for Precast Vaults and Manholes 6' x 12' and Larger	CD 140
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1
		UGS

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CD 141 Conduit Recess Layout — Precast Concrete Vaults — 7' x 10', 8' x 10', and Larger
Scope CD 141.1 Conduit Terminators

Figure CD 141-1: Standard and Alternate Recess Layouts



Note(s):

1. Standard layout for 7' x 10' and 8' x 10' and copper vault, will consist of two flat-wall conduit recesses, furnished at each end of the structure.
2. Deep recesses will only be furnished when specified on the working drawing.
3. Alternate #2 layout is not available on seven-foot wide vaults. For seven-foot wide vaults, see [VA 411](#) for conduit recess dimensions and terminators.
4. When "Alternate #2 Layout" is required, mark "A" on end where side recesses are required.
5. The face of the deep recess on the 8' x 10' long vault will have a minimum height of 32 inches.
6. Face of the 8' x 14' and longer vault deep recesses to have a 75-inch minimum height. Minimum height from floor to recess face is 22 inches. Minimum height from recess face to ceilings is eight inches. See [CD 142](#) for other conduit recess dimensions and terminators.
7. With SCE Company approval, small variations in design may be allowed precasters in order to accommodate individual methods of manufacturing.

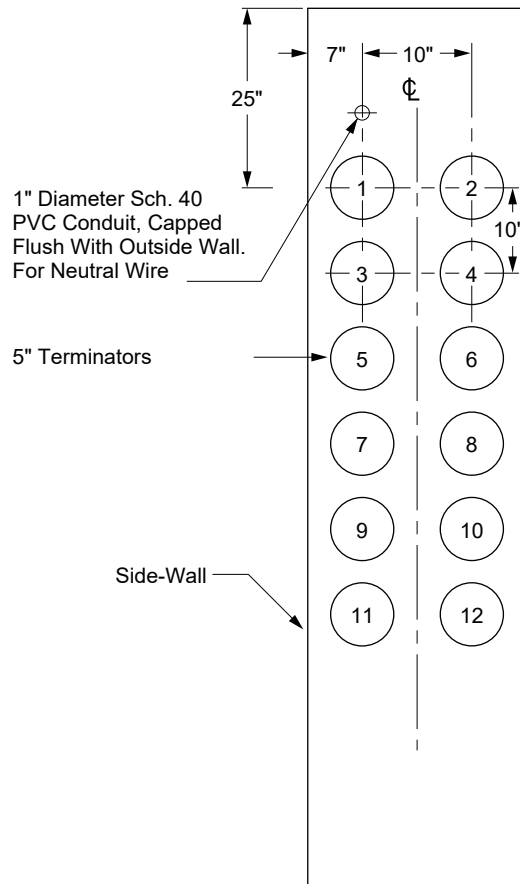
Approved by: <i>PHH</i>	Conduit Recess Layout — Precast Concrete Vaults — 7' x 10', 8' x 10', and Larger	CD 141
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1
		UGS

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CD 142 Conduit Terminators for Precast Tunnel Vaults

Scope CD 142.1 Conduit Terminators for Precast Tunnel Vaults

Figure CD 142-1: Conduit Terminators for Precast Tunnel Vaults



Unless specified otherwise, mainline conduits will be installed in the terminators in numerical order starting with position 5.

Working drawings or inspector may change positions for special cases.

For new construction, conduit terminations shall start at the bottom terminators.

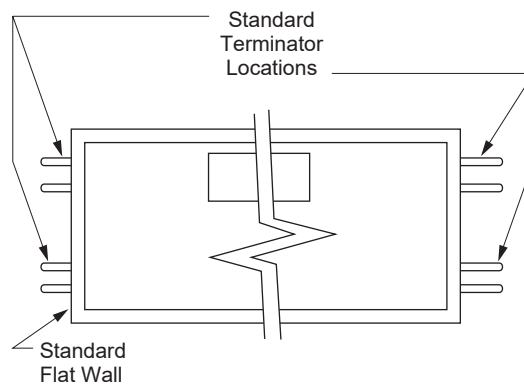


Figure CD 142-1.1: Vault Top View

Approved by:

ajf

Conduit Terminators for Precast Tunnel Vaults

CD 142

Sheet 1 of 2

Effective Date:
07-27-2018

What's Changed? Figure CD 142-1, added new note to begin terminations from the lowest terminator for new construction. Updated figure for clarity,

UGS

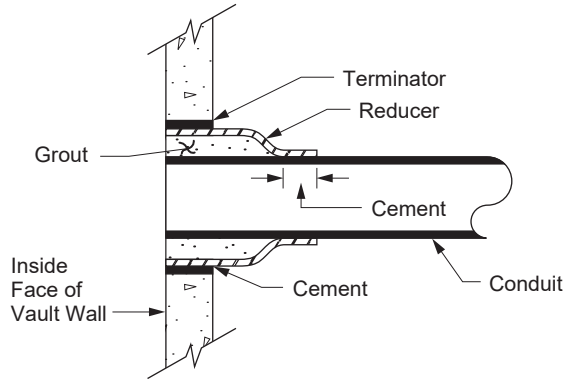


Figure CD 142-1.2: Side View

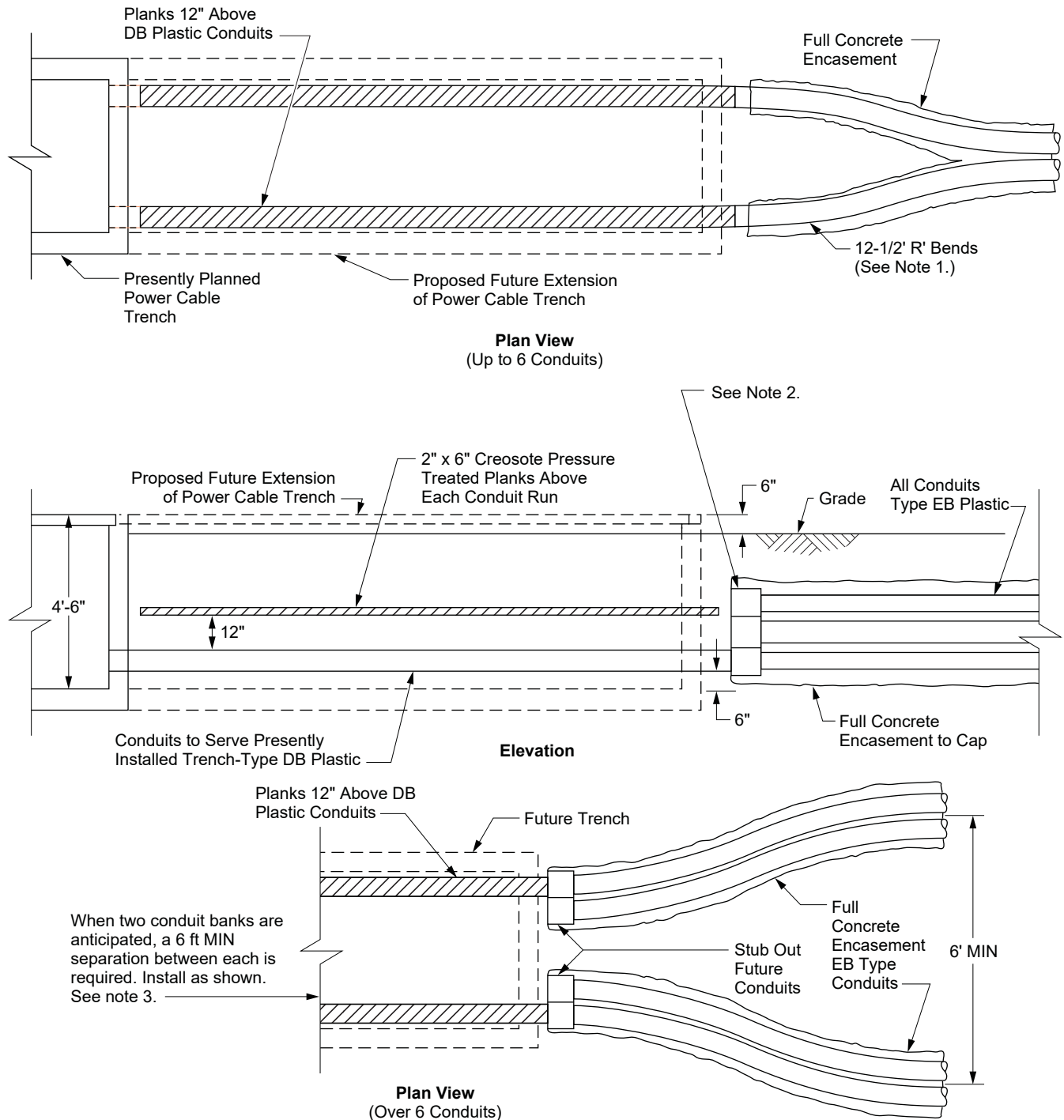
1.0 Requirements:

1. Two sets of 12 five-inch or six-inch terminators, as specified, will be furnished in each end wall unless otherwise specified on working drawing.
2. Terminators must provide a watertight seal with or without conduits installed.
3. Reducers will be furnished (number per working drawing) when small diameter conduit is to be installed. Reduced conduit will be finished flush with inside recess wall and grouted ([Figure CD 142-1.2 \[Sheet 2\]](#)).

CD 144 Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned

Scope CD 144.1 Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned

Figure CD 144-1: Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned



Approved by: <i>PhH</i>	Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned	CD 144
Effective Date: 10-26-2012	What's Changed?	Sheet 1 of 2
		UGS

Note(s):

1. See [MC 800](#).
2. Cap conduits per [CD 148](#) for extending into future trench.
3. See [MC 800](#) for additional details.

CD 144

Conduit Bank Entrance to Power Cable Trench Where Trench Extension is Planned

Approved by:

PHH

Sheet 2 of 2

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Effective Date:

10-26-2012

UGS

CD 146 Intercepting Existing Conduit Runs

Scope CD 146.1 Intercepting Existing Conduit Runs

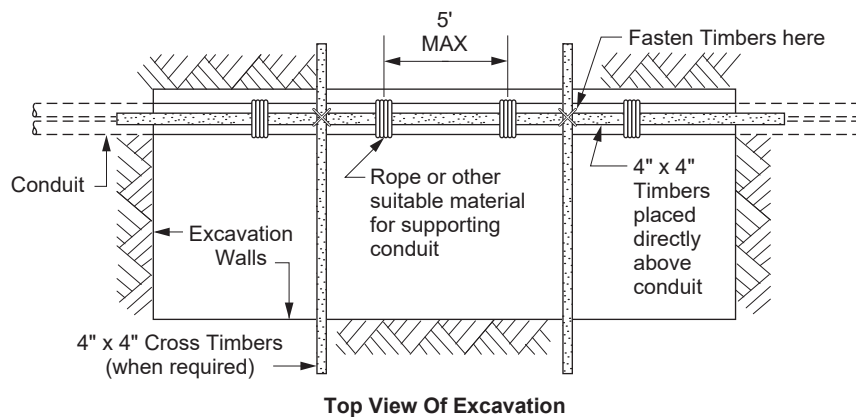
When intercepting existing conduit, adequate support must be provided in order to prevent damage to the cables. If the conduit run to be intercepted is concrete encased, carefully remove all existing concrete. Generally, the encasement can be removed without damage to plastic, HDG, or similar conduit materials. These conduit should remain over the cable for protection during the structure installation.

Transite, soapstone, and other similar materials are very heavy and will usually break up when the concrete is removed. With this type of material, remove entire conduit and protect the cable by splitting a length of plastic conduit longitudinally and fitting it over the cable. The split conduit should be held together at no more than five-foot intervals with rope or tape.

After cables are suitably protected, the conduit must be supported at five-foot maximum intervals during the substructure installation. The sketches below show acceptable methods of supporting the exposed conduit.


After the substructure installation is completed, the conduit must be supported from the inside of the structure at three-foot (maximum) intervals. Where attachment points are necessary, insert one-half inch flush anchors into the walls or ceilings. One-half inch eye bolts may then be used to anchor the rope or other suitable supporting materials. Metallic straps of any type must not be used.

Figure CD 146-1: Acceptable Methods of Supporting Conduit



Note(s):

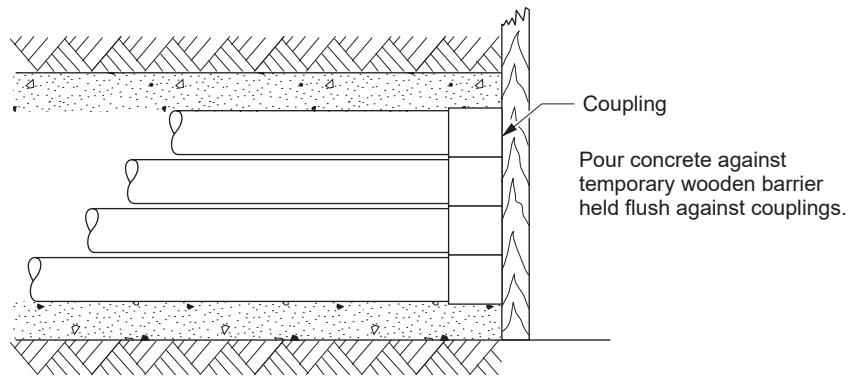
1. Where excavation is extensive in length or a large number of conduit are being supported, cross timbers may be required to adequately support the conduit bank.
2. Size and number of timbers to be increased as required for size of excavation and weight of conduit.

Approved by: 	Intercepting Existing Conduit Runs	CD 146
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1
		UGS

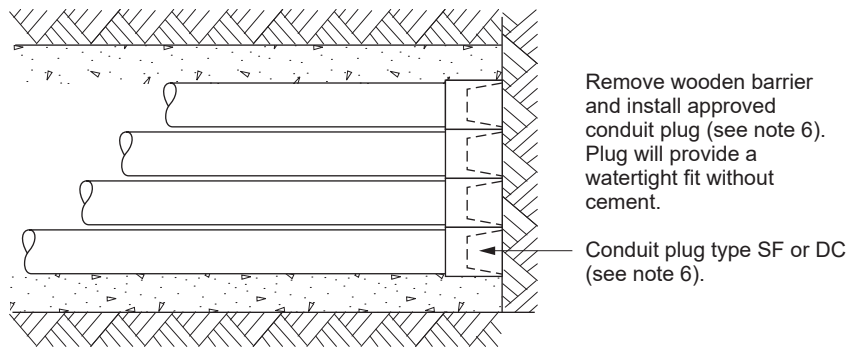
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CD 148 Capping Main Line Conduit
Scope CD 148.1 Capping Main Line Conduit

Figure CD 148-1: Capping Main Line Conduit




Typical Conduit Bank



Completed Capped Conduit Assembly

Note(s):

1. When capping unencased conduit (two maximum), install conduit plug in coupling same as shown above (do not stagger).
2. See [CD 120](#) for conduit spacing and concrete encasement.
3. Conduit plug types 1, 2, and 3 are not recommended for this application.
4. Where a conduit is stubbed out to curb or property line to be picked up later, it must terminate on a level course at a minimum depth of 30 inches from flow line of gutter unless specified otherwise.
5. Stubbed conduit to have location, marked at time of installation, by one of the following methods: Curb to be marked by chiseling an "E" on curb face, or 2" x 4" board, or pull rope or pull tape installed at capped conduit and extended to 12 inches below the surface.
6. See [CD 180](#).

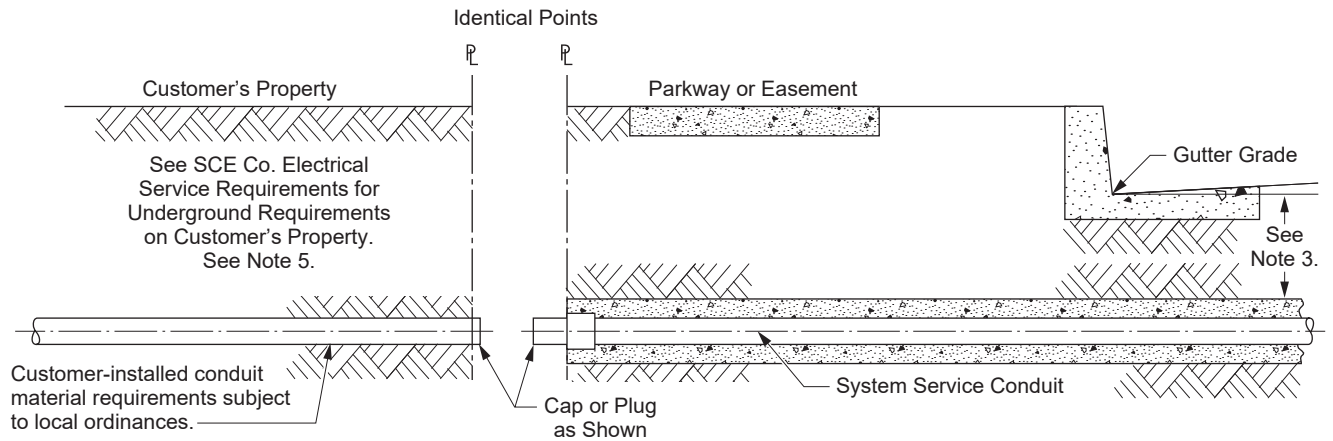
Approved by: 	Capping Main Line Conduit	CD 148
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1 UGS

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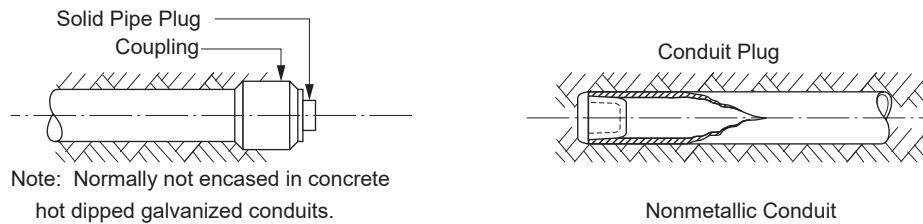
CD 150 Service Lateral Terminations

Scope CD 150.1 Service Lateral Terminations

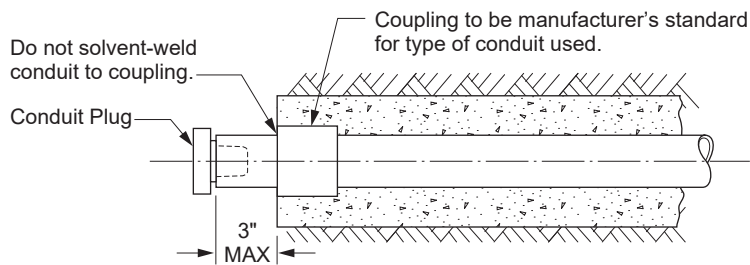
Figure CD 150-1: Service Lateral Terminations



Typical Conduit Terminations



Terminators for Direct Burial



Encased Conduit Termination

Note(s):

1. All service laterals will terminate in such location that an extension of same will have 12 inches minimum clearance from property line corner unless specified otherwise.
2. See CD 100 for approved type of conduit.
3. See CD 100 for general trench, backfill, and concrete requirements.
4. See CD 120 for conduit spacing requirements.
5. Where a conduit is stubbed out to curb or property line to be picked up later, it must terminate on a level course at a minimum depth of 30 inches from flow line of gutter unless specified otherwise.
6. Stubbed conduit to have location marked at time of installation by one of the following methods: Curb to be mark by chiseling an "E" on curb face, or 2" x 4" board, or pull rope or pull tape installed at capped conduit and extended to 12 inches below the surface.

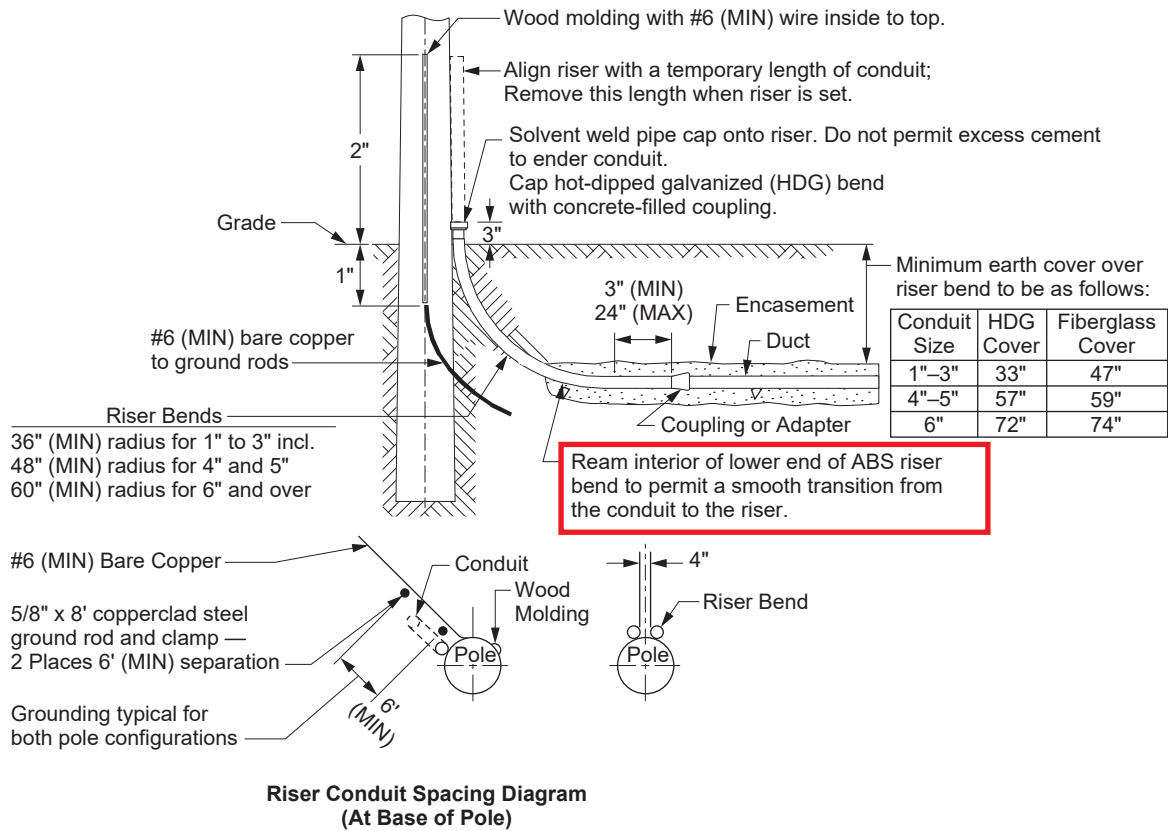
Approved by: 	Service Lateral Terminations	CD 150
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1
		UGS

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CD 160 Pole Riser Bend Standard Location

Scope CD 160.1 Pole Riser Bend Standard Location

Figure CD 160-1: Pole Riser Bend Standard Location



Note(s):

- Approved riser bend materials and sizes are shown in the following table.

Table CD 160-1: Approved Riser Bend Materials and Sizes — Standard Location

Material	Size							
	1"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
ABS	—	—	—	X	X	X	X	—
Fiberglass	—	—	—	—	X	X	X	X ^{a/}
HDG	X	X	X	X	X	X	X	X ^{a/}

^{a/} Six-inch HDG or Fiberglass riser bend will be used when specified on the working drawing. See AC 702 for grounding HDG riser bends.

= For Reference Only

- The top and bottom of three-, four-, five-, or six-inch fiberglass bends are furnished with permanently attached PVC couplings. Also included is a six-inch long, three-, four-, five-, or six-inch Schedule 80 PVC stub-out, solvent welded into the top coupling. See CD 166 for fiberglass riser bend material information and suppliers.

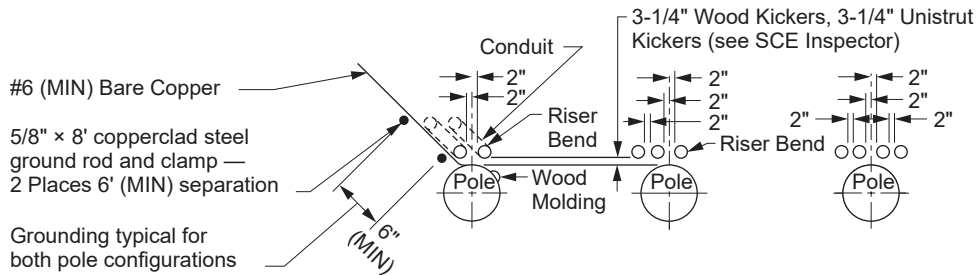
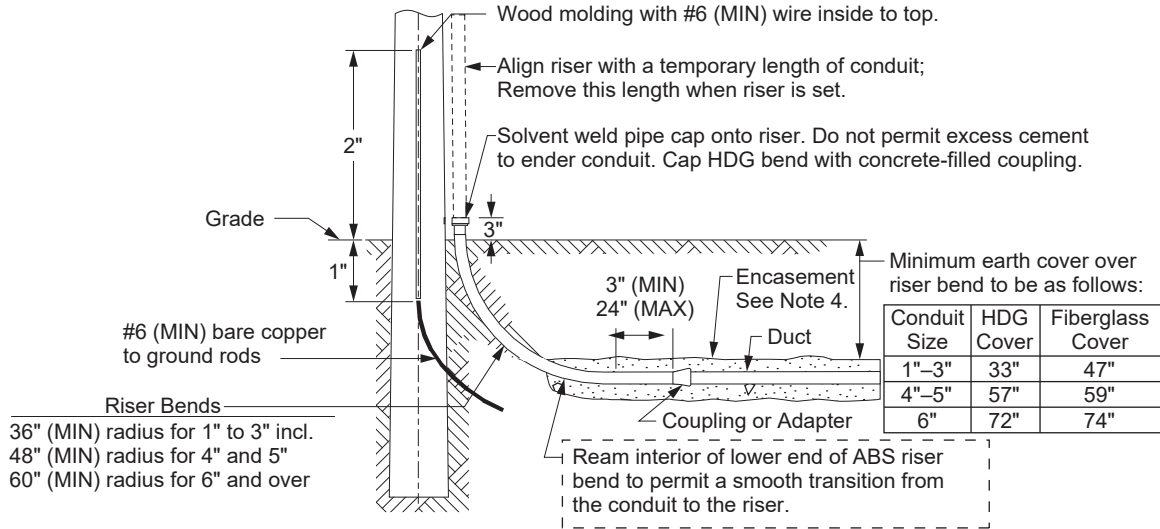
3. Two ground rods are required at all primary riser poles. Drive rods in trench bottom with six feet minimum separation in undisturbed earth. Leave the rod tops three inches above the trench bottom and attach continuous ground wire with clamps. Extend wire to indicated location on pole and stub up two feet above grade in wood moulding. All grounding materials furnished by the contractor. See [AC 703](#) for approved grounding materials. Ground rods are not required on light weight steel (LWS) poles.
4. Encasement required only when called out on working drawing, or as required per UGS [CD 120.1](#).
5. PVC risers may be substituted for fiberglass for straight runs of 150 feet or less in conduit sizes four inches and under.

CD 160	Pole Riser Bend Standard Location	Approved by: <i>afj</i>
Sheet 2 of 2	What's Changed? Added statement to Note 3 explaining that ground rods are not required for light weight steel poles. Added reference to CD 120.1 to Note 4.	Effective Date:
UGS		07-27-2018

CD 161 Pole Riser Bend for Risers on Kicker Blocks

Scope CD 161.1 Pole Riser Bend for Risers on Kicker Blocks

Figure CD 161-1: Pole Riser Bend for Risers on Kicker Blocks



Riser Conduit Spacing Diagram (At Base of Pole)

Note(s):

- Approved riser bend materials and sizes are shown on the following table.

Table CD 161-1: Approved Riser Bend Materials and Sizes — Risers on Kicker Blocks

Material	Size							
	1"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
ABS	—	—	—	X	X	X	X	—
Fiberglass	—	—	—	—	X	X	X	X ^{a/}
HDG	X	X	X	X	X	X	X	X

^{a/} Six-inch HDG or fiberglass riser bend will be used when specified on the working drawing. See AC 702 for grounding HDG riser bends.

= For Reference Only

Approved by:

Pole Riser Bend for Risers on Kicker Blocks

CD 161

Sheet 1 of 2


Effective Date:

11-10-2011

What's Changed? Figure CD 161-1 was updated to reflect 3 1/4" unistrut kickers.

UGS

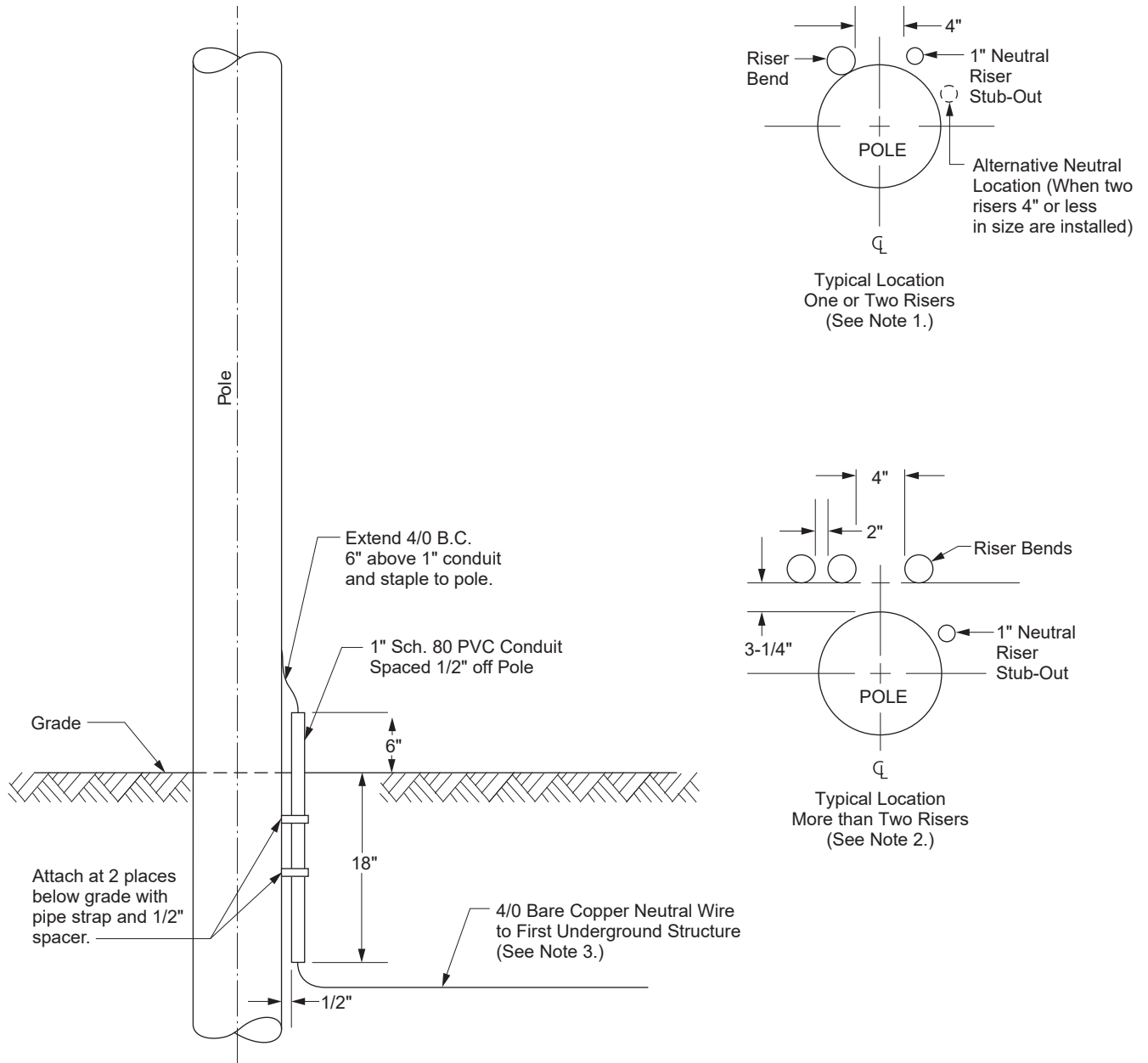
2. The top and bottom of three-, four-, five-, or six-inch fiberglass bends are furnished with permanently attached PVC couplings. Also included is a six-inch long, three-, four-, five-, or six-inch Schedule 80 PVC stub-out, solvent welded into the top coupling. See [CD 166](#) for fiberglass riser bend material information and suppliers.
3. Two ground rods are required at all primary riser poles. Drive rods in trench bottom with six feet minimum separation in undisturbed earth. Leave the rod tops three inches above the trench bottom and attach continuous ground wire with clamps. Extend wire to indicated location on pole and stub up two feet above grade in wood moulding. All grounding materials furnished by the contractor. See [AC 703](#) for approved grounding materials.
4. Encasement required only when called out on working drawing.
5. Schedule 80 PVC bends may be substituted for fiberglass bends for straight runs of 150 feet or less in conduit sizes four inches and under.

CD 161	Pole Riser Bend for Risers on Kicker Blocks	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date:
UGS		11-10-2011

CD 162 Neutral Wire Riser Installation for Four-Wire Systems

Scope CD 162.1 Neutral Riser Wire Installation for Four-Wire Systems

Figure CD 162-1: Neutral Riser Wire Installation for Four-Wire Systems



Note(s):

1. See CD 160.
2. See CD 161.
3. Install bare copper neutral wire only when specified on working drawing. For mainline applications (including 4-wire taplines) when the neutral is present on an overhead structure that feeds a primary riser, the neutral shall be continuous to the first underground structure. A bare copper neutral wire, as specified on the working drawing, shall be placed, and fully encased in concrete, at the lower region of the duct bank, preferably in-between conduits.

Approved by:

PHH

Neutral Wire Riser Installation for Four-Wire Systems

CD 162

Effective Date:
07-27-2007

What's Changed? Note 3 is now written out instead of referenced.

Sheet 1 of 1

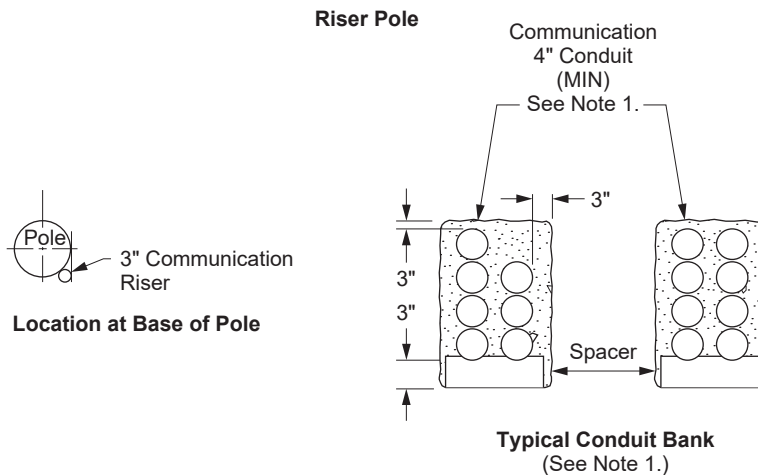
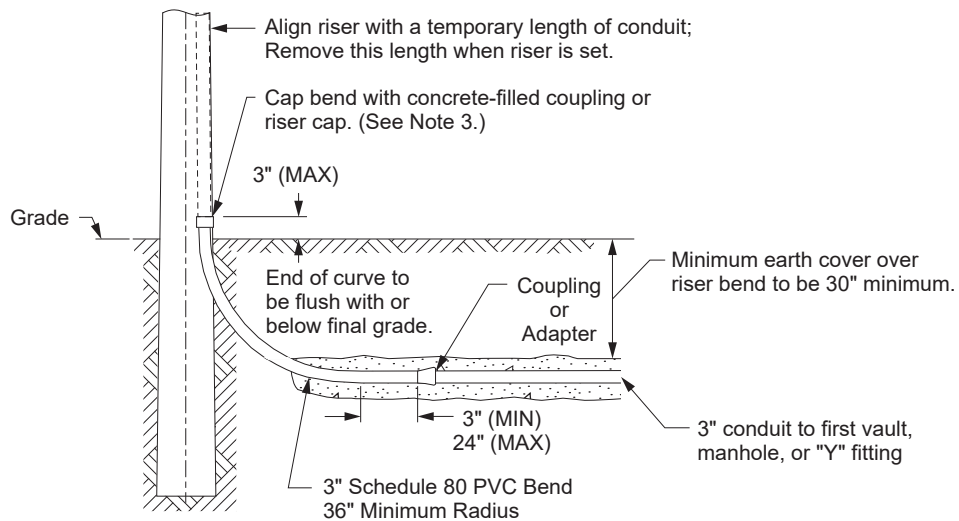
UGS

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CD 163 Communication Conduit and Riser Bend Installation

Scope CD 163.1 Communication Conduit and Riser Bend Installation

Figure CD 163-1: Communication Conduit and Riser Bend Installation



Note(s):

1. All communication conduits to be four inches minimum for vault-to-vault or manhole-to-manhole runs. Install three-inch conduit from "Y" fitting, or last vault or manhole to riser pole. Install four-inch "Y" fitting with reducers on pole side per [CD 111](#).
2. Unless otherwise specified, communication conduit will be against pole.
3. See [CD 180](#).

Approved by:

ajf

Communication Conduit and Riser Bend Installation

CD 163

Sheet 1 of 1

Effective Date:
07-27-2018

What's Changed? Figure CD 163-1: Updated minimum earth cover over riser bend to be 30" minimum.

UGS

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CD 164 Specification for Abandoning Conduit and Risers

Scope CD 164.1 Specification for Abandoning Conduit and Risers

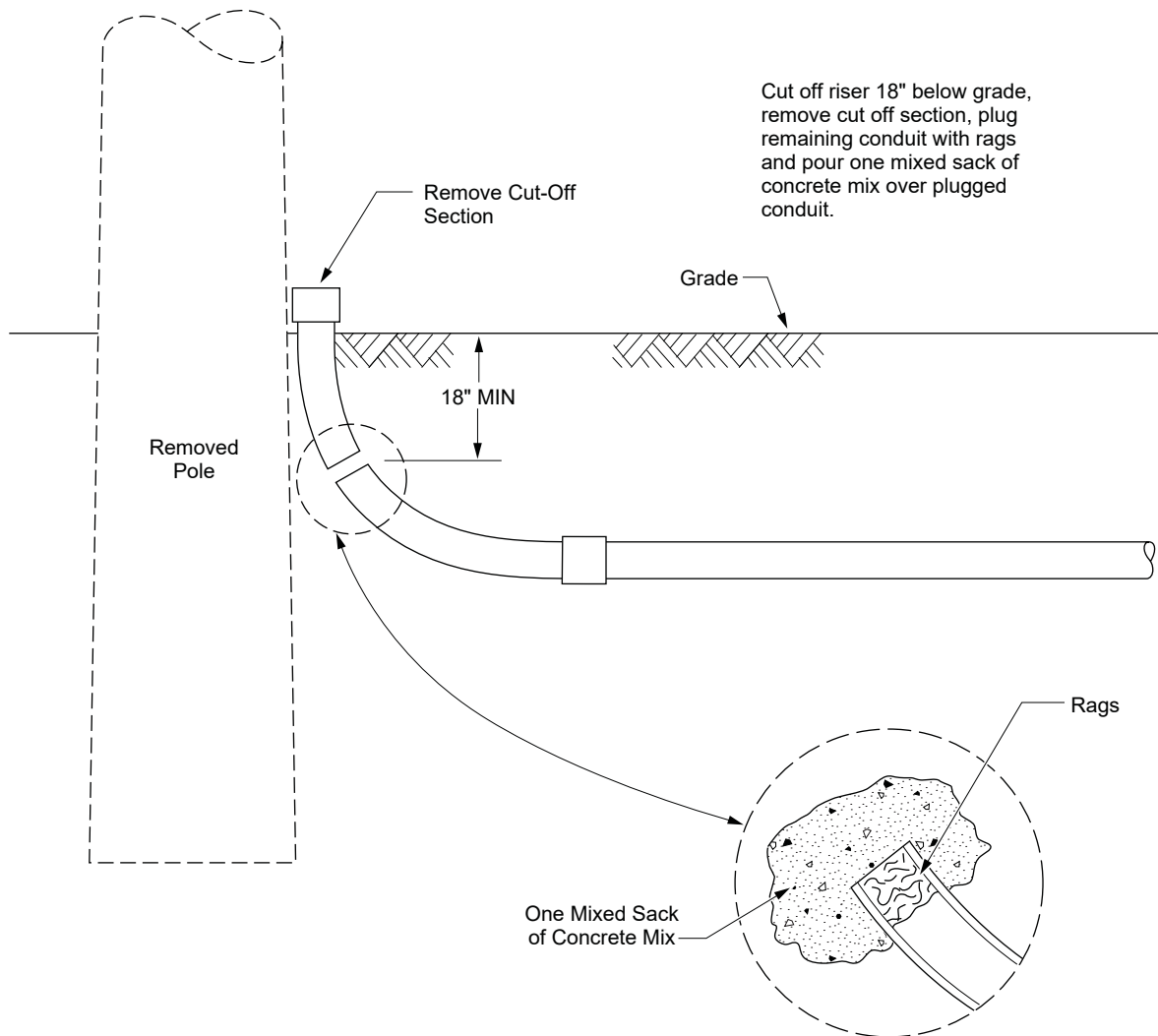
1.0 Conduit


- 1.1 Any conduit that is exposed will be removed from the ground.
- 1.2 The substructure end of any abandoned conduit will be permanently sealed against the entrance of water, gas, or other foreign substances.

2.0 Risers

Any conduit extending above ground will be cut off a minimum of 18 inches below ground level and permanently sealed. (See [Figure CD 164-1 \[Sheet 1\]](#).)

Figure CD 164-1: Specification for Abandoning Conduit and Risers



Approved by:

 Effective Date:
 01-26-2007

Specification for Abandoning Conduit and Risers

What's Changed?

CD 164

Sheet 1 of 1

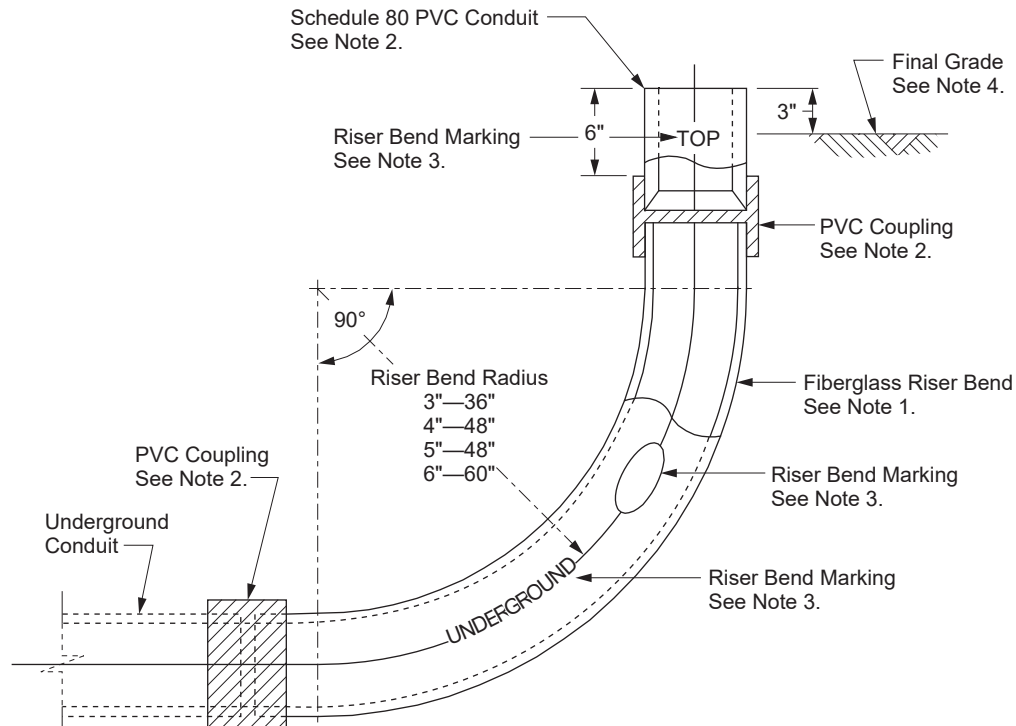
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CD 166 Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends

Scope CD 166.1 Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends

Figure CD 166-1: Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends



Note(s):

1. The riser bend is available in three-, four-, five-, or six-inch sizes. The main body of the bend is manufactured from fiberglass material and is medium gray in color.
2. The top and bottom of riser bend is furnished with PVC couplings permanently epoxy bonded to the fiberglass bend. A Schedule 80 PVC six-inch long stub-out is solvent welded into the top PVC coupling.
3. The top Schedule 80 PVC stub-out of bend is stenciled "TOP," and bottom of bend is stenciled "UNDERGROUND." Manufacturers name, size, and date (month and year) will be stenciled on the center of the riser bend.
4. The top of Schedule 80 PVC stub-out will be placed three inches above final grade. No portion of the fiberglass material of the bend will be exposed above the finish grade.
5. The approved manufacturers and suppliers are:
 - a. Manufacturers: FRE Conduit, Smith Product Company, and Champion v, Inc.
 - b. Suppliers:
 - Cal-Duct, Inc.
2522 Lee Avenue
South El Monte, CA 91733
 - SAF-T-CO Supply, Inc.
1300 E. Normandy Place
Santa Ana, CA 92705
 - One Time Utility
501 Garfield St.,
Santa Ana, Ca 92701

Approved by:

ajf

Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends

CD 166

Sheet 1 of 1

Effective Date:
04-26-2019

What's Changed? The approved manufacturer information has been updated.

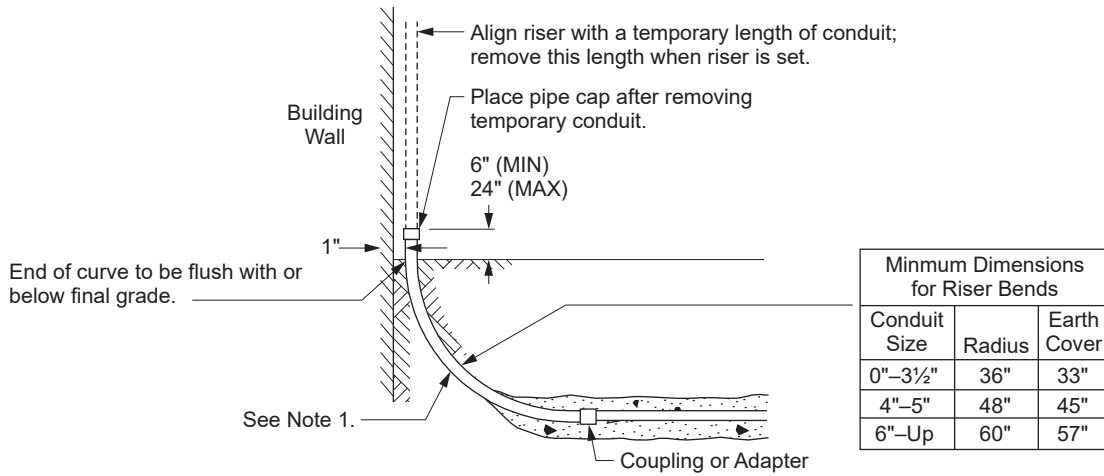
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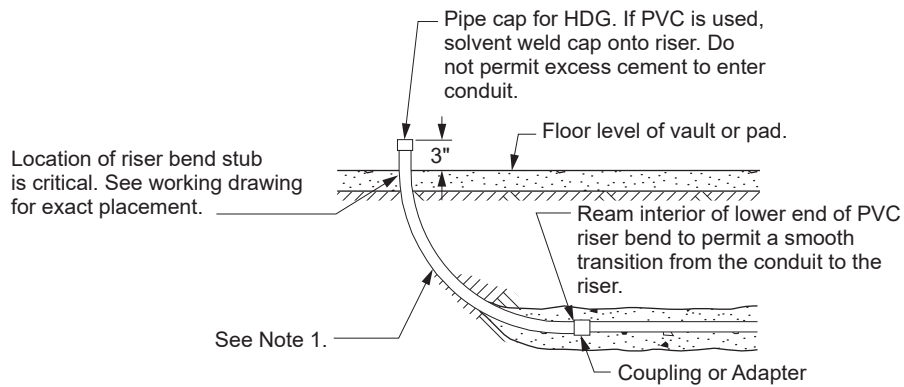
CD 170 Riser Bend Installation at Wall or Pad

Scope CD 170.1 Riser Bend Installation at Wall or Pad

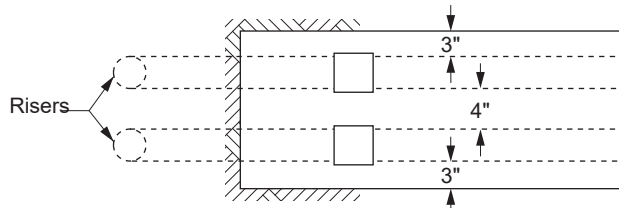
Figure CD 170-1: Riser Bend Installation at Wall or Pad



Typical Riser at Building



Typical Riser at Vault or Pad



Plan-View for Two Conduit Terminals

Note(s):

1. Fiberglass, Schedule 40, or 80 PVC or HDG. PVC is subject to requirements of local ordinances. HDG must be grounded per AC 702. PVC only for secondary runs and straight primary runs of less than 150 feet length with 4" or smaller duct.

Approved by:

PhH

Riser Bend Installation at Wall or Pad

CD 170

Sheet 1 of 1

Effective Date:
01-26-2007

What's Changed?

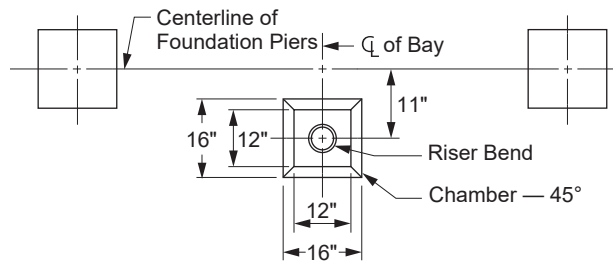
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CD 172 Underground Risers in Substation

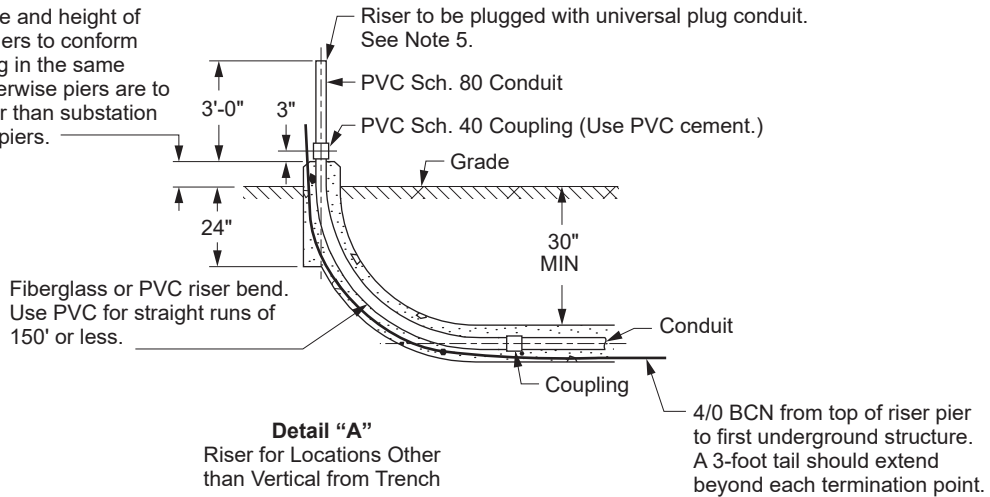
Scope CD 172.1 Underground Risers in Substation

Figure CD 172-1: Underground Risers in Substation — Plan and Details “A” and “B”

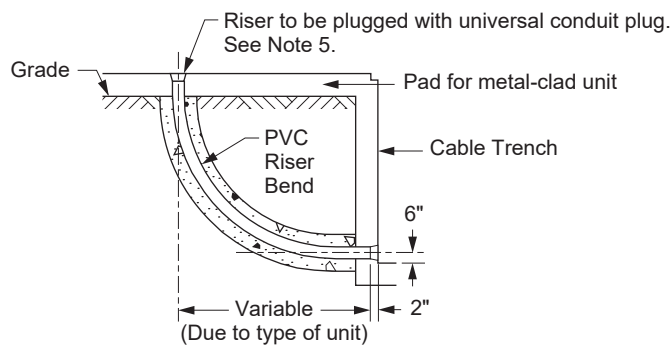


Plan
Location for Riser (See Detail “A.”)

Note: Shape and height of new riser piers to conform with existing in the same rack — otherwise piers are to be 8" higher than substation foundation piers.



Detail “A”
Riser for Locations Other than Vertical from Trench



Detail “B”
Riser for Metal-Clad Unit

Approved by:

PhH

Underground Risers in Substation

CD 172

Sheet 1 of 3

Effective Date:
10-26-2012

What's Changed?

UGS

Note(s):

1. Conduit — All conduit to be five inches unless noted otherwise. Bends to have 48-inch minimum radius. Material DB-PVC conduit PVC Schedule 80 conduit (above ground).
2. Concrete — Four-inch concrete envelope for all buried conduit. See [GI 020](#) and [CD 100](#).
3. Conduit Termination — All conduit ends to be reamed and finished smooth.
4. Trench — See [MC 800](#) for trench detail.
5. See [CD 180](#).

CD 172

Underground Risers in Substation

Approved by:



Sheet 2 of 3

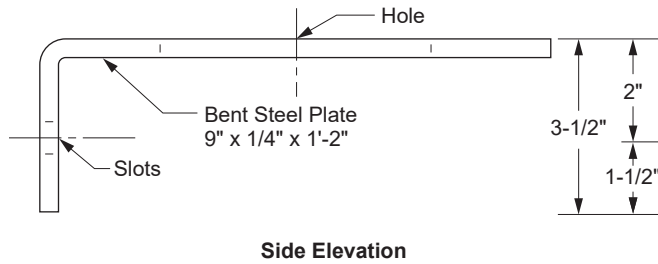
What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Effective Date:

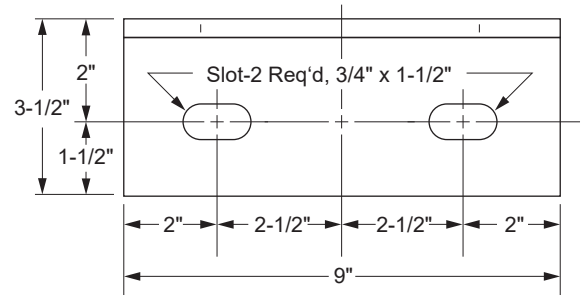
10-26-2012

UGS

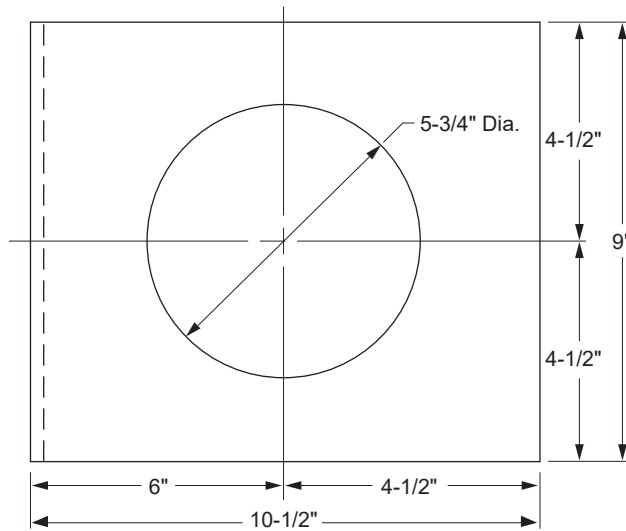
Figure CD 172-2: Underground Risers in Substation — Details of Riser Anchor Plate and Detail 3



Side Elevation

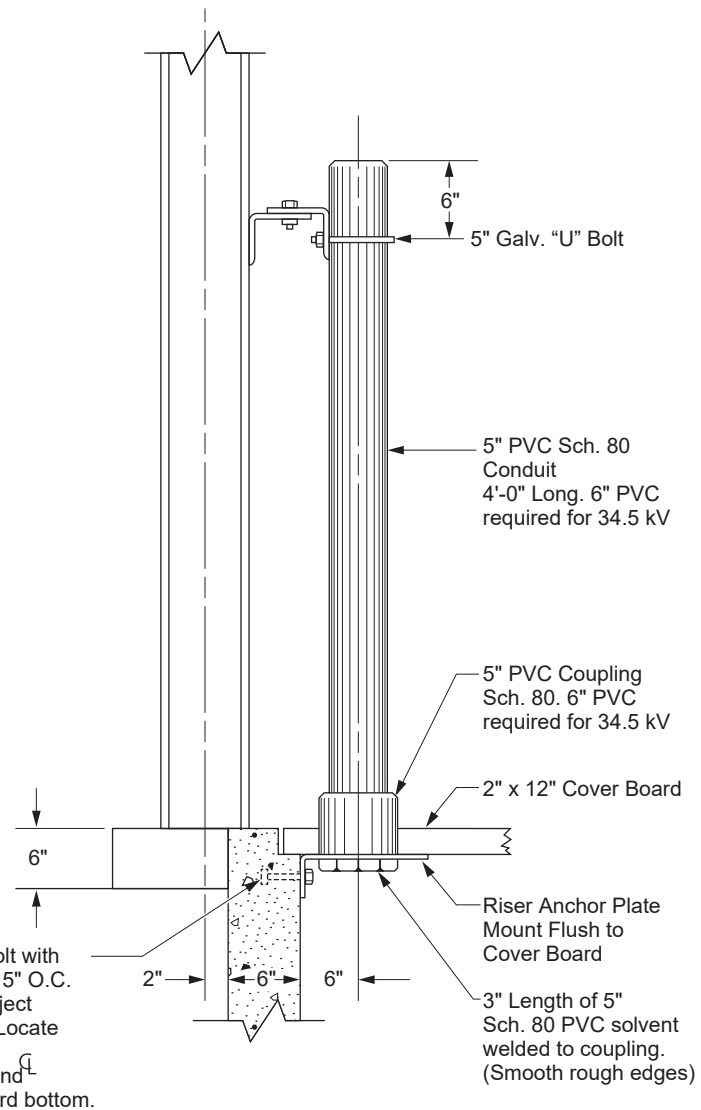


Front Elevation



Plan

Details of Riser Anchor Plate
(For use — see Detail No. 3)



Detail No. 3

Riser — Vertical from Trench

Approved by:

PhH

Underground Risers in Substation

CD 172

Sheet 3 of 3

Effective Date:
10-26-2012

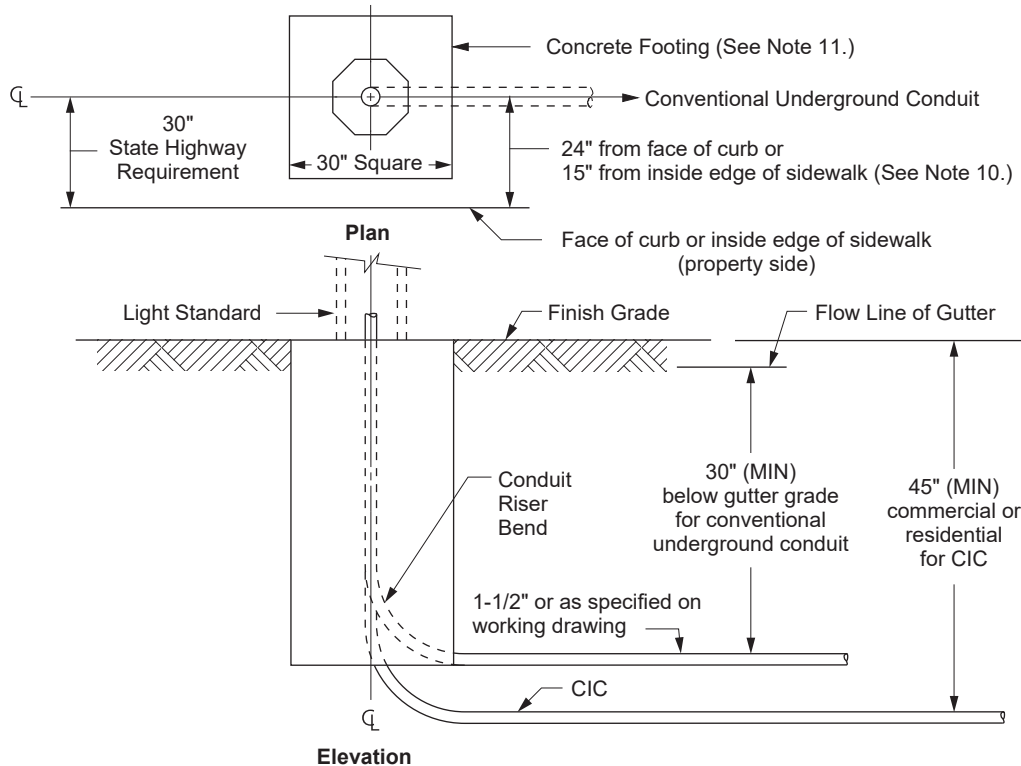
What's Changed?

UGS

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CD 175 Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard
Scope CD 175.1 Typical Conduit and Riser Bend Installation for Service to One Streetlight Standard

Figure CD 175-1: Typical Conduit and Riser Bend Installation for Service to One Streetlight Standard



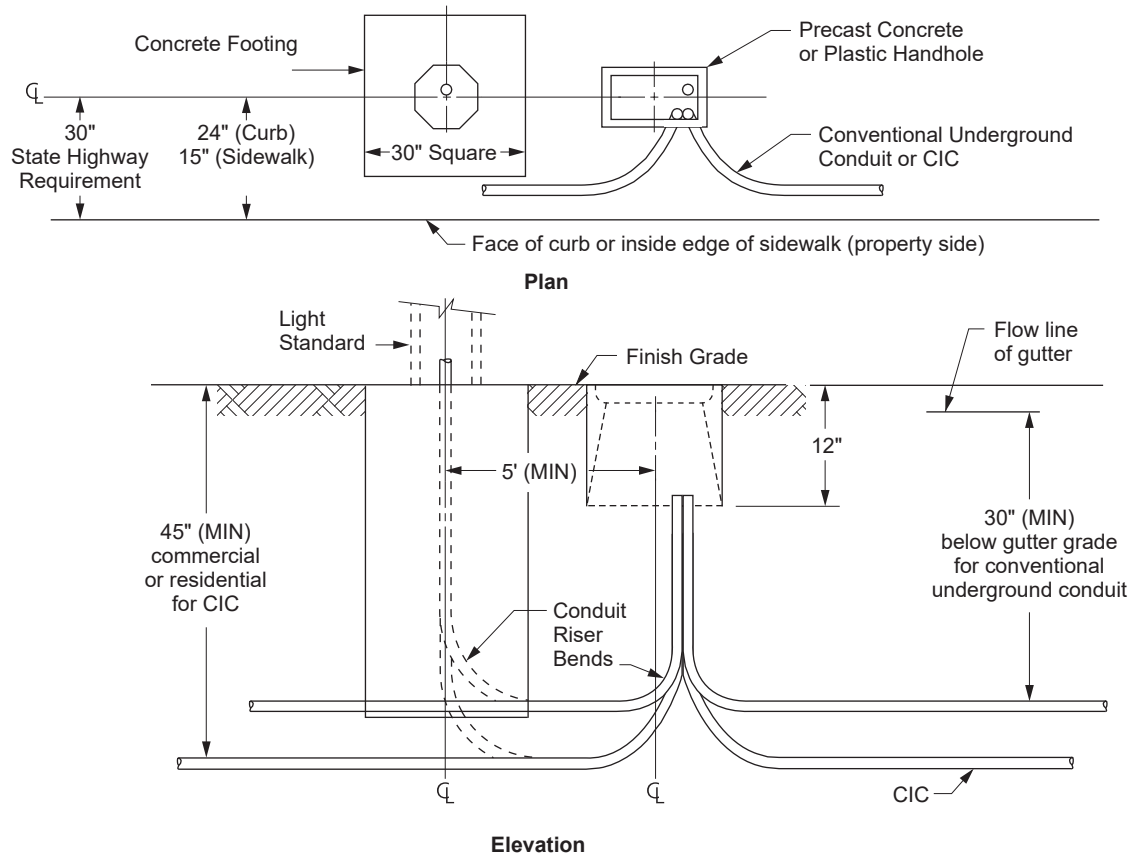
Note(s):

1. Typical location for streetlight standard:
 - a. With parkway—place behind inside edge of curb.
 - b. Without parkway—place behind inside edge of sidewalk when curb and sidewalk do not exceed 5-1/2 feet in width, or per local inspection agency.
2. A semi-rigid or rigid conduit bend "DB" thickness minimum will be used when a conventional conduit system is installed. See working drawing for size and material.
3. No encasement required unless otherwise specified.
4. In a rigid conduit installation, short lengths of properly coupled conduit may be used to form sweeps of a radius not normally supplied by manufacturers. In trench runs, the maximum deflection allowed will be 1/2 inch for lengths two feet or shorter, and one inch for lengths over two feet.
5. For riser bends, the minimum radius permitted will be 24 inches; for horizontal bends, a minimum radius of 36 inches.
6. A pull rope or pull tape will be installed in each empty conduit.
7. See [CD 175](#) for looping installations.
8. Five-foot clearance to be maintained from fire hydrant.
9. Four-foot clearance to be maintained from top of slope of commercial driveway and two-foot clearance from residential driveway.
10. On state highway, the streetlight centerline location will be six inches behind sidewalk when sidewalk is less than seven feet wide.
11. See [MC 890](#) for foundation details.
12. For new or rebuilt streetlight systems, if space permits or at no additional cost or low cost minor work, maintain a minimum clearance of 36 inches for pedestrian right-of-way access. Avoid streetlight placement in wheelchair ramp locations.

Approved by: 	Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard	CD 175
Effective Date: 10-26-2012	What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.	Sheet 1 of 3
		UGS

Scope CD 175.2 Typical Conduit and Riser Bend Installation for Handhole through Service to Streetlight Standards

Figure CD 175-2: Typical Conduit and Riser Bend Installation for Handhole through Service to Streetlight Standards



Note(s):

1. Handhole loop through service is used when a two-inch or larger conduit is required.
2. Typical location for streetlight standard:
 - a. With parkway—place behind inside edge of curb.
 - b. Without parkway—place behind inside edge of sidewalk when curb and sidewalk do not exceed 5-1/2 feet in width, or per local inspection agency.
3. A semi-rigid or rigid conduit bend "DB" **thickness minimum** will be used when a conventional conduit system is installed. See working drawing for size and material.
4. No encasement required unless otherwise specified.
5. In a rigid conduit installation, short lengths of properly coupled conduit may be used to form sweeps of a radius not normally supplied by manufacturers. In trench runs, the maximum deflection allowed will be 1/2 inch for lengths two feet or shorter, and one inch for lengths over two feet.
6. For riser bends, the minimum radius permitted will be 24 inches; for horizontal bends, a minimum radius of 36 inches.
7. A pull rope or pull tape will be installed in each empty conduit.
8. Five-foot clearance to be maintained from fire hydrant.
9. Four-foot clearance to be maintained from top of slope of commercial driveway and two-foot clearance from residential driveway.
10. On state highway, the streetlight centerline location will be six inches behind sidewalk when sidewalk is less than seven feet wide.
11. See [MC 890](#) for foundation details.
12. For new or rebuilt streetlight systems, if space permits or at no additional cost or low cost minor work, maintain a minimum clearance of 36 inches for pedestrian right-of-way access. Avoid streetlight placement in wheelchair ramp locations.

CD 175

Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard

Approved by:

[Signature]

Sheet 2 of 3

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

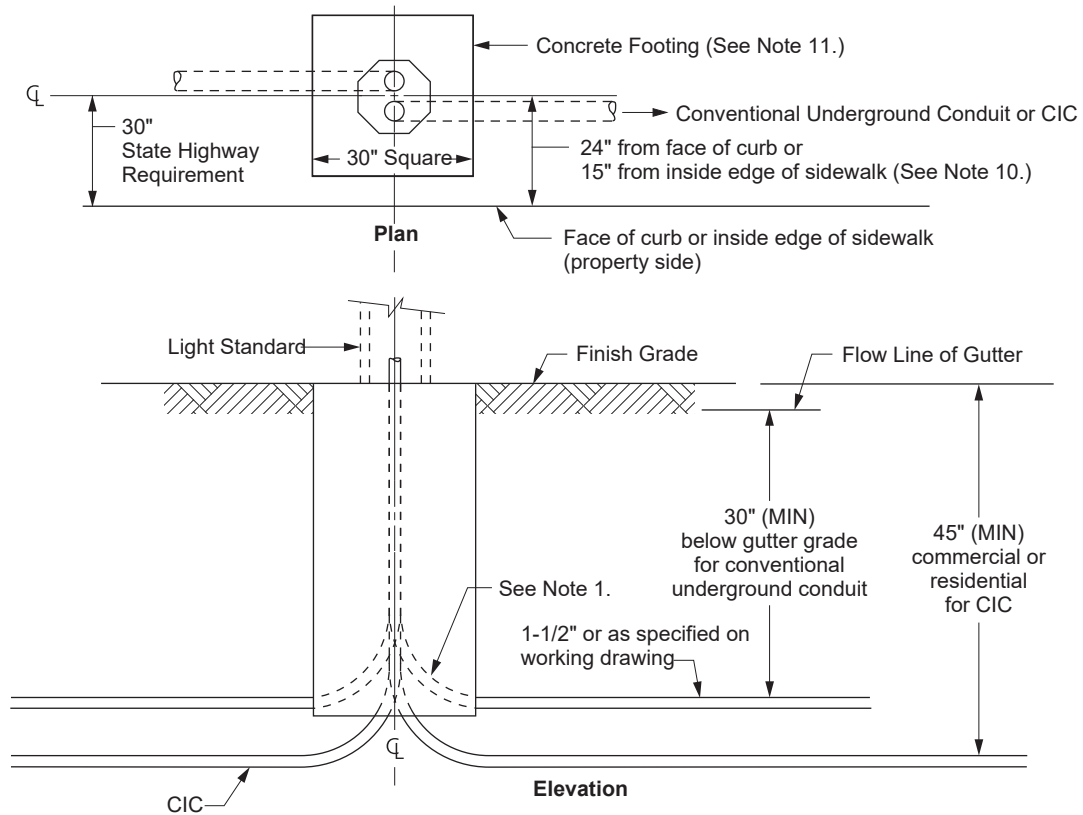
Effective Date:

10-26-2012

UGS

Scope CD 175.3 Typical Conduit and Riser Bend Installation Loop through Service to Streetlight Standards

Figure CD 175-3: Typical Conduit and Riser Bend Installation Loop through Service to Streetlight Standards



Note(s):

1. Loop through streetlight service is limited to a maximum of two 1-1/2-inch conduits.
2. Typical location for streetlight standard:
 - a. With parkway—place behind inside edge of curb.
 - b. Without parkway—place behind inside edge of sidewalk when curb and sidewalk do not exceed 5-1/2 feet in width, or per local inspection agency.
3. A semi-rigid or rigid conduit bend "DB" thickness minimum will be used when a conventional conduit system is installed. See working drawing for size and material.
4. No encasement required unless otherwise specified.
5. In a rigid conduit installation, short lengths of properly coupled conduit may be used to form sweeps of a radius not normally supplied by manufacturers. In trench runs, the maximum deflection allowed will be one-half inch for lengths two feet or shorter, and one inch for lengths over two feet.
6. For riser bends, the minimum radius permitted will be 24 inches; for horizontal bends, a minimum radius of 36 inches.
7. A pull rope or pull tape will be installed in each empty conduit.
8. Five-foot clearance to be maintained from fire hydrant.
9. Four-foot clearance to be maintained from top of slope of commercial driveway and two feet clearance from residential driveway.
10. On state highway, the streetlight centerline location will be six inches behind sidewalk when sidewalk is less than seven feet wide.
11. See MC 890 for foundation details.
12. For new or rebuilt streetlight systems, if space permits or at no additional cost or low cost minor work, maintain a minimum clearance of 36 inches for pedestrian right-of-way access. Avoid streetlight placement in wheelchair ramp locations.

Approved by:

Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard

CD 175

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Sheet 3 of 3

UGS

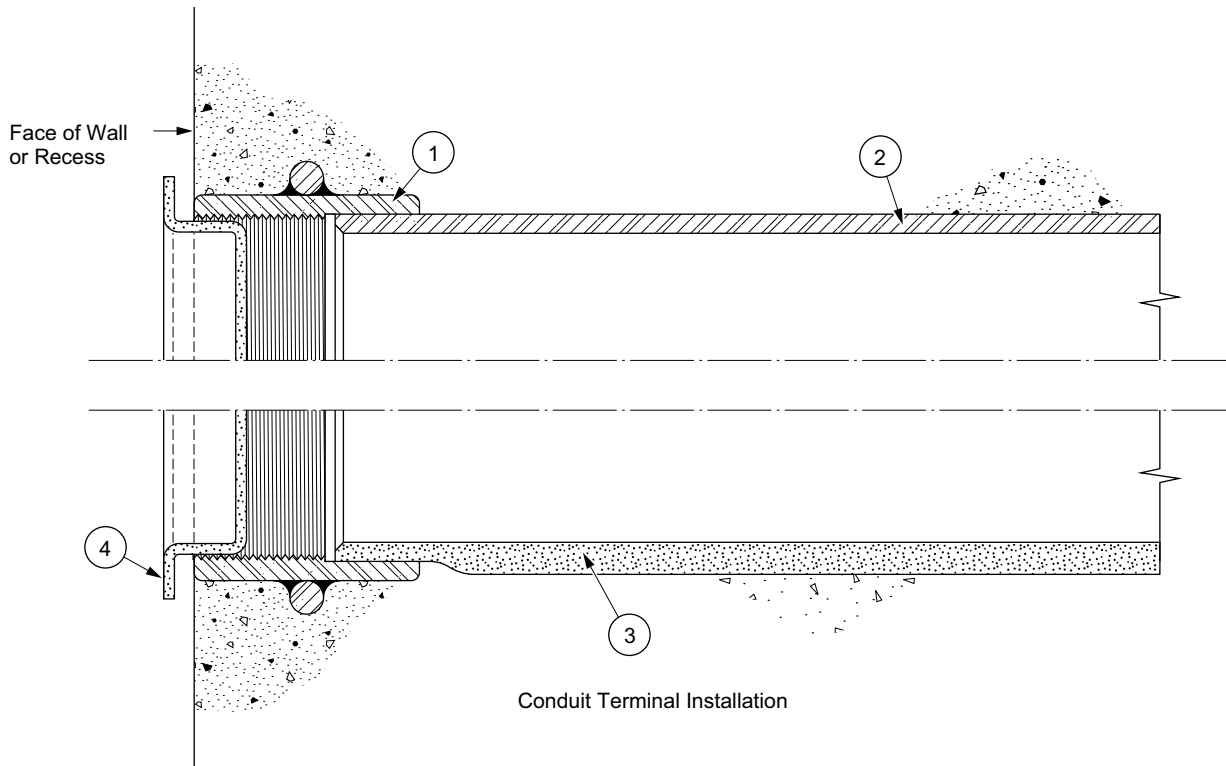
► SCE Public ◀

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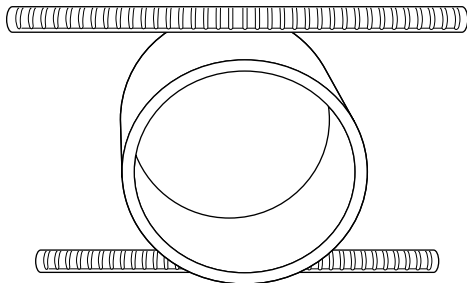
CD 177 Riser Conduit Lower Terminal (Anchor for Cable Support)

Scope CD 177.1 Riser Conduit Lower Terminal (Anchor for Cable Support)

Figure CD 177-1: Riser Conduit Lower Terminal (Anchor for Cable Support)

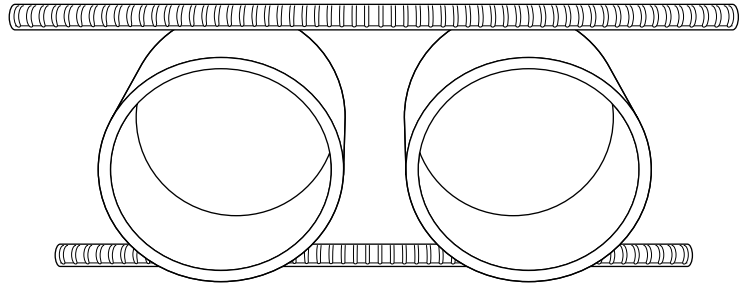


Hot Dip Galvanize After Fabrication



Single Cable Support Anchor
(Steel)

Hot Dip Galvanize After Fabrication



Double Cable Support Anchor
(Steel)

Approved by:

ajf

Riser Conduit Lower Terminal (Anchor for Cable Support)

CD 177

Sheet 1 of 2

Effective Date:

04-26-2019

What's Changed?

UGS

► SCE Public ◀

Note(s):

1. Cable support anchor. May be fabricated from standard weight steel couplings.
Remove 1/3 of the threads to permit insertion of standard IPS pipe of same nominal diameter of conduit.
 - Single: Solid weld two six-inch lengths of No. 4 rebar on opposite sides.
 - Double: Solid weld two 15-inch lengths of No. 4 rebar on opposite sides. Couplings 1-1/2 inches apart.
2. Plastic or H.D.G. Conduit.
3. Transite conduit.
4. Plastic conduit plug.

Approved Suppliers:

- Maydwell & Hartzell, Inc.
- INWESCO

CD 177	Riser Conduit Lower Terminal (Anchor for Cable Support)	Approved by: <i>a/j</i>
Sheet 2 of 2	What's Changed? Removed various manufacturers from the approved suppliers list. Corrected spelling error for Inwesco.	Effective Date:
UGS		04-26-2019

CD 180 Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures

Scope CD 180.1 Blank Conduit Plugs

Figure CD 180-1: Blank Conduit Plugs

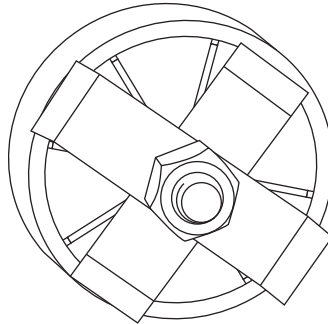


Figure CD 180-1.1: Type 1 Blank Conduit Plug

Note(s):

1. Manufacturers:
INWESCO, Inc. (4" and 5")
2. Suppliers:
INWESCO, Inc.
746 N. Coney Ave.
Azusa, CA 91702

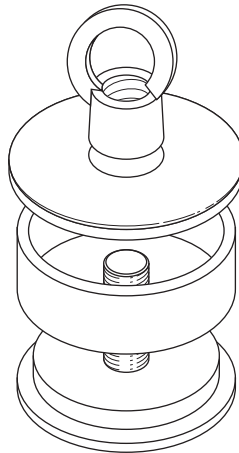



Figure CD 180-1.2: Type 3 and DC Blank Conduit Plugs

Note(s):

1. Suppliers:
 - a. Cal-Duct, Inc.
2522 Lee Ave.
South El Monte, CA 91733
 - b. Jensen Precast
14221 San Bernardino Ave.
Fontana, CA 92335

Approved by: 	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures	CD 180
Effective Date: 04-26-2019	What's Changed? Removed Armorcast from list of approved suppliers.	Sheet 1 of 4 UGS

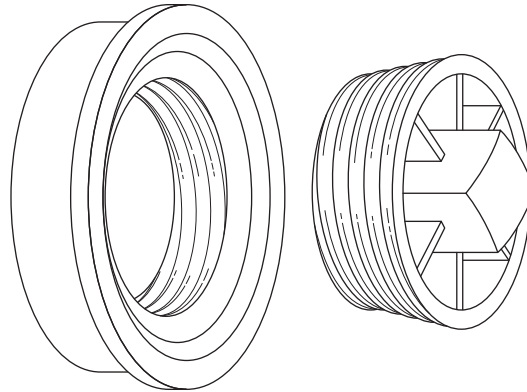


Figure CD 180-1.3: Type 2 and SF Blank Conduit Plugs

Note(s):

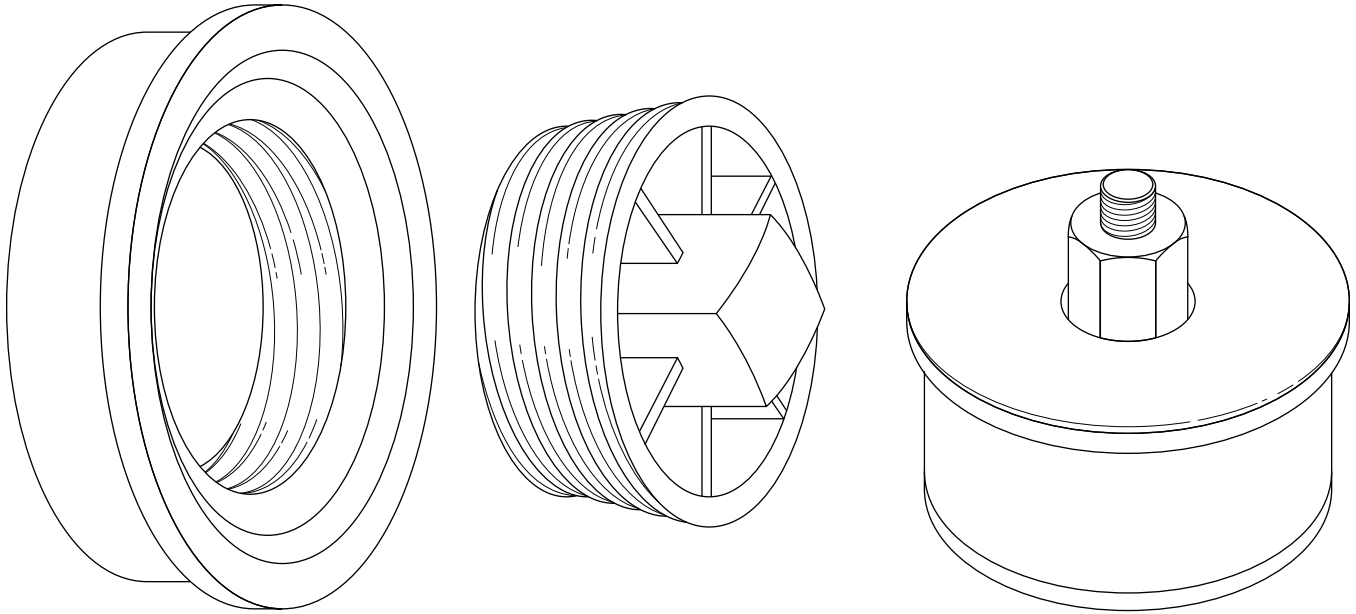
1. Manufacturer:
ETCO
2. Suppliers:
 - a. Jensen Precast
14221 San Bernardino Ave.
Fontana, CA 92335
 - b. Cal-Duct, Inc.
2522 Lee Ave.
South El Monte, CA 91733
 - c. Southwest Utility Sales
1222 Normandy Place
Santa Ana, CA 92705

Note(s):

1. Each conduit terminated at vaults, manholes, and PME and PMH structures will be sealed by means of a blank conduit plug to prevent water from entering through the conduit system.
2. Blank conduit plugs, Type 2 and 3, are available in one- through six-inch sizes.
3. Each plug has a place to secure the pull rope or pull tape. The pull rope or pull tape is to be tied securely to the blank plug.
4. Do not use any type of cement when installing plugs. Use installation instructions provided by the individual manufacturer. Type 3 plugs are designed for hand installation only.

Scope CD 180.2 Conduit Plug and Riser Cap

Figure CD 180-2: Conduit Plug



**Type SF
Blank Conduit Plug**

**Type DC Blank
Conduit Plug**

Note(s):

1. The SF conduit plug is available in four-, five-, and six-inch sizes; the DC plug is available in one- through six-inch sizes. Each plug will fit types EB and DB conduit.
2. The pull rope or pull tape should be tied securely to the plug.
3. When installing the plug, it is not necessary to use any type of cement.
4. See [CD 180](#) for suppliers.


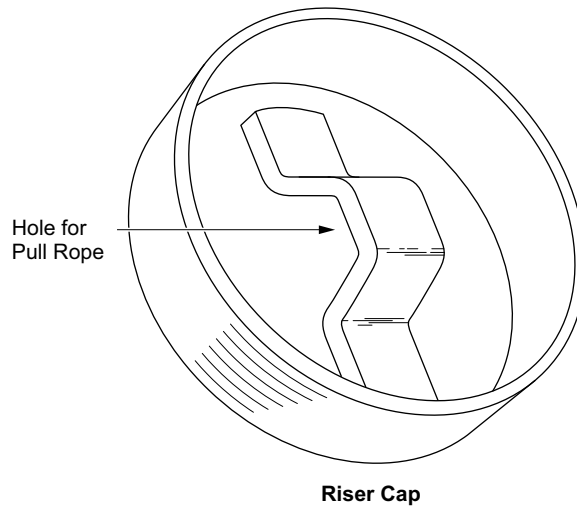

Approved by: 	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures	CD 180
Effective Date: 04-26-2019	What's Changed?	Sheet 3 of 4 UGS

Figure CD 180-3: Riser Cap



Note(s):

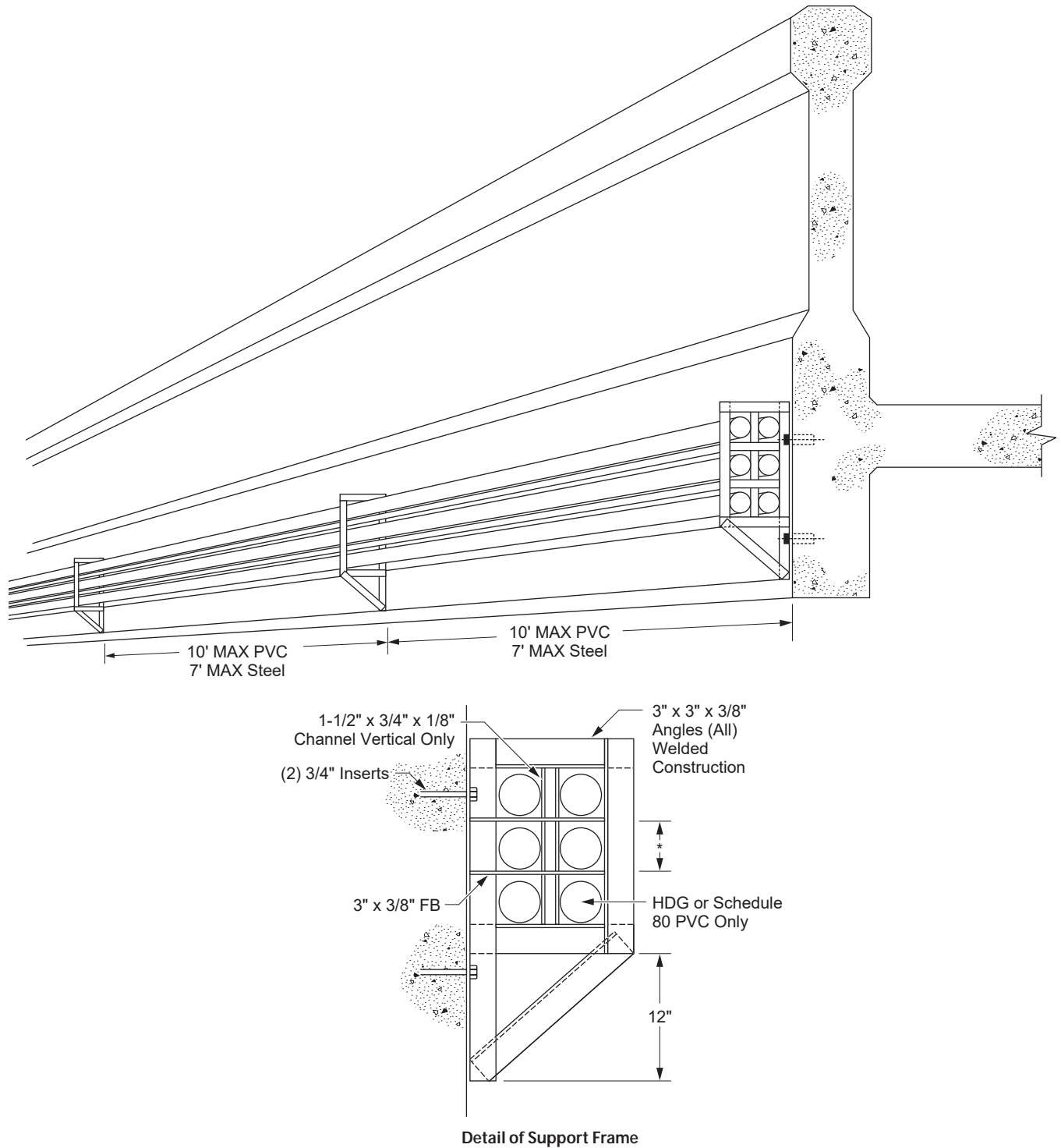
1. This ABS riser cap is available in four- through six-inch sizes. A plastic strap is welded to the inside of the cap. The pull rope or pull tape should be tied securely to the cap through this strap.
2. This plug should be cemented to the Sch. 80. ABS riser bend stubbed at a pole. It will provide a watertight, tamperproof installation.
3. Manufacturer:
 Vimar, Inc.
 This cap is available from:
 Cal-Duct, Inc.
 2522 Lee Ave.
 South El Monte, CA 91733

CD 180	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures	Approved by: 
Sheet 4 of 4	What's Changed?	Effective Date:
UGS		04-26-2019

CD 190 Supports for Conduits on Bridges

Scope CD 190.1 Exterior Supports — General Fabrication and Installation Guide

Figure CD 190-1: Exterior Support — General Fabrication and Installation Guide



Approved by:

RR

Supports for Conduits on Bridges

CD 190

Sheet 1 of 5

Effective Date:
04-24-2020

What's Changed?

UGS

► SCE Public ◀

Note(s):

1. Squares for conduit to be appx. 1/2" larger than O.D. of conduit.
2. See [Note 1 \(Sheet 4\)](#) for weights of materials.
3. See [Section 1.0 \(Sheet 4\)](#) for notes.

Figure CD 190-2: Supports for Conduits on Bridges

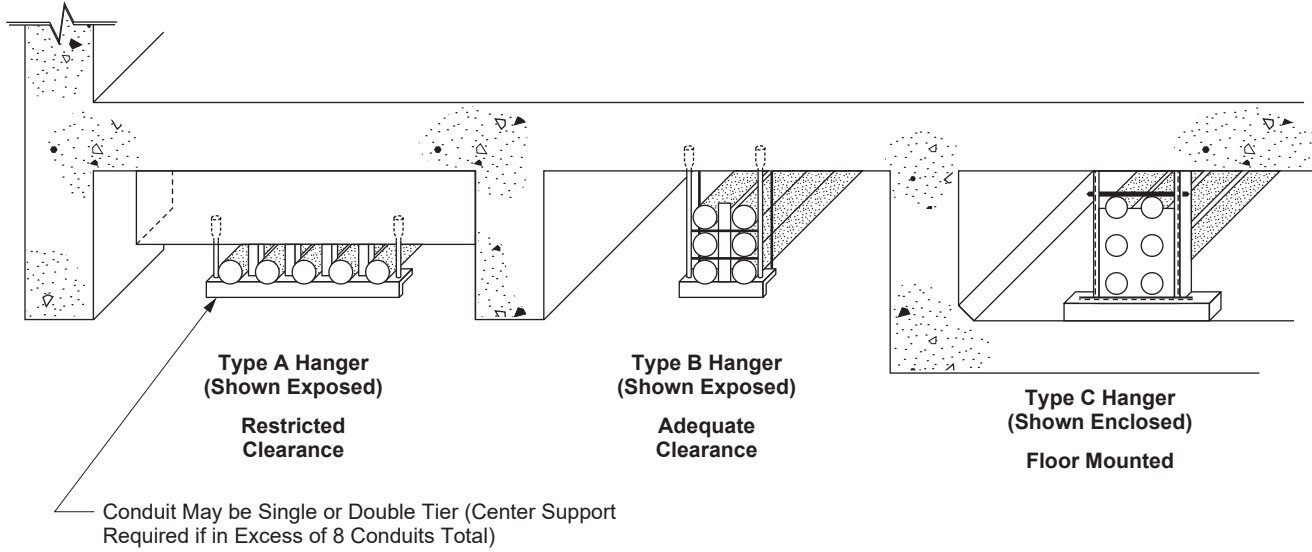


Figure CD 190-2.1

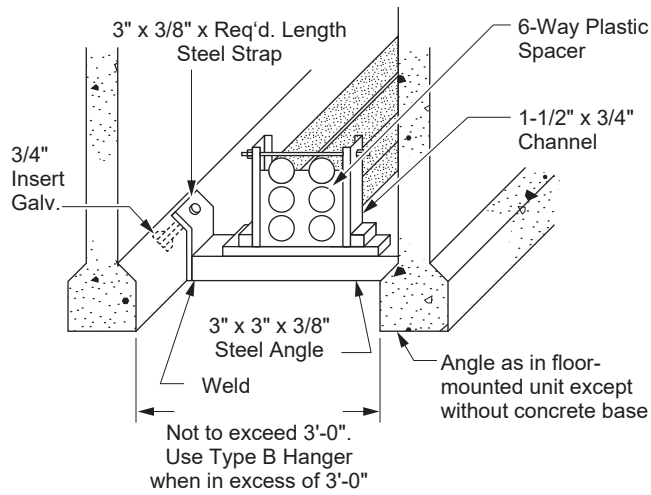


Figure CD 190-2.2: Type D Alternate to Hanger Support (Shown Exposed)

CD 190

Supports for Conduits on Bridges

Approved by:

RR

Sheet 2 of 5

What's Changed?

Effective Date:

UGS

04-24-2020

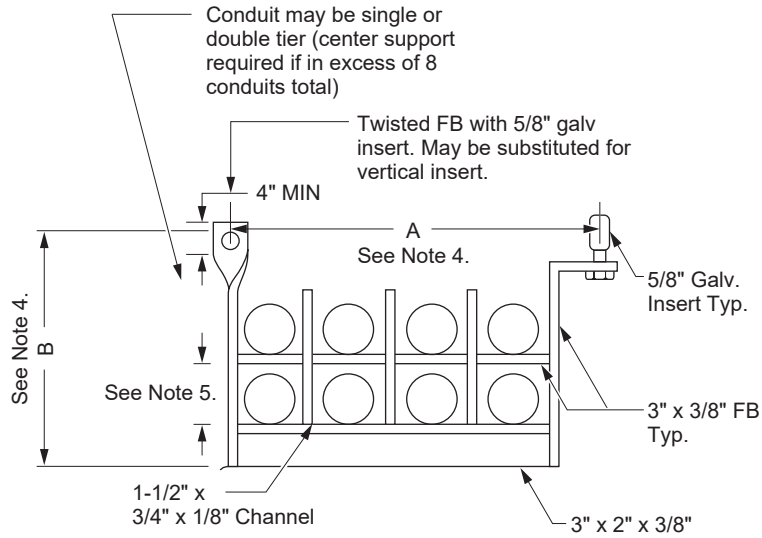


Figure CD 190-2.3: Type A Details

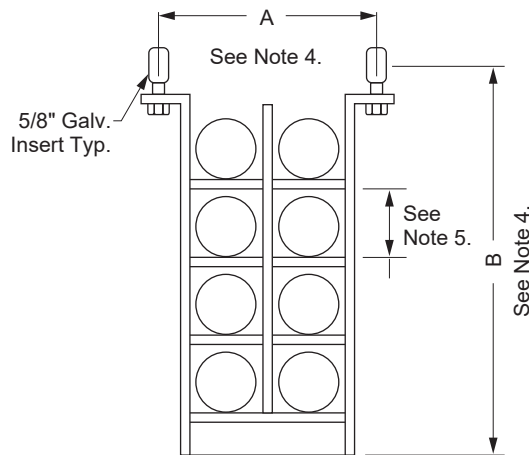


Figure CD 190-2.4: Type B Details

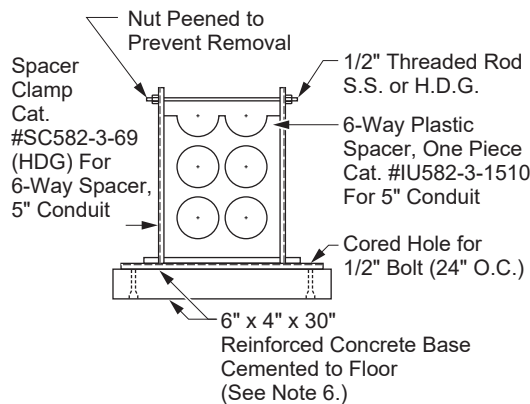


Figure CD 190-2.5: Type C Details

Approved by:

RR

Supports for Conduits on Bridges

CD 190

Sheet 3 of 5

Effective Date:
04-24-2020

What's Changed?

UGS

Note(s):

- Weights for materials:

	HDG Steel	Sch. 80 PVC
4"	10.9 lb/ft	2.8 lb/ft
5"	14.8 lb/ft	3.9 lb/ft
6"	19.2 lb/ft	5.3 lb/ft

- 3" x 3" x 3/8" Steel Angle = 7.2 lbs./ft
 1-1/2" x 3/4" Steel Channel = 2.5 lbs./ft
 2" x 4" Wood = 1.6#ft
 Concrete Base = 40#
- Bolts:
 1/2" Dia. = 0.7 lb/ft
 5/8" Dia. = 1.1 lb/ft
 3/4" Dia. = 1.5 lb/ft
- See Section 3.4 (Sheet 5).
- See Section 3.6 (Sheet 5).
- See Section 3.8 (Sheet 5).


1.0 Conduit

- For exposed installations — Schedule 80 PVC or standard HDG steel.
- For enclosed installations — (Isolated from public and maintenance crews) Type DB, ABS, or PVC, or HDG steel.
- Conduit configuration to be shown on working drawing. Typical illustrations are for depicting material required.
- All HDG conduit must be grounded at each end of the bridge crossing. In addition, a ground must be bonded to the conduit on each side of all expansion joints per CD 192 (Sheet 1).
- Following are the dimensions of the minimum opening in bridge abutments for conduit bank entrance and exit. All figures are based on 5-inch plastic conduit, vertical configuration, and spaced.
 - 4 conduit bank. 18" wide by 18" high
 - 6 conduit bank. 18" wide by 26" high
 - 8 conduit bank. 18" wide by 33" high
 - 10 conduit bank. 18" wide by 41" high

2.0 Expansion Joints

They will be installed (as recommended by the conduit manufacturer and approved by the Company) as follows:


- HDG steel — At each bridge expansion joint CD 192 (Sheet 1).
- Plastic — At 200 feet maximum intervals or, if bridge is shorter than 200 feet, one joint per CD 191 (Sheet 1).

CD 190 Sheet 4 of 5 UGS	Supports for Conduits on Bridges	Approved by: 
	What's Changed?	Effective Date: 04-24-2020

- 2.3 Conduit to be anchored at each expansion joint by solvent welding collars on conduit at each side of hanger support.
- 2.4 They will be installed per manufacturer's specifications, compensating for ambient temperature.

3.0 Hanger Support

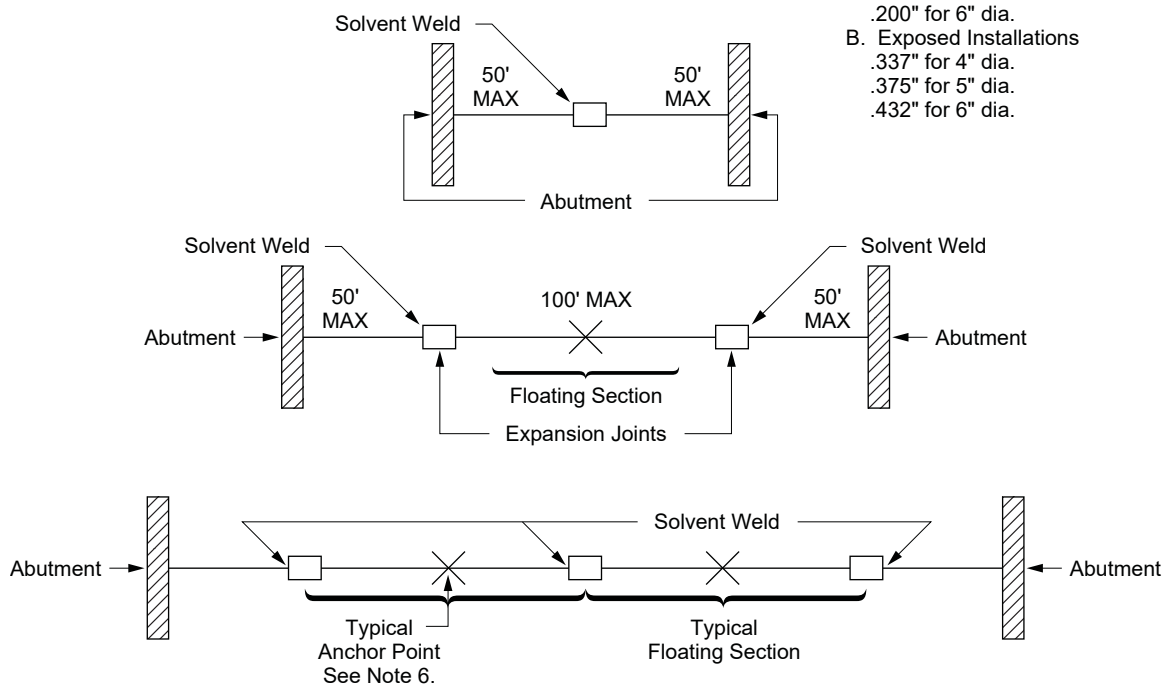
- 3.1 Supports to be a seven feet maximum spacing for steel conduit, five feet maximum spacing for DB plastic conduit, and ten feet maximum spacing for Schedule 80 plastic conduit.
- 3.2 Supports to be hot dipped galvanized after fabrication. All bolts, studs, nuts, and so forth, to be stainless steel. Hardware for attaching Type "C" hangers (bolts, studs, nuts, and so forth) may be hot dipped galvanized.
- 3.3 Exterior supports to be located on down-stream side of bridge.
- 3.4 Dimensions "A" and "B" to be determined from type, size, and number of conduits installed. Supports should be loose enough to allow conduit to expand and contract with temperature changes.
- 3.5 Peen, center punch, or spot weld at thread line of all bolts to lock nuts in place.
- 3.6 Squares that enclose conduit in supports should be approximately one-half inch larger than the O.D. of the conduit.
- 3.7 Mounting surface for a Type "C" hanger will be cleaned by sandblasting or other equivalent methods.
- 3.8 Epoxy for attachment of concrete or polymer concrete (RPM) base to be Indoco No. 2104, BW Epoxy binder.
- 3.9 Spacer, epoxy, and clamps available from Armorcast Products, Inwesco, Inc., and Maydwell & Hartzell, Inc. Type "C" concrete base available from Oldcastle Infrastructure and Jensen Precast. Type "C" polymer concrete (RPM) base is available from Armorcast Products.
- 3.10 Bridge inserts will be galvanized.
- 3.11 Slight variation allowed if approved by UG Planning Supervisor.
- 3.12 Steel support hangers are available from Armorcast Products and Inwesco Inc.

Approved by: 	Supports for Conduits on Bridges	CD 190
Effective Date: 04-24-2020	What's Changed? Section 3.9: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.	Sheet 5 of 5 UGS

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CD 191 Expansion Joint for Plastic Conduit
Scope CD 191.1 Expansion Joint for Plastic Conduit

Figure CD 191-1: Expansion Joint for Plastic Conduit



Note(s):

1. The expansion joint is a length of coupling stock extruded from the same material as the conduit that it joins.
2. The mating ends of conduit will be beveled to provide a smooth transition within the joint.
3. The expansion joint will be solvent welded three to four inches onto one end of the conduit.
4. The mating end of the conduit will then be positioned 22 inches into the free end of the expansion joint. Do not solvent weld.
5. Install all expansion joints at the midway point between conduit supports so the maximum distance can be maintained from all spacers, supports, or straps.
6. Install the expansion joint within 50 feet of the bridge abutment per CD 190. When only one expansion joint is required, **do not** anchor the expansion joint or conduit. When two or more expansion joints are required, each section of floating conduit must be anchored at mid-point between the expansion joints to prevent excessive longitudinal movement. Conduit to be anchored by solvent welding collars at each side of hanger support.
7. Expansion joint material shall be UL listed.

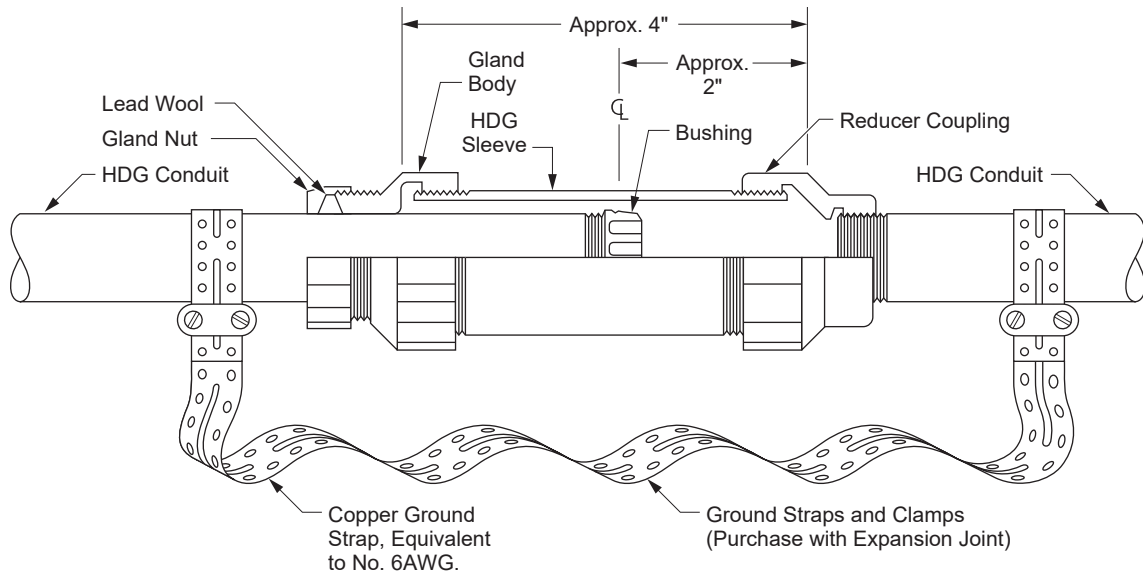
Approved by: <i>ajf</i>	Expansion Joint for Plastic Conduit	CD 191
Effective Date: 07-27-2018	What's Changed? Revised distance from abutment to solvent weld and expansion joints to 50'. Added Note 7.	Sheet 1 of 1
		UGS

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CD 192 Expansion Joint for HDG Conduit on Bridges

Scope CD 192.1 Expansion Joint for HDG Conduit on Bridges

Figure CD 192-1: Expansion Joint for HDG Conduit on Bridges



Note(s):

1. The expansion joint is used in long HDG conduit runs to permit linear movement caused by thermal expansion and contraction.
2. Fitting permits four inches of conduit movement.
3. Expansion joint to be installed at each bridge expansion joint per [CD 190](#).
4. Suggested suppliers: Graybar Electric Co., Calif. Wholesale Electric.
5. Protect cables by de-burring conduit ends prior to installation in the expansion joint.
6. See [CD 191](#) for installation.

Approved by:	Expansion Joint for HDG Conduit on Bridges	CD 192
Effective Date:	What's Changed?	Sheet 1 of 1
01-26-2007		UGS

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CD 197 Conduit Mandrels — Type I and Type III

Scope CD 197.1 Conduit Mandrels — Type I and Type III

Figure CD 197-1: Conduit Mandrels — Type I and Type III

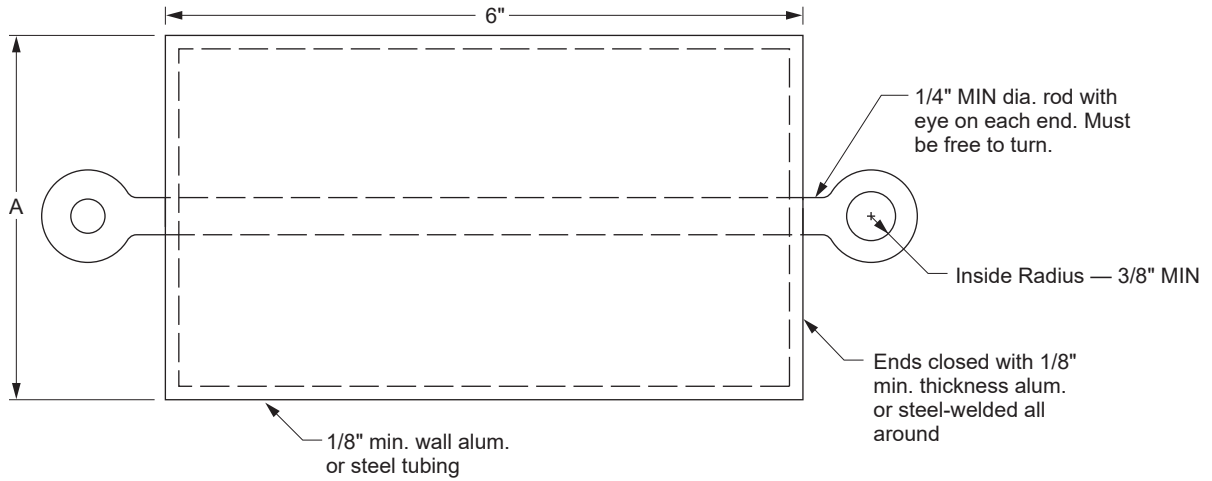


Table CD 197-1: Conduit Mandrels Data

Nominal Conduit Size	Dimension "A"	
	Type I ^{a/}	Type III ^{b/}
1-1/2"	1-1/4"	—
2"	1-3/4"	1.500"
3"	2-3/4"	2.375"
3-1/2"	3-1/4"	—
4"	3-3/4"	3.400"
5"	4-3/4"	4.400"
6"	5-3/4"	5.263"

^{a/} Type I mandrels are used in EB-20, DB-60, DB-100, DB-120, and Sch. 40 plastic conduits.

^{b/} Type III mandrels are only to be used in Sch. 80 plastic conduits.

Available from:
INWESCO, Inc.
746 N. Coney Ave.
Azusa, CA 91702

Approved by:

ajf

Conduit Mandrels — Type I and Type III

CD 197

Sheet 1 of 1

Effective Date:
01-26-2019

What's Changed? Removed Armorcast and Polestar from list of suppliers.


UGS

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Handholes and Pull Boxes

Table of Contents

Standard	Title
HP 200	Handhole Requirements
HP 200.1	Handhole Requirements
HP 200.2	Handhole Requirements — Replacement Boxes
HP 205	Typical Handhole Installation
HP 205.1	Typical Handhole Installation
HP 210	Pull Box Requirements
HP 210.1	Pull Box Requirements
HP 215	Pull Box 2' x 3' Precast Concrete (For Reference Only)
HP 215.1	Pull Box 2' x 3' Precast Concrete (For Reference Only)
HP 220	Pull Box 2-1/2' x 4' Precast Concrete
HP 220.1	Pull Box 2-1/2' x 4' Precast Concrete
HP 225	Pull Box 3' x 5' Precast Concrete
HP 225.1	Pull Box 3' x 5' Precast Concrete
HP 228	Pull Box 4' x 6'- 6" Precast Concrete
HP 228.1	Pull Box 4' x 6'- 6" Precast Concrete
HP 230	Poured Concrete Pull Boxes — Construction Details
HP 230.1	Poured Concrete Pull Boxes — Construction Details

Approved by: 	Handholes and Pull Boxes Table of Contents	HP
Effective Date: 10-29-2021		Sheet i
		UGS

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HP 200 Handhole Requirements

Scope HP 200.1 Handhole Requirements

The following tabulation shows the size and type of various handholes, manufacturers' names, an arbitrarily assigned item number, and SAP numbers. This item number will be the identification used when listed on the "List of Materials" on the working drawing.

Table HP 200-1: Concrete — Unit (Box and Cover) — Parkway

Item Number	Nominal Size (Inside)	Manufacturers' Numbers				SAP Number
		BES Products	Brooks Products ^{a/}	Christy Concrete Products ^{b/}	J&R Concrete Products	
HH-2 ^{b/c/}	10.5" x 17" x 24"	—	36PBB-36MBBE-36PBCC238	N09B-N09X12-N09T72	E3 1/2 PB, E3 1/2--PB-EXT, E3 1/2-C-ED	10117724
HH-6	17" x 30" x 24"	—	66MBB-66MBBE-66PBCC238	N36B-N36X12-N36T72	E6B-PB, E6B-(12")EXT, E6B-C-ED	10117326
HH-1 ^{c/ d/}	10.5" x 17" x 12"	C9E	36PBB-36PBCC238	N09B-N09T72	E3 1/2-PB, E3 1/2-C-ED	10117723
HH-3	13" x 24" x 12"	C30	38MBB-38PBCC238	N30B-N30T72	E5-2-PB, E5-2-C-ED	10117319
HH-4	13" x 24" x 24"	—	38MBB-38MBBE-38PBCC238	N30B-N30X12-N30T72	—	10117315
HH-5 ^{c/}	17" x 30" x 12"	C36	66MBB-66PBCC238	N36B-N36T72	E6B-PB, E6B-C-ED	10117322

^{a/} Brooks Products (formerly Carson-Brooks)

^{b/} Old Castle Enclosure Solutions is the parent company of Christy Concrete Products.

^{c/} Limited to streetlight use.

^{d/} Not approved for use on new construction.

Table HP 200-2: Plastic (HDPE) — Unit (Box and Cover) — Parkway

Item Number	Nominal Size (Inside)	Manufacturers' Numbers		SAP Number
		New Basis ^{a/}	Carson Industries ^{b/}	
HH-7 ^{c/ d/}	10.5" x 17" x 12"	SEA-141912-C012	141912-4HYE60AU0	10117728
HH-8	13" x 24" x 15"	SEA-132415-C012	132415-3BYE60GU0	10117725
HH-9	17" x 30" x 15"	SEA-173015-C020	173015-3BYE60GU0	10117726

^{a/} New Basis (formerly Associated Plastics)

^{b/} Old Castle Enclosure Solutions is the parent company of Carson Industries (formerly Carson-Brooks)

^{c/} Limited to Streetlight Use

^{d/} Not approved for use on new construction

= For Reference Only

Table HP 200-3: FRP and RPM — Unit (Box and Cover) — Parkway

Fiberglass Reinforced Plastic (FRP), Polymer Concrete (RPM)					
Item Number	Nominal Size (Inside)	Manufacturers' Numbers			SAP Number
		Armorcast Products	CDR Systems ^{a/}	Quazite Corp. ^{b/}	
HH-12 ^{c/}	17" x 30" x 30"	A6001640AX30	A10173030A0C4	PD1730Z500C4	10117431
HH-10 ^{c/}	13" x 24" x 18"	A600-1946A	PA10-1324-18	PG1324-Z549	10117408
HH-11 ^{c/}	17" x 30" x 18"	A600-1640A	PA10-1730-18	PG1730-Z567	10117412

^{a/} Hubbell Power Systems is the parent company of CDR Systems.

^{b/} Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company — P&C)

^{c/} Not approved for use on new construction.

Table HP 200-4: FRP and RPM — Unit (Box and Cover) — Light Traffic

Fiberglass Reinforced Plastic (FRP), Polymer Concrete (RPM)				
Item Number	Nominal Size (Inside)	Manufacturers' Numbers		SAP Number
		Armorcast Products	CDR Systems ^{a/}	
HH-14	17" x 30" x 18"	A6001640TA-ED	A12173018A0C4	10117375
HH-13 ^{b/}	13" x 24" x 18"	A600-1946TA-ED	PA12-1324-18	10117298
HH-15 ^{c/}	17" x 30" x 30"	—	PA12-1730-30	10117333

^{a/} Hubbell Power Systems is the parent company of CDR Systems.

^{b/} Not approved for use on new construction.

Note(s):

1. See [HP 205](#) for typical installation.
2. Handholes installed in sidewalks shall be concrete (see [Table HP 200-1 \[Sheet 1\]](#)) or polymer concrete (see [Table HP 200-3 \[Sheet 2\]](#)). Handholes are for non-traffic loading only. See [Note 4](#) for handholes for vehicle loads.
3. Slight variations may occur between manufacturers' products.
4. Handholes should not be placed in areas where deliberate vehicle loads are planned. Such locations as driveways and parking lots should not have handholes. When this is unavoidable use only the products listed in [Table HP 200-4 \(Sheet 2\)](#).
5. When ordering new units, be sure to verify that the required Penta-head locking bolts and Edison logo on the cover are included with the order.

= For Reference Only

HP 200

Handhole Requirements

Approved by:



Sheet 2 of 4

What's Changed? Parent company notes added. Sections made "For Reference Only."

Effective Date:

10-24-2014

UGS

Scope HP 200.2 Handhole Requirements — Replacement Boxes

Table HP 200–5: Concrete (Box Only) — Parkway

Item Number	Nominal Size (Inside)	Manufacturers' Numbers			SAP Number
		Brooks Products ^{a/}	Christy Concrete Products	J&R Concrete Products	
HB-1 ^{b/}	10.5" x 17" x 12"	36PBB	N09B	E3 1/2-PB	10117462
HB-2 ^{c/}	10.5" x 17" x 24"	36PBB-36MBBE	N09B-N09X12	E3 1/2-PB, E3 1/2-PB-EXT	10117463
HB-3 ^{c/}	13" x 24" x 12"	38MBB	N30B	E5-2-PB	10117465
HB-4	13" x 24" x 24"	38MBB-38MBBE	N30B-N30X12	–	10117484
HB-5 ^{c/}	17" x 30" x 12"	66MBB	N36B	E6-B-PB	10117470
HB-6 ^{c/}	17" x 30" x 24"	66MBB-66MBBE	N36B-N36X12	E6-B-PB, E6-B-(12")EXT	10117472

^{a/} Brooks Products (formerly Carson-Brooks Inc.)

^{b/} Not approved for use on new construction.

Table HP 200–6: Plastic HDPE (Box Only) — Parkway

Item Number	Nominal Size (Inside)	Manufacturers' Numbers		SAP Number
		New Basis ^{a/}	Carson Industries ^{b/}	
HB-9	17" x 30" x 15"	SEB173015CH0	173015-*HY***OU0	10117471
HB-7 ^{c/}	10.5" x 17" x 12"	SEB141912CH0	141912-*HY***OU0	10117464
HB-8	13" x 24" x 15"	SEB132415CH0	132415-*HY***OU0	10117466

^{a/} New Basis (formerly Associated Plastics)

^{b/} Old Castle Enclosure Solutions is the parent company of Carson Industries (formerly Carson-Brooks Inc.)

^{c/} Not approved for use on new construction.

Table HP 200–7: FRP and RPM (Box Only) — Parkway

Fiberglass Reinforced Plastic (FRP), Polymer Concrete (RPM)					
Item Number	Nominal Size (Inside)	Manufacturers' Numbers			SAP Number
		Armorcast Products	CDR Systems ^{a/}	Quazite Corp. ^{b/}	
HB-11	17" x 30" x 18"	A6001640X18-ED	B10173018A	PG1730B529	10117413
HB-10 ^{c/}	13" x 24" x 18"	A600-1946X18-ED	PB10-1324-18	PG1324-B514	10117467
HB-12 ^{c/}	17" x 30" x 30"	A600-1640X30-ED	PB10-1730-30	PG1730-B502	10117473

^{a/} Hubbell Power Systems is the parent company of CDR Systems.

^{b/} Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company — P&C)

^{c/} Not approved for use on new construction.

= For Reference Only

Table HP 200–8: FRP and RPM (Box Only) — Light Traffic

Fiberglass Reinforced Plastic (FRP), Polymer Concrete (RPM)				
Item Number	Nominal Size (Inside)	Manufacturers' Numbers		SAP Number
		Armorcast Products	CDR Systems ^{a/}	
HB-13 ^{b/}	13" x 24" x 18"	A600-1946TX18-ED	PB12-1324-18	10117474
HB-14 ^{b/}	17" x 30" x 18"	A600-1640TX18-ED	PB12-1730-18	10117475
HB-15 ^{b/}	17" x 30" x 30"	–	PB12-1730-30	10117476


^{a/} Hubbell Power Systems is the parent company of CDR Systems.

^{b/} Not approved for use on new construction.

HP 200

Handhole Requirements

Approved by:



Sheet 4 of 4

What's Changed? Parent company notes added. Sections made "For Reference Only."

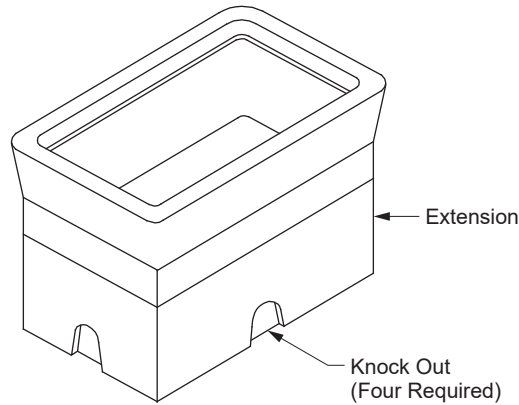
Effective Date:

10-24-2014

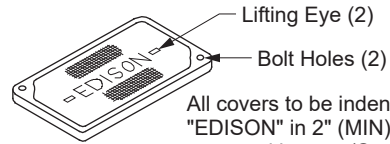
UGS

HP 205 Typical Handhole Installation
Scope HP 205.1 Typical Handhole Installation

Figure HP 205-1: Typical Handhole Installation

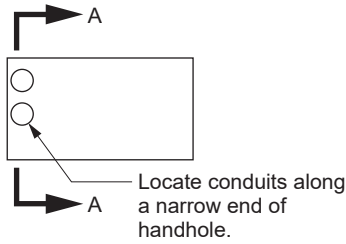


**Typical Assembly
(Without Cover)**

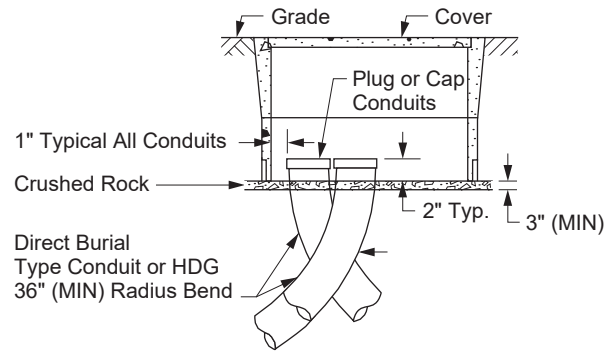


All covers to be identified with "EDISON" in 2" (MIN) block recessed letters. (See Note 4.)

Typical Cover



Conduit Location



Section A-A

Note(s):

1. See HP 200 for dimensions of various size handholes available.
2. Radius angle may be reduced to less than 90° providing the projected center line of the conduit clears handhole opening.
3. Two hold down devices to be supplied with each handhole.
4. Cover shall be identified with "EDISON" in minimum 2-inch letters or labels permanently secured to the lid.
5. For maintenance on 10-1/2" x 17" concrete handholes use swingbolt with SAP 10204721.

Approved by:

ajf

Typical Handhole Installation

HP 205

Sheet 1 of 1

Effective Date:
01-29-2016

What's Changed? Figure HP 205-1 was updated for clarity.

UGS

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HP 210 Pull Box Requirements

Scope HP 210.1 Pull Box Requirements

1.0 General

Pull boxes which have acceptable precast or nonconcrete counterparts are shown on the working drawings (List of Materials) by item number. The type of pull boxes approved for each item number are listed below. Other pull boxes are listed by drawing number. Unless specified on the working drawing, any of the structures covered by a particular item number are acceptable.

All pull boxes shall be furnished with 1/2" x 2-1/2" S.S. pentahead bolts for cover securing. RPM cover bolts shall be furnished with captive steel washers (see [FC 618](#)).

Depths of pull boxes listed are minimum. Greater depths may be necessary where required conduit cover dictates (see work drawing).

2.0 Poured-in-Field Pull Boxes

Each pull box shall include accessories and facilities in conformance with the requirements set forth in the drawings, specifications, schedules, and tabulations referred to below:

1. Concrete and reinforcement [GI 020](#)
2. Opening cover as shown on [HP 230](#) or as modified on the working drawing.
3. Conduit entrance [CD 132](#)
4. Inserts [AC 720](#), [AC 723](#), and [AC 729](#)
5. Sump [AC 710](#)
6. Ground wire/ground rod (if required) [AC 700](#)

3.0 Precast and Nonconcrete Pull Boxes

Each pull box shall include accessories and facilities as required in field constructed pull boxes. (Some variations have been allowed from precast manufacturers. See [HP 215](#), [HP 220](#), [HP 225](#) and [HP 228](#).)

Intercept boxes are available as shown. They are normally supplied with a bottom. Specify if a bottom is not desired.

RPM pull box covers shall be utilized for parkway installations (see [FC 618](#)). For light-traffic applications, see [FC 601](#), [FC 606](#), and [FC 612](#). Lift-assisted covers are traffic rated and can be installed in either traffic and parkway location.

All pull boxes shall be placed on a 6" crushed rock base. Mastic sealant shall be used on joints in precast and nonconcrete boxes.

Approved by:	Pull Box Requirements	HP 210
		Sheet 1 of 3
Effective Date:	What's Changed?	UGS
10-29-2021		▶ SCE Public ◀

Table HP 210–1: Pull Box Requirements — Unit (Box and Cover)

Manufacturers and Model Numbers								
Item Number	Nominal Size ^{a/}	Type	Field Construction Drawings	Jensen Precast ^{b/}		Oldcastle Infrastructure		Quazite Corporation ^{c/}
				Standard Type	Intercept Type	Standard Type	Intercept Type	Standard Type ^{d/}
PB-1	2' x 3' x 3'	(P)	HP 215 W/Cover FC 618 RPM	K2436- DP36-11P	K2436- DI36-11P	ED 23-36 RPM	ED 23-36 IPB RPM	PG2436Z591C4
PB-3	2'-6" x 4' x 3'-6"	(P)	HP 220 W/Cover FC 618 RPM	K3048- DP42-11P	K3048- DI42-11P	ED 264-42 RPM	ED 264-42 IPB RPM	PG3048Z707C4
PB-4	2'-6" x 4' x 3'-6"	(LT)	HP 220 W/Cover FC 606 Steel	K3048- DP42-11T	K3048- DI42-11T	ED 264-42 Traffic	ED 264-42 IPB Traffic	–
PB-5	3' x 5' x 4'	(P)	HP 225 W/Cover FC 618 RPM	K3660- DP50-11P	K3660- DI50-11P	ED 35-48 RPM	ED 35-48 IPB RPM	PG3660Z527C4
PB-6	3' x 5' x 4'	(LT)	HP 225 W/Cover FC 612 Steel	K3660- DP50-11T	K3660- DI50-11T	ED 35-48 Traffic	ED 35-48 IPB Traffic	–
PB-2	2' x 3' x 3'	(LT)	HP 215 W/Cover FC 601 Steel	K2436- DP36-11T	K2436- DI36-11T	ED 23-36 Traffic	ED 23-36 IPB Traffic	–
PB-7	3' x 5' x 4'	(FT)	HP 225 W/Cover FC 615 Steel	–	–	ED 35-48 TXH LA	ED 35-48 IPB TXH LA	–
PB-8	4' x 6'-6" x 5'	(FT)	HP 228 W/Cover FC 616 Steel	–	–	ED 466-64 TXH LA	ED 466-64 IPB TXH LA	–

^{a/} All Depths MINIMUM. (P) Parkway, (LT) Light-Traffic, (FT) Full-Traffic

^{b/} Jensen Precast (formerly Brooks Products Inc.)

^{c/} Hubbell Power Systems is the parent company of Quazite Corporation (formerly Power and Communications Systems Company — P&C)

^{d/} Quazite Corporation boxes and covers are reinforced plastic mortar (RPM)

= For Reference Only

HP 210

Pull Box Requirements

Approved by:

RR

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

10-29-2021

Table HP 210–2: Pull Box SAP Numbers

Nominal Size	Style	Type	SAP Number (Unit-Box and Cover)
2' x 3' x 3' ^{a/}	Standard	(P)	10117479
2' x 3' x 3' ^{a/}	Intercept	(P)	10117480
2' x 3' x 3' ^{a/}	Intercept	(LT)	10117489
2'-6" x 4' x 3'-6"	Standard	(P)	10117481
2'-6" x 4' x 3'-6"	Intercept	(P)	10117482
2'-6" x 4' x 3'-6"	Standard	(LT)	10117490
2'-6" x 4' x 3'-6"	Intercept	(LT)	10117491
2'-6" x 4' x 3'-6"	Standard	(FT)	10117494
2'-6" x 4' x 3'-6"	Intercept	(FT)	10117495
3' x 5' x 4'	Standard	(P)	10117483
3' x 5' x 4'	Intercept	(P)	10117487
3' x 5' x 4'	Standard	(FT)	10214885
3' x 5' x 4'	Intercept	(FT)	10214886
2' x 3' x 3'	Standard	(LT)	10117488
4' x 6'-6" x 5'	Standard	(FT)	10214888
4' x 6'-6" x 5'	Standard	(P)	10214889

^{a/} Not approved for use on new construction.

Table HP 210–3: Pull Box Grade Rings

Item Number	Type of Box	Extension Height	Manufacturers' Numbers			SAP Number
			Jensen Precast ^{a/}	Oldcastle Infrastructure ^{b/}	Quazite Corp. ^{c/}	
PX-3 ^{d/}	2' x 3'	6 inch	PB2436-R6	ED-23-06-GR	–	10117507
PX-4 ^{d/}	2' x 3'	12 inch	PB2436-R12	ED-23-12-GR	–	10117508
PX-5	2'-6" x 4'	6 inch	PB3048-R6	ED-264-06-GR	–	10117509
PX-6	2'-6" x 4'	12 inch	PB3048-R12	ED-264-12-GR	–	10117510
PX-7	3' x 5'	6 inch	PB3660-R6	ED-35-06-GR	–	10117511
PX-8	3' x 5'	12 inch	PB3660-R12	ED-35-12-GR	–	10117512
PX-1 ^{d/}	2' x 3'	4 inch	–	–	PG2436-ED04	10117505
PX-2 ^{d/}	3' x 5'	2.5 inch	–	–	PG3660-ED03	10117506

^{a/} Jensen Precast (formerly Brooks Products Inc.)

^{b/} Old Castle Precast is the parent company of Utility Vault Company.

^{c/} Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company – P&C)

^{d/} Not approved for use on new construction.

= For Reference Only

Approved by:

RR

Pull Box Requirements

HP 210

Sheet 3 of 3

Effective Date:
10-29-2021

What's Changed? Table HP 210-2: Removed "For Reference Only" categorization for 3' x 5' x 4' Standard and Intercept (P) Type pull boxes.

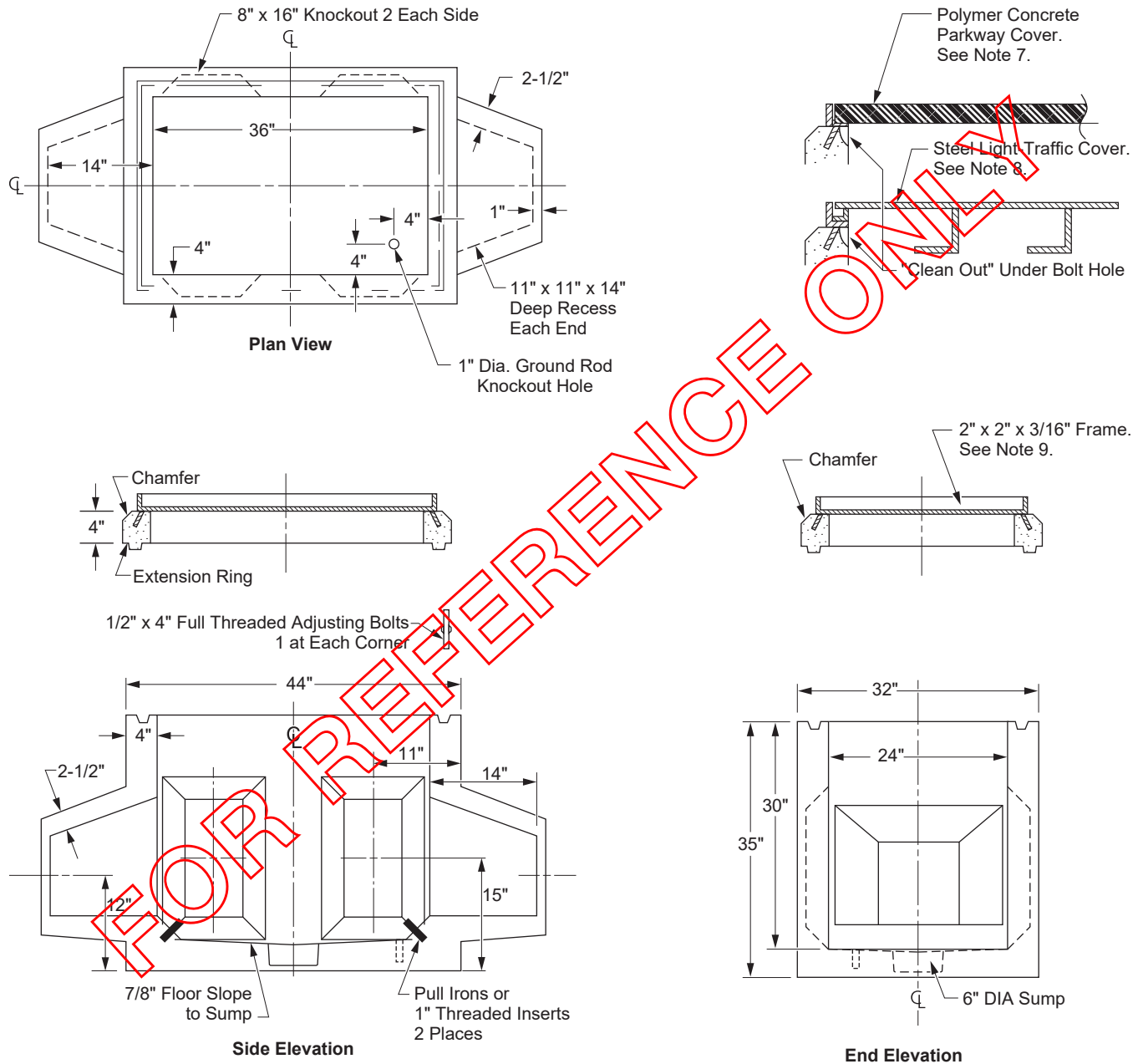
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HP 215 Pull Box 2' x 3' Precast Concrete (For Reference Only)

Scope HP 215.1 Pull Box 2' x 3' Precast Concrete (For Reference Only)

Figure HP 215-1: Pull Box 2' x 3' Precast Concrete



Note(s):

1. Reinforcement: H20-S bridge loading.
2. Concrete: Concrete shall be Class "A" with 28-day compressive strength of 3,000 psi (minimum). Slight taper (3/4" in depth of pull box) and 1" chamfer on all inside corners permitted for ease of forming.

Approved by:

RR

Pull Box 2' x 3' Precast Concrete (For Reference Only)

HP 215

Sheet 1 of 2

Effective Date:
10-30-2020

What's Changed? Standard was made "For Reference Only."

UGS

Note(s):

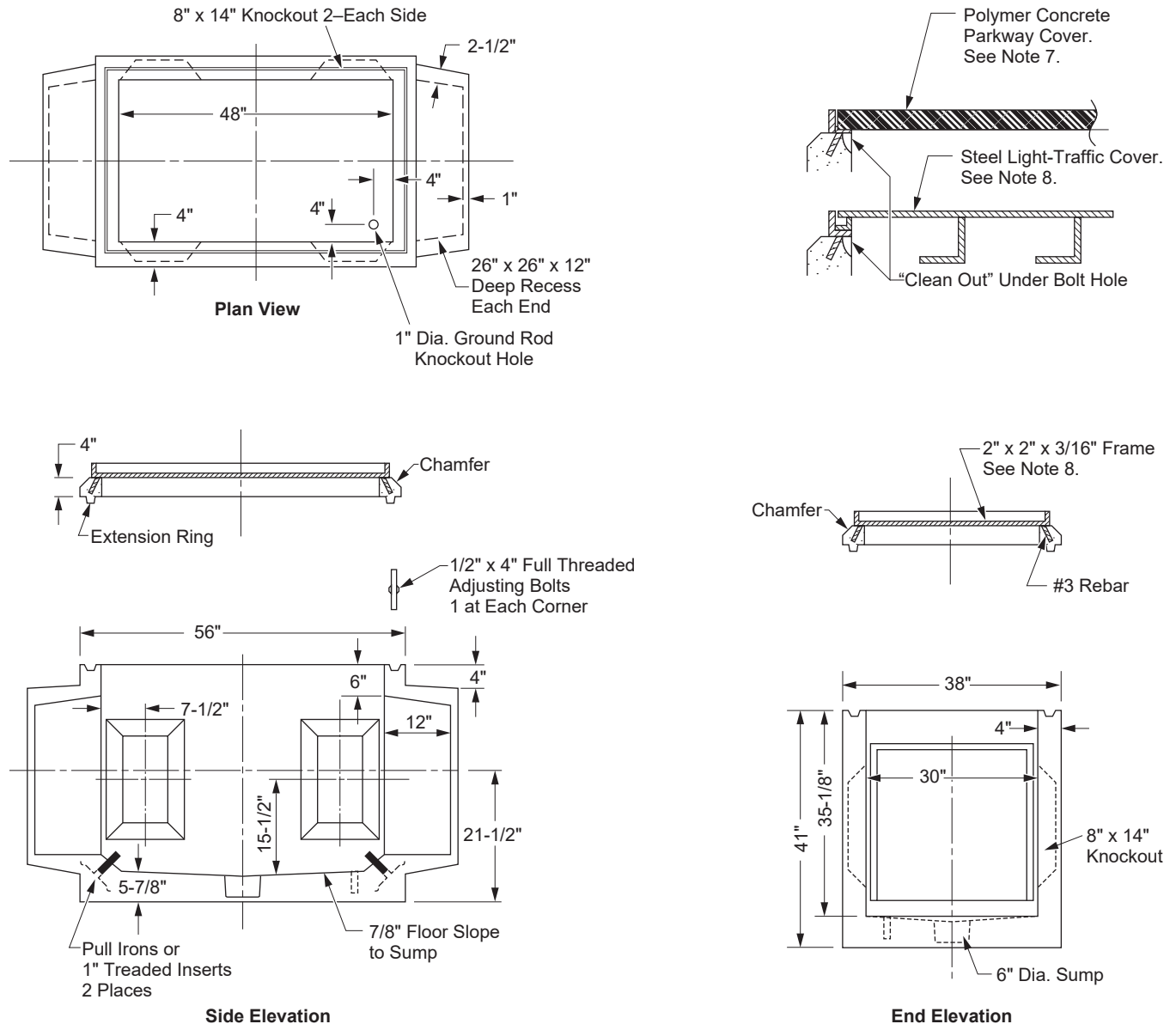
3. **Installation:**
Pull box shall be placed on 6" (minimum) compacted rock or sand base to ensure uniform distribution of soil pressure in floor. Minimum excavation for pull box shall be 36" x 72" x depth to suit job.
4. **Covers:**
See [FC 601](#) and [FC 618](#) for pull box covers.
5. **Grade Rings:**
Installing contractor shall provide grade rings (6" minimum) as necessary in order to maintain cover over conduits per SCE specifications or permit agency specifications, whichever is greater.
6. **Pull Irons and Eyes:**
See [AC 729](#) for pull irons and [AC 720](#) for pull eyes.
7. See [FC 618](#).
8. See [FC 601](#).
9. See [FC 603](#).

FOR REFERENCE ONLY

HP 215	Pull Box 2' x 3' Precast Concrete (For Reference Only)	Approved by: <i>RR</i>
Sheet 2 of 2	What's Changed? Standard was made "For Reference Only."	Effective Date: 10-30-2020
UGS		

HP 220 Pull Box 2-1/2' x 4' Precast Concrete
Scope HP 220.1 Pull Box 2-1/2' x 4' Precast Concrete

Figure HP 220-1: Pull Box 2-1/2' x 4' Precast Concrete



Note(s):

1. Reinforcement:
H20-S bridge loading.
2. Concrete:
Concrete shall be Class "A" with 28-day compressive strength of 3,000 psi (minimum). Slight taper (3/4" in depth of pull box) and 1" chamfer on all inside corners permitted for ease of forming.
3. Installation:
Pull box shall be placed on 6" (minimum) compacted rock or sand base to insure uniform distribution of soil pressure in floor. Minimum excavation for pull box shall be 46" x 83" x depth to suit job

Approved by:

PhH

Pull Box 2-1/2' x 4' Precast Concrete

HP 220

Sheet 1 of 2


Effective Date:

01-26-2007

What's Changed?

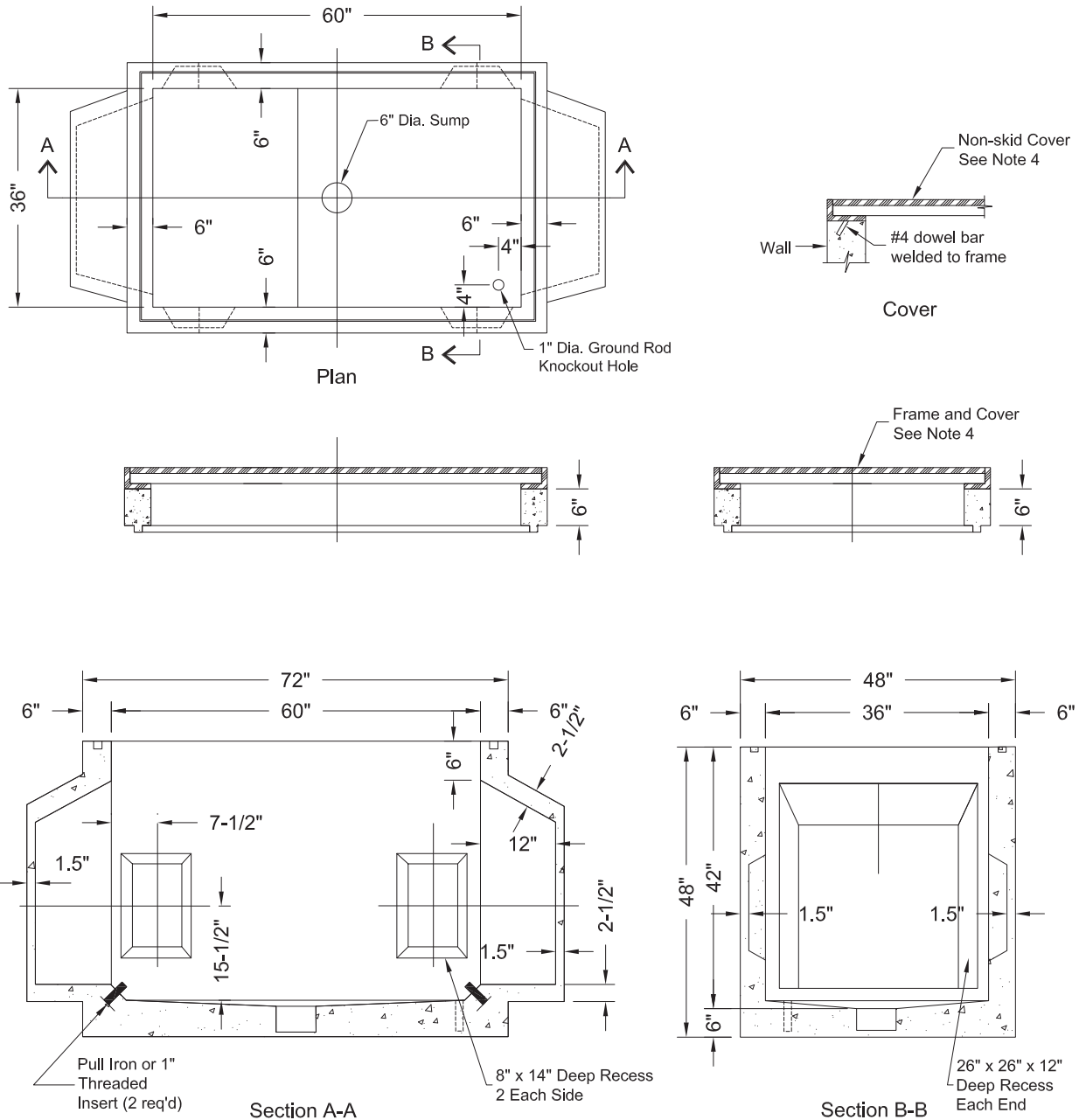
UGS

4. Covers:
See [FC 606](#) and [FC 618](#) for pull box covers.
5. Grade Rings:
Installing contractor shall provide grade rings (6" minimum) as necessary in order to maintain cover over conduits per SCE specifications or permit agency specifications, whichever is greater.
6. Pull Irons and Eyes:
See [AC 729](#) for pull irons and [AC 720](#) for pull eyes.
7. See [FC 618](#).
8. See [FC 606](#).

HP 220	Pull Box 2-1/2' x 4' Precast Concrete	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date:
UGS		01-26-2007

HP 225 Pull Box 3' x 5' Precast Concrete
Scope HP 225.1 Pull Box 3' x 5' Precast Concrete

Figure HP 225-1: Pull Box 3' x 5' Precast Concrete



Note(s):

1. Structural Design Criteria:
 - H20-S bridge loading per ASTM C857.
 - Cover Design shall meet ASTM C1802, Load Level 6 (Full Traffic).

Approved by:

RR

Pull Box 3' x 5' Precast Concrete

HP 225


Sheet 1 of 2

Effective Date:
01-29-2021

What's Changed? Updated Figure Notes, structural design criteria ASTM requirements.

UGS

2. **Concrete:**
Concrete shall be Class "A" with 28-day compressive strength of 3,000 psi (minimum). Slight taper (3/4" in depth of pull box) and 1" chamfer on all inside corners permitted for ease of forming.
3. **Installation:**
Pull box shall be placed on 6" (minimum) compacted rock or sand base to ensure uniform distribution of soil pressure in floor. Minimum excavation for pull box shall be 52" x 97" x depth to suit job.
4. **Covers:**
See [FC 615](#) and [FC 618](#) for pull box covers. Minimum cover coefficient of friction (COF) of 0.70.
5. **Grade Rings:**
Installing contractor shall provide grade rings (6" minimum) as necessary in order to maintain cover over conduits per SCE specifications or permit agency specifications, whichever is greater.
6. **Pull Irons and Eyes:**
See [AC 729](#) or pull irons and [AC 720](#) for pull eyes.
7. 2/0 Grounding required.

HP 225	Pull Box 3' x 5' Precast Concrete	Approved by: 
Sheet 2 of 2	What's Changed? Note 4, updated reference to FC 615 and added minimum cover coefficient of friction (COF). Added Note 7.	Effective Date:
UGS		01-29-2021

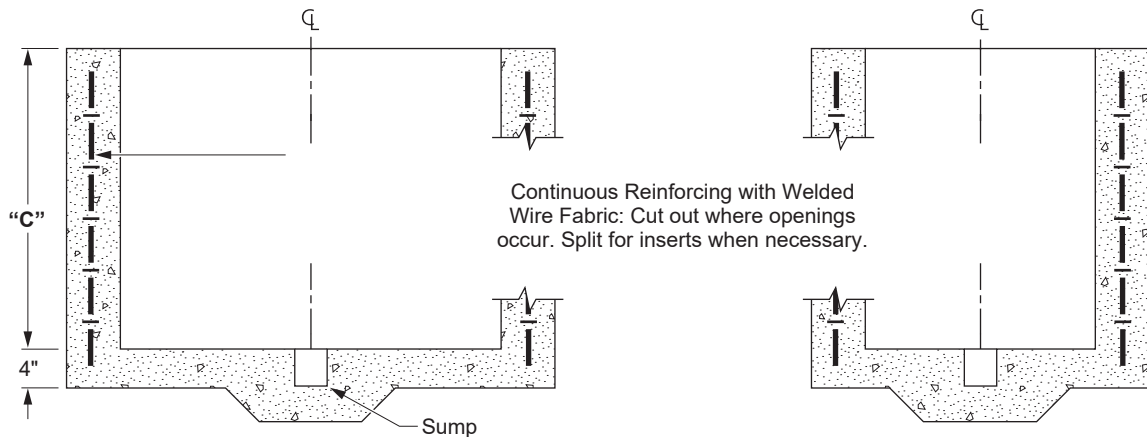
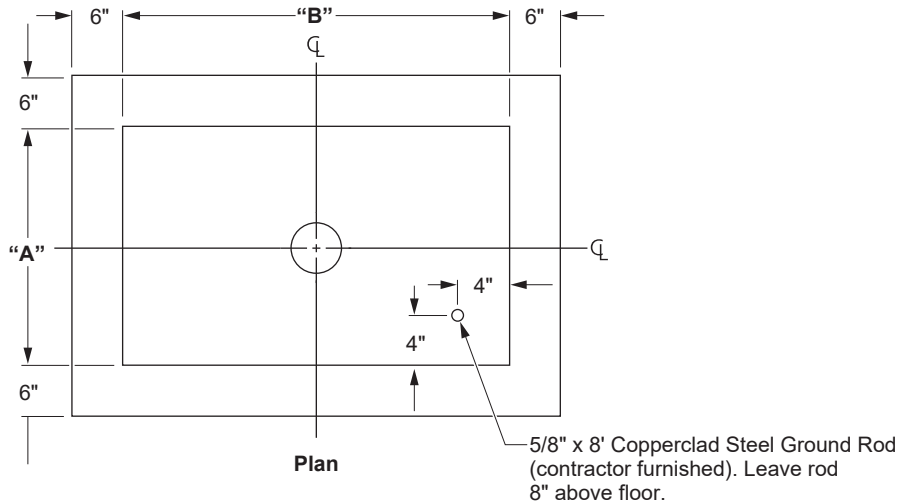
2. **Concrete:**
Concrete shall be Class "A" with 28-day compressive strength of 3,000 psi (minimum). Slight taper (3/4" in depth of pull box) and 1" chamfer on all inside corners permitted for ease of forming.
3. **Installation:**
Pull box shall be placed on 6" compacted rock or sand base to ensure uniform distribution of soil pressure in floor. Minimum excavation for pull box shall be 84" x 114" x depth to suit job.
4. **Covers:**
See [FC 616](#) for pull box covers.
5. **Grade Rings:**
Installing contractor shall provide grade rings (6" minimum) as necessary in order to maintain cover over conduits per SCE specifications or permit agency specifications, whichever is greater.
6. **Pull Irons and Eyes:**
See [AC 729](#) for pull irons and [AC 720](#) for pull eyes.
7. **2/0 Grounding required.**

HP 228	Pull Box 4' x 6'- 6" Precast Concrete	Approved by: <i>RR</i>
Sheet 2 of 2	What's Changed? Note 4, updated reference to FC 616. Added Note 7.	Effective Date:
UGS		01-29-2021

HP 230 Poured Concrete Pull Boxes — Construction Details

Scope HP 230.1 Poured Concrete Pull Boxes — Construction Details

Figure HP 230-1: Poured Concrete Pull Boxes — Construction Details — Plan



Note(s):

1. See [HP 210](#) for pull box requirements.
2. See [Figure HP 230-2 \(Sheet 2\)](#) for installation of cover designated on working drawing.
3. Reinforcing: to be welded, wire fabric - 12 ga. -2" square mesh 3/8 lb. per square foot.
4. Inserts: 2 required each box for cable pulling. See [AC 723](#). 4-6 required each box for cover hold down. See cover details.
5. Concrete: Per [GI 020](#).

Table HP 230-1: Center Line Sections

Inside Dimensions			Concrete	Excavation	Reinforcing	
"A"	"B"	"C"	Cubic Yards	Cubic Yards	Parkway	Traffic
24"	36"	36" MIN	0.81	1.48	None	29.3 sq ft
		48" MAX	1.04	1.92	None	38.0 sq ft
30"	48"	36" MIN	1.05	2.16	None	43.5 sq ft
		48" MAX	1.33	2.81	None	57.0 sq ft

Approved by:

PhH

Poured Concrete Pull Boxes — Construction Details

HP 230

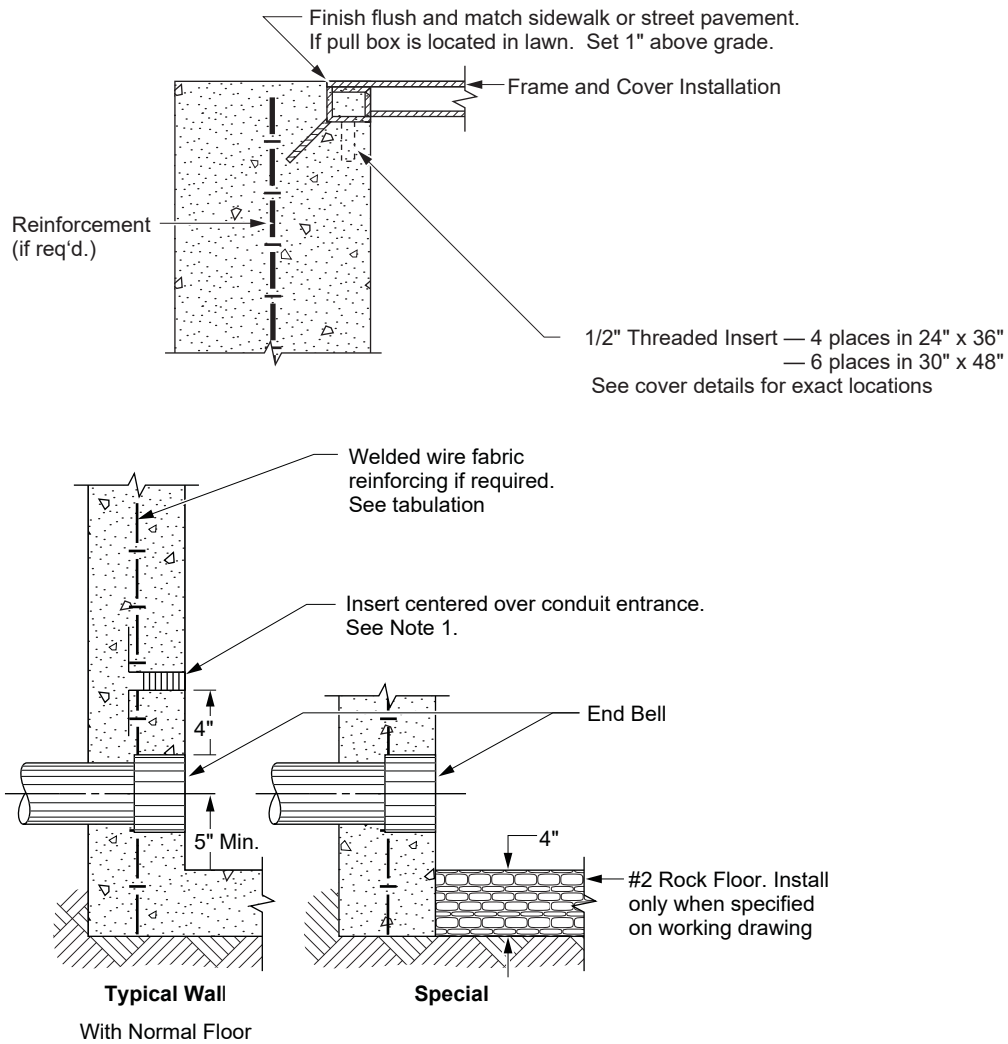
Sheet 1 of 2

Effective Date:
01-26-2007

What's Changed?

UGS

Figure HP 230-2: Poured Concrete Pull Boxes — Construction Details — Typical and Special Wall



Note(s):

1. See AC 720.

See:

FC 601, FC 618, FC 603, FC 606, FC 618, and FC 608.

HP 230

Poured Concrete Pull Boxes — Construction Details

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

01-26-2007

Manholes

Table of Contents

Standard	Title
MH 300	Manholes Requirements
MH 300.1	Manholes Requirements
MH 310	Precast Tub-Type Manholes
MH 310.1	Precast Tub-Type Manholes
MH 318	Precast Manhole Neck Detail
MH 318.1	Precast Manhole Neck Detail
MH 319	Manhole Neck Detail
MH 319.1	Manhole Neck Detail
MH 320	4' x 6' x 7' Manhole — Traffic Loading
MH 320.1	4' x 6' x 7' Manhole — Traffic Loading
MH 325	4' x 8' x 7' Manhole — Traffic Loading
MH 325.1	4' x 8' x 7' Manhole — Traffic Loading
MH 330	6' x 8' x 7' Manhole — Traffic Loading
MH 330.1	6' x 8' x 7' Manhole — Traffic Loading
MH 335	7' x 7' x 7' Manhole — Traffic Loading
MH 335.1	7' x 7' x 7' Manhole — Traffic Loading
MH 340	6' x 10' x 7' Manhole — Traffic — Heavy Loading
MH 340.1	6' x 10' x 7' Manhole — Traffic — Heavy Loading
MH 350	Manhole Neck Details — 27" Opening
MH 350.1	Manhole Neck Details — 27" Opening

Approved by:	Manholes Table of Contents	MH
Effective Date:	04-24-2020	Sheet i
		UGS

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MH 300 Manholes Requirements

Scope MH 300.1 Manholes Requirements

1.0 General

- 1.1 Manholes that have acceptable precast counterparts are shown on the working drawings (List of Materials) by item number and the types of manholes approved for each item number are listed below. Other manholes are listed by drawing number. Unless otherwise noted on the working drawings, any of the structures covered by a particular item number are acceptable.
- 1.2 All manhole installations will be watertight. Standard manhole cover/frame size is 30 inches. Manhole covers to be cast-iron for traffic loading, and Reinforced Polymer Material (RPM) for parkway loading. Manhole entry covers will be bolted closed and any lift holes sealed.

2.0 Poured Manholes


Each manhole will include accessories and facilities in conformance with the requirements set forth in the drawings, specifications, schedules, and tabulations referred to below:

- 2.1 Concrete and reinforcement as shown on the drawing and in conformance with [GI 020](#);
- 2.2 Opening cover as shown on structure drawing or as modified on the working drawing (shown in the List of Materials);
- 2.3 Conduit entrance ([CD 130](#));
- 2.4 Inserts ([AC 720](#) and [AC 722](#));
- 2.5 Sump ([AC 710](#));
- 2.6 Ground wires ([AC 700](#));
- 2.7 Neck ([MH 350](#); see [MH 318](#) for precast concrete)];
- 2.8 Ladders (when required) ([AC 740](#)).

3.0 Precast Manholes

Each precast manhole will be manufactured in conformance with the requirements as referred to below:

- 3.1 Manholes will be manufactured and installed to the requirements as set forth in [GI 030](#);
- 3.2 Each manhole will include accessories and facilities as required in poured manholes. (Some small construction variations have been allowed the precast concrete manufacturers.);
- 3.3 Manholes will be placed on a 6-inch minimum thickness of mechanically compacted crushed aggregate base (3/4-inch maximum).
- 3.4 All walls and ceilings to be painted white.
- 3.5 Manholes will be supplied with four (4) ground bus supports per [AC 731](#).

Approved by: 	Manholes Requirements	MH 300
Effective Date: 04-24-2020	What's Changed?	Sheet 1 of 2 UGS

3.6 Maximum placement depth is 4 feet, measured from grade to the top outside surface of the manhole and under conditions assumed in [GI 030](#). Contact Division Underground Planning Supervisor if greater depth is required.

Table MH 300–1: Manholes

Item No.	Nominal Size	Field Construction Drawings	Precast Concrete Manufacturers ^{a/}	
			Jensen Precast	Oldcastle Infrastructure
M-3	4' x 6'-6" x 7'	–	K466-DM84-11	ED466-84MH
M-10 ^{b/}	5' x 10'-6" x 7'	–	K5106-FM84-11	ED5106-84MH
M-11 ^{b/}	6' x 12' x 7'	–	K612-FM84-11	ED612-84MH
M-1 ^{c/}	4' x 6'-6" x 5'-6"	–	K466-DM66-11	–
M-2	4' x 6' x 7'	MH 320	–	–
M-4	4' x 8' x 7'	MH 325	–	–
M-5	4'-6" x 8'-6" x 7'	–	K4686-DM84-11	ED4686-84MH
M-6	6' x 8' x 7'	MH 330	K68-DM84-11	ED68-84MH
M-7	6' x 10' x 7'	–	K610-DM84-11P	ED610-84MH
M-8	6' x 10' x 7' (T)	MH 340	K610-DM84-11T	ED610-84MH-Traffic
M-9	7' x 7' x 7'	MH 335	Special Order	–

^{a/} Standard style enclosures are listed. For intercept part numbers add "-INT" to the end of the standard part number.

^{b/} Tub Style

^{c/} Not approved for use on new construction.

Table MH 300–2: Manhole SAP Numbers

Nominal Size	Type	SAP Number
4' x 6'-6" x 5'-6" ^{a/}	Standard	10117536
4' x 6'-6" x 7'	Standard	10117282
4' x 6'-6" x 7'	Intercept	10117537
5' x 10'-6" x 7'	Standard	10117539
5' x 10'-6" x 7'	Intercept	10117540
6' x 12' x 7'	Standard	10117541
6' x 12' x 7'	Intercept	10117542

^{a/} Not approved for use on new construction.

= For Reference Only

MH 300

Manholes Requirements

Approved by:

RR

Sheet 2 of 2

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

Effective Date:

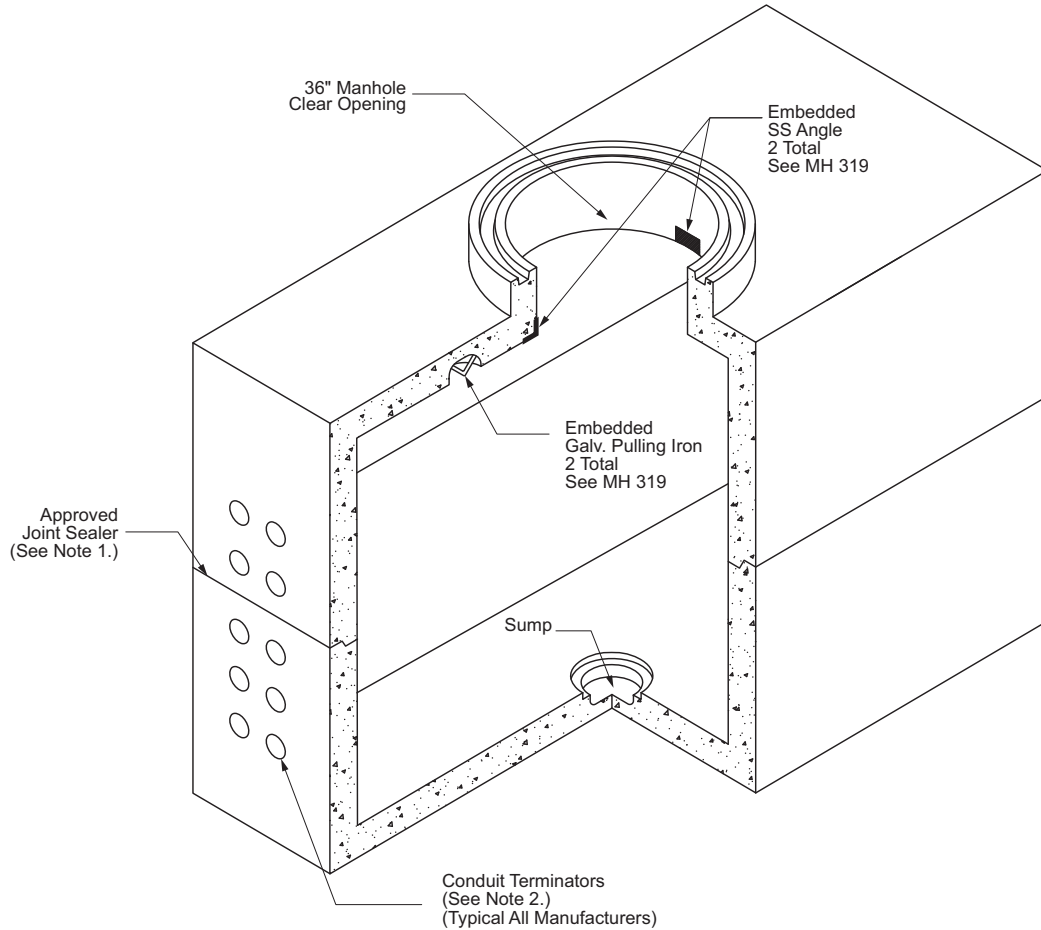
04-24-2020

UGS

MH 310 Precast Tub-Type Manholes

Scope MH 310.1 Precast Tub-Type Manholes

Figure MH 310–1: Precast Tub-Type Manholes



Notes:

Note(s):

- 1. See [GI 030](#).
- 2. See [CD 142](#).

1.0 Excavation Size:

Consult manufacturer's installation guides for exact excavation dimensions for each structure size.

2.0 UGS Reference:

- [GI 030](#) General Specification for Precast Reinforced Concrete Structures
- [GI 035](#) Allowable Tolerances for Installed Precast Structures
- [CD 142](#) Conduit Entrance
- [MH 319](#) Manhole Neck, Frame, Cover, and Restraint Detail
- [AC 711](#) Sump Drain and Detail
- [AC 740](#) Ladders

Approved by:
ajf

Precast Tub-Type Manholes

MH 310

Sheet 1 of 2

Effective Date: **What's Changed?** Section 2.0 UGS References updated.
04-27-2018

UGS

Note(s):

1. Conduit terminators to be generally located as shown on [CD 142](#). Standard conduit entrance will be a flat wall design. Slight variations by manufacturers may be allowable with Company approval.
2. Tub-type structures will be furnished with 1/2" threaded bronze grounding inserts, as shown on [VA 411](#).
3. Inside walls and ceiling to be painted white

MH 310

Precast Tub-Type Manholes

Approved by:

ajf

Sheet 2 of 2

What's Changed?

Effective Date:

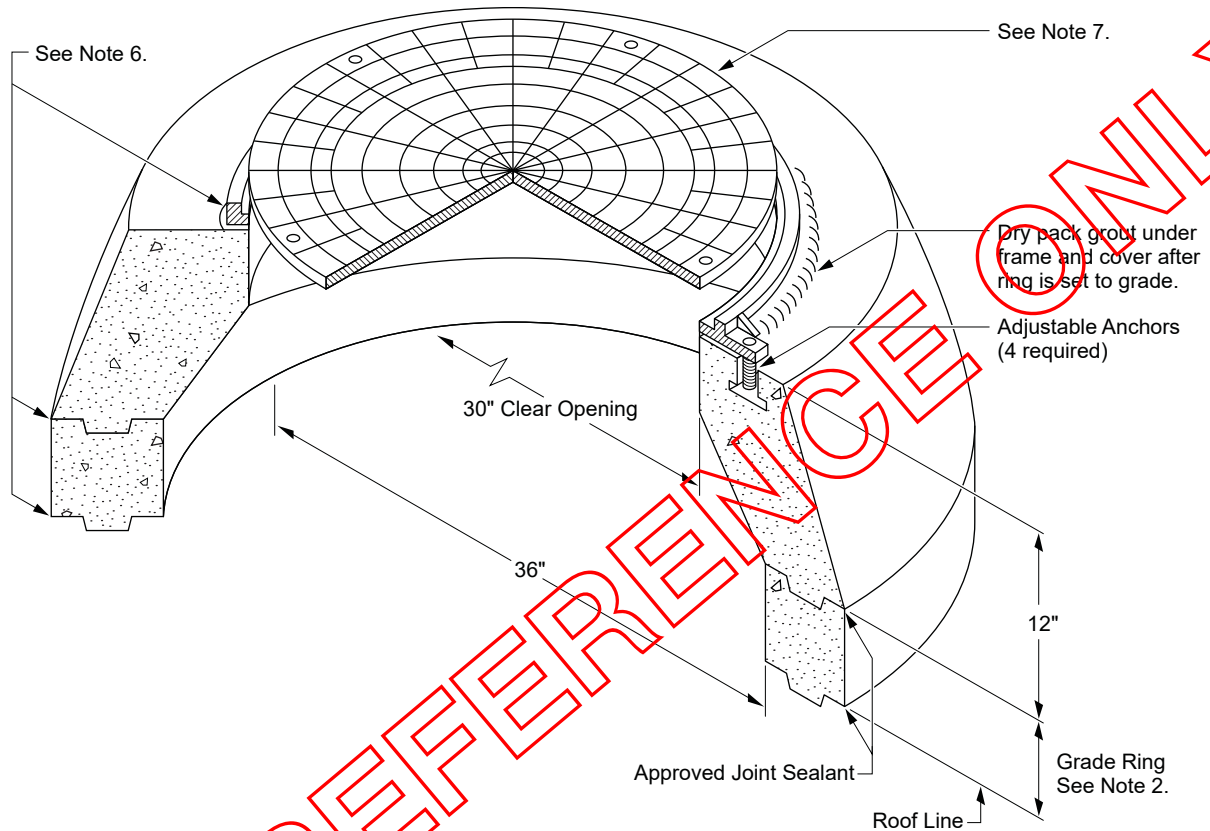
UGS

04-27-2018

MH 318 Precast Manhole Neck Detail

Scope MH 318.1 Precast Manhole Neck Detail

Figure MH 318-1: Precast Manhole Neck Detail



Note(s):

1. See AC 740 for ladder installation (when required).
2. Various size grade rings available (3", 6", 12", and so on). See Table MH 318-2 (Sheet 2).
3. Reinforcement designed for H-20 bridge loading.
4. Standard manhole cover/frame size is 30 inches.
5. RPM cover is to be used when in non-vehicular traffic conditions.
6. Bonding adhesive per GI 030.
7. Cover and frame per FC 621.

Table MH 318-1: Replacement 30-Inch Diameter Manhole Neck and Cover — Cast Iron Traffic

Manufacturer	Part Number	SAP
Jensen Precast	K36-MN14-11T	10117543
Oldcastle Infrastructure	A-1106 Frame and Cover	10117543

Approved by:

RR

Precast Manhole Neck Detail

MH 318

Sheet 1 of 2

Effective Date:
04-24-2020

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

UGS

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Table MH 318–2: Manhole Grade Rings

Item Number	Extension Height	Manufacturers' Numbers		SAP
		Jensen Precast ^{a/}	Oldcastle Infrastructure	
MX-1	3 inch	MN36-R3	ED-3603-GR	10117545
MX-2	6 inch	MN36-R6	ED-3606-GR	10117546
MX-3	12 inch	MN36-R12	ED-3612-GR	10117547

^{a/} Jensen Precast (formerly Brooks Products, Inc.)

MH 318

Precast Manhole Neck Detail

Approved by:

RR

Sheet 2 of 2

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

Effective Date:

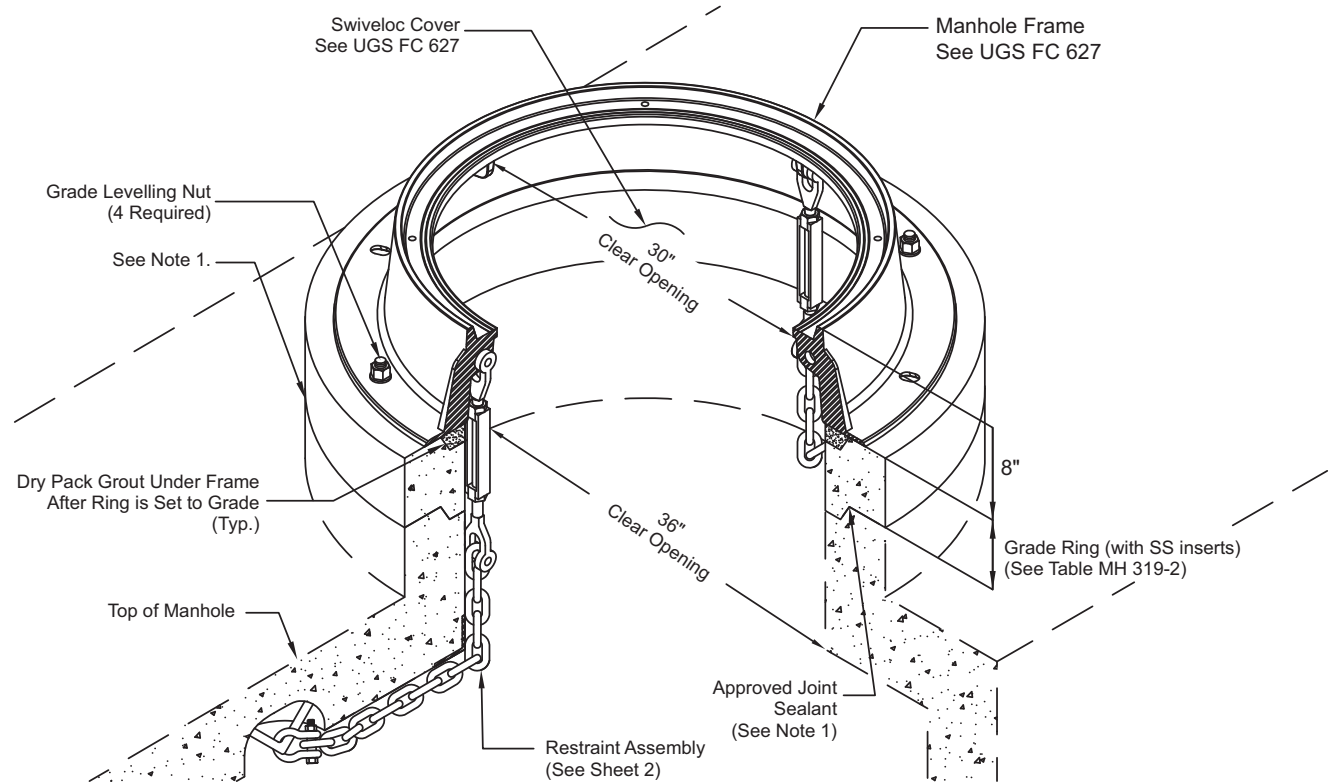
04-24-2020

UGS

MH 319 Manhole Neck, Frame, Cover, and Restraint Detail

Scope MH 319.1 Manhole Neck Detail

Figure MH 319-1: Manhole Neck Detail



Note(s):

1. Bonding adhesive per GI 030

Table MH 319-1: Replacement Manhole Frame - Ductile Iron (Traffic)

Manufacturer	Part Number	SAP Number
Neenah Foundry	NF-0150T132F	10209493

Table MH 319-2: Manhole Grade Rings (with Stainless Steel Inserts)

Item Number	Extension Height	Manufacturer's Numbers		SAP Number
		Jensen Precast	Oldcastle Precast	
MX-1	6-inch	MN36-R6F	ED-3606-GR/MX-1	10210061
MX-2	12-inch	MN36-R12F	ED-3612-GR/MX-2	10210062

Approved by:

ajf

Manhole Neck, Frame, Cover, and Restraint Detail

MH 319

Sheet 1 of 3

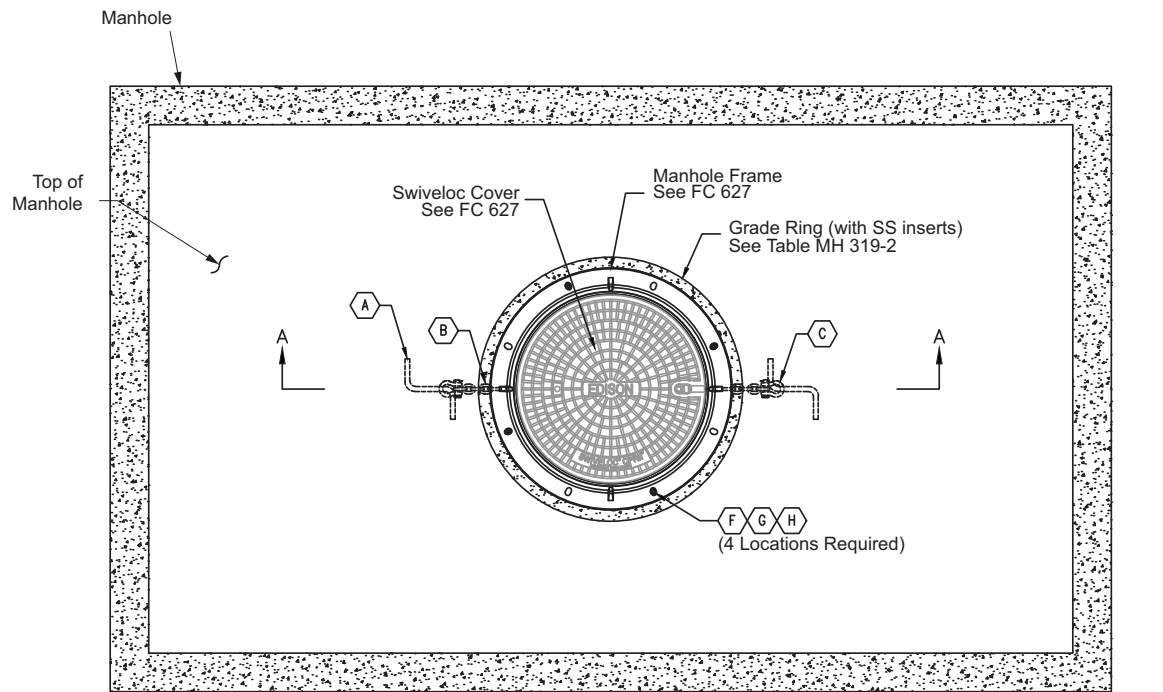
Effective Date:
04-27-2018

What's Changed? Figure MH 319-1, updated reference for restraint assembly and approved joint seal.

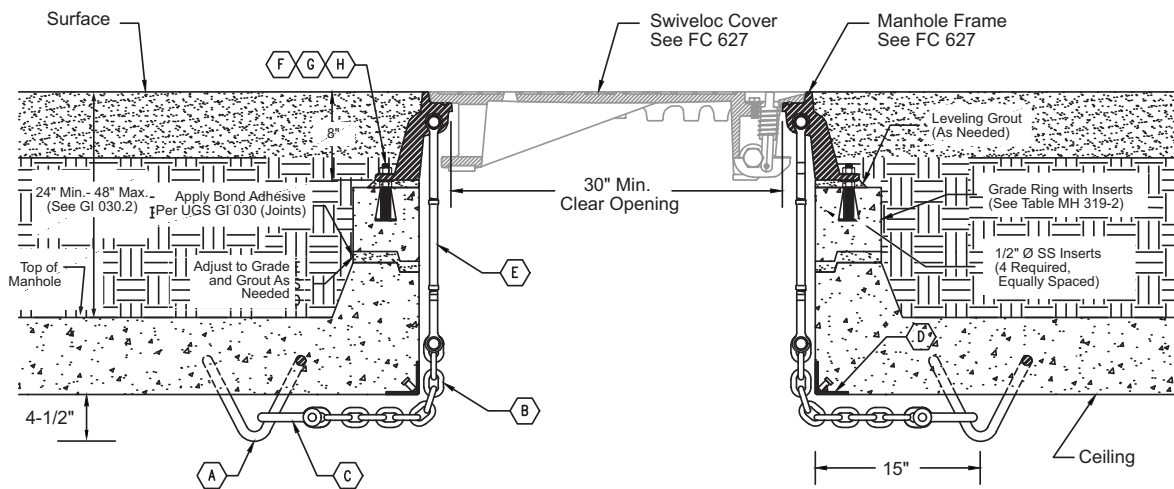
UGS

Scope MH 319.2 Precast Manhole - Restraint Installation Detail

Figure MH 319-2: Precast Manhole - Restraint Installation Detail



Manhole Plan View



Section View A-A

Note(s):

1. See GI 030.
2. See CD 142.
3. See Scope MH 319.3 (Sheet 3) for General Notes and Key Notes.
4. If an event (such as an electrical fault) occurs inside the structure, Structural engineering shall be notified within 3 days in order to determine if the cover(s) and restraints can be reused or will require replacement.

MH 319

Manhole Neck, Frame, Cover, and Restraint Detail

Approved by:

ajf

Sheet 2 of 3

What's Changed? Figure MH 319-2 reference updated, 4-12" callout added.

Effective Date:

04-27-2018









UGS


Scope MH 319.3 General and Key Notes

General Notes

1. All restraints shall be installed taut with no slack in any of the components (turnbuckle, chain, shackle, etc.). Chains shall be in their normal position and not be twisted while making restraint taut.

Table MH 319-3: Precast Manhole - Restraint Assembly Kit

Key Notes: Restraint Assembly Kit for Manholes			
Item	Description	SAP Number	Oty
	7/8" Ø Galv. Pull Iron.	—	2
	1/2" Ø Galv. Chain – Grade 30 (Field Cut)	10209810	15 ft.
	5/8" Ø Galv. Shackle with 3/4" Pin w/ Cotter Pins (Min. 3.5 ton WLL)	10209811	2
	Embedded Stainless Steel Angle L3 x 3 x 1 / 4–6" Long	—	2
	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pins) Turnbuckle (Min. 2.6 ton WLL)	10209813	2
	1/2" Ø x 8" Length — All Thread Rod (Grade 8 Steel)	10209815	4
	1/2" – 13 Hex Nut (Grade 8 Steel)	10209816	8
	1/2" – Flat Washer (Grade 8 Steel)	10209817	8

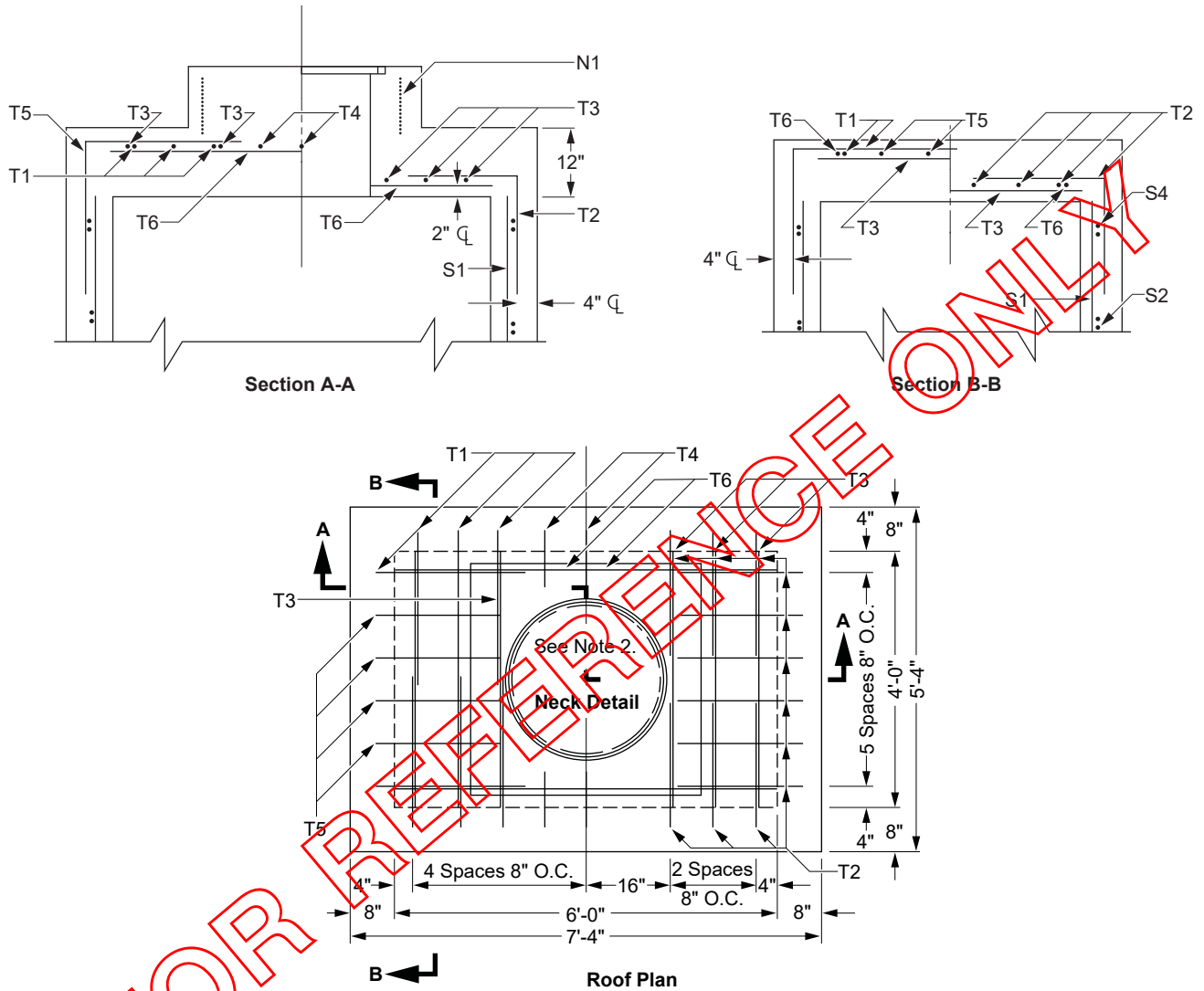
Approved by: 	Manhole Neck, Frame, Cover, and Restraint Detail	MH 319
Effective Date: 04-27-2018	What's Changed?	Sheet 3 of 3
		UGS

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MH 320 4' x 6' x 7' Manhole — Traffic Loading

Scope MH 320.1 4' x 6' x 7' Manhole — Traffic Loading

Figure MH 320-1: 4' x 6' x 7' Manhole — Traffic Loading — Cover



Note(s):

1. See [MH 300](#) for reference drawings giving installation details, schedules, and general requirements for manhole structures and accessories.

See working drawings for additional details of neck, conduit bank, and so on.

Excavation: 14.2 Cu. Yds.

Concrete: 7.06 Cu. Yds.

Total Rebar: 781 Lbs.

2. See [MH 350](#).

Approved by:

PhH

4' x 6' x 7' Manhole — Traffic Loading

MH 320

Sheet 1 of 4

Effective Date:
10-29-2004

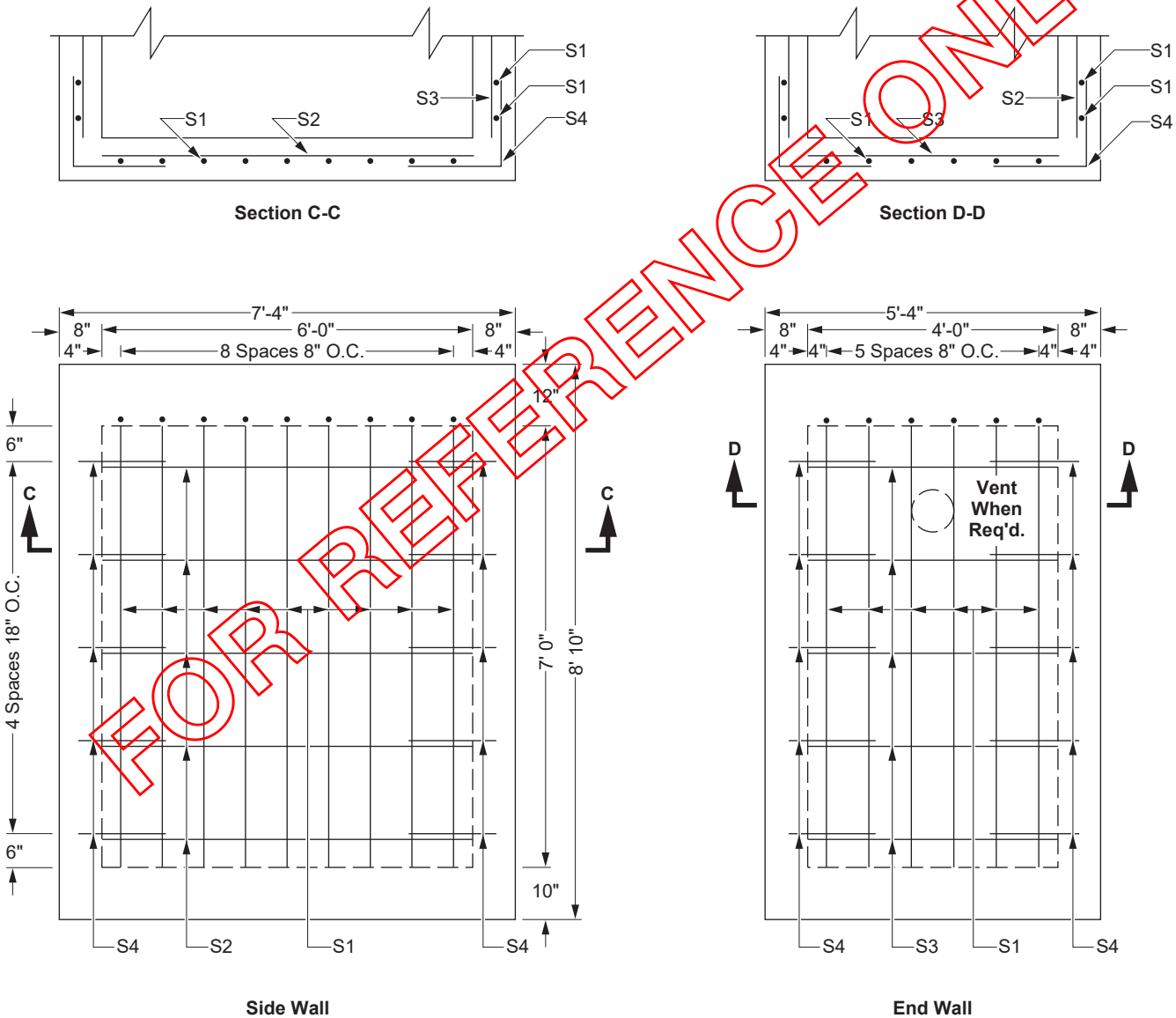
What's Changed?

UGS

Table MH 320-1: Reinforcing Schedule — 4' x 6' x 7' Manhole — Traffic Loading — Cover

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
T1	16	4'-10"	29" V.	#5	81
T2	24	3'-8"	23" H.	#5	92
T3	10	4'-0"	Straight	#5	42
T4	6	3'-4"	29" V.	#5	21
T5	8	4'-5"	29" V.	#5	37
T6	4	6'-0"	Straight	#5	25
N1	1	110"	Welded Wire Fabric 2" x 2" 12 Ga. Min.		3

Figure MH 320-2: 4' x 6' x 7' Manhole — Traffic Loading — Wall



MH 320

4' x 6' x 7' Manhole — Traffic Loading

Approved by:

PHH

Sheet 2 of 4

What's Changed?

Effective Date:

10-29-2004

UGS

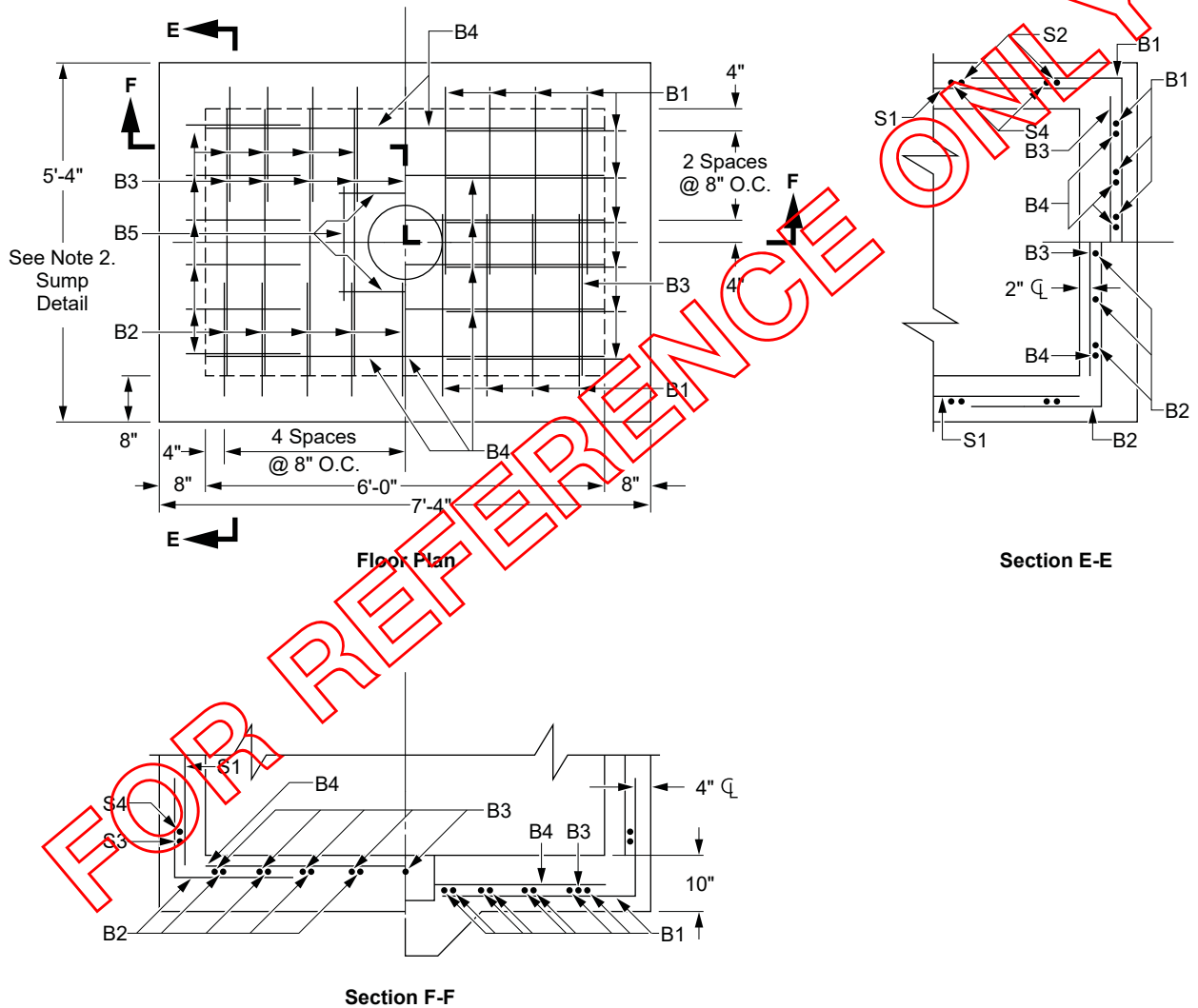
Note(s):

1. All side steel 4" clear from outside surface.

Table MH 320-2: Reinforcing Schedule — 4' x 6' x 7' Manhole — Traffic Loading — Wall

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
S1	30	7'-0"	Straight	#3	79
S2	10	6'-0"	Straight	#3	23
S3	10	4'-0"	Straight	#3	15
S4	20	2'-10"	17" H.	#3	22

Figure MH 320-3: 4' x 6' x 7' Manhole — Traffic Loading — Floor



Note(s):

1. All floor and roof steel 2" minimum clear from outside surfaces. All side steel 4" minimum clear from outside surfaces.
2. See AC 710.

Approved by:

PHH

4' x 6' x 7' Manhole — Traffic Loading

MH 320

Sheet 3 of 4

Effective Date:
10-29-2004

What's Changed?

UGS

Table MH 320-3: Reinforcing Schedule — 4' x 6' x 7' Manhole — Traffic Loading — Floor

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
B1	28	4'-8"	29" H.	#5	126
B2	30	3'-8"	23" H.	#5	115
B3	11	4'-0"	Straight	#5	46
B4	8	6'-0"	Straight	#5	50
B5	4	1'-9"	Straight	#5	7

FOR REFERENCE ONLY

MH 320

4' x 6' x 7' Manhole — Traffic Loading

Approved by:

PHH

Sheet 4 of 4

What's Changed?

Effective Date:

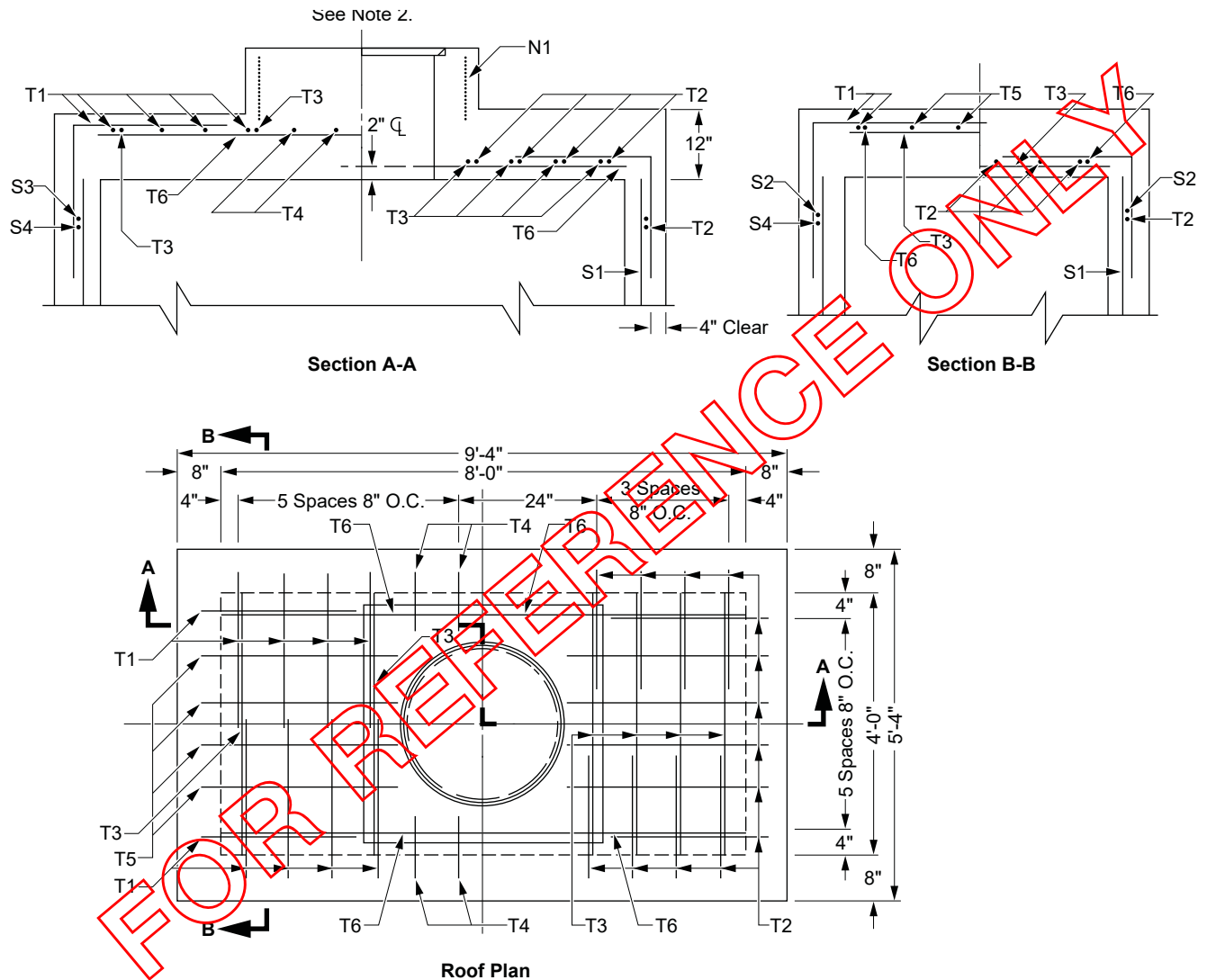
10-29-2004

UGS

MH 325 4' x 8' x 7' Manhole — Traffic Loading

Scope MH 325.1 4' x 8' x 7' Manhole — Traffic Loading

Figure MH 325-1: 4' x 8' x 7' Manhole — Traffic Loading — Roof



1. See [MH 300](#) for reference drawings giving installation details, schedules, and general requirements for manhole structures and accessories. See working drawings for additional details of neck, conduit banks, and so on.

Excavation: 18.11 Cu. Yds.
Concrete: 8.4 Cu. Yds.
Total Rebar: 975 Lbs.

2. See [MH 350](#).

Approved by:

RK

4' x 8' x 7' Manhole — Traffic Loading

MH 325

Sheet 1 of 5

Effective Date:
7-25-2008

What's Changed? This type of poured in place manhole is no longer valid for new construction. The standard was made for reference only for rebuilding or expanding existing structures.

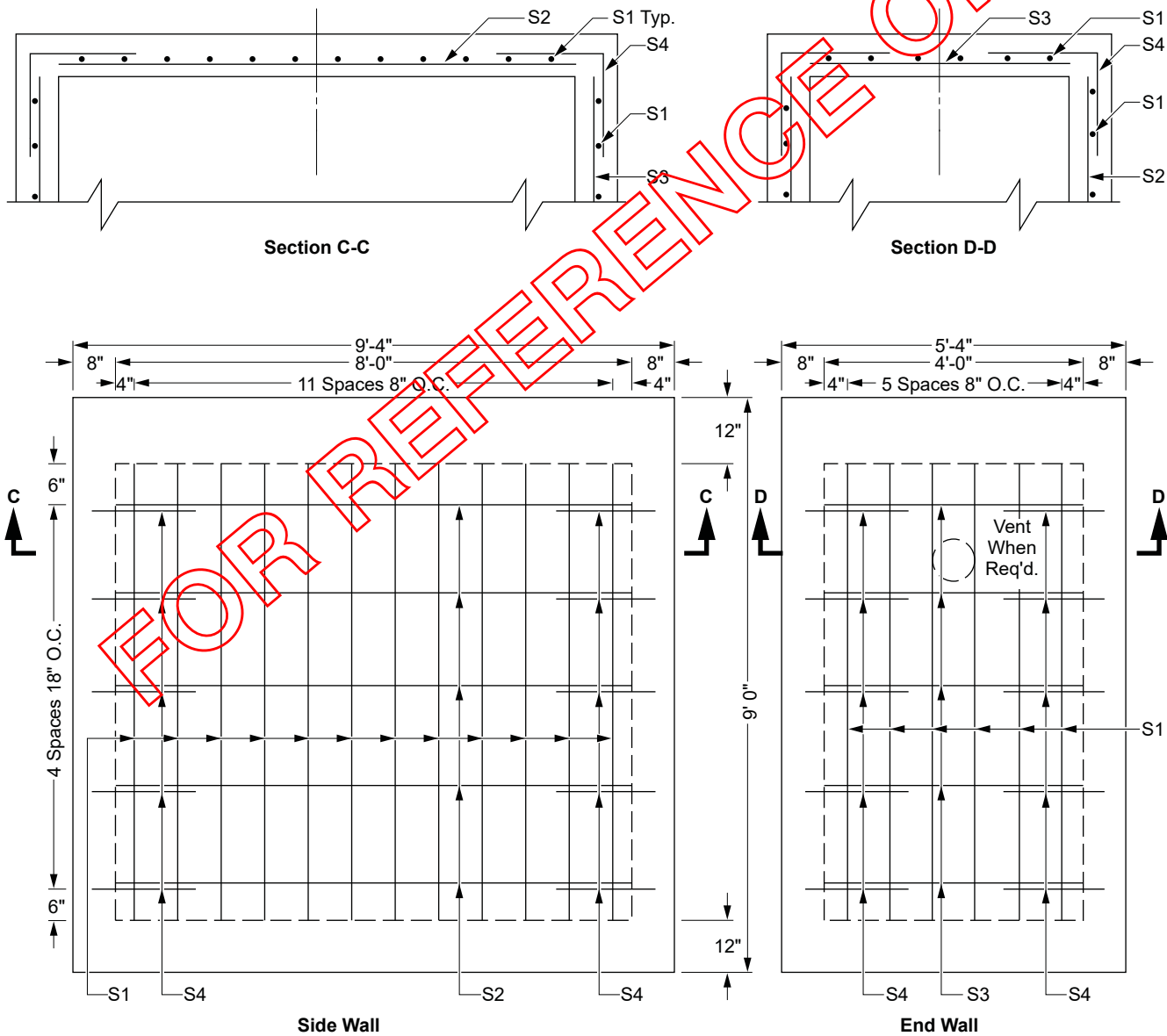
UGS

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Table MH 325-1: Reinforcing Schedule — 4' x 8' x 7' Manhole — Traffic Loading — Roof

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
T1	20	4'-10"	29" V.	#5	101
T2	28	3'-8"	23" H.	#5	110
T3	12	4'-0"	Straight	#5	51
T4	8	3'-4"	29" V.	#5	28
T5	8	5'-3"	34" H.	#5	45
T6	4	8'-0"	Straight	#5	34
N1	1	110"	Welded Wire Fabric 2" x 2" 12 Ga. Min.		3

Figure MH 325-2: 4' x 8' x 7' Manhole — Traffic Loading — Wall



MH 325

4' x 8' x 7' Manhole — Traffic Loading

Approved by:

RK

Sheet 2 of 5

What's Changed? This type of poured in place manhole is no longer valid for new construction. The standard was made for reference only for rebuilding or expanding existing structures.

Effective Date:

7-25-2008

UGS

Table MH 325-2: Reinforcing Schedule — 4' x 8' x 7' Manhole — Traffic Loading — Wall

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
S1	36	7'-0"	Straight	#3	95
S2	10	8'-0"	Straight	#3	31
S3	10	4'-0"	Straight	#3	15
S4	20	2'-10"	17" H.	#3	22

1. All side steel 4" clear from outside surface.

FOR REFERENCE ONLY

Approved by:

RK

4' x 8' x 7' Manhole — Traffic Loading

MH 325

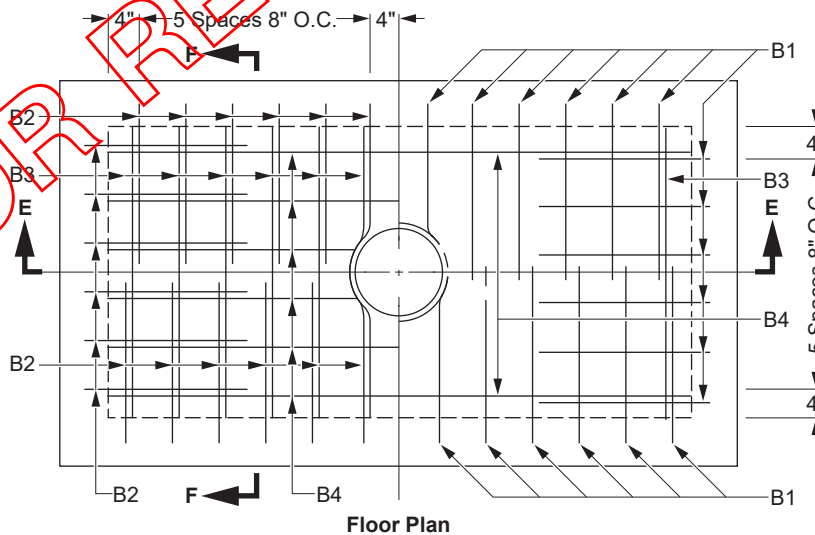
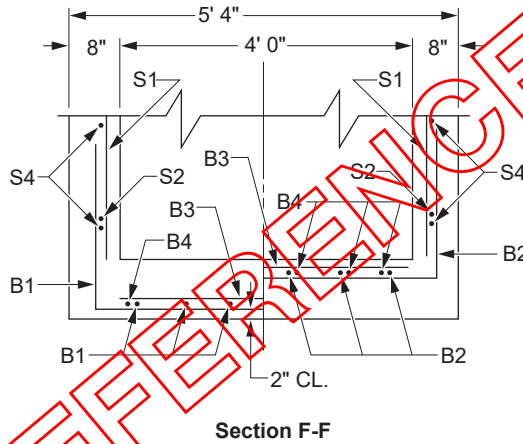
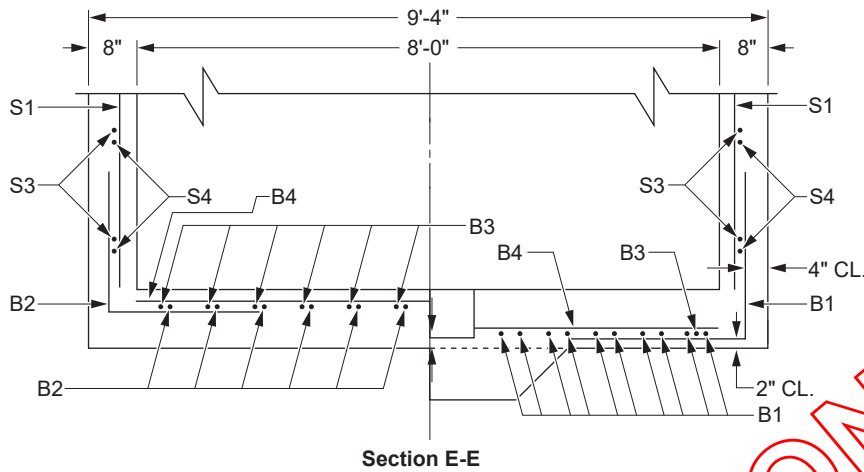
Sheet 3 of 5

Effective Date:
7-25-2008

What's Changed? This type of poured in place manhole is no longer valid for new construction. The standard was made for reference only for rebuilding or expanding existing structures.

UGS

Figure MH 325-3: 4' x 8' x 7' Manhole — Traffic Loading — Floor



All floor and roof steel 2" min. clear from outside surfaces. All side steel 4" minimum clear from outside surfaces.

MH 325

4' x 8' x 7' Manhole — Traffic Loading

Approved by:

RK

Sheet 4 of 5

What's Changed? This type of poured in place manhole is no longer valid for new construction. The standard was made for reference only for rebuilding or expanding existing structures.

Effective Date:

7-25-2008

UGS

Table MH 325-3: Reinforcing Schedule — 4' x 8' x 7' Manhole — Traffic Loading — Floor

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
B1	36	4'-8"	29" H.	#5	176
B2	36	3'-8"	23" H.	#5	138
B3	14	4'-0"	Straight	#5	59
B4	8	8'-0"	Straight	#5	67

FOR REFERENCE ONLY

Approved by:

RK

4' x 8' x 7' Manhole — Traffic Loading

MH 325

Sheet 5 of 5

Effective Date:
7-25-2008

What's Changed? This type of poured in place manhole is no longer valid for new construction. The standard was made for reference only for rebuilding or expanding existing structures.

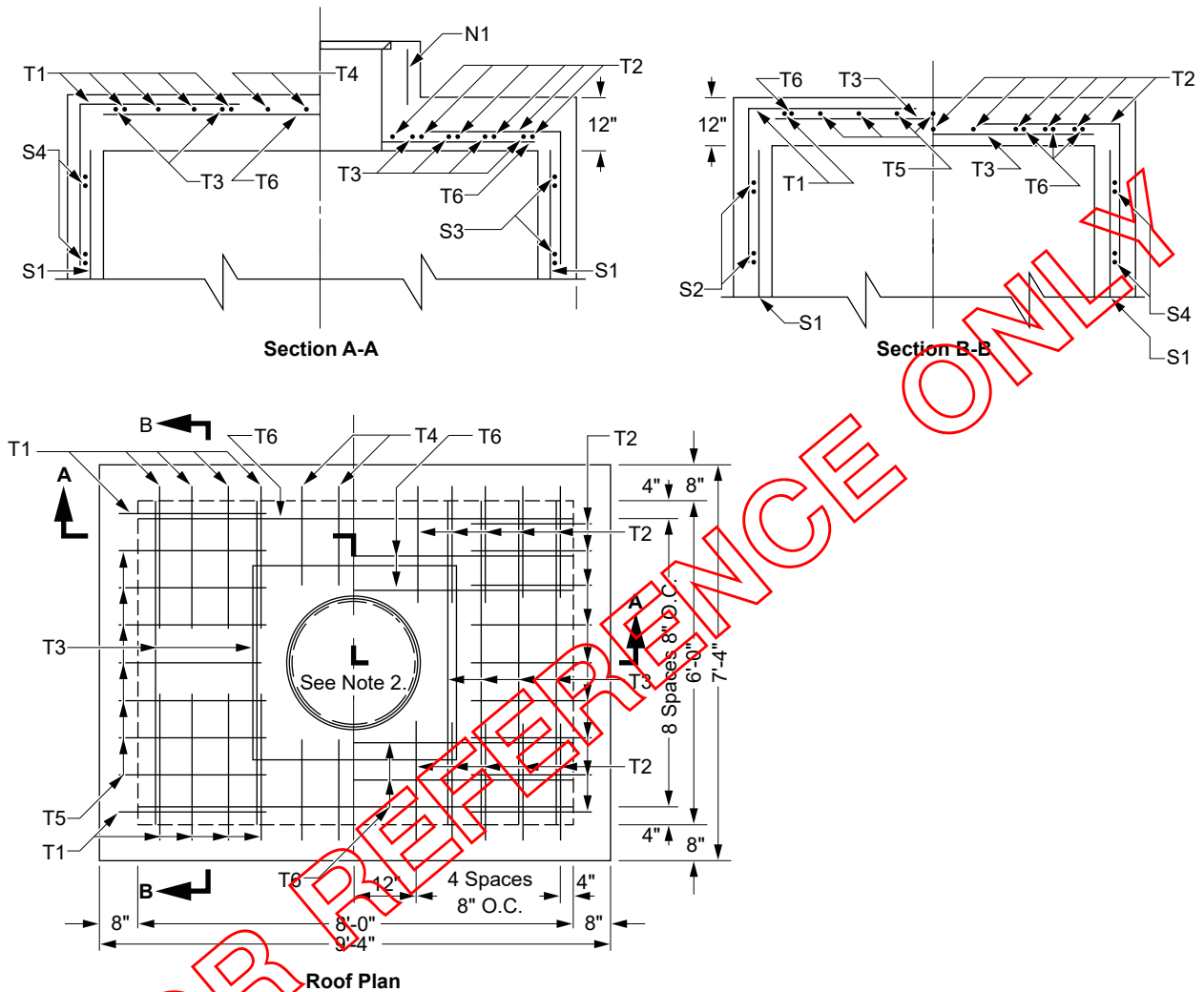
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MH 330 6' x 8' x 7' Manhole — Traffic Loading

Scope MH 330.1 6' x 8' x 7' Manhole — Traffic Loading

Figure MH 330-1: 6' x 8' x 7' Manhole — Traffic Loading — Roof



Note(s):

1. See [MH 300](#) for reference drawings giving installation details, schedules, and general requirements for manhole structures and accessories. See working drawings for additional details of neck, conduit bank, and so on.

Excavation: 25.3 Cu. Yds.

Concrete: 11.3 Cu. Yds.

Total Rebar: 1,857 Lbs.

2. See [MH 350](#).

Approved by:

PhH

6' x 8' x 7' Manhole — Traffic Loading

MH 330

Sheet 1 of 4

Effective Date:

What's Changed?

10-29-2004

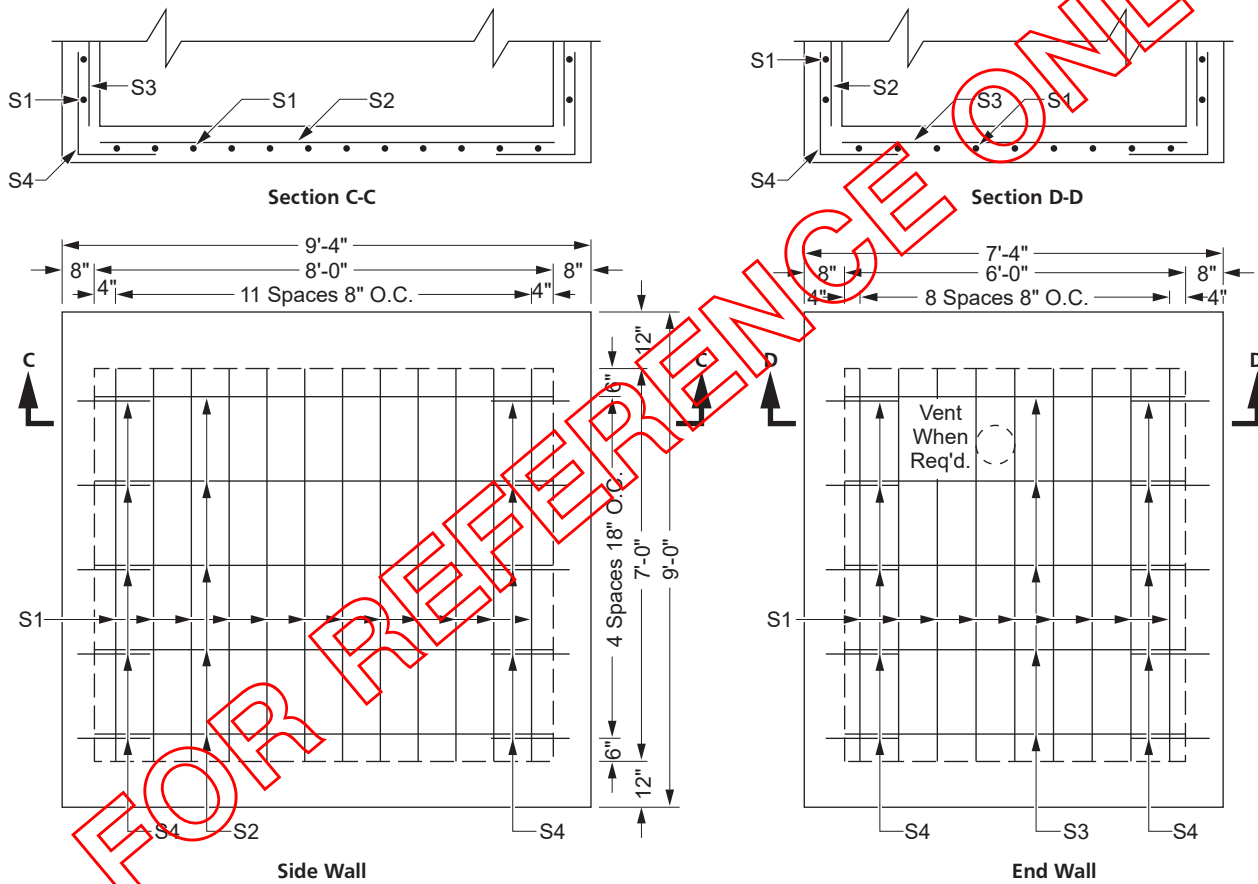
UGS

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Table MH 330-1: Reinforcing Schedule — 6' x 8' x 7' Manhole — Traffic Loading — Roof

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
T1	20	5'-6"	33" V.	#6	166
T2	38	4'-4"	27" H.	#6	247
T3	12	6'-0"	Straight	#6	109
T4	8	4'-8"	33" V.	#6	57
T5	14	5'-9"	33" H.	#6	121
T6	8	8'-0"	Straight	#6	97
N1	1	12" x 110"	Welded Wire Fabric 2" x 2" 12 Ga. Min.		3

Figure MH 330-2: 6' x 8' x 7' Manhole — Traffic Loading — Wall



Note(s):

1. All side steel 4" clear from outside surface.

MH 330

6' x 8' x 7' Manhole — Traffic Loading

Approved by:

PHH

Sheet 2 of 4

What's Changed?

Effective Date:

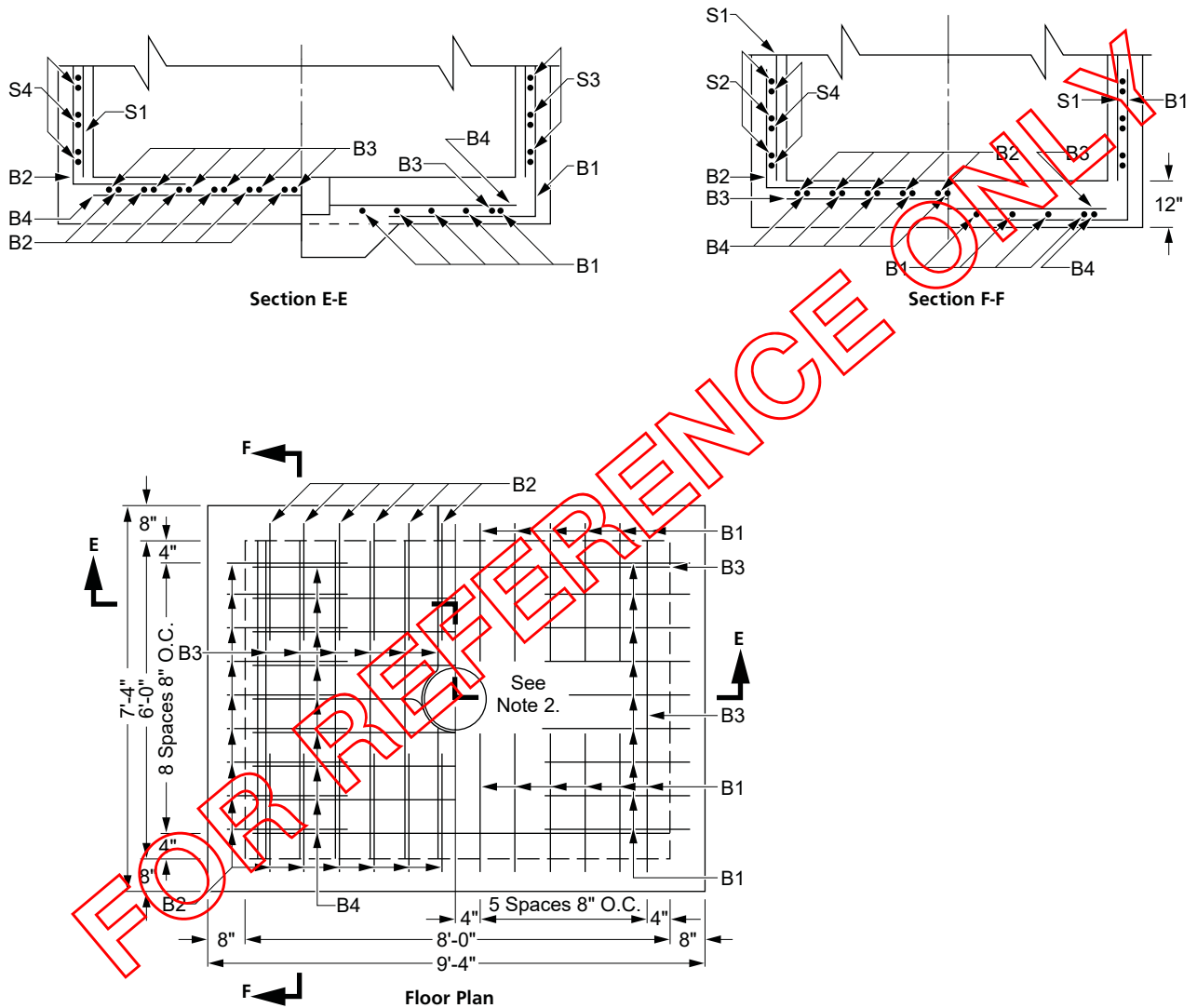
UGS

10-29-2004

Table MH 330-2: Reinforcing Schedule — 6' x 8' x 7' Manhole — Traffic Loading — Wall

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
S1	42	7'-0"	Straight	#3	111
S2	10	8'-0"	Straight	#3	31
S3	10	6'-0"	Straight	#3	23
S4	20	2'-10"	17"	#3	22

Figure MH 330-3: 6' x 8' x 7' Manhole — Traffic Loading — Floor



Note(s):

1. All floor and roof steel 2" minimum clear from outside surfaces. All side steel 4" minimum clear from outside surfaces
2. See AC 710.

Approved by:

PhH

6' x 8' x 7' Manhole — Traffic Loading

MH 330

Sheet 3 of 4

Effective Date:
10-29-2004

What's Changed?

UGS

Table MH 330-3: Reinforcing Schedule — 6' x 8' x 7' Manhole — Traffic Loading — Floor

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
B1	42	5'-4"	29" H.	#6	337
B2	42	4'-4"	23" H.	#6	273
B3	14	6'-0"	Straight	#6	127
B4	11	8'-0"	Straight	#6	133

FOR REFERENCE ONLY

MH 330

6' x 8' x 7' Manhole — Traffic Loading

Approved by:



Sheet 4 of 4

What's Changed?

Effective Date:

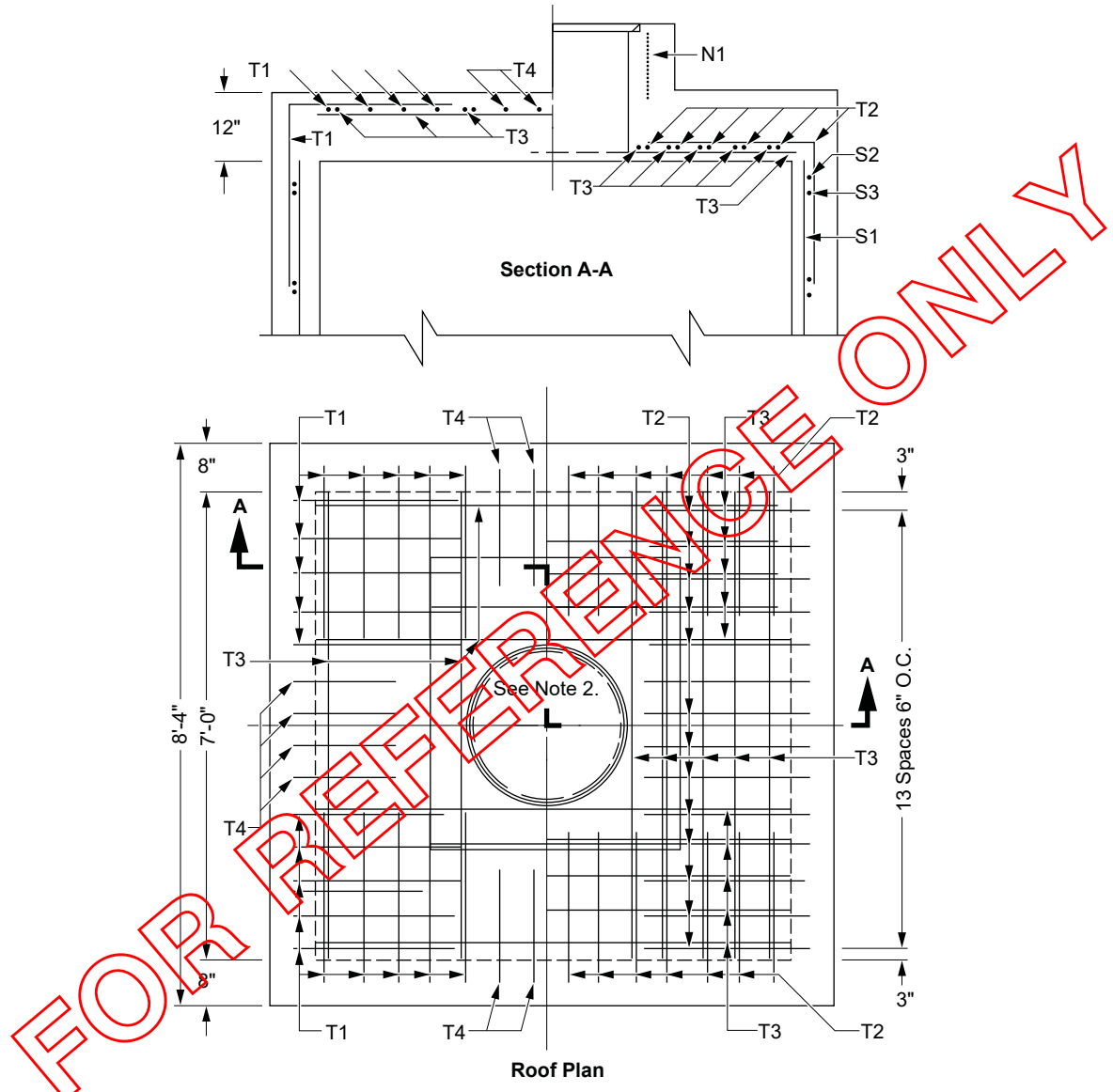
UGS

10-29-2004

MH 335 7' x 7' x 7' Manhole — Traffic Loading

Scope MH 335.1 7' x 7' x 7' Manhole — Traffic Loading

Figure MH 335-1: 7' x 7' x 7' Manhole — Traffic Loading — Roof



Note(s):

1. See [MH 300](#) for reference drawings giving installation details, schedules, and general requirements for manhole structures and accessories. See working drawings for additional details of neck, conduit bank, and so on.

Excavation: 25.7 Cu. Yds.
Concrete: 10.5 Cu. Yds.
Total Rebar: 2,468 Lbs.

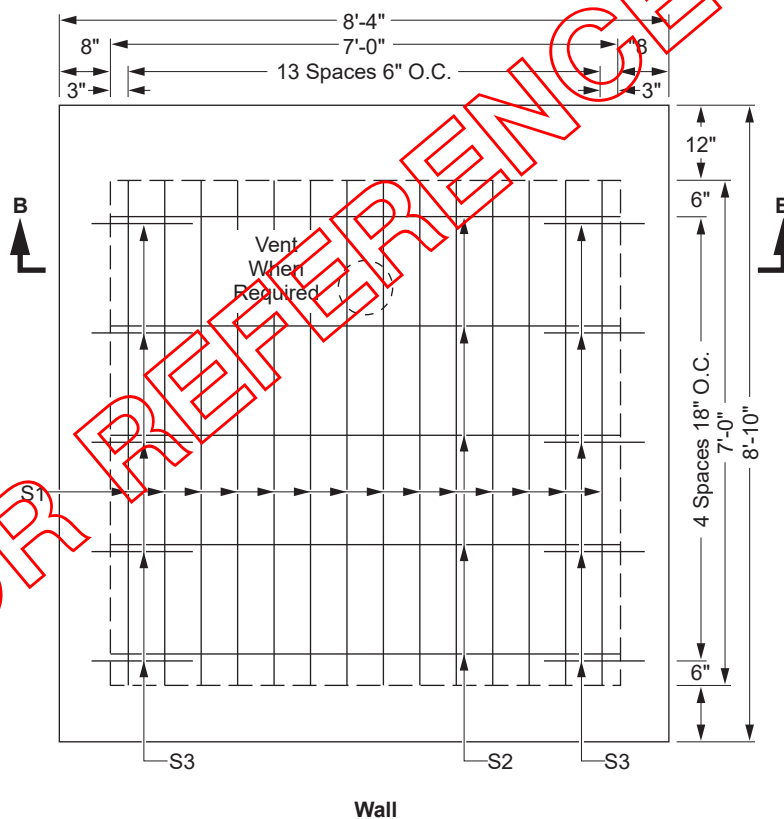
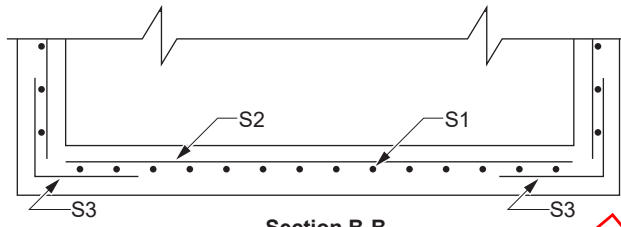
2. See [MH 350](#).

Approved by: <i>PhH</i>	7' x 7' x 7' Manhole — Traffic Loading	MH 335
Effective Date: 10-29-2004	What's Changed?	Sheet 1 of 4 UGS

Table MH 335-1: Reinforcing Schedule — 7' x 7' x 7' Manhole — Traffic Loading — Roof

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
T1	40	5'-3"	33" V.	#6	316
T2	56	4'-4"	27" H.	#6	364
T3	28	7'-0"	Straight	#6	295
T4	16	4'-5"	33" V.	#6	107
N1	1	110"	Welded Wire Fabric 2" x 2" 12 Ga. Min.		3

Figure MH 335-2: 7' x 7' x 7' Manhole — Traffic Loading — Wall



FOR REFERENCE ONLY

Note(s):

- All side steel 4" clear from outside surface.

MH 335

7' x 7' x 7' Manhole — Traffic Loading

Approved by:

PHH

Sheet 2 of 4

What's Changed?

Effective Date:

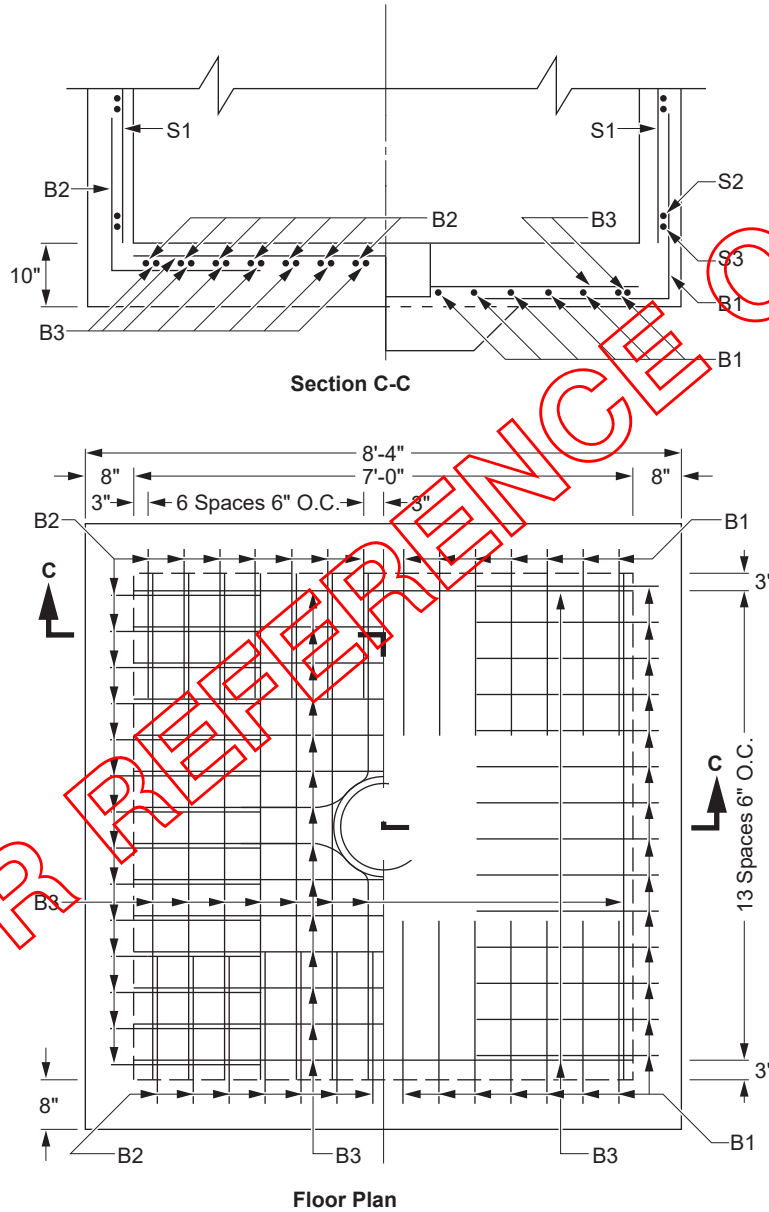
UGS

10-29-2004

Table MH 335-2: Reinforcing Schedule — 7' x 7' x 7' Manhole — Traffic Loading — Wall

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
S1	56	7'-0"	Straight	#3	148
S2	20	7'-0"	Straight	#3	53
S3	20	2'-10"	17" H.	#3	22

Figure MH 335-3: 7' x 7' x 7' Manhole — Traffic Loading — Floor



FOR REFERENCE ONLY

Approved by:

PhH

7' x 7' x 7' Manhole — Traffic Loading

MH 335

Sheet 3 of 4

Effective Date:
10-29-2004

What's Changed?

UGS

Table MH 335-3: Reinforcing Schedule — 7' x 7' x 7' Manhole — Traffic Loading — Floor

Mark	Quantity	Length	Long Leg	Size	Wt. Lbs.
B1	56	5'-4"	33" H.	#6	449
B2	56	4'-4"	27" H.	#6	364
B3	32	7'-0"	Straight	#6	337

Note(s):

1. All floor and roof steel 2" minimum clear from outside surfaces. All side steel 4" minimum clear from outside surfaces.

FOR REFERENCE ONLY

MH 335

7' x 7' x 7' Manhole — Traffic Loading

Approved by:



Sheet 4 of 4

What's Changed?

Effective Date:

UGS

10-29-2004

MH 340 6' x 10' x 7' Manhole — Traffic — Heavy Loading

Scope MH 340.1 6' x 10' x 7' Manhole — Traffic — Heavy Loading

Figure MH 340-1: 6' x 10' x 7' Manhole — Traffic — Heavy Loading

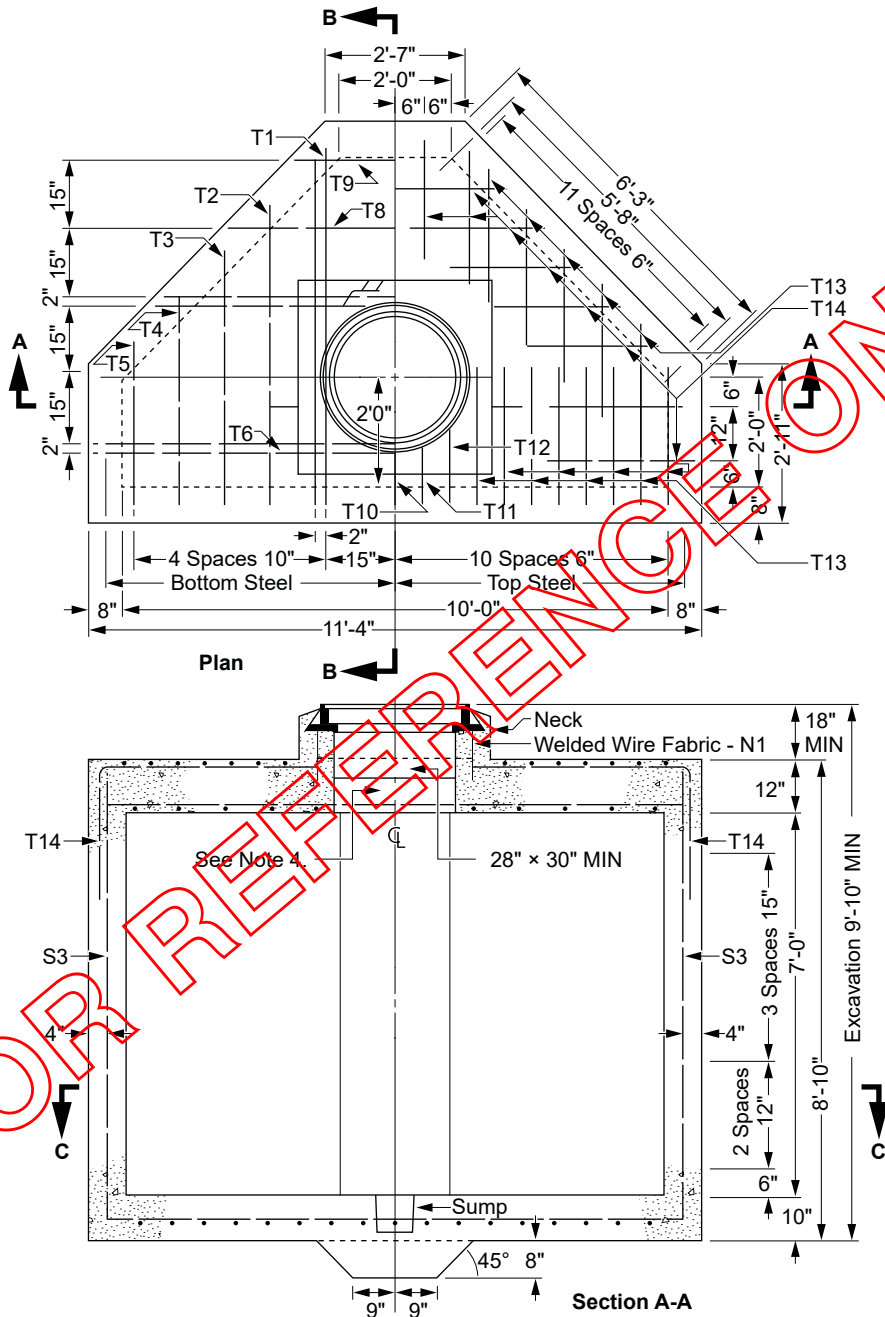


Figure MH 340-1.1: Plan and Section A-A

Approved by:

PHH

6' x 10' x 7' Manhole — Traffic — Heavy Loading

MH 340

Sheet 1 of 3

Effective Date:
10-29-2004

What's Changed?

UGS

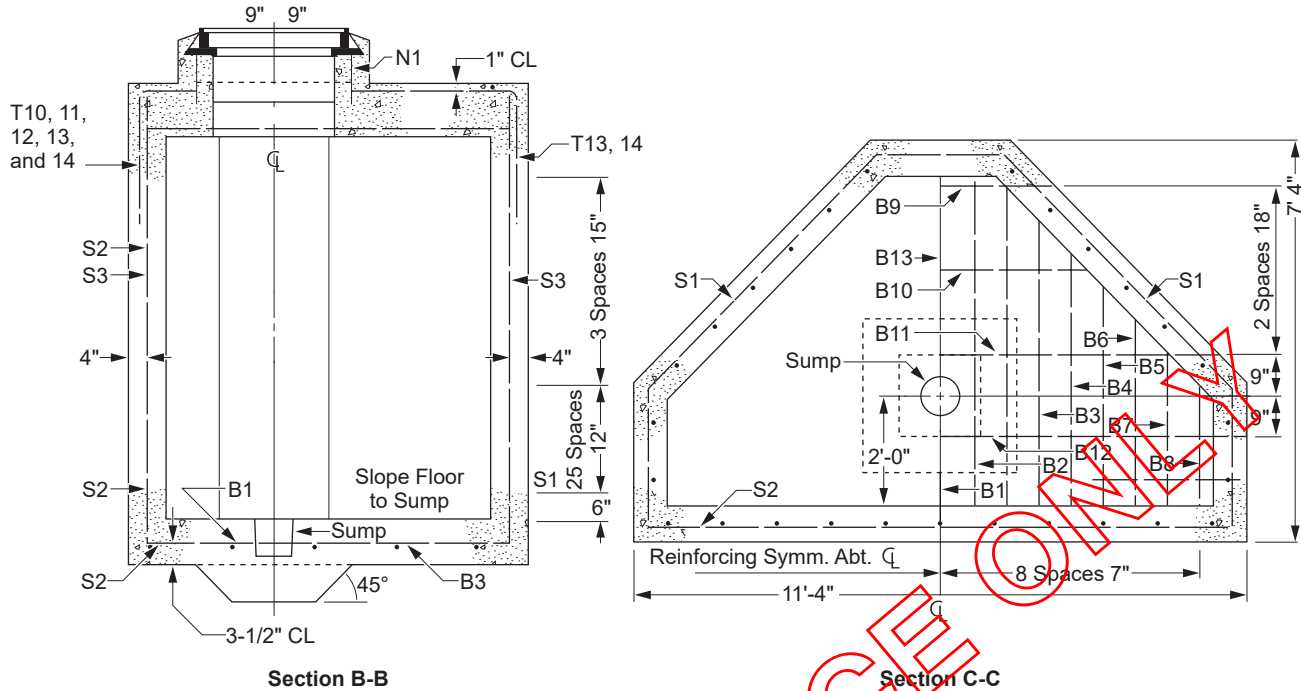


Figure MH 340-1.2: Section B-B and Section C-C

Note(s):

1. See MH 300 (page MH-1) for reference drawing giving installation details, schedules, and general requirements for structures and accessories.
2. For total quantities of steel, castings, and related foundry items, see Summary Sheet for each set of working drawings.
3. See working drawings for additional neck, conduit bank, and so on.
4. See MH 350.

Table MH 340-1: List of Materials — 6' x 10' x 7' Manhole — Traffic — Heavy Loading

Quantity	Description
1 Only	26 Manhole Casting
3.8 Cu. Yds.	Concrete
As Detailed	Pull Eyes

MH 340

6' x 10' x 7' Manhole — Traffic — Heavy Loading

Approved by:

PHH

Sheet 2 of 3






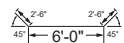
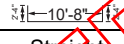
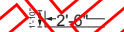
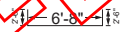
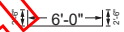
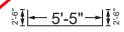
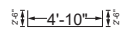
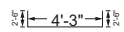
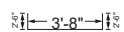
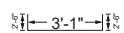
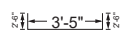
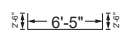
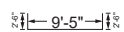
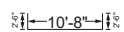
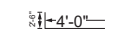
What's Changed?

Effective Date:

UGS

10-29-2004

Table MH 340-2: Reinforcing Schedule 6' x 10' x 7' Manhole — Traffic — Heavy Loading

Mark	Quantity	Type	Size	Total Length	Wt. Lbs.
T1	4	Straight	5/8" Dia.	6'-4"	26.4
T2	2	Straight	5/8" Dia.	5'-6"	11.5
T3	2	Straight	5/8" Dia.	4'-3"	3.7
T4	2	Straight	5/8" Dia.	3'-10"	8.0
T5	2	Straight	5/8" Dia.	3'-0"	6.3
T6	2	Straight	1/2" Dia.	10'-8"	14.3
T7	2	Straight	1/2" Dia.	8'-4"	11.1
T8	1	Straight	1/2" Dia.	5'-6"	3.7
T9	1	Straight	1/2" Dia.	3'-2"	2.1
T10	1		1/2" Dia.	3'-6"	2.4
T11	2		3/4" Dia.	4'-2"	12.5
T12	2		1/2" Dia.	4'-0"	5.4
T13	18		3/4" Dia.	5'-6"	148.8
T14	26		1/2" Dia.	5'-0"	85.6
N1	1	Welded Wire Fabric 12 G.A. — 2" x 2" Mesh (Min.) 4' x 13' Normal			4.7
S1	12		1/2" Dia.	10'-8"	85.5
S2	7		1/2" Dia.	15'-4"	71.5
S3	29	Straight	1/2" Dia.	8'-1"	152.0
B1	1		1/2" Dia.	4'-4"	2.9
B2	4		1/2" Dia.	11'-8"	31.2
B3	2		1/2" Dia.	11'-0"	14.7
B4	2		1/2" Dia.	10'-5"	13.2
B5	2		1/2" Dia.	9'-10"	13.1
B6	2		1/2" Dia.	9'-3"	12.4
B7	2		1/2" Dia.	8'-8"	11.6
B8	2		1/2" Dia.	8'-1"	10.7
B9	1		1/2" Dia.	8'-5"	5.6
B10	1		1/2" Dia.	11'-5"	7.6
B11	1		1/2" Dia.	14'-5"	9.6
B12	1		1/2" Dia.	15'-8"	10.5
B13	1		1/2" Dia.	6'-6"	4.6

Note(s):

- 23.12 Cu. Yds. Excavation
- 820.9 Lbs. Reinforcing Steel

Approved by:

PhH

6' x 10' x 7' Manhole — Traffic — Heavy Loading

MH 340

Sheet 3 of 3

Effective Date:
10-29-2004

What's Changed?

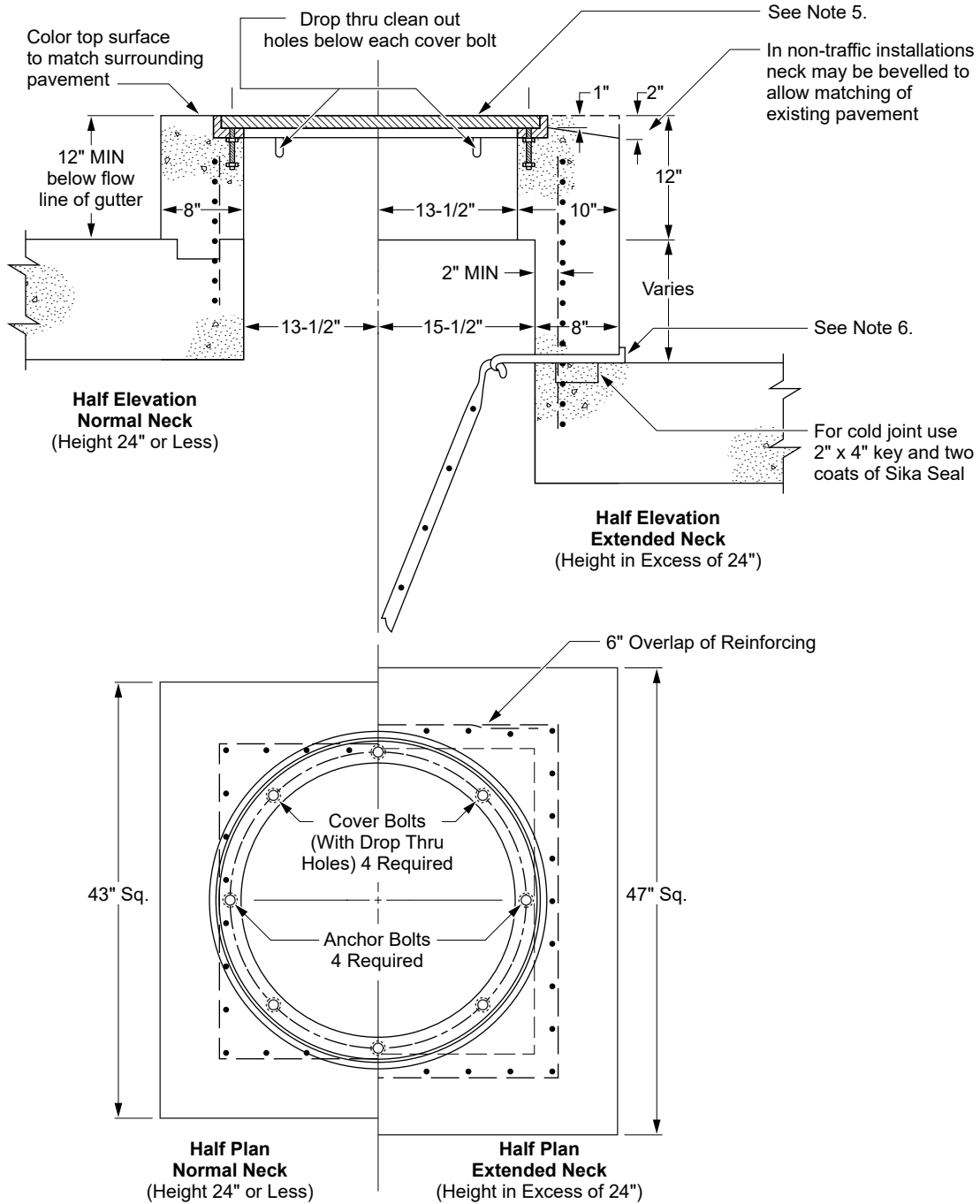
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MH 350 Manhole Neck Details — 27" Opening

Scope MH 350.1 Manhole Neck Details — 27" Opening

Figure MH 350-1: Manhole Neck Details — 27" Opening



Note(s):

1. Reinforcing: No. 3 rebar on 12" centers or 4 x 4-10/10 WWF minimum concrete coverage will be 2".
2. Concrete: per [GI 020](#).

Approved by:

PHH

Manhole Neck Details — 27" Opening

MH 350

Sheet 1 of 2

Effective Date:
10-29-2004

What's Changed?

UGS

3. Approved variations may be allowed precasters to accommodate manufacturing processes.
4. Use 30" round opening if specified on substructure drawing.
5. See [FC 620](#) for manhole cover.
6. See [AC 740](#) for ladder installation.

MH 350

Manhole Neck Details — 27" Opening

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

10-29-2004

UGS

Vaults

Table of Contents

Standard	Title
VA 400	Vault Requirements
VA 400.1	Vault Requirements
VA 410	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High
VA 410.1	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High
VA 410.2	Precast Tub-Type Vaults
VA 410.3	Precast Tub-Type Vaults with Cover Restraints
VA 411	Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High
VA 411.1	Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High
VA 411.2	Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High with Cover Restraint
VA 430	Vault — Traffic Loading — 4' x 8' x 7'
VA 430.1	Vault — Traffic Loading — 4' x 8' x 7' — Roof
VA 430.2	Vault — Traffic Loading — 4' x 8' x 7' — Walls
VA 430.3	Vault — Traffic Loading — 4' x 8' x 7' — Floor
VA 432	6' x 8' x 7' Vault — Traffic — Normal Loading
VA 432.1	6' x 8' x 7' Vault — Traffic — Normal Loading
VA 434	6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading
VA 434.1	6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading
VA 436	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"
VA 436.1	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Roof
VA 436.2	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Walls
VA 436.3	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Floor
VA 438	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"
VA 438.1	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof
VA 438.2	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Sides
VA 438.3	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Floor

Approved by:	Vaults Table of Contents	VA
Effective Date:	04-24-2020	Sheet i
		UGS

Standard	Title
VA 440	Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4"
VA 440.1	Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof
VA 440.2	Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Walls
VA 440.3	Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Floor
VA 442	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4"
VA 442.1	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Roof
VA 442.2	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Walls
VA 442.3	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Floor
VA 444	8' x 22' x 12' Vault — Traffic — Normal Loading
VA 444.1	8' x 22' x 12' Vault — Traffic — Normal Loading
VA 446	5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading
VA 446.1	5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading
VA 446.2	Alternate Roof Plan for VA 446 (Not Optional)
VA 448	Vault — Traffic Loading — 8' x 24' x 9'-4"
VA 448.1	Vault — Traffic Loading — 8' x 24' x 9'-4" — Roof
VA 448.2	Vault — Traffic Loading — 8' x 24' x 9'-4" — Floor
VA 448.3	Vault — Traffic Loading — 8' x 24' x 9'-4" — Walls
VA 450	Vault (Traffic) — 8' x 26' x 9'-4"
VA 450.1	Vault (Traffic) — 8' x 26' x 9'-4"
VA 460	5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 460.1	5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 462	5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 462.1	5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 464	5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 464.1	5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading
VA 466	8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading
VA 466.1	8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading
VA 470	Neck Vault Details
VA 470.1	Neck Vault Details

VA	Vaults	Approved by:
	Table of Contents	<i>RR</i>
Sheet ii		Effective Date:
UGS		04-24-2020

VA 400 Vault Requirements

Scope VA 400.1 Vault Requirements

1.0 General

- 1.1 Vaults that have acceptable precast counterparts are shown on the working drawings (List of Materials [LOM]) by item number and the types of vaults approved for each item number are listed on [Table VA 400–1 \(Sheet 2\)](#). Other vaults are listed by drawing number. Unless otherwise noted on the working drawings, any of the structures covered by a particular item number are acceptable.
- 1.2 All vault installations will be watertight. Standard manhole cover/frame size is 30 inches. Manhole cover is to be cast-iron for traffic loading, and RPM for parkway loading. Manhole entry covers will be bolted closed and any lift holes sealed. All 4' x 5' vault covers must be 8-inches thick. Vault covers must be replaceable without removal of vault necks.

2.0 Poured Vaults

Each vault will include accessories and facilities in conformance with the requirements set forth in the drawings, specifications, schedules, and tabulations referred to below:

- 2.1 Concrete and reinforcement as shown on structure drawings and in conformance with [GI 020](#);
- 2.2 Open cover as shown on the structure drawing or as modified on the working drawing (shown on the LOM);
- 2.3 Conduit entrance [CD 130](#)
- 2.4 Inserts [AC 720](#)
[AC 722](#)
[AC 725](#)
- 2.5 Sump [AC 710](#)
[AC 711](#)
- 2.6 Ground rods and wire [AC 700](#)
- 2.7 Ladder [AC 742](#)
- 2.8 Vents As detailed on working drawings
- 2.9 Neck [VA 470](#)

3.0 Precast Vaults

Each precast vault will be manufactured in conformance with the requirements as referred to below.

- 3.1 Vaults will be manufactured and installed to the requirements as set forth in [GI 030](#).

Approved by:	Vault Requirements	VA 400
Effective Date:	What's Changed?	Sheet 1 of 3
04-24-2020		UGS

- 3.2 Each vault will include accessories and facilities as required in poured vaults. (Some small construction variations have been allowed the precast concrete manufacturers.)
- 3.3 Vaults will be placed on a 6-inch (minimum) thickness of mechanically compacted crushed aggregate base (3/4" maximum).
- 3.4 All walls and ceilings are to be painted white.
- 3.5 Maximum placement depth is 4 feet, measured from grade to top outside surface of vault and under conditions assumed in [GI 030](#). Contact Division Underground Planning Supervisor if greater depth is required.
- 3.6 Flat wall conduit terminator entrances on end walls are standard. Side wall conduit terminators will only be furnished when specified on the working drawing.
- 3.7 See [Table VA 400–1 \(Sheet 2\)](#) for approved precast concrete vault manufacturers.
- 3.8 Vaults will be supplied with four (4) ground bus support per [AC 731](#).

Table VA 400–1: Vault Requirements

Item Number	Nominal Size (Inside)	Type	Manufacturers' Numbers		SAP
			Jensen Precast ^{a/}	Oldcastle Infrastructure	
V510	5' x 10'-6" x 7'	TUB Style	K5106-FV84-11	ED 5106-84VT	10117550
V510I	5' x 10'-6" x 7'	Intercept	K5106-FV84-11-INT	ED 5106-84VT-INT	10117575
V612	6' x 12' x 7'	TUB Style	K612-FV84-11	ED 612-84VLT	10117286
V612I	6' x 12' x 7'	Intercept	K612-FV84-11-INT	ED 612-84VLT-INT	10117576
V714	7' x 14' x 8'	TUB Style	K714-FV96-11	ED 714-96VLT	10117551
V714I	7' x 14' x 8'	Intercept	K714-FV96-11-INT	ED 714-96VLT-INT	10117577
V718A	7' x 18' x 8' Type 1	TUB Style	K718-FV96-11	ED 718-96DV-Type 1	10117552
V718AI	7' x 18' x 8' Type 1	Intercept	K718-FV96-11-INT	ED 718-96DV-INT-Type 1	10117578
V718B	7' x 18' x 8' Type 2	TUB Style	–	ED 718-96DV-Type 2	10117553
V718BI	7' x 18' x 8' Type 2	Intercept	–	ED 718-96DV-INT-Type 2	10117579
V716	7' x 16' x 8'	Tunnel Style	K78-TV16-11	ED 78-16-Tunnel	10117554
V720	7' x 20' x 8'	Tunnel Style	K78-TV20-11	ED 78-20-Tunnel	10117555
V724	7' x 24' x 8'	Tunnel Style	K78-TV24-11	ED 78-24-Tunnel	10117556
V816	8' x 16' x 9'-4" (or 9'-6")	This vault is available in other lengths. See VA 410 .	K816-FV114-11	ED 816-114TV	10117557
V820	8' x 20' x 9'-4" (or 9'-6")	This vault is available in other lengths. See VA 410 .	K820-FV112-11	ED 820-114TV	10117558
V1025	10' x 25' x 12'	Panel Style	Special Order	ED 1025-144 Panel-VT	10117559

^{a/} Jensen Precast (formerly Brooks Products, Inc.)

= For Reference Only


VA 400	Vault Requirements	Approved by: 
Sheet 2 of 3	What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.	Effective Date: 04-24-2020
UGS		

Table VA 400–2: Vault Grade Rings

Item Number	Extension Height	Manufacturers' Numbers		SAP
		Jensen Precast ^{a/}	Oldcastle Infrastructure	
VX-1	6 inch	VN45-R6	ED-45-06-GR	10117560
VX-2	12 inch	VN45-R12	ED-45-12-GR	10117561

^{a/} Jensen Precast (formerly Brooks Products Inc.)

Approved by:

RR

Vault Requirements

VA 400

Sheet 3 of 3

Effective Date:
04-24-2020

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

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VA 410 Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High

Scope VA 410.1 Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High

Figure VA 410-1: Precast Vertical Section Vault

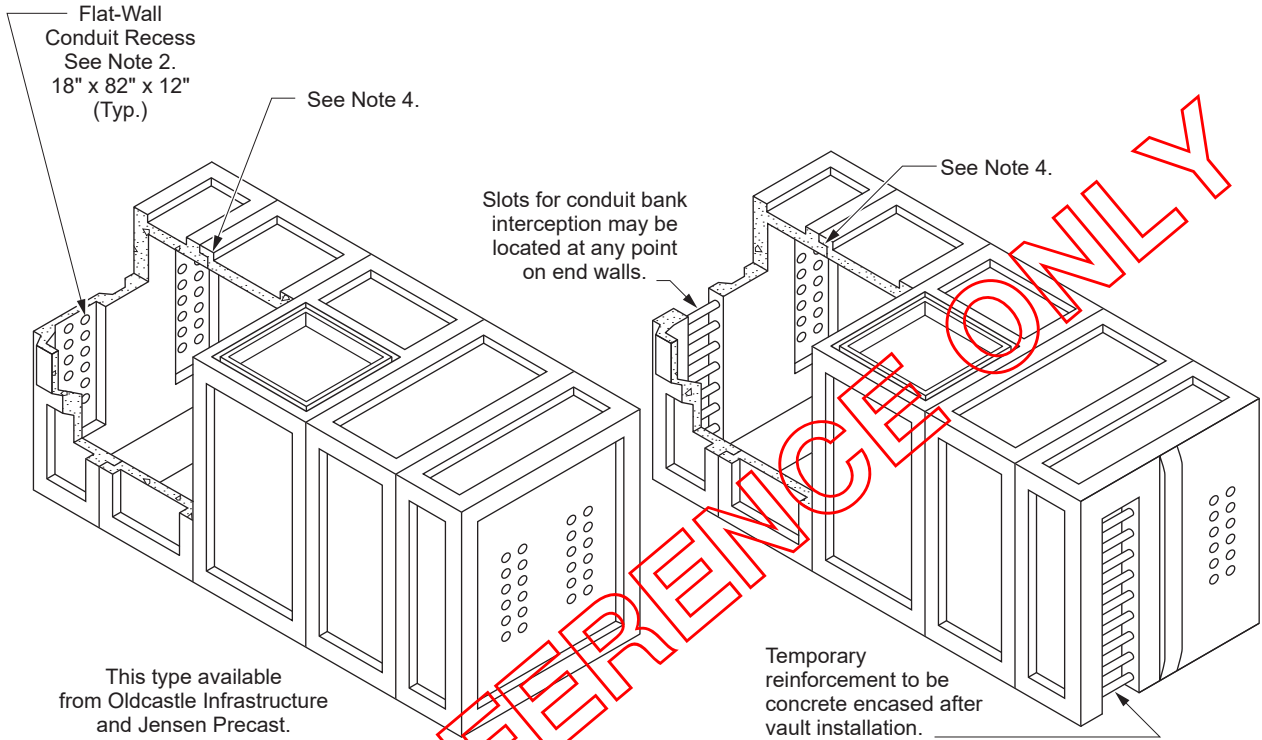


Figure VA 410-1.1: Intercept Type

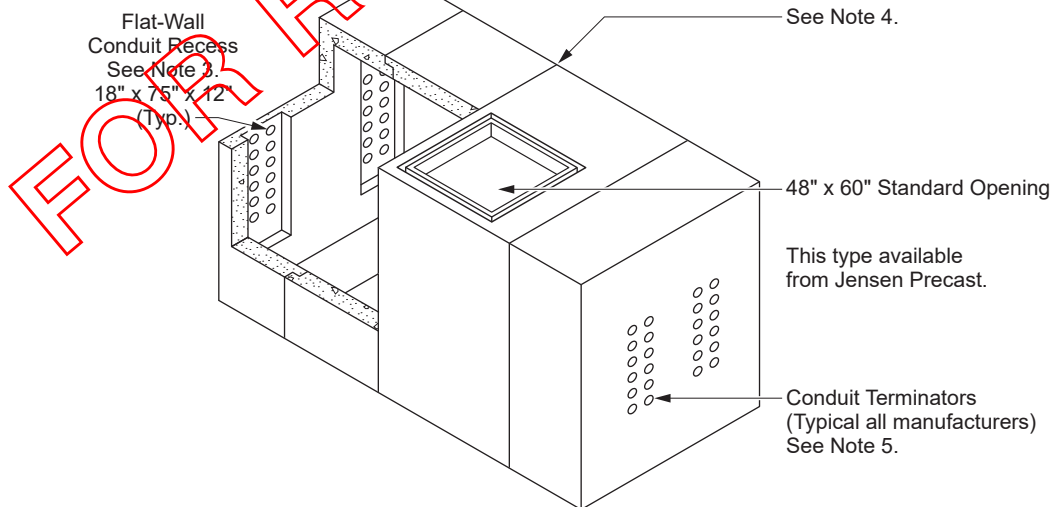



Figure VA 410-1.2: Standard Type

Approved by: 	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High	VA 410 Sheet 1 of 8
Effective Date: 04-24-2020	What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure in Figure VA 410-1.1.	UGS ▶ SCE Public ◀

Note(s):

1. Intercept type only: concrete floor 9" thickness poured in place.
2. Standard type only: 2 flat-wall recesses each end standard. Alternative configuration; 4 flat-wall recesses (2 on both sides) either or both ends. Flat-wall conduit recesses are standard. Deep recesses will only be furnished when specified on the working drawing.
3. See [CD 141](#) for layout.
4. Approved joint sealer. See [GI 030](#).
5. See [CD 142](#).

1.0 Concrete

Concrete to have a minimum 28-day strength of 3,000 psi.

2.0 Reinforcement

Designed for H-20 traffic loading (see [GI 030](#)).

3.0 Installation

Intercept vault floor to be poured after precast installation. Floor will slope toward standard size sump under opening (no trough required). Seal all cold joints with Sika Seal or other specified material. Standard vault to be placed on 6" (minimum) dry mechanically compacted rock (3/4" minimum – 1-1/4" maximum) to ensure uniform distribution of soil pressure on floor. Vault to be set with 1/2" slope per 8' of width toward sump side. Set vault level end-to-end (lengthwise). See [GI 030](#) for additional information.

4.0 Excavation Size (Minimum)

Varies with each manufacturer. Consult manufacturer's installation guides for exact dimensions for each vault size.

5.0 Weight

Section weights vary between manufacturers. Each section is generally between 10,000 pounds and 26,000 pounds. Consult manufacturer's specifications for exact values.

6.0 Length

By combining various sections, vault lengths of 14', 16', 18', 20', 22', 24', 26', 30', and others may be obtained.

7.0 UGS Reference Drawings

- | | |
|---------------------------------|---|
| 1. GI 035 | Allowable Tolerances for Installed Precast Vaults |
| 2. FC 660 | Vault Cover — Precast Concrete, 48" x 60" |
| 3. CD 130 | 141 and 142 Recesses for Conduit Entrance |
| 4. AC 725 | Inserts: Type, Location, and Quantity |
| 5. AC 711 | Sump Drain and Detail |
| 6. AC 700 | Ground Rods and Ground Wires |
| 7. AC 751 | Vent Locations |
| 8. AC 740 | Ladder |
| 9. VA 470 | Vault Neck, Poured or Precast |

Note(s):

1. Conduit recesses to be generally as shown on [CD 130](#), [CD 141](#), and [CD 142](#). Standard conduit recesses will be a flatwall design. Deep recesses will only be furnished when specified on the working drawing. Slight variations by manufacturers may be allowed with Company approval.

VA 410

Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High

Approved by:

RR

Sheet 2 of 8

What's Changed?


Effective Date:

04-24-2020

UGS

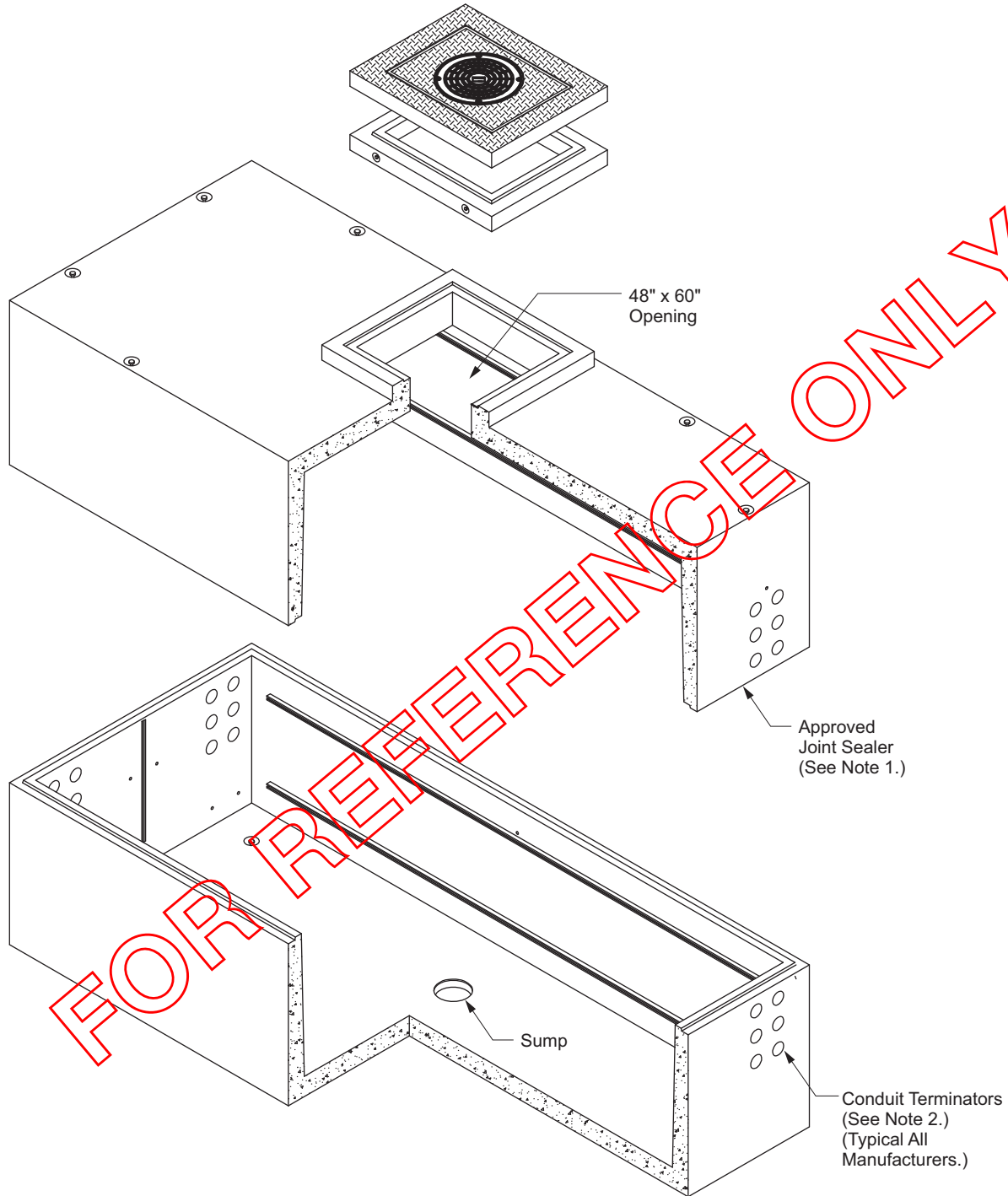
2. Vertical stack-up vaults will be furnished with a 5/8" (minimum) copper-clad steel grounding bar, and blind ground-rod hole in every end section.
3. Tunnel-type vaults will be furnished with 1/2" ground bus inserts, and 1/2" bronze grounding inserts, as shown on VA 411.
4. Threaded bronze grounding inserts will have a #2 solid hard-drawn copper wire permanently brazed to the insert and to the structure rebar. Variations in insert design may be allowed to the precasters, with SCE Company approval.
5. All vent locations to be furnished with 10" plastic vent terminators.
6. Inside walls and ceiling to be painted white.

FOR REFERENCE ONLY

Approved by: 	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High	VA 410
Effective Date: 04-24-2020	What's Changed?	Sheet 3 of 8 UGS

Scope VA 410.2 Precast Tub-Type Vaults

Figure VA 410-2: Precast Tub-Type Vaults



FOR REFERENCE ONLY

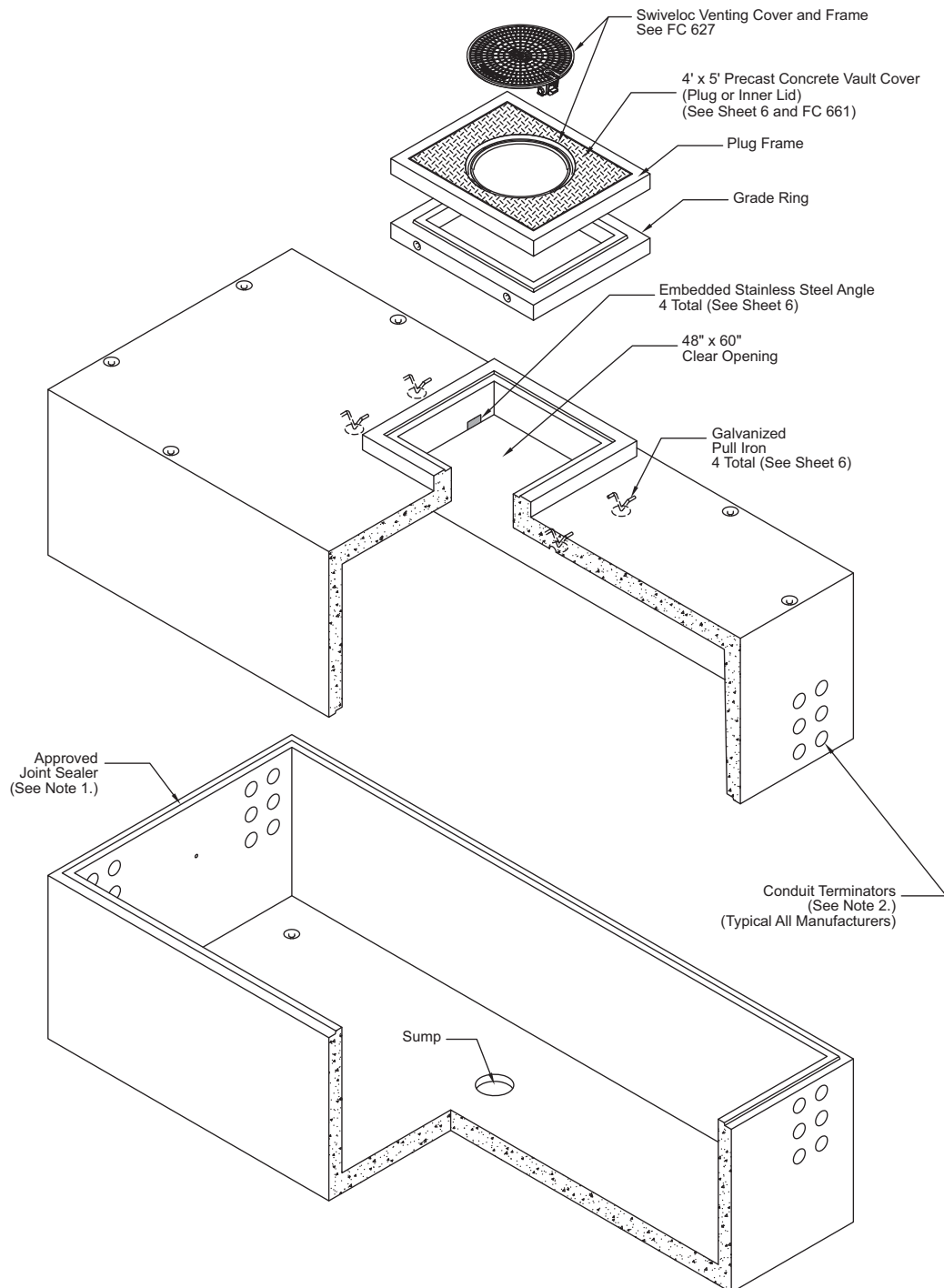
Note(s):

- 1. See [GI 030](#).
- 2. See [CD 142](#).

VA 410	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High	Approved by: <i>RR</i>
Sheet 4 of 8	What's Changed?	Effective Date: 04-24-2020
UGS		

Scope VA 410.3 Precast Tub-Type Vaults with Cover Restraints

Figure VA 410-3: Precast Tub-Type Vaults with Cover Restraints



Note(s):

1. See [GI 030](#)
2. See [CD 142](#)

Approved by:

RR

Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High

Effective Date:

04-24-2020

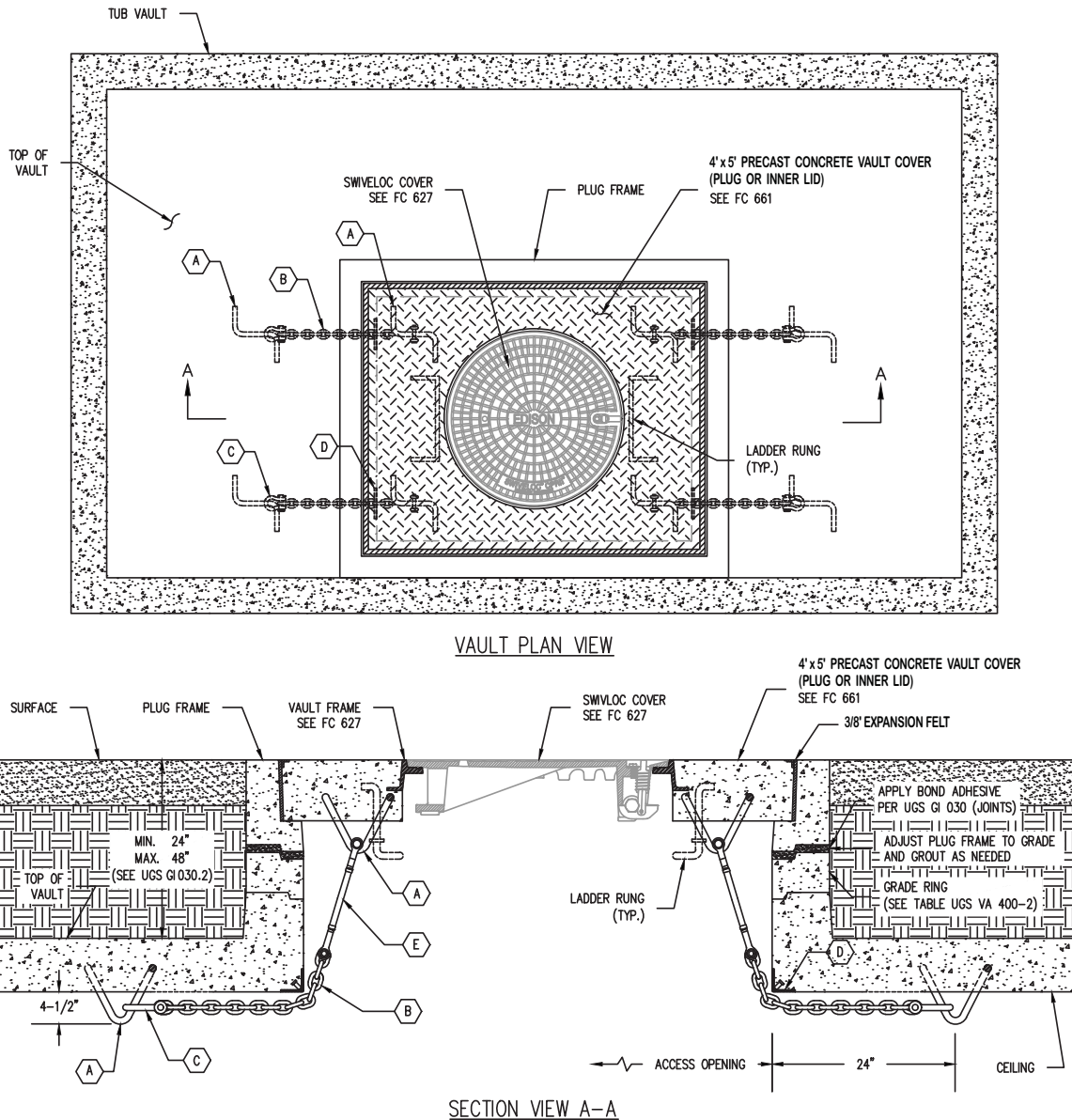
What's Changed?

VA 410

Sheet 5 of 8

UGS

Figure VA 410-4: Precast Tub-Type Vaults with Cover Restraints – Plan and Section View



Note(s):

1. See [Scope VA 410.4 \(Sheet 7\)](#) for general notes and key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days to determine if the cover(s) and restraints can be reused or will require replacement.

VA 410

Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High

Approved by:

RR

Sheet 6 of 8

What's Changed?

Effective Date:

UGS

04-24-2020

Scope VA 410.4 General and Key Notes

General Note(s):

1. All Restraints shall be installed taut with no slack in any of the components (turnbuckle, chain, shackle, etc.). Chains shall be in their normal position and not be twisted while making taut.

Table VA 410–1: Precast Tub-Type Vaults – Restraint Assembly Kit

Key Notes: Restraint Assembly Kit for Vaults			
Item	Description	SAP Number	Oty
A	7/8" Ø Galv. Pull Iron.	—	8
B	1/2" Ø Galv. Chain, Grade 30 (Field Cut)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Pin w/ Cotter Pins (Min. 3.5 ton WLL)	10209811	4
D	Embedded Stainless Steel Angle L3 x 3 x 1 / 4–6" Long	—	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pins) Turnbuckle (Min. 2.6 ton WLL)	10209813	4

Approved by:	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High	VA 410
Effective Date:	What's Changed?	Sheet 7 of 8
04-24-2020		UGS

1.0 Excavation Size:


Consult manufacturer's installation guides for exact excavation dimensions for each structure size.

2.0 UGS Reference:

[GI 030](#) General Specification for Precast Structures
[GI 035](#) Allowable Tolerances for Installed Precast Structures
[VA 470](#) Vault Neck, Poured or Precast
[FC 661](#) 4' x 5' Precast Concrete Vault Cover
[AC 711](#) Sump Drain and Detail
[AC 725](#) Inserts: Type, Location, and Quantity
[AC 742](#) Ladder
[AC 751](#) Vent Locations

Note(s):

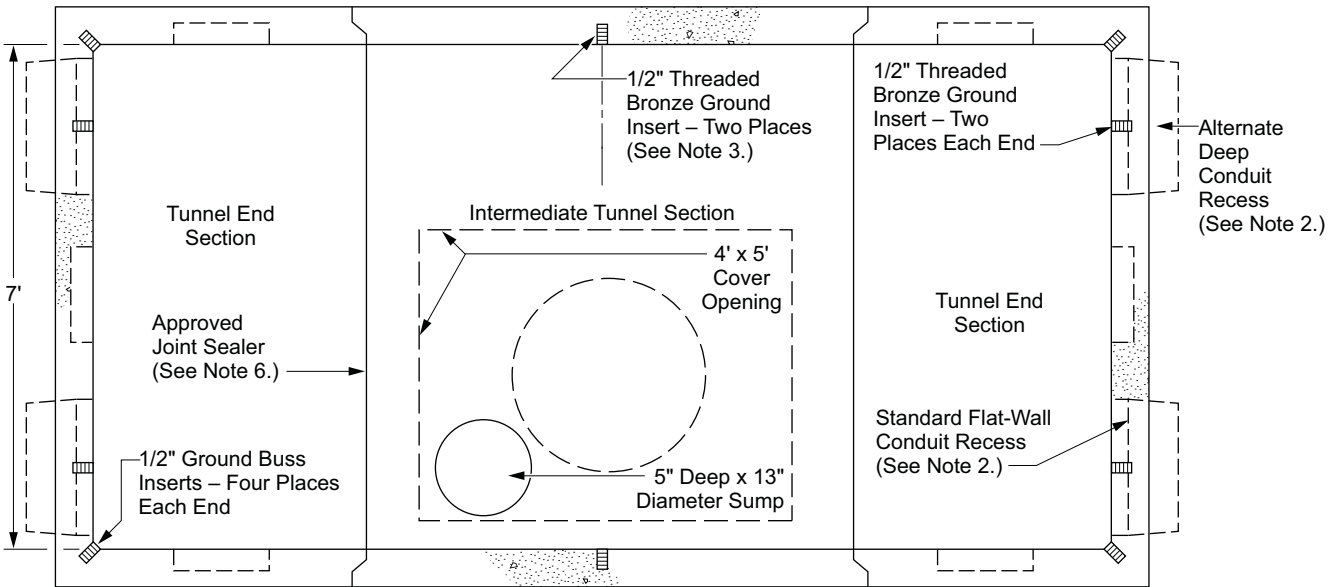
1. Conduit terminators to be generally located as shown on [CD 142](#). Standard conduit entrance will be a flatwall design. Slight variations by manufacturers may be allowable with Company approval.
2. Tub-type structures will be furnished with 1/2" threaded bronze grounding inserts, as shown on [VA 411](#).
3. All vent locations to be furnished with 10" plastic vent terminators.
4. Inside walls and ceiling to be painted white.

VA 410 Sheet 8 of 8 UGS	Precast Vertical Section Vault — 8' Wide x Variable Lengths (14' Minimum) x 9'-4" or 9'-6" High	Approved by: 
	What's Changed?	Effective Date: 04-24-2020

VA 411 Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

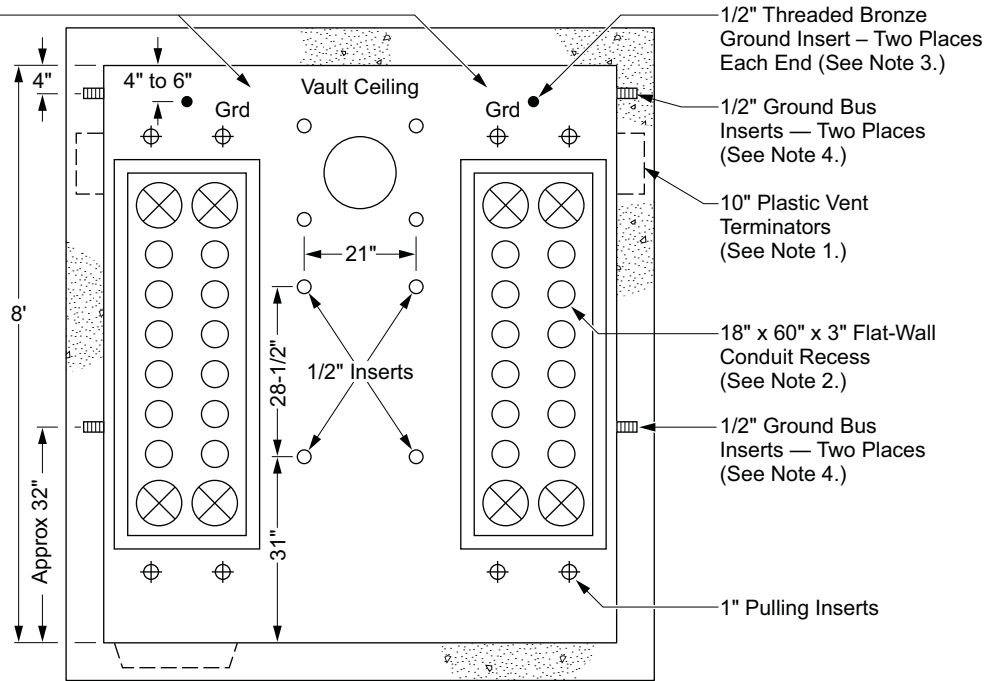
Scope VA 411.1 Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Figure VA 411-1: Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High



Ground Insert Marking (See Note 3.)

Plan View



End View

Note(s):

1. Three 10" plastic vent terminators are required in each end section.
2. Both end sections will have as a standard two flat-wall conduit recesses, 18" wide, 50" high, and 3" deep. Alternate deep recesses will be furnished only when specified on the working drawing. See CD 141 for additional information.

Approved by:

ajf

Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Effective Date:

04-27-2018

What's Changed?

VA 411

Sheet 1 of 6

UGS

3. Each end and intermediate section will have two cast-in 1/2" threaded bronze grounding inserts, placed 4" minimum, to 6" maximum down from the ceiling, positioned as shown in the drawings. Abbreviations "GRD" will be stenciled in red letters a minimum of 1-1/2 high, adjacent to each grounding insert. See Note 8 for additional details.
4. Each end section will have four 1/2" ground buss inserts as shown on the drawing. Four "J" bolts (AC 731) will be furnished, installed in the top inserts.
5. With SCE Company approval, small variations in design may be allowed precasters in order to accommodate individual methods of manufacturing.
6. See GI 030 for additional information.
7. Inside walls and ceiling to be painted white.
8. Threaded bronze grounding inserts will have a #2 solid hard-drawn copper wire, permanently brazed to the insert and to the structure rebar. Variations in insert design may be allowed to the precasters, with SCE Company approval.

1.0 Concrete

Concrete to have a minimum 28-day strength of 3,000 psi.

2.0 Reinforcement

Designed for H-20 traffic loading (see UGS-30).

3.0 Installation

Standard vault to be placed on 6" (minimum) dry mechanically compacted rock (3/4" minimum 1-1/2" maximum) to insure uniform distribution of soil pressure on floor. Vault to be set with 1/2" slope per 7' of width toward pump side. Set vault level end to end (lengthwise). See GI 030 for additional information.

4.0 Excavation Size (Minimum)

Varies with each manufacturer. Consult manufacturer's installation guides for exact dimensions for each vault size.

5.0 Weight

Section weights vary between manufacturers. Each section is generally between 10,000 pounds and 26,000 pounds. Consult manufacturer's specifications for exact values.

6.0 Length

By combining various sections, vault lengths of 14', 18', and 22' may be obtained.

7.0 UGS Reference Drawings

- GI 035 Allowable Tolerances for Installed Precast Vaults
- VA 470 Vault Neck, Poured or Precast
- FC 661 4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame
- AC 700 Ground Wires
- AC 711 Sump Drain and Detail
- AC 725 Inserts: Type, Location, and Quantity
- AC 742 Ladder

VA 411

Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Approved by:



Sheet 2 of 6

What's Changed?

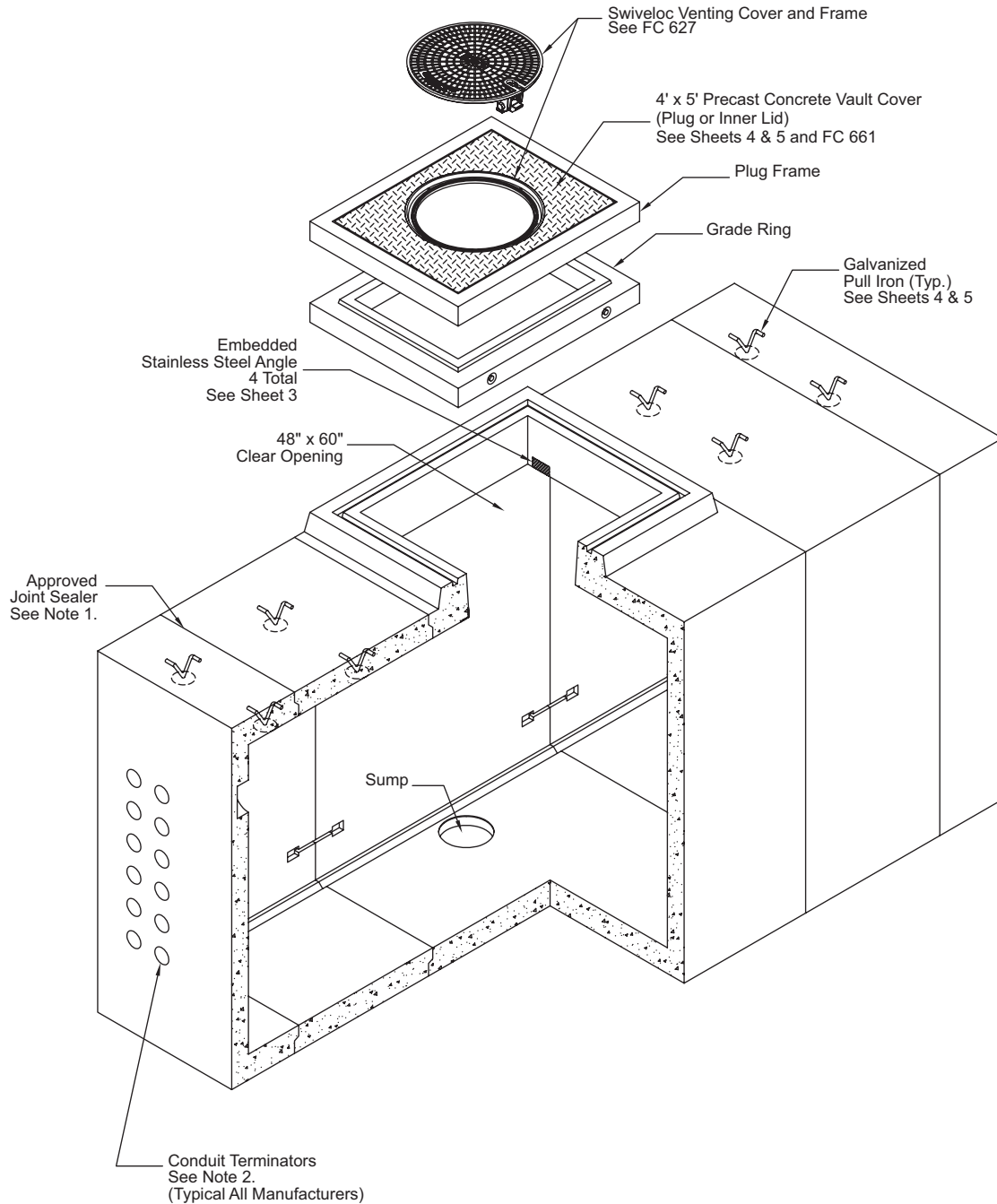
Effective Date:

04-27-2018

UGS

Scope VA 411.2 Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High with Cover Restraint

Figure VA 411-2: Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High with Cover Restraint



- Note(s):**
1. See [GI 030](#)
 2. See [CD 142](#)

Approved by:

ajj

Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Effective Date:
04-27-2018

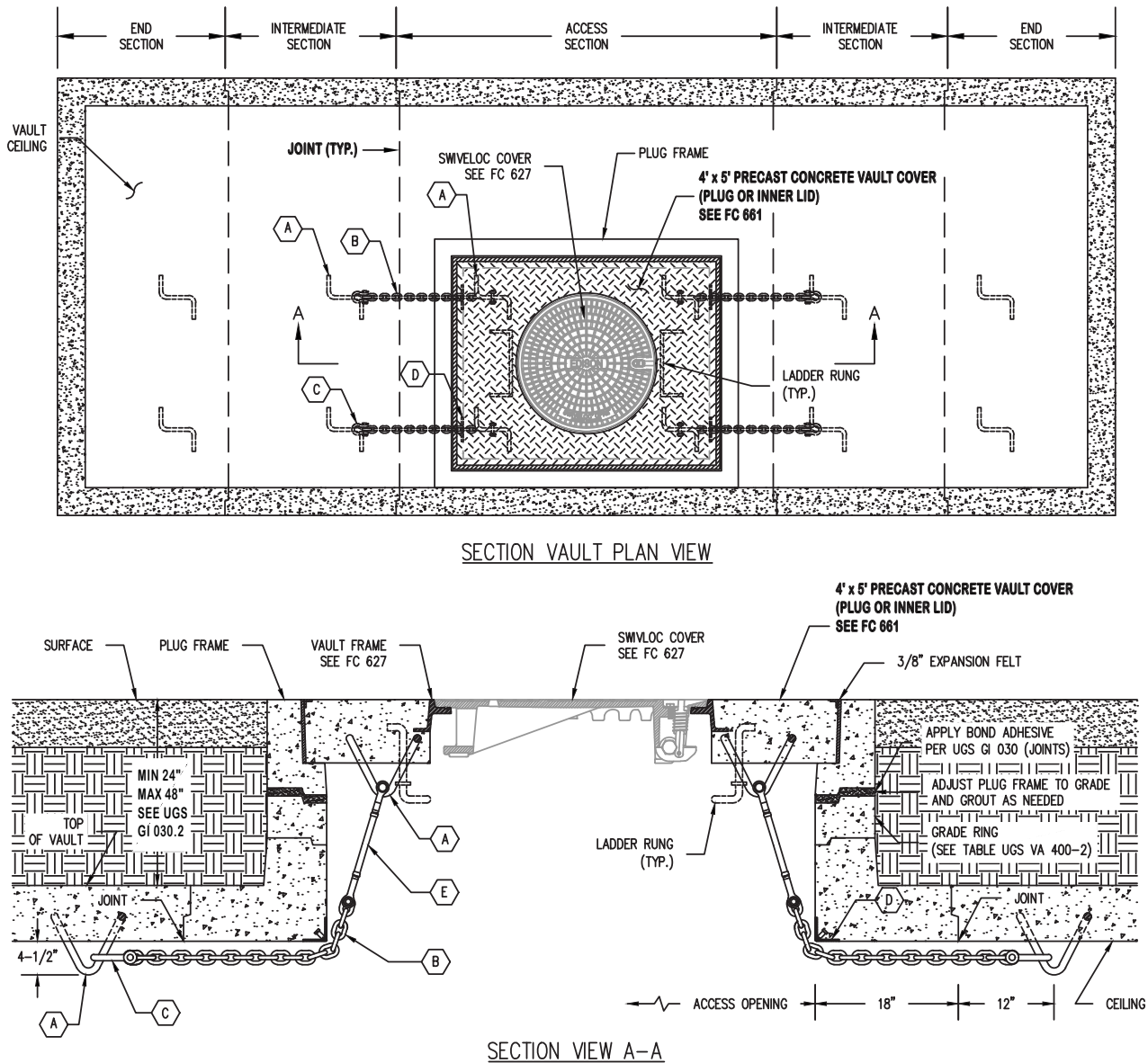
What's Changed? Figure VA 411-2 was updated.

VA 411

Sheet 3 of 6

UGS

Figure VA 411-3: Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High with Cover Restraint-Plan and Section View



Note(s):

1. See Scope VA 411.3 Sheet 6 for General and Key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the cover(s) and restraints can be reused or will require replacement.

VA 411

Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Approved by:

ajf

Sheet 4 of 6

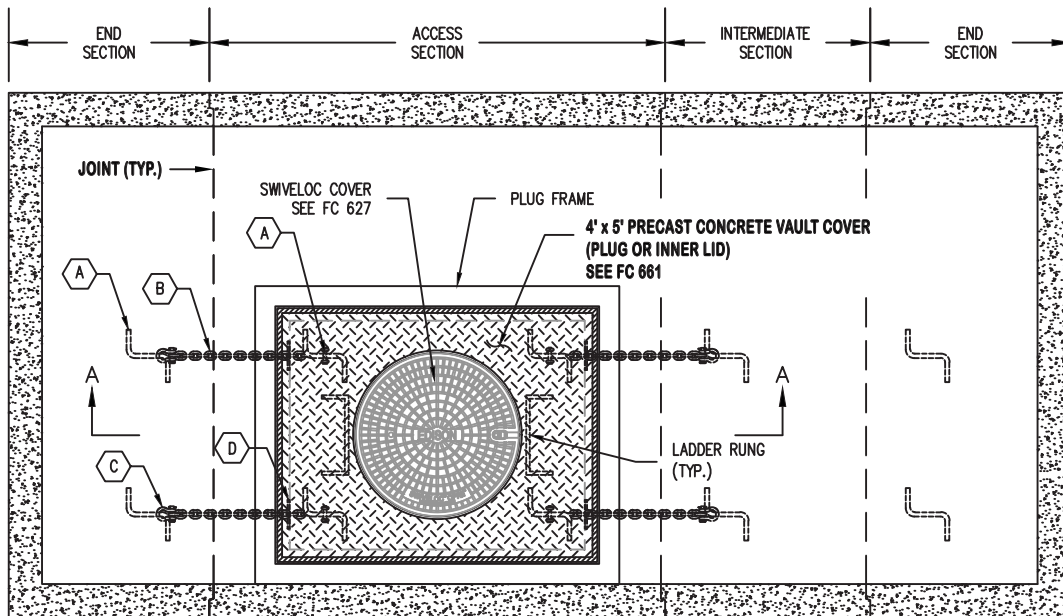
What's Changed? Figure VA 411-3 was updated with reference to UGS GI 030.2 in section view.

Effective Date:

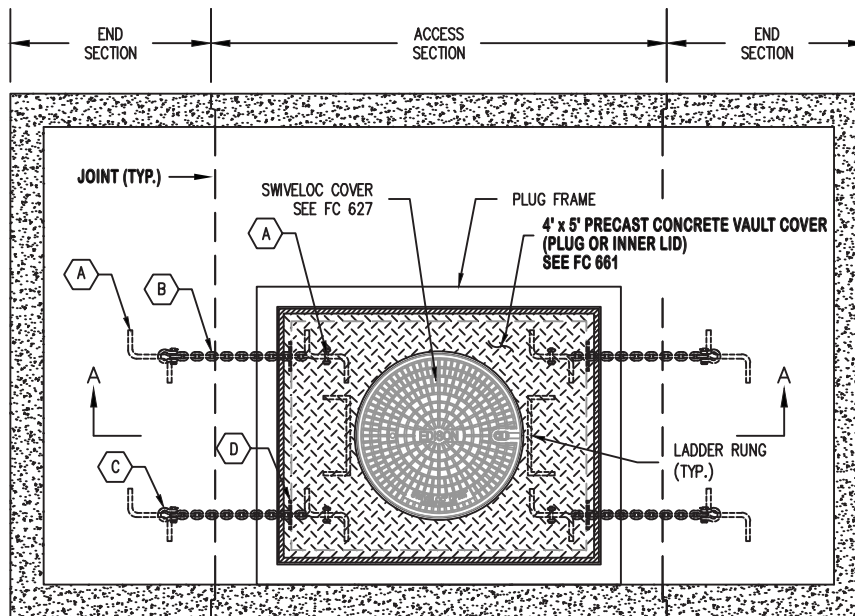
04-27-2018

UGS

Figure VA 411-4: Precast Vertical Section Vault – Restraint Installation Details



SECTION VAULT PLAN VIEW



SECTION VAULT PLAN VIEW

Note(s):

1. See Scope VA 411.3 Sheet 6 for General and Key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the cover(s) and restraints can be reused or will require replacement.

Approved by:

ajf

Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Effective Date:

04-27-2018

What's Changed?

VA 411

Sheet 5 of 6

UGS

Scope VA 411.3 General and Key Notes

General Note(s):

1. All Restraints shall be installed taut with no slack in any of the components (turnbuckle, chain, shackle, etc.). Chains shall be in their normal position and not be twisted while making taut.

Table VA 411-1: Precast Tub-Type Vaults – Restraint Assembly Kit

Key Notes: Restraint Assembly Kit for Vaults			
Item	Description	SAP Number	Oty
A	7/8" Ø Galv. Pull Iron.	—	Varies
B	1/2" Ø Galv. Chain, Grade 30 (Field Cut)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Pin w/ Cotter Pins (Min. 3.5 ton WLL)	10209811	4
D	Embedded Stainless Steel Angle L3 x 3 x 1 / 4-6" Long	—	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pins) Turnbuckle (Min. 2.6 ton WLL)	10209813	4

VA 411

Precast Vertical Section Vault — 7' Wide x Variable Lengths (10' Minimum) x 8' High

Approved by:

ajf

Sheet 6 of 6

What's Changed? Table VA 411-1 was updated with new quantities for each kit item.

Effective Date:

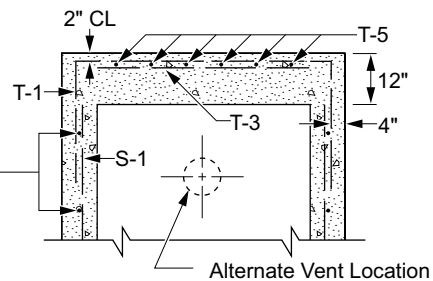
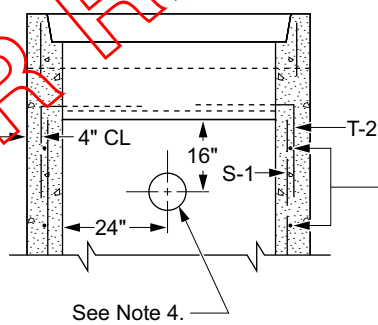
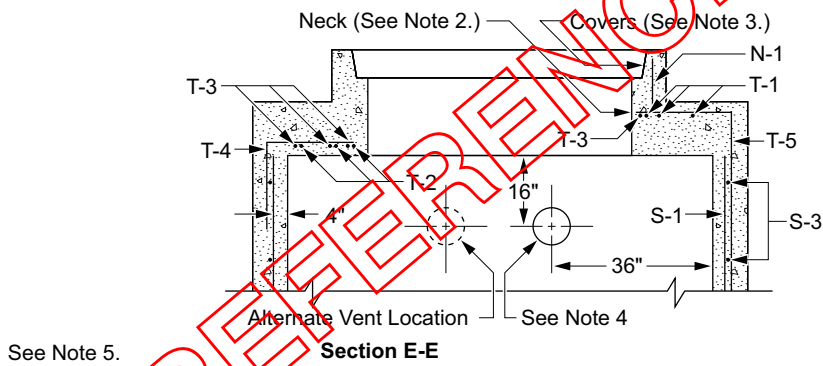
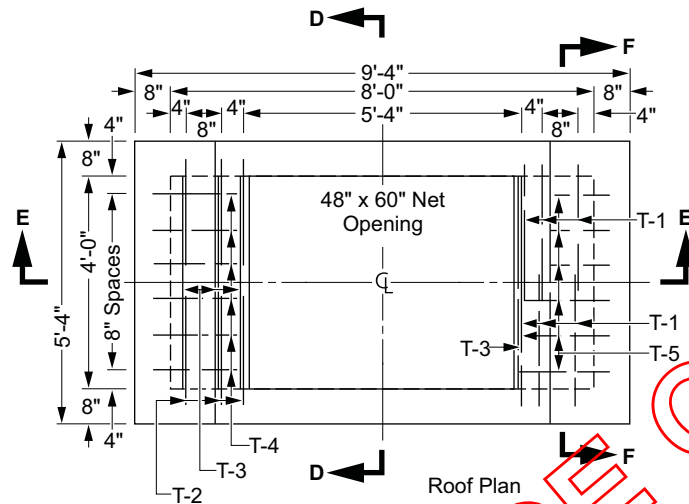
04-27-2018

UGS

VA 430 Vault — Traffic Loading — 4' x 8' x 7'

Scope VA 430.1 Vault — Traffic Loading — 4' x 8' x 7' — Roof

Figure VA 430-1: Vault — Traffic Loading — 4' x 8' x 7' — Roof



Note(s):

1. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. See working drawings and additional neck, conduit bank, and so on.
2. See VA 400.

Approved by:

PhH

Vault — Traffic Loading — 4' x 8' x 7'

VA 430

Effective Date:

05-16-2005

What's Changed?

Sheet 1 of 6

UGS

3. See FC 641.
4. Vent per AC 751.
5. See Scope VA 430.2 (Sheet 3) for "S" steel.

Table VA 430-1: Reinforcing Schedule — Vault — Traffic Loading — 4' x 8' x 7' — Roof

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
T-1	12		#5	4'-10"	61	T-4	12		#5	3'-5"	43
T-2	12		#5	3'-8"	46	T-5	12		#5	4'-1"	51
T-3	8	Straight	#5	4'-0"	33	T-6		None Required			

Note(s):

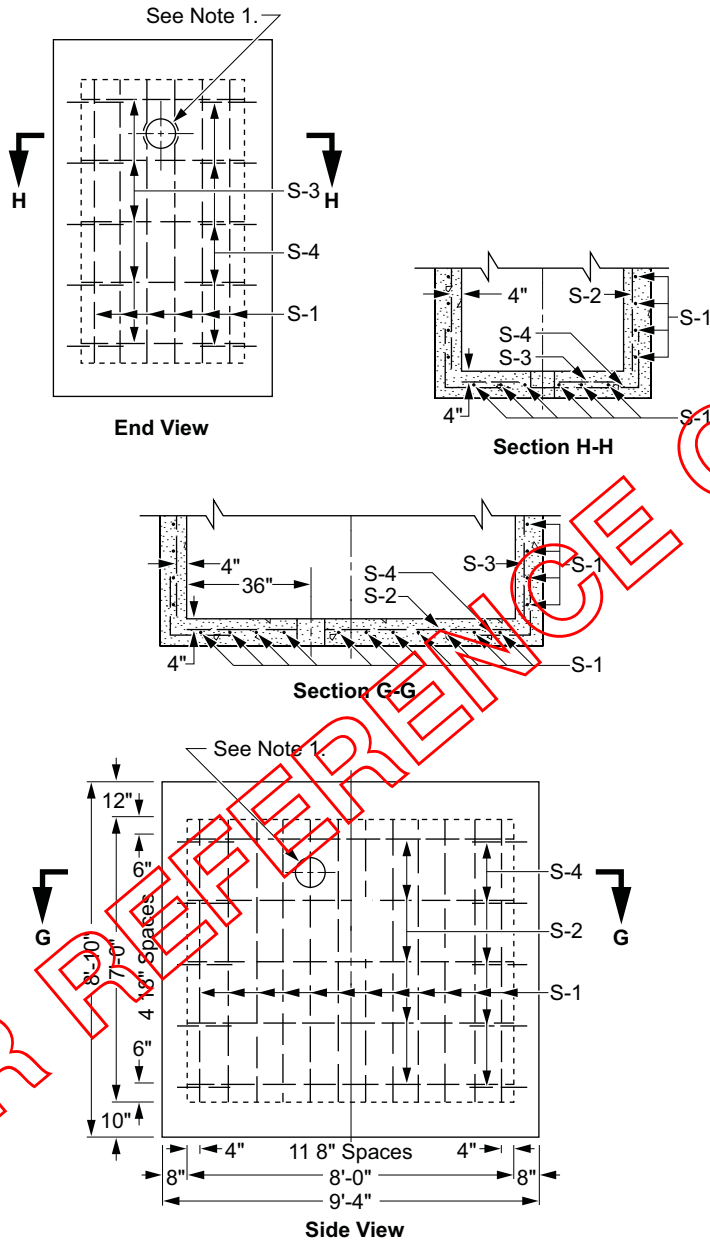
1. N-1 20 ft 2" x 2" x #12 welded wire mesh 12" wide (normal) approx. 7 pounds net.

FOR REFERENCE ONLY

VA 430	Vault — Traffic Loading — 4' x 8' x 7'	Approved by:
Sheet 2 of 6	What's Changed?	Effective Date: 05-16-2005
UGS		

Scope VA 430.2 Vault — Traffic Loading — 4' x 8' x 7' — Walls

Figure VA 430-2: Vault — Traffic Loading — 4' x 8' x 7' — Walls



Note(s):
1. Vent per AC 751.

Approved by:

PhH

Vault — Traffic Loading — 4' x 8' x 7'

VA 430

Effective Date:

05-16-2005

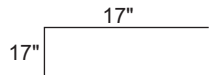
What's Changed?

Sheet 3 of 6


UGS

► SCE Public ◀

Table VA 430-2: Reinforcing Schedule — Vault — Traffic Loading — 4' x 8' x 7' — Walls

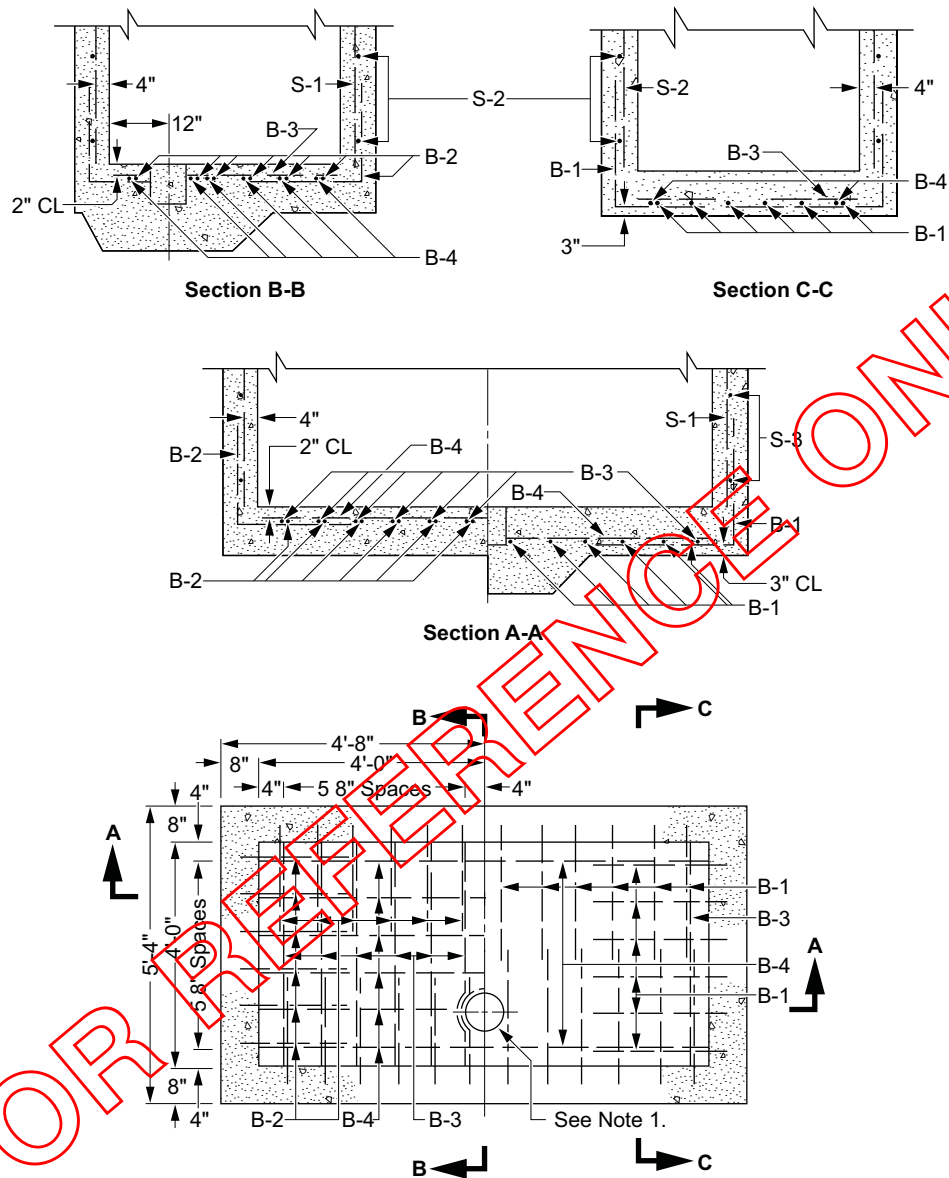
Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
S-1	36	Straight	#3	7'-10"	95	S-3	10	Straight	#3	4'-10"	15
S-2	10	Straight	#3	8'-0"	30	S-4	20		#3	2'-10"	21

FOR REFERENCE ONLY

VA 430	Vault — Traffic Loading — 4' x 8' x 7'	Approved by: 
Sheet 4 of 6	What's Changed?	Effective Date: 05-16-2005
UGS		

Scope VA 430.3 Vault — Traffic Loading — 4' x 8' x 7' — Floor

Figure VA 430-3: Vault — Traffic Loading — 4' x 8' x 7' — Floor



Note(s):

1. Sump per AC 710.

Approved by:

PhH

Vault — Traffic Loading — 4' x 8' x 7'

VA 430

Effective Date:

05-16-2005

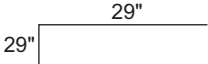
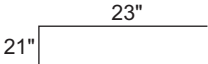
What's Changed?

Sheet 5 of 6


UGS

► SCE Public ◀

Table VA 430-3: Reinforcing Schedule — Vault — Traffic Loading — 4' x 8' x 7' — Floor

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
B-1	36		#5	4'-10"	181	B-3	14	Straight	#5	4'-0"	58
B-2	36		#5	3'-8"	139	B-4	8	Straight	#5	8'-0"	67

FOR REFERENCE ONLY

VA 430	Vault — Traffic Loading — 4' x 8' x 7'	Approved by: 
Sheet 6 of 6	What's Changed?	Effective Date: 05-16-2005
UGS		

VA 432 6' x 8' x 7' Vault — Traffic — Normal Loading

Scope VA 432.1 6' x 8' x 7' Vault — Traffic — Normal Loading

Figure VA 432-1: 6' x 8' x 7' Vault — Traffic — Normal Loading

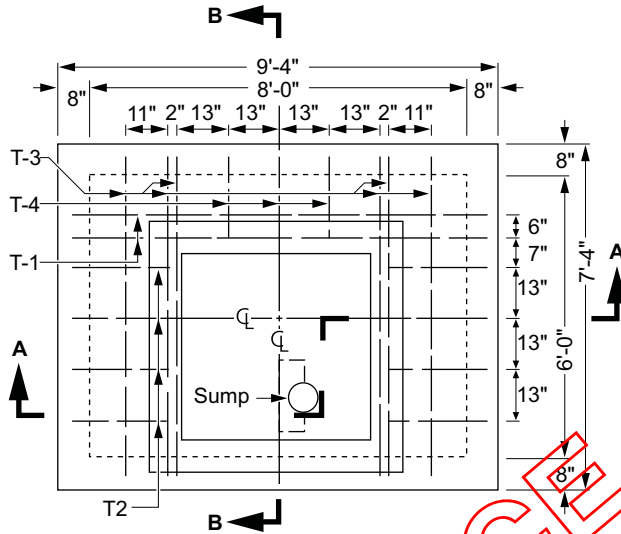


Figure VA 432-1.1: Roof Plan

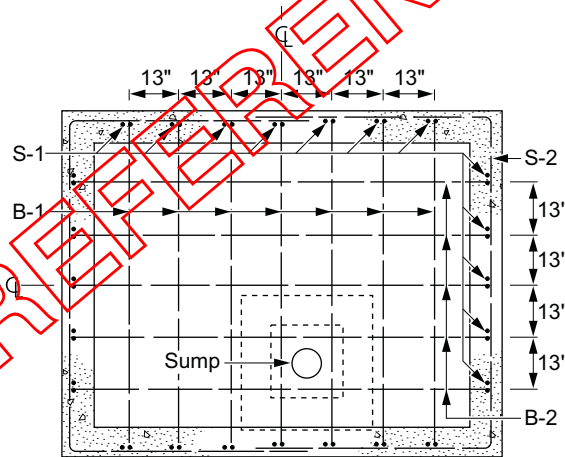



Figure VA 432-1.2: Section C-C

FOR REFERENCE ONLY

Approved by: 	6' x 8' x 7' Vault — Traffic — Normal Loading	VA 432
Effective Date: 05-16-2005	What's Changed?	Sheet 1 of 3 UGS

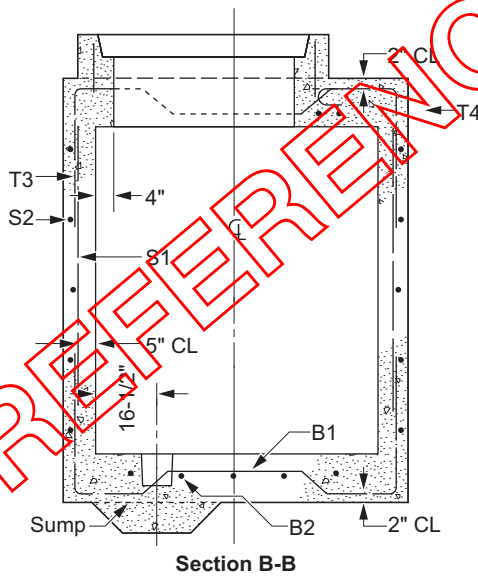
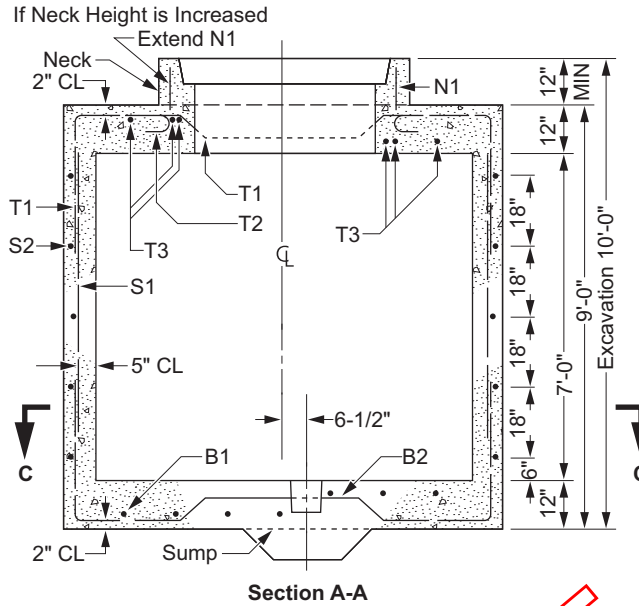


Figure VA 432-1.3: Section A-A and B-B

Table VA 432-1: List of Materials — 6' x 8' x 7' Vault — Traffic — Normal Loading

Quantity	Description
1 only	48" sq Vault Casting
10.3 cu. yds.	Concrete. See GI 020 .
As detailed	Pull eyes

VA 432

6' x 8' x 7' Vault — Traffic — Normal Loading

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

05-16-2005

Table VA 432-2: Reinforcing Schedule — 6' x 8' x 7' Vault — Traffic — Normal Loading

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
B1	7		1/2"	13'-3"	61.96
B2	5		3/8"	15'-3"	28.67
S1	24	Straight	3/8"	6'-0"	54.14
S2	10		3/8"	16'-11"	63.62
T1	3		1/2"	15'-3"	30.56
T2	8		1/2"	5'-7"	29.82
T3	6		5/8"	13'-3"	82.68
T4	3		1/2"	5'-3"	10.52
N1	20 ft ²	12" Wide (Normal)	Welded wire fabric 12 ga. 2" x 2" mesh MIN		7.20

Note(s):

1. For method of dimensioning shapes, see [GI 025](#).
2. See [VA 400](#) for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
3. For total quantities of steel, castings, and related foundry items, see summary sheet for each set of working drawings.
4. See working drawings for additional neck, conduit banks, and so on.
5. 25.2 cu. yds. excavation
369.17 pounds of reinforcing steel

FOR REFERENCE ONLY

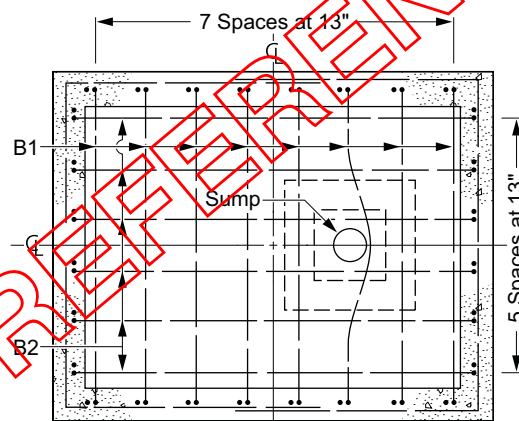
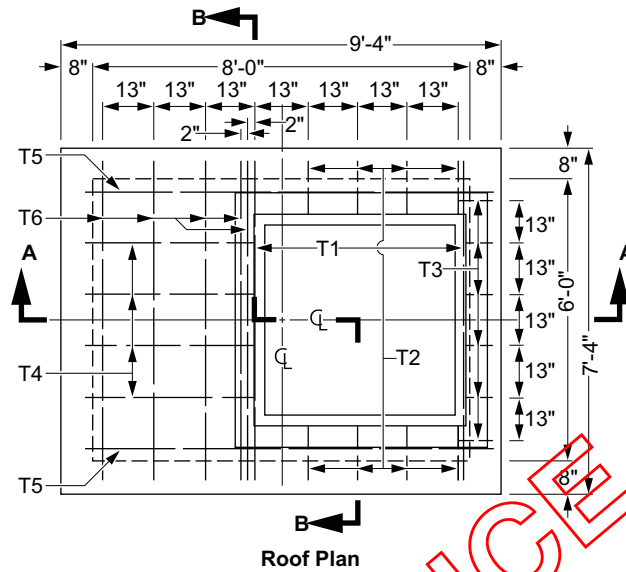
Approved by: 	6' x 8' x 7' Vault — Traffic — Normal Loading	VA 432
Effective Date: 05-16-2005	What's Changed?	Sheet 3 of 3
		UGS

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VA 434 6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading

Scope VA 434.1 6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading

Figure VA 434-1: 6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading



All Steel Symmetrical About C-C
Section C-C

Excavation: 30.85 Cu. Yds.
Reinforcing Steel: 459.0 Cu. Yds.

Figure VA 434-1.1: Floor Plan — Section C-C

FOR REFERENCE ONLY

Approved by:	6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading	VA 434
Effective Date:	What's Changed?	Sheet 1 of 3
05-16-2005		UGS

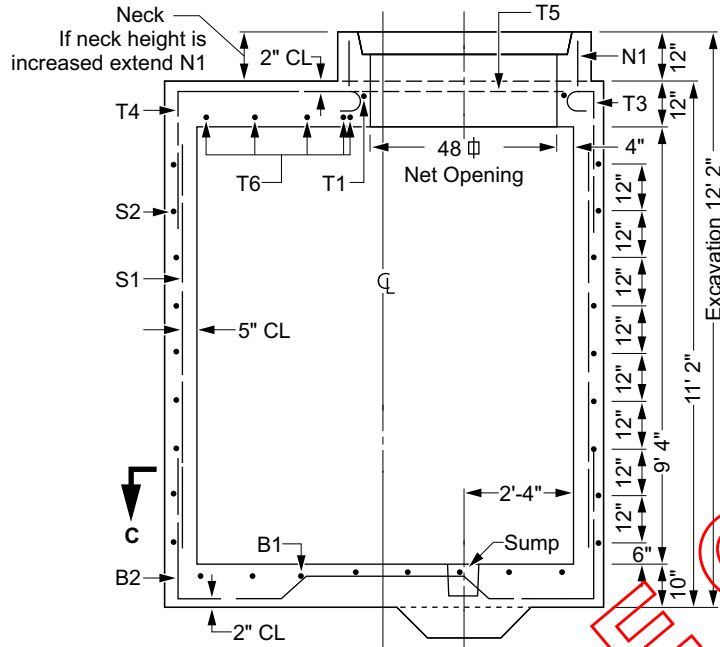


Figure VA 434-1.2: Section A-A

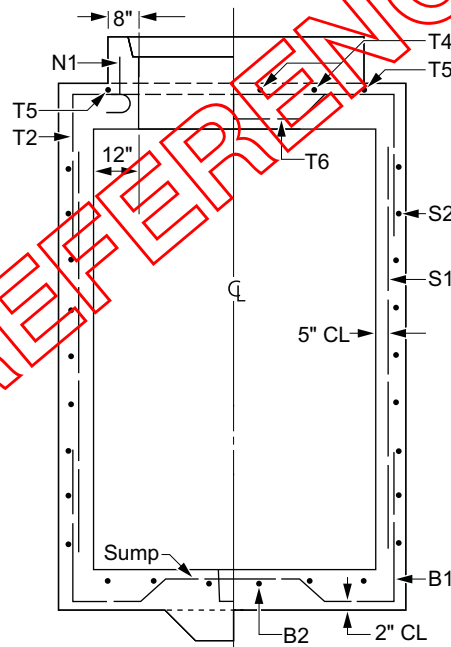


Figure VA 434-1.3: Section B-B

Note(s):

1. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
2. For total quantities of steel, castings, and related foundry items, see summary sheet for each set of working drawings.
3. See working drawings for additional neck, conduit banks, and so on.

VA 434

6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

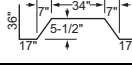
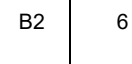

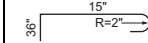
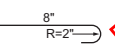

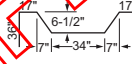
UGS

05-16-2005

Table VA 434-1: List of Materials — 6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading

Quantity	Description
1 Only	48" sq Cover
11.75 cu yd	Concrete GI 020
As Detailed	Pull Eyes


Table VA 434-2: Reinforcing Schedule — 6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
B1	8		1/2"	13'-2"	70.38
B2	6		3/8"	15'-2"	34.22
S1	28	Straight	3/8"	8'-6"	89.49
S2	18		3/8"	16'-11"	114.51
T1	2	Straight	3/8"	6'-4"	5.20
T2	8		1/2"	4'-6"	24.05
T3	6		1/2"	3'-11"	15.71
T4	4		1/2"	7'-2"	19.16
T5	2	Straight	3/8"	8'-10"	9.96
T6	5		5/8"	13'-3"	69.10
N1	20 ft ²	12" Wide (Normal)	Welded Wire Fabric — 12 ga. 2" x 2" Mesh 0.36 lb per ft ²		7.20

Note(s):

- For method of dimensioning shapes, see [GI 025](#).

FOR PREPARED ONLY

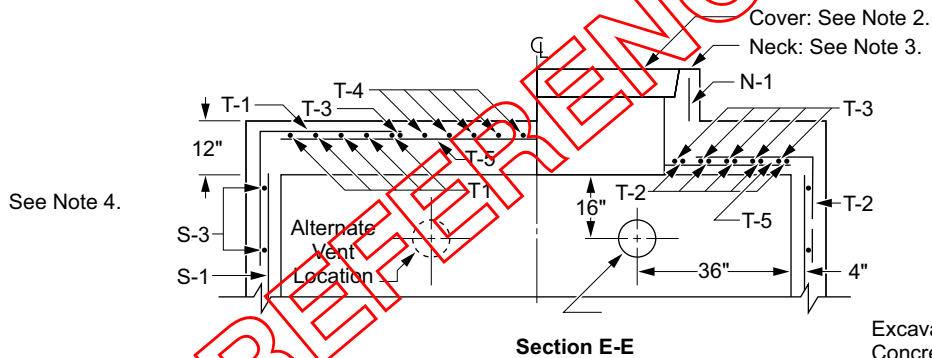
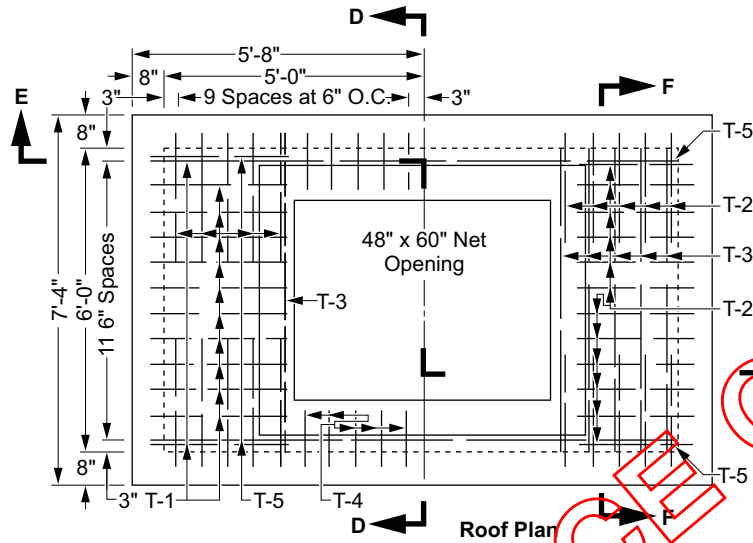
Approved by: 	6' x 8' x 9'-4" Vault — Traffic — Standard Casting — Normal Loading	VA 434
Effective Date: 05-16-2005	What's Changed?	Sheet 3 of 3
		UGS

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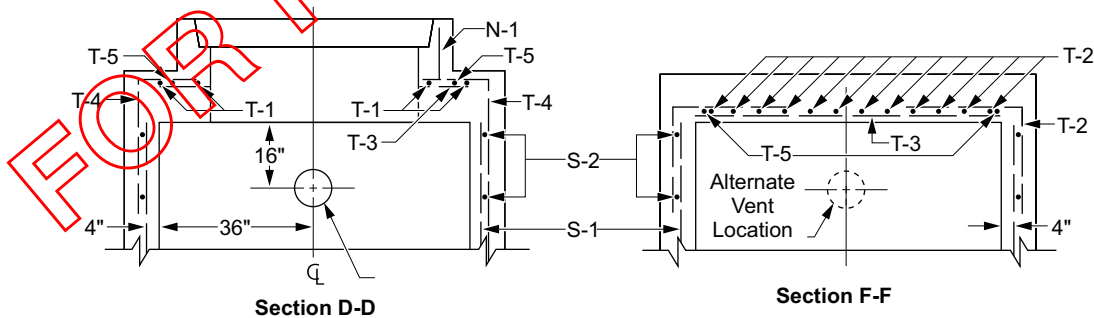
VA 436 Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"

Scope VA 436.1 Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Roof

Figure VA 436-1: Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Roof



Excavation: 37.5 Cu. Yds.
Concrete: 13.5 Cu. Yds.
Reinforcing Steel: 1,935 Lb



Note(s):

1. See [Table VA 436-1 \(Sheet 2\)](#) for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. See working drawings for additional neck, conduit bank, and so on.
2. See [FC 641](#).
3. See [VA 470](#).
4. See [Table VA 436-2 \(Sheet 4\)](#).

Approved by:

PhH

Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"

VA 436

Effective Date:

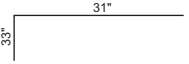
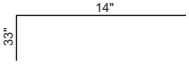
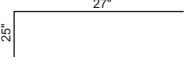
05-16-2005

What's Changed?

Sheet 1 of 6

UGS

Table VA 436-1: Reinforcing Schedule — Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Roof

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
T-1	44		#5	5'-4"	245	T-4	20		#5	3'-11"	82
T-2	44		#5	4'-4"	199	T-5	4	Straight	#5	10'-0"	42
T-3	12	Straight	#5	6'-0"	75						

Note(s):

1. N-1 20 ft 2" x 2" x #12 welded wire mesh 12" wide (normal) approx. 7 pounds net.

FOR REFERENCE ONLY

VA 436

Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"

Approved by:



Sheet 2 of 6

What's Changed?

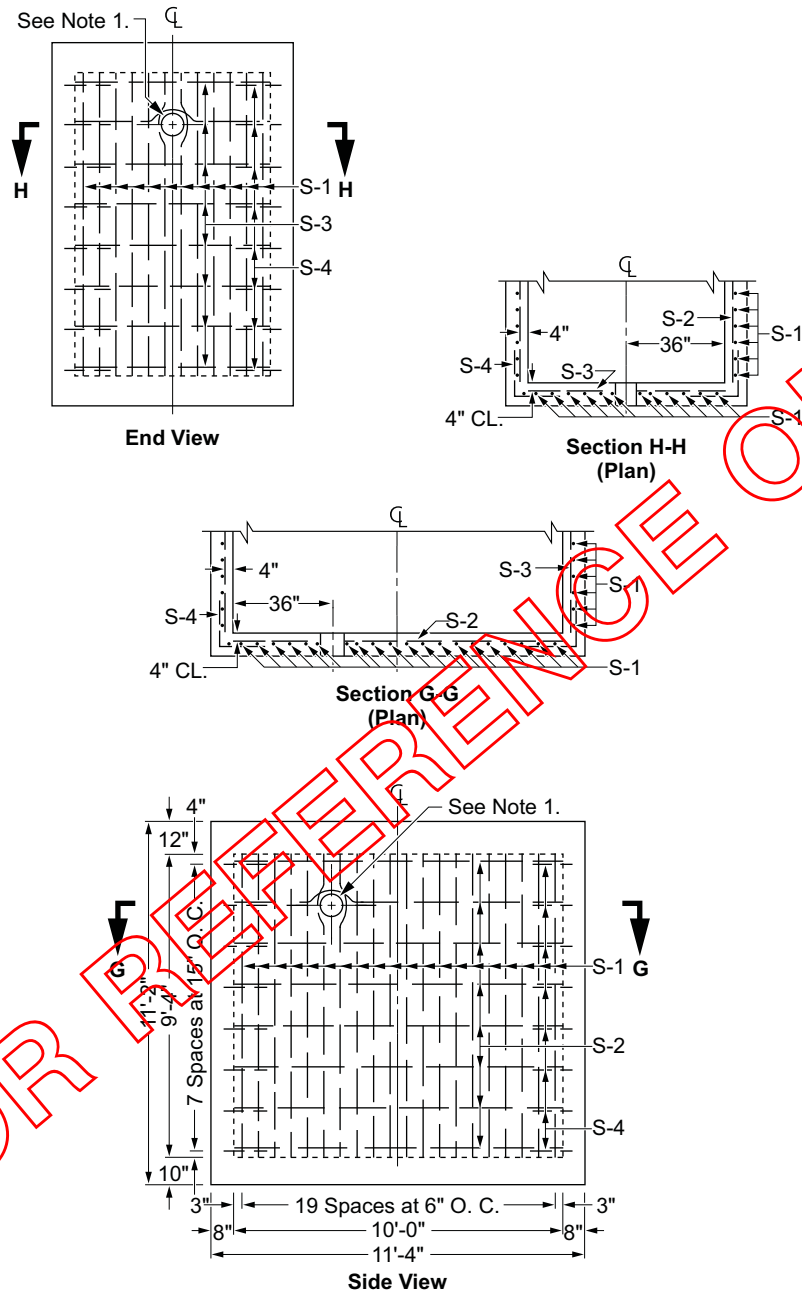
Effective Date:

UGS

05-16-2005

Scope VA 436.2 Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Walls

Figure VA 436-2: Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Walls



Note(s):
1. Vent per AC 751.

Approved by:

PhH

Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"

VA 436

Effective Date:

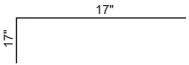
05-16-2005

What's Changed?

Sheet 3 of 6

UGS

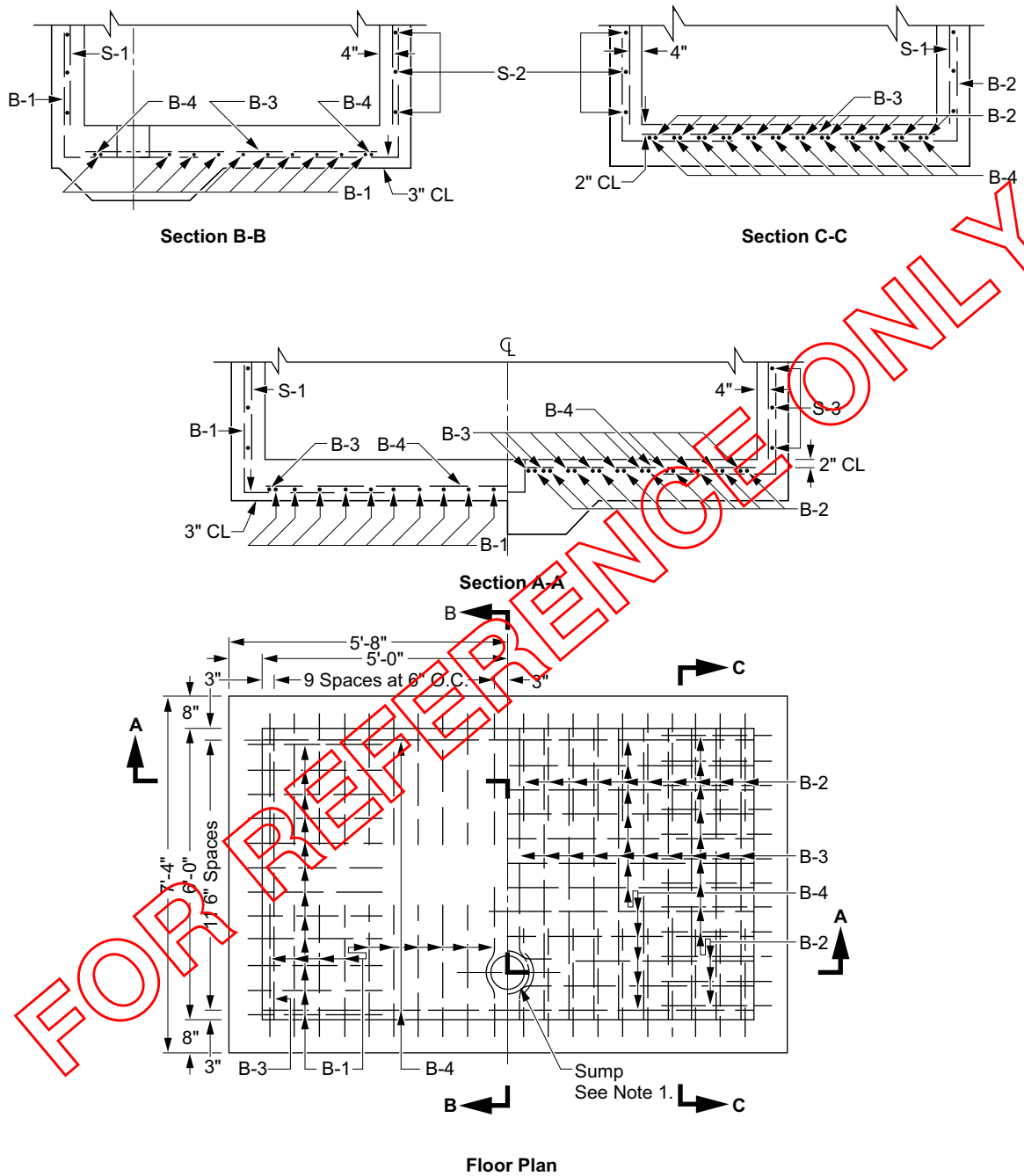
Table VA 436-2: Reinforcing Schedule — Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Walls

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
S-1	64	Straight	#3	9'-4"	225	S-3	16	Straight	#3	6'-0"	36
S-2	16	Straight	#3	10'-0"	60	S-4	32		#3	2'-10"	34

FOR REFERENCE ONLY

Scope VA 436.3 Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Floor

Figure VA 436-3: Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Floor



Note(s):
1. See AC 710.


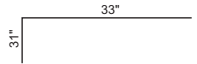
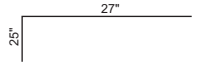
Approved by: 	Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4"	VA 436
Effective Date: 05-16-2005	What's Changed?	Sheet 5 of 6 UGS

Table VA 436-3: Reinforcing Schedule — Vault — Traffic Loading — 6'-0" x 10'-0" x 9'-4" — Floor

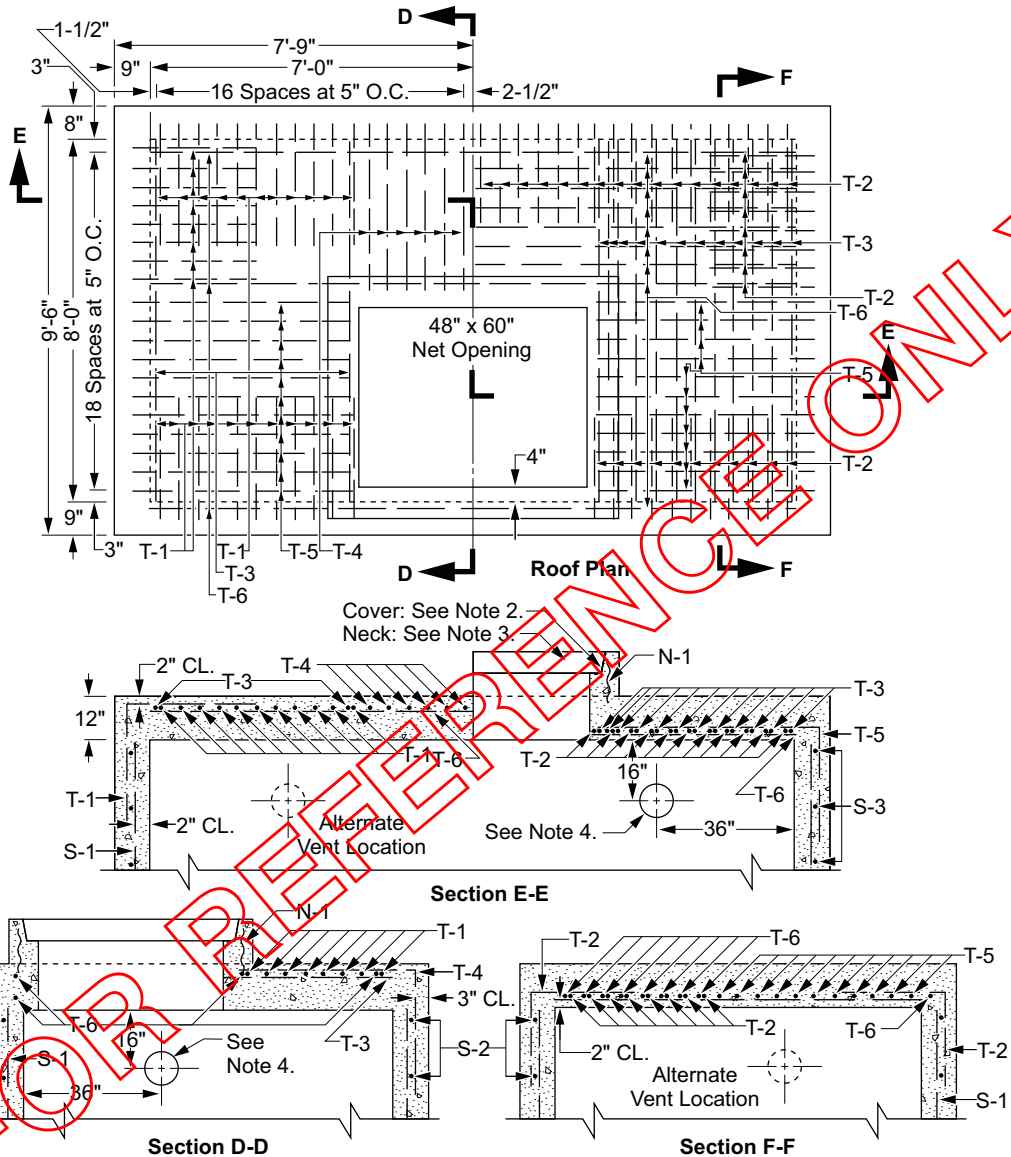
Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
B-1	64		#5	5'-4"	357	B-3	22	Straight	#5	6'-0"	138
B-2	64		#5	4'-4"	289	B-4	14	Straight	#5	10'-0"	146

FOR REFERENCE ONLY

VA 438 Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"

Scope VA 438.1 Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof

Figure VA 438-1: Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof



Note(s):

1. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. See working drawings for additional neck, conduit bank, and so on.
2. See FC 641.
3. See VA 470.
4. Vent per AC 751.

Approved by:

PhH

Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"

VA 438

Effective Date:

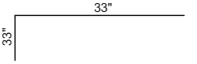
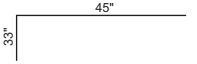
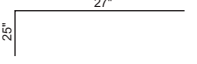
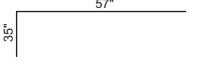
05-16-2005

What's Changed?

Sheet 1 of 6

UGS

Table VA 438-1: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
T-1	60		#6	5'-6"	496	T-4	12		#6	6'-6"	117
T-2	72		#6	4'-4"	469	T-5	44		#6	7'-8"	507
T-3	28	Straight	#6	8'-0"	336	T-6	12	Straight	#6	14'-0"	252

Note(s):

- N-1 20 ft 2" x 2" x #12 welded wire mesh 12" wide (normal) approx. 7 pounds net.

FOR REFERENCE ONLY

VA 438

Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"

Approved by:



Sheet 2 of 6

What's Changed?

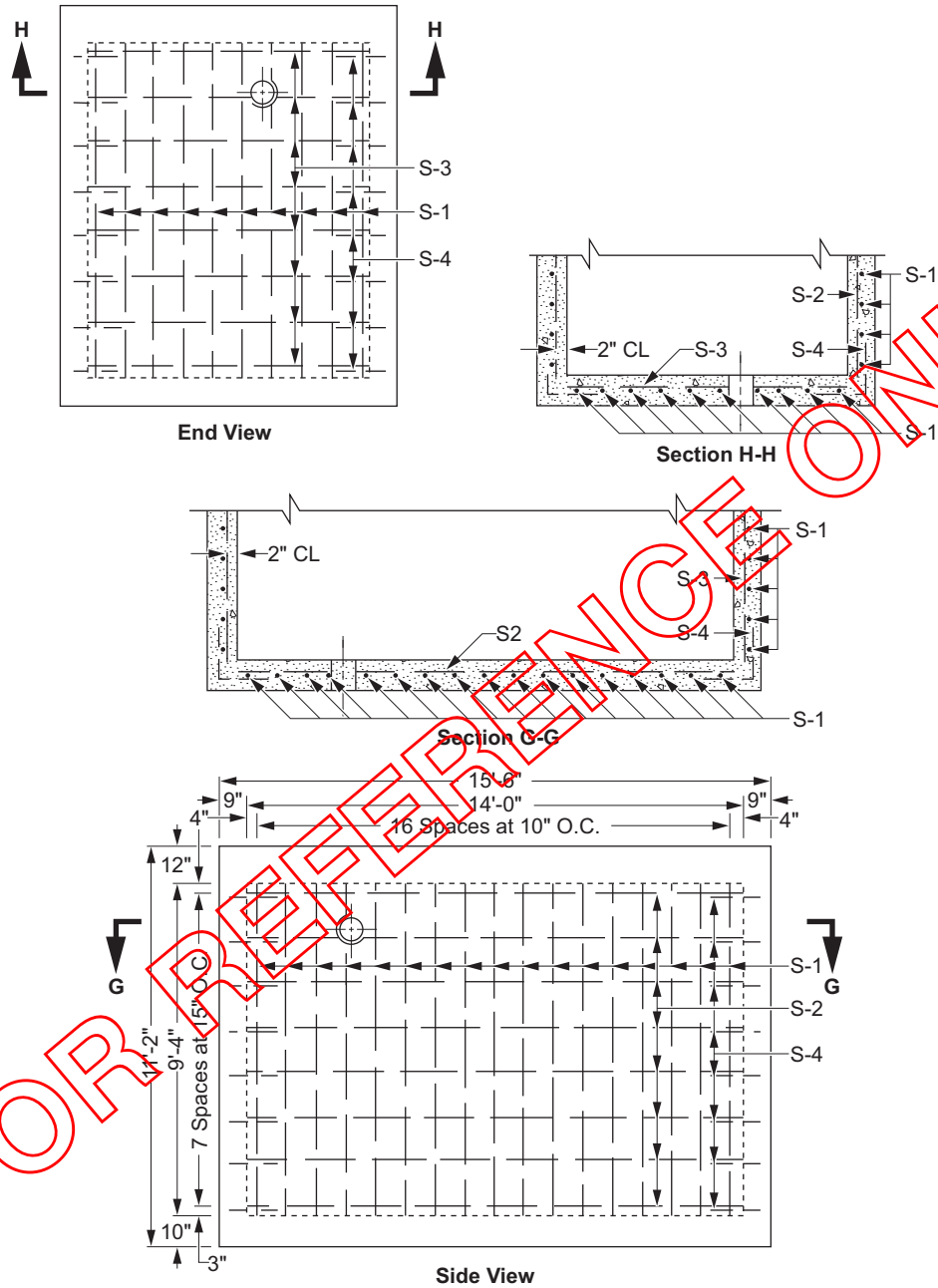
Effective Date:

UGS

05-16-2005

Scope VA 438.2 Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Sides

Figure VA 438-2: Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Sides



FOR REFERENCE ONLY

Approved by:
PhH

Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"

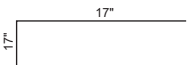
VA 438

Effective Date: **What's Changed?**
05-16-2005

Sheet 3 of 6

UGS

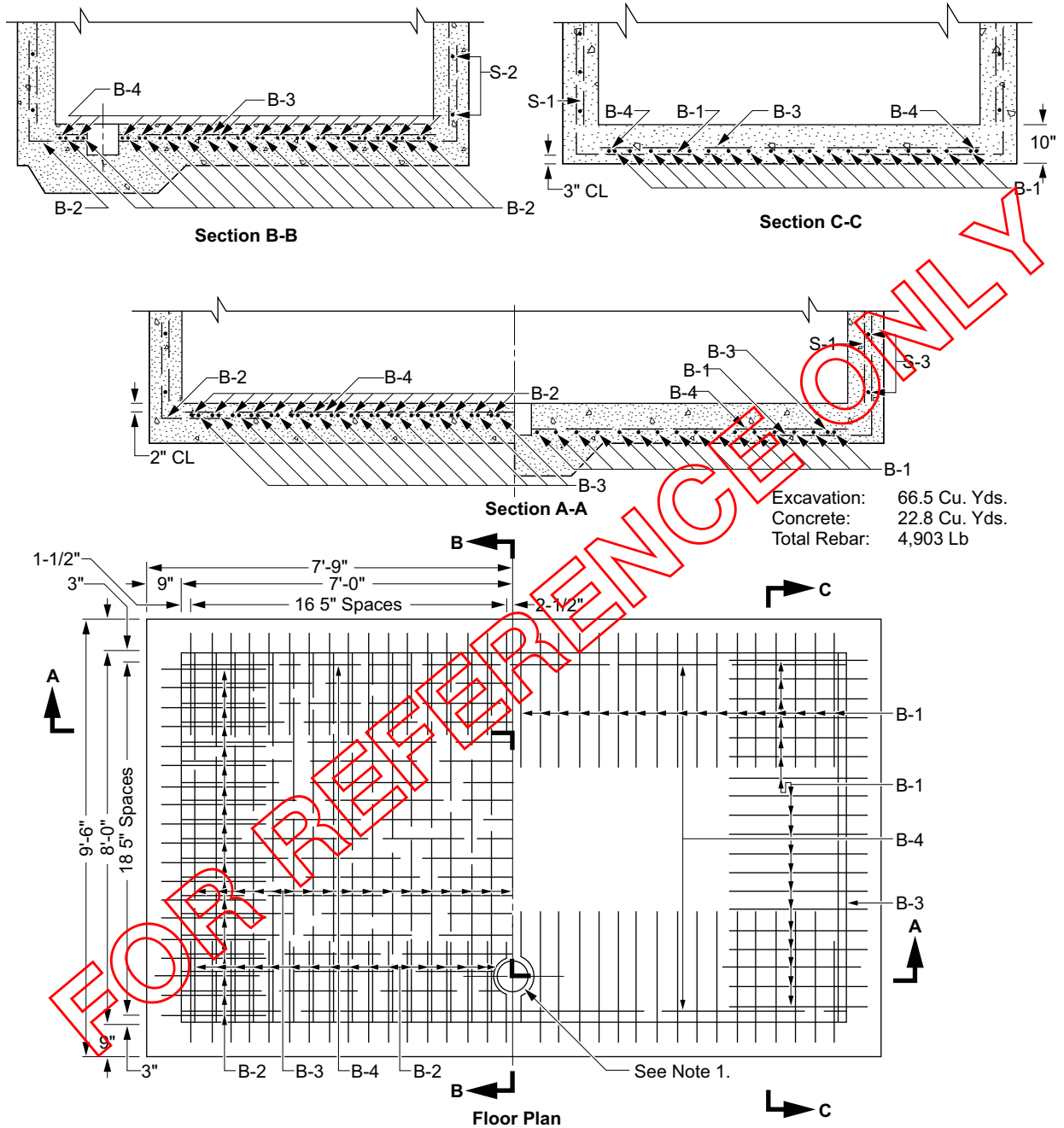
Table VA 438-2: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Sides

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
S-1	54	Straight	#3	9'-4"	190	S-3	16	Straight	#3	8'-0"	48
S-2	16	Straight	#3	14'-0"	84	S-4	32		#3	2'-10"	34

FOR REFERENCE ONLY

Scope VA 438.3 Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Floor

Figure VA 438-3: Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Floor



- Note(s):**
 1. Sump per AC 710.

Approved by:

PHH

Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4"

VA 438

Effective Date:

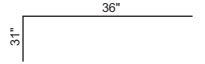
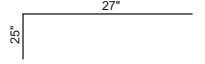
05-16-2005

What's Changed?

Sheet 5 of 6

UGS

Table VA 438-3: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Floor

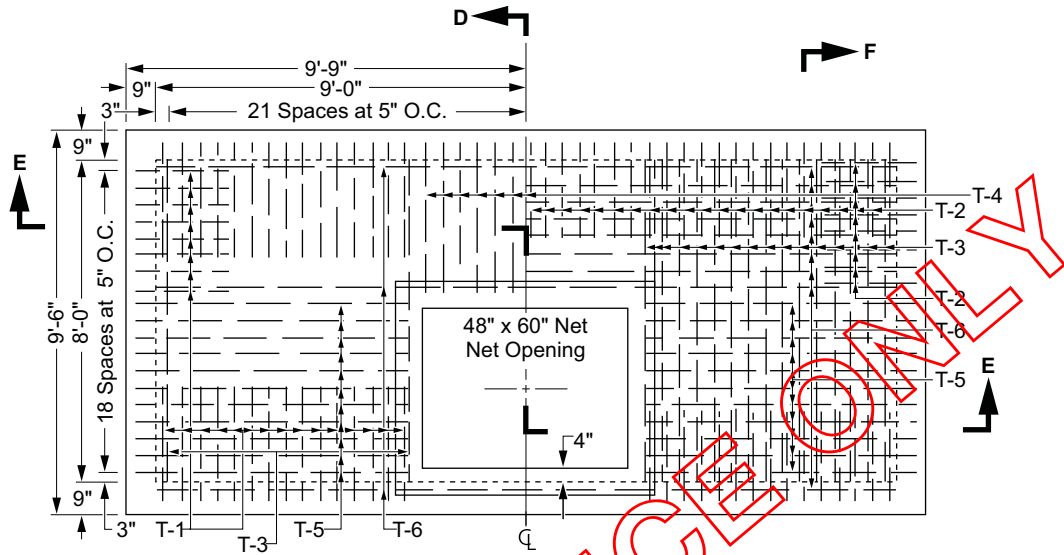
Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
B-1	106		#6	5'-7"	889	B-3	36	Straight	#6	8'-0"	342
B-2	106		#6	4'-4"	690	B-4	21	Straight	#6	14'-0"	442

FOR REFERENCE ONLY

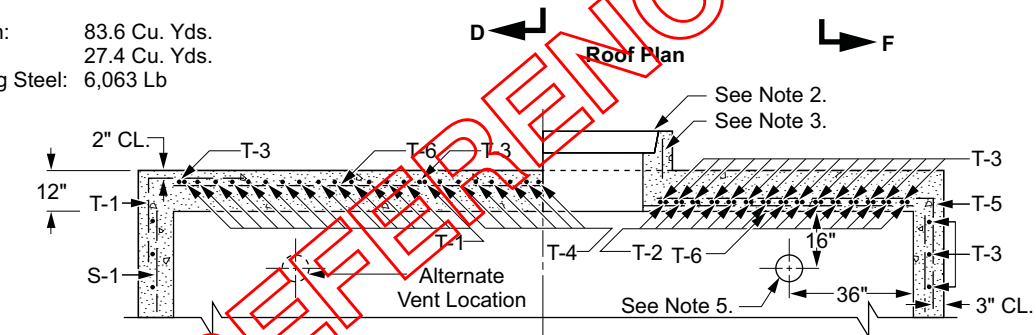
VA 440 Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4"

Scope VA 440.1 Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof

Figure VA 440-1: Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof

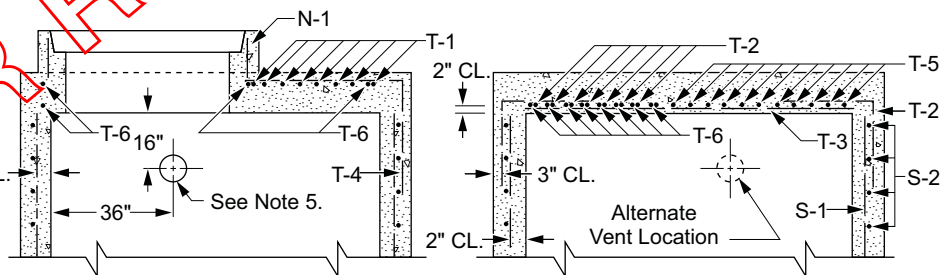


Excavation: 83.6 Cu. Yds.
Concrete: 27.4 Cu. Yds.
Reinforcing Steel: 6,063 Lb



See Note 4.

Section E-E



Section D-D

Section F-F

Note(s):

1. See [VA 400](#) for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. See working drawings for additional neck, conduit bank, and so on.
2. See [FC 641](#).
3. See [VA 470](#).
4. See [Scope VA 440.2](#).
5. Vent per [AC 751](#).

Approved by:

PhH

Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4"

VA 440

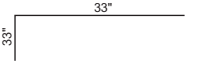
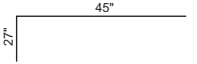
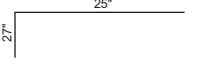
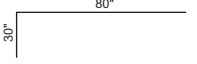
Effective Date:
05-16-2005

What's Changed?

Sheet 1 of 6

UGS

Table VA 440-1: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 14'-0" x 9'-4" — Roof

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
T-1	76		#6	5'-6"	628	T-4	13		#6	6'-0"	117
T-2	89		#6	4'-4"	579	T-5	44		#6	9'-2"	606
T-3	36	Straight	#6	8'-0"	433	T-6	11	Straight	#6	18'-0"	298

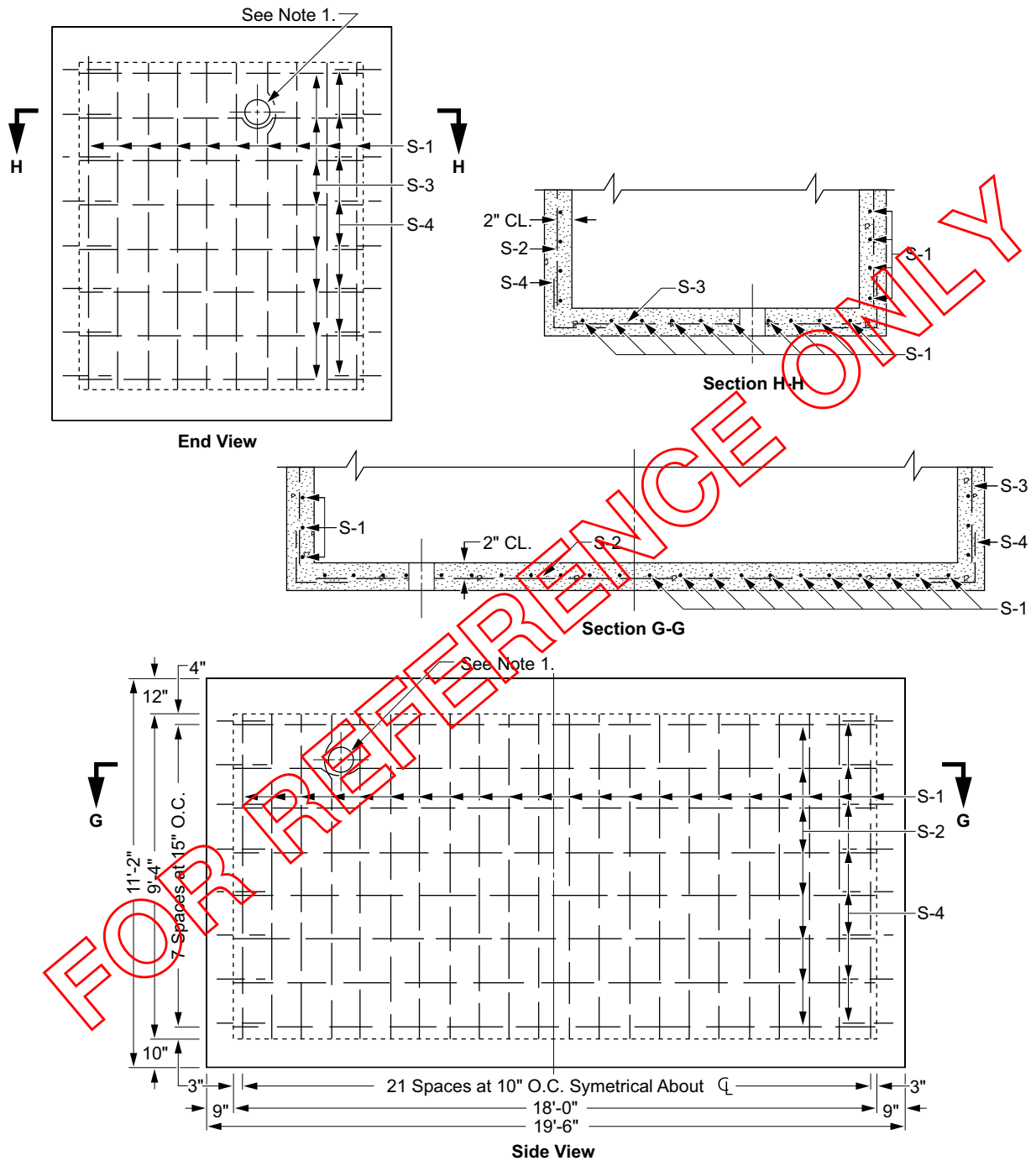
Note(s):

1. N-1 20 ft 2" x 2" x #12 welded wire mesh 12" wide (normal) approx. 7 pounds net.

FOR REFERENCE ONLY

Scope VA 440.2 Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Walls

Figure VA 440-2: Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Walls



- Note(s):**
1. Vent per AC 751.

Approved by:

PhH

Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4"

VA 440

Sheet 3 of 6

Effective Date:

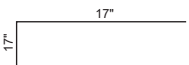
05-16-2005

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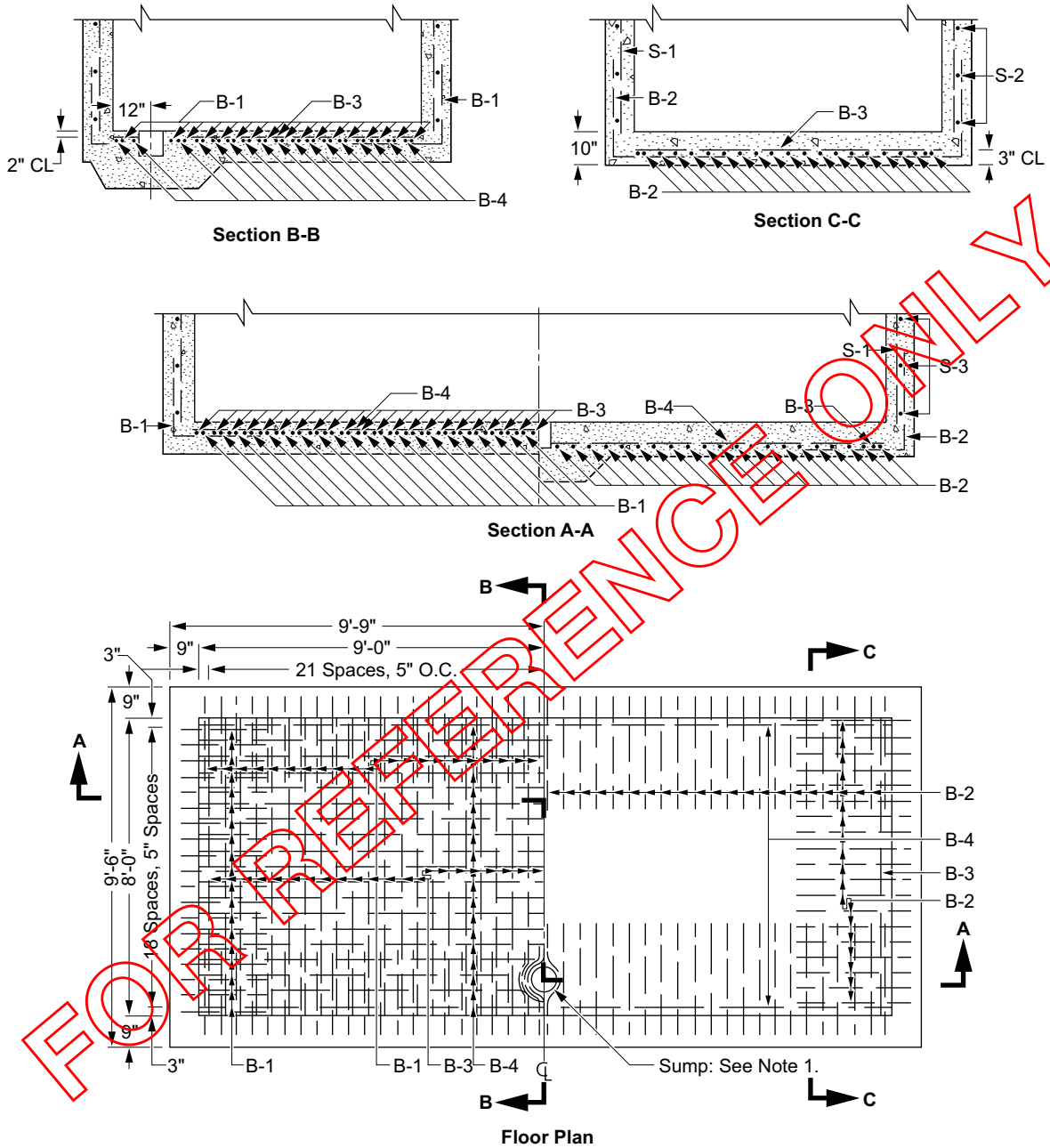
Table VA 440-2: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Walls

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
S-1	64	Straight	#3	9'-4"	223	S-3	16	Straight	#3	8'-0"	48
S-2	16	Straight	#3	18'-0"	109	S-4	32		#3	2'-10"	30

FOR REFERENCE ONLY

Scope VA 440.3 Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Floor

Figure VA 440-3: Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Floor



Note(s):
1. See AC 710.

Approved by:

PhH

Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4"

VA 440

Effective Date:

05-16-2005

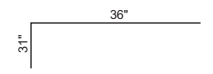
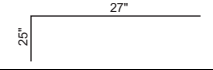
What's Changed?

Sheet 5 of 6

UGS

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Table VA 440-3: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 18'-0" x 9'-4" — Floor

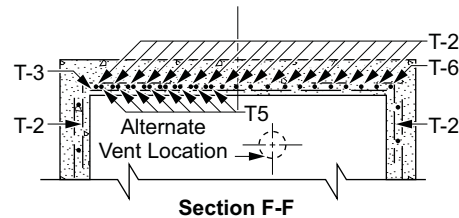
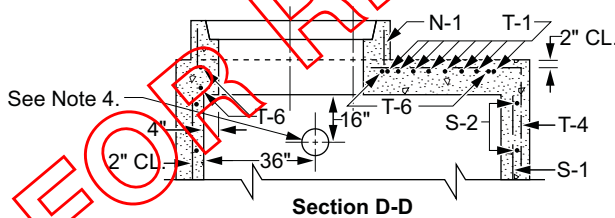
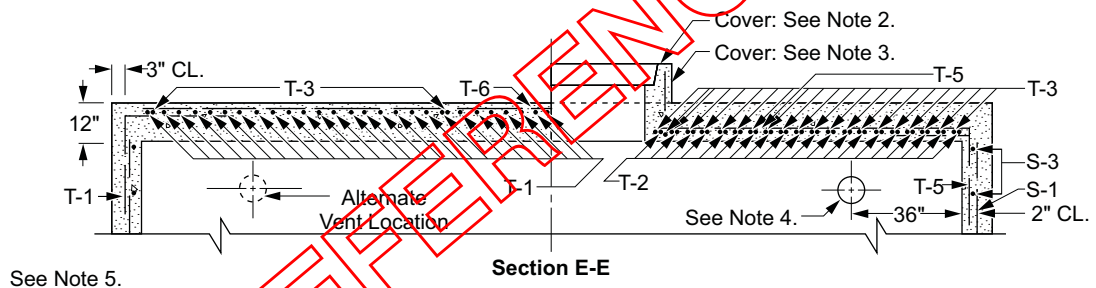
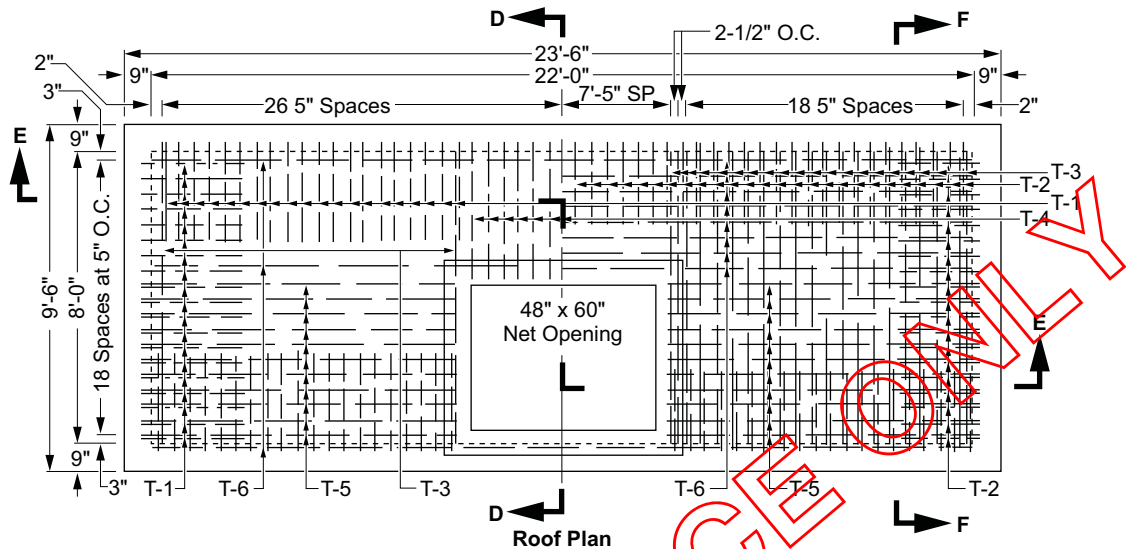
Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
B-1	124		#6 Ø	5'-7"	1040	B-3	45	Straight	#6 Ø	8'-0"	541
B-2	124		#6 Ø	4'-4"	807	B-4	21	Straight	#6 Ø	18'-0"	568

FOR REFERENCE ONLY

VA 442 Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4"

Scope VA 442.1 Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Roof

Figure VA 442-1: Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Roof



Note(s):

1. See [VA 400](#) for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. See working drawings for additional neck, conduit bank, and so on.
2. See [FC 641](#).
3. See [VA 470](#).
4. Vent per [AC 751](#).
5. See [Scope VA 442.2 \(Sheet 3\)](#) for "S" steel.

Approved by:

PhH

Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4"

VA 442

Effective Date:

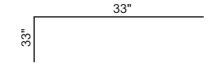
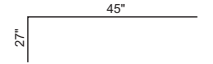
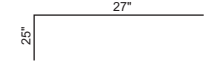
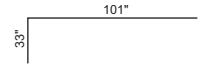
05-16-2005

What's Changed?

Sheet 1 of 6

UGS

Table VA 442-1: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Roof

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
T-1	118		#6	5'-6"	974	T-4	13		#6	6'-0"	117
T-2	131		#6	4'-4"	853	T-5	44		#6	11'-2"	738
T-3	46	Straight	#6	8'-0"	553	T-6	11	Straight	#6	22'-0"	363

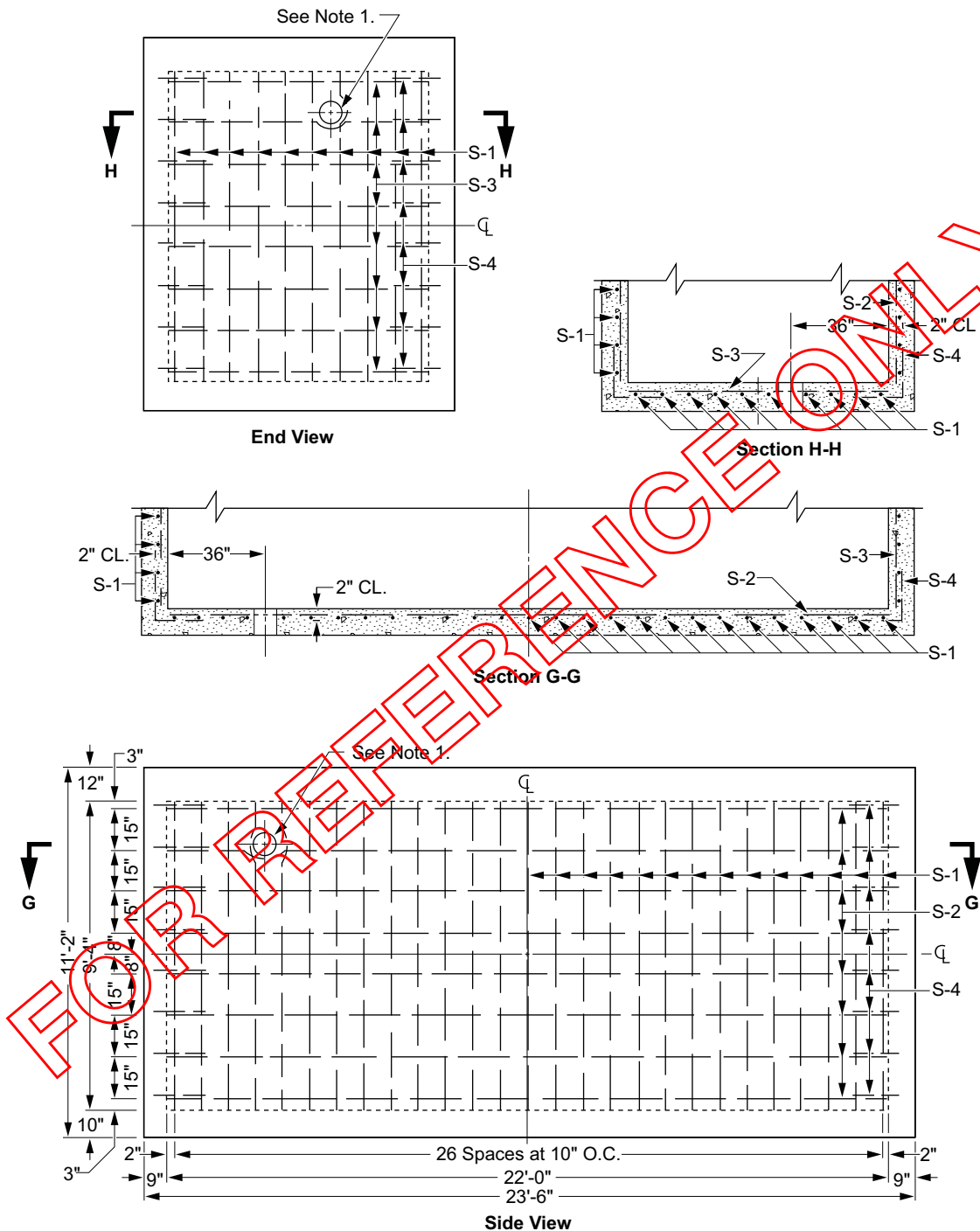
Note(s):

1. N-1 20 ft 2" x 2" x #12 welded wire mesh 12" wide (normal) approx. 7 pounds net.

FOR REFERENCE ONLY

Scope VA 442.2 Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Walls

Figure VA 442-2: Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Walls



Note(s):
1. Vent per AC 751.

Approved by:

PhH

Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4"

VA 442

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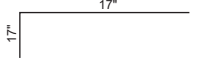
05-16-2005

What's Changed?

Sheet 3 of 6

UGS

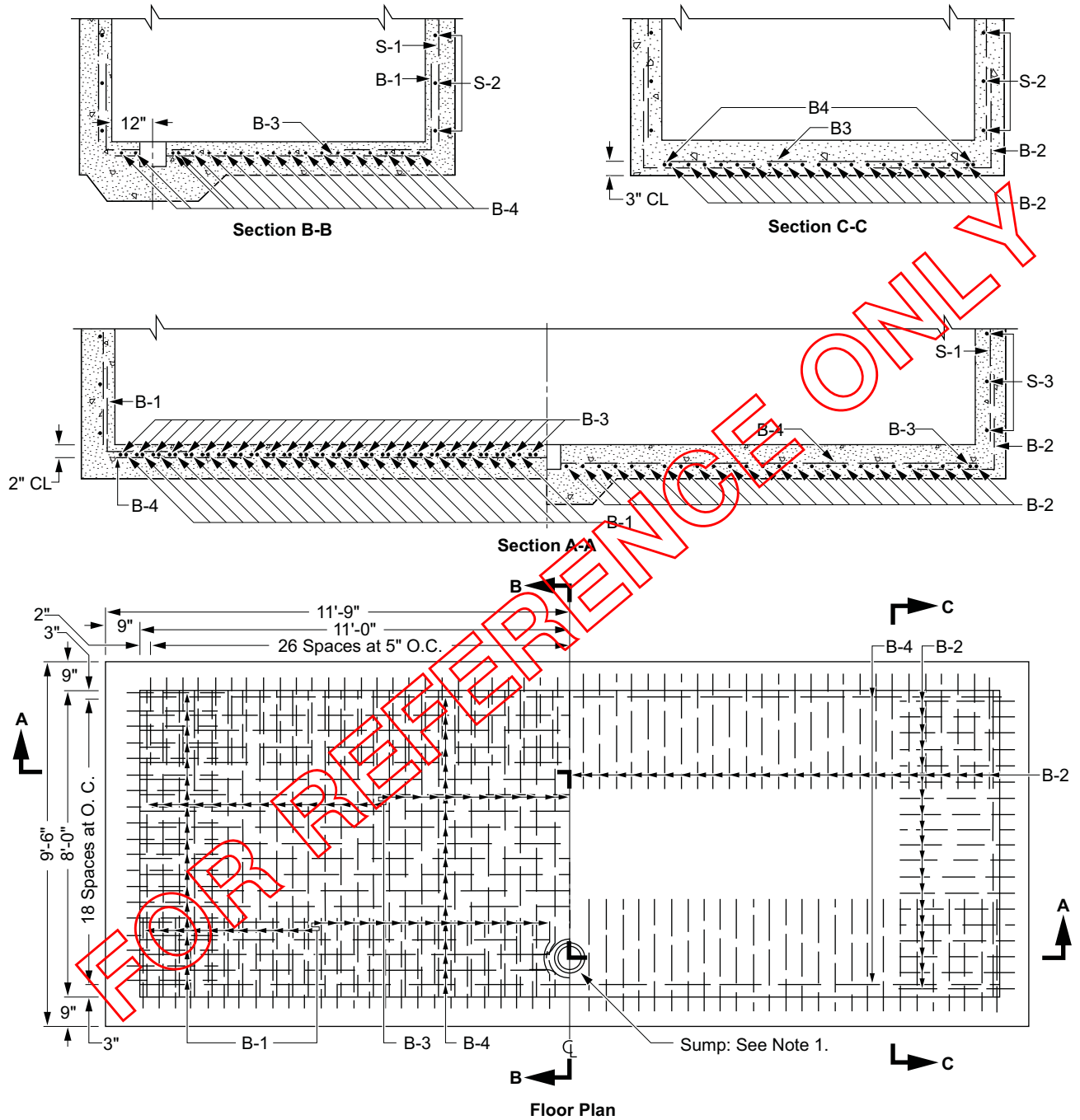
Table VA 442-2: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Walls

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
S-1	74	Straight	#3	9'-4"	263	S-3	16	Straight	#3	8'-0"	48
S-2	16	Straight	#3	22'-0"	132	S-4	32		#3	2'-10"	34

FOR REFERENCE ONLY

Scope VA 442.3 Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Floor

Figure VA 442-3: Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Floor



Note(s):
1. See AC 710.


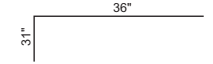
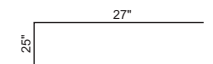
Approved by: 	Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4"	VA 442
Effective Date: 05-16-2005	What's Changed?	Sheet 5 of 6 UGS

Table VA 442-3: Reinforcing Schedule — Vault — Traffic Loading — 8'-0" x 22'-0" x 9'-4" — Floor

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
B-1	144		#6	5'-7"	1208	B-3	55	Straight	#6	8'-0"	661
B-2	144		#6	4'-4"	937	B-4	21	Straight	#6	22'-0"	694

FOR REFERENCE ONLY

VA 444 8' x 22' x 12' Vault — Traffic — Normal Loading

Scope VA 444.1 8' x 22' x 12' Vault — Traffic — Normal Loading

Figure VA 444-1: 8' x 22' x 12' Vault — Traffic — Normal Loading

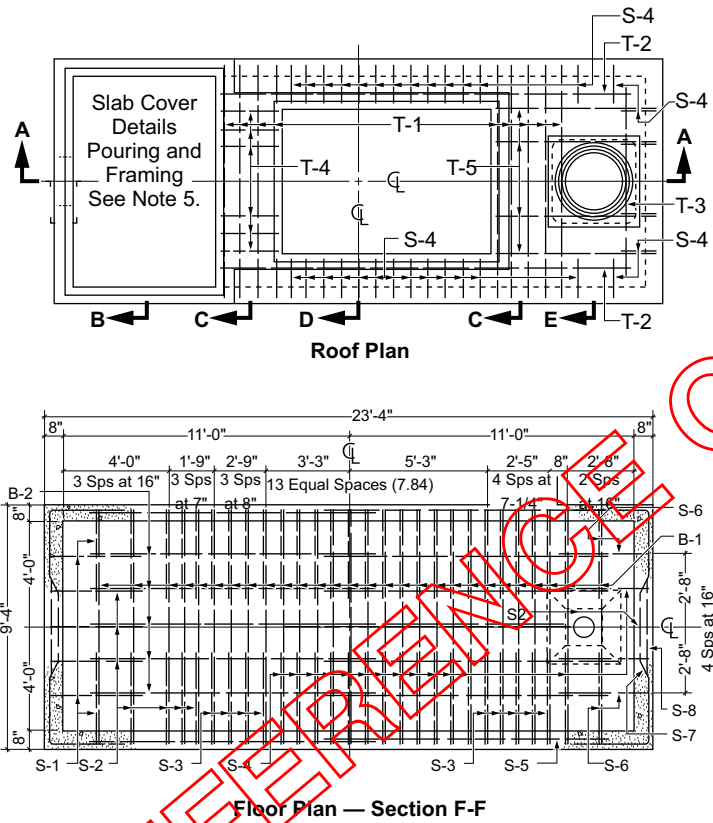


Figure VA 444-1.1: Roof Plan and Floor Plan — Section F-F

FOR REVIEW ONLY

Approved by:	8' x 22' x 12' Vault — Traffic — Normal Loading	VA 444
Effective Date:	What's Changed?	Sheet 1 of 3
05-16-2005		UGS

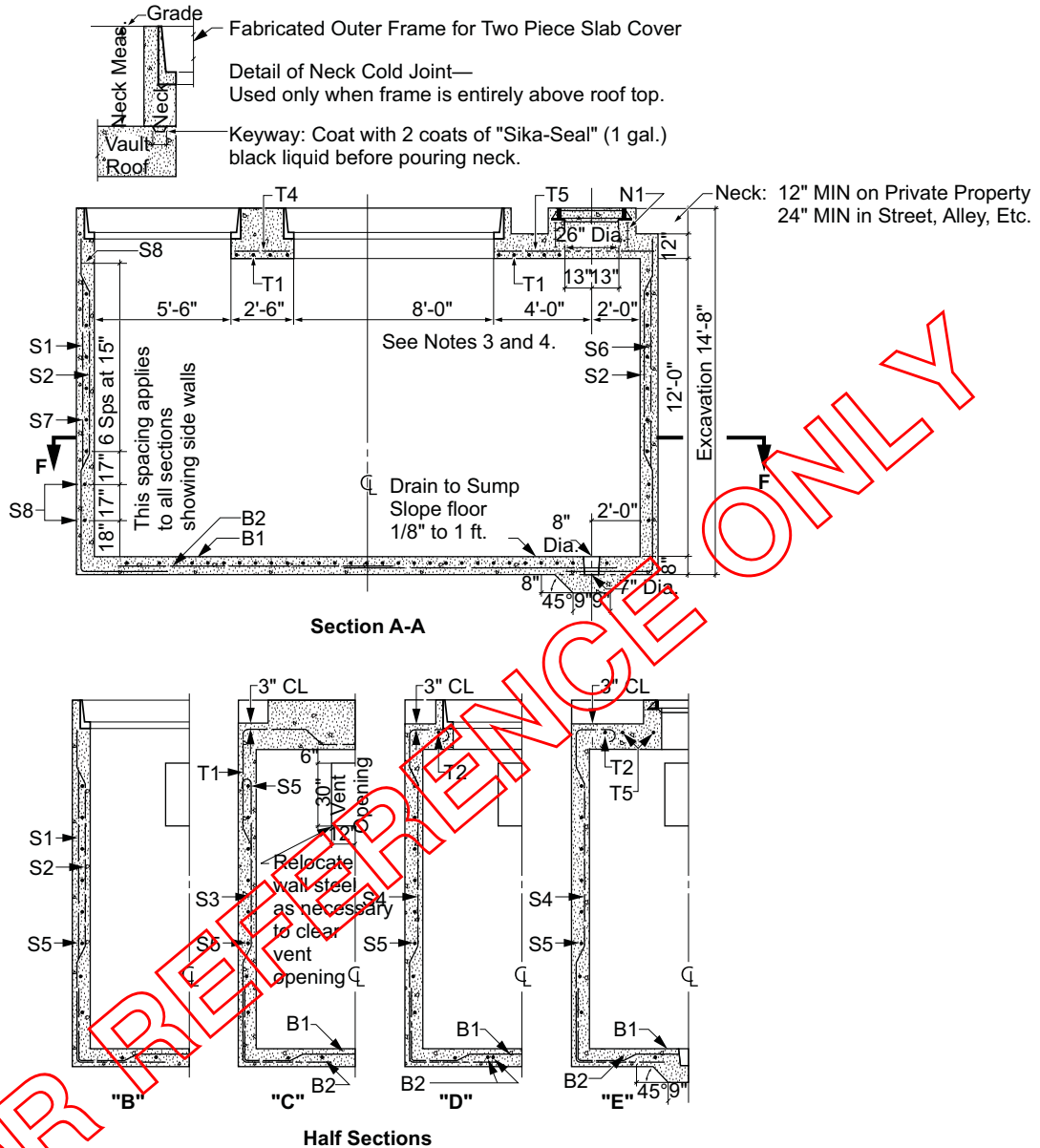


Figure VA 444-1.2: Section A-A and Half Sections

Note(s):

1. The steel design for this vault is based on the use of concrete with a minimum strength of 3000 psi at 28 days.
2. See VA 400 for index to reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. For total quantities of steel, casting, and related foundry items, see summary sheet for each set of working drawings. See working drawings for additional neck, conduit bank, and so on.
3. Conduits at vault entrance to maintain 1-1/2" separation and will terminate in end bells or beveled recesses.
4. Steel, unless shown otherwise, to clear exterior surfaces 1-1/2" and interior surfaces by 3/4".
5. See FC 650.

VA 444

8' x 22' x 12' Vault — Traffic — Normal Loading

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

05-16-2005

Table VA 444-1: List of Materials — 8' x 22' x 12' Vault — Traffic — Normal Loading

Quant.	Description
1	26" DIA Traffic Casting SCE Co. Drawing NT 19663
2	5'-6" x 8'-0" 2 Pc. Slab Cover SCE Co. FC 644
31 - cu yd	Concrete
As Detailed	Pull Eyes SCE Co. AC 733 (8-1/2")

Table VA 444-2: Reinforcing Schedule — 8' x 22' x 12' Vault — Traffic — Normal Loading

Mark	Quant.	Type	Size (DIA)	Total Lgth.	Wgt. Lb.
B1	28		1/2"	15'-2"	283.74
B2	10	Straight	1/2"	11'-0"	73.48
S1	4		3/4"	16'-8"	100.02
S2	12		3/4"	16'-10"	302.94
S3	18		1/2"	15'-5"	185.41
S4	28		3/4"	19'-0"	798.00
S5	36	Straight	1/2"	11'-0"	264.53
S6	4		3/4"	19'-2"	115.02
S7	12		1/2"	14'-7"	116.87
S8	6		1/2"	18'-11"	75.83
T1	9		3/4"	19'-4"	260.96
T2	2	Straight	1/2"	16'-0"	21.38
T3	1	Straight	1/2"	7'-0"	4.68
T4	6	Straight	1/2"	2'-2"	8.70
T5	4	Straight	1/2"	6'-4"	16.91
N1	1	Welded Wire Fabric 12 ga. 2" x 2" Mesh 0.36# P.S.F. MIN. ^{a/}		1' x 13'	4.68

^{a/} When vault necks exceed 16", reinforcing will be required for all necks.

Note(s):

1. For method of dimensioning shapes, see [GI 025](#).

Approved by: 	8' x 22' x 12' Vault — Traffic — Normal Loading	VA 444
Effective Date: 05-16-2005	What's Changed?	Sheet 3 of 3
		UGS
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VA 446 5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

Scope VA 446.1 5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

Figure VA 446-1: 5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

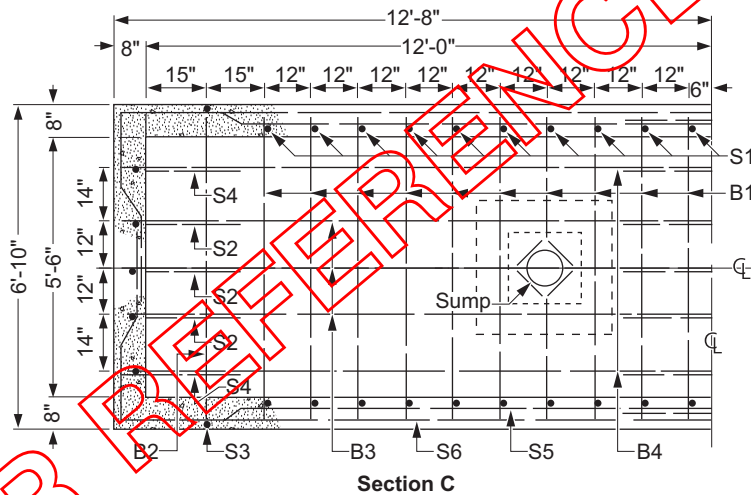
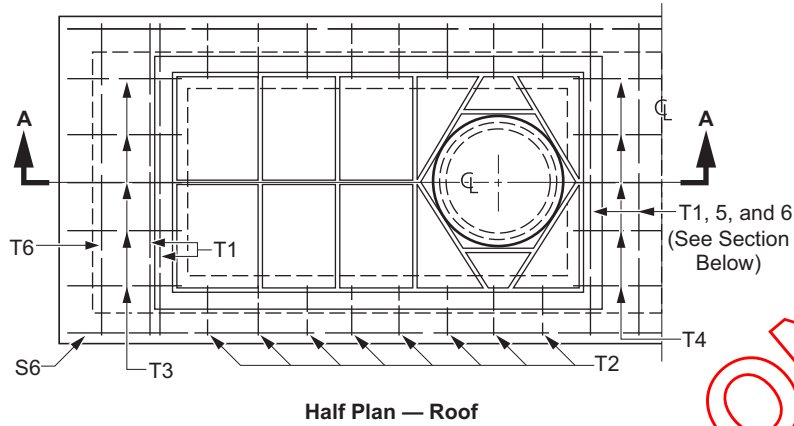


Figure VA 446-1.1: Half Plan — Roof and Section C

FOR REFERENCE ONLY

Approved by:

PhH

5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

VA 446

Effective Date:
05-16-2005

What's Changed?

Sheet 1 of 5

UGS

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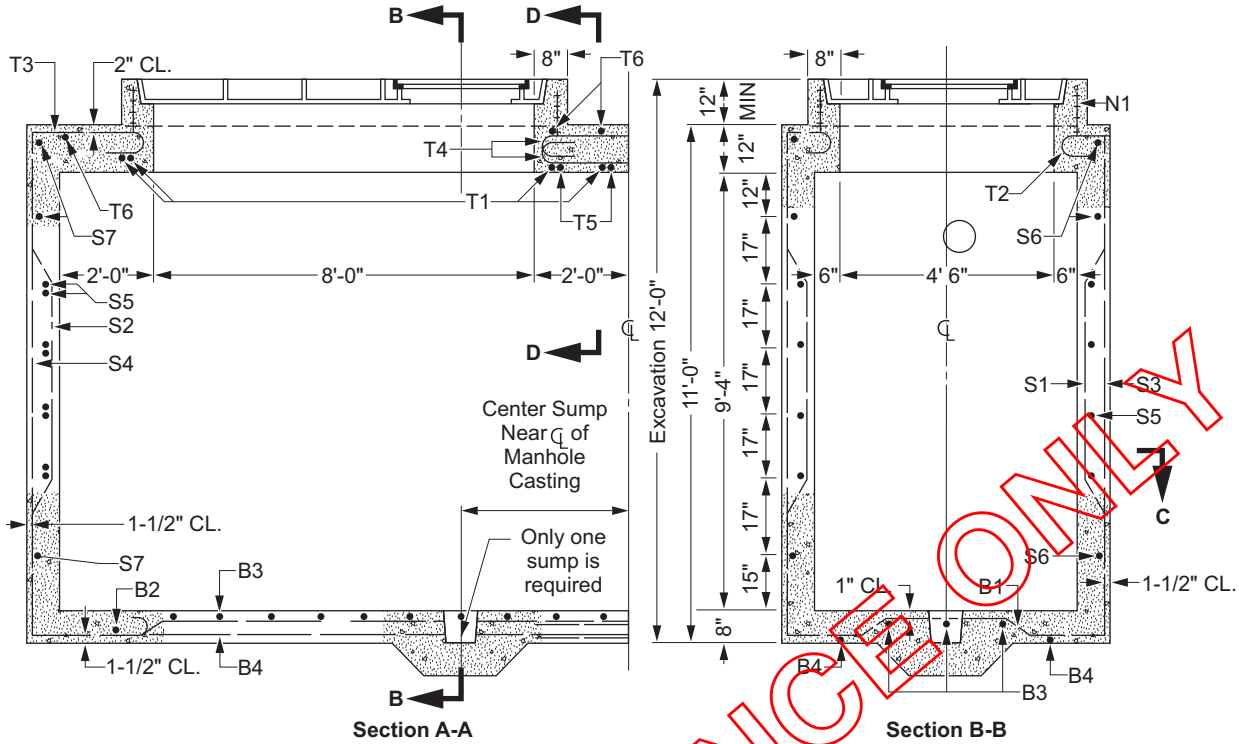
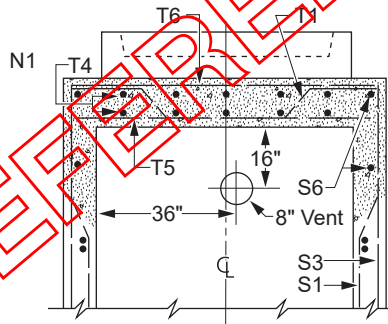


Figure VA 446-1.2: Section A-A and Section B-B



Excavation: 76.8 cu yd
Reinforcing Steel: 1004.6 Lb

Figure VA 446-1.3: Section D-D

Note(s):

1. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
2. For total quantities of steel, castings, and related foundry items. See summary sheet for each set of working drawings.
3. See working drawings for additional neck, conduit bank, and so on.
4. 76.8 cu. yds of excavation
5. 1004.6 pounds reinf. steel

VA 446

5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

Approved by:

PHH

Sheet 2 of 5

What's Changed?

Effective Date:

UGS

05-16-2005

Table VA 446-1: List of Materials — 5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

Quantity	Description
2	54" x 96" cast pan covers
23.6 cu yd	Concrete
As Detailed	Pull eyes

Table VA 446-2: Reinforcing Schedule — 5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
B1	20		1/2"	13'-0"	173.68
B2	2		1/2"	12'-10"	17.14
B3	6		3/8"	17'-11"	40.43
B4	4		3/8"	17'-8"	26.58
S1	40		3/8"	10'-11"	164.24
S2	6		3/8"	13'-11"	31.40
S3	4	Straight	3/8"	10'-8"	16.29
S4	4		3/8"	13'-8"	20.56
S5	16		3/8"	18'-7"	111.78
S6	12	Straight	3/8"	14'-6"	65.42
S7	6	Straight	3/8"	5'-6"	12.41
T1	8		5/8"	13'-5"	111.98
T2	32		3/8"	4'-8"	56.19
T3	10		1/2"	6'-2"	41.22
T4	10		1/2"	5'-0"	33.40
T5	4	Straight	3/8"	6'-6"	9.78
T6	6		1/2"	12'-10"	51.42
N1	58 ft ²	12 Ga. Welded Wire Fabric		2" x 2" Mesh	20.66

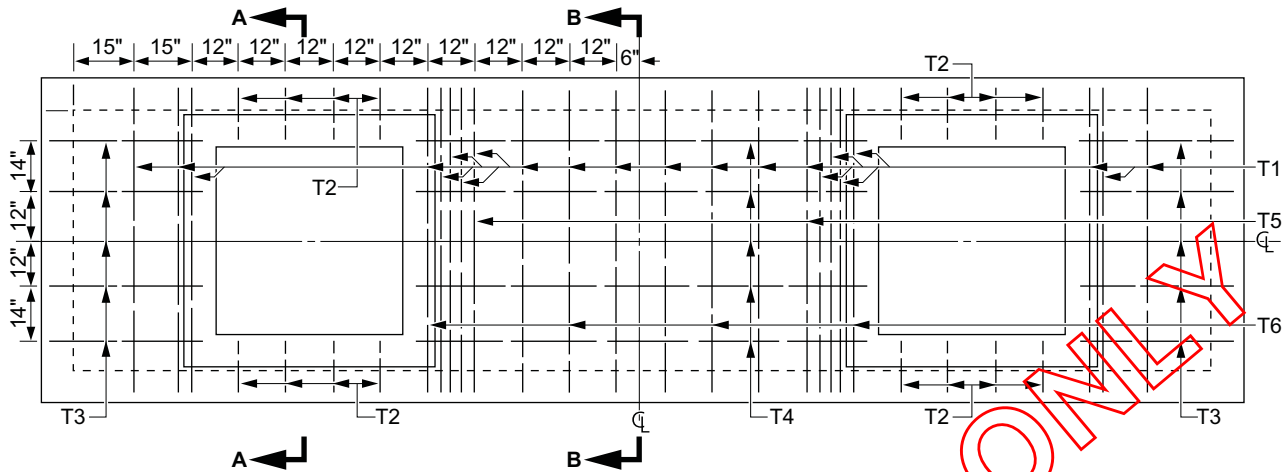
Note(s):

- For method of dimensioning shapes, see [GI 025](#).

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Effective Date: 05-16-2005	What's Changed?	Sheet 3 of 5
		UGS

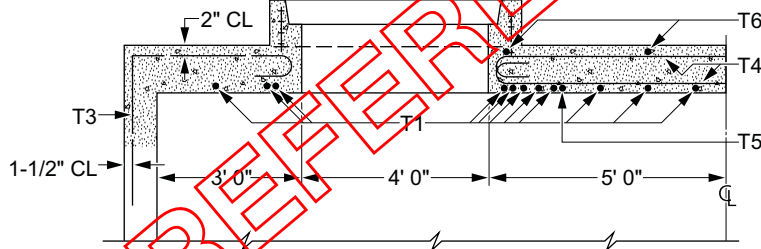
Scope VA 446.2 Alternate Roof Plan for VA 446 (Not Optional)

Figure VA 446-2: Alternate Roof Plan for VA 446 (Not Optional)

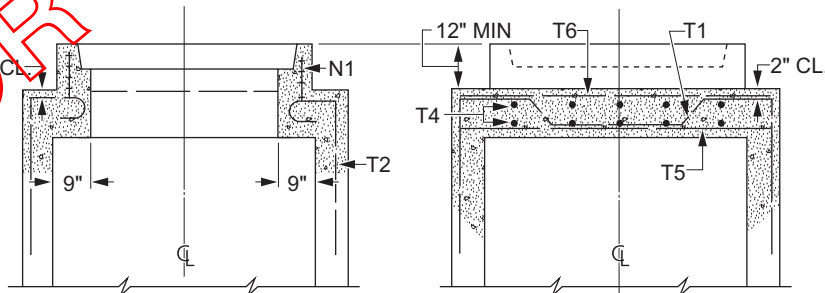


Roof Plan

For Wall, Floor Details and General Information,
See Note 3.



Center Line Section — Half Room Plan



Section A-A

Section B-B

Note(s):

1. 1192.5 pounds of reinforced steel — total for vault.
2. This roof requires an additional 2 cu. yards of concrete.
3. See [Scope VA 446.1 \(Sheet 1\)](#).

VA 446

5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading

Approved by:

PHH

Sheet 4 of 5

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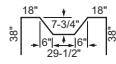



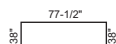
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Table VA 446-3: List of Materials for Alternate Roof Plan for VA 446


Quantity	Description
2	48" x 48" Cast
25.6 cu yd	Concrete (Total for Vault)
As Detailed	Pull Eyes

Table VA 446-4: Reinforcing Schedule for Alternate Roof Plan for VA 446

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
T1	22		5/8"	13'-5"	307.9
T2	16		3/8"	4'-11"	29.6
T3	10		1/2"	7'-2"	47.9
T4	10		1/2"	11'-0"	73.5
T5	2	Straight	3/8"	6'-6"	4.9
T6	4		1/2"	12'-10"	34.3
N1	40 ft ²	12 Ga. Welded Wire Fabric	2" x 2" Mesh		14.4

4. For method of dimensioning shapes, see [GI 025](#).

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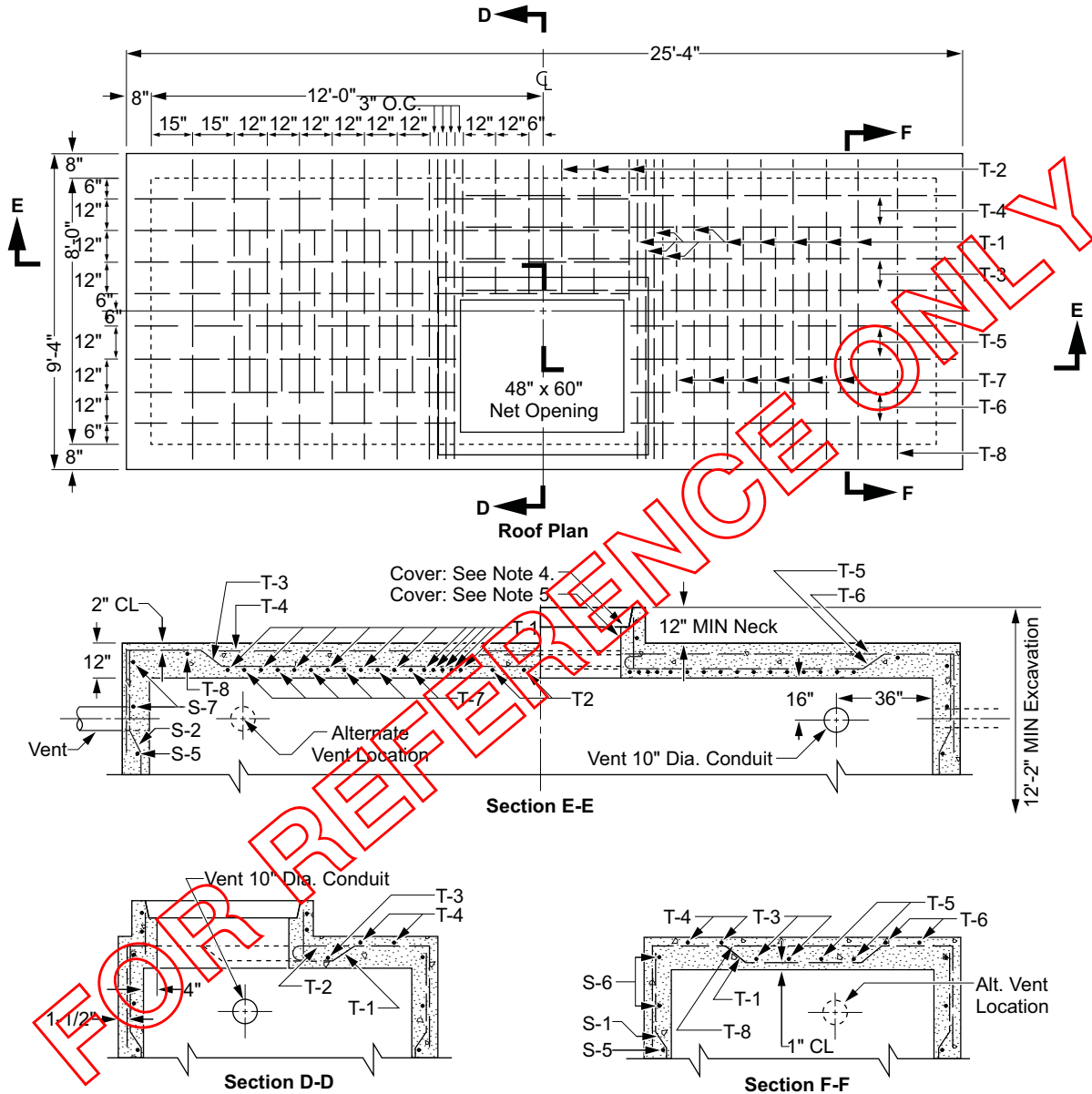
Approved by: 	5'-6" x 24'-0" x 9'-4" Vault — Traffic — Normal Loading	VA 446
Effective Date: 05-16-2005	What's Changed?	Sheet 5 of 5
		UGS

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VA 448 Vault — Traffic Loading — 8' x 24' x 9'-4"

Scope VA 448.1 Vault — Traffic Loading — 8' x 24' x 9'-4" — Roof

Figure VA 448-1: Vault — Traffic Loading — 8' x 24' x 9'-4" — Roof



Note(s):

1. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
2. For total quantities of steel, castings, and related foundry items see summary sheet for each set of working drawings.
3. See working drawings for additional neck, conduit bank, and so on.
4. See FC 641.
5. See VA 470.

Approved by:

PhH

Vault — Traffic Loading — 8' x 24' x 9'-4"

VA 448

Effective Date:

05-16-2005

What's Changed?

Sheet 1 of 6

UGS

Table VA 448-1: Reinforcing Schedule — Vault — Traffic Loading — 8' x 24' x 9'-4" — Roof

Mark	Quant.	Type	Size	Lgth. Each	Wt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wt. Lb
T-1	20		#6 Ø	15'-10"	476	T-5	4		#5 Ø	14'-2"	59
T-2	6		#5 Ø	8'-3"	70	T-6	4		#5 Ø	13'-9"	58
T-3	4		#5 Ø	18'-5"	104	T-7	12	Straight	#6 Ø	5'-0"	90
T-4	4		#5 Ø	18'-2"	76	T-8	2		#5 Ø	15'-4"	32

Note(s):

1. For method of dimensioning shapes see [GI 025](#).

FOR REFERENCE ONLY

VA 448

Vault — Traffic Loading — 8' x 24' x 9'-4"

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PHH

Sheet 2 of 6

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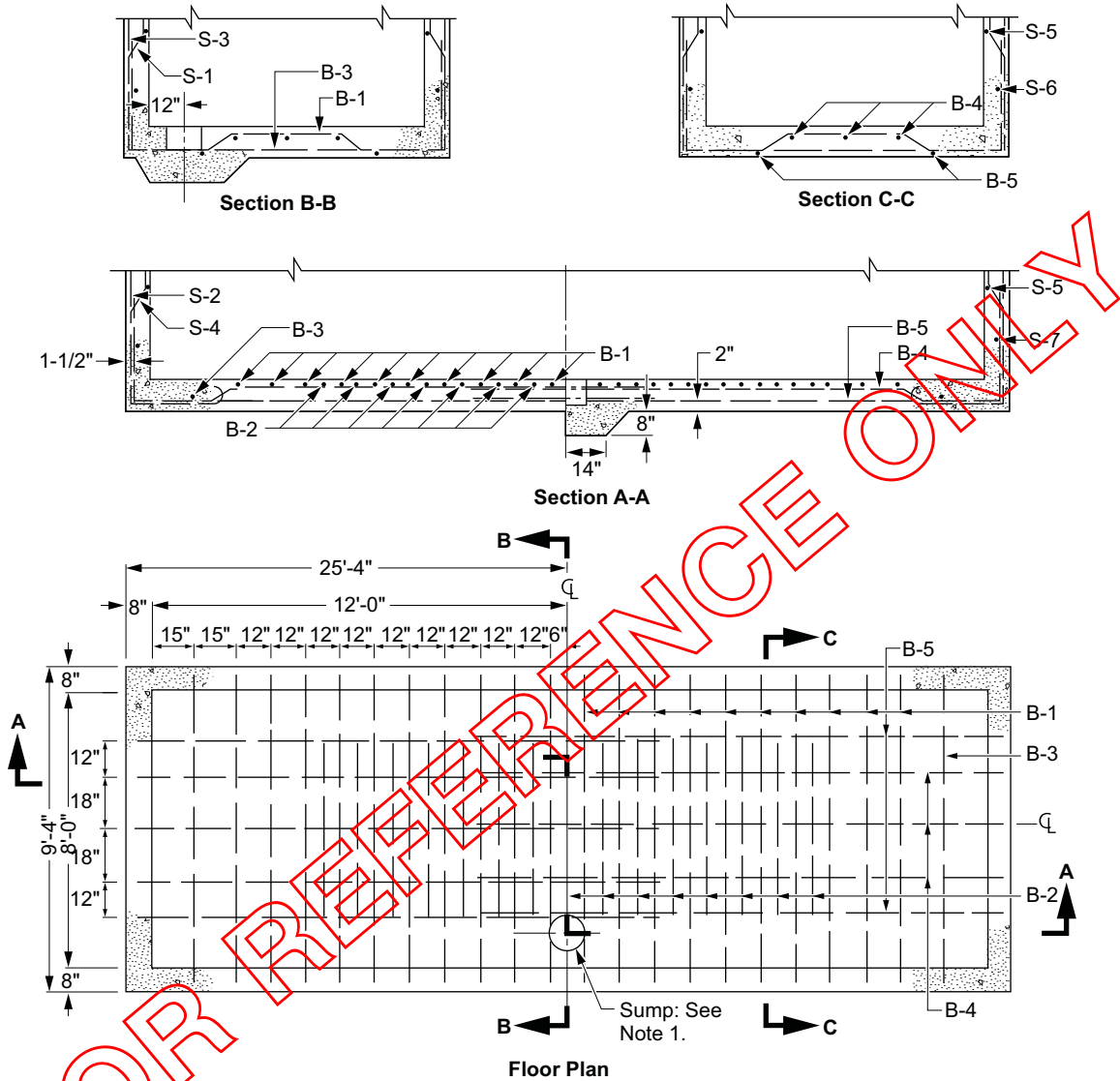
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05-16-2005

Scope VA 448.2 Vault — Traffic Loading — 8' x 24' x 9'-4" — Floor

Figure VA 448-2: Vault — Traffic Loading — 8' x 24' x 9'-4" — Floor



Note(s):

1. See AC 710.

Approved by:

PHH

Vault — Traffic Loading — 8' x 24' x 9'-4"

VA 448

Effective Date:

05-16-2005

What's Changed?

Sheet 3 of 6

UGS

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Table VA 448-2: Reinforcing Schedule — Vault — Traffic Loading — 8' x 24' x 9'-4" — Floor

Mark	Quant.	Type	Size	Lgth. Each	Wt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wt. Lb
B-1	20		5 Ø	15'-8"	327	B-4	6		3 Ø	18'-3"	42
B-2	15	Straight	3 Ø	5'-0"	29	B-5	4		3 Ø	18'-2"	28
B-3	2		5 Ø	15'-4"	32						

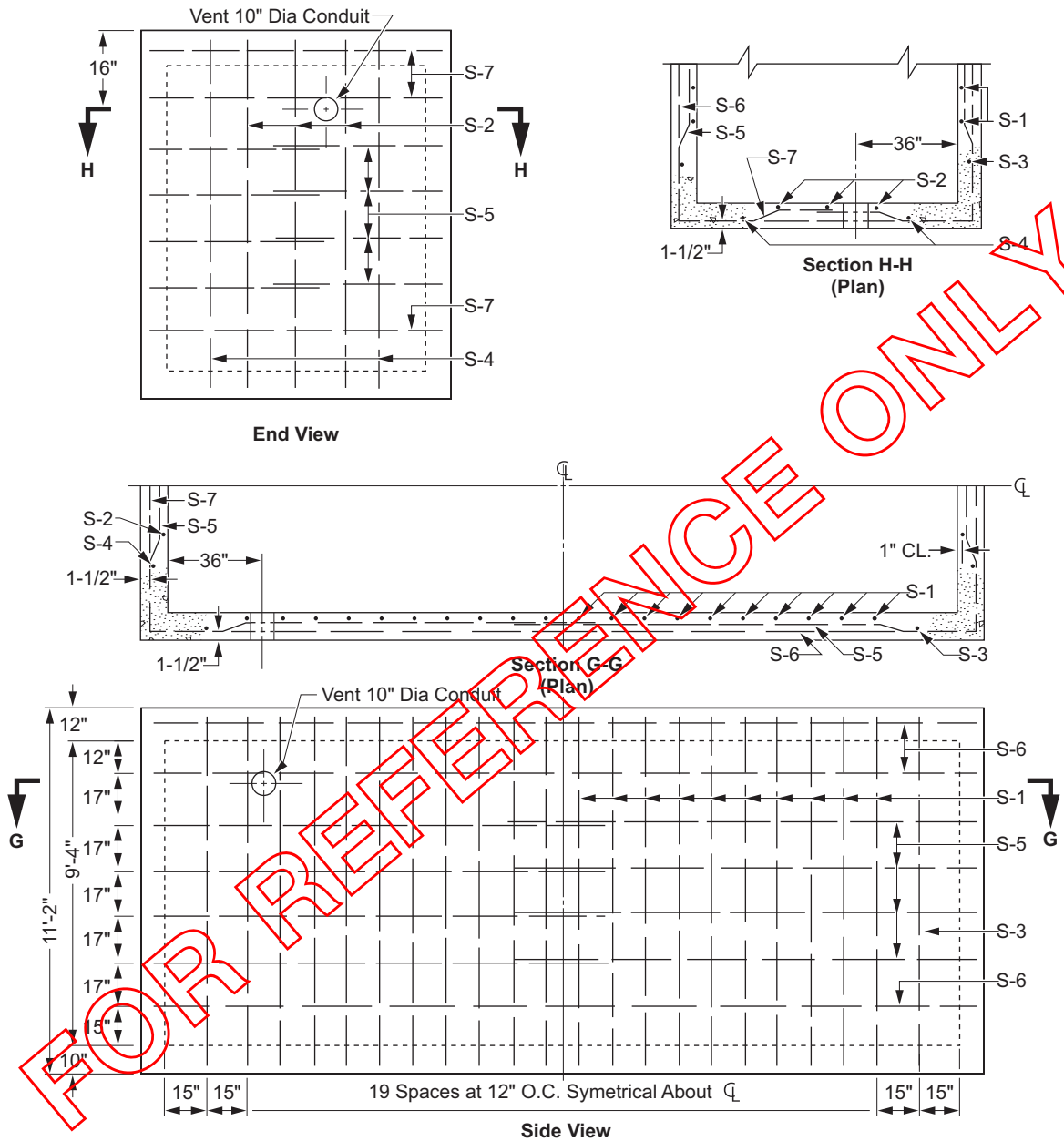
Note(s):

- For method of dimensioning shapes, see [GI 025](#).

FOR REFERENCE ONLY

Scope VA 448.3 Vault — Traffic Loading — 8' x 24' x 9'-4" — Walls

Figure VA 448-3: Vault — Traffic Loading — 8' x 24' x 9'-4" — Walls



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PhH

Vault — Traffic Loading — 8' x 24' x 9'-4"

VA 448

Effective Date:
05-16-2005

What's Changed?

Sheet 5 of 6

UGS

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Table VA 448-3: Reinforcing Schedule — Vault — Traffic Loading — 8' x 24' x 9'-4" — Walls

Mark	Quant.	Type	Size	Lgth. Each	Wt. Lb	Mark	Quant.	Type	Size	Lgth. Each	Wt. Lb
S-1	40		5 Ø	10'-11"	456	S-5	16		3 Ø	19'-3"	116
S-2	6		3 Ø	13'-11"	31	S-6	6	Straight	3 Ø	24'-0"	54
S-3	4	Straight	3 Ø	10'-8"	16	S-7	6	Straight	3 Ø	8'-0"	18
S-4	4		3 Ø	13'-8"	21						

Note(s):

- For method of dimensioning shapes, see [GI 025](#).

FOR REFERENCE ONLY

VA 450 Vault (Traffic) — 8' x 26' x 9'-4"

Scope VA 450.1 Vault (Traffic) — 8' x 26' x 9'-4"

Figure VA 450-1: Vault (Traffic) — 8' x 26' x 9'-4"

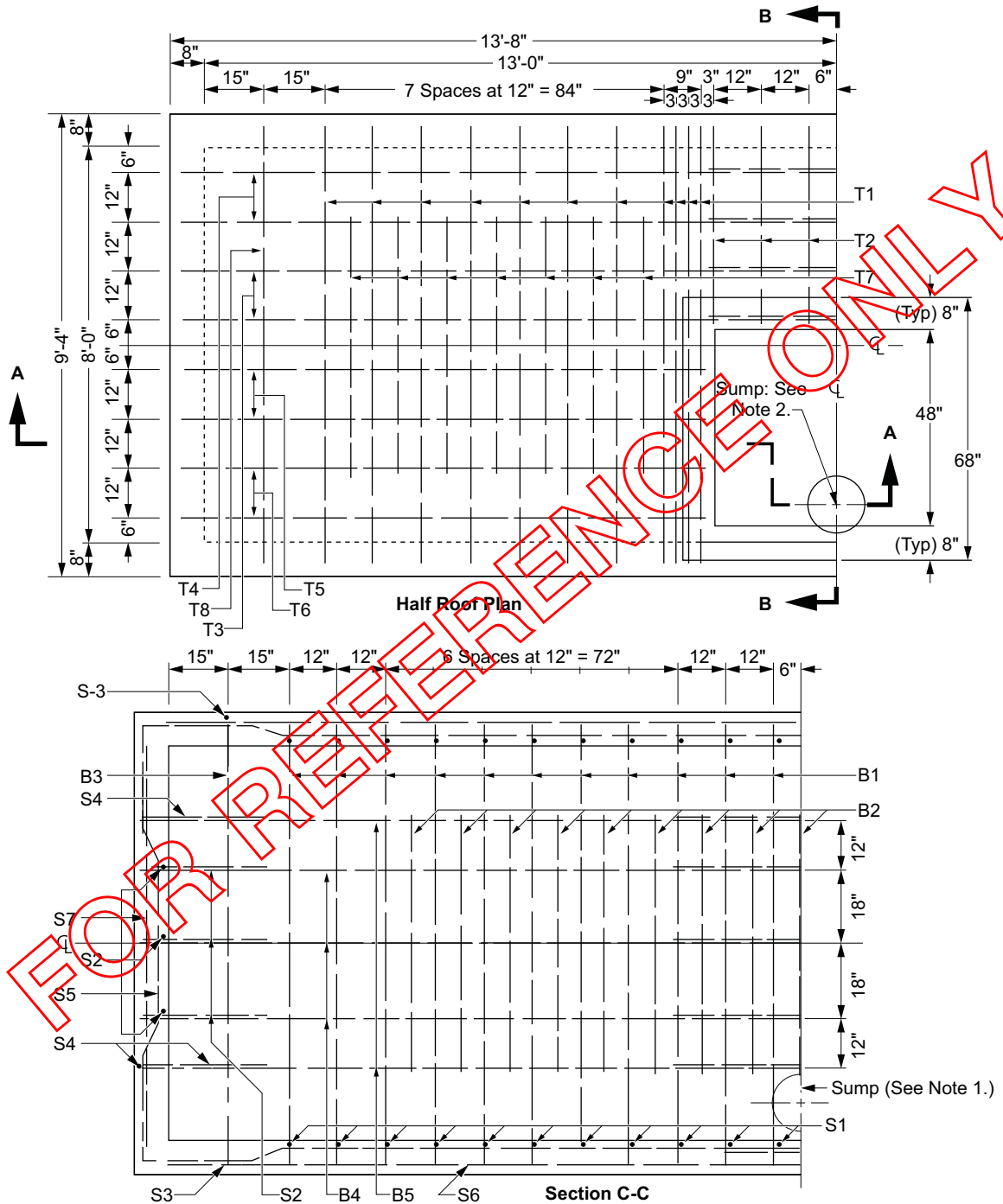


Figure VA 450-1.1: Half Roof Plan and Section C-C

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PHH

Vault (Traffic) — 8' x 26' x 9'-4"

VA 450

Effective Date:

05-16-2005

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Sheet 1 of 4

UGS

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Note(s):

1. Deflect floor steel as required to allow for installation of pump.
2. See AC 710.

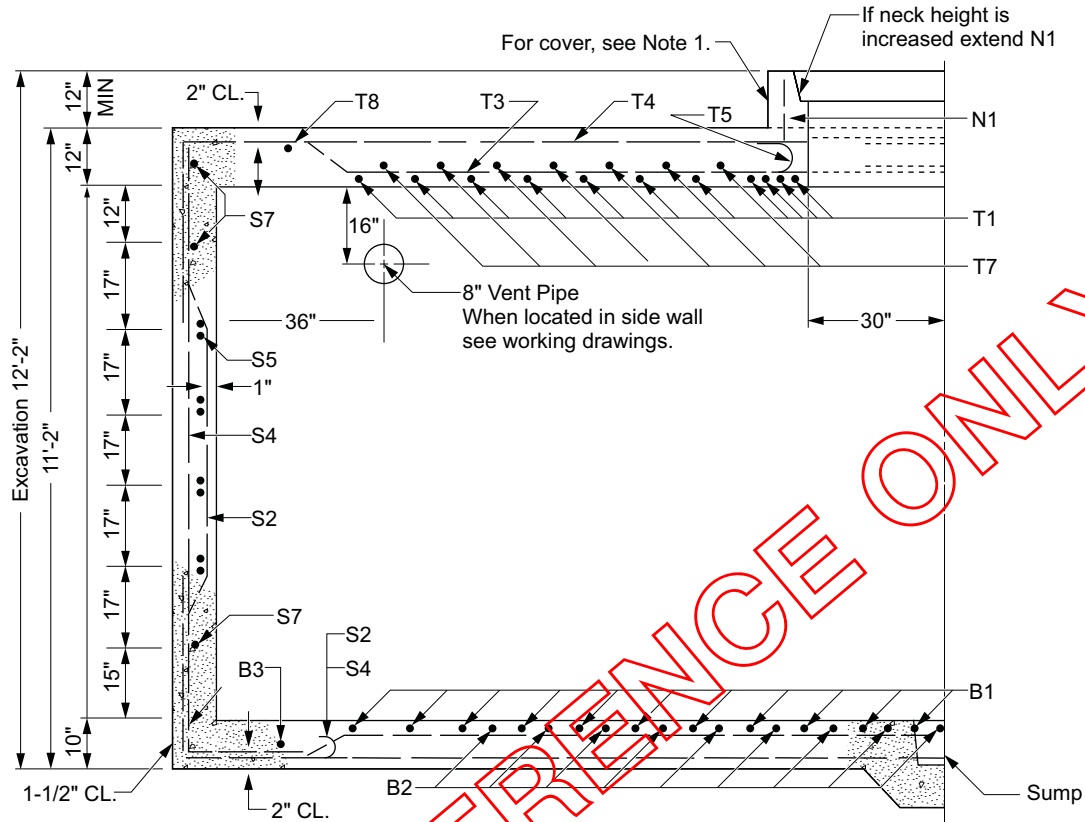


Figure VA 450-1.2: Section A-A

Note(s):

1. See VA 470.

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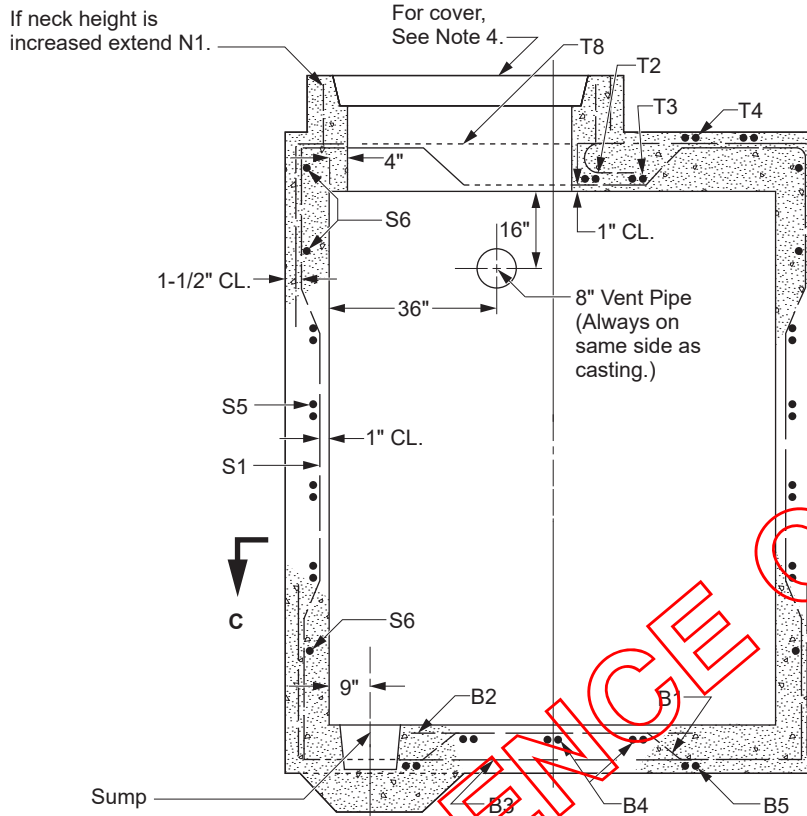


Figure VA 450-1.3: Section B-B

Note(s):

1. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
2. For total quantities of steel castings and related foundry items, see summary sheets for each set of working drawings.
3. See drawings for additional necks, conduit bank, and so on.
4. See FC 641.

Table VA 450-1: List of Materials — Vault (Traffic) — 8' x 26' x 9'-4"

Quantity	Description
1 Only	48' x 60' Vault Casting
33.25 cu yd	Concrete
	Inserts — See AC 725

Approved by:

PhH

Vault (Traffic) — 8' x 26' x 9'-4"

VA 450

Sheet 3 of 4

Effective Date:

What's Changed?

05-16-2005

UGS

Table VA 450-2: Reinforcing Schedule — Vault (Traffic) — 8' x 26' x 9'-4"

Mark	Quant.	Type	Size	Length Each	Weight Lb
B1	22		5	15'-8"	360
B2	17	Straight	3	5'-0"	32
B3	2		5	15'-4"	32
B4	6		3	19'-3"	44
B5	4		3	19'-2"	29
S1	44		5	10'-11"	502
S2	6		3	13'-11"	32
S3	4	Straight	3	10'-8"	16
S4	4		3	13'-8"	21
S5	16		3	19'-3"	116
S6	6	Straight	3	26'-0"	59
S7	6	Straight	3	8'-0"	18
T1	22		6	15'-10"	524
T2	6		5	8'-3"	52
T3	4		5	19'-5"	81
T4	4		5	19'-2"	80
T5	4		5	15'-2"	63
T6	4		5	14'-6"	61
T7	14	Straight	6	5'-0"	106
T8	2		5	15'-4"	32
N1	23 ft ²	12" Wide Normal	Welded Wire Fabric 12 Ga. 2" x 2" Mesh. 8 MIN		

Note(s):

- For methods of dimensioning shapes, see [GI 025](#).

VA 450

Vault (Traffic) — 8' x 26' x 9'-4"

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Sheet 4 of 4

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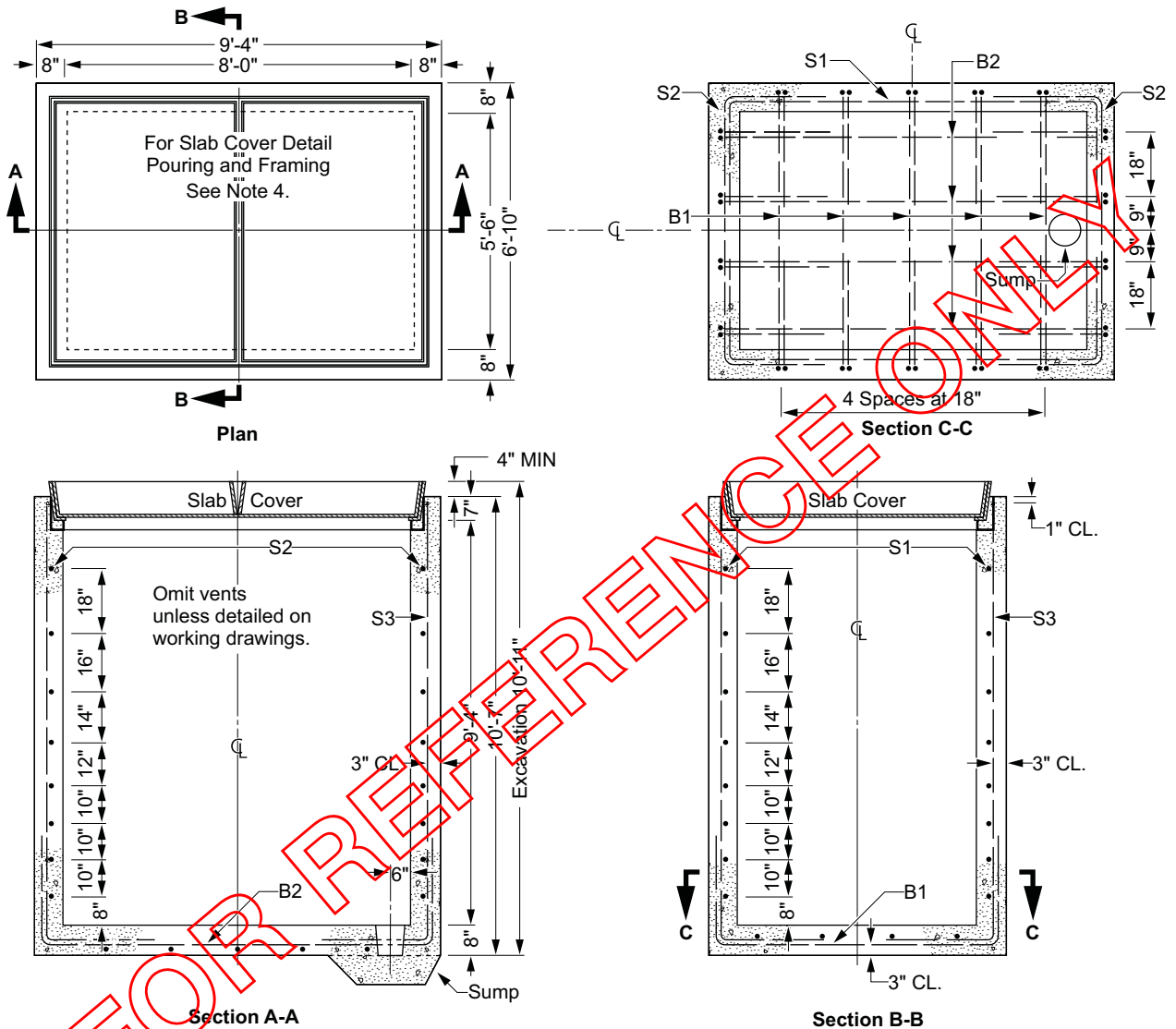
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VA 460 5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Scope VA 460.1 5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Figure VA 460-1: 5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading



Excavation: 25.93 cu yd
Reinforcing Steel: 316.89 cu yd

Note(s):

1. See [VA 400](#) for index to reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
2. For total quantities of steel, castings, and related foundry items see summary sheet for each set of working drawings.
3. See working drawings for conduit bank, and so on.
4. See [FC 650](#).

Approved by:

PHH

5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

VA 460

Effective Date:

05-16-2005

What's Changed?

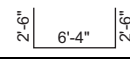
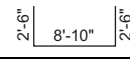
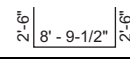
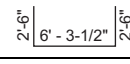
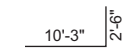
Sheet 1 of 2

UGS

Table VA 460-1: List of Materials — 5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Quantity	Description
1 Only	5-1/2" x 8' — 2 Pc. Slab Cover
9.0 cu yd	Concrete
As Detailed	Pull Eyes


Table VA 460-2: Reinforcing Schedules — 5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
B1	5		5/8"	11'-4"	58.92
B2	4		3/8"	13'-10"	20.80
S1	16		3/8"	13' - 9-1/2"	82.96
S2	16		3/8"	11' - 3-1/2"	67.92
S3	18		3/8"	12' - 9"	86.29

Note(s):

1. For method of dimensioning shapes, see [GI 025](#).

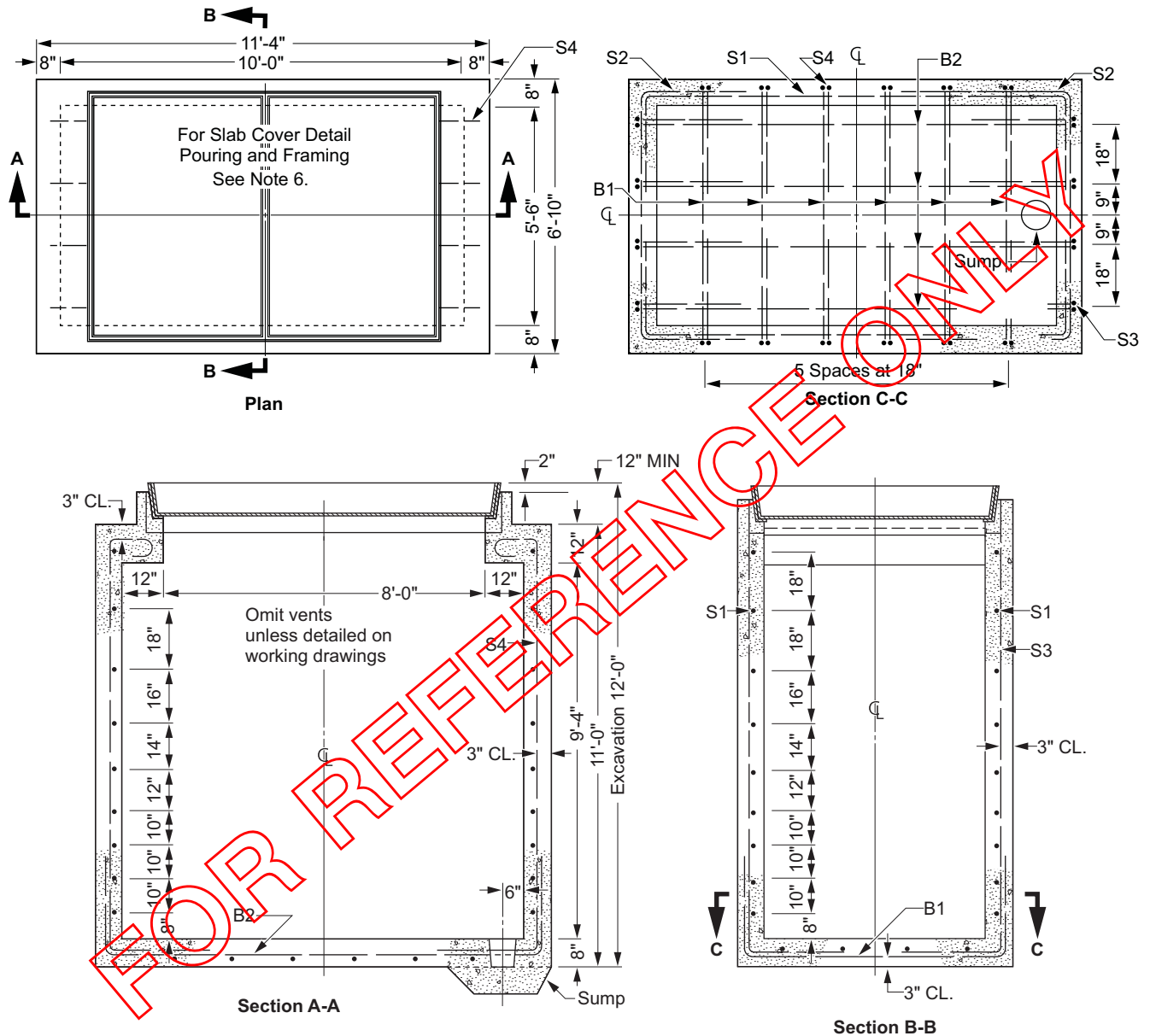
FOR REFERENCE ONLY

VA 460	5'-6" x 8' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 05-16-2005
UGS		

VA 462 5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Scope VA 462.1 5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Figure VA 462-1: 5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading



Note(s):

1. 34.4 cu yd Excavation
2. 382.23 Pounds Reinforcing Steel
3. See VA 400 for index to reference drawing giving installation details, schedules, and general requirements for vault structures and accessories.
4. For total quantities of steel, castings, and related foundry items see summary sheet for each set of working drawings.
5. See working drawings for conduit bank, and so on.
6. See FC 650.

Approved by:

PhH

5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

VA 462

Effective Date:

What's Changed?

Sheet 1 of 2

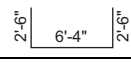
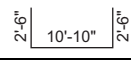
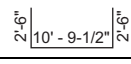
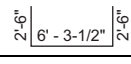
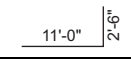
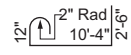
05-16-2005

UGS

Table VA 462-1: List of Material — 5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Quantity	Description
1 Only	5-1/2" x 8' — 2 Pc. Slab Cover
12.0 cu yd	Concrete
As Detailed	Pull Eyes

Table VA 462-2: Reinforcing Schedule — 5'-6" x 10' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
B1	6		5/8"	11'-4"	70.70
B2	4		3/8"	15'-10"	23.81
S1	18		3/8"	15' - 9-1/2"	106.87
S2	18		3/8"	11' - 3-1/2"	76.41
S3	12		3/8"	13'-6"	60.91
S4	8		3/8"	14'-6"	43.62

Note(s):

- For method of dimensioning shapes, see [GI 025](#).

FOR REFERENCE ONLY

VA 464 5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Scope VA 464.1 5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Figure VA 464-1: 5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

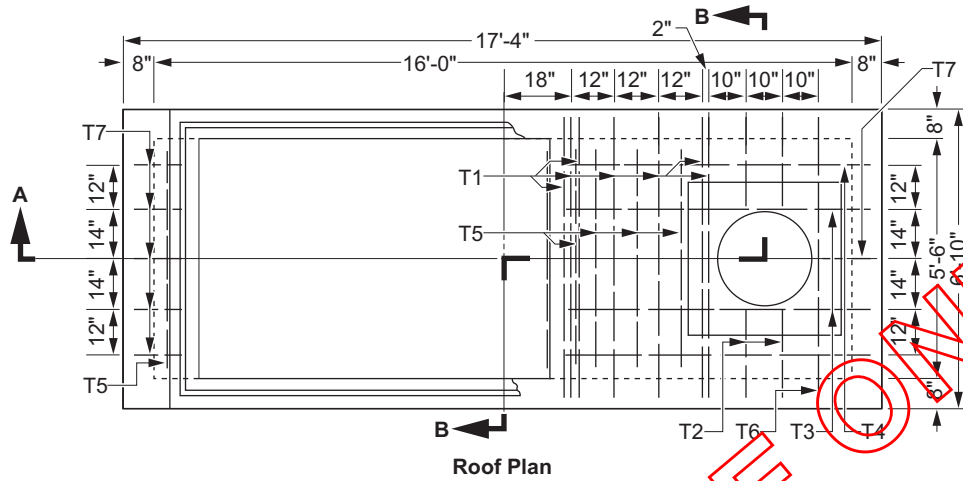


Figure VA 464-1.1: Roof Plan

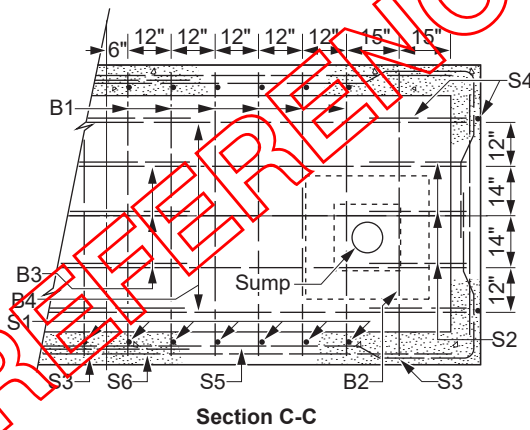


Figure VA 464-1.2: Section C-C

FOR REFERENCE ONLY

Approved by:	5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading	VA 464
Effective Date:	What's Changed?	Sheet 1 of 3
05-16-2005		UGS

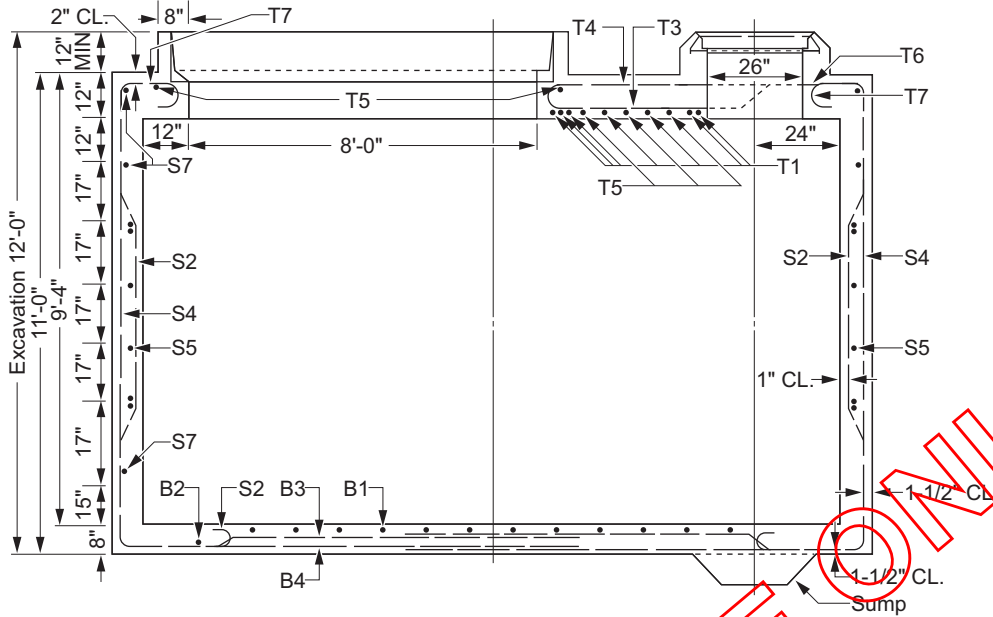


Figure VA 464-1.3: Section A-A

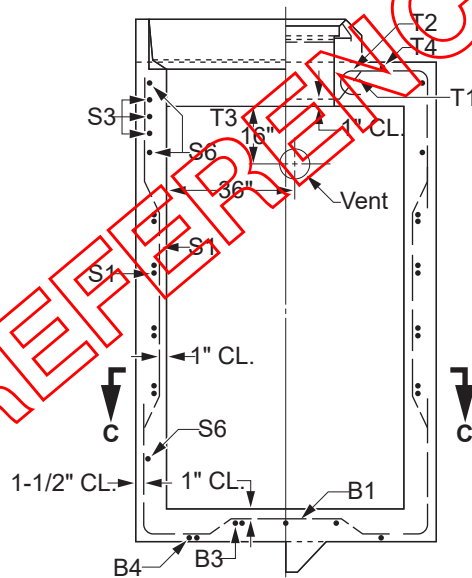


Figure VA 464-1.4: Section B-B

Note(s):

1. 52.60 cu. yds. excavation pounds reinforcing steel.
2. See VA 400 for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories.
3. For total quantities of steel, castings, and related foundry items, see summary sheet for each set of working drawings.
4. See working drawings for additional neck, conduit bank, and so on.

VA 464

5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

05-16-2005

Table VA 464-1: List of Material — 5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Quantity	Description
1 Only	5-1/2' x 8' Slab Frame and Cover
1 Only	26 DIA Manhole Casting
18.5 cu yd	Concrete (GI 020)
As Detailed	Pull Eyes

Table VA 464-2: Reinforcing Schedule — 5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading

Mark	Quant.	Type	Size (DIA)	Lgth. Each	Wgt. Lb
B1	12		1/2"	13'-0"	104.21
B2	2		1/2"	12'-10"	17.14
B3	6		3/8"	13'-11"	31.40
B4	4		3/8"	13'-10"	20.80
S1	24		3/8"	10'-11"	98.54
S2	6		3/8"	13'-11"	31.43
S3	10	Straight	3/8"	10'-8"	40.12
S4	4		3/8"	13'-8"	20.56
S5	16		3/8"	14'-7"	87.71
S6	6	Straight	3/8"	16'-0"	36.10
S7	6	Straight	3/8"	5'-6"	12.41
T1	7		5/8"	13'-5"	97.70
T2	4		5/8"	5'-10"	24.45
T3	2		5/8"	11'-5"	23.75
T4	2		3/8"	11'-2"	8.40
T5	5	Straight	3/8"	5'-0"	9.40
T6	1		1/2"	12'-10"	8.57
T7	6		5/8"	5'-1"	31.70

FOR REVIEW ONLY

Approved by: 	5'-6" x 16' x 9'-4" Vault — Slab Cover — Traffic — Normal Loading	VA 464
Effective Date: 05-16-2005	What's Changed?	Sheet 3 of 3
		UGS

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VA 466 8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Scope VA 466.1 8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Figure VA 466-1: 8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

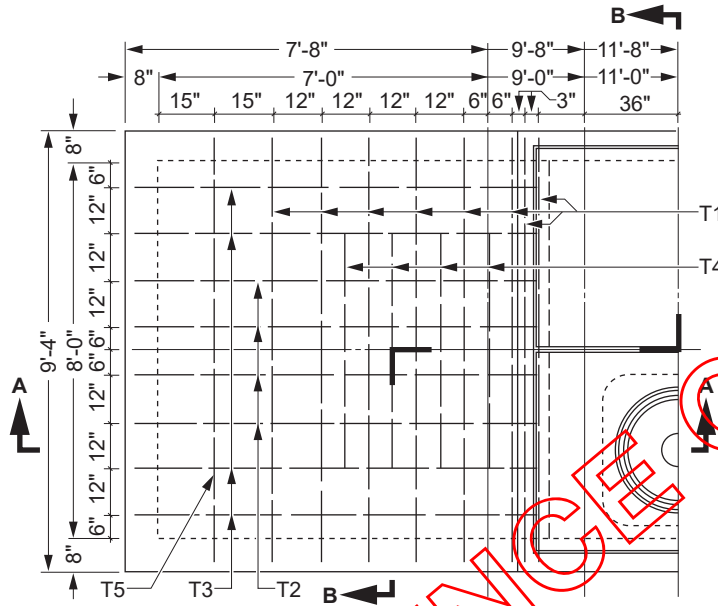


Figure VA 466-1.1: Roof Half-Plan

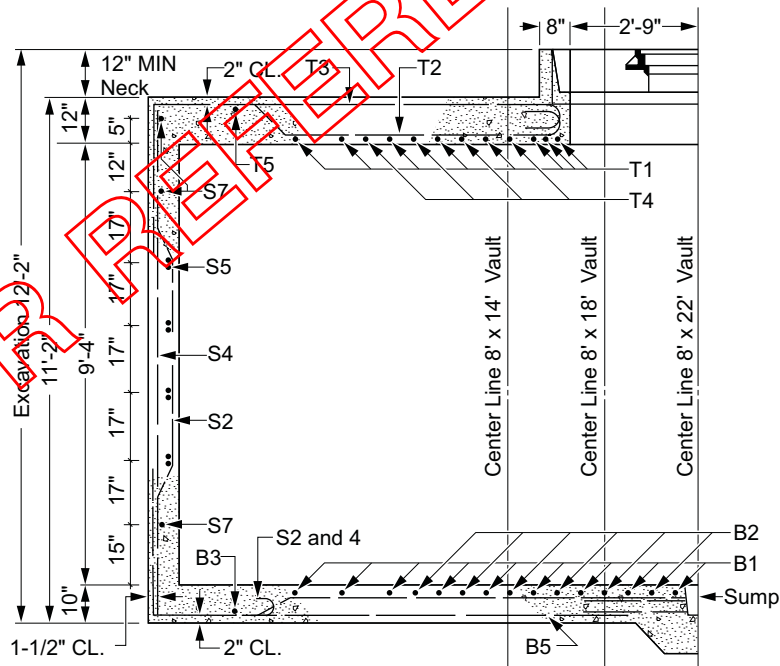


Figure VA 466-1.2: Section A-A

Approved by:

PhH

8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

VA 466

Effective Date:

05-16-2005

What's Changed?

Sheet 1 of 5

UGS

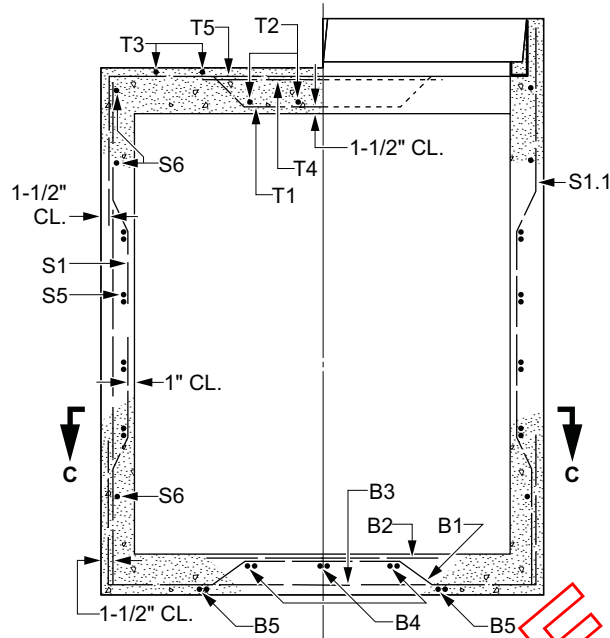


Figure VA 466-1.3: Section B-B

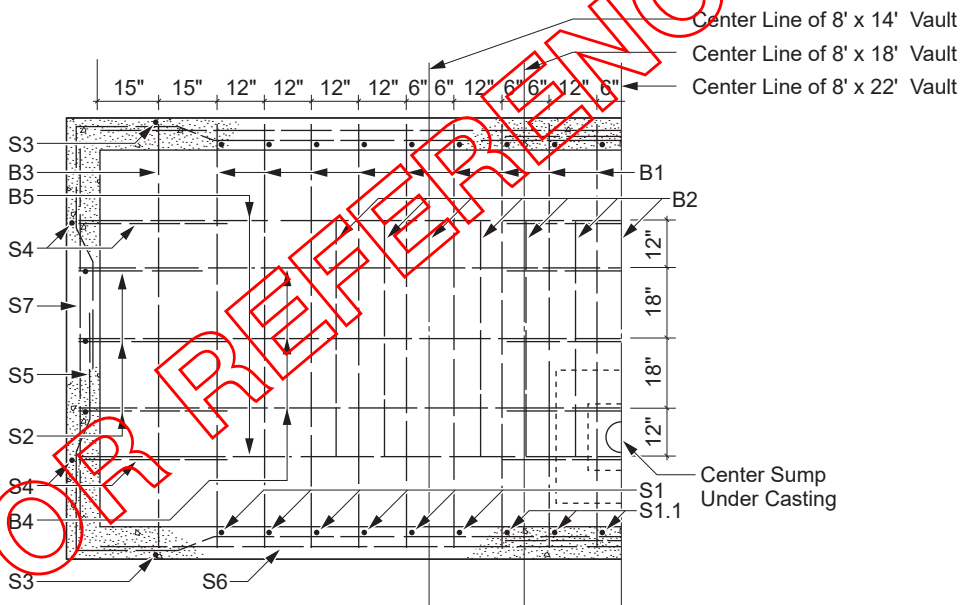


Figure VA 466-1.4: Section C-C

Note(s):

1. These 3 sizes of vaults have been consolidated into one drawing because all three are identical in steel placement and slab location and installation. See [Table VA 466-1 \(Sheet 3\)](#), [Table VA 466-2 \(Sheet 4\)](#), and [Table VA 466-3 \(Sheet 5\)](#) for steel schedule, excavation, and concrete yardages.
2. See [VA 400](#) for reference drawings giving installation details, schedules, and general requirements for vault structures and accessories. For total quantities steel, castings, and related foundry items, see summary on each set of working drawings. See working drawings for additional neck, conduit bank, and so on.
3. Locate center of vent pipe entrance 16" below ceiling and 36" from end or side wall as shown on working drawing.

VA 466

8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Approved by:

PHH

Sheet 2 of 5

What's Changed?

Effective Date:

UGS

05-16-2005

Table VA 466-1: 8'-0" x 14'-0" — 8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	
B1	10		5	15'-8"	162.97	
B2	5	Straight	3	5'-0"	9.40	
B3	2		5	15'-4"	31.89	
B4	6		3	15'-3"	34.40	
B5	4		3	13'-2"	19.81	
S1	8		3	10'-11"	32.88	
S1.1	12		3	11'-11"	53.76	
S2	6		3	13'-11"	31.40	
S3	4	Straight	3	10'-8"	16.05	
S4	4		3	13'-8"	20.56	
S5	16		3	15'-3"	91.74	
S6	6	Straight	3	14'-0"	31.58	
S7	6	Straight	3	8'-0"	18.05	
T1	8		6	15'-10"	190.24	
T2	8		5	8'-8"	72.32	
T3	8		5	8'-6"	70.96	
T5	2		5	15'-4"	31.98	
					Total:	919.99

Note(s):

- 5'-6" x 8'-0" 2 Pc. Slab Cover/26" DIA Casting
- Excavation — 64.5 cu yd
- Concrete — 19.3 cu yd
- For method of dimensioning shapes, see [GI 025](#).

Approved by: 	8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading	VA 466
Effective Date: 05-16-2005	What's Changed?	Sheet 3 of 5
		UGS

Table VA 466-2: 8'-0" x 18'-0" — 8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb
B1	14		5	15'-8"	228.16
B2	9	Straight	3	5'-0"	16.92
B3	2		5	15'-4"	31.89
B4	6		3	15'-3"	34.40
B5	4		3	15'-2"	22.82
S1	16		3	10'-11"	65.76
S1.1	12		3	11'-11"	53.76
S2	6		3	13'-11"	31.40
S3	4	Straight	3	10'-8"	16.05
S4	4		3	13'-8"	20.56
S5	16		3	17'-3"	103.78
S6	6	Straight	3	18'-0"	40.61
S7	6	Straight	3	8'-0"	18.05
T1	12		6	15'-10"	285.36
T2	8		5	10'-8"	89.04
T3	8		5	10'-6"	87.60
T4	4	Straight	3	5'-0"	7.52
T5	2		5	15'-4"	31.98
Total:					1185.66

Note(s):

1. 5'-6" x 8'-0" 2 Pc. Slab Cover/26" DIA Casting
2. Excavation — 81.3 cu yd
3. Concrete — 23.6 cu yd
4. For method of dimensioning shapes, see GI 025.

VA 466

8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Approved by:

PHH

Sheet 4 of 5

What's Changed?

Effective Date:

05-16-2005

UGS

Table VA 466-3: 8'-0" x 22'-0" — 8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading

Mark	Quant.	Type	Size	Lgth. Each	Wgt. Lb	
B1	18		5	15'-8"	293.34	
B2	13	Straight	3	5'-0"	24.44	
B3	2		5	15'-4"	31.89	
B4	6		3	17'-3"	38.92	
B5	4		3	17'-2"	25.82	
S1	24		3	10'-11"	98.64	
S1.1	12		3	11'-11"	53.76	
S2	6		3	13'-11"	31.40	
S3	4	Straight	3	10'-8"	16.05	
S4	4		3	13'-8"	20.56	
S5	16		3	19'-3"	115.81	
S6	6	Straight	3	22'-0"	49.63	
S7	6	Straight	3	8'-0"	18.05	
T1	16		6	15'-10"	380.48	
T2	8		5	12'-8"	105.68	
T3	8		5	12'-6"	104.32	
T4	8	Straight	3	5'-0"	15.04	
T5	2		5	15'-4"	31.98	
					Total:	1455.81

FOR REFERENCE ONLY

Note(s):

- 5'-6" x 8'-0" 2 Pc. Slab Cover/26" DIA Casting
- Excavation — 98.1 cu yd
- Concrete — 28.0 cu yd
- For method of dimensioning shapes, see [GI 025](#).

Approved by: 	8' x 14', 18', and 22' x 9'-4" Vault — Traffic Slab Cover — Normal Loading	VA 466
Effective Date: 05-16-2005	What's Changed?	Sheet 5 of 5
		UGS

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VA 470 Neck Vault Details

Scope VA 470.1 Neck Vault Details

Figure VA 470-1: Neck Vault Details

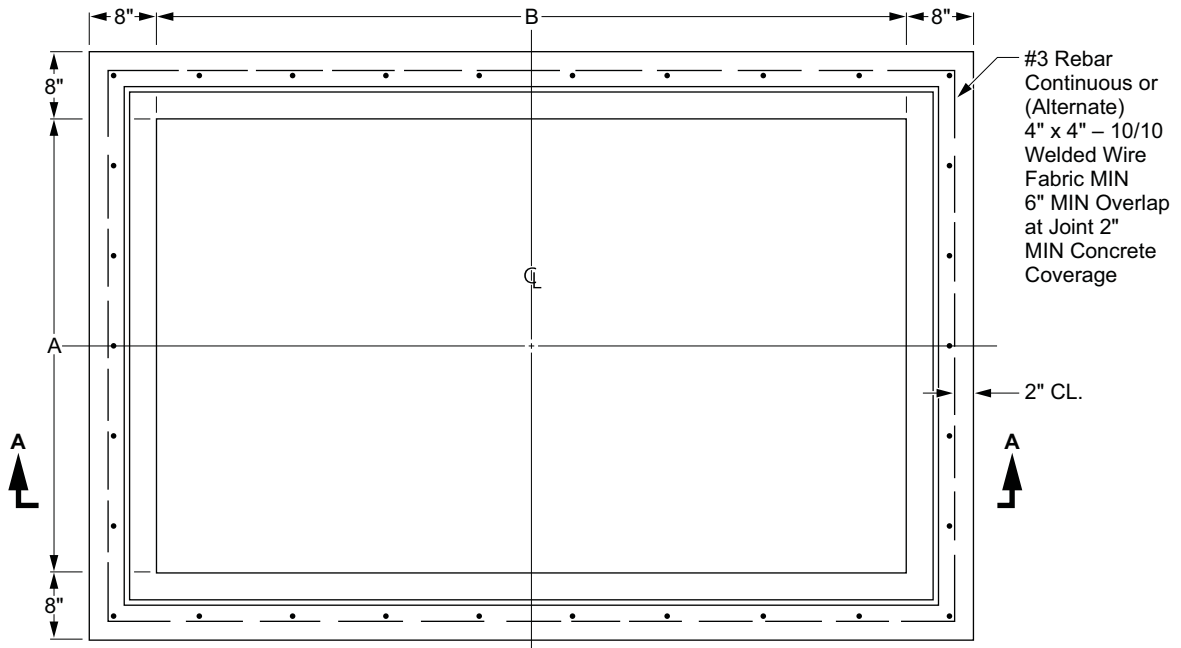



Figure VA 470-1.1: Neck Vault Details

Approved by: 	Neck Vault Details	VA 470
Effective Date: 05-16-2005	What's Changed?	Sheet 1 of 3 UGS

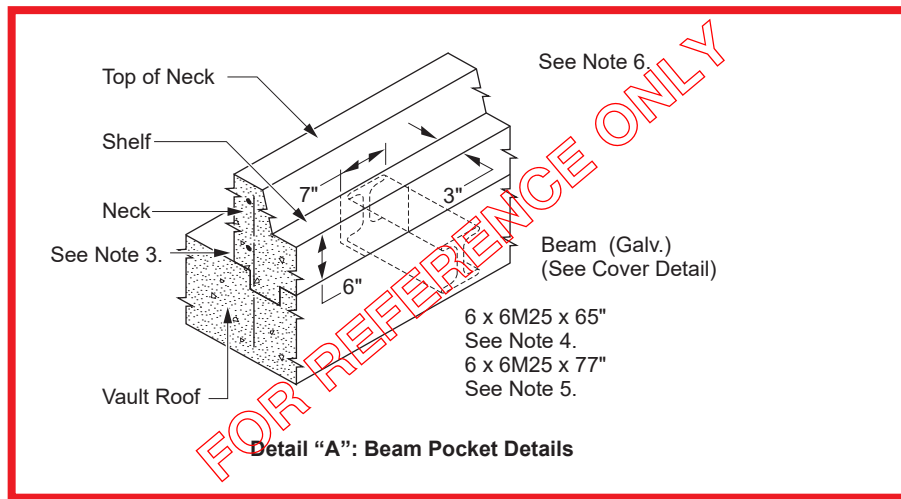
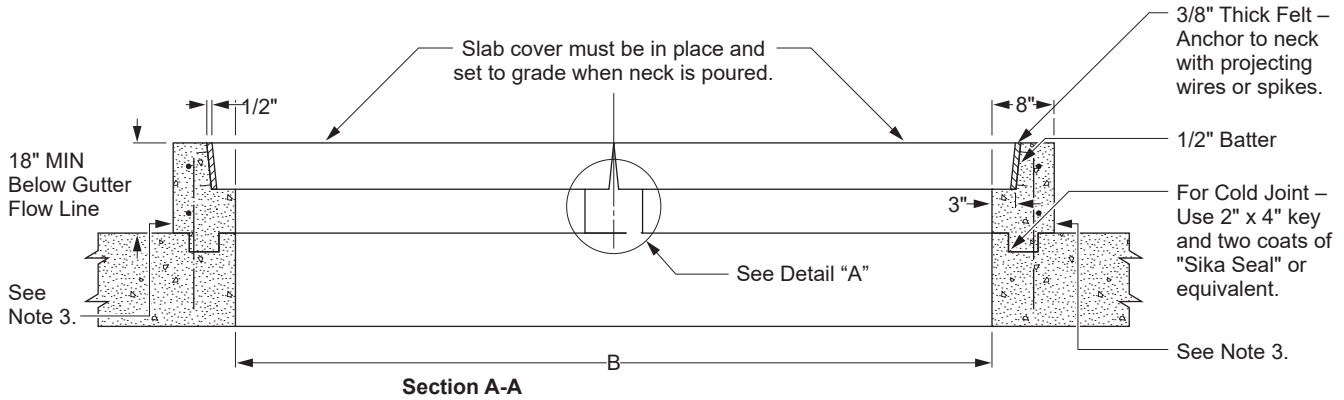


Figure VA 470-1.2: Section A-A and Beam Pocket Details

= For Reference Only

Note(s):

1. Concrete per [GI 020](#).
2. Manufactured precast necks with these requirements may be purchased from SCE approved suppliers.
3. Bonding adhesive per [GI 030](#).
4. See [FC 642](#).
5. See [FC 643](#).
6. Beam pocket required for [FC 642](#), 5' x 8', and [FC 643](#). 6' x 8' two-piece covers only. Beam must be removable and even with lip of neck without spacers when installed.

VA 470

Neck Vault Details

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

05-16-2005

Table VA 470-1:

Vault Cover		Dimensions	
No.	Size	Clear Opening	
		A	B
FC 640	48" x 48"	48"	48"
FC 641	48" x 48"	48"	48"
FC 642	60" x 96"	60"	90"
FC 643	72" x 96"	72"	96"

= For Reference Only

Approved by:

PhH

Neck Vault Details

VA 470

Sheet 3 of 3

Effective Date:

05-16-2005

What's Changed?


UGS

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Surface or Semi-Buried Structures

Table of Contents


Standard	Title
SS 500	Slab Box and Pad Requirements
SS 500.1	Slab Box and Pad Requirements for Pad-Mounted Single-Phase and Three-Phase Equipment
SS 502	Equipment Poured Pad (Typical)
SS 502.1	Shows Equipment Poured Pad (Typical)
SS 503	Pad for Surface-Mounted Voltage Regulator Poured in Field
SS 503.1	Pad for Surface-Mounted Regulator Poured in Field
SS 503.2	Berm for Surface-Mounted Voltage Regulator Poured in Field
SS 503.3	Grounding for Surface-Mounted Voltage Regulator Poured in Field
SS 504	Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)
SS 504.1	Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)
SS 505	38" x 43" Non-Concrete Box Pad for Single-Phase Transformers
SS 505.1	Non-Concrete Box Pad for Single-Phase Transformers
SS 506	Polymer Concrete Pad for Surface-Mounted Transformers, PME-1, and PME-2
SS 506.1	Polymer Concrete Pad for Surface-Mounted Single-Phase Transformers
SS 507	Polymer Concrete Pad for PME-1
SS 507.1	Polymer Concrete Pad for PME-1
SS 508	Bart Pad Structure
SS 508.1	60" x 72" x 22" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 500 kVA)
SS 508.2	72" x 114" x 22" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 1,500 kVA)
SS 508.3	72" x 114" x 30" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 2,500 kVA)
SS 510	Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter
SS 510.1	Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers)

Approved by: 	Surface or Semi-Buried Structures Table of Contents	SS
Effective Date: 10-29-2021		Sheet i
		UGS

Standard	Title
	with Load Interrupter
SS 515	Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear
SS 515.1	Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear
SS 520	Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction
SS 520.1	Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction
SS 522	Pad for Underground Switch Capacitor Control Pedestal
SS 522.1	Pad for Underground Switch Capacitor Control Pedestal
SS 530	6' x 8'-6" and 8' x 10' Slab Box for Pad-Mounted Transformer, VFI-4, and RAR
SS 530.1	6' x 8'-6" x 6" and 8' x 10' x 6" Slab Box for Pad-Mounted Transformer, VFI-4, and RAR
SS 533	Slab Box — Pad-Mounted Transformers
SS 533.1	Slab Box for Pad-Mounted Transformers — 75 kVA–1,000 kVA 3Ø
SS 535	10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators
SS 535.1	10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators
SS 535.2	Shows Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators
SS 535.3	Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Box Section
SS 536	Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box
SS 536.1	Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box for 2-Way Pad-Mounted SF6 Switch
SS 537	Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box
SS 537.1	Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box for 2-Way, 3-Way, and 4-Way, G&W Pad-Mounted RAM and RAG Gas Switches
SS 538	Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box
SS 538.1	Precast Concrete Equipment Slab Box — 8' x 10' x 8" Pad with 4' x 7' x 3'-6" Box for 2-Way, 3-Way, and 4-Way Pad-Mounted RAG Gas Switches, VFI 9, VFI 12, Bypass Switch, and 33 kV Primary Metering Cabinet

SS	Surface or Semi-Buried Structures Table of Contents	Approved by: <i>RR</i>
		Effective Date: 10-29-2021


Standard	Title
SS 539	10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches
SS 539.1	10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches
SS 540	Structure for PME-3, PME-4, and PME-5
SS 540.1	Structure for PME-3, PME-4, and PME-5
SS 541	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II
SS 541.1	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I for 4-, 5-, and 6-Way Gas
SS 541.2	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type II for PME-6 through PME-12 Switchgears
SS 542	Unistrut/Chain Link Enclosure
SS 542.1	Unistrut/Chain Link Enclosure
SS 544	Masonry Enclosure
SS 544.1	Masonry Enclosure
SS 546	Concrete Type Enclosure
SS 546.1	Concrete Type Enclosure
SS 548	Unistrut/Chain Link Enclosure Cover (Removable)
SS 548.1	Unistrut/Chain Link Enclosure Cover (Removable)
SS 549	Chain Link Fence (Surface Mounted Equipment)
SS 549.1	Chain Link Fence (Surface Mounted Equipment)
SS 549.2	Chain Link Fence Safety Signs
SS 560	Subsurface Structure Requirements
SS 560.1	Subsurface Structure Requirements
SS 562	Concrete Enclosure 4' x 4' x 4'
SS 562.1	For Use with following BURD Switches — Switched Only – 2W-3 Pole, 3W-3 Pole — Switched and Fused – 2W-2 Pole, 2W-3 Pole
SS 563	Concrete Enclosure — 36" Inner Diameter x 36" — SAP 10117680
SS 563.1	For Use with following BURD Switches — Switched Only – 2W-1 Pole, 2W-2 Pole 3W-1 Pole, 3W-2 Pole — Switched and Fused – 2W-1 Pole

Approved by: 	Surface or Semi-Buried Structures Table of Contents	SS
Effective Date: 10-29-2021		Sheet iii
		UGS

Standard	Title
SS 564	Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'
SS 564.1	Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'
SS 565	Subsurface Equipment Enclosure — 4' x 7' x 7'
SS 565.1	Subsurface Equipment Enclosure — 4' x 7' x 7' — (4' x 7' x 4')
SS 566	Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7'
SS 566.1	Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7' — (5' x 8'-1/2" x 4')
SS 568	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'
SS 568.1	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'
SS 568.2	Top Slab/Cover with Removable Beams
SS 568.3	Cover Frame/Gasket Insert Detail
SS 568.4	Gasket Plan View for Precast Surface Operable Parkway Enclosure
SS 568.5	List of Materials for Precast Surface Operable Parkway Enclosure
SS 575	Transformer Enclosure — 3' x 6' Concrete — BURD
SS 575.1	Concrete Enclosure for 4-Wire BURD Transformers for Use in Rocky Areas Only (3' x 6')
SS 575.2	Replacement Part for Steel Tamper Vent: Underground Retrofit Shield (URS)
SS 577	Transformer Enclosure — 3'-6" x 6' Concrete — BURD
SS 577.1	Concrete Enclosure for 3-Wire BURD Transformers for Use in Rocky Areas Only (3'-6" x 6') (SAP 10117686)
SS 577.2	Replacement Part for Steel Tamper Vent: Polyethylene Underground Retrofit Shield (PURS)
SS 580	Transformer Housing — Semi-Buried — 4' x 4' x 4'
SS 580.1	Transformer Housing — Semi-Buried — 4' x 4' x 4'
SS 580.2	Hood Details
SS 580.3	Cover Details
SS 585	3Ø Subsurface Transformer Enclosure
SS 585.1	3Ø Subsurface Transformer Enclosure
SS 586	PMH Concrete Enclosure
SS 586.1	PMH Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'
SS 586.2	Moisture Barrier Plates

SS	Surface or Semi-Buried Structures Table of Contents	Approved by: <i>RR</i>
	Sheet iv	Effective Date: 10-29-2021
UGS		

Standard	Title
SS 587	PME Concrete Enclosure
SS 587.1	PME Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'
SS 590	Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'
SS 590.1	Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'
SS 590.2	Top Section for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 590.3	Base for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 590.4	Detail Information for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 590.5	List of Materials for 5' x 10'-6" x 7' Precast Tub-Type Structure
SS 591	Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box
SS 591.1	Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box for PME-3, PME-4, and PME-5 Switchgear
SS 592	Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box
SS 592.1	Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box for PMH-4 Switchgear
SS 593	PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"
SS 593.1	PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"
SS 599	Perimeter Walls for Pad-Mounted Equipment and Underground Structures
SS 599.1	Perimeter Walls for Pad-Mounted Equipment and Underground Structures
SS 600	Protection Wall
SS 600.1	Protection Wall for Replacement of Single-Phase, Mini-Pad-Mounted Transformers
SS 602	Landscaping Around Pad-Mounted Equipment
SS 602.1	Landscaping Around Pad-Mounted Equipment

Approved by: 	Surface or Semi-Buried Structures Table of Contents	SS
Effective Date: 10-29-2021		Sheet v
		UGS

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SS 500 Slab Box and Pad Requirements

Scope SS 500.1 Slab Box and Pad Requirements for Pad-Mounted Single-Phase and Three-Phase Equipment

The following table identifies the size of various slab boxes, pads, manufacturer's name, and an arbitrarily assigned item number. On the List of Material (LOM) for each working drawing, the item number will be used as identification.

1.0 Slab Boxes — Precast Concrete

Slab boxes will be furnished complete with pad, box, cover, blind lifting holes, footing (6' x 8'-6" and 8' x 10'), and approved size stainless steel Penta head bolts for cover securing.

Table SS 500-1: Slab Boxes — Precast Concrete Pads — Precast Concrete

Item No.	Nominal Size	Drawings	Manufacturers' Reference Numbers		SAP
			Jensen Precast ^{a/}	Oldcastle Infrastructure	
SB-1	6' x 8'-6" Slab with Footing and 4' x 7' x 3'-6" Box	SS 530	K686-SB42-11	ED-686-SB	10117562
SB-2	8' x 10' Slab with Footing and 4' x 7' x 3'-6" Box	SS 530	K810-SB42-11	ED-810-SB	10117563
SB-3	10' x 12' Slab with 5' x 8'-6" x 5' Box	SS 535	K586-SB60-11	ED-1012-SB	10117564
SB-4	10' x 12' Slab with 8' x 10' x 7' Box	SS 539	—	ED-1012-SB Type 2	10171022
SB-5	4'-6" x 7' Slab with 3' x 5' x 3'-6" Box	SS 536	K3660-PUV42-11	ED-467-SB	10117565
SB-6	7' x 8' Slab with 4' x 7' x 5' Box	SS 537	K78-SB60-11	ED-78-SB	10117566
SB-7	8' x 10' x 8" Slab with 4' x 7' x 3'-6" Box	SS 538	K810-SB42-11	ED-810-SB538	10117617

^{a/} Jensen Precast (formerly Brooks Products Inc.)

Table SS 500-2: Pads — Precast Concrete

Item No.	Nominal Size	Manufacturers' Reference Numbers ^{a/}		SAP Number
		Jensen Precast ^{b/}	Oldcastle Infrastructure	
P-1	4' x 4'-6"	PD4854-T4-11	ED 4854-04 Concrete	10118012
P-2	6' x 5'-6"	PD6672-T6-11	ED 6672-06TP	10118011
P-3	7'-10" x 6'	PD7294-T6-11	ED 7294-06TP	10118013

^{a/} See SS 504 for poured in the field and precast concrete pads.

^{b/} Jensen Precast (formerly Brooks Products, Inc.)


Approved by: 	Slab Box and Pad Requirements	SS 500
Effective Date: 07-30-2020	What's Changed?	Sheet 1 of 3
		UGS

Table SS 500–3: Polymer Concrete (RPM)

Item No.	Nominal Size	Manufacturers' Reference Numbers ^{a/}					SAP
		Armorcast Products	Oldcastle Infrastructure	CDR Systems ^{b/}	New Basis	Quazite Corp. ^{c/}	
P-5	48" x 54"	A6001986	ED-4854-04 Polymer	PH54481826502	9707	PH5448-1826502	10118092
P-4 ^{d/}	34" x 40"	—	—	—	9690	—	10117850

^{a/} See [SS 506](#) and [SS 507](#) for polymer (RPM) pads.

^{b/} Hubbell Power Systems is the parent company of CDR Systems.

^{c/} Hubbell Power Systems is the parent company of Quazite Corp (formerly Power and Communication Systems Company)

^{d/} Not approved for use on new construction.

Table SS 500–4: PMH and PME Enclosures and Pads

Item No.	Nominal Size	Reference	Manufacturers' Reference Numbers		SAP
			Jensen Precast ^{a/}	Oldcastle Infrastructure	
PH-1	5' x 10'-6" x 7' PMH Box	SS 590	K5106-PUV84-11	ED-5106-84-PMH	10117567
PH-2	4' x 6' Pad with 2'-6" x 4' Box	SS 591	K3048-PUV36-11	ED-264-30-PMH-5	10117568
PH-5	4' x 6' Pad with 2'-6" x 4' Opening	SS 540	PD3048-P-11	ED-4872-06-PAD	10117288
PH-3 ^{b/}	4' x 4'-6" Pad with 2' x 3' Box	SS 592	K2436-PUV36-11	ED-23-30-PMH-4	10117569
PH-4 ^{b/}	4' x 6' with 2' x 3' Opening — PME Pad	SS 593	—	ED-4872-06-MP	10117287

^{a/} Jensen Precast (formerly Brooks Products Inc.)

^{b/} Not approved for use on new construction.

Table SS 500–5: Bart Pads

Item No.	Nominal Size	Reference	Manufacturers' Reference Numbers		SAP
			Jensen Precast	Oldcastle Infrastructure	
BP-1	60" x 72" x 22" w/box	SS 508.1	—	ED-56-Type 1-SB	10117864
BP-2	72" x 114" x 22" w/box	SS 508.2	—	ED-696-Type 2-SB	10117863
BP-3	72" x 114" x 30" w/box	SS 508.3	—	ED-696-Type 3-SB	10169529

Note(s):

1. See [AC 701](#) for pad-mounted transformer/capacitor grounding requirements and [AC 703](#) for approved grounding materials.

= For Reference Only

SS 500

Slab Box and Pad Requirements

Approved by:

RR

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

07-30-2020

Table SS 500-6: Fiberglass Box Pad

Item Number	Nominal Size	Manufacturer's Reference Numbers
		ProGlass ^{a/}
FP-1 ^{b/}	38" x 43" x 20"	TX 423820

^{a/} ProGlass — Division of Power Glass, Inc., P.O. Box 581, Wauna, WA, 98395

^{b/} This pad is experimental for trial use. Contact Linear & Structural Strategies regarding use of this pad for single-phase mini pad applications.

EXPERIMENTAL

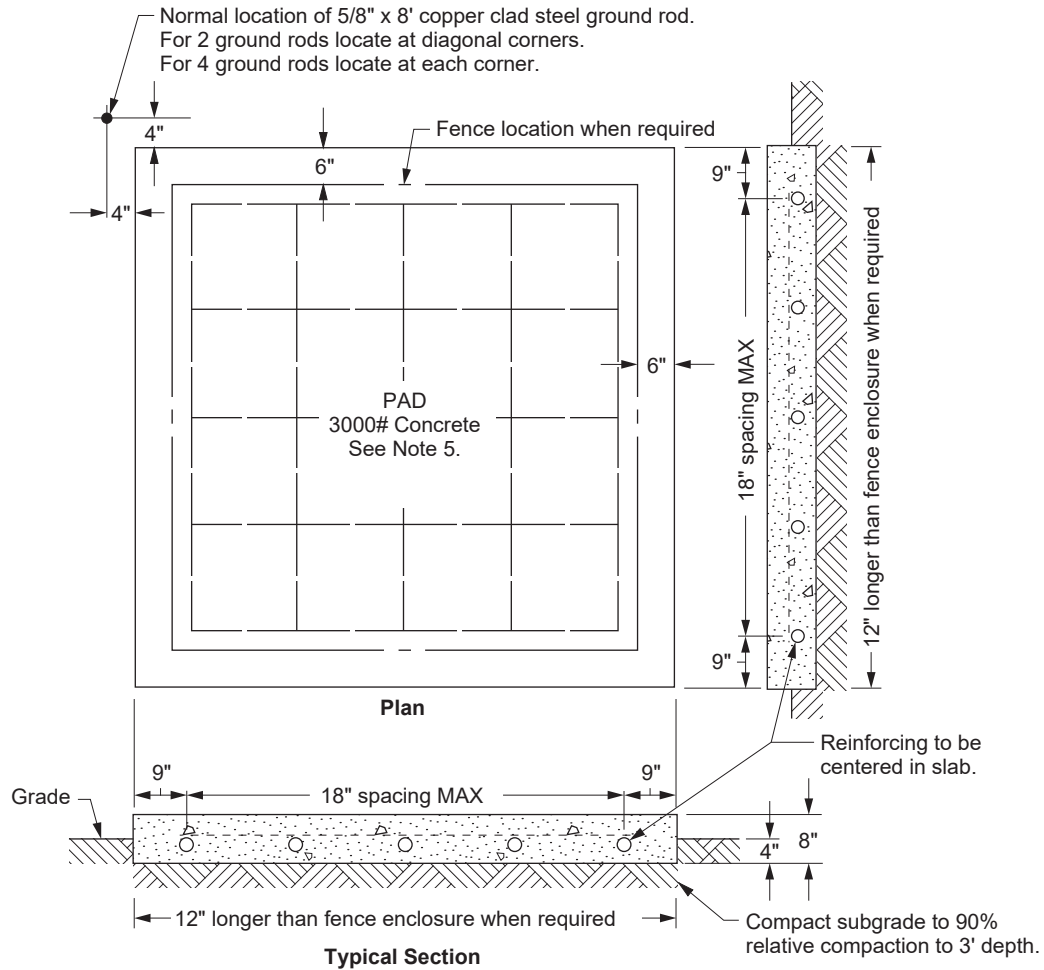
Approved by:	Slab Box and Pad Requirements	SS 500
Effective Date:	What's Changed? Distribution Apparatus Engineering (DAE) changed to Linear & Structural Strategies.	Sheet 3 of 3
07-30-2020		UGS

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SS 502 Equipment Poured Pad (Typical)

Scope SS 502.1 Shows Equipment Poured Pad (Typical)

Figure SS 502-1: Equipment Poured Pad (Typical)



Note(s):

1. Reinforced steel: #3 rebar @ 18" O.C. each direction.
2. Ground Rods, Clamps, and Ground Wire: To be furnished by the contractor. Contractor will install all grounding materials for customer-owned pads. Ground to be buried outside of pad and connected to rod with ground clamp.
3. Riser Detail: Typical — See [CD 170](#).
4. Riser Locations: See working drawing for detail.
5. See [GI 020](#).
6. Riser bends shall be Schedule 40 PVC minimum on the primary side.

Approved by:

PhH

Equipment Poured Pad (Typical)

SS 502

Sheet 1 of 1

Effective Date:
04-27-2007

What's Changed? Added notation that riser bends shall be Sch. 40 PVC minimum on the primary side.

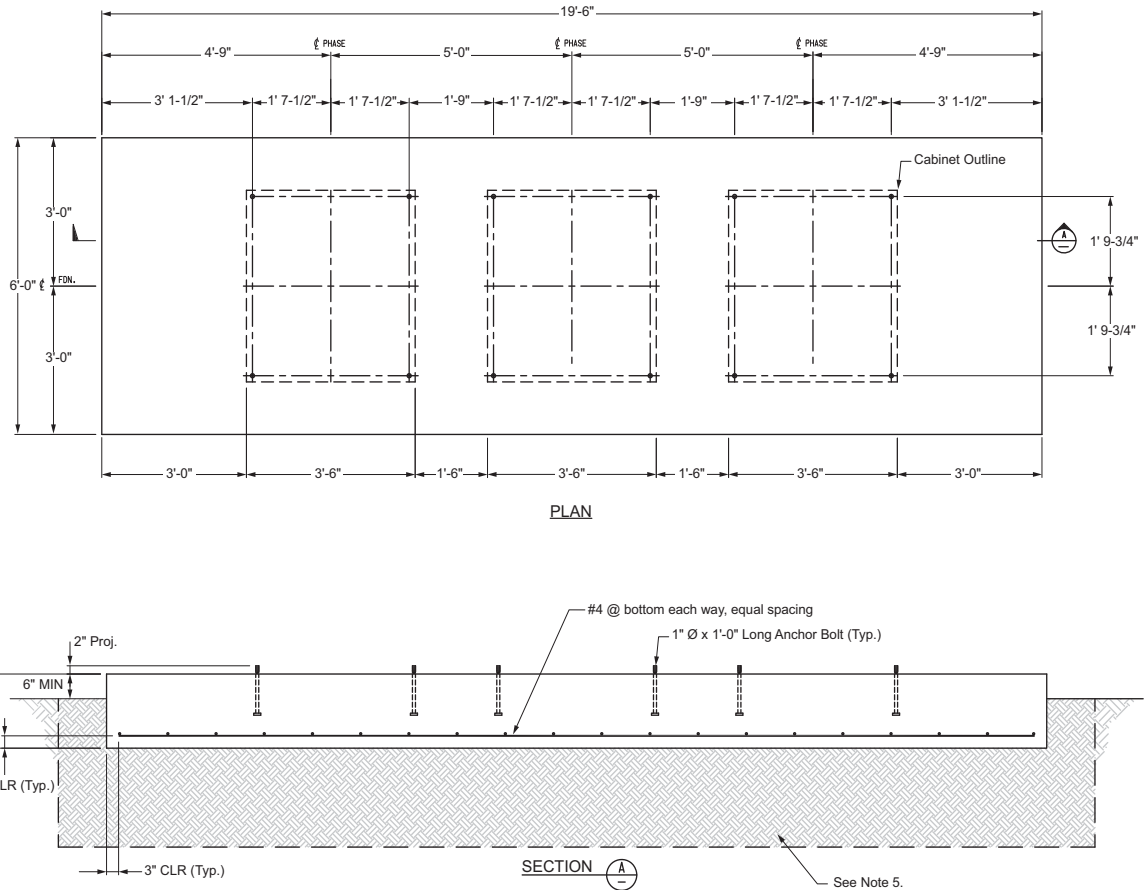
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SS 503 Pad for Surface-Mounted Voltage Regulator Poured in Field

Scope SS 503.1 Pad for Surface-Mounted Regulator Poured in Field

Figure SS 503–1: Pad for Surface-Mounted Voltage Regulator Poured in Field



Note(s):

- Contractor shall verify equipment assignment with structural engineer prior to placement of concrete foundations.
- Dimension tolerance between center lines of anchor bolt for a common apparatus shall be 1/8 inch.
- All exposed edges and corners of concrete shall be chamfered 3/4" or tooled.
- Flat concrete surfaces shall be steel troweled.
- Compact upper 8" of soil under footing per ASTM D1557.

Table SS 503–1: Material List

Description	Quantity
Concrete 2500 PSI @ 28 Days per GI 020	6.5 Cubic Yards
#4 Rebar x 5'-6" Long, ASTM A615 GR.60	20 Each
#4 Rebar x 19'-0" Long, ASTM A615 GR.60	7 Each
1" x 1'-2" Long Hilti `HAS-E` threaded rod with std. nut and washer, A36/ISO 898 CLAS 5.8 Steel ASTM B633 Zinc Plating (10 rods/nuts/washers per box. 1 required per hole)	12 Each
Hilti HIT-HY 200 Adhesive Capsules 11.01 oz cartridge	12 Each

Approved by:

B.C.

Pad for Surface-Mounted Voltage Regulator Poured in Field

SS 503

Sheet 1 of 3

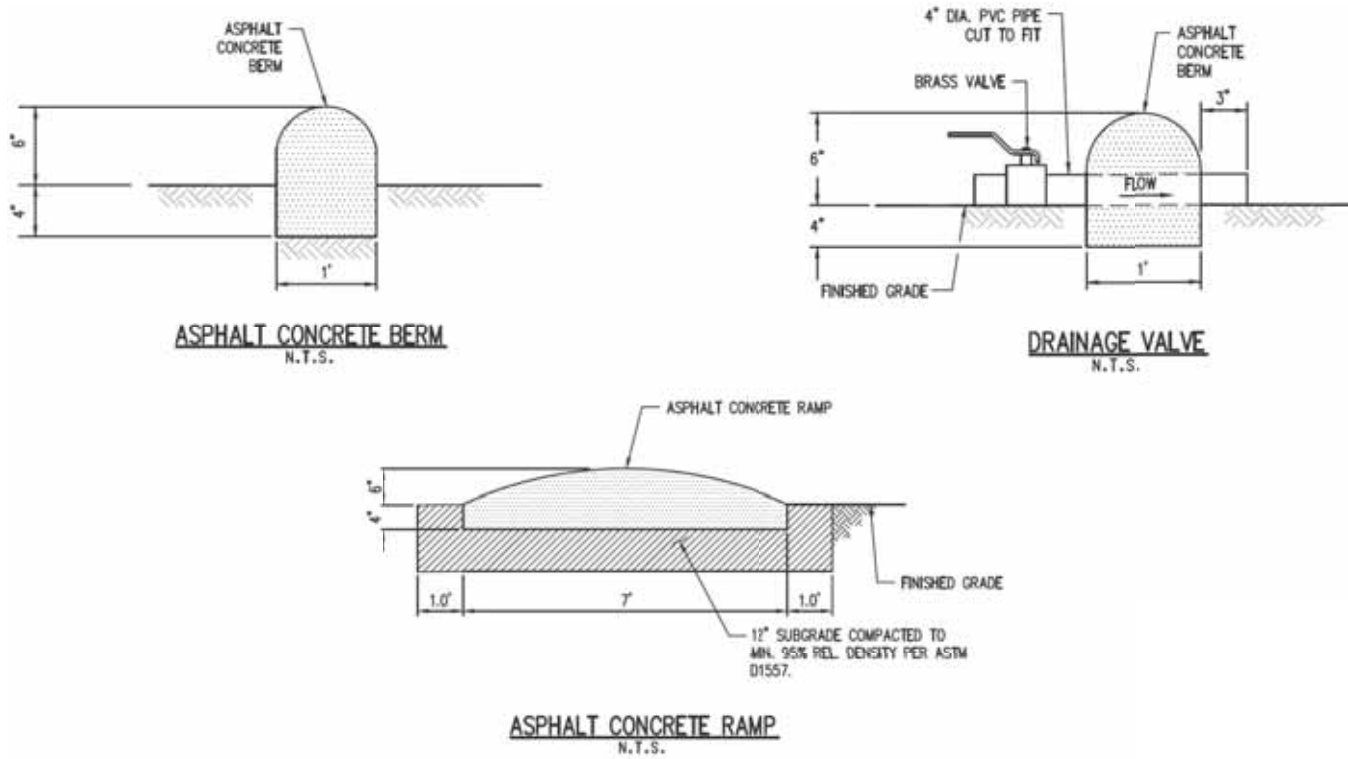
Effective Date:
07-28-2017

What's Changed? Initial issue.

UGS

Scope SS 503.2 Berm for Surface-Mounted Voltage Regulator Poured in Field

Figure SS 503-2: Berm for Surface-Mounted Voltage Regulator Poured in Field



SS 503

Pad for Surface-Mounted Voltage Regulator Poured in Field

Approved by:

B. C.

Sheet 2 of 3

What's Changed? Initial issue.

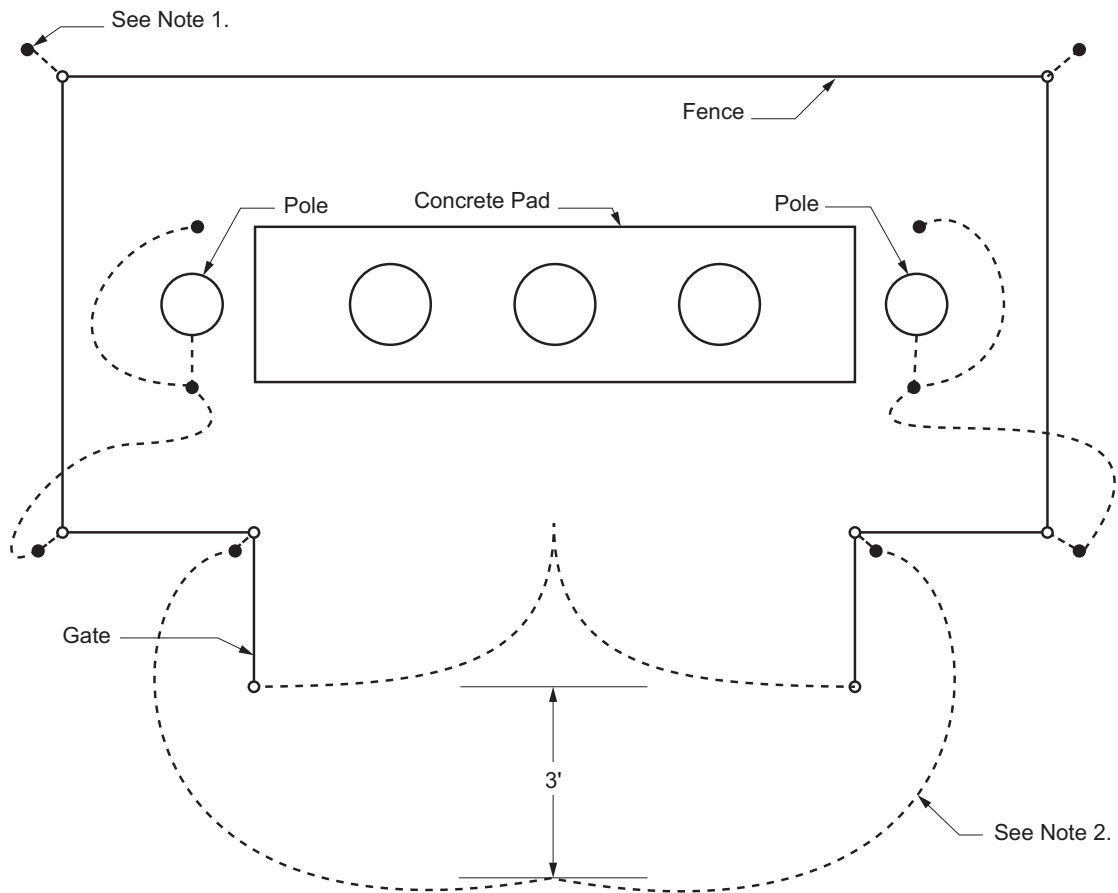
Effective Date:

UGS

07-28-2017

Scope SS 503.3 Grounding for Surface-Mounted Voltage Regulator Poured in Field

Figure SS 503-3: Grounding for Surface-Mounted Voltage Regulator Poured in Field



Note(s):

1. Grounding requirements for 33 kV Surface Mounted Voltage Regulators ONLY.
2. Install ground rods along the fence by each post and by the wood poles.
3. Gateposts shall be bonded together by a buried grounding conductor running on the inside of the gate 30" deep.
4. The grounding rods shall be driven until the upper end is flush or below the final grade.
5. Ground rods must be 5/8" x 8'.
6. Ground cable clamps for 5/8" rod and 1/4" common guy.

Approved by:

B. C.

Pad for Surface-Mounted Voltage Regulator Poured in Field

SS 503

Sheet 3 of 3

Effective Date:
07-28-2017

What's Changed? Initial issue.

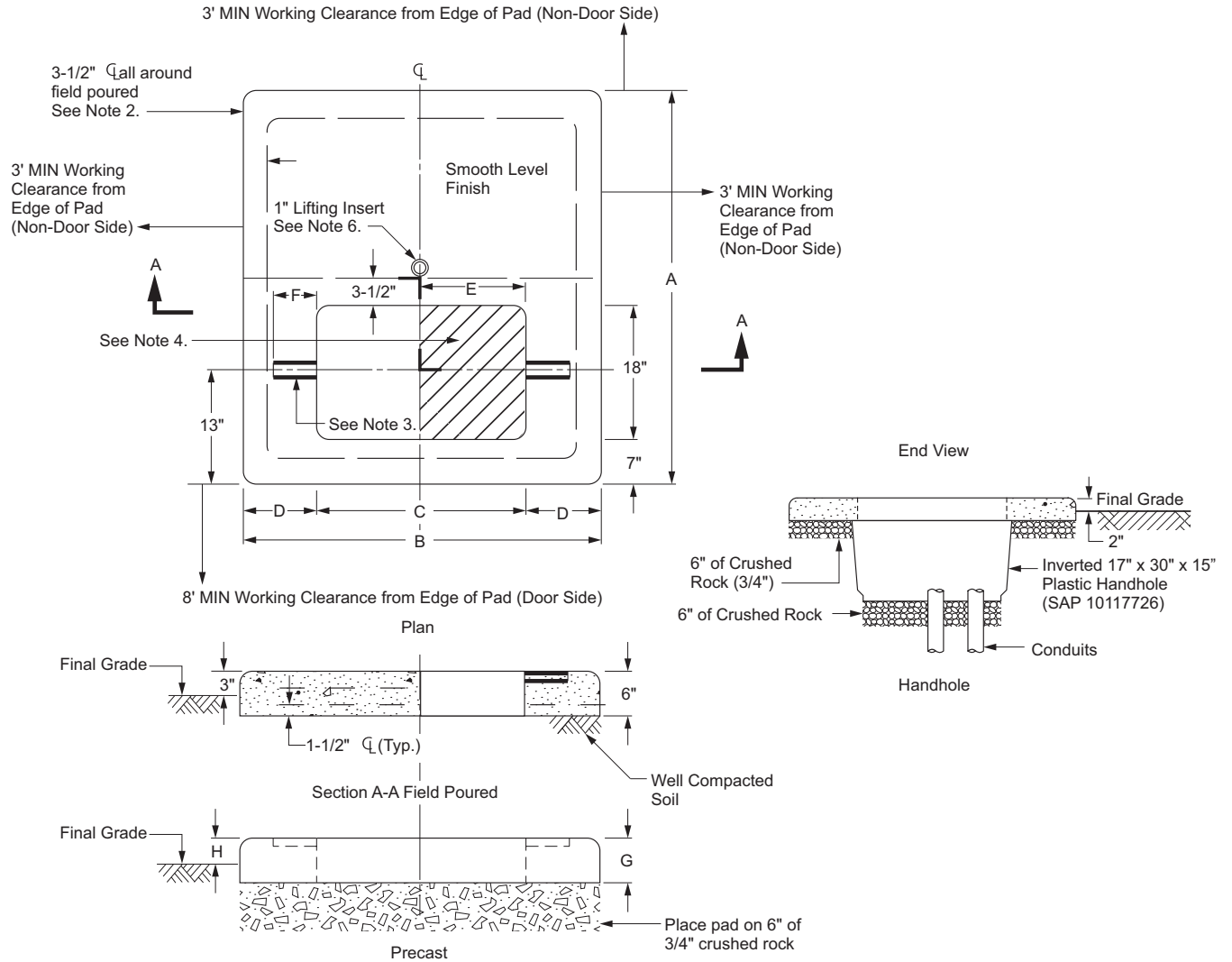
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SS 504 Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)

Scope SS 504.1 Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)

Figure SS 504-1: Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)



Approved by:
ajj

Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)

Effective Date:
07-27-2018

What's Changed?

SS 504

Sheet 1 of 2

UGS

Table SS 504–1: Surface-Mounted Transformer Pads — Dimensions

Transformer	Pad Dimensions (in)								Weight (lb)	SAP
	A	B	C	D	E	F	G	H		
1Ø 25 kVA–167 kVA	54	48	26	11	12	6	4	2	750	10118012
3Ø 75 kVA–150 kVA No Switch	66	72	38	17	15	6	6	3	2,200	10118011 See Note 8
3Ø 75 kVA–500 kVA SW and Fuse	72	94	50	22	22	14	6	3	3,200	10118013 See Note 8

Note(s):

- Concrete to be 3,000 psi (minimum) at 28 days.
- Reinforcing steel to be No. 4 bars installed in a double net. Perimeter bars to be continuous (8 inch minimum lap or weld).
- Hold-down brackets to be P-3200 series unistrut (or equal).
- Primary cables must be installed in shaded area of drawing above as far to the right as possible on single phase transformers only. On three-phase transformers primary cables must be installed in the unshaded area of drawing above as far left as possible.
- See [AC 701](#) for pad-mounted transformer/capacitor grounding requirements and [AC 703](#) for approved grounding materials.
- 1-inch listing insert to be located at center of gravity on precast pads.
- See [SS 500](#) for approved manufacturers.
- The three-phase transformer shall only be used on a pad when four or fewer services are to be installed. A slab box should be used when more than four services will be installed.
- Use a thin layer of redi-crete (or equivalent) for rodent and weed control or where transformer does not fully cover opening in pad.
- A 17" x 30" x 15" plastic handhole (SAP 10117726) shall be inverted and installed under the cable opening of the pad. This will provide adequate cable slack for operation of the load-break elbows on single phase transformers only.

= For Reference Only

SS 504

Pad for Surface-Mounted Transformer Poured in Field Construction and Precast Construction (Concrete)

Approved by:

a/j

Sheet 2 of 2

What's Changed? Note 8 was updated for clarity.

Effective Date:

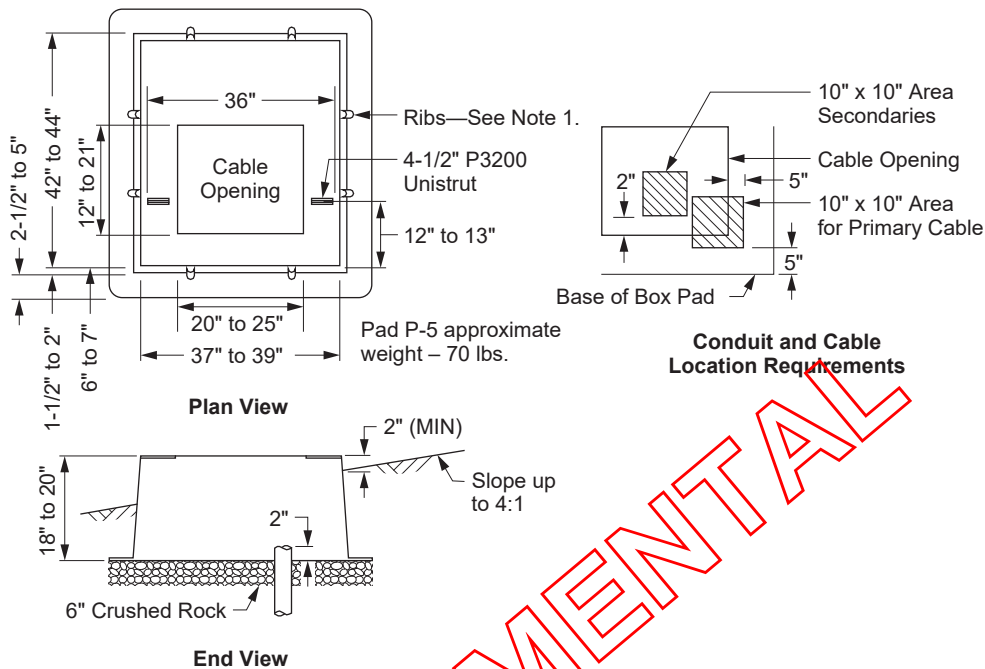
07-27-2018

UGS

SS 505 38" x 43" Non-Concrete Box Pad for Single-Phase Transformers

Scope SS 505.1 Non-Concrete Box Pad for Single-Phase Transformers

Figure SS 505-1: Non-Concrete Box Pad for Single-Phase Transformers



Note(s):

1. Experimental for trial use only. Contact Linear & Structural Strategies prior to using.
2. Riser bends shall be Schedule 40 PVC minimum on the primary side.

1.0 Installation Notes:

- 1.1 Box Pad to be set level on 6" of crushed rock base.
- 1.2 Box Pad can be used in slopes of up to 4:1 without the need for a level finish grade. A minimum of cover over the bottom lip is needed.
- 1.3 Contractor will set the box pad level to within 1/4" and to the correct grade relative to the finish curb or other reference elevation.
- 1.4 Subgrade below the pad will be mechanically compacted to 85% relative compaction unless local building authorities require higher.
- 1.5 Ground rods will be per [AC 701](#).
- 1.6 Seal the bottom of the opening around the conduits with a thin layer of Redi-Crete or liquid asphalt emulsion for rodent control. Drive two 1" diameter PVC pipe through to act as drains.
- 1.7 Use template to locate primaries and secondaries and stake separately.

Approved by: <i>RR</i>	38" x 43" Non-Concrete Box Pad for Single-Phase Transformers	SS 505
Effective Date: 07-30-2021	What's Changed? Distribution Apparatus Engineering (DAE) changed to Linear & Structural Strategies.	Sheet 1 of 2 UGS

2.0 Fabrication Notes:

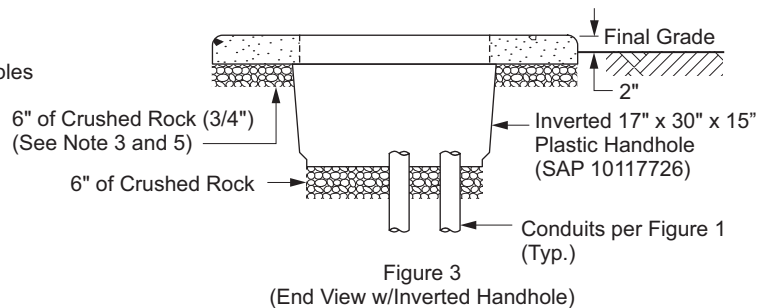
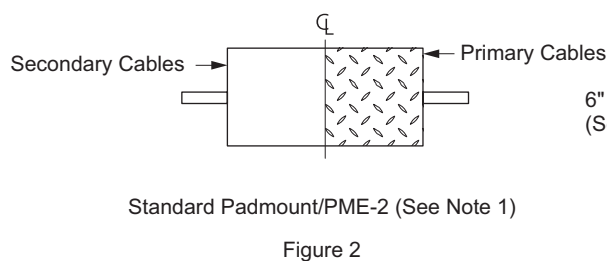
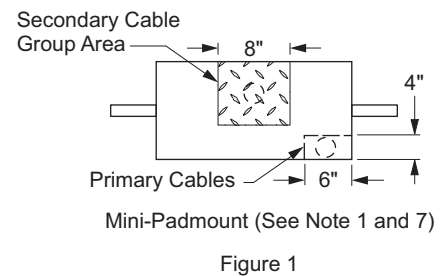
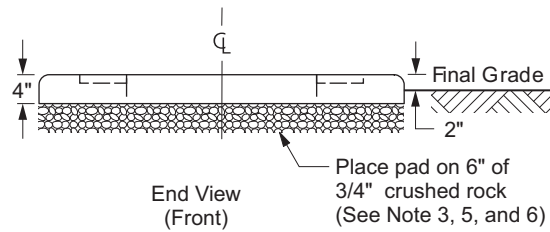
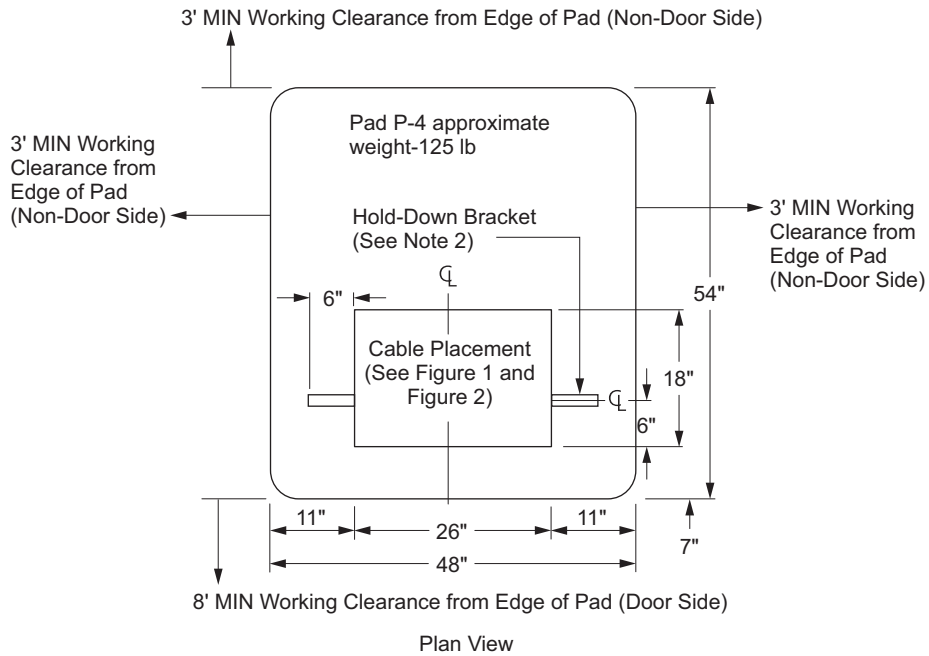
- 2.1 Pad will be built to meet the "GENERAL," "HARDWARE," "MATERIAL QUALIFICATION TEST," and "STRUCTURAL CAPABILITIES TESTS" requirements for Pad 4 of Edison specification No. PCTP-9-94 except color will be concrete gray or telephone green, and dimensions on this drawing will control. Load frame will be 32" wide and deflection frame will be 36" wide.
- 2.2 Manufacturer will cast-in a manufacturer identification logo to the top of the box pad. Additionally a serial number or other means to identify date of manufacture are required on the inside or outside of the box pad. Markers or paint alone are not acceptable.
- 2.3 Pad will meet the lateral loading and deflection requirements and tests of Western Underground WUC 3.6.

EXPERIMENTAL

SS 505	38" x 43" Non-Concrete Box Pad for Single-Phase Transformers	Approved by: <i>RR</i>
Sheet 2 of 2	What's Changed?	Effective Date: 07-30-2021
UGS		

SS 506 Polymer Concrete Pad for Surface-Mounted Transformers, PME-1, and PME-2
Scope SS 506.1 Polymer Concrete Pad for Surface-Mounted Single-Phase Transformers

Figure SS 506-1: Polymer Concrete Pad for Surface-Mounted Single-Phase Transformers



Approved by:
B. C.
Effective Date:
04-29-2016

Polymer Concrete Pad for Surface-Mounted Transformers, PME-1, and PME-2

What's Changed? Figure SS 506-1 updated for clarity.

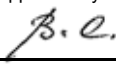
SS 506
Sheet 1 of 2
UGS
► SCE Public ◀

1.0 Manufacturing Notes:

1. Pad will be manufactured in accordance with SCE specification PCTP-9-94 "Polymer Concrete Transformer and Equipment Pads" and meet all requirements for Pad 4.
2. Hold-down brackets to be P-3200 series unistrut (or equal).
3. See [SS 500](#) for approved manufacturers.

2.0 Installation Notes:

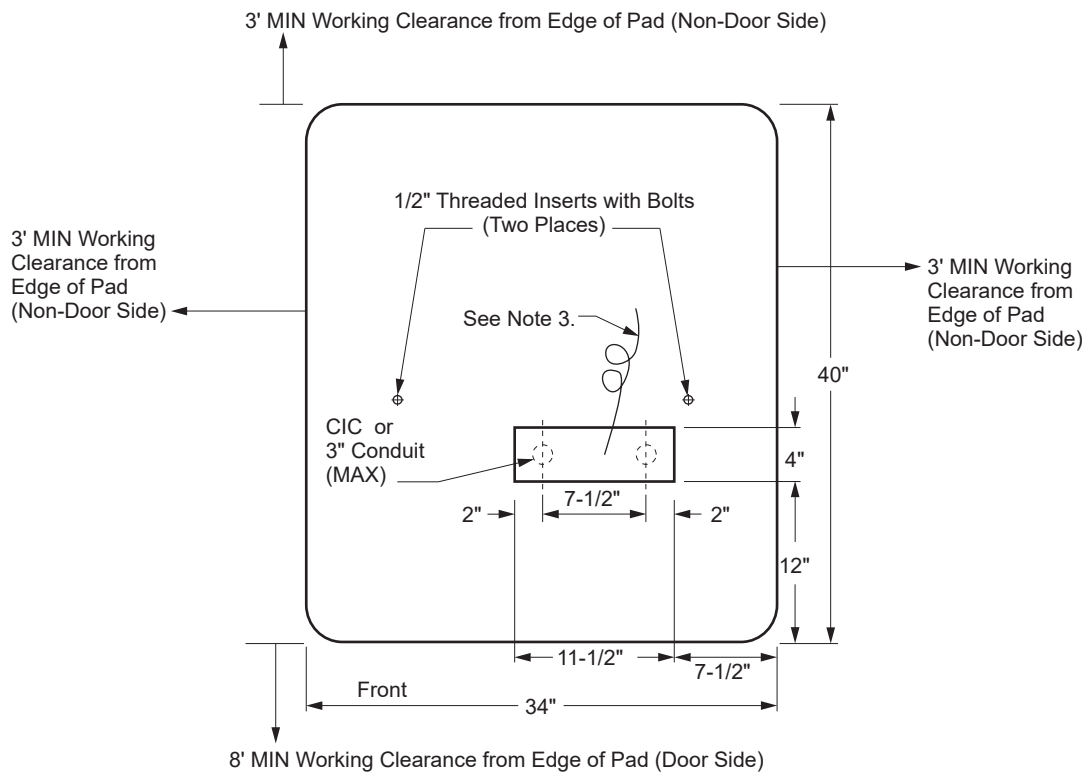
1. Primary and secondary cables for mini-pad-mounted transformers should be placed into the clear opening areas as shown in [Figure 1](#); other transformers use [Figure 2](#). The work order drawings will identify which case is required.
2. For ground rod installation see [AC 701](#).
3. Subgrade soil below crushed gravel is to be mechanically compacted to 85 percent relative compaction unless higher is required by construction permit. Contractor is responsible for maintaining proper conduit location after grading.
4. Pad to be placed to proper grade relative to finished curb or other reference elevation and level to within 1/4 inch.
5. An inverted handhole, as shown in [Figure 3](#), shall be installed for new construction or when existing pad requires replacement. The existing conduits can remain in place.
6. Seal the bottom of the opening around the conduits with a thin layer of Redi-Crete or liquid asphalt emulsion for rodent control. Drive two 1-inch diameter PVC pipe through to act as drains.
7. For conduit installation using [Figure 1](#), a template should be used to locate conduit or CIC.
8. Service conduits shall be sealed or plugged when the transformer is located above a customer's meter panel, per G.O. 128, Rule 31.6.
9. Riser bends shall be Schedule 40 PVC minimum on the primary side.

SS 506 Sheet 2 of 2	Polymer Concrete Pad for Surface-Mounted Transformers, PME-1, and PME-2	Approved by: 
	UGS	What's Changed?

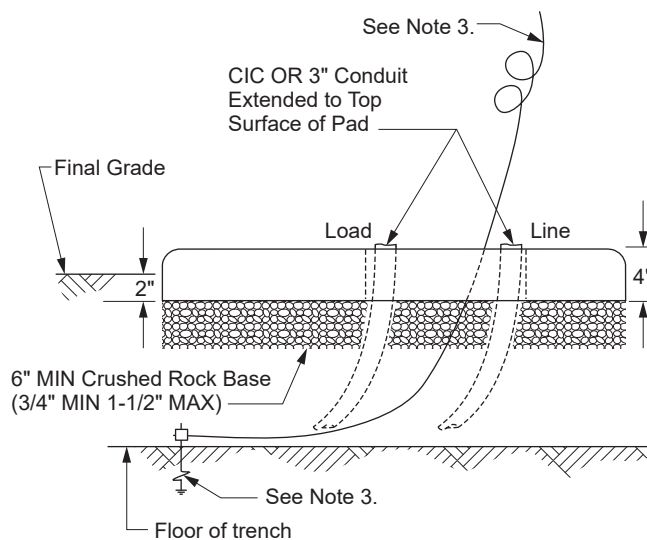
SS 507 Polymer Concrete Pad for PME-1

Scope SS 507.1 Polymer Concrete Pad for PME-1

Figure SS 507-1: Polymer Concrete Pad for PME-1



Plan View



**End View
(Front)**

Approved by:

RK

Polymer Concrete Pad for PME-1

SS 507

Sheet 1 of 2

Effective Date:
01-30-2009

What's Changed? Updated the title in UGS SS 507 for clarity. Figure SS 507-1 was revised to clarify the working clearance requirements for PME-1.

UGS

Note(s):

1. Place the pad on a level 6" minimum crushed rock base.
2. Fill the pad opening around the CIC or conduit with a thin layer of Redi-Crete (or equivalent) for rodent and weed control
3. Install one 5/8" ground rod and connect to #6 BC (minimum) as shown (See AC 703). Grounding materials are furnished and installed by the contractor.
4. Riser bends shall be Schedule 40 PVC minimum on the primary side.

SS 507

Polymer Concrete Pad for PME-1

Approved by:

RK

Sheet 2 of 2

What's Changed?

Effective Date:

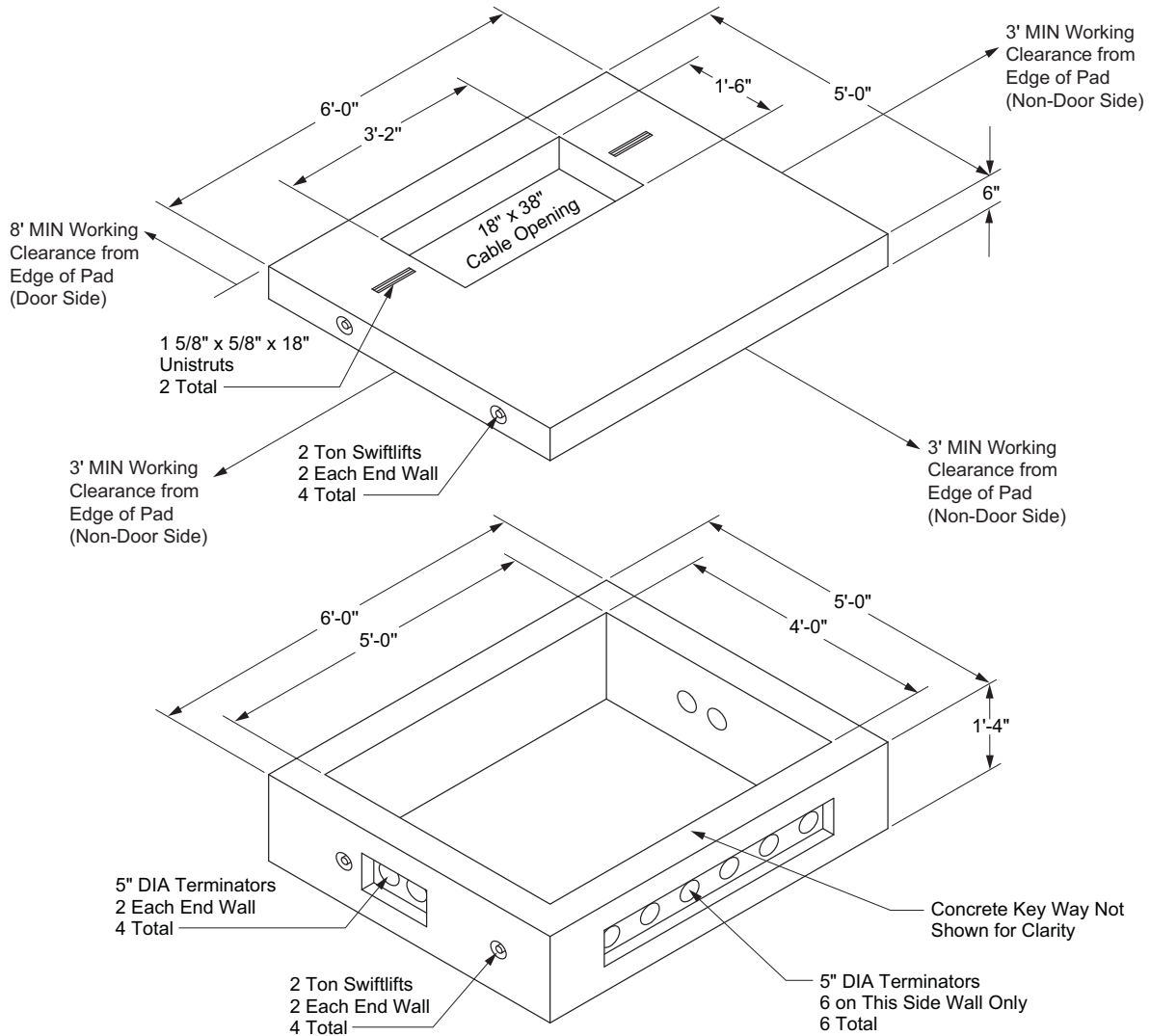
UGS

01-30-2009

SS 508 Bart Pad Structure

Scope SS 508.1 60" x 72" x 22" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 500 kVA)

Figure SS 508-1: Bart Pad Structure — 60" x 72" x 6" Pad with 60" x 72" x 16" Box



Approximate Weights
Box - 1900 lb
Pad - 1900 lb

Approved by:

Bart Pad Structure

SS 508

Effective Date:
10-26-2012

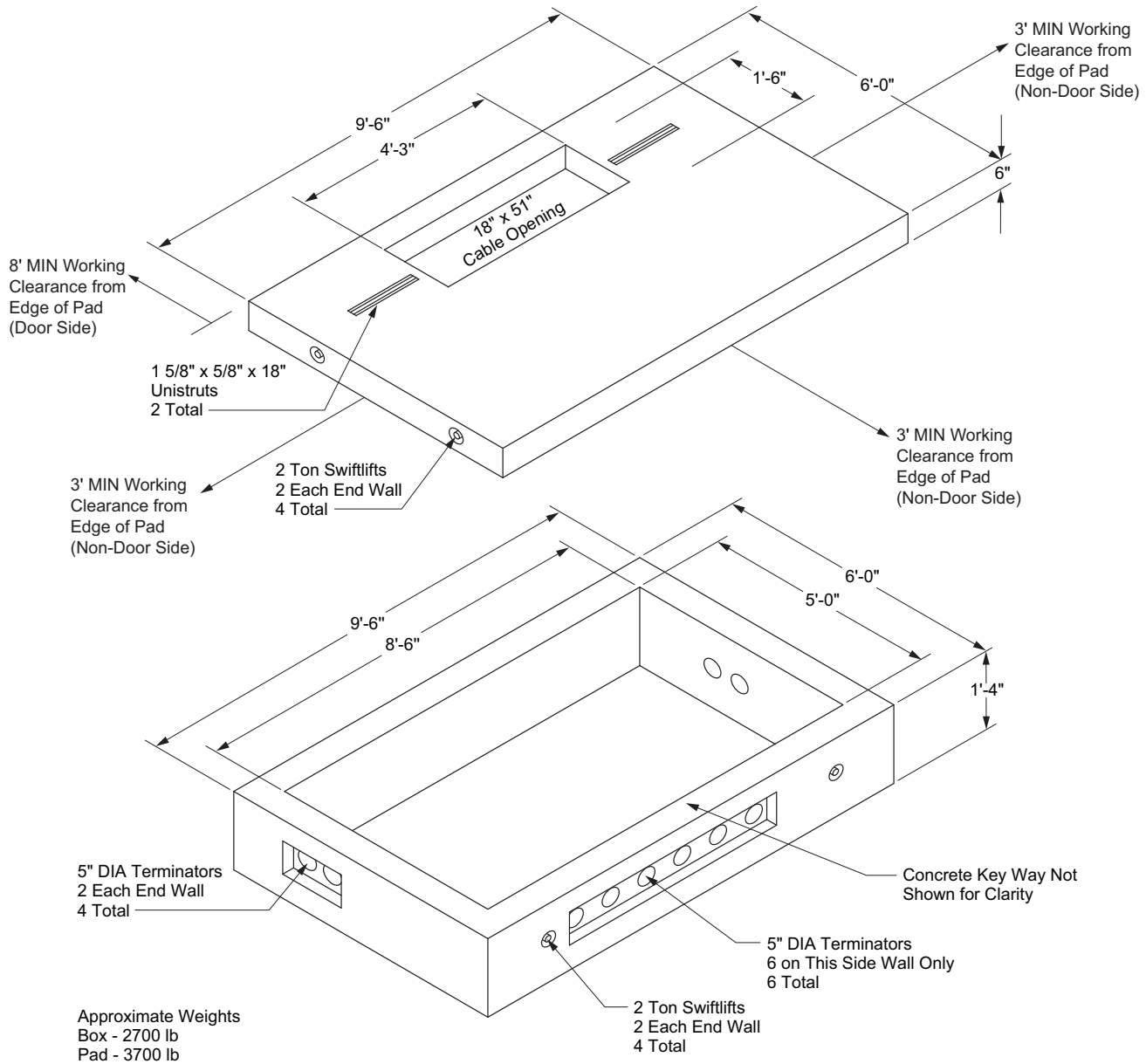
What's Changed? Figure SS 508-1 was updated for clarity.

Sheet 1 of 4

UGS

Scope SS 508.2 72" x 114" x 22" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 1,500 kVA)

Figure SS 508-2: 508-2: Bart Pad Structure - 72" x 114" x 6" Pad with 60" x 102" x 16" Box



SS 508

Bart Pad Structure

Approved by:

Sheet 2 of 4

What's Changed?

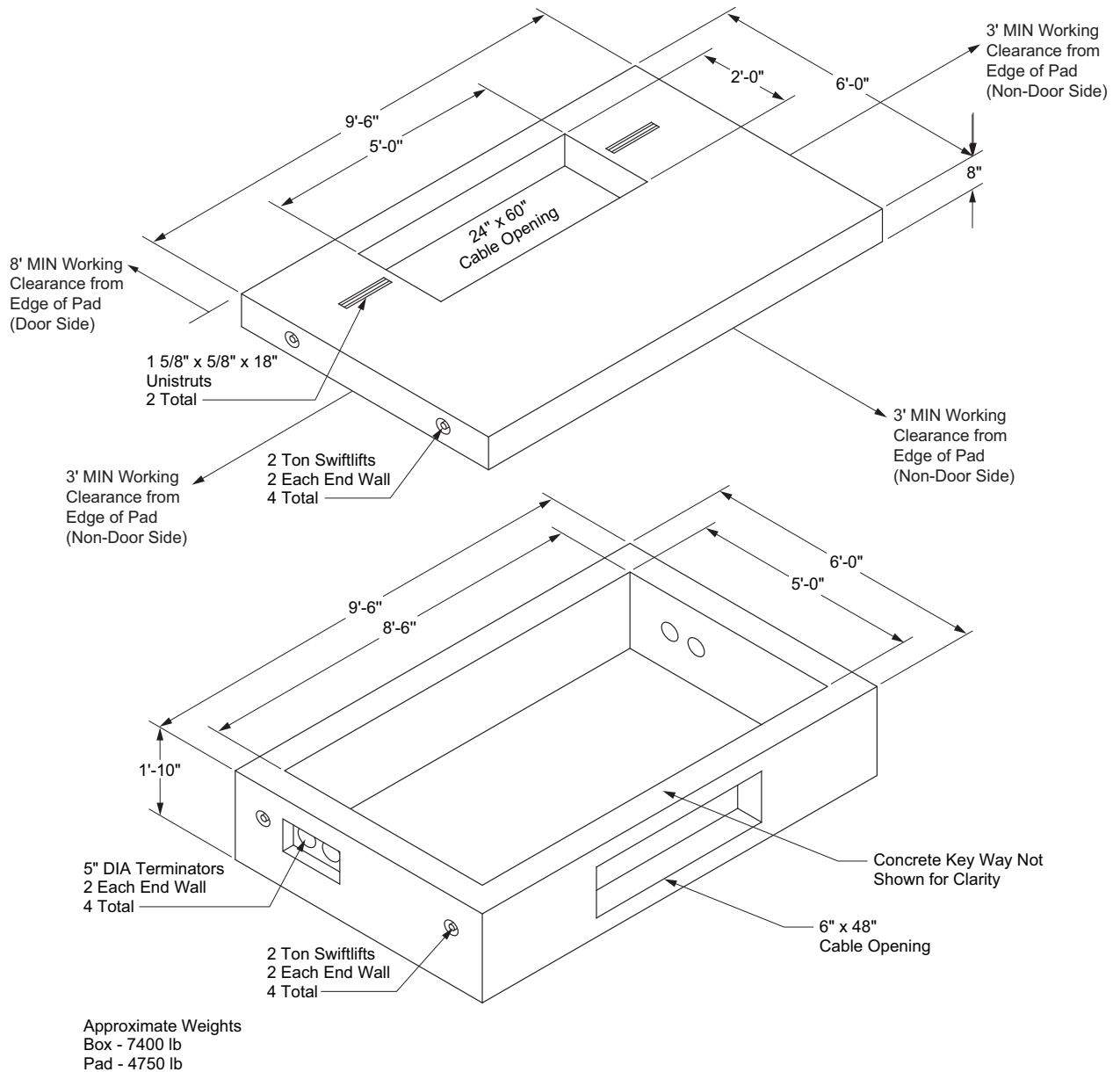
Effective Date:

UGS

10-26-2012

Scope SS 508.3 72" x 114" x 30" Bart Pad with Box (For 3Ø Pad-Mounted Transformers up to 2,500 kVA)

Figure SS 508-3: Bart Pad Structure - 72" x 114" x 8" Pad with 60" x 102" x 22" Box



Note(s):

1. The building floor system shall be designed to support a dead load of 110 percent of the combined weight of the proposed transformer and Bart pad/box. The 10 percent accommodates for miscellaneous loads; that is the weights of the dolly, cables and maintenance equipment.

Approved by:

Bart Pad Structure

SS 508


Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Sheet 3 of 4

UGS

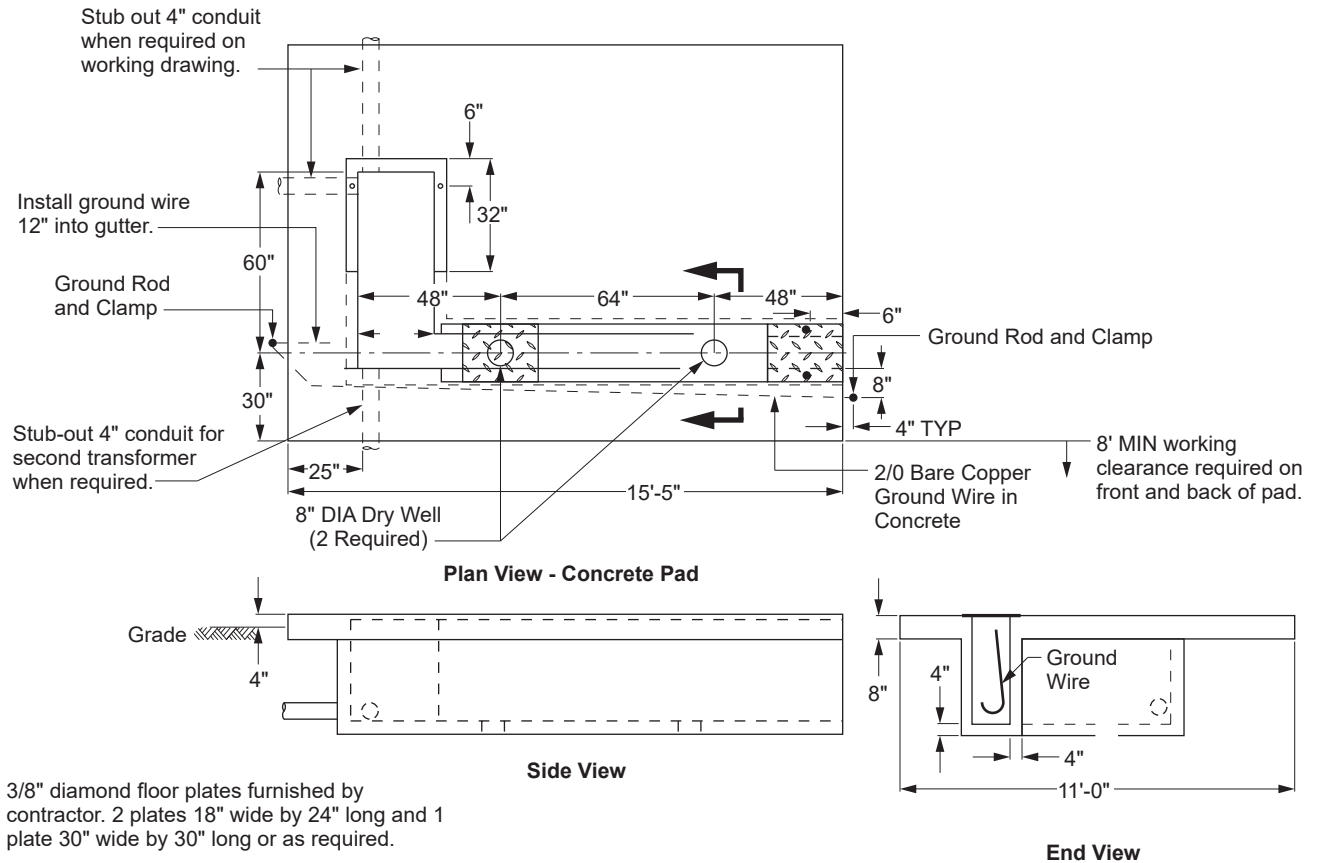
2. For vaults that appear to be undamaged and comply with the requirements of MC 860, [Section 3.0](#), an additional 1-inch diameter inserts or pulling eyes may be installed into the transformer vault/room walls only (excluding ceiling) to facilitate the moving of the transformer and pad into the final position. The pulling loads shall not exceed 5,000 lb without approval of engineering. If the vault is damaged and violates the requirements of MC 860, [Section 3.0](#), engineering shall be contacted before additional 1-inch diameter inserts or pulling eyes are installed.
3. Inserts located at the bottom edge of the box may be used for lifting brackets when installing or moving the box or for seismic anchoring when required by local codes or ordinances.
4. Equipment access to the building or enclosure must be designed to allow for the installation of the portable pad/box, and pad-mount transformers.
5. Use appropriate rigging equipment to support the overall pad/box weight when lifting and installing the Bart Pad structure (Refer to Rigging Standard Manual for guidance).
6. Bart Pads in vault rooms that have the potential of being subjected to water intrusion/flooding shall not be installed for the reason that Pad-Mounted Transformers are not design to be submerged in water.
7. Pad-mounted equipment exceeding 500 lb in weight installed onto the Bart Pad shall be secured to the pad with a minimum of four stainless steel seismic anchors through the equipment baseframes. Use 5/8-inch diameter anchors (SAP 10072174). When the baseframe hole diameter exceeds 3/4 inches, provide an approved oversize washer under the nuts. Threads shall be scoured (damaged) or double nutted to avoid loosening of the nuts once the installation is complete.

SS 508	Bart Pad Structure	Approved by: 
Sheet 4 of 4	What's Changed?	Effective Date: 10-26-2012
UGS		

SS 510 Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter

Scope SS 510.1 Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter

Figure SS 510–1: Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter



Note(s):

- Contractor is to furnish and install a concrete pad 15'-5" x 11'-0" x 0'-8" thick reinforced with 6" x 6" mesh - No. 10 gauge. The concrete is to have a 28 day breaking strength of not less than 3,000 psi. The pad is to be level with a smooth finish. (See [GI 020](#)).
- Contractor is to furnish and install 3/8" inserts and hold down bolts (6 total) as shown. Floor plate to be drilled and painted with red oxide primer.
- Ground rods, clamps and wire will be furnished to contractor only for Edison owned pads. Contractor will provide all grounding materials required for customer owned structures. Install each rod in shown location with top 6" grade. Install continuous 2/0 bare copper ground wire through the concrete and attach to each rod using a clamp. Continue wire back through concrete and into gutter, as shown
- Contractor is to furnish the number and size of service conduits required by the Edison Company.
- Conduits will be terminated in 12" x 24" gutter or in a pullbox at the end of the gutter. The gutter may not be extended into the building unless approved by local inspection authority and an adequate seal against water is provided.
- There will be 2 dry wells 8" in diameter located as shown above.
- Protection barriers are required if pad is exposed to traffic. (See [MC 830](#)).

Approved by:

B. C.

Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter

SS 510

Sheet 1 of 2

Effective Date:

10-23-2015

What's Changed?

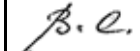
UGS

8. A clear passageway of 10' minimum width will be available at all times from the pad to an accessible roadway for transformer maintenance.
9. Contractor to furnish all diamond floor plates, as required.
10. Conduits entering the trench will be fully encased with a minimum of 3 inches of concrete when the top of the conduits are less than 24 inches below final grade.
11. Cover to be 3/16" safety floor plate for 30" x 48" clear opening. To be hot dip galvanized per ASTM A123 after fabrication.

SS 510

Customer Substation Pad (for 1,500–2,500 kVA 3Ø Pad-Mounted Transformers) with Load Interrupter

Approved by:



Sheet 2 of 2

What's Changed? Note 11 was updated for clarity.

Effective Date:

UGS

10-23-2015

SS 515 Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear

Scope SS 515.1 Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear

Figure SS 515-1: Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear

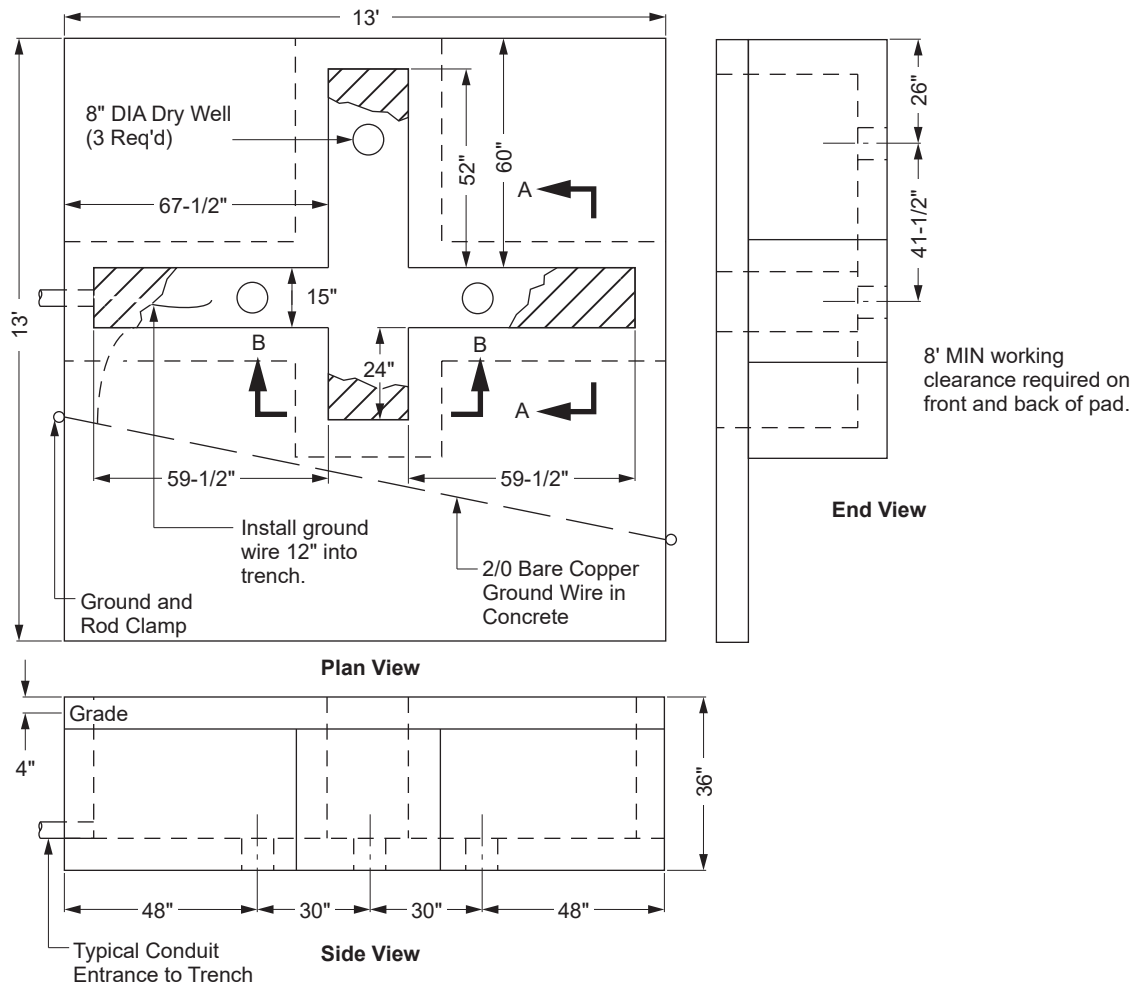


Figure SS 515-1.1: Plan, End, and Side Views

Approved by: 	Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear	SS 515
Effective Date: 10-23-2015	What's Changed?	Sheet 1 of 2 UGS

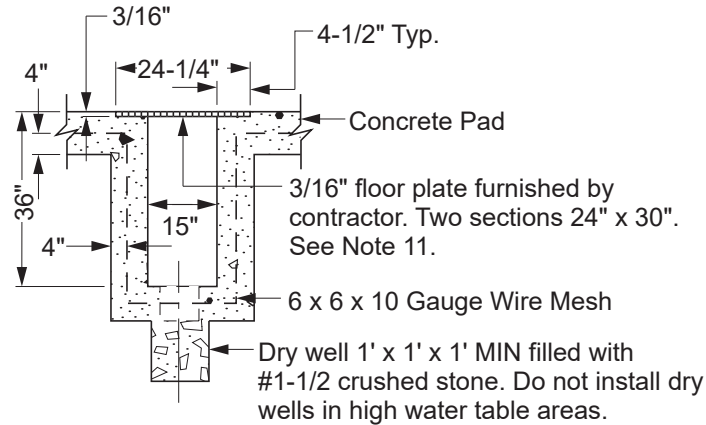


Figure SS 515-1.2: Section A-A

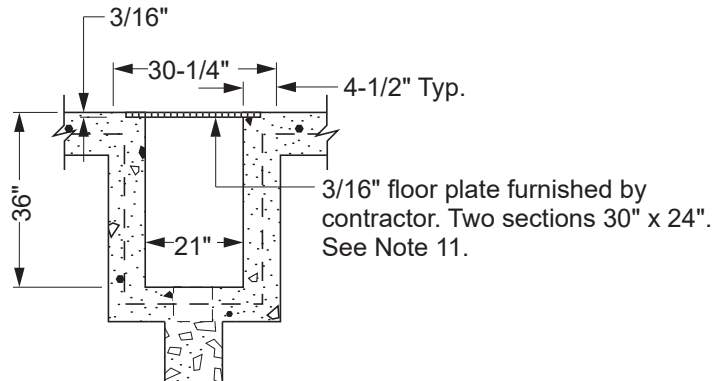


Figure SS 515-1.3: Section B-B

Note(s):

1. The pad will be 8" in thickness, the trench sides and bottom will all be 4" in thickness.
2. All concrete will have a minimum 28-day breaking strength of 3000 psi (see [GI 020](#)).
3. All concrete will be reinforced with 6" x 6" mesh - #10 gauge extending within 3" of the pad outside edges.
4. Contractor is to furnish and install pad finished smooth and level.
5. The top surface of the pad will be 4" above finish grade.
6. Protection barriers are required if pad is exposed to vehicular traffic (see [MC 830](#)).
7. Ground rods, clamps, and wire will be furnished and installed by contractor. Install each rod in shown location with top 6" below grade. Install continuous 2/0 bare copper ground wire through the concrete and attach to each rod using clamp. Continue wire back through concrete to trench and leave 12" inches exposed in trench.
8. Conduits entering the trench will be fully encased with a minimum of 3" of concrete when the top of the conduits are less than 24" below final grade.
9. Conduits and cables to enter any of the four ends of the cable trench only. The trenches can also be extended into adjacent pads supporting other equipment when desired.
10. A clear passage way of 10' minimum width will be available at all times from the pad to an accessible roadway for transformer maintenance.
11. Contractor to furnish all diamond floor plates, as required.
12. All plates will be 3/16" thick. Floor plates shall be hot dip galvanized per ASTM A123 after fabrication.
13. See working drawing for encasement schedule.

SS 515

Concrete Pad for Mounting S/C and ESCO Preferred Emergency Switchgear

Approved by:

B. C.

Sheet 2 of 2

What's Changed? Note 12 was updated for clarity.

Effective Date:

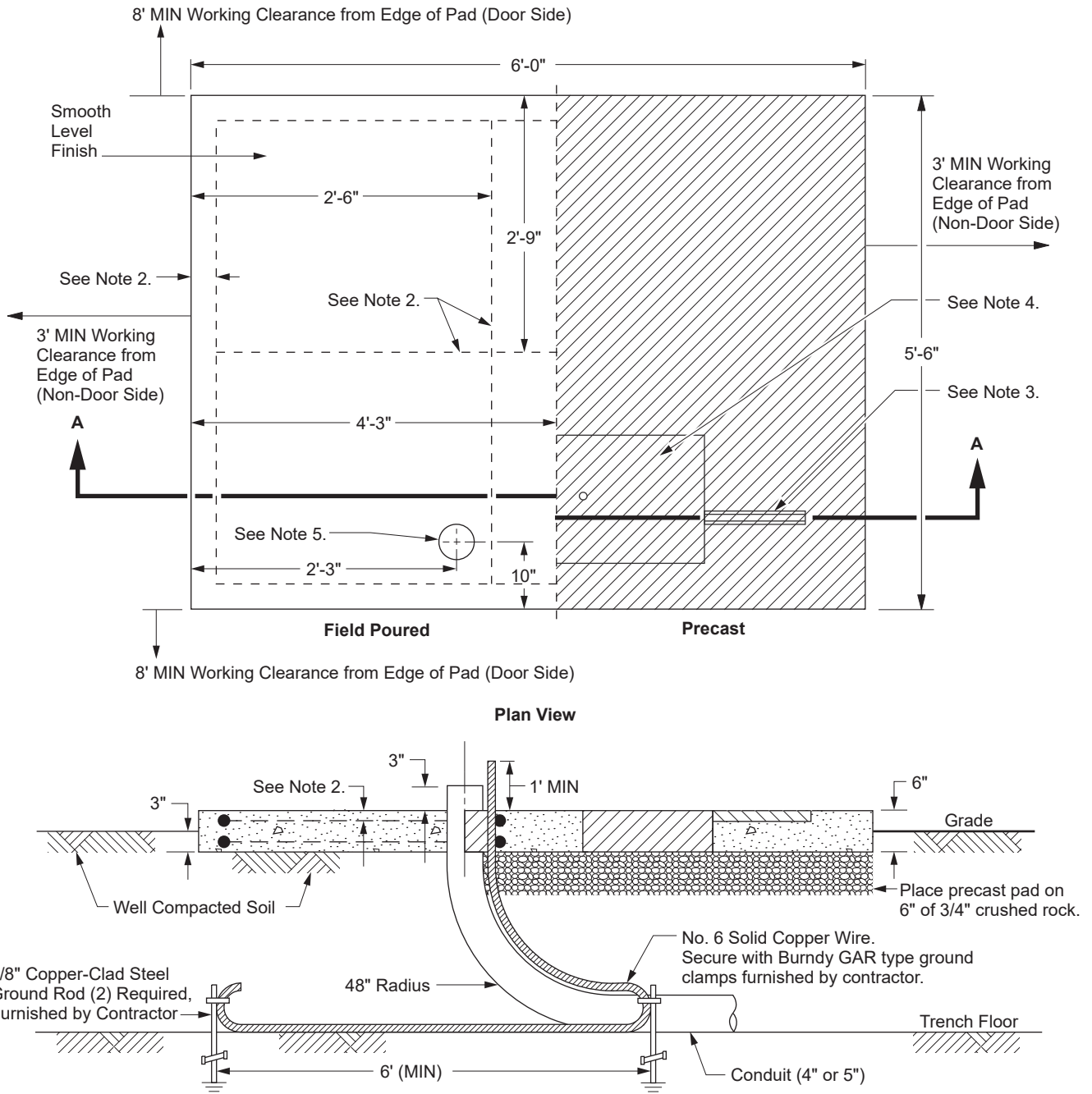
10-23-2015

UGS

SS 520 Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction

Scope SS 520.1 Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction

Figure SS 520-1: Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire — Systems



Approved by:
RK

Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction

SS 520

Effective Date:
01-30-2009

What's Changed? Figure SS 520-1 was revised to clarify the working clearance requirements for capacitor cabinets.

Sheet 1 of 2

UGS

Note(s):

1. Poured pad concrete to be 3,000 psi (minimum) at 28 days.
2. Poured pad reinforcing steel to be No. 4 bars installed in double net. Perimeter bars to be continuous (8" minimum lap or weld).
3. See [SS 504](#) for precast pad details (Pad No. 2). Unistrut only required for precast pads.
4. Precast pad opening will be filled with a minimum of 3" Redi-Crete mortar (or equivalent).
5. Conduit riser will be located to the dimensions on the plan view drawing.
6. For "Ungrounded Wye" 3-wire/4-wire pad-mounted capacitors, refer to DUG, UC 120.
7. See [AC 703](#) for approved grounding material manufacturers.
8. A working clearance of 8 feet minimum on door side of pad-mounted cabinet doors, and 3 feet on each side, will be kept as clearances for the retaining wall.

SS 520

Pad for Surface-Mounted Capacitor Cabinet — 3-Wire or 4-Wire Systems — Precast and Field Poured Construction

Approved by:

RK

Sheet 2 of 2

What's Changed? Updated Note 8 for clarity.

Effective Date:

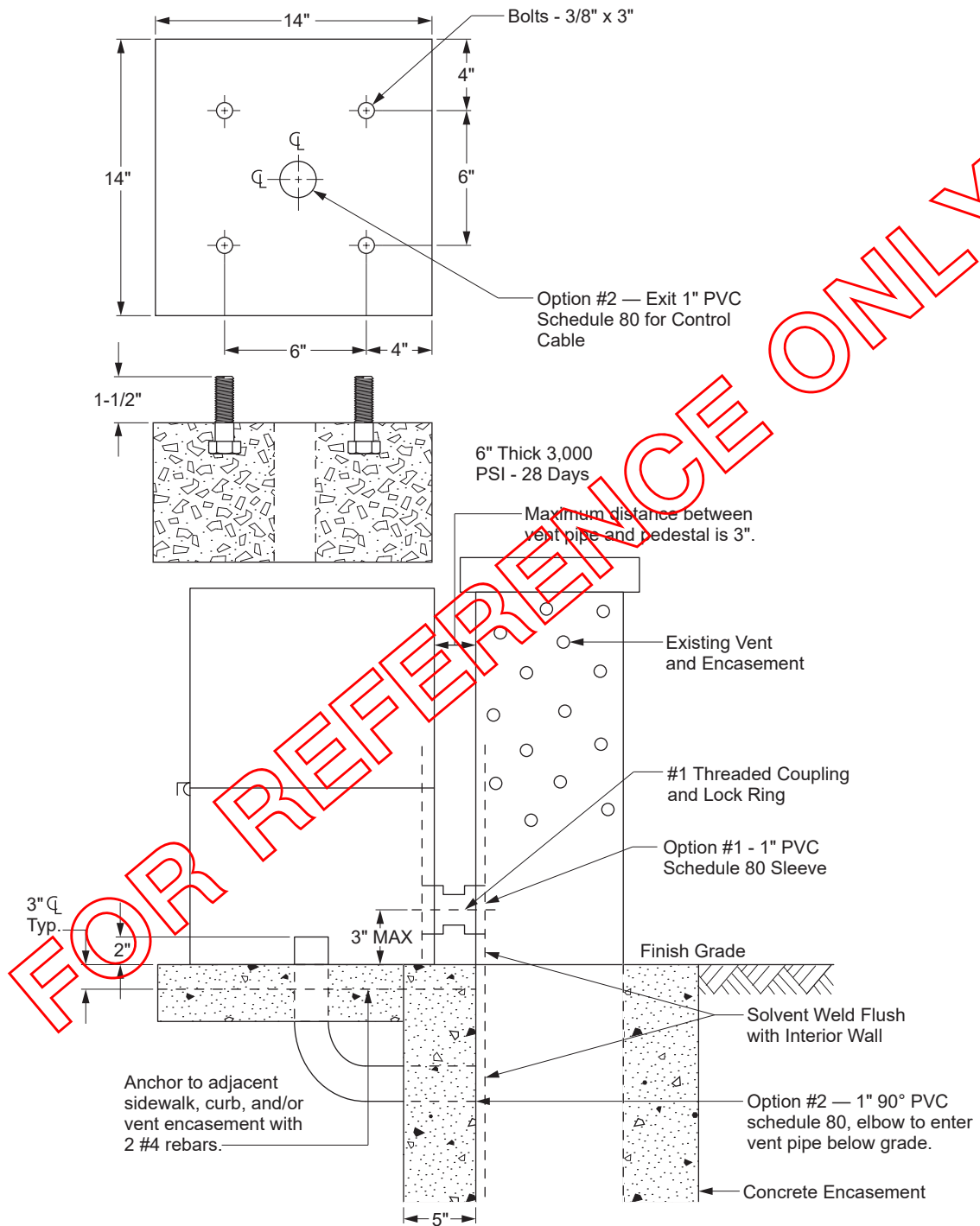
01-30-2009

UGS

SS 522 Pad for Underground Switch Capacitor Control Pedestal

Scope SS 522.1 Pad for Underground Switch Capacitor Control Pedestal

Figure SS 522-1: Pad for Underground Switch Capacitor Control Pedestal



Approved by:

PhH

Pad for Underground Switch Capacitor Control Pedestal

SS 522

Sheet 1 of 1

Effective Date:
01-26-2007

What's Changed?

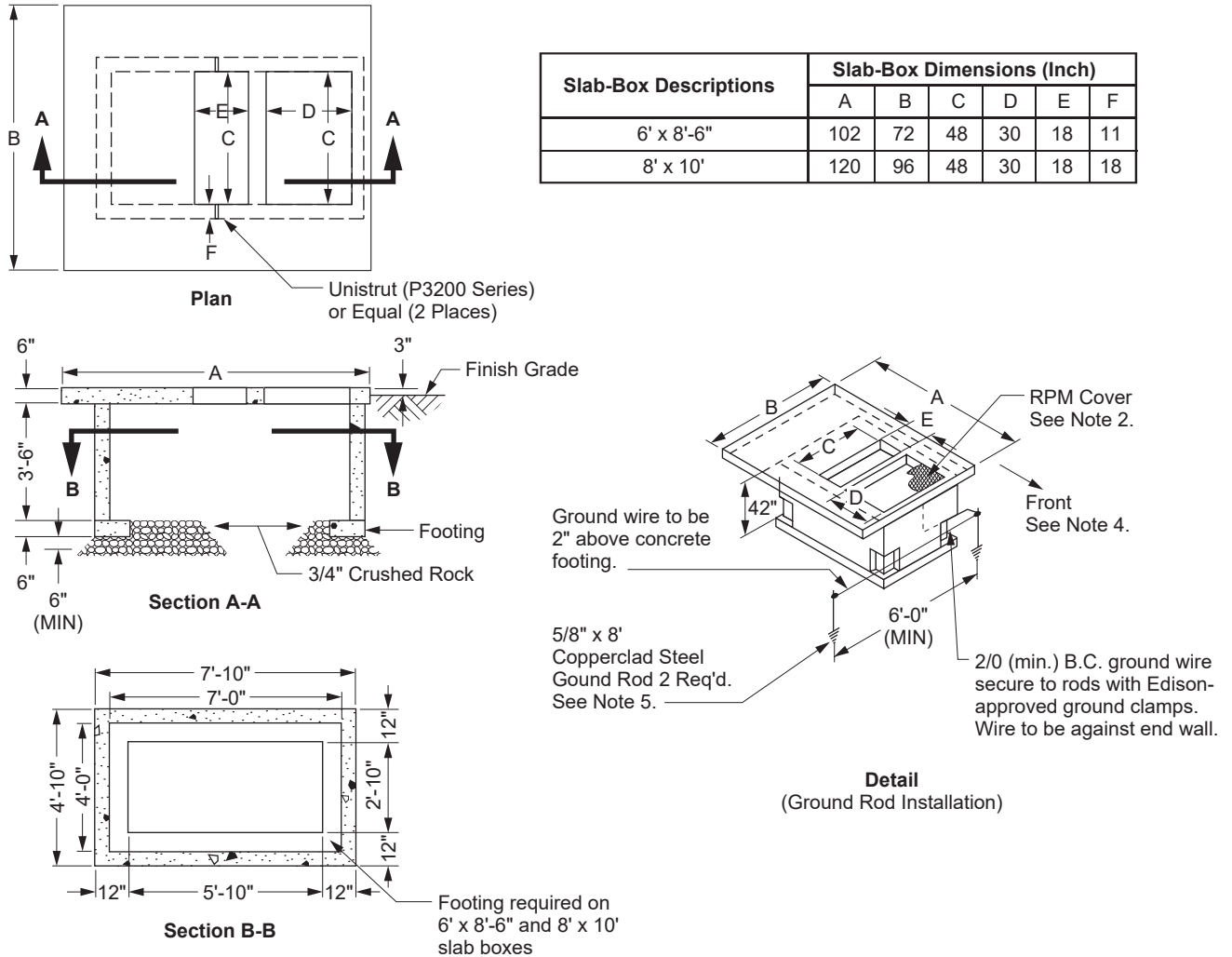
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SS 530 6' x 8'-6" and 8' x 10' Slab Box for Pad-Mounted Transformer, VFI-4, and RAR

Scope SS 530.1 6' x 8'-6" x 6" and 8' x 10' x 6" Slab Box for Pad-Mounted Transformer, VFI-4, and RAR

Figure SS 530-1: 6' x 8'-6" x 6" and 8' x 10' x 6" Slab Box — Plan, Section A-A, Section B-B, and Detail



Note(s):

1. Pad overhang to rest on undisturbed earth or well-compacted backfill to prevent future subsidence.
2. The slab 30" x 48" clear opening will be covered with a 2-1/2" x 4' RPM cover as shown on [FC 618](#). Six 1/2" stainless steel bolts with stainless steel captive washers will be supplied for cover bolt down.
3. Slab RPM cover recess will be concrete (nonmetal framed), and provided with six 1/2" threaded inserts, each with clean out holes.
4. An 8' minimum clearance is required on door side of cabinet for operation. Refer to [Figure SS 530-3 \(Sheet 3\)](#) and [Figure SS 530-4 \(Sheet 3\)](#) for working clearances.
5. Ground rods, clamps, and wire will be furnished and installed by the contractor. See [AC 703](#) for approved grounding materials. Ground wire to be a minimum of 2/0 bare copper.
6. Mastic sealant is required at joints.
7. See [Figure SS 530-2 \(Sheet 2\)](#) for conduit entrance guidelines.
8. See [SS 500](#) for approved manufacturers.

Approved by:

ajj

6' x 8'-6" and 8' x 10' Slab Box for Pad-Mounted Transformer, VFI-4, and RAR

SS 530

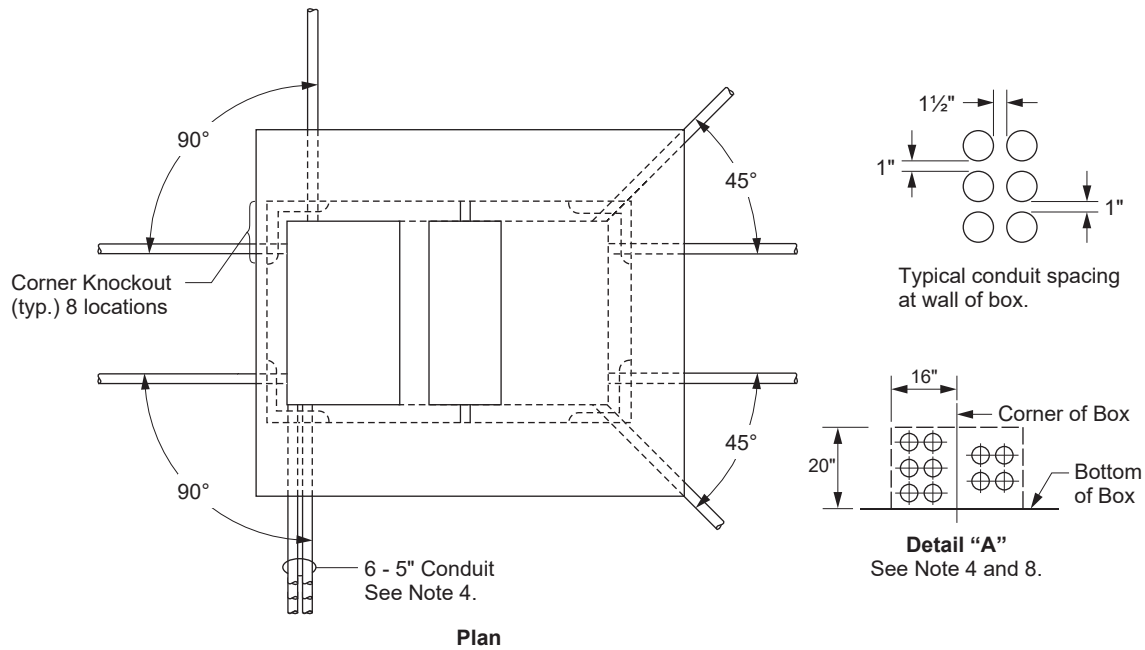
Sheet 1 of 3

Effective Date:
07-27-2018

What's Changed?

UGS

Figure SS 530-2: 6' x 8'-6" and 8' x 10' Slab Box — Plan and Detail "A"



Note(s):

1. All conduits are to enter slab box at corner knockouts within the angles shown. The working drawing will specify how many conduits are to be installed.
2. Install all conduits within the cast-in knockouts.
3. All conduits to be installed on a level course adjacent to box.
4. A maximum of six five-inch conduits can be installed into any one knockout. When six five-inch conduits are installed, do not install more than four 5-inch conduits in adjacent knockout (See Note 8).
5. All conduits to be cut smooth and flush with inside wall of box.
6. Pour a 12" minimum of concrete encasement (per CD 134) around all conduits that are not encased.
7. Grout work around all conduits to be flush with inside surface of structure and have a smooth finish.
8. When conduits are installed in both knockouts of any one corner, the conduits will be vertically staggered in order to allow cable to cross over (see Detail "A").
9. Install grade rings as necessary in order to maintain minimum 30" cover over conduits. See CD 100.

SS 530

6' x 8'-6" and 8' x 10' Slab Box for Pad-Mounted Transformer, VFI-4, and RAR

Approved by:

ajf

Sheet 2 of 3

What's Changed? Figure SS 530-2: added dimensions for Detail "A."

Effective Date:

UGS

07-27-2018

Figure SS 530-3: Pad Mounted Transformer and VFI-4 Working Clearances

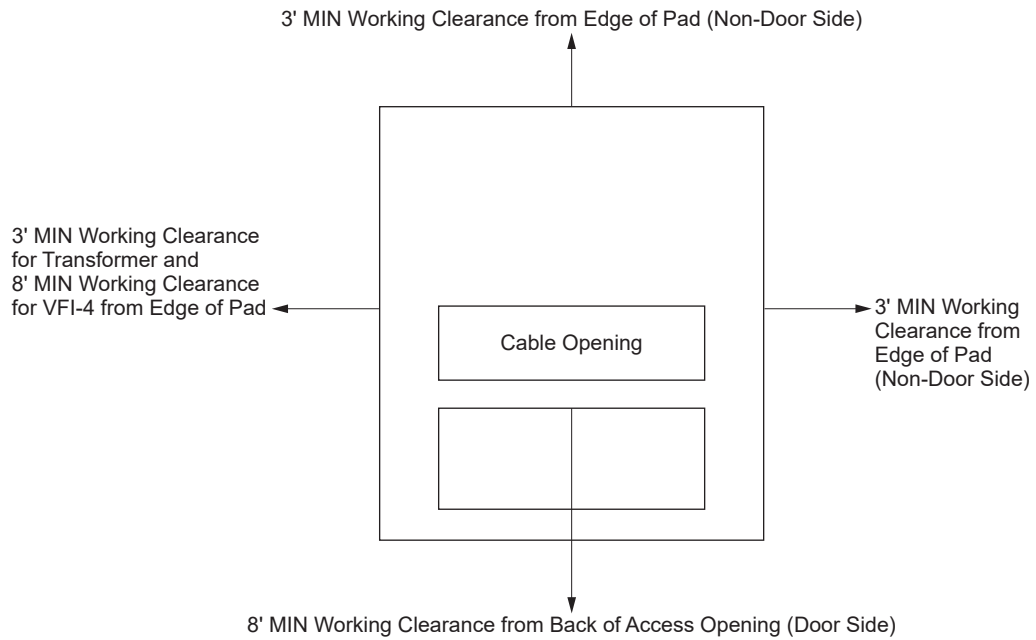
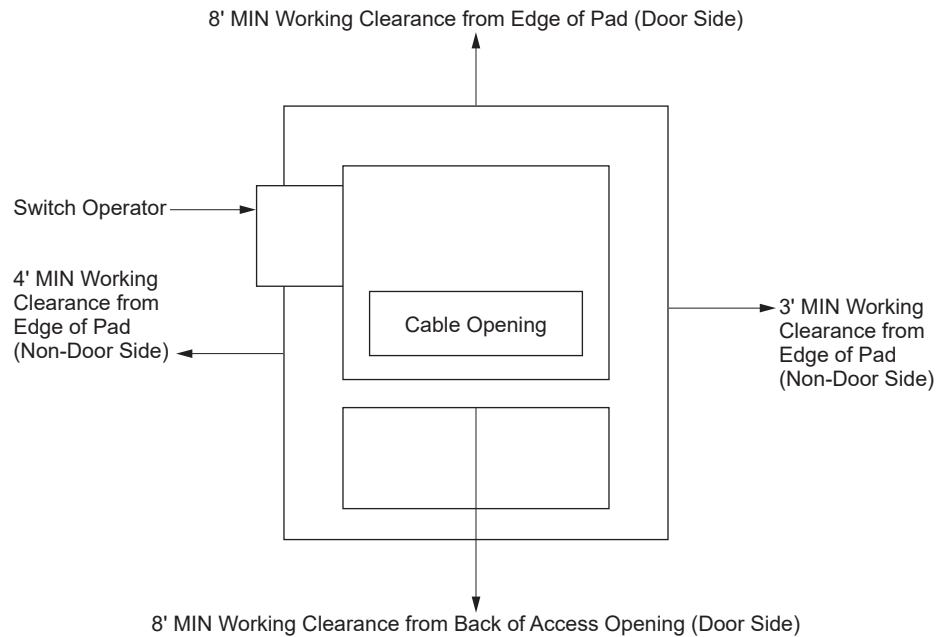


Figure SS 530-4: RAR Working Clearances



Approved by:

ajf

6' x 8'-6" and 8' x 10' Slab Box for Pad-Mounted Transformer, VFI-4, and RAR

SS 530

Effective Date:

07-27-2018

What's Changed?

Sheet 3 of 3

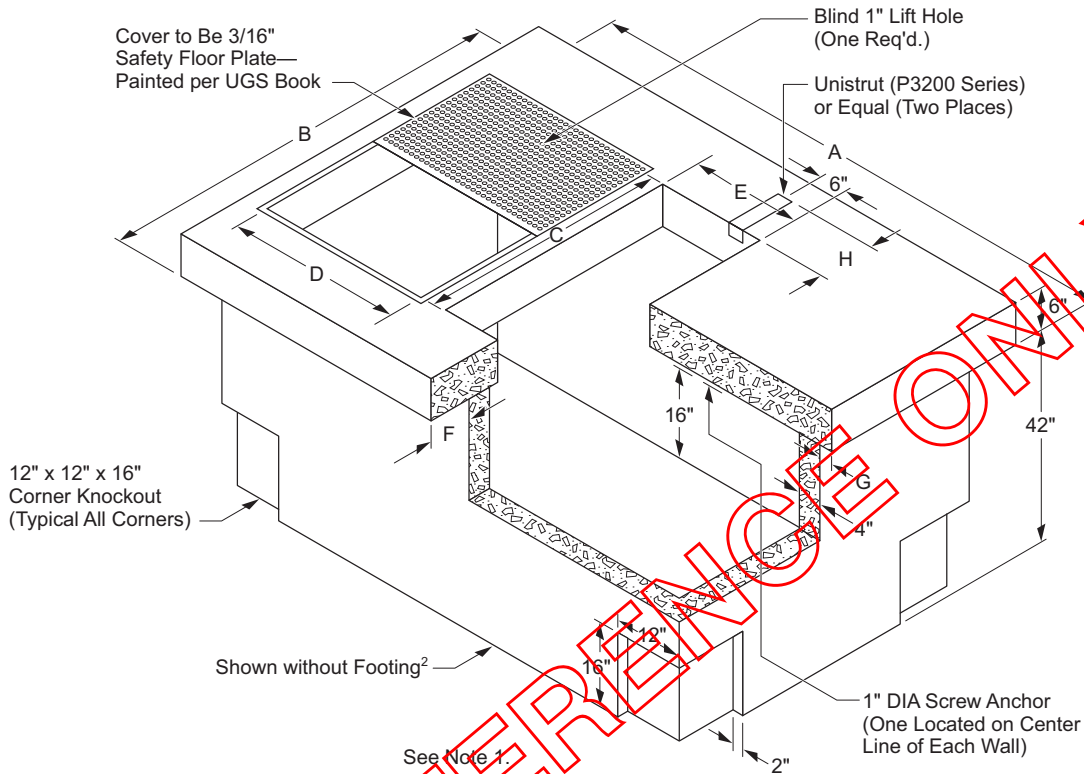
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SS 533 Slab Box — Pad-Mounted Transformers

Scope SS 533.1 Slab Box for Pad-Mounted Transformers — 75 kVA–1,000 kVA 3Ø

Figure SS 533–1: Slab Box for Pad-Mounted Transformers — 75 kVA–1,000 kVA 3Ø



Note(s):

- To be purchased with footing installation per UGS book.

Table SS 533–1: Slab Box for Pad-Mounted Transformers — 75–1,000-kVA 3Ø

Transformer Class and Capacity Padmount	Slab Box Dimensions (in)							
	A	B	C	D	E	F	G	H
3Ø 75 kVA–500 kVA ^{a/}	96	72	48	30	18	8	2	11 ^{b/}
3Ø 750 kVA–1,000 kVA ^{c/}	120	96	48	30	18	20	26	18

^{a/} For use only when there are more than four service runs.

^{b/} 1,500 kVA 3Ø transformers may be placed on the 96" x 120" slab box if a pole, pad, or vault is available for fusing equipment. Use the 11' x 15'-5" pad (refer to UGS book) where 1,500–3,750-kVA and padmount fusing are planned.

^{c/} To be purchased with footing installation per UGS book.

Note(s):

- Precast units can be obtained from Jensen Precast (formerly Brooks Products) or Oldcastle Infrastructure under drawing numbers 1550TPV42-ED1, 1553TPV42-ED1, SB-6.6-66, and SB-10.6-66.
- Slab-box to be placed on 6 inches compacted rock.
- Slots of Unistrut must be filled with duct seal to seal off opening after padmount installation.

Approved by:

RR

Slab Box — Pad-Mounted Transformers

SS 533

Sheet 1 of 1

Effective Date:
04-24-2020

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

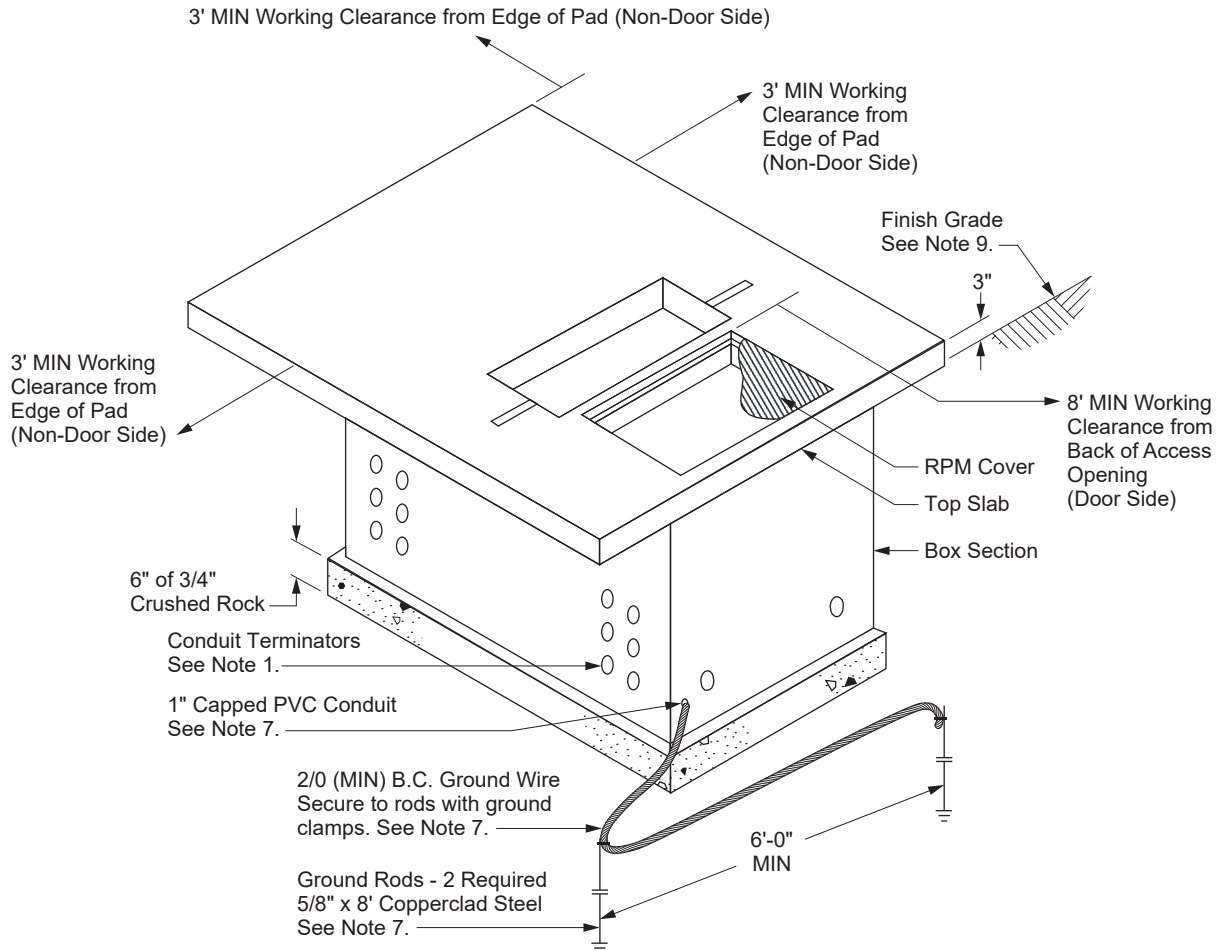
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SS 535 10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators

Scope SS 535.1 10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators

Figure SS 535–1: 10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators



Note(s):

1. Conduit terminators to be located as shown on [Figure SS 535–2 \(Sheet 2\)](#) to [Figure SS 535–5 \(Sheet 5\)](#). Standard conduit entrance will be a flatwall design. Slight variations by manufacturers may be allowed with Company approval.
2. When cable trench openings are required in a slab box, they can be special ordered from the concrete precaster.
3. For slab box structural design criteria, see [Figure SS 535–2 \(Sheet 2\)](#) to [Figure SS 535–5 \(Sheet 5\)](#).
4. For list of material requirements notes, see [Table SS 535–1 \(Sheet 6\)](#).
5. Consult manufacturers' installation guides for excavation dimensions.
6. An 8' minimum clearance is required on door side of transformer for operation.
7. Ground rods, clamps, and wire will be furnished by contractor. See [AC 703](#) for approved grounding materials. Ground wire to be a minimum of 2/0 bare copper. Ground wire to be placed through capped one-inch PVC conduit at either end of slab box. A minimum three-foot length of ground wire will be placed in slab box.
8. Mastic sealant is required at joints.
9. Top surface of slab box will be set three inches above finished grade.
10. See [SS 500](#) for approved manufacturers.

Approved by:

ajf

10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators

SS 535

Effective Date:
07-26-2019

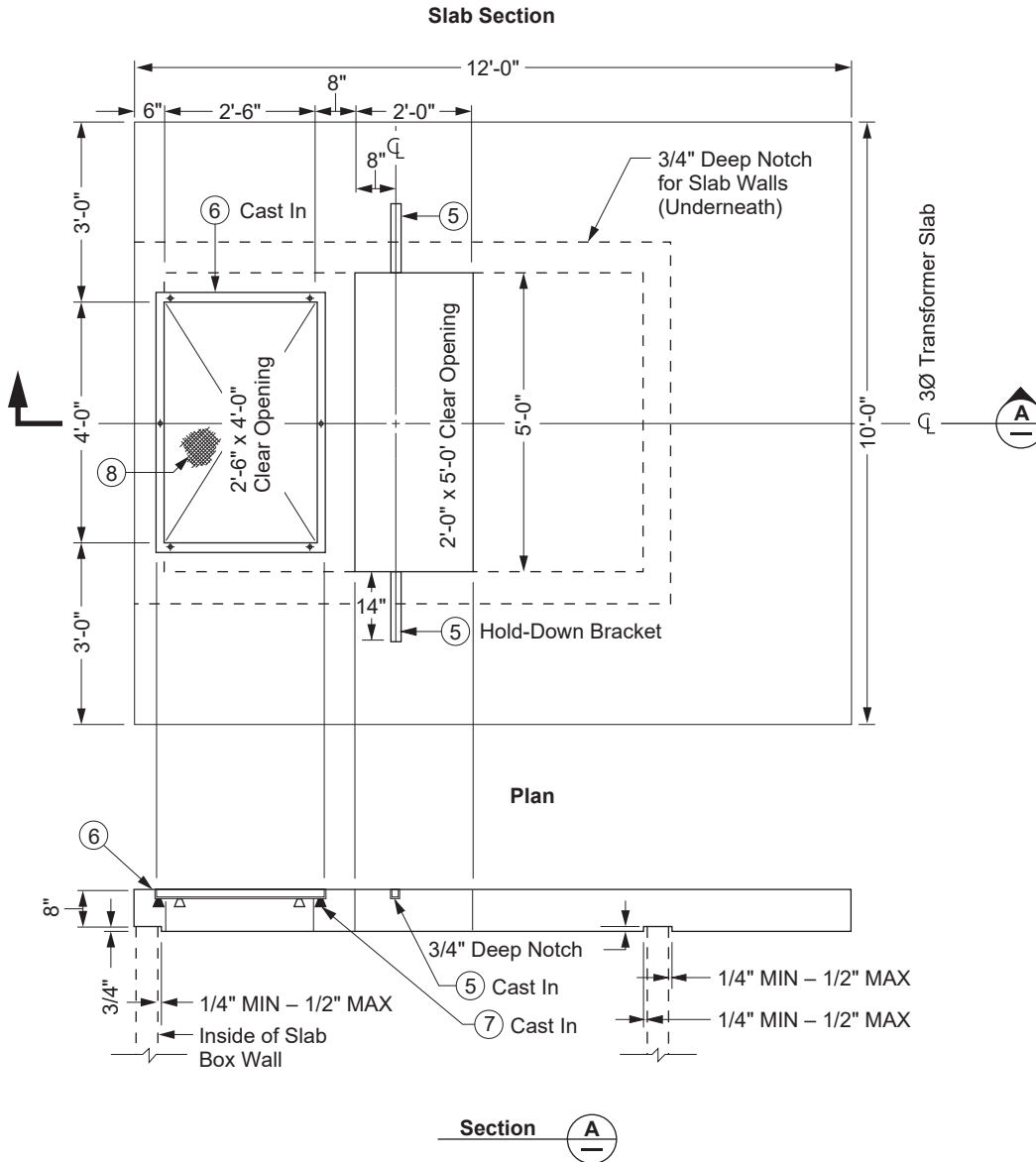
What's Changed? Standard has been updated to include Voltage Regulators.

Sheet 1 of 6

UGS

Scope SS 535.2 Shows Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators

Figure SS 535-2: Shows Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Plan and Section C



Note(s):

1. For list of materials and notes, see [Table SS 535-1 \(Sheet 6\)](#).

SS 535

10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators

Approved by:

ajf

Sheet 2 of 6

What's Changed? Standard has been updated to include Voltage Regulators.

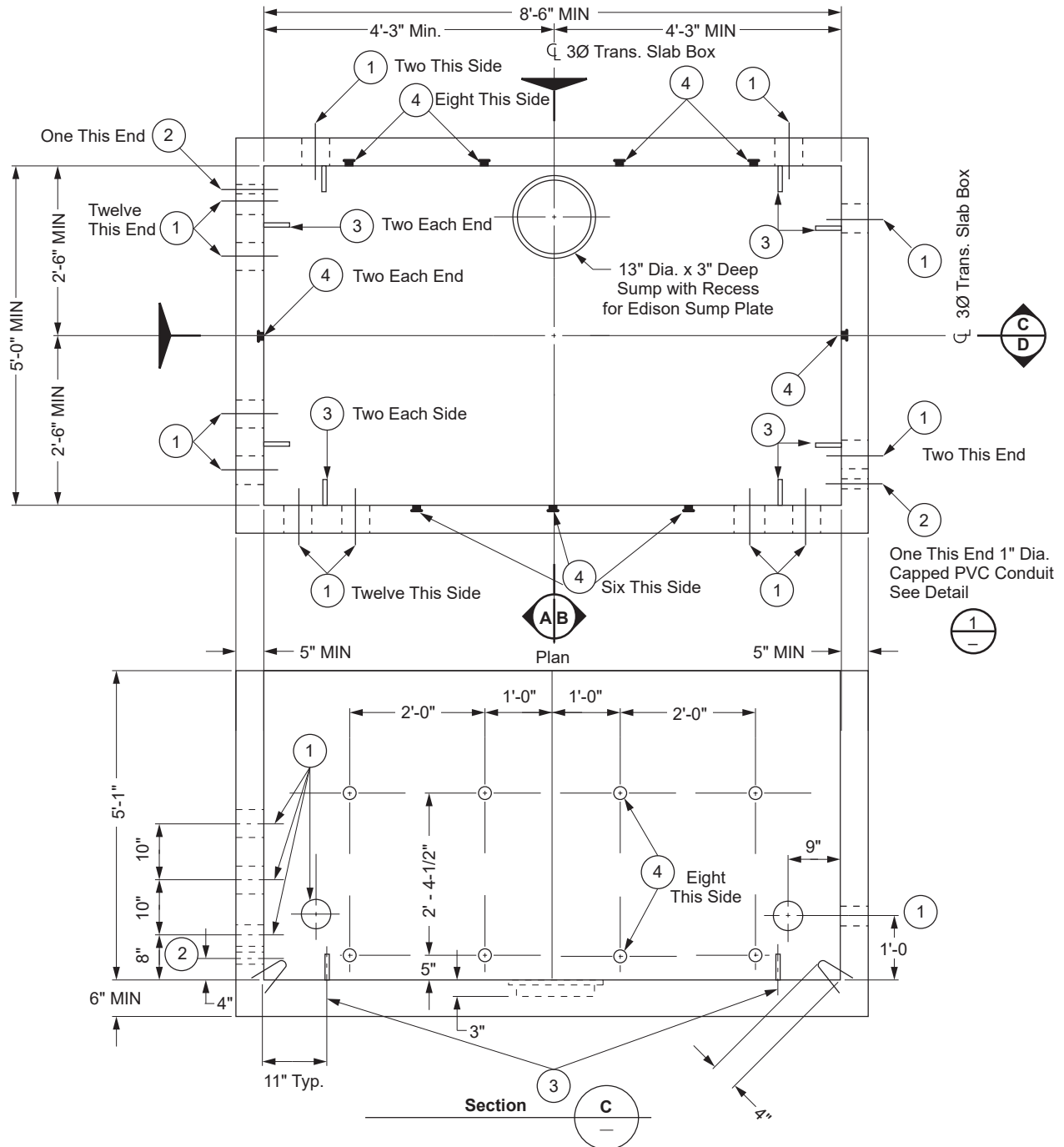
Effective Date:

07-26-2019

UGS

Scope SS 535.3 Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Box Section

Figure SS 535-3: Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Box Section — Plan and Section C



Note(s):

- 1. For list of materials and notes, see [Table SS 535-1 \(Sheet 6\)](#).


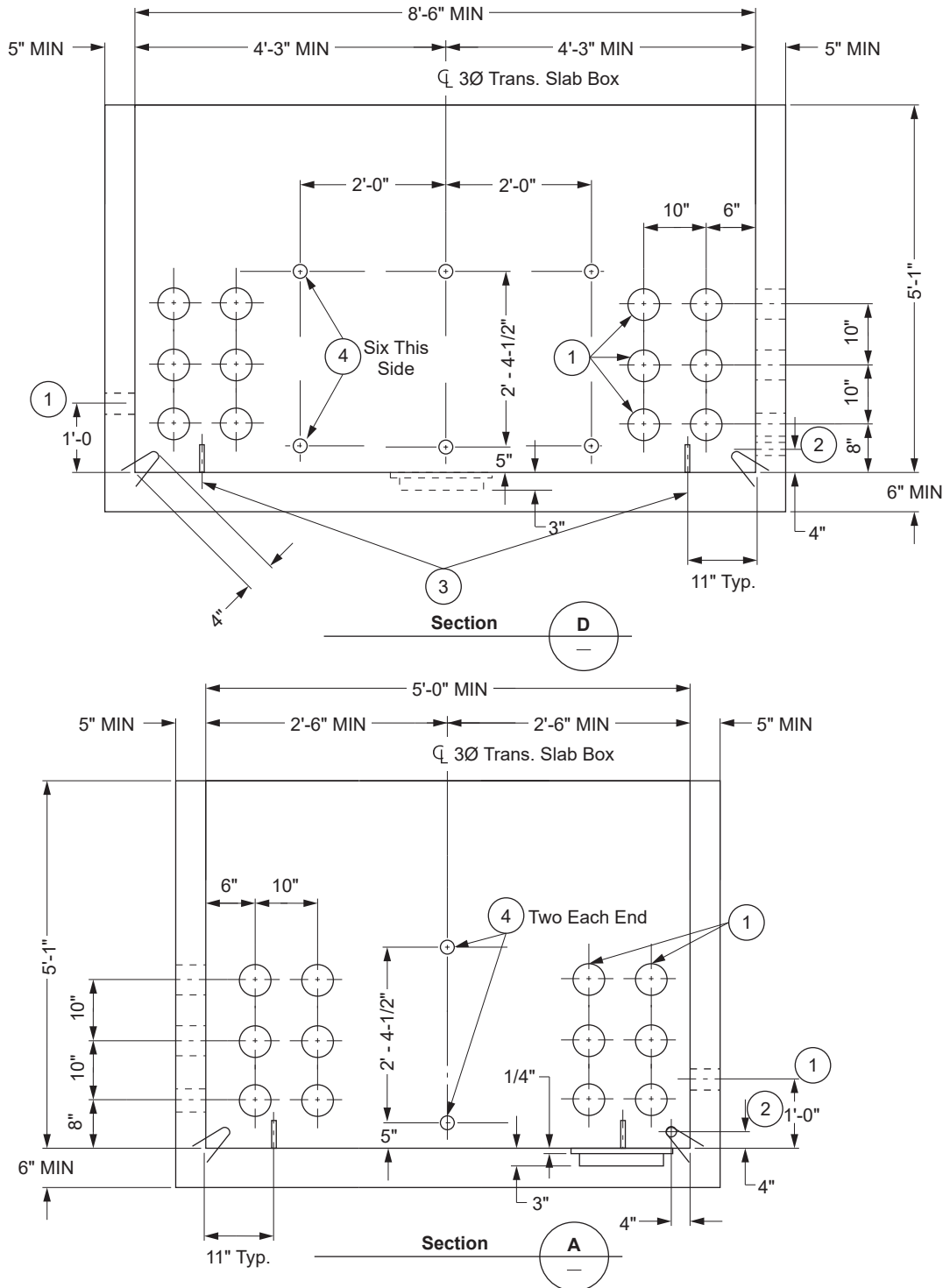
Approved by: 	10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators	SS 535
Effective Date: 07-26-2019	What's Changed? Standard has been updated to include Voltage Regulators.	Sheet 3 of 6 UGS

Figure SS 535-4: Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Box Section — Sections D and A



Note(s):

1. For list of materials and notes, see [Table SS 535-1 \(Sheet 6\)](#).

SS 535

10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators

Approved by:

ajf

Sheet 4 of 6

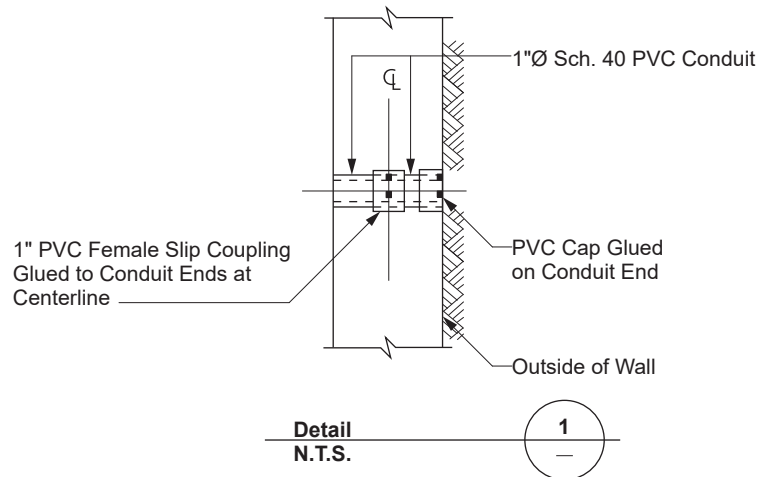
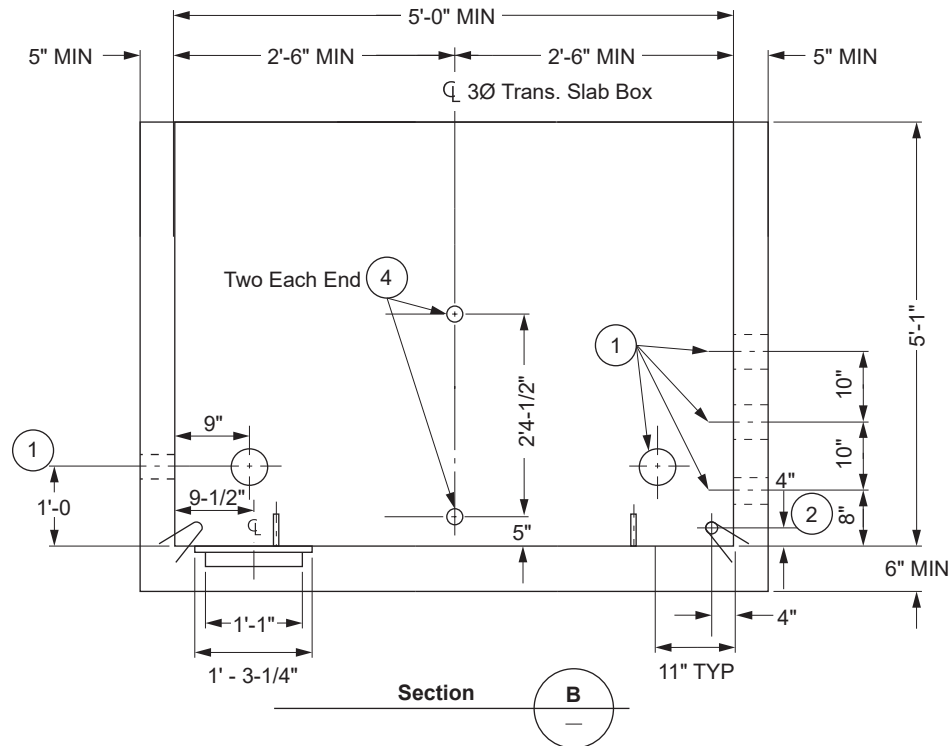
What's Changed? Standard has been updated to include Voltage Regulators.

Effective Date:

07-26-2019

UGS

Figure SS 535-5: Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Box Section — Section B and Detail 1



Note(s):

1. For list of materials and notes, see [Table SS 535-1 \(Sheet 6\)](#).


Approved by: 	10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators	SS 535
Effective Date: 07-26-2019	What's Changed? Standard has been updated to include Voltage Regulators.	Sheet 5 of 6 UGS

Table SS 535–1: List of Materials — Precast Slab Box for 3Ø Pad-Mounted Transformers and Pad-Mounted Voltage Regulators — Box Section

Ref. No.	Description	Quantity
①	5" DIA Plastic Conduit Terminators ^{a/}	28
②	Capped Schedule 40 PVC 1" Conduit (See Detail 1) ^{b/}	2
③	Pull Irons 7/8" DIA Vertical ^{c/}	8
④	1/2" DIA Plastic Inserts — Imper. Constr. Products — 15000 ^{d/}	18
⑤	Hold-Down Brackets, P-3200 Series Unistrut, 1'-2" Long ^{e/}	2
⑥	Hot-Dipped Galvanized 30" x 48" Steel Pull Box Frame ^{f/}	1
⑦	1/2" DIA Open Bottom Threaded Insert — Star #P35T ^{g/}	6
⑧	30" DIA 48" RPM Pull Box Cover ^{h/}	1
⑨	1/2" x 2-1/2" Large S.S. Penta-Head Bolt with Captive Free-Spinning Round Flat S.S. Washer ^{i/}	6

^{a/} Plastic conduit terminators will be an Edison-approved one-piece design.

^{b/} A one-inch dia. capped Schedule 40 PVC conduit will be installed as shown in Detail 1.

^{c/} Seven-eighths-inch pull irons will be designed for a working tension of 20,000 pounds plus a safety factor of 2.

^{d/} One-half-inch threaded plastic inserts will be Imperial Construction Products, Part No. 15000.

^{e/} Hold-down brackets will be P-3200 series Unistrut (or equivalent), 1'-2" long. Brackets will be hot-dipped galvanized after fabrication. The end of the two brackets adjacent to the slab cable entrance will be permanently blocked solid.

^{f/} 30" x 48" steel pull box frame will be constructed as shown in FC 608. Frame to be hotdipped galvanized after fabrication.

^{g/} One-half-inch open bottom metal threaded inserts will be Star, Part #P35T or equivalent. A cleanout hole will be provided under each insert.

^{h/} 30" x 48" RPM pull box cover will be constructed as shown in FC 618.

^{i/} 30" x 48" RPM pull box cover will be attached to cover frame/inserts with 1/2" x 2-1/2" long S.S. Penta-head bolts with captive free-spinning round flat S.S. washers.

Note(s):

- Design and construction of three-phase transformer slab box will conform to GI 030 wherever applicable (specification for precast reinforced concrete vaults and manholes).
- Walls will be painted white.
- No lifting inserts or like devices will be installed in floor of base section.
- No lifting inserts or like devices will be installed on top outside slab surface.
- Slab will be designed to support a maximum transformer weight of 30,000 pounds. For dimensional distribution of transformer loads, contact SCE Corp.
- Structural design will be approved by Los Angeles County Road and Bridge Department.

SS 535

10' x 12' Precast Slab Box for 3Ø Pad-Mounted Transformers up to 5,000 kVA and Pad-Mounted Voltage Regulators

Approved by:



Sheet 6 of 6

What's Changed? Standard has been updated to include Voltage Regulators.

Effective Date:

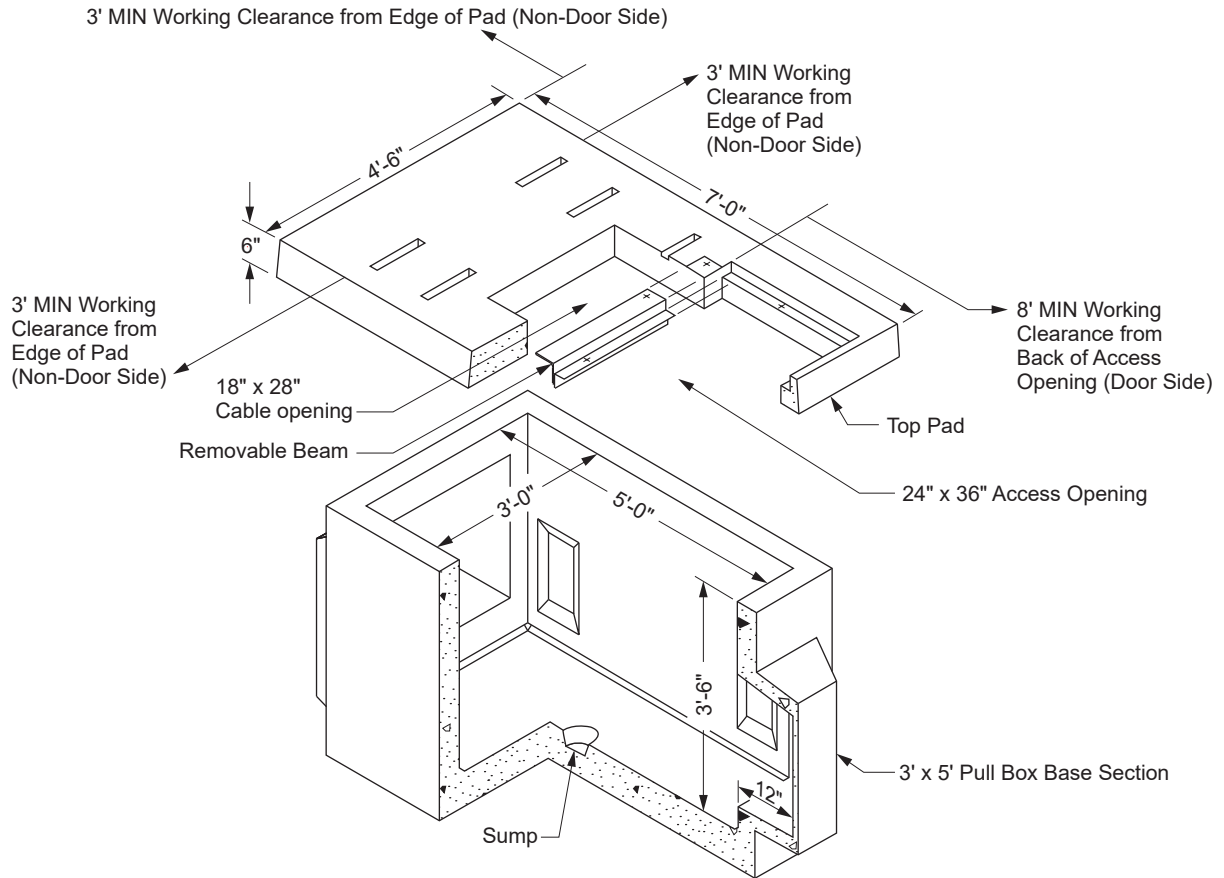
07-26-2019

UGS

SS 536 Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box

Scope SS 536.1 Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box for 2-Way Pad-Mounted SF6 Switch

Figure SS 536-1: 4'-6" x 7' Pad with 3' x 5' Pull Box for 2-Way Pad-Mounted SF6 Switch



1.0 Excavation Size:

Minimum excavation for pull box will be 52" x 97" x depth to suit job. Installing contractor will provide grade rings (6 inch minimum) as necessary in order to maintain cover over conduits per SCE requirements or permit agency requirements, whichever is greater. Backfill material will be well compacted to prevent subsidence.

2.0 UGS References:

- AC 700 Ground Rod — Ground Wires
- AC 703 Grounding Materials
- MC 830 Protection Barriers

Approved by:

RR

Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box

SS 536

Sheet 1 of 5

Effective Date:
04-24-2020

What's Changed?

UGS

3.0 Reference Drawing:

5230867-0: Equipment Slab Box, 4'-6" x 7'-0" Pad w/3' x 5' Pull Box for 2-Way SF6 Pad-Mounted Switchgear.

4.0 Installation Notes:

- 4.1 Pad and pull box will be set level. Pull box will be placed on 6 inch (minimum) compacted rock base to ensure uniform distribution of soil pressure in floor.
- 4.2 Mastic sealant is required at joints.
- 4.3 Top surface of pad will be set three inches above finished grade.
- 4.4 One ground rod will be furnished and installed by contractor. Install ground rod through floor of box per [AC 700](#). Ground rod material will comply to [AC 703](#).
- 4.5 An 8 foot (minimum) clearance is required on door side of Equipment Slab Box for operation.
- 4.6 Protection barriers will be installed if pad is exposed to vehicular traffic per [MC 830](#).

<p>SS 536</p>	<p>Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box</p>	<p>Approved by: <i>RR</i></p>
<p>Sheet 2 of 5</p> <p>UGS</p>	<p>What's Changed?</p>	<p>Effective Date: 04-24-2020</p>

Figure SS 536-2: Pad Plan View — Precast Concrete Equipment Slab Box

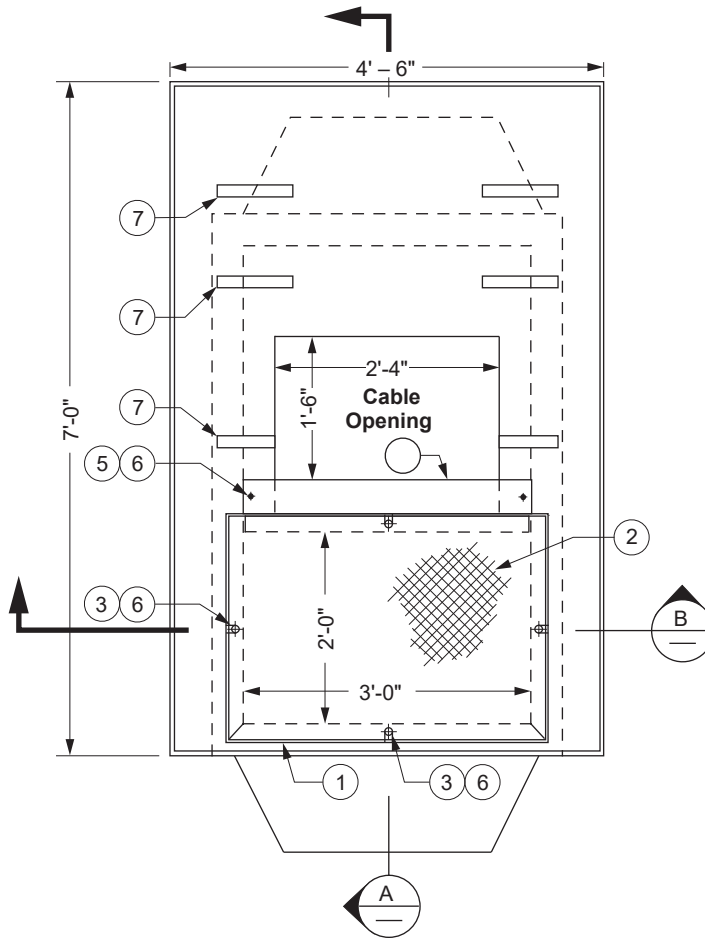


Table SS 536-1: Precast Concrete — Precast Concrete Equipment Slab Box

Nominal Size	Manufacturers' Reference Numbers	
	Jensen Precast	Oldcastle Infrastructure
4'-6" x 7'	K3660-PUV42-11	ED-467-SB

Note(s):

- Item number and SAP number are listed in [SS 500](#).

Approved by:

RR

Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box

SS 536

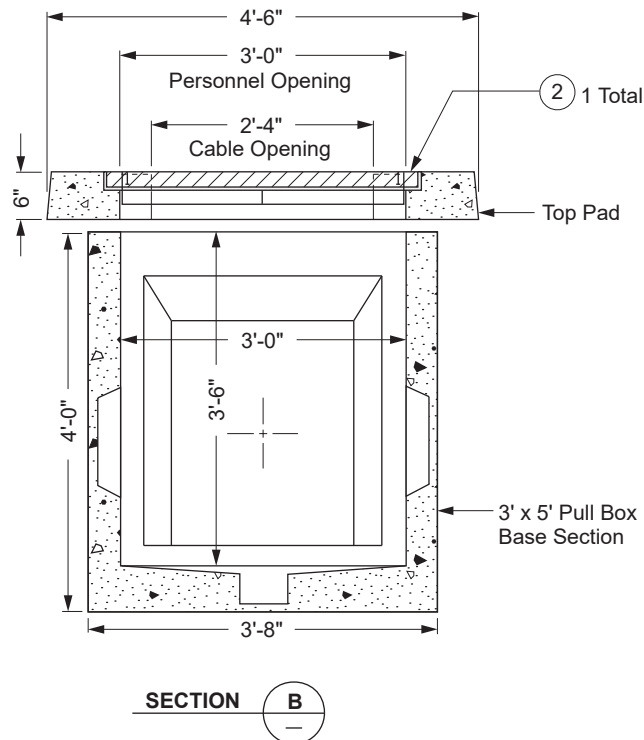
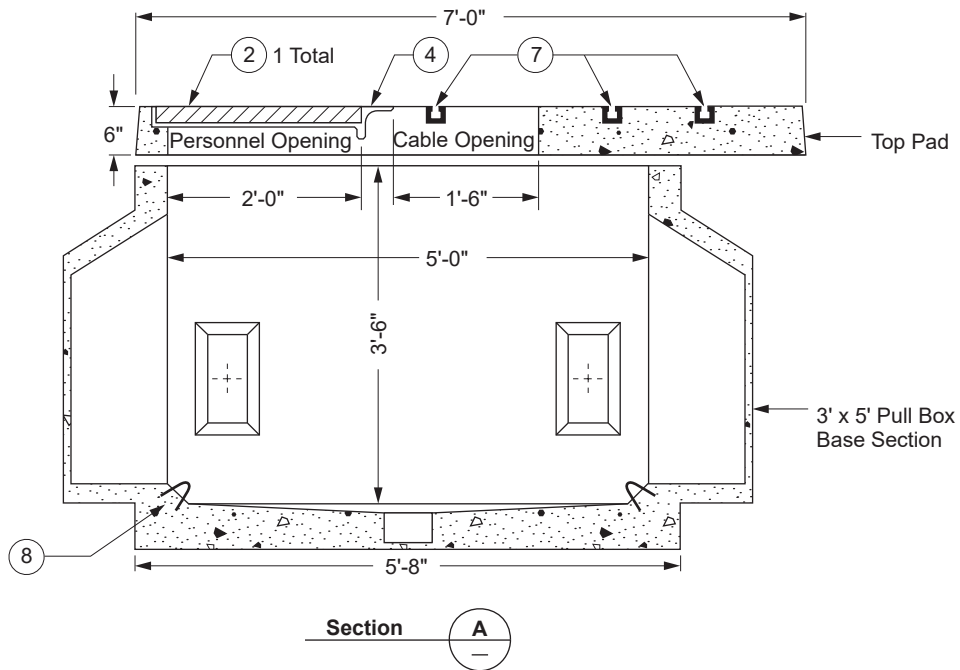
Effective Date:
04-24-2020

What's Changed? Table SS 536-1: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure; parent company note removed.

Sheet 3 of 5

UGS

Figure SS 536-3: Precast Concrete — Precast Concrete Equipment Slab Box



SS 536

Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box

Approved by:

RR

Sheet 4 of 5

What's Changed?


Effective Date:

UGS

04-24-2020

Note(s):

1. 24" x 36" hotdipped galvanized steel frame (3-sided) 2" x 2" x 3/16" or cast in concrete.
2. 24" x 36" polymer concrete pull box cover. (1 total)
3. 1/2" x 2-1/2" long s.s. Penta-head bolt with captive free spinning round flat s.s. washers to secure 2' x 3' polymer pull box cover to pad. (4 total)
4. Removable galvanized steel beam designed to support 24" x 36" personnel cover and switch cabinet enclosure. (1 total)
5. 1/2" x 1-1/2" long stainless steel countersunk machine screw for securing removable beam to pad. (2 total)
6. 1/2-inch diameter open bottom threaded insert with clean out hole or galvanized unistrut channel with unistrut nuts. (5 total)
7. Galvanized unistrut channels for securing the switch tank and cabinet enclosure to pad. (6 total)
8. 7/8-inch diameter pulling irons. (2 total)

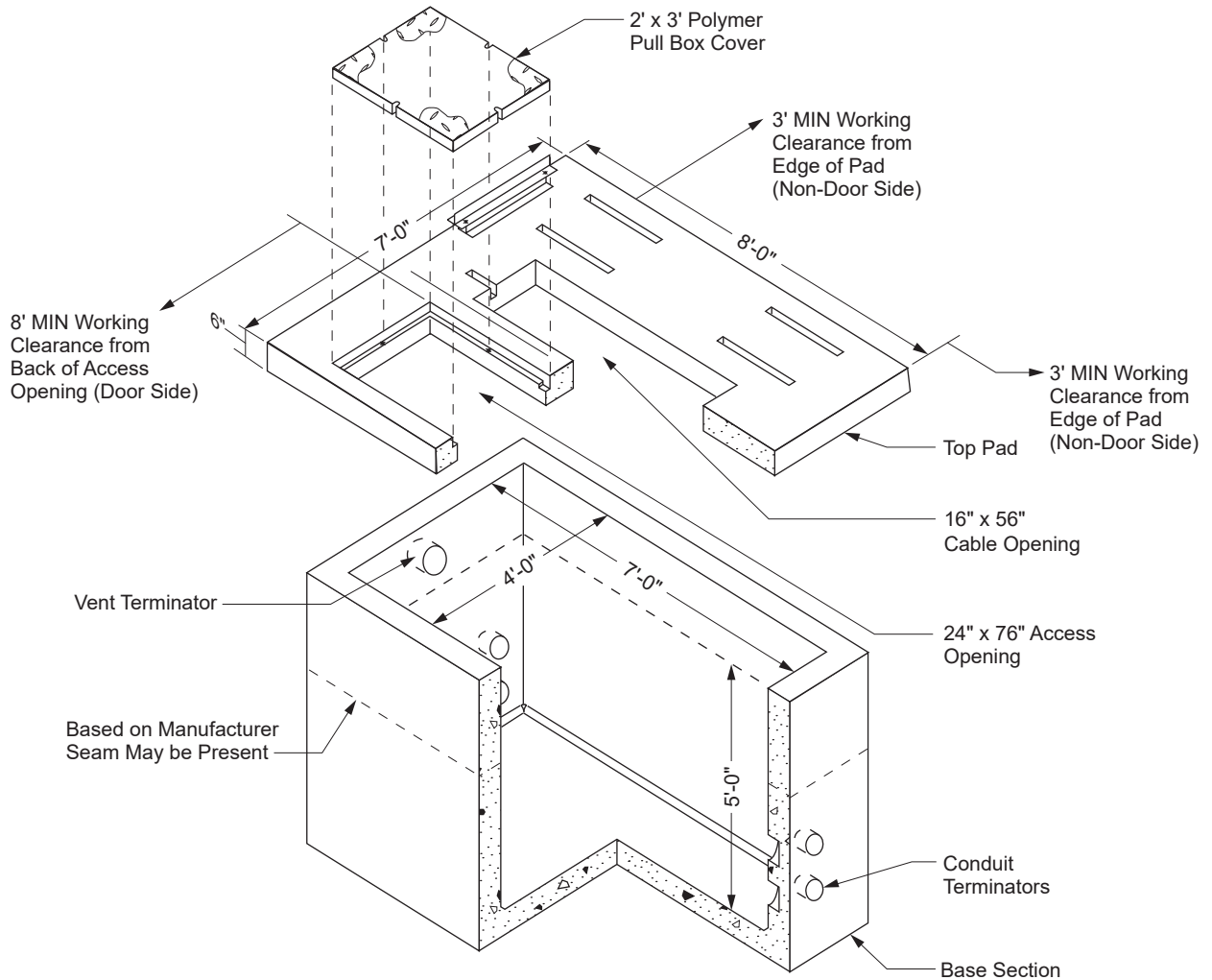
Approved by: 	Precast Concrete Equipment Slab Box — 4'-6" x 7' Pad with 3' x 5' Pull Box	SS 536
Effective Date: 04-24-2020	What's Changed?	Sheet 5 of 5 UGS

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SS 537 Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box

Scope SS 537.1 Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box for 2-Way, 3-Way, and 4-Way, G&W Pad-Mounted RAM and RAG Gas Switches

Figure SS 537-1: 7' x 8' Pad with 4' x 7' x 5' Box for 2-Way, 3-Way, and 4-Way, G&W Pad-Mounted RAM and RAG Gas Switches



1.0 Excavation Size:

Consult manufacturers' installation guides for exact excavation dimensions. Backfill will be well compacted to prevent subsidence.

2.0 UGS References:

[AC 731](#) J-Bolt Support for Neutral/Ground Bus

[MC 830](#) Protection Barriers

Approved by:

RR

Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box

SS 537

Sheet 1 of 5

Effective Date:
04-24-2020

What's Changed?

UGS

3.0 Reference Drawings:

5230383-0: Equipment Slab Box 7' x 8' Pad w/4' x 7' x 5' Box for 2, 3 and 4-Way G&W SF₆ Pad-Mounted Switchgear.

5230384-0: 28" x 80" Steel Cover Frame w/Removable "I" Beam for 7' x 8' Pad

4.0 Installation Notes:

- 4.1 Install box so the sump is located under personnel opening.
- 4.2 Pad and slab box will be set level. Slab box will be placed on 6 inch (minimum) compacted rock base to ensure uniform distribution of soil pressure in floor. Pad overhang to rest on undisturbed earth or well compacted backfill to prevent subsidence.
- 4.3 Mastic sealant is required at seams.
- 4.4 Top surface of pad will be set 3 inches above finish grade.
- 4.5 Attach pad to box with anchor brackets and bolts as furnished and recommended by precast concrete manufacturer.
- 4.6 An 8 foot (minimum) clearance is required on door side of switch pad for operation.
- 4.7 Protection barriers will be installed if pad is exposed to vehicular traffic per [MC 830](#).

SS 537	Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box	Approved by: <i>RR</i>
Sheet 2 of 5	What's Changed?	Effective Date:
UGS		04-24-2020

Figure SS 537-2: Pad Plan View — 7' x 8' Pad with 4' x 7' x 5' Box for 2-Way, 3-Way, and 4-Way, G&W Pad-Mounted RAM and RAG Gas Switches

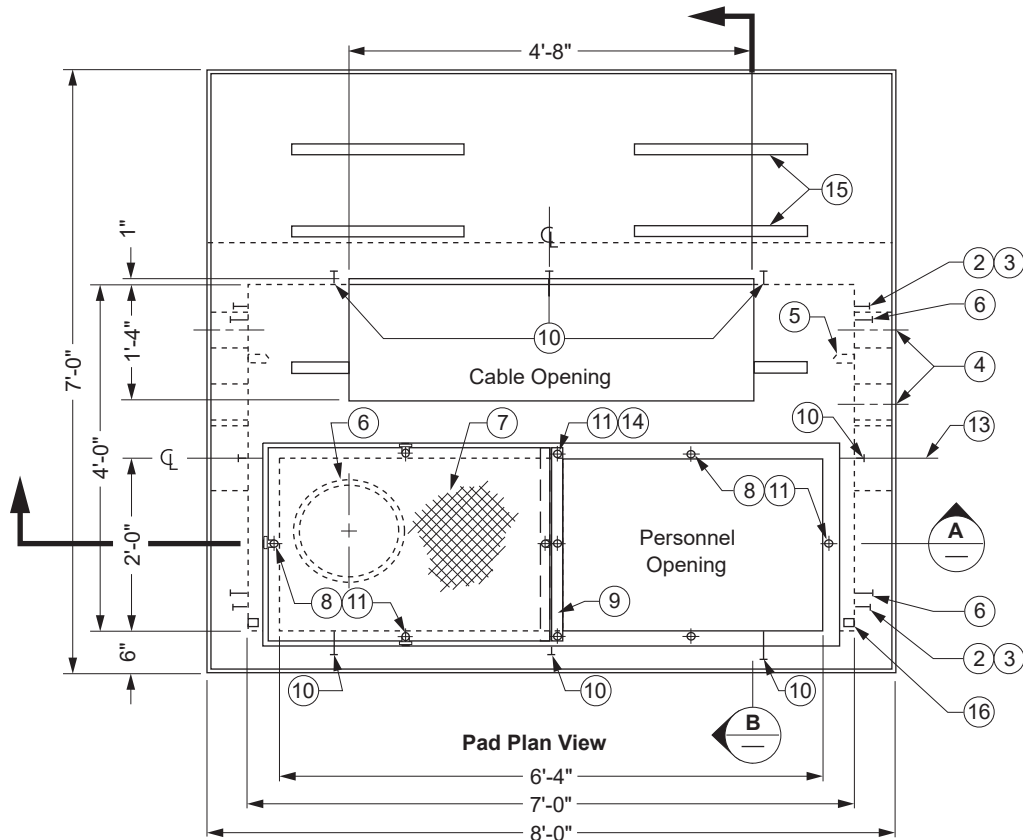


Table SS 537-1: Precast Concrete — 7' x 8' Pad with 4' x 7' x 5' Box

Nominal Size	Manufacturers' Reference Numbers	
	Jensen Precast	Oldcastle Infrastructure
7' x 8'	K78-SB60-11	ED-78-SB

Note(s):

- Item number and SAP numbers are listed in [SS 500](#).

Approved by:

RR

Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box

SS 537

Effective Date:
04-24-2020

What's Changed? Table SS 537-1: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure; parent company note removed.

Sheet 3 of 5

UGS

Figure SS 537-3: Sections B and A — 7' x 8' Pad with 4' x 7' x 5' Box

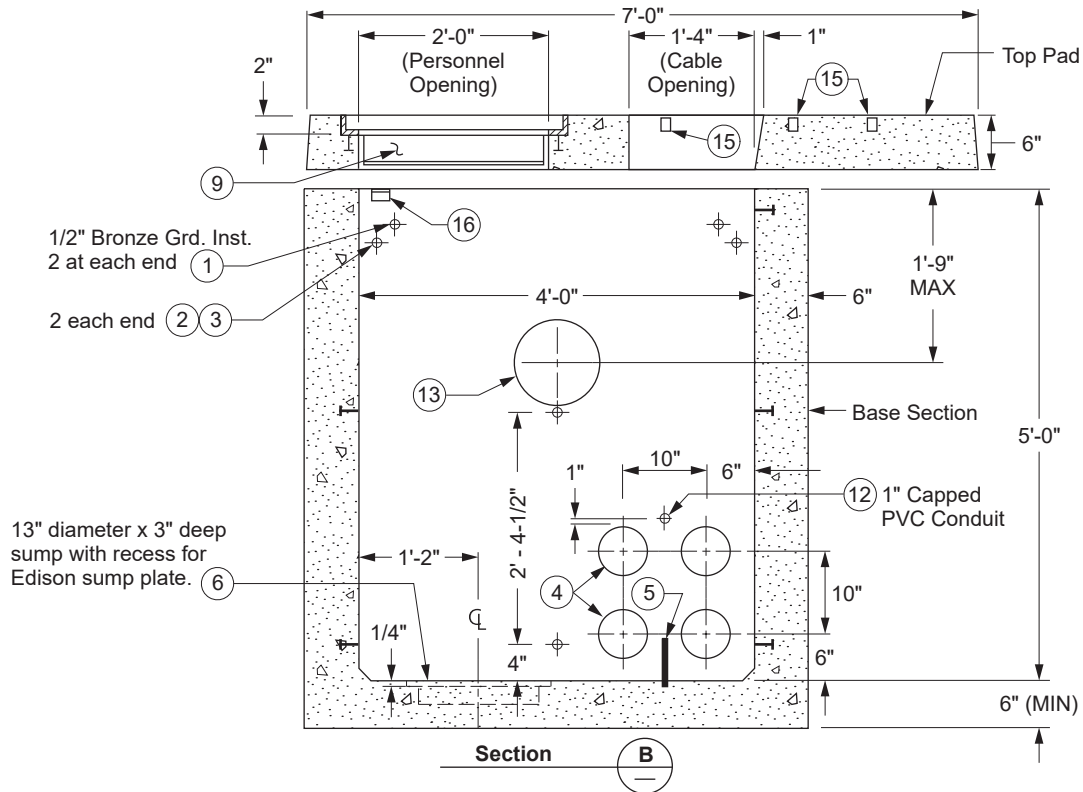


Figure SS 537-3.1

SS 537

Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box

Approved by:

RR

Sheet 4 of 5

What's Changed?

Effective Date:

UGS

04-24-2020

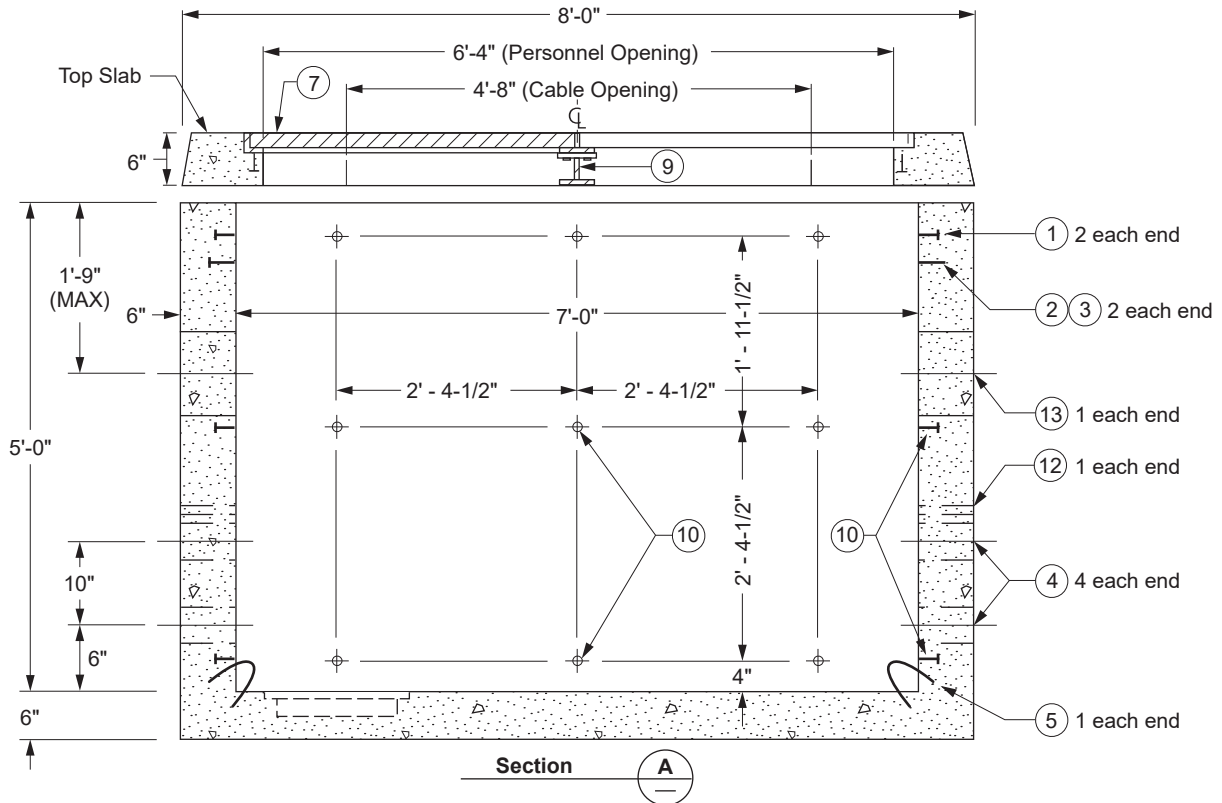


Figure SS 537-3.2

Note(s):

1. 1/2-inch diameter threaded bronze grounding insert. (4 total)
2. 1/2-inch diameter threaded galvanized insert for J-Bolts. (4 total)
3. 1/2" x 6" galvanized J-Bolt to support neutral/ground bus. (4 total)
4. 5-inch diameter plastic conduit terminators. (8 total)
5. 7/8-inch diameter pulling irons for cable pulling and rigging purposes. (2 total)
6. 13-inch diameter x 3" deep sump with Edison sump plate. (1 total)
7. 24" x 36" polymer concrete pullbox cover. (2 total)
8. 1/2" x 2-1/2" large s.s. Penta-Hd. bolt with captive free spinning round flat s.s. washers. (8 total)
9. Removable galvanized steel "I" beam with floating nut plates. (1 total)
10. 1/2-inch diameter threaded plastic insert for cable rack mounting. (19 total)
11. 1/2-inch diameter threaded open bottom insert with cleanout hole or galvanized unistrut channel with unistut nuts. (8 total)
12. 1-inch diameter capped PVC conduit for 4/0 neutral wire. (2 total)
13. 10-inch diameter plastic vent terminator. (2 total)
14. 1/2" x 1-1/2" large s.s. counter sunk machine screw for securing beam to pad. (2 total)
15. Galvanized unistrut channel for securing switch tank and enclosure to pad. (6 total)
16. Galvanized anchor bracket assembly to prevent pad and box from separating (location varies based on manufacturer). (2 total)

Approved by:

RR

Precast Concrete Equipment Slab Box — 7' x 8' Pad with 4' x 7' x 5' Box

SS 537

Sheet 5 of 5

Effective Date:
04-24-2020

What's Changed?

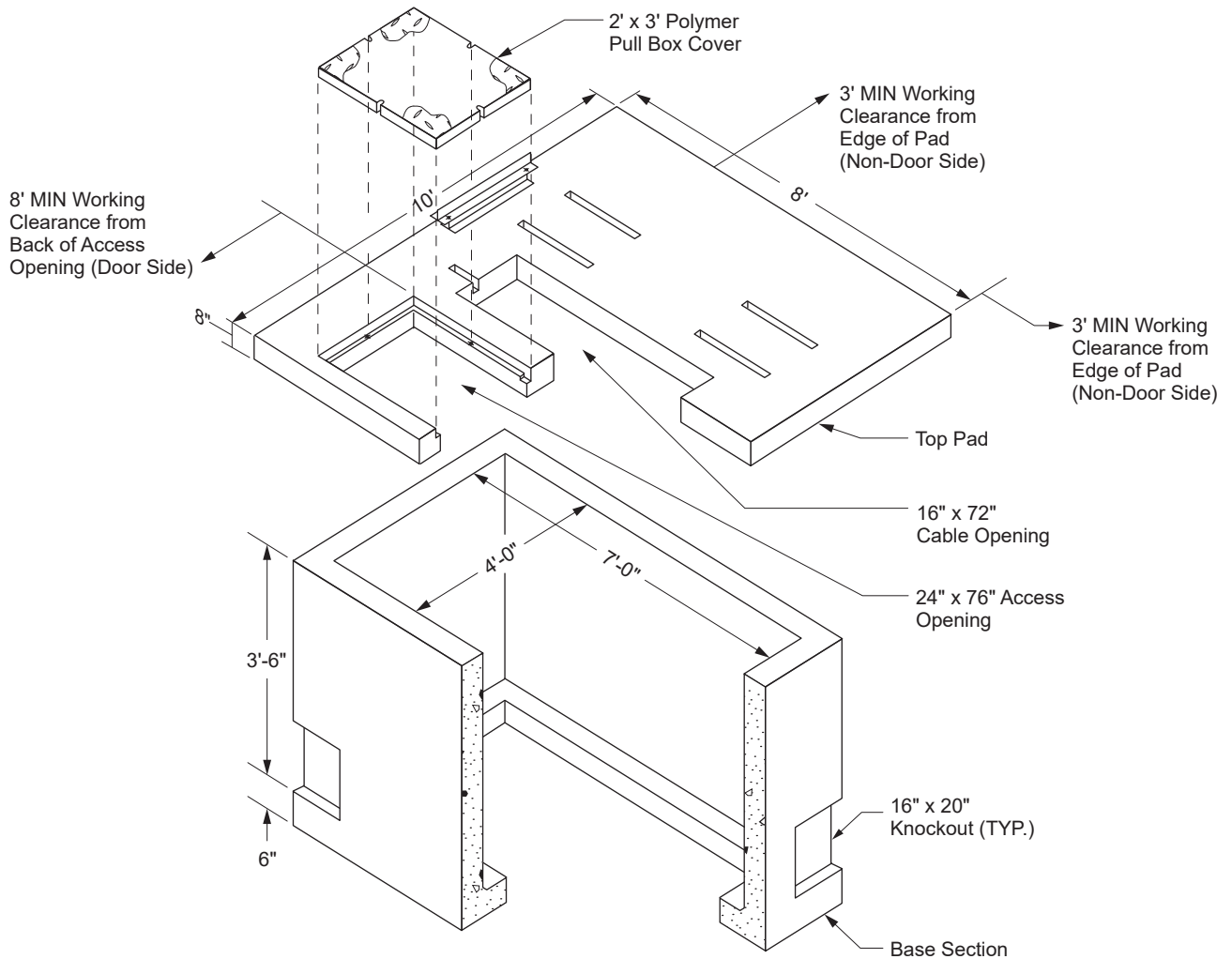
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SS 538 Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box

Scope SS 538.1 Precast Concrete Equipment Slab Box — 8' x 10' x 8" Pad with 4' x 7' x 3'-6" Box for 2-Way, 3-Way, and 4-Way Pad-Mounted RAG Gas Switches, VFI 9, VFI 12, Bypass Switch, and 33 kV Primary Metering Cabinet

Figure SS 538-1: 8' x 10' Pad with 4' x 7' x 3'-6" Box for 2-Way, 3-Way, and 4-Way Pad-Mounted Gas Switches, VFI 9, VFI 12, Bypass Switch, and 33 kV Primary Metering Cabinet



1.0 Excavation Size

Consult manufacturer's installation guide for exact excavation dimensions. Backfill will be well compacted to prevent subsidence.

2.0 UGS References

[AC 703](#) for approved grounding material

[MC 830](#) for protection barriers

Approved by:

ajj

Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box

SS 538

Sheet 1 of 6

Effective Date:
07-27-2018

What's Changed? Figure SS 538-1: added 16" x 20" callout for conduit knockout.

UGS

3.0 Installation Notes

- 3.1 Install box and completely backfill until the soil is flush with the box top minus the keyhole height. This is vital in order to provide soil support for the pad to avoid cracking and damaging of the pad. Be sure to compact further after placement of the pad to ensure soil support.
- 3.2 Pad and slab box will be set level. Slab box will be placed on 6" (minimum) compacted rock base to ensure uniform distribution of soil pressure on floor. Pad overhang to rest on undisturbed earth or well-compacted backfill to prevent subsidence.
- 3.3 Top surface of pad will be set 3" above finish grade.
- 3.4 Mastic sealant is required at seams.
- 3.5 An 8-foot minimum working clearance is required on door side of pad-mounted cabinet doors.
- 3.6 Ground rods, clamps, and wire will be furnished and installed by the contractor. See [AC 703](#) for approved grounding materials. Ground wire to be a minimum of 2/0 bare copper.
- 3.7 Protection barriers will be installed if pad is exposed to vehicular traffic per [MC 830](#).


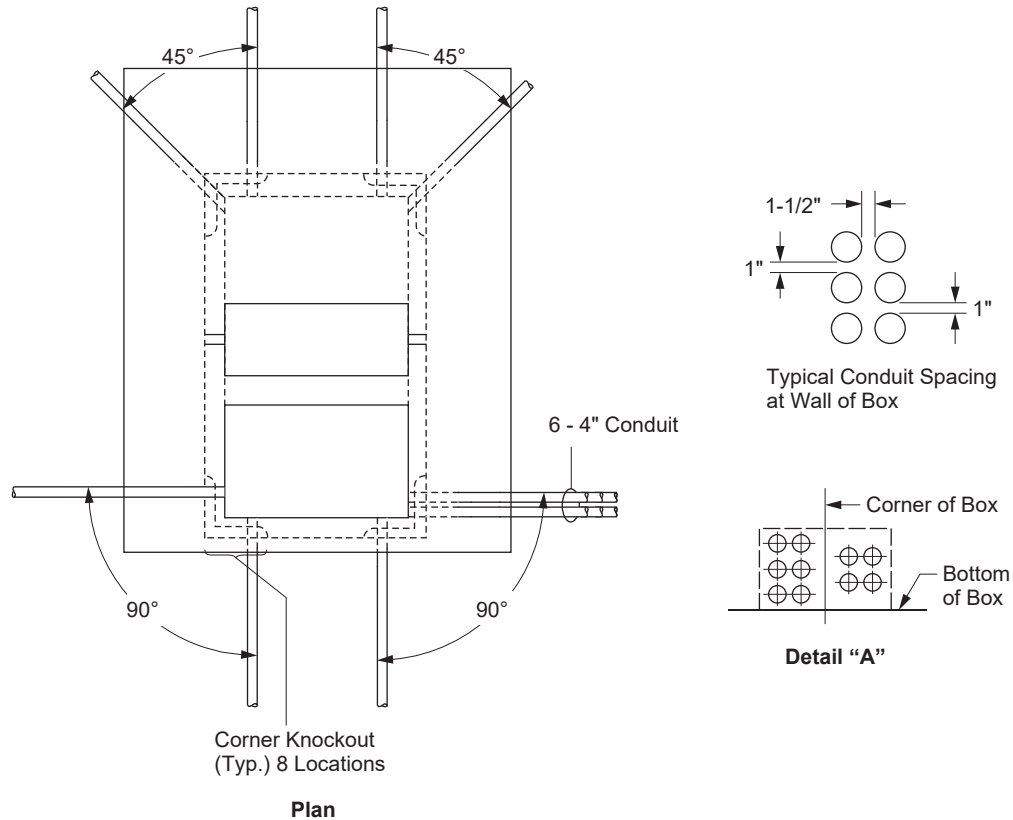
SS 538	Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box	Approved by: 
Sheet 2 of 6	What's Changed?	Effective Date:
UGS		07-27-2018

Figure SS 538-2: 8' x 10' Slab Box for Pad-Mounted Equipment — Plan and Detail "A"



Note(s):

1. All conduits are to enter slab box at corner knockouts within the angles shown. The working drawing will specify how many conduits are to be installed.
2. Install all conduits within the cast-in knockouts.
3. All conduits to be installed on a level course adjacent to box.
4. A maximum of six 4-inch conduits can be installed into any one knockout. When six 4-inch conduits are installed, do not install more than four 4-inch conduits in adjacent knockout (See Note 8).
5. All conduits to be cut smooth and flush with inside wall of box.
6. Pour a 12" minimum of concrete encasement (per CD 134) around all conduits that are not encased.
7. Grout work around all conduits to be flush with inside surface of structure and have a smooth finish.
8. When conduits are installed in both knockouts of any one corner, the conduits will be vertically staggered in order to allow cable to cross over (see Detail "A").
9. Install grade rings as necessary in order to maintain minimum 30" cover over conduits. See CD 100.

Approved by: <i>ajf</i>	Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box	SS 538
Effective Date: 07-27-2018	What's Changed?	Sheet 3 of 6
		UGS

Figure SS 538-3: Pad Plan View — Precast Concrete Equipment Slab Box

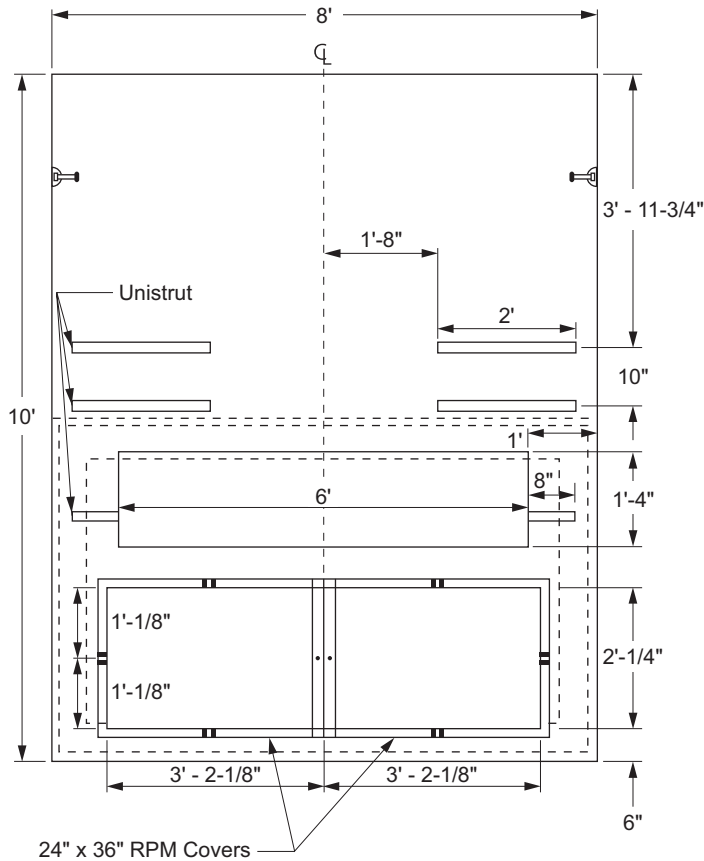
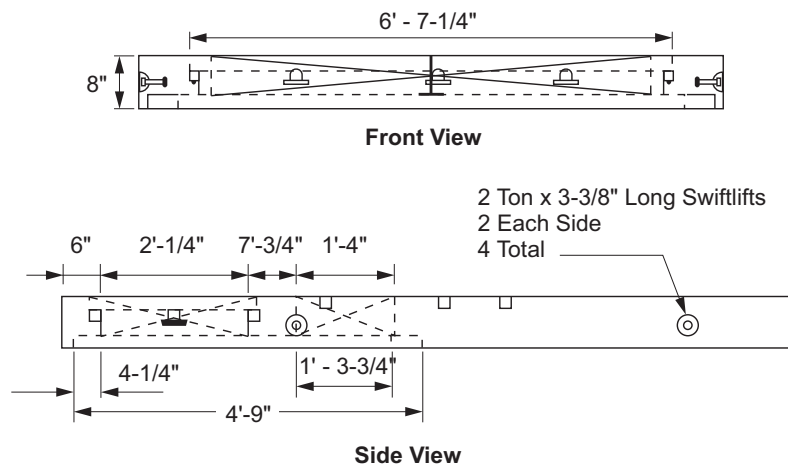


Figure SS 538-4: Pad End View (Front and Side) — Precast Concrete Slab Boxes



SS 538

Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box

Approved by:

a/j

Sheet 4 of 6

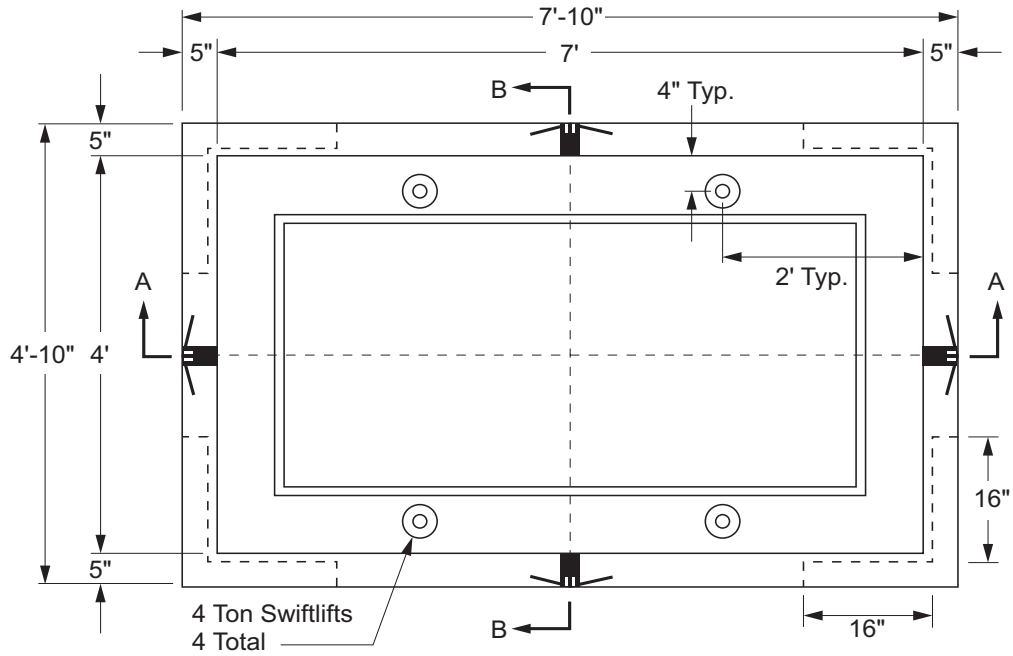
What's Changed?

Effective Date:

UGS

07-27-2018

Figure SS 538-5: Box Section Plan View — Precast Concrete Slab Box



Approved by:
ajf

Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box

SS 538

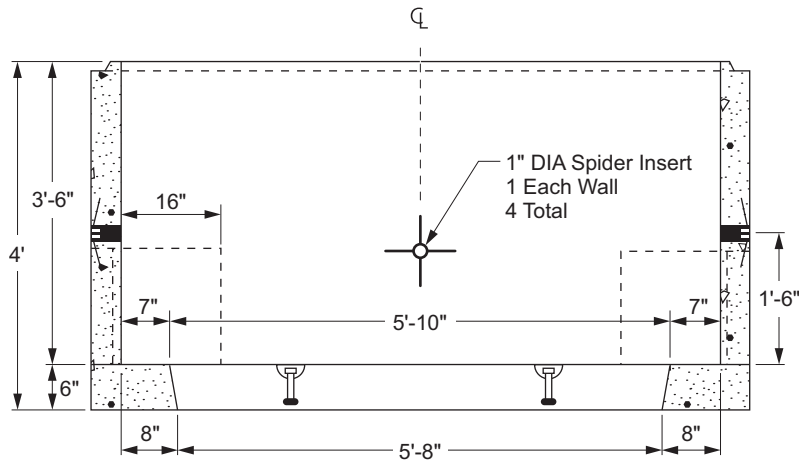
Effective Date:
07-27-2018

What's Changed? Figure SS 538-5: revised several dimensions for precast slab box.

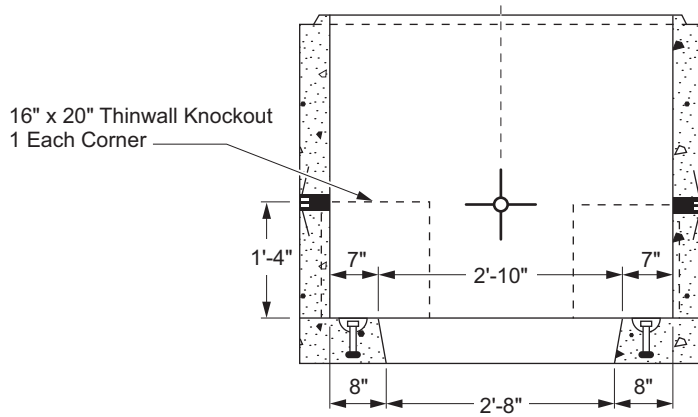
Sheet 5 of 6

UGS

Figure SS 538-6: Box Section Detail "A" and "B" — Precast Concrete Slab Box



Detail "A"



Detail "B"

SS 538

Precast Equipment Slab Box — 8' x 10' Pad with 4' x 7' x 3'-6" Box

Approved by:

a/j

Sheet 6 of 6

What's Changed? Figure SS 538-6: updated dimensions for thinwall knockout.

Effective Date:

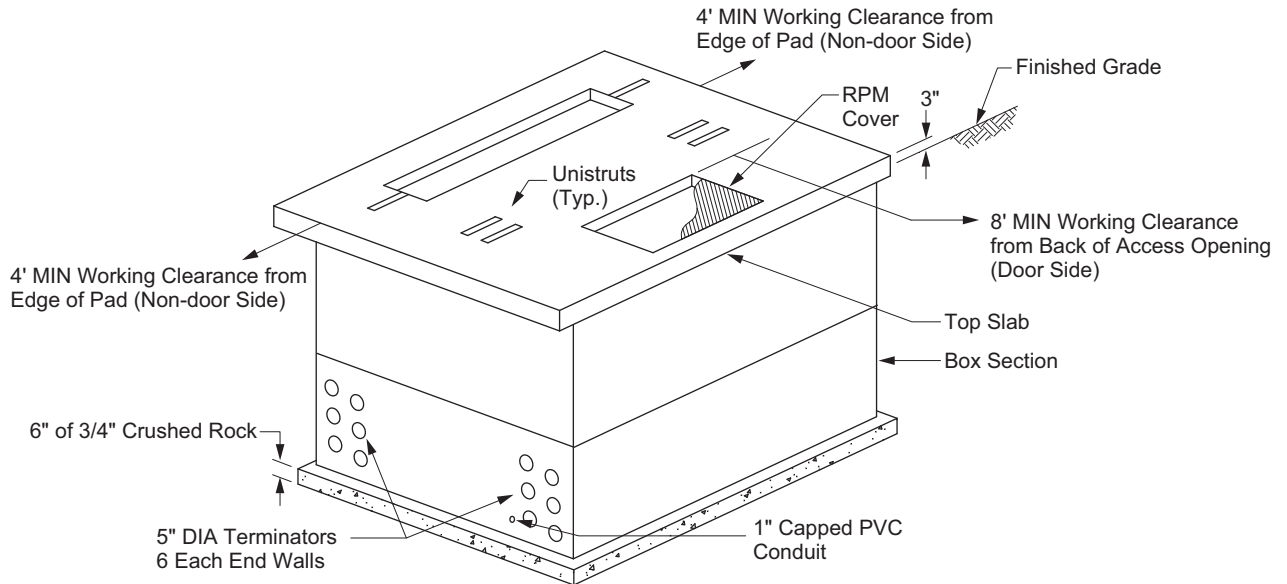
07-27-2018

UGS

SS 539 10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches

Scope SS 539.1 10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches

Figure SS 539-1: 10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches



Note(s):

1. 30" x 48" polymer concrete cover (1 total).
2. 1/2" x 2-1/2" long stainless steel penta - head bolt with captive free spinning round flat stainless steel washers to secure 30" x 48" polymer concrete cover to pad (6 total).
3. Galvanized unistrut channels for securing the switch tank and cabinet enclosure to pad (6 total).
4. All equipment supported by precast slab box shall be suitably anchored for seismic purposes.

1.0 Excavation Size:

Minimum excavation for slab box will be 120" x 144" x depth that will set the pad at least three inches above the finished grade. Provide grade rings (12" minimum) as necessary in order to maintain cover over conduits per SCE requirements or permit agency requirements, whichever is greater. Backfill material shall be well compacted to prevent subsidence.

2.0 UGS References:

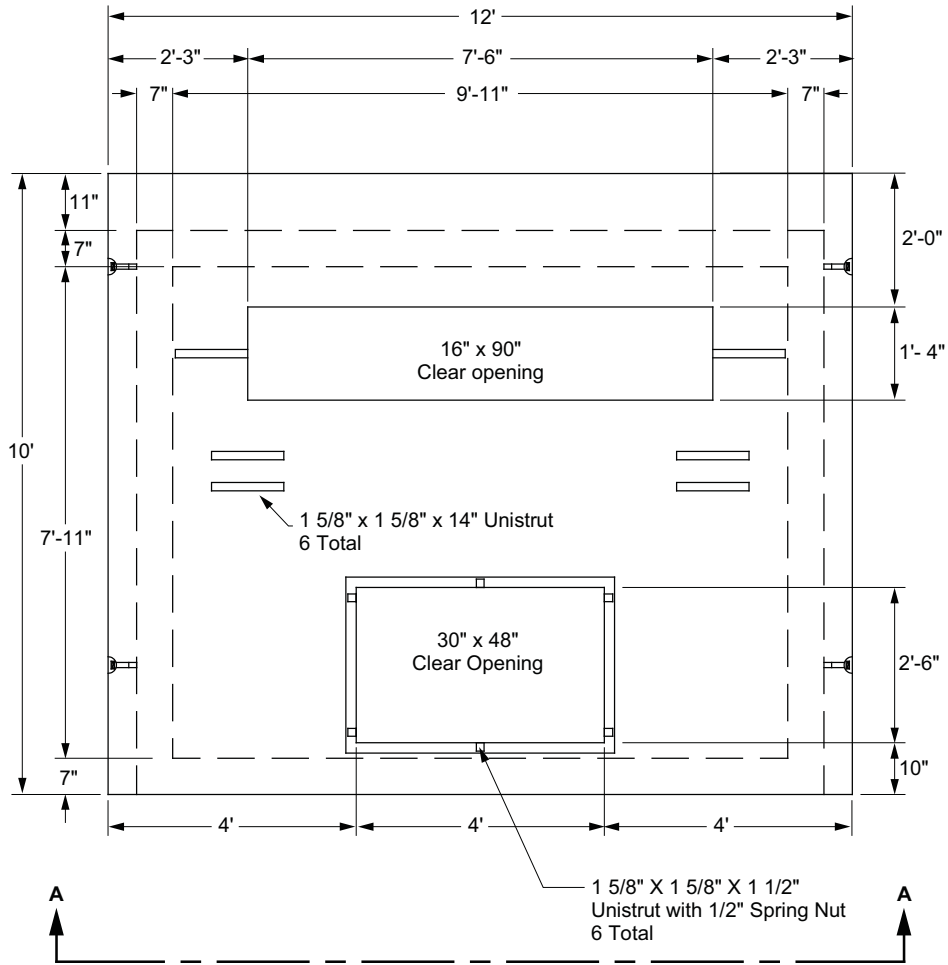
- [AC 731 J-Bolts Support for Neutral/Ground Bus](#)
- [MC 830 Protection Barriers](#)

3.0 Installation Notes:

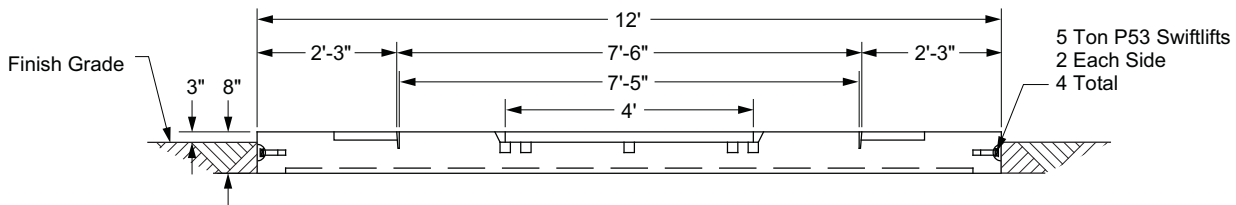
1. Pad and pull box shall be set level. Pull box will be placed on 6" (minimum) compacted rock base to ensure uniform distribution of soil pressure on base of structure.
2. Mastic sealant is required at all joint connections.
3. Top surface of pad shall be set three inches above finished grade.
4. An 8' (minimum) working clearance from back of access opening is required directly in front of equipment doors for operation.
5. Protection barriers shall be installed if pad is exposed to vehicular traffic per [MC 830](#).

Approved by:	10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches	SS 539
Effective Date:	What's Changed? Pad cable opening orientation updated.	Sheet 1 of 4
10-30-2020		UGS

Figure SS 539-2: 10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches - Plan View (Pad)



PLAN VIEW



ELEVATION A-A

SS 539

10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches

Approved by:

RR

Sheet 2 of 4

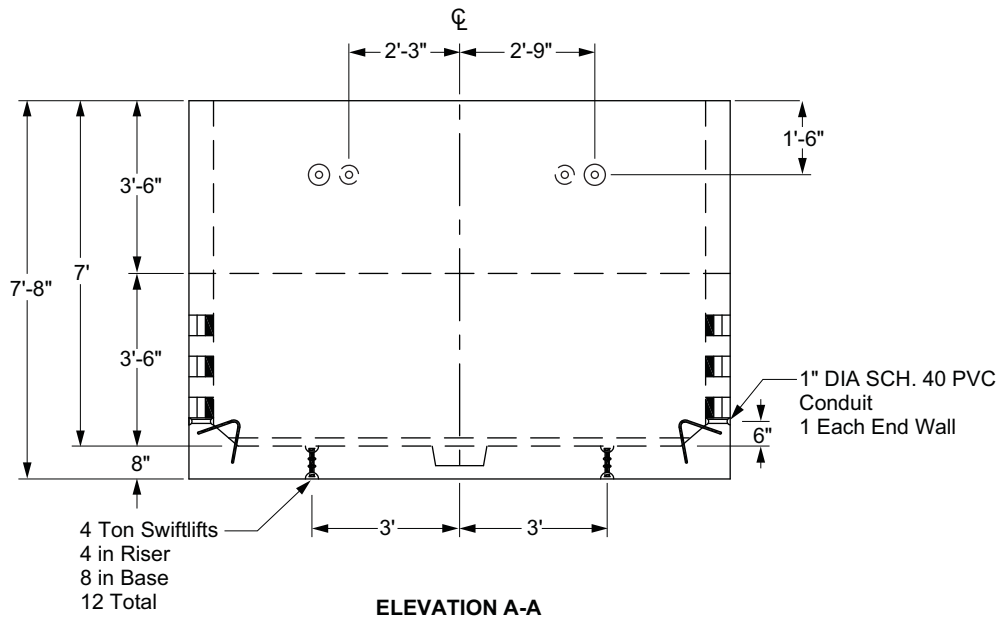
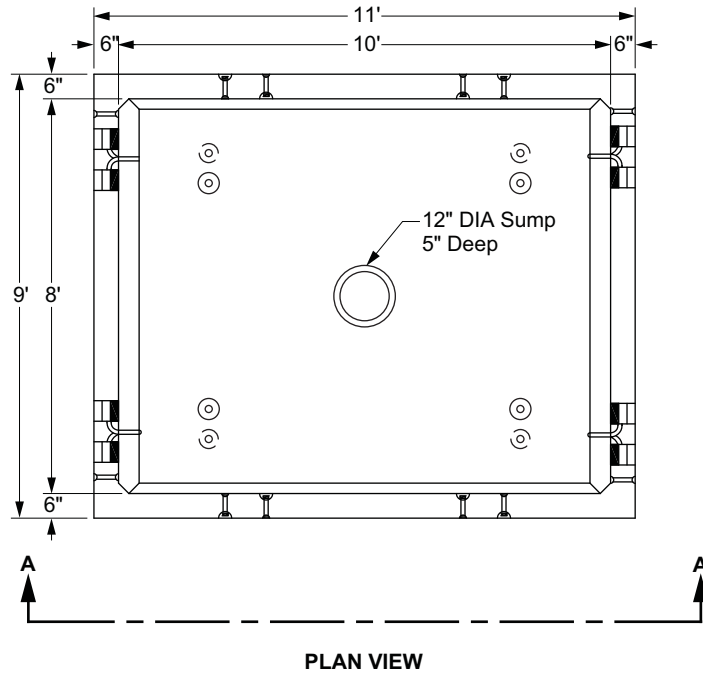
What's Changed? Pad cable opening orientation updated.

Effective Date:

10-30-2020

UGS

Figure SS 539-3: 10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches - Plan View (Slab Box)




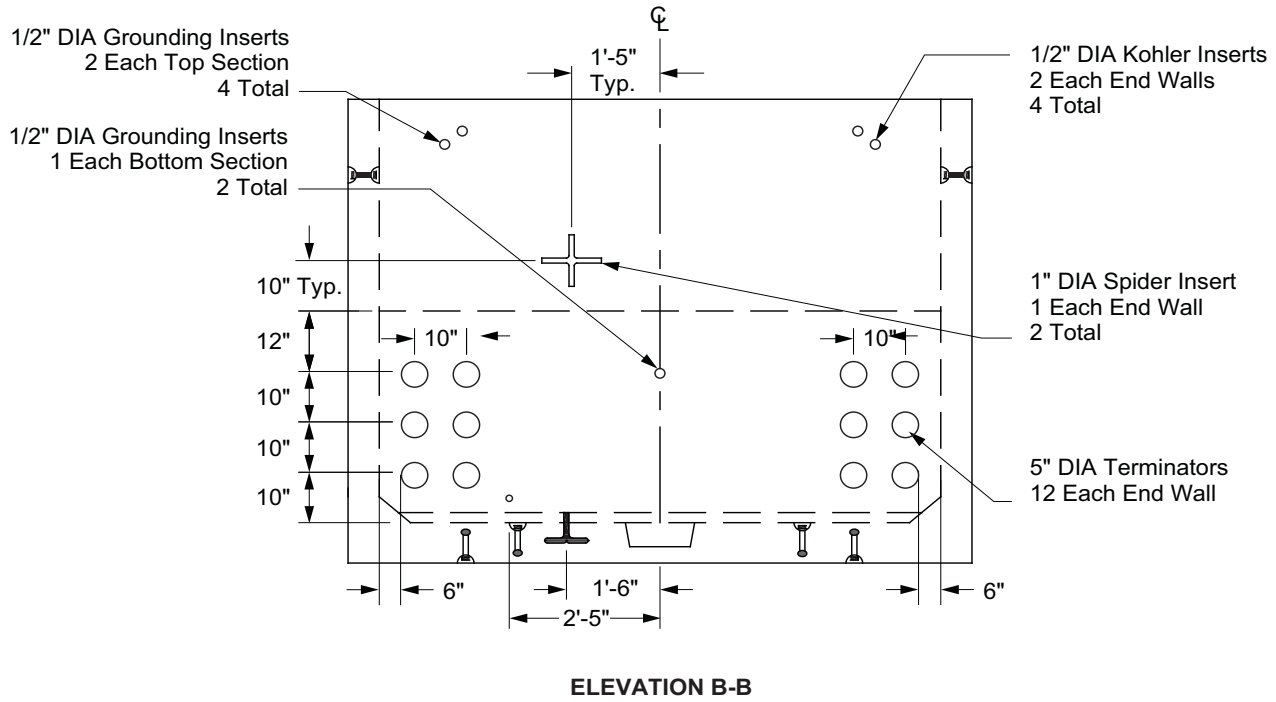
Approved by: 	10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches	SS 539
Effective Date: 10-30-2020	What's Changed? Pad cable opening orientation updated.	Sheet 3 of 4 UGS

Figure SS 539-4: 10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches - Side View (Slab Box)



SS 539

10' x 12' Precast Slab Box for 6-way Pad-Mounted RAM Gas Switch, 5-way and 6-way Pad-Mounted RAG Gas Switches

Approved by:

RR

Sheet 4 of 4

What's Changed? Pad cable opening orientation updated.

Effective Date:

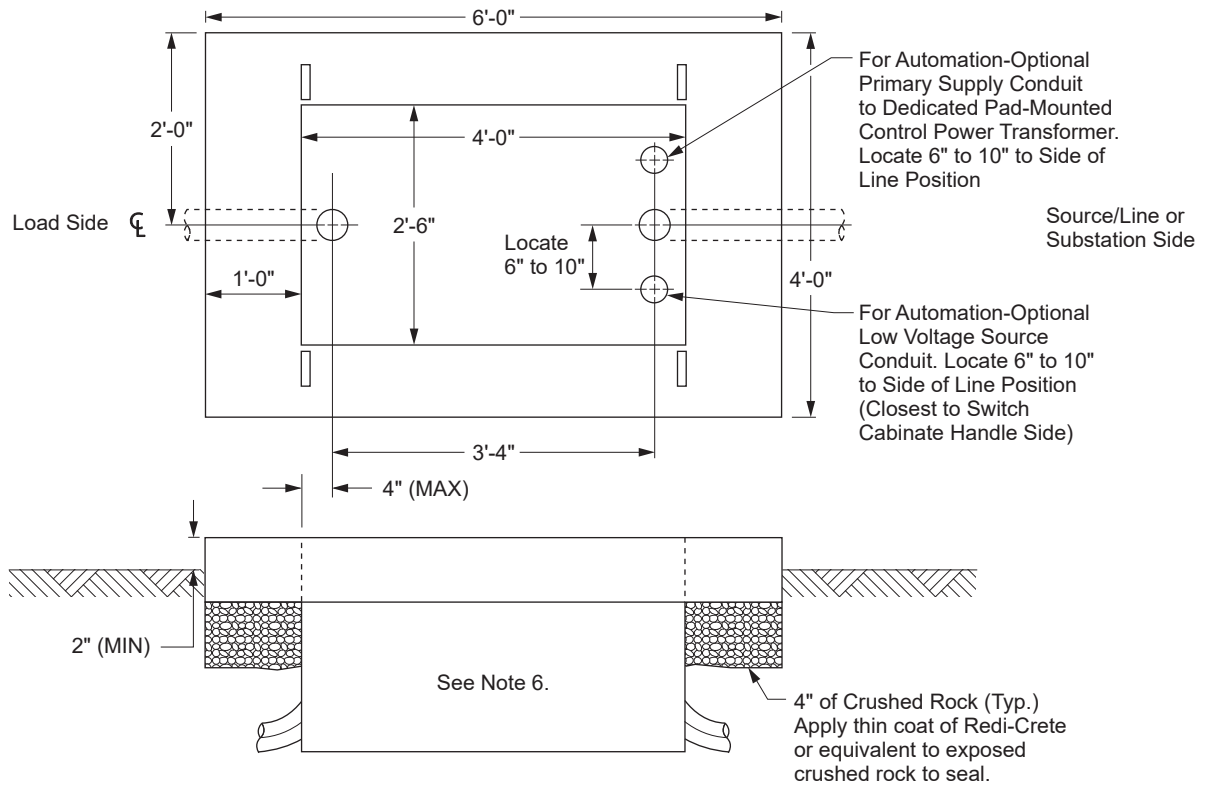
10-30-2020

UGS

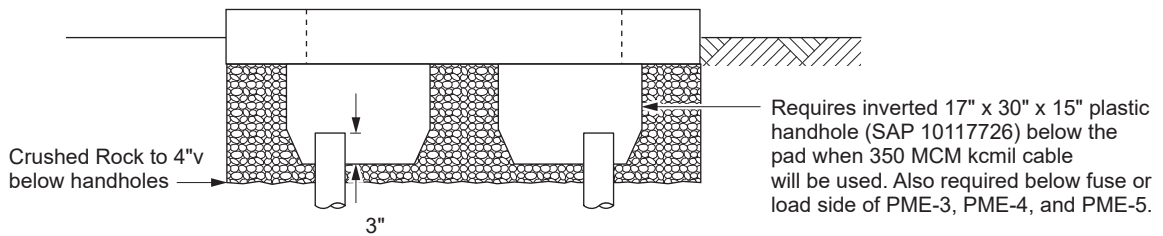
SS 540 Structure for PME-3, PME-4, and PME-5

Scope SS 540.1 Structure for PME-3, PME-4, and PME-5

Figure SS 540-1: Pad Installation — Structure for PME-3, PME-4, and PME-5



Primary Installation - Pad with Pull Box



Alternate Installation - Pad with Handhole

Note(s):

1. Identify bus, switch, or fuse position sides on drawing.
2. Riser bend must terminate vertically.
3. Not to be used as a cable pulling structure with inverted handhole design, cable feeding only.
4. Identify inverted handholes on drawings when required.
5. On pad with no handholes, the duct should be against the concrete edge of the opening.
6. See **SS 591** for pull box design and working clearance around the pad.
7. Service conduits shall be seated or plugged when the transformer is located above a customer's meter panel, per G.O. 128, Rule 31.6.
8. Riser bends shall be Schedule 40 PVC minimum on the primary side.

Approved by:

RR

Structure for PME-3, PME-4, and PME-5

SS 540

Sheet 1 of 3

Effective Date:
04-24-2020

What's Changed?

UGS

Figure SS 540-2: Structure for PME

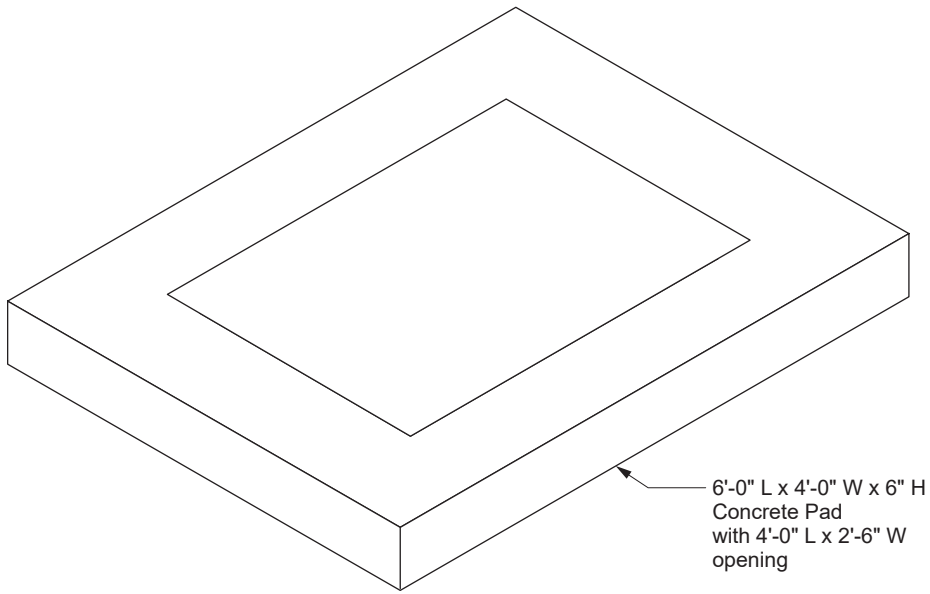


Figure SS 540-2.1

SS 540

Structure for PME-3, PME-4, and PME-5

Approved by:

RR

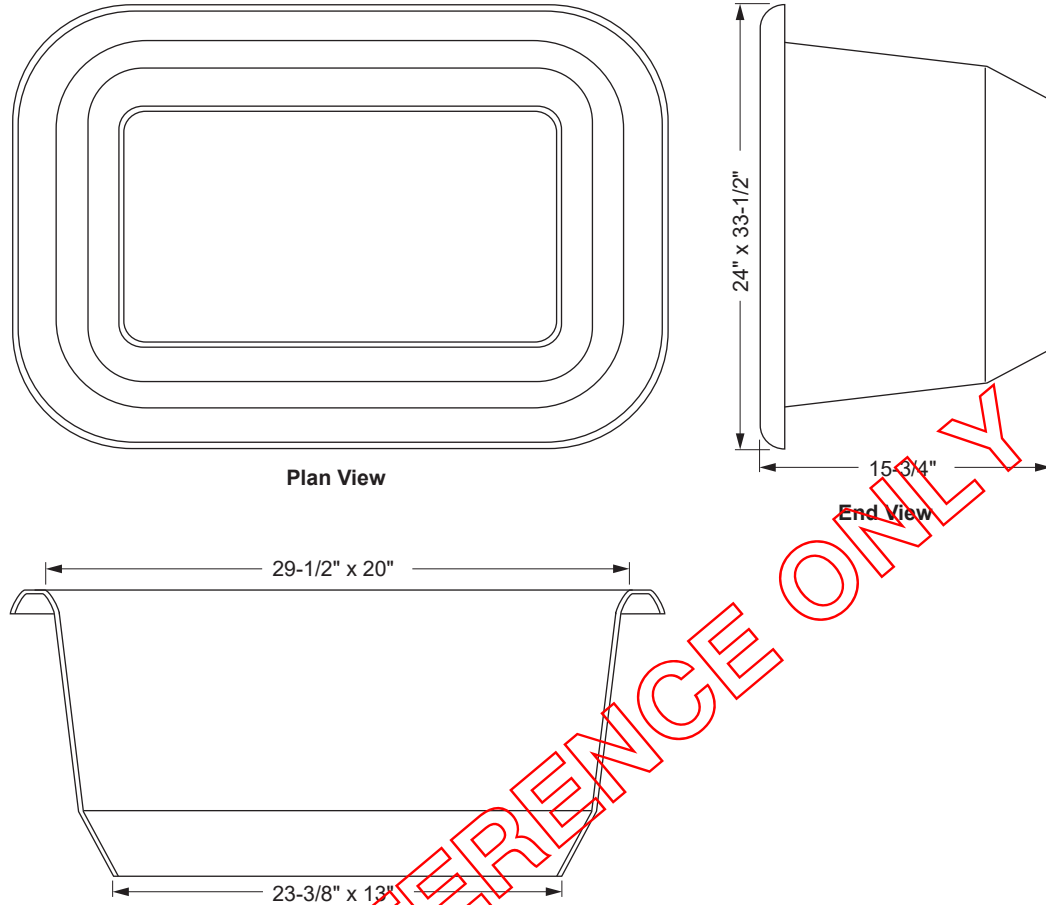
Sheet 2 of 3

What's Changed?

Effective Date:

UGS

04-24-2020



Plan View

End View

Section View

Figure SS 540-2.2: Inverted FRP Handhole (13" x 24" x 15")

Note(s):

1. 13" W x 24" L x 15" H inverted FRP handhole is placed under fuse position or for 750 kcmil or 1,000 kcmil cable.

Table SS 540-1: Precast Concrete — Structure for PME 3, 4, and 5

Item	Supplier	Part Number	SAP
6'-0" L x 4'-0" W x 6" H Precast Concrete Pad w/2'-6" x 4' Opening	Oldcastle Infrastructure Jensen Precast	ED4872-06-PAD PD3048-P-11	10117288
13" L x 24" W x 15" H FRP Handhole without Cover ^{a/}	CDR	PB10-1324-18-0206	10117275
17" L x 30" W x 15" H Plastic HDPE Handhole with Cover	New Basis Carson Industries	SEB173015CH0 173015-HY-OU0	10117726

= For Reference Only

^{a/} For existing installations only. For new installations, use 17" x 30" x 15" plastic handhole.

Approved by:

RR

Structure for PME-3, PME-4, and PME-5

SS 540

Sheet 3 of 3

Effective Date:
04-24-2020

What's Changed? Table SS 540-1: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure; parent company note removed.

UGS

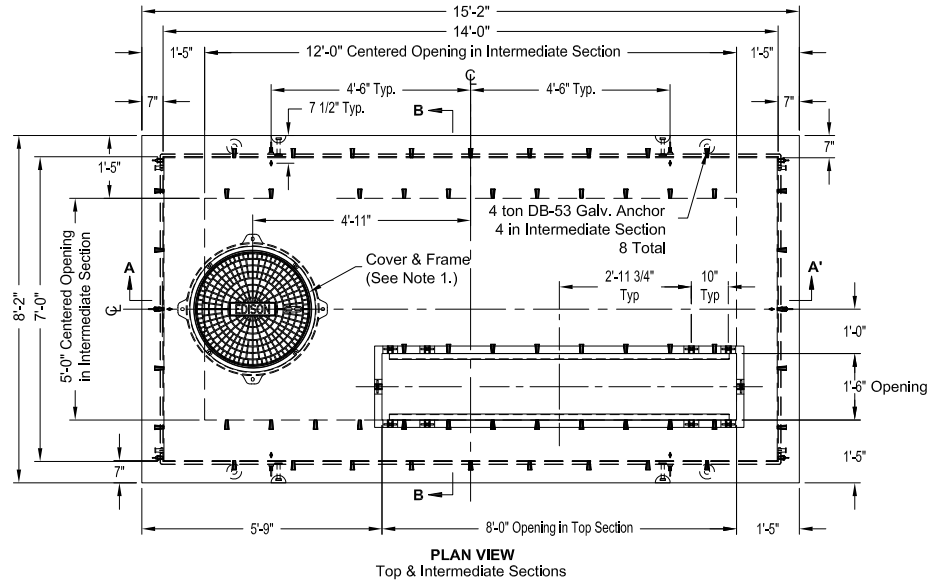
► SCE Public ◀

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SS 541 7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

Scope SS 541.1 7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I for 4-, 5-, and 6-Way Gas

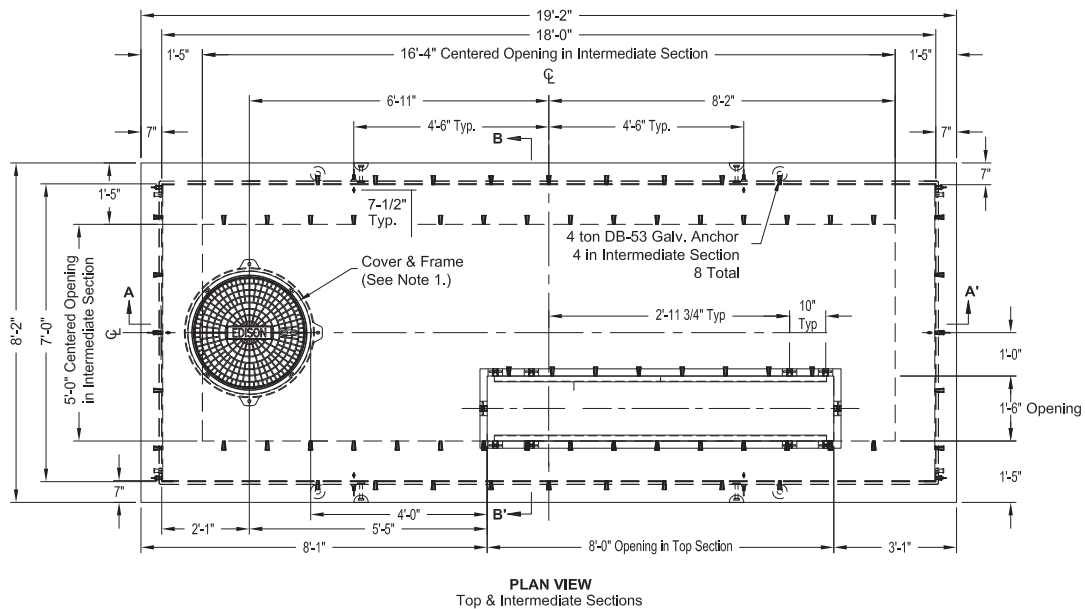
Figure SS 541-1: 7' x 14' x 11' Tub-Style Structure with Modular Top Type I



Note(s):

1. Composite manhole cover may be used for replacement (SAP 10205271).

Figure SS 541-2: 7' x 18' x 11' Tub-Style Structure with Modular Top Type I



Note(s):

1. Composite manhole cover may be used for replacement (SAP 10205271).

Approved by:

RR

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

SS 541

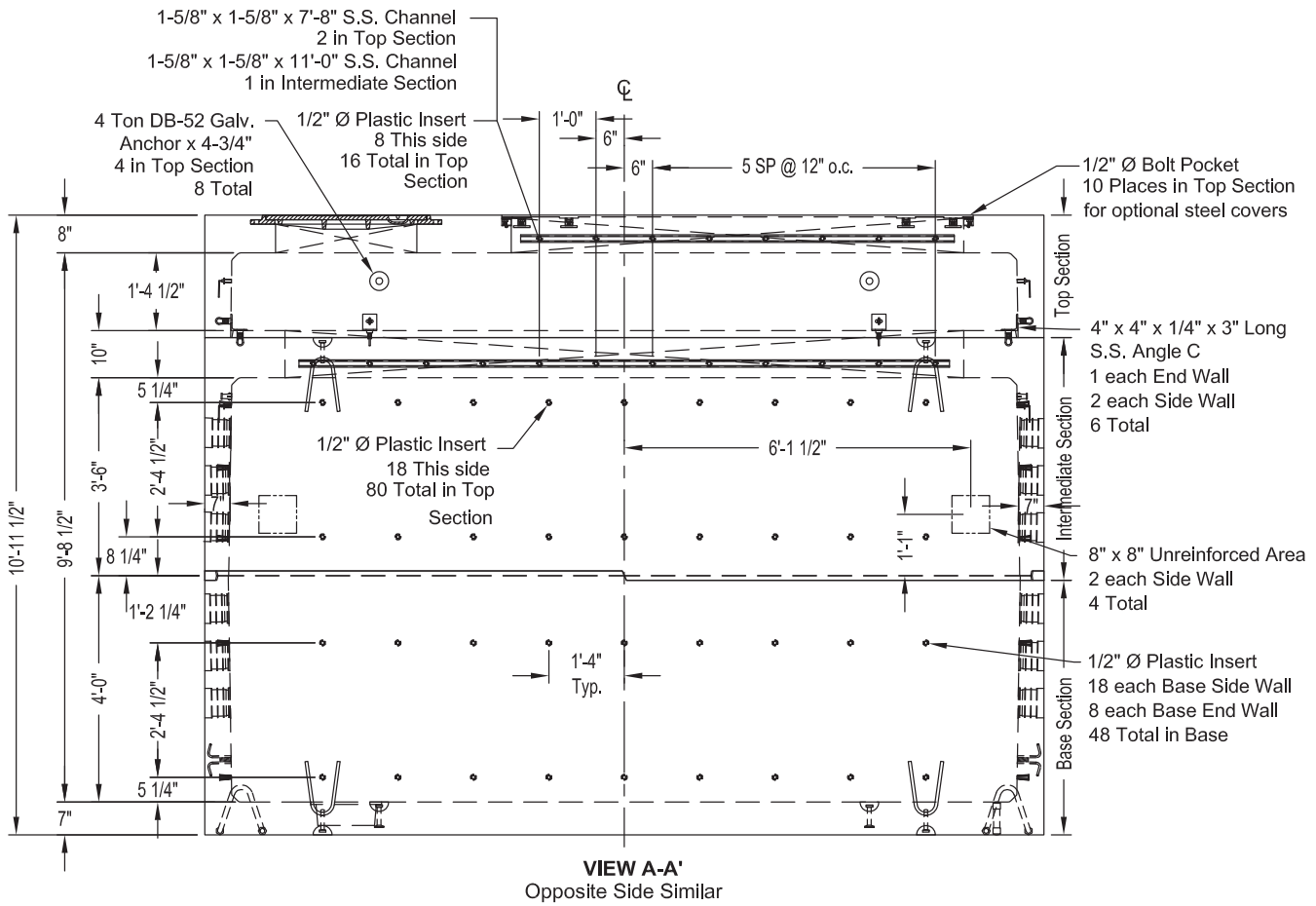
Sheet 1 of 10

Effective Date:
10-29-2021

What's Changed? Corrected title for Figure SS 541-2: 7' x 18' x 11' Tub-Style Structure with Modular Top Type I.

UGS

Figure SS 541-3: 7' x 14' x 11' and 7' x 18' x 11' Tub-Style Structure with Modular Top Type I



SS 541

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

Approved by:

RR

Sheet 2 of 10

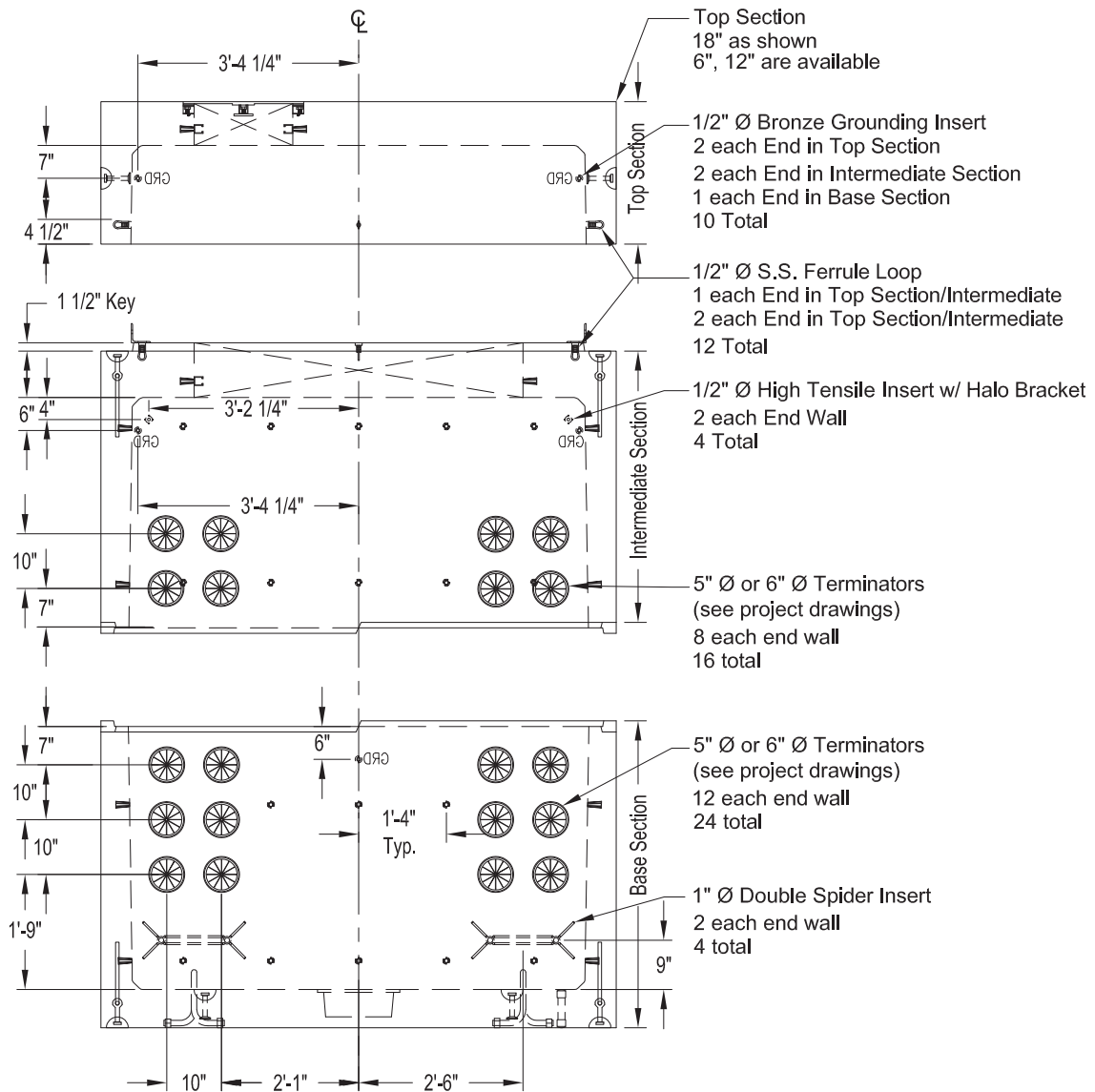
What's Changed? New terminators added.

Effective Date:

10-29-2021

UGS

Figure SS 541-4: 7' x 14' x 11' and 7' x 18' x 11' Tub-Style Structure with Modular Top Type I



VIEW B-B'
Opposite Side Similar

Approved by:

RR

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

SS 541

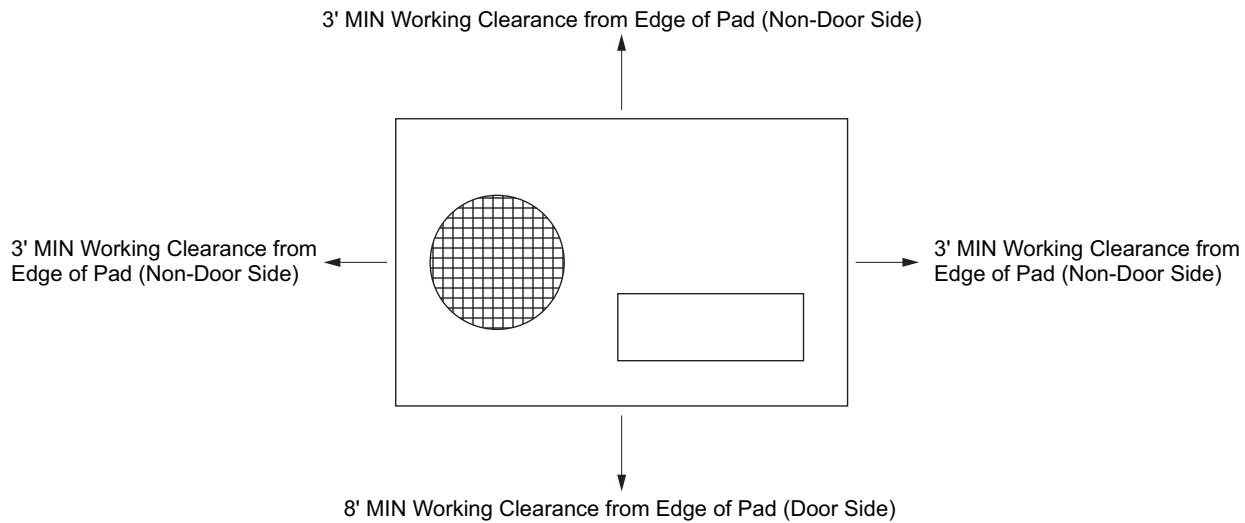
Sheet 3 of 10

Effective Date:
10-29-2021

What's Changed? New terminators added.

UGS

Figure SS 541–5: 7' x 14' x 11' Tub-Style Structure with Modular Top Type I Working Clearances



Note(s):

1. Placement of the PME enclosure is site-specific. The Design Organization will determine the placement of the switch door opening based on field conditions.
2. To allow for shaping and termination of cables, it is recommended that the structure and cabinet be placed in location 1 (as shown on the drawing) whenever possible.
3. When a PME switch is installed in placement location 2, cable steps or cable hooks shall be used to shape cable to maximize working space in the structure.
4. The 4-foot clearance of the side of new PME installations will enable the placement of automated switching equipment (RCS).
5. Alternate position (Placement 2) is not approved for new construction.
6. Alternate position (Placement 2) requires District Manager approval.

SS 541	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II	Approved by: <i>RR</i>
Sheet 4 of 10	What's Changed?	Effective Date: 10-29-2021
UGS		

Scope SS 541.2 7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type II for PME-6 through PME-12 Switchgears

Figure SS 541-6: 7' x 14' x 11' Tub-Style Structure with Modular Top Type II

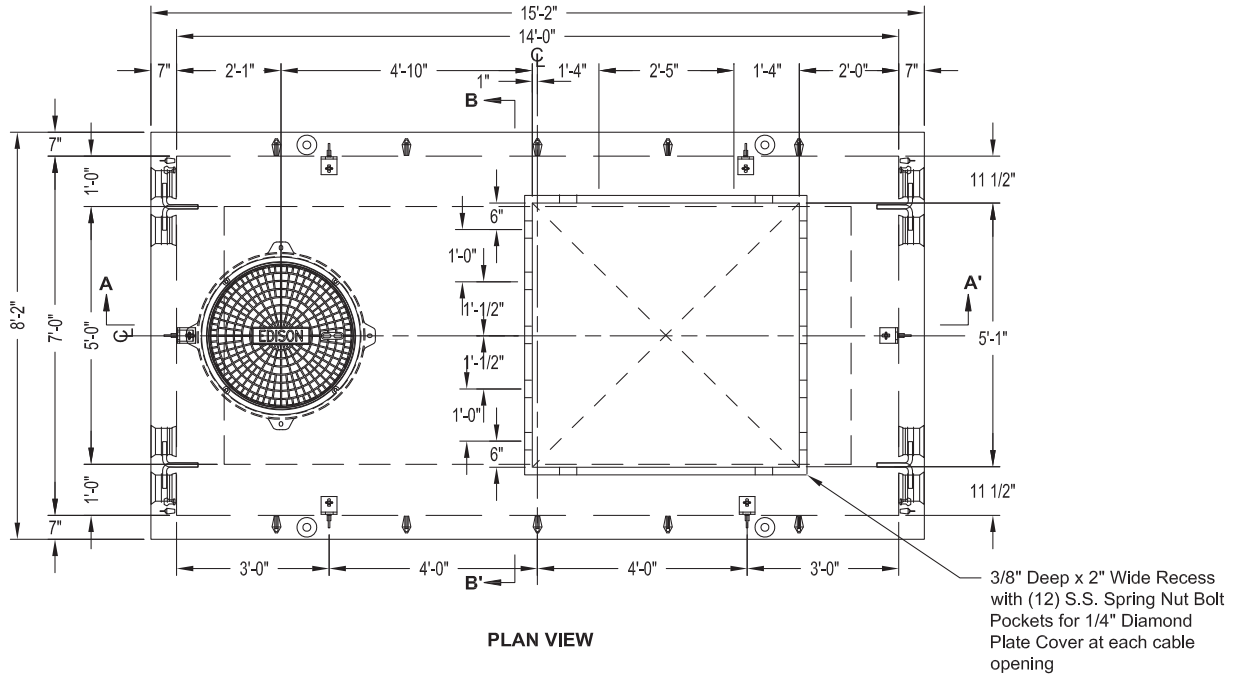
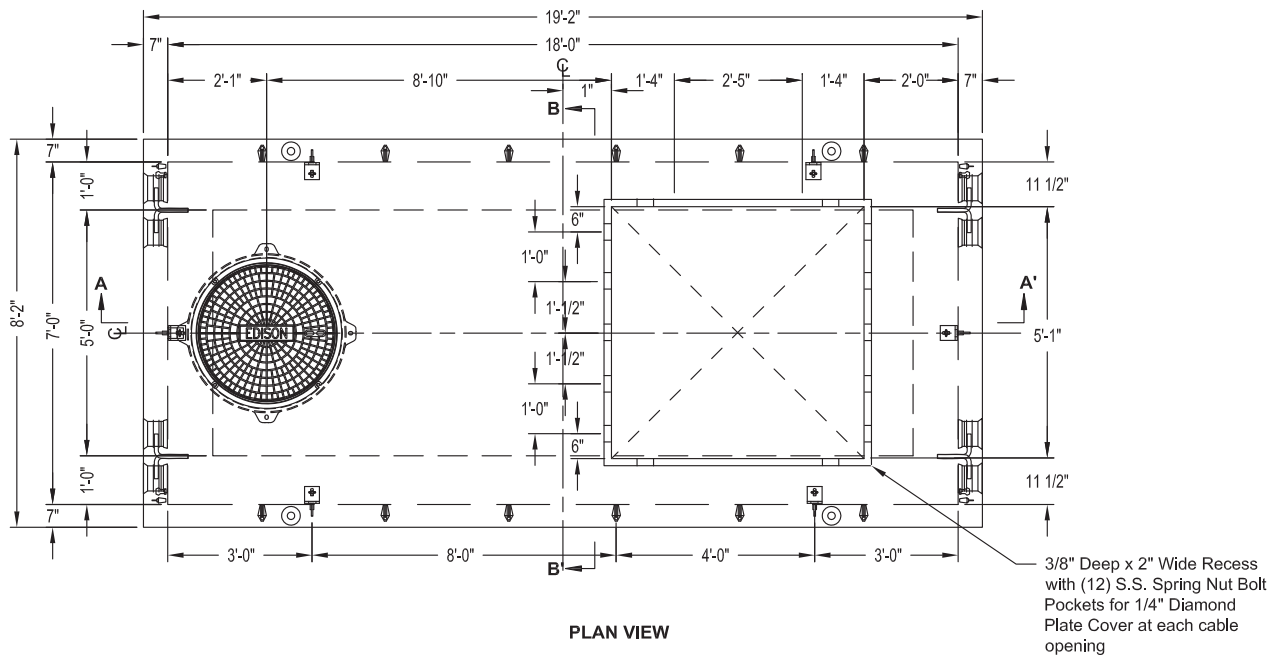


Figure SS 541-7: 7' x 18' x 11' Tub-Style Structure with Modular Top Type II



Approved by:

RR

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

Effective Date:

10-29-2021

What's Changed?

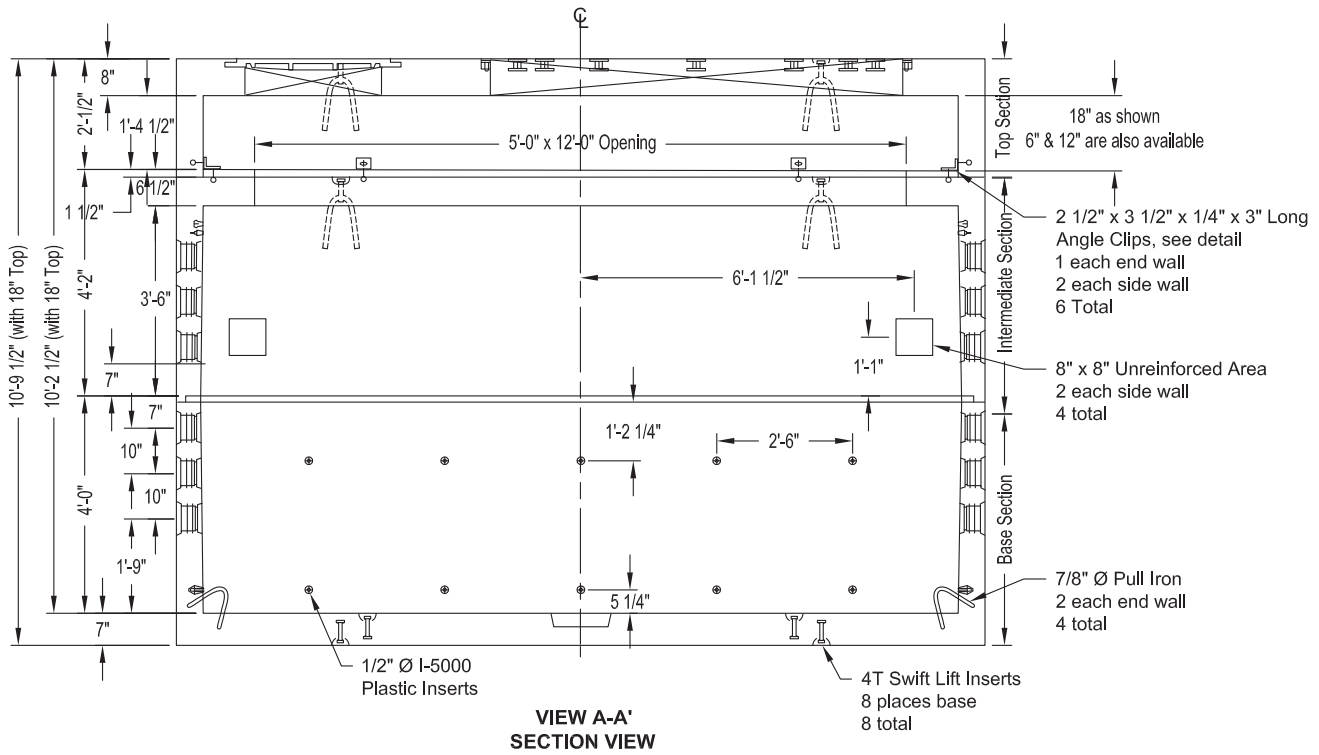
SS 541

Sheet 5 of 10

UGS

► SCE Public ◀

Figure SS 541-8: 7' x 14' x 11' and 7' x 18' x 11' Tub-Style Structure with Modular Top Type II



SS 541

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

Approved by:

RR

Sheet 6 of 10

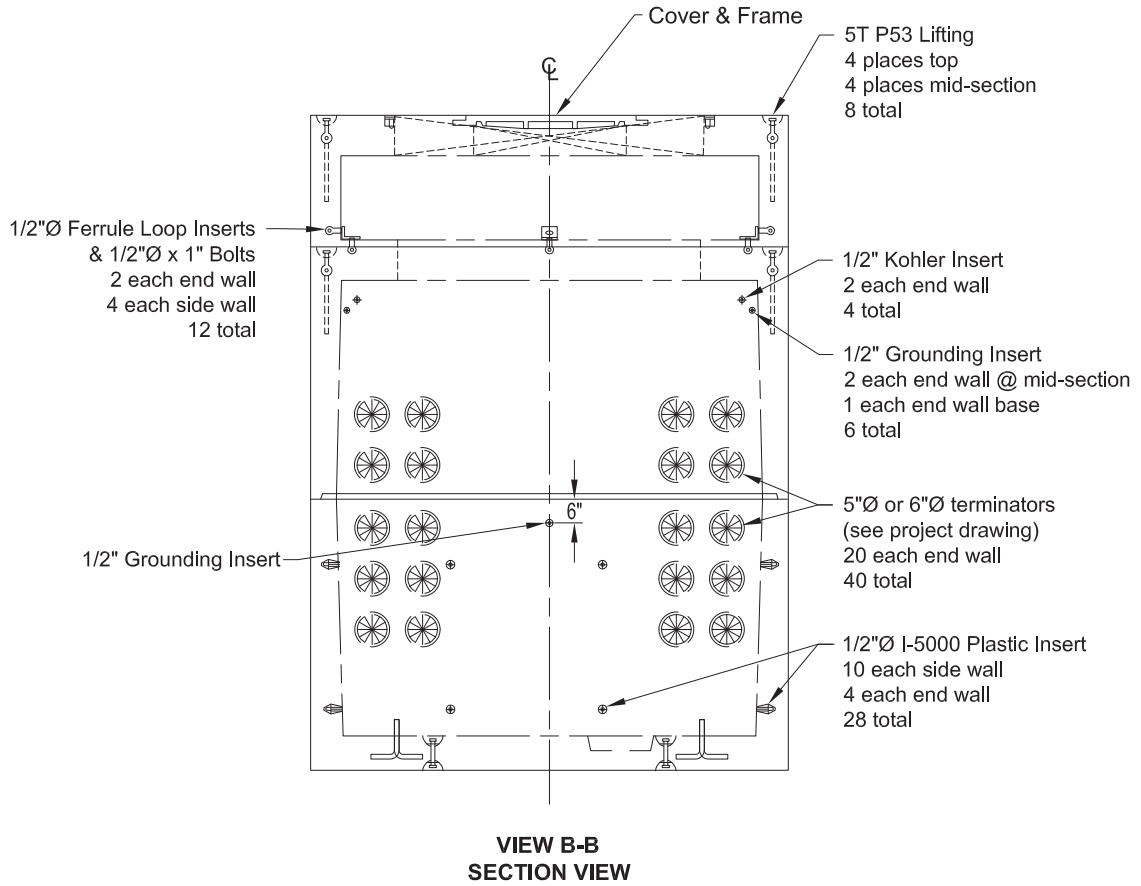
What's Changed?

Effective Date:

10-29-2021

UGS

Figure SS 541-9: 7' x 14' x 11' Tub-Style Structure with Modular Top Type II



Approved by:

RR

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

SS 541

Sheet 7 of 10

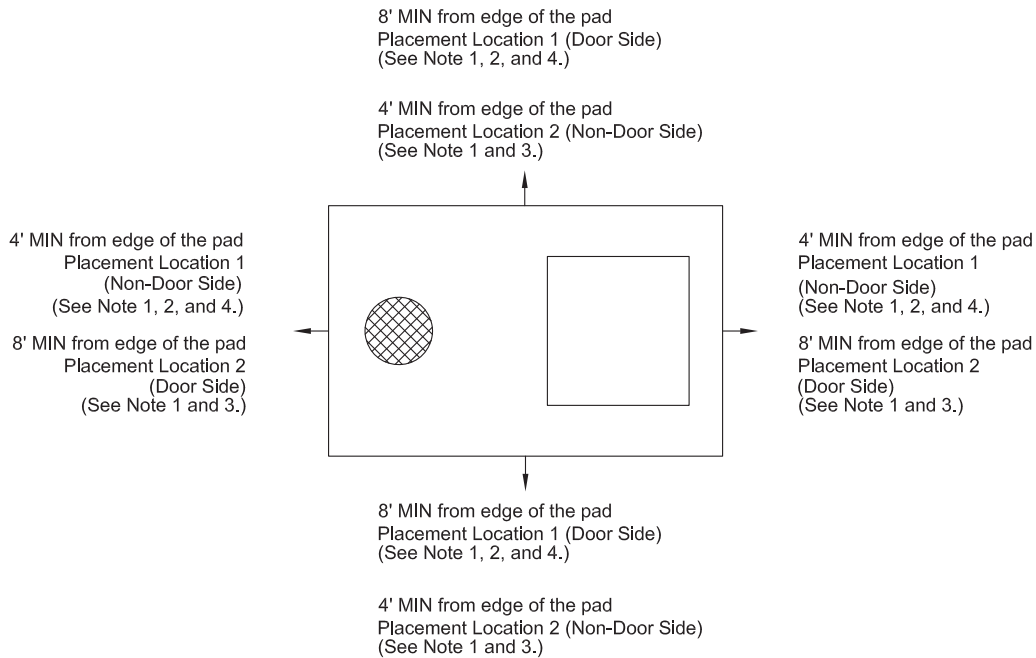
Effective Date:

10-29-2021

What's Changed?

UGS

Figure SS 541–10: 7' x 14' x 11' Tub-Style Structure with Modular Top Type II Working Clearances

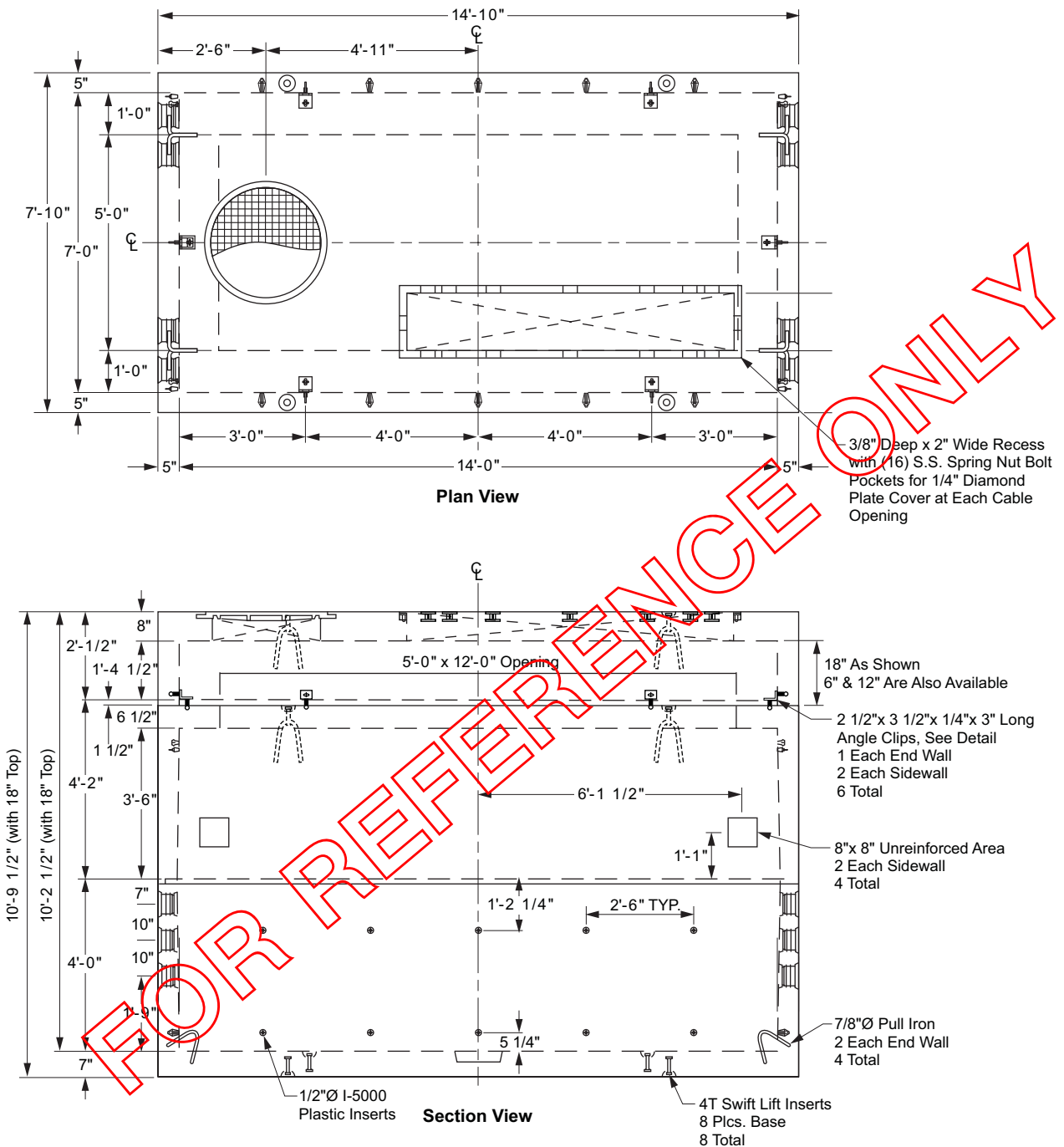


Note(s):

1. Placement of the PME enclosure is site-specific. The Design Organization will determine the placement of the switch door opening based on field conditions.
2. To allow for shaping and termination of cables, it is recommended the structure and cabinet be placed in location 1 (as shown on drawing) whenever possible.
3. When a PME switch is installed in placement location 2, cable steps or cable hooks shall be used to shape cable to maximize working space in the structure.
4. The 4-foot clearance on the side of new PME installations will enable the placement of automated switching equipment (RCS).
5. Alternate position (Placement 2) is not approved for new construction.
6. Alternate position (Placement 2) requires District Manager approval.

SS 541	7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II	Approved by: <i>RR</i>
Sheet 8 of 10	What's Changed?	Effective Date: 10-29-2021
UGS		

Figure SS 541-11: 7' x 14' x 11' Tub-Style Structure with Modular Top Type I (For Reference Only)



FOR REFERENCE ONLY

Approved by:

RR

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

SS 541

Sheet 9 of 10

Effective Date:

10-29-2021

What's Changed?

UGS

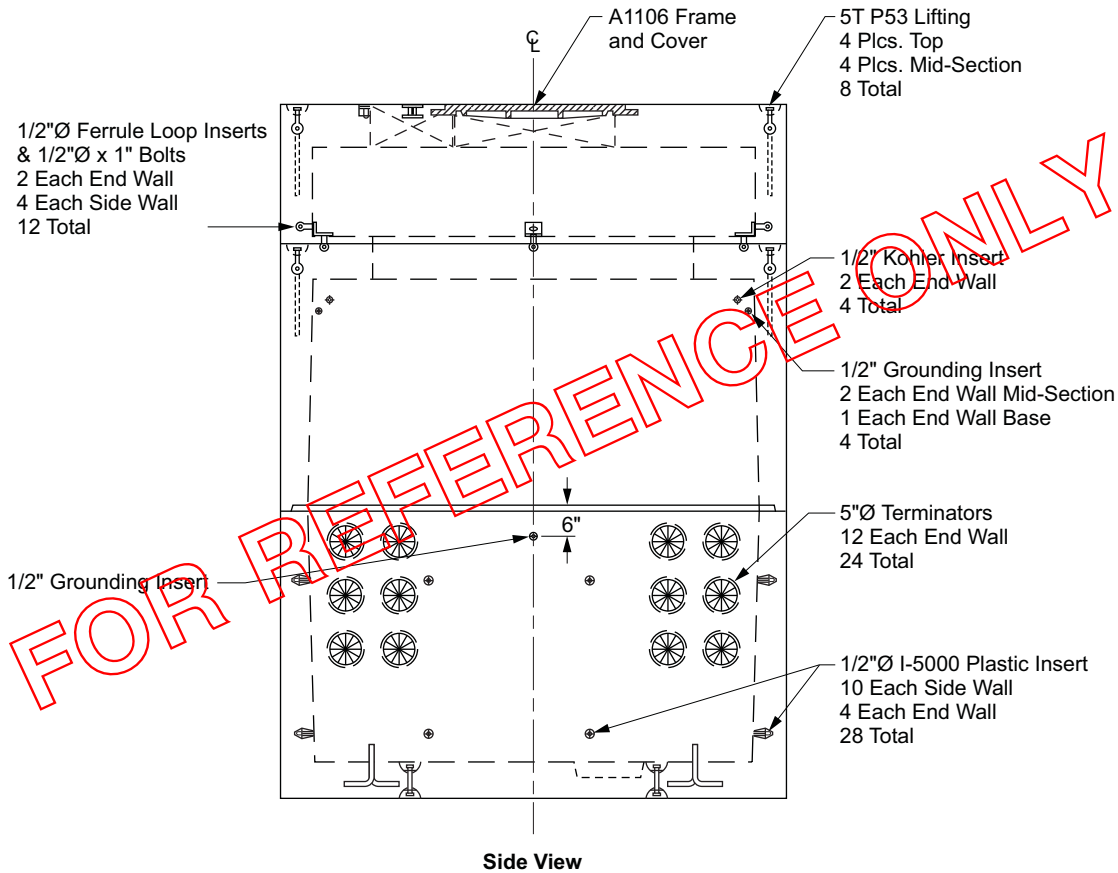


Figure SS 541-11.1: 7' x 14' x 11' Tub-Style Structure with Modular Top Type I (For Reference Only)

SS 541

7' x 14' x 11' Precast Tub-Style Structure with Modular Top Type I and II

Approved by:

RR

Sheet 10 of 10

What's Changed?

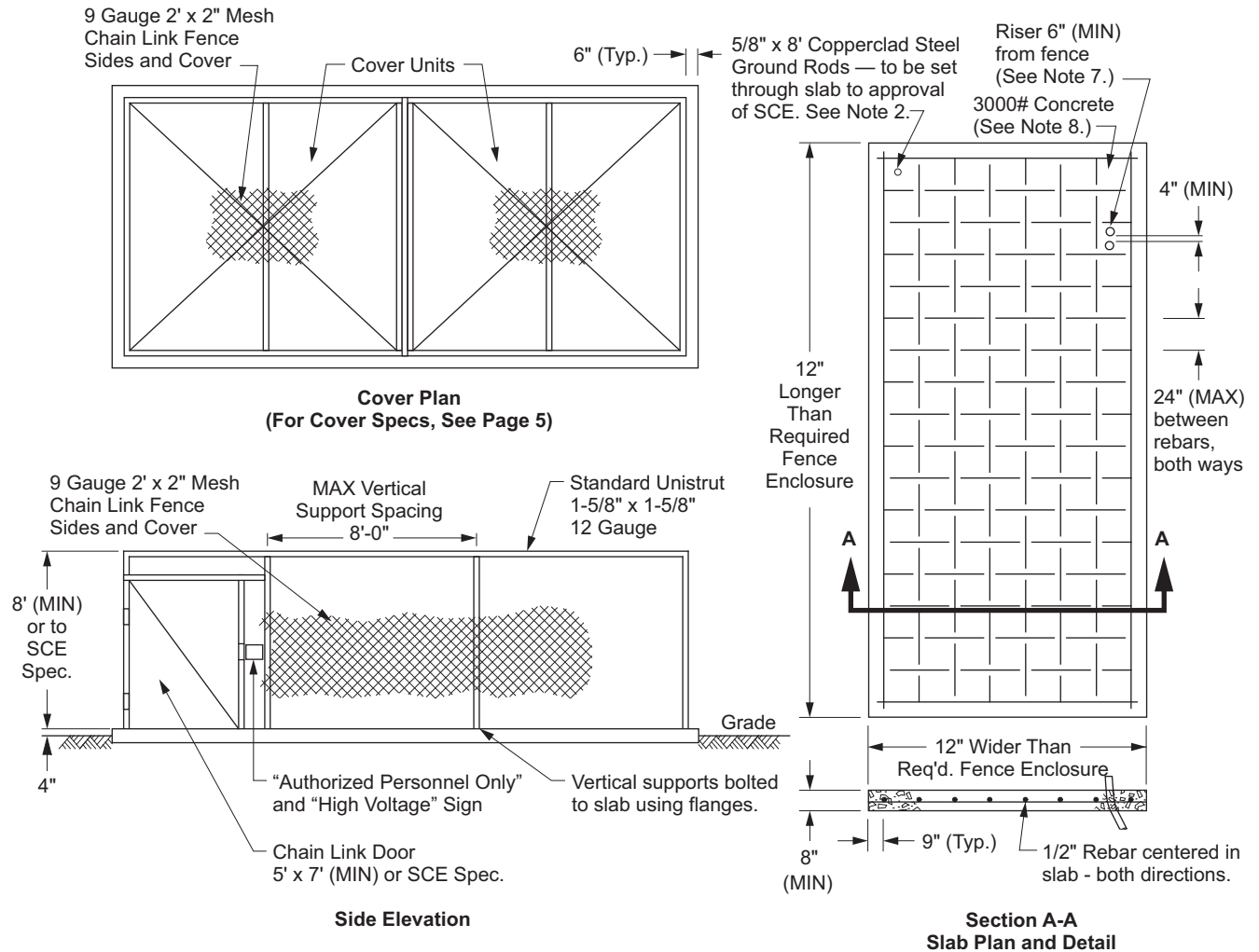
Effective Date:

UGS

10-29-2021

SS 542 Unistrut/Chain Link Enclosure
Scope SS 542.1 Unistrut/Chain Link Enclosure

Figure SS 542-1: Unistrut/Chain Link Enclosure



Note(s):

1. All fences to be installed to meet local standards.
2. All grounding material will be furnished by the contractor. Contractor will install ground rods. Number and position of rods to be specified by SCE.
3. All fence material to be galvanized.
4. Enclosure to be a prefabricated assembly.
5. Line posts to be standard unistrut (1-5/8" x 1-5/8" 12 ga.).
6. Corner posts to be 2 standard unistrut welded together.
7. See [CD 170](#).
8. See [GI 020](#).

Approved by: 	Unistrut/Chain Link Enclosure	SS 542
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1
		UGS

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SS 544 Masonry Enclosure

Scope SS 544.1 Masonry Enclosure

Figure SS 544-1: Masonry Enclosure

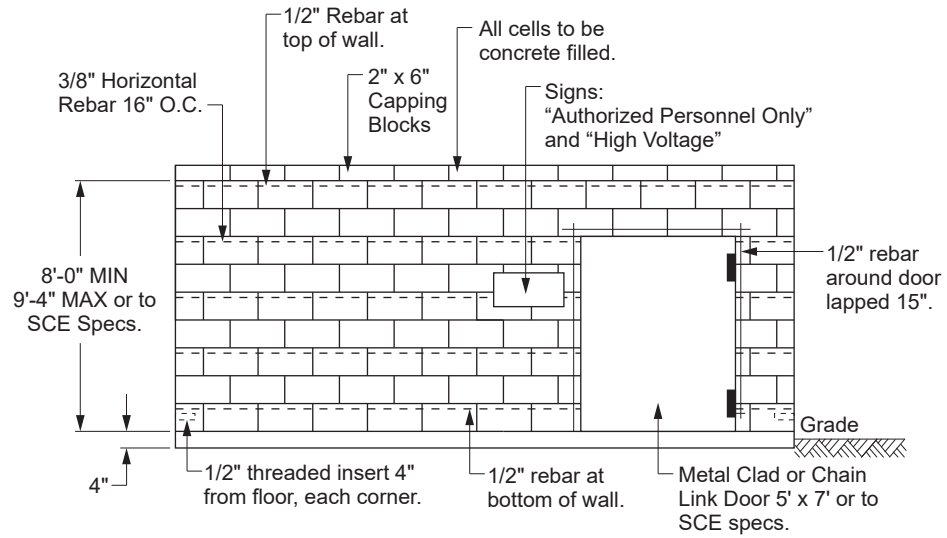


Figure SS 544-1.1: Side Elevation

Approved by: <i>PhH</i>	Masonry Enclosure	SS 544
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 3
		UGS

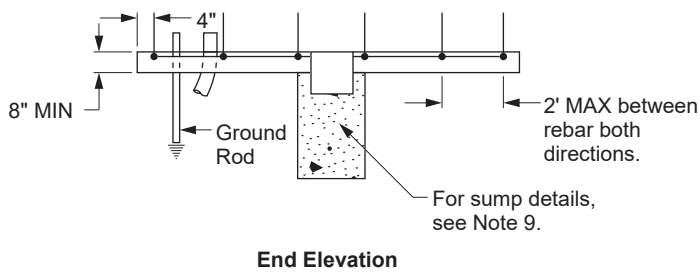
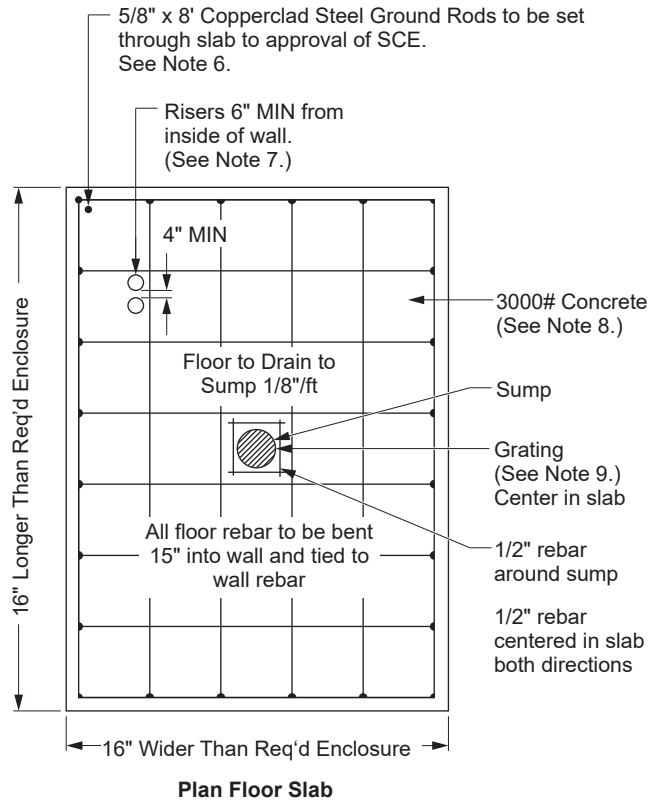


Figure SS 544-1.2: Plan Floor Slab and End Elevation

SS 544

Masonry Enclosure

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

01-26-2007

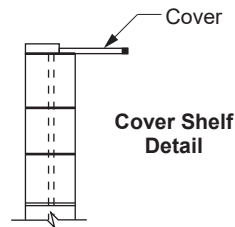
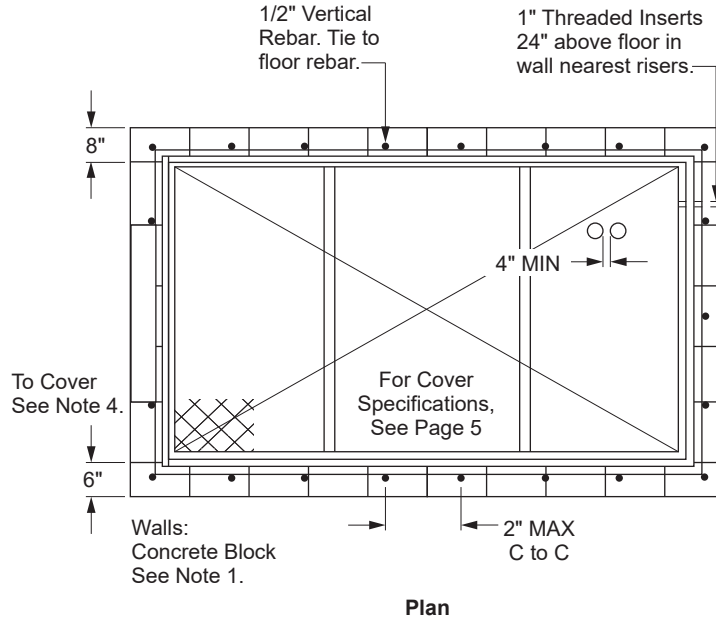


Figure SS 544-1.3: Plan and Cover Shelf Detail

Note(s):

1. Hollow 8" x 16" blocks to be used (See Note 4).
2. All work must meet local standards.
3. Use type "S" mortar per Uniform Building Code.
4. Capping blocks to be 2" x 6" x 16" set flush with the outside face leaving a 2" shelf for fence cover.
5. Slab to be smooth and sloped 1/8" per foot towards sump.
6. Ground rods will be furnished by the contractor. Number and position of rods to be specified by SCE.
7. See CD 170.
8. See GI 020.
9. See AC 710.

Approved by:

PhH

Masonry Enclosure

SS 544

Effective Date:

01-26-2007

What's Changed?

Sheet 3 of 3

UGS

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SS 546 Concrete Type Enclosure
Scope SS 546.1 Concrete Type Enclosure

Figure SS 546-1: Concrete Type Enclosure

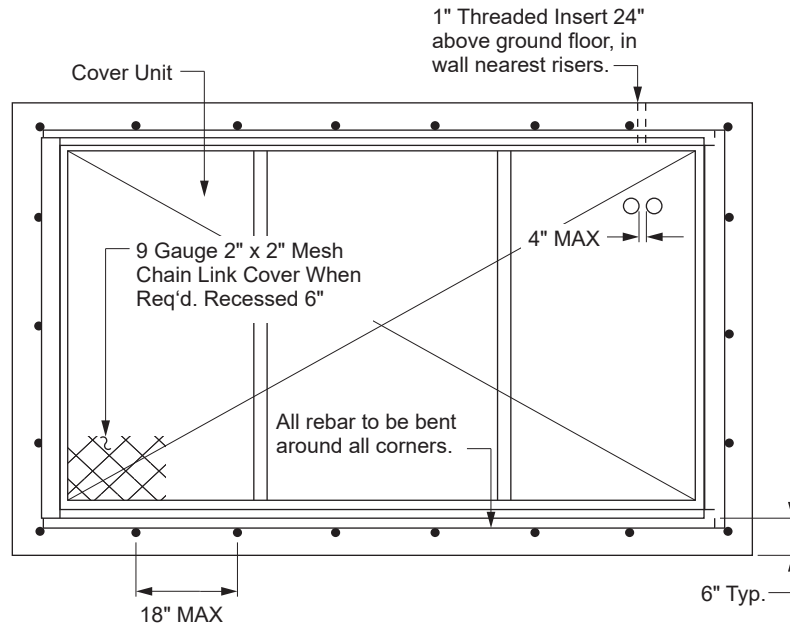



Figure SS 546-1.1: Cover Plan

Approved by: 	Concrete Type Enclosure	SS 546
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 3 UGS

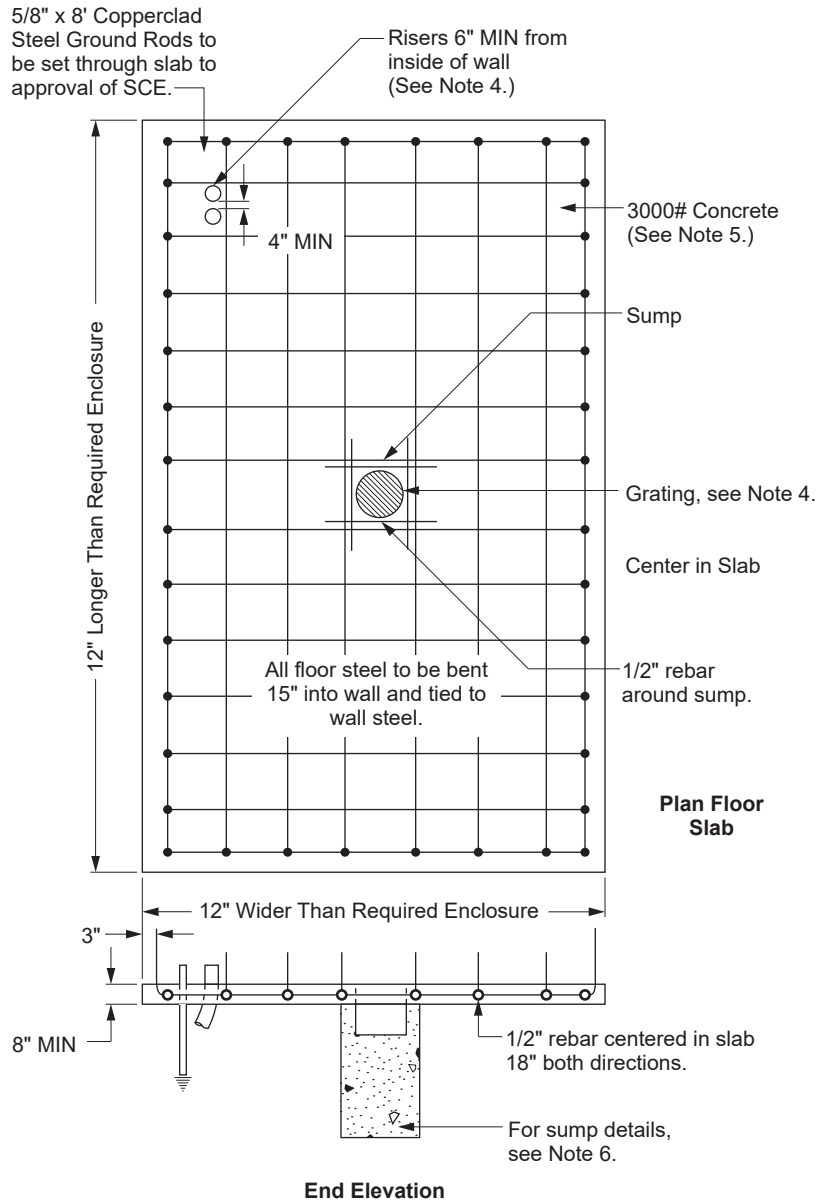


Figure SS 546-1.2: Plan Floor Slab and End Elevation

SS 546

Concrete Type Enclosure

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

01-26-2007

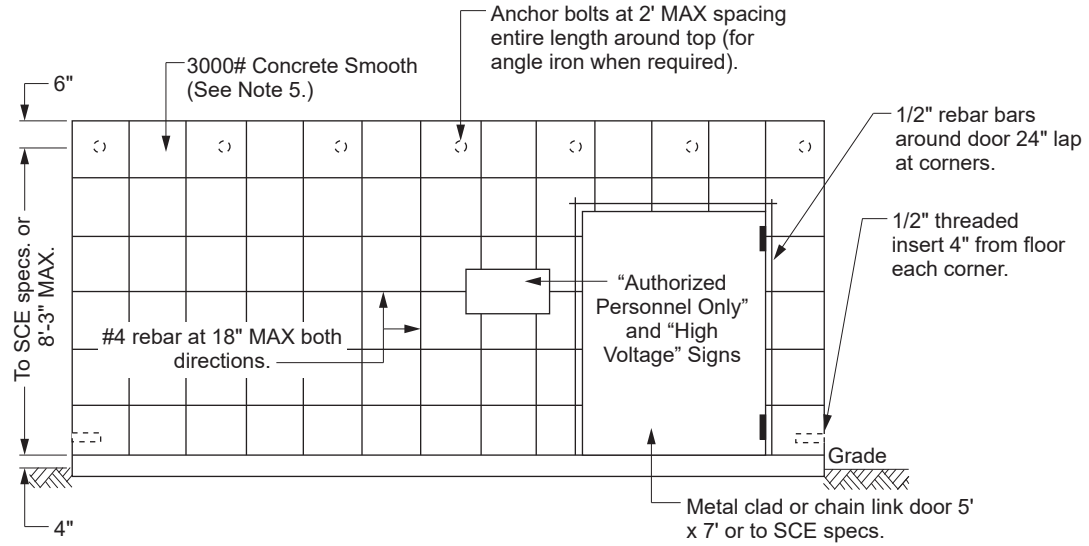


Figure SS 546-1.3: Side Elevation

Note(s):

1. All work must meet local codes.
2. Slab to be smooth and sloped 1/8" by the per foot toward sump.
3. Ground rods will be furnished by the contractor. Number and position of rods to be specified by SCE.
4. See [CD 170](#).
5. See [GI 020](#).
6. See [AC 710](#).

Approved by:

PhH

Concrete Type Enclosure

SS 546

Effective Date:
01-26-2007

What's Changed?

Sheet 3 of 3

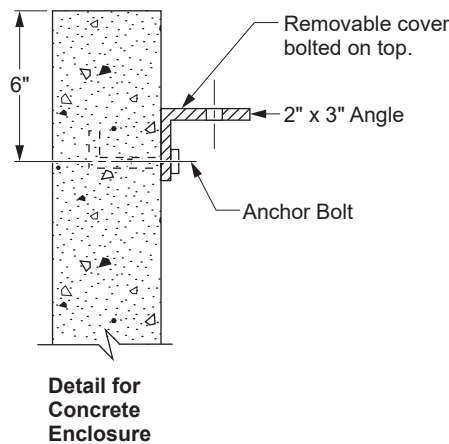
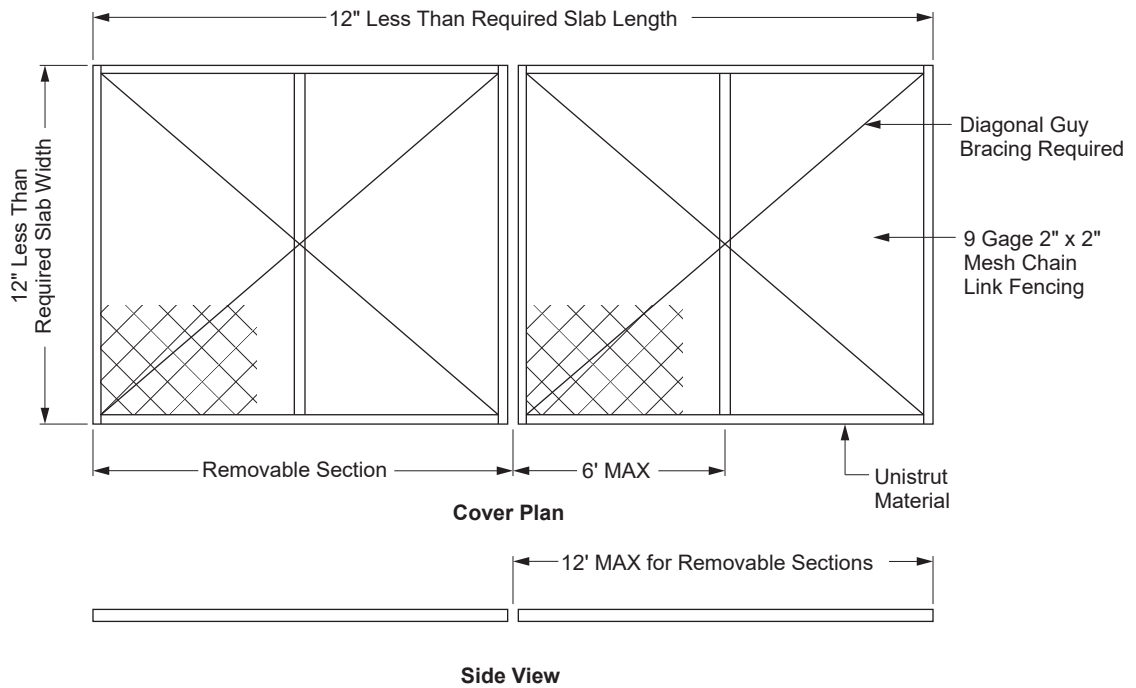
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SS 548 Unistrut/Chain Link Enclosure Cover (Removable)

Scope SS 548.1 Unistrut/Chain Link Enclosure Cover (Removable)

Figure SS 548-1: Unistrut/Chain Link Enclosure Cover (Removable)



Note(s):

1. Dimensions of cover depend on size of enclosure.
2. Cover mandatory when enclosure is on school grounds, or within 6' of building.
3. All cover material must be galvanized.
4. All covers must be bolted down.
5. Cover to be removable. Maximum size of removable sections to be 12' x 12'.

Approved by:	Unistrut/Chain Link Enclosure Cover (Removable)	SS 548
Effective Date:	What's Changed?	Sheet 1 of 1
01-26-2007		UGS

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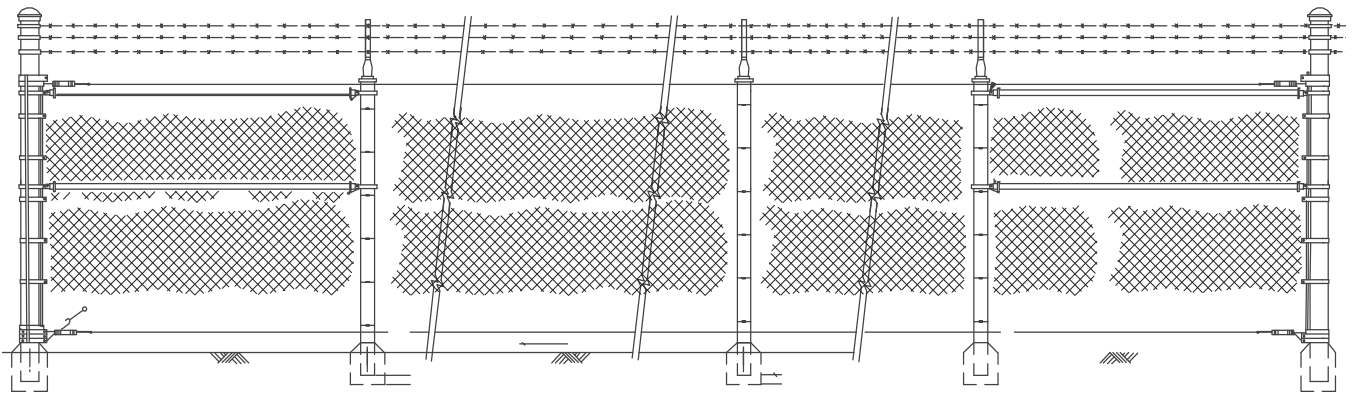
SS 549 Chain Link Fence (Surface Mounted Equipment)

Scope SS 549.1 Chain Link Fence (Surface Mounted Equipment)

1.0 General Requirements

- 1.1 Chain link fence shall comply with UGS [SS 542](#) and ASTM F5567-00 at a minimum.
- 1.2 Chain link fence shall be a minimum of 8 feet high.
- 1.3 Chain link fence fabric shall be 9 gauge galvanized steel wire, no larger than 2" X 2" mesh size.
- 1.4 The fence shall utilize Y-shaped 12 ½ gauge galvanized barbed wire with 3 strands outside and 2 strands inside.
- 1.5 End post, gate post, and corner post shall be 2-1/2" in diameter
- 1.6 Brace and line post shall be 2" in diameter.
- 1.7 Post foundation concrete shall be 2500 psi @ 28 days.
- 1.8 Post shall be set at a depth per ASTM F567 - 00.
- 1.9 Ground rods will be furnished by the contractor. Number and position of rods to be specified by SCE.

Figure SS 549-1: Chain Link Fence (Surface Mounted Equipment)



Approved by: <i>B. C.</i>	Chain Link Fence (Surface Mounted Equipment)	SS 549
Effective Date: 07-28-2017	What's Changed? Initial issue.	Sheet 1 of 2
		UGS

Scope SS 549.2 Chain Link Fence Safety Signs

1.0 General Requirements

1.1 High Voltage Sign

Signs shall read as follows: "DANGER/HIGH VOLTAGE/UNLAWFUL FOR UNAUTHORIZED PERSONS TO ENTER." (SAP 10135410), see Figure SS 549-2. A sign shall be mounted on each entrance gate and at least two sides of the enclosure. If obstructions are in the line of sight, place signs in locations which will provide the most visibility.

1.2 Keep Out! Sign

Signs shall read as follows: "DANGER/Keep Out!/Hazardous voltage inside will cause severe injury or death. Do not enter this enclosure." (SAP 10135426), see Figure SS 549-3. One sign shall be mounted outside of each entrance gate, and at least one on each side of the enclosure. These signs shall be mounted approximately 7 feet above the ground or near the top of the fence, where it would be most visible. If obstructions are in the line of sight, place signs in locations which will provide the most visibility.

Figure SS 549–2: High Voltage Sign



Figure SS 549–3: Keep Out! Sign



SS 560 Subsurface Structure Requirements

Scope SS 560.1 Subsurface Structure Requirements

The following tabulation shows the sizes of various subsurface structures, manufacturers' names and numbers, and an arbitrarily assigned item number.

The Item Number will be the identification used when listed on the "List of Materials" on each working drawing.

Table SS 560-1: Subsurface Structures

Item No.	Type	Nominal Size (Inside)	Number of		Precast Concrete Manufacturers' No.	
			Covers	Grates	Jensen Precast	Oldcastle Infrastructure
SS-21	Parkway	5' x 8-1/2' x 5'	3 ^{a/}	0	K585-SE60-11P	ED586-60-SOE
SS-22	Parkway	4' x 4' x 4'	1	0	K44-SE48-11P	ED44-48-BURD-P
SS-23	Full-Traffic	4' x 4' x 4'	1 ^{b/}	0	K44-SE48-11T	ED44-48-BURD-Traffic
SS-2	Light-Traffic	4' x 4' x 4'	1	0	Special Order	ED44-48TS
SS-3	Parkway	4' x 7' x 4'	3	0	Special Order	ED47-48RPM
SS-4	Light-Traffic	4' x 7' x 4'	3	0	Special Order	ED47-48TS
SS-7	Parkway	4' x 7' x 7'	2	0	Special Order	ED47-84RPMV
SS-8	Light-Traffic	4' x 7' x 7'	2	0	Special Order	ED47-84TSV
SS-9	Parkway	4' x 7' x 7'	3	0	Special Order	ED47-84RPM
SS-10	Light-Traffic	4' x 7' x 7'	3	0	Special Order	ED47-84TS
SS-11	Parkway	5' x 8-1/2' x 4'	4	0	Special Order	ED586-48RPM
SS-12	Light-Traffic	5' x 8-1/2' x 4'	4	0	Special Order	ED586-48TS
SS-15	Parkway	5' x 8-1/2' x 7'	2	4	Special Order	ED586-84RPMV
SS-16	Light-Traffic	5' x 8-1/2' x 7'	2	4	Special Order	ED586-84TSV
SS-17	Parkway	5' x 8-1/2' x 7'	4	0	Special Order	ED586-84RPM
SS-18	Light-Traffic	5' x 8-1/2' x 7'	4	0	Special Order	ED586-84TS
SS-19	Full-Traffic	4' x 7' x 7'	3 ^{c/}	0	Special Order	ED47-84 Full Traffic
SS-20	Full-Traffic	5' x 8-1/2' x 7'	3 ^{c/}	0	Special Order	ED586-84 Full Traffic

^{a/} Removable Support Beams

^{b/} 30" Cast Iron MH Cover

^{c/} 2' x 2' Cast Iron Covers

= For Reference Only

Note(s):

1. All structures will be supplied complete with the correct number of covers, grates, and tamper shields. (Tamper shields not required with solid covers.)
2. All structures contain a precast concrete floor.
3. See [SS 562](#), [SS 564](#), [SS 566](#), [SS 568](#), [SS 590](#), and [FC 618](#) for details.
4. Two grounding bars are provided in enclosures SS-3 through SS-20 (except SS-22 and SS-23). Enclosure SS-21 is provided with four 1/2" threaded bronze grounding inserts.
5. RPM covers will be provided for all parkway 4' x 4' (SS-22), 4' x 7', and 5' x 8'-6" enclosures.

Approved by:	Subsurface Structure Requirements	SS 560
Effective Date:	What's Changed? Table SS 560-1: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure; parent company note removed.	Sheet 1 of 1
04-24-2020		UGS

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SS 562 Concrete Enclosure 4' x 4' x 4'

Scope SS 562.1 For Use with following BURD Switches — Switched Only – 2W-3 Pole, 3W-3 Pole — Switched and Fused – 2W-2 Pole, 2W-3 Pole

Figure SS 562–1: Concrete Enclosure 4' x 4' x 4' — SAP 10117682 Nontraffic — SAP 10117683 Light Traffic (Parking Lots)

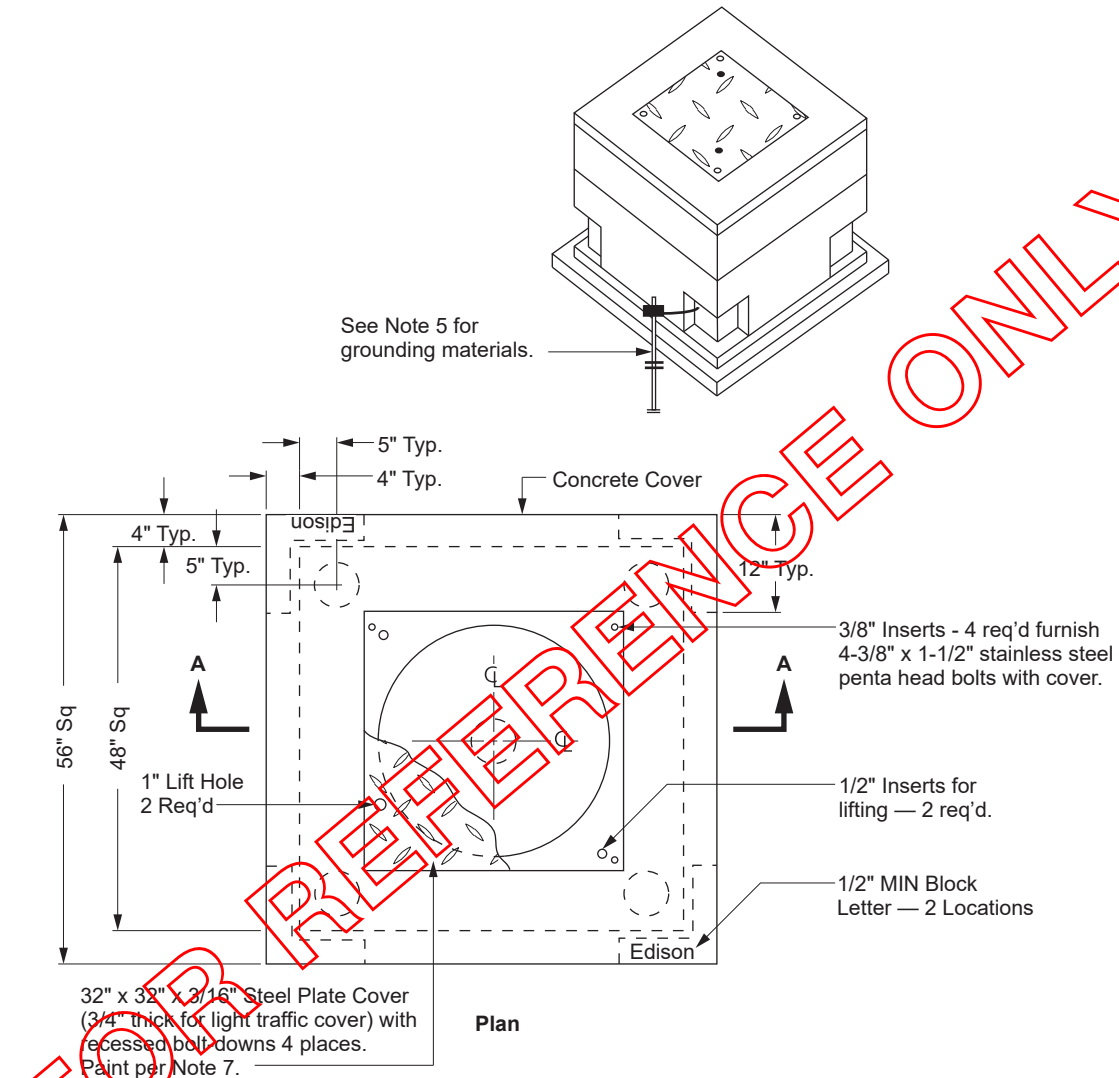


Figure SS 562–1.1

Approved by: <i>PhH</i>	Concrete Enclosure 4' x 4' x 4'	SS 562
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 2
		UGS

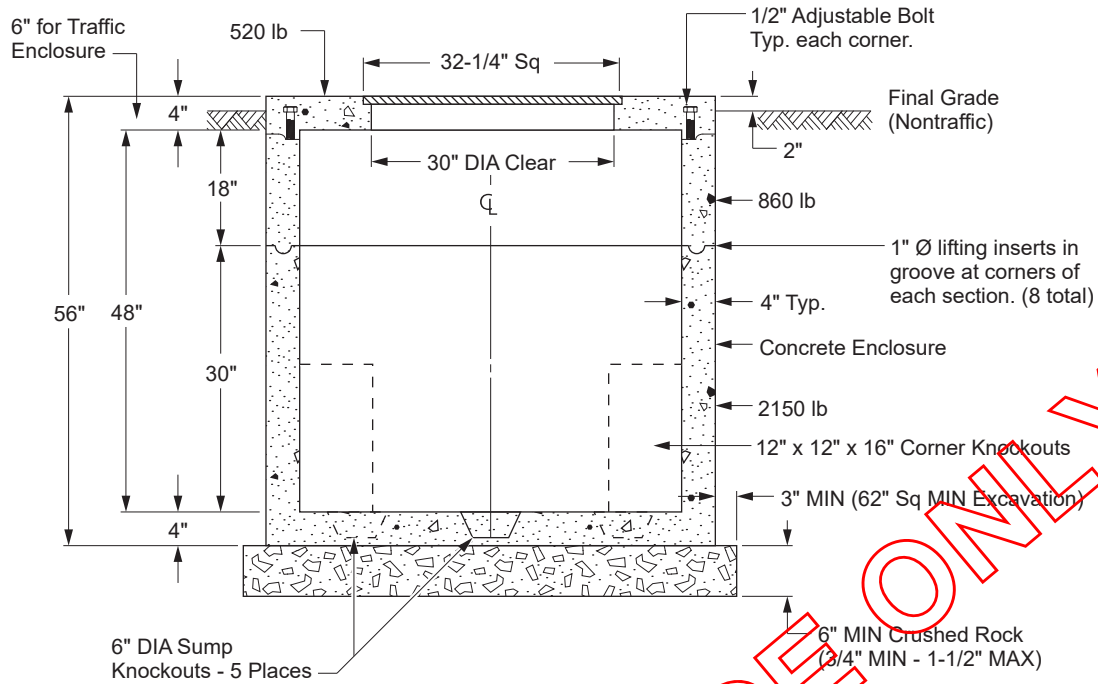


Figure SS 562-1.2: Section A-A

Note(s):

1. Enclosure to be furnished complete with cover plate and adequate lifting inserts.
2. Six-inch grade rings are available (SAP 10118069).
3. Sealant required at joints.
4. See **SS 560** for approved manufacturers.
5. Secure #6 minimum B.C. ground wire to one 5/8" x 8" copperclad steel ground rod with a Burndy "GAR" type ground clamp. (Leave 10 feet of ground wire inside enclosure).
6. See **SS 564** for new design for this structure.
7. See **FC 601**.

FOR REFERENCE ONLY

SS 562

Concrete Enclosure 4' x 4' x 4'

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

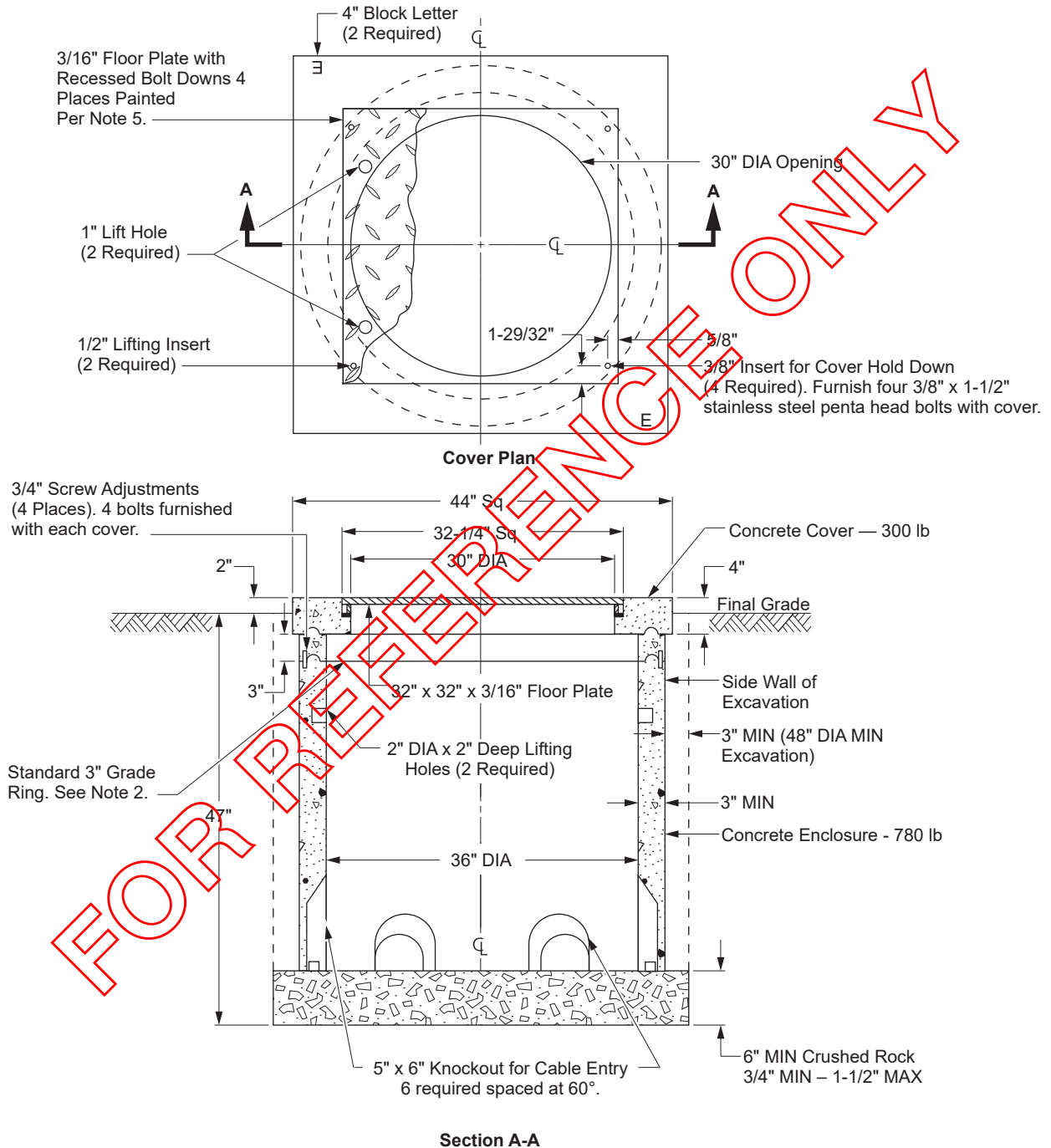
UGS

01-26-2007

SS 563 Concrete Enclosure — 36" Inner Diameter x 36" — SAP 10117680

Scope SS 563.1 For Use with following BURD Switches — Switched Only – 2W-1 Pole, 2W-2 Pole 3W-1 Pole, 3W-2 Pole — Switched and Fused – 2W-1 Pole

Figure SS 563-1: Concrete Enclosure



FOR REFERENCE ONLY

Approved by:

PhH

Concrete Enclosure — 36" Inner Diameter x 36" — SAP 10117680

SS 563

Effective Date:
10-26-2007

What's Changed? This standard was made For Reference Only. SCE no longer performs this type of installation.


Sheet 1 of 2

UGS

Note(s):

1. Enclosure is no longer available. Replacement concrete covers and cover plates are available.
2. Replacement concrete covers are available (plate not included) with SAP 10117669.
3. Steel cover to be interchangeable with transformer enclosure grate, steel cover SAP 10117514.
4. Replacement parts available from Jensen Precast.
5. See [FC 601](#).
6. For parkway use only.

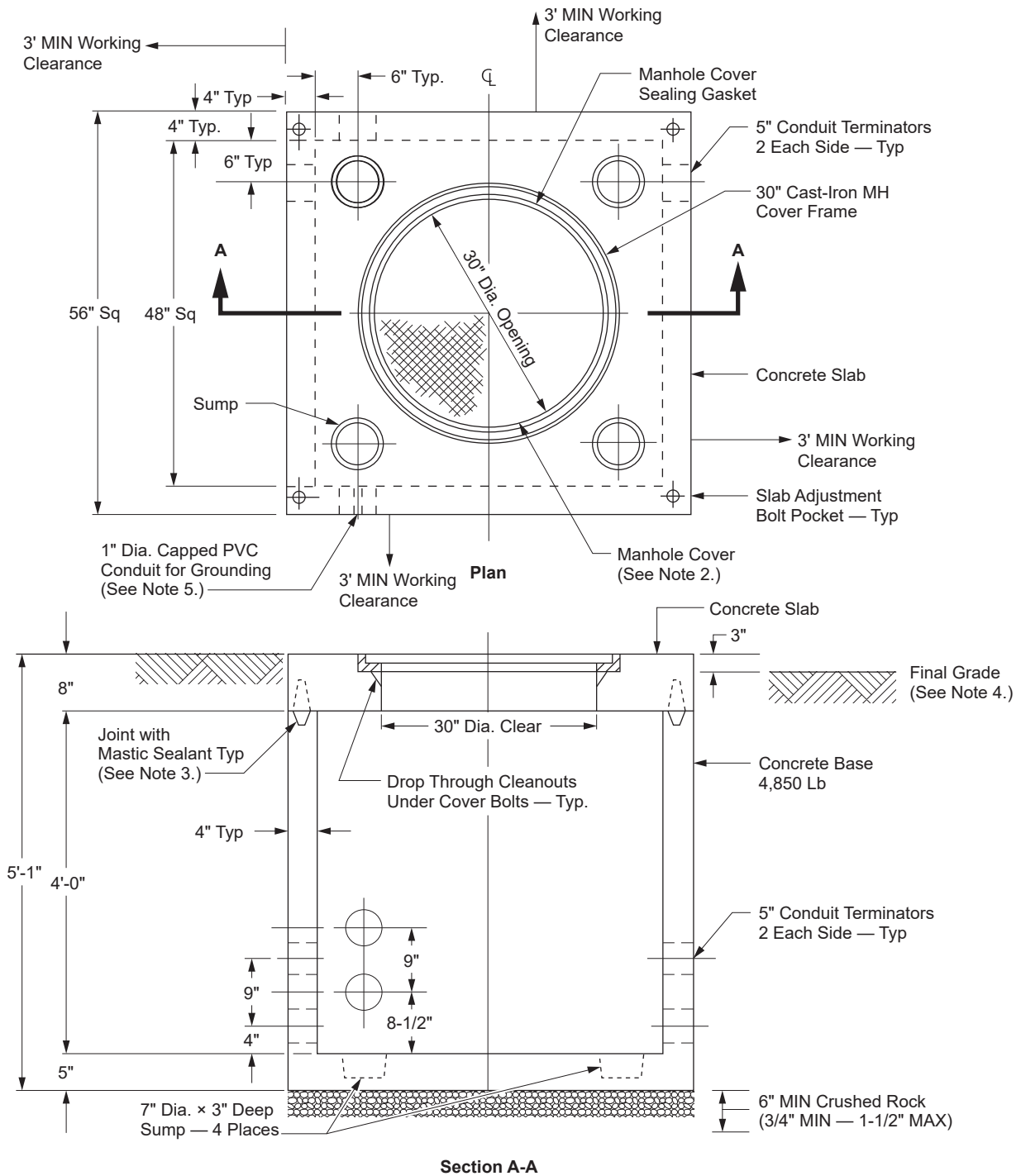
FOR REFERENCE ONLY

SS 563	Concrete Enclosure — 36" Inner Diameter x 36" — SAP 10117680	Approved by: 
Sheet 2 of 2	What's Changed? This standard was made For Reference Only. SCE no longer performs this type of installation.	Effective Date: 10-26-2007
UGS		

SS 564 Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'

Scope SS 564.1 Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'

Figure SS 564-1: Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'



Approved by:

B.C.

Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'

SS 564

Sheet 1 of 2

Effective Date:

04-28-2017

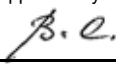
What's Changed?

UGS

Note(s):

1. Parkway SAP 10117682.
Full traffic SAP 10117683.
2. Enclosure to be furnished complete with manhole gasket, cover, and related bolts. Full-traffic manhole cover is cast-iron and parkway is RPM. Composite manhole covers may be installed for existing parkway (non-traffic) installations.
3. Mastic sealants required at slab/base joint if cover slab is not elevated.
4. Top surface of enclosure slab will be set three inches above grade when installed in a planted area. In paved installations, top surface of slab to be flush with grade.
5. Secure #6 minimum BC ground wire to one 5/8" x 8' copper-clad steel ground rod with a bronze ground clamp. See [AC 703](#) for grounding material. Ground wire to be inserted through capped one-inch PVC conduit. (Leave 10 feet of ground wire inside enclosure.)
6. See [SS 560](#) for approved manufacturers.
7. Replacement parts may be ordered from the following SAP numbers:
 Top Cap Concrete Cover: SAP 10117534
 RPM Parking Lid: SAP 10117535
 Cast Iron Traffic Lid: SAP 10117544
 6-inch Grade Ring: SAP 10118069
 Composite Manhole Cover: SAP 10205271

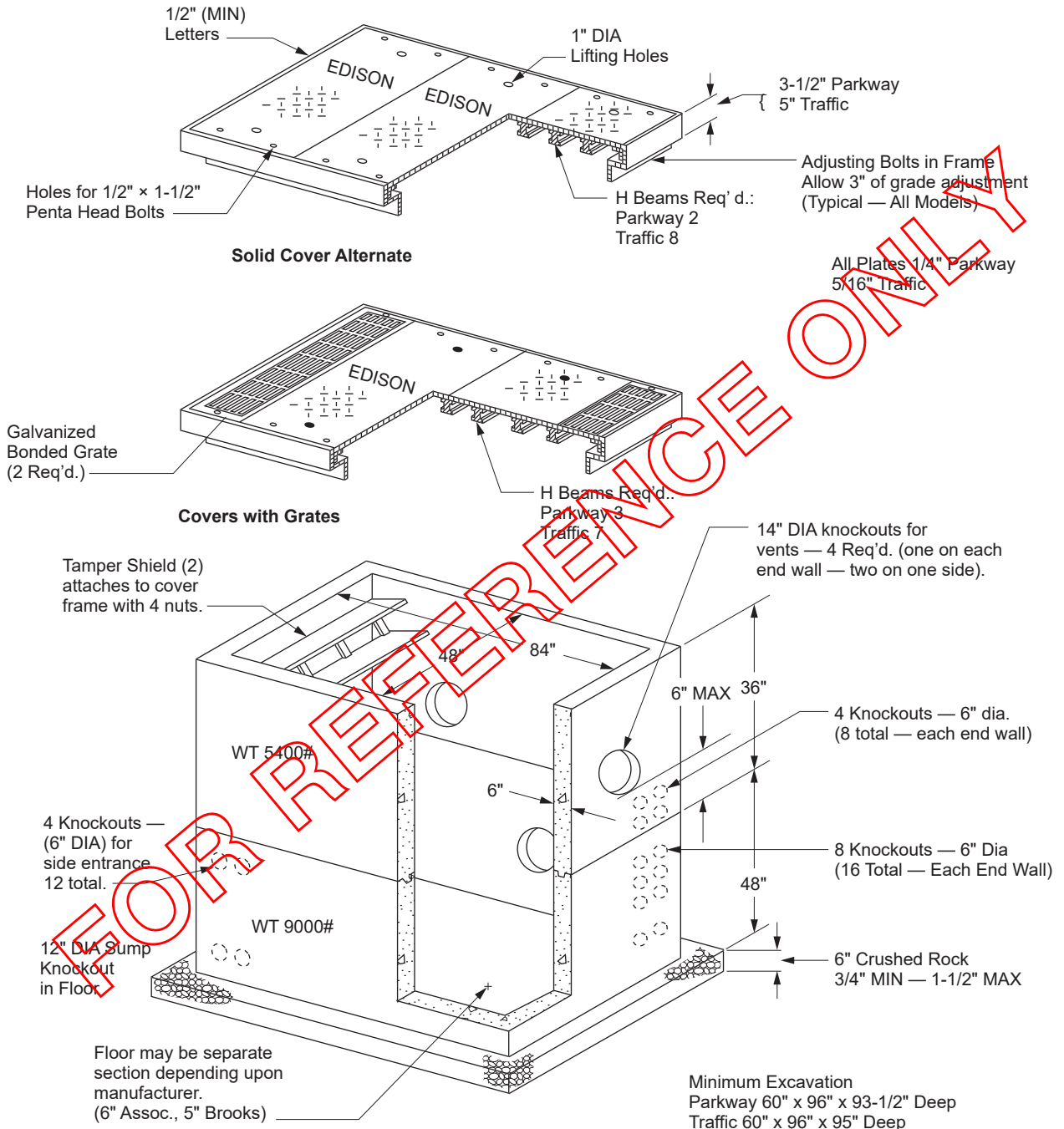
= For Reference Only

SS 564	Precast Concrete BURD Switch Enclosure — 4' x 4' x 4'	Approved by: 
Sheet 2 of 2	What's Changed? Added composite manhole information to Note 1 and Note 7.	Effective Date: 04-28-2017
UGS		

SS 565 Subsurface Equipment Enclosure — 4' x 7' x 7'

Scope SS 565.1 Subsurface Equipment Enclosure — 4' x 7' x 7' — (4' x 7' x 4')

Figure SS 565-1: Subsurface Equipment Enclosure — 4' x 7' x 7'



Approved by:

PHH

Subsurface Equipment Enclosure — 4' x 7' x 7'

SS 565

Effective Date:
01-26-2007

What's Changed?


Sheet 1 of 2

UGS

Note(s):

1. Twelve stainless steel penta head bolts furnished.
2. Enclosures available in parkway and traffic loading types, with vented or solid covers. See [SS 560](#) for approved manufacturers and ordering information.
3. Covers will be identified with model numbers on the underside and painted in accordance with [FC 601](#).
4. Grout under frame when adjusting bolts are used.
5. Sealant required at joints.
6. Two grounding bars are provided in each enclosure.
7. Four-foot-deep enclosure utilizes base section (with floor) and cover only.

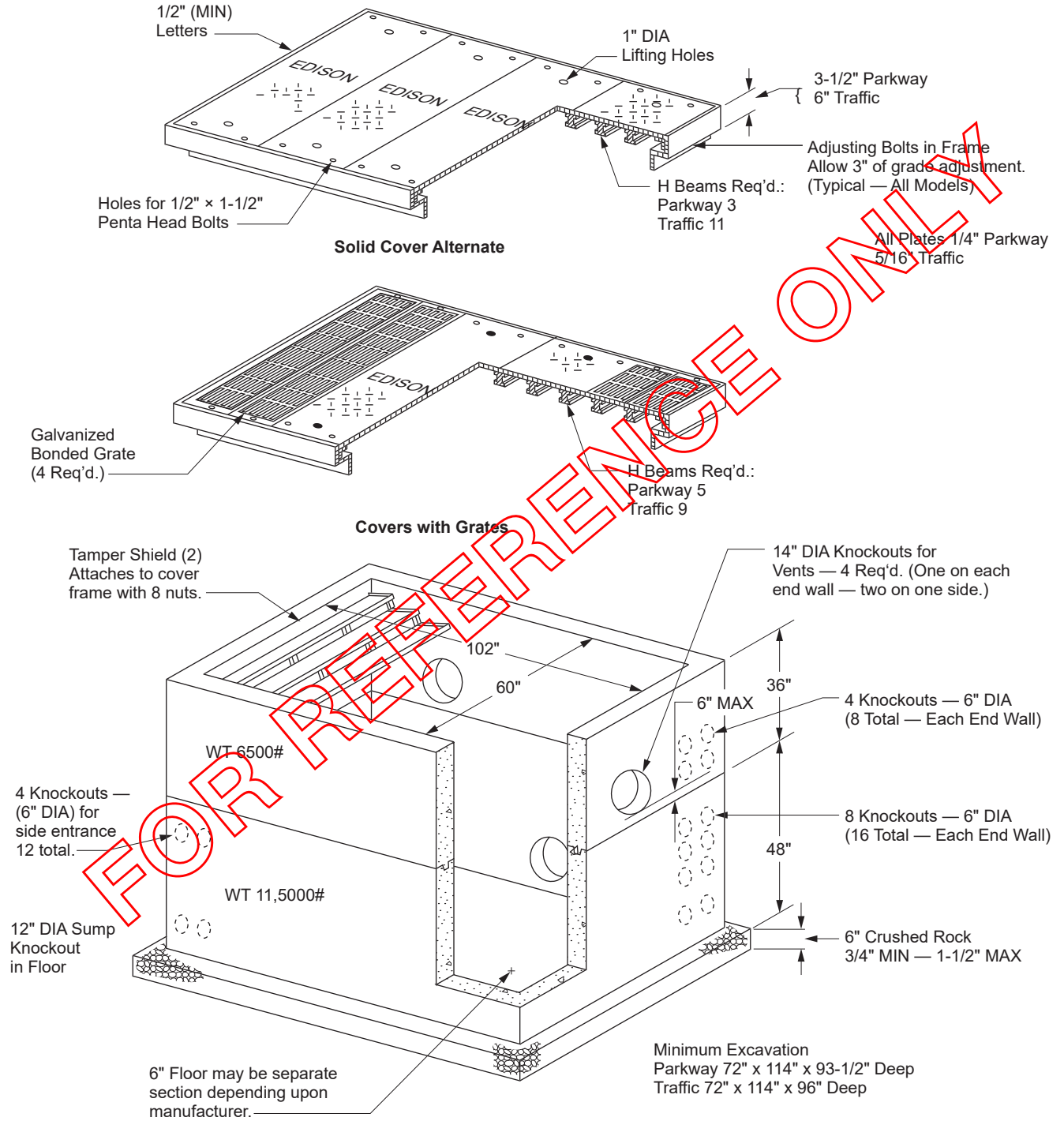
FOR REFERENCE ONLY

SS 565	Subsurface Equipment Enclosure — 4' x 7' x 7'	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 01-26-2007
UGS		

SS 566 Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7'

Scope SS 566.1 Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7' — (5' x 8'-1/2" x 4')

Figure SS 566-1: Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7'



FOR REFERENCE ONLY

Approved by:
PhH
Effective Date:
01-26-2007

Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7'

What's Changed?

SS 566


Sheet 1 of 2

UGS

Note(s):

1. Twelve stainless steel penta head bolts furnished.
2. Enclosures available in parkway and traffic loading types, with vented or solid covers. See [SS 560](#) for approved manufacturers and ordering information.
3. Covers will be identified with model numbers on the underside and painted in accordance with [FC 601](#).
4. Grout under frame when adjusting bolts are used.
5. Sealant required at joints.
6. Two grounding bars are provided in each enclosure.
7. Four-foot-deep enclosure utilizes base section (with floor) and cover only.

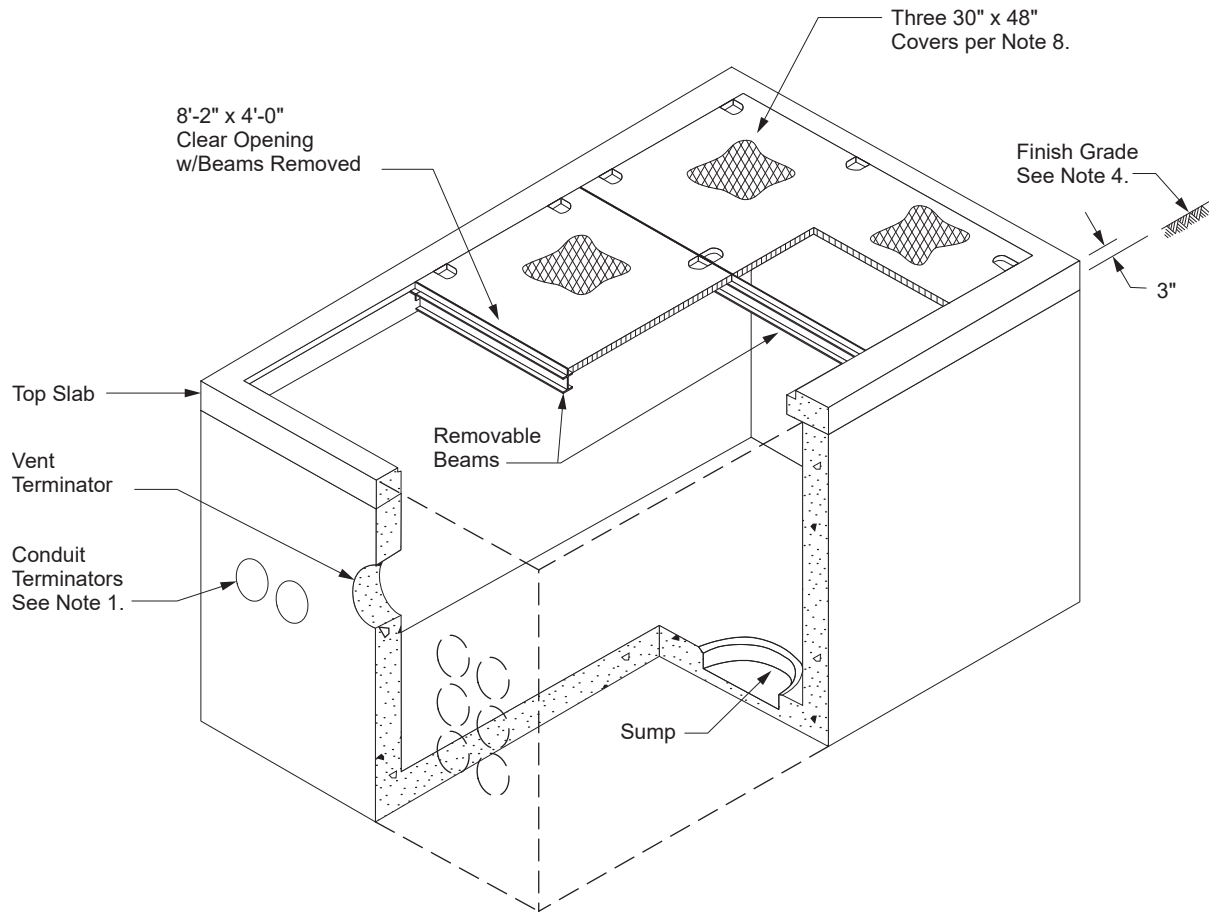
FOR REFERENCE ONLY

SS 566	Subsurface Equipment Enclosure — 5' x 8'-1/2" x 7'	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 01-26-2007
UGS		

SS 568 Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'

Scope SS 568.1 Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'

Figure SS 568-1: Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'



1.0 Excavation Size:

Consult manufacturers' installation guides for exact excavation dimensions.

2.0 UGS References:

[GI 030](#) General Specification for Precast Structures

[GI 035](#) Allowable Tolerances for Installed Precast Structures

[CD 142](#) Conduit Entrance

[FC 618](#) Polymer Concrete Pull Box Covers

[AC 711](#) Sump Drain and Detail

Note(s):

1. Conduit terminators to be generally located as shown in [CD 142](#). Standard conduit entrance will be a flatwall design. Slight variations by manufacturers may be allowable with Company approval.
2. For surface operable enclosure structural design criteria, see [Figure SS 568-2 \(Sheet 3\)](#) and [Figure SS 568-3 \(Sheet 4\)](#).

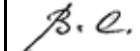
Approved by:	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'	SS 568
Effective Date:	What's Changed?	Sheet 1 of 7
10-24-2014		UGS

3. For a list of material requirements and notes, see [Table SS 568-1 \(Sheet 7\)](#).
4. Top surface of enclosure slab will be set three inches above finish grade when installed in a planted area. In paved installations, top surface of slab to be flush with grade.
5. See [SS 560](#) for listing of approved surface operable enclosure manufacturers' names and catalog numbers.
6. Mastic sealant is required between top slab and enclosure.
7. Structure SAP number is SAP 10117580. For special fault indicator covers refer to DUG, TD 100.

SS 568

Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'

Approved by:



Sheet 2 of 7

What's Changed? SAP Number added to Note 7.

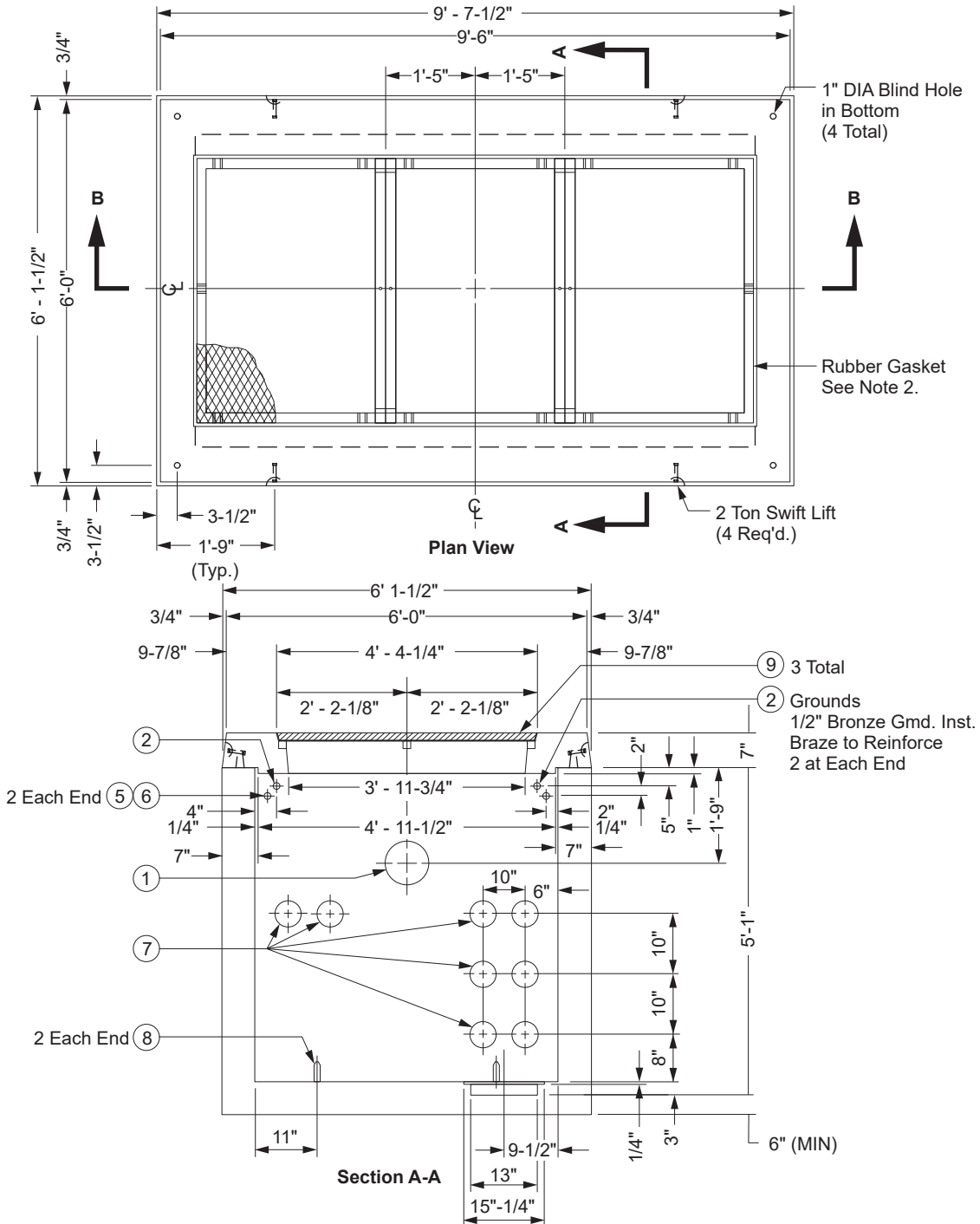
Effective Date:

UGS

10-24-2014

Scope SS 568.2 Top Slab/Cover with Removable Beams

Figure SS 568-2: Top Slab/Cover with Removable Beams — Plan and Section A-A



- Note(s):**
1. For list of materials and notes, see [Table SS 568-1 \(Sheet 7\)](#).
 2. See Detail "B" in [Figure SS 568-5 \(Sheet 6\)](#).

Approved by:
B.C.

Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'

SS 568

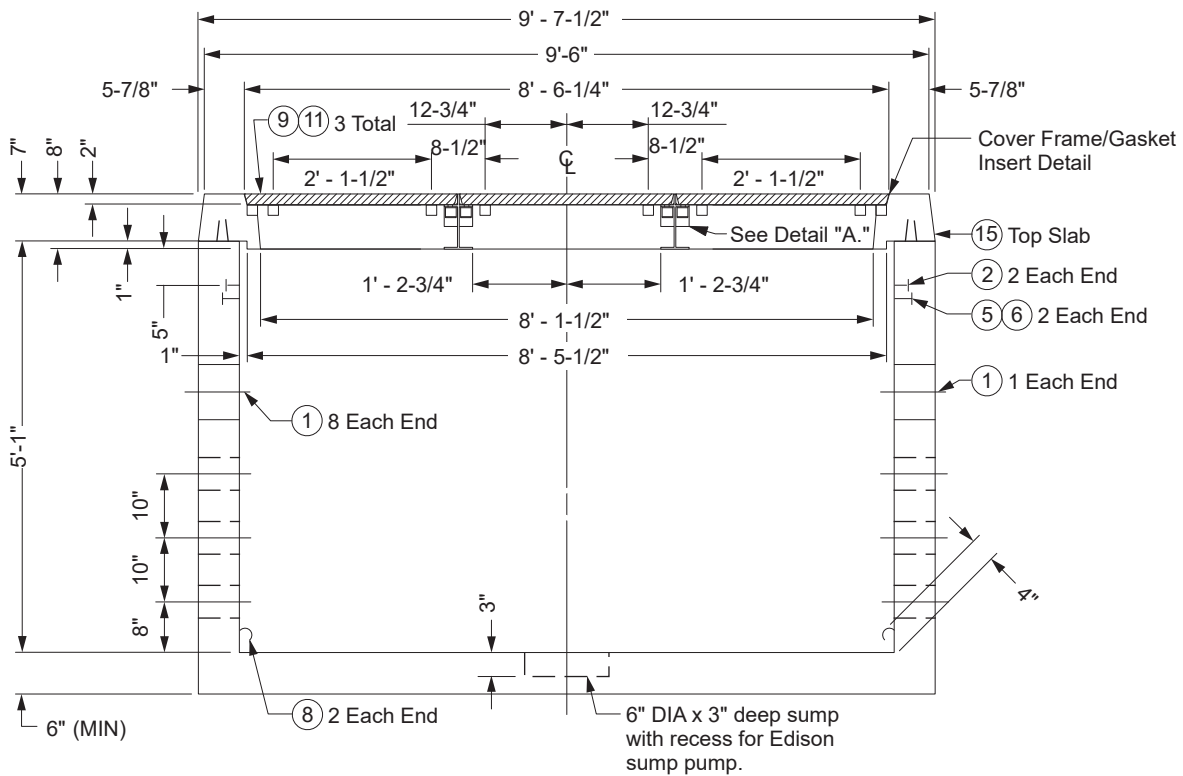
Effective Date:
10-24-2014

What's Changed?

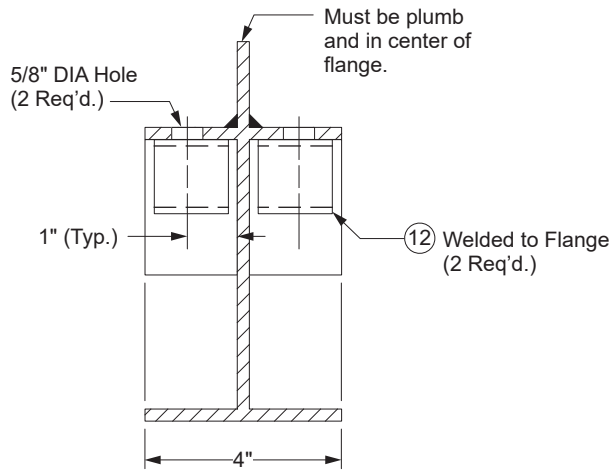
Sheet 3 of 7

UGS

Figure SS 568-3: Top Slab/Cover with Removable Beams — Section B-B and Detail "A"



Section B-B



Detail "A"

Note(s):

1. For list of materials and notes, see [Table SS 568-1 \(Sheet 7\)](#).

SS 568

Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'

Approved by:

B. C.

Sheet 4 of 7

What's Changed?

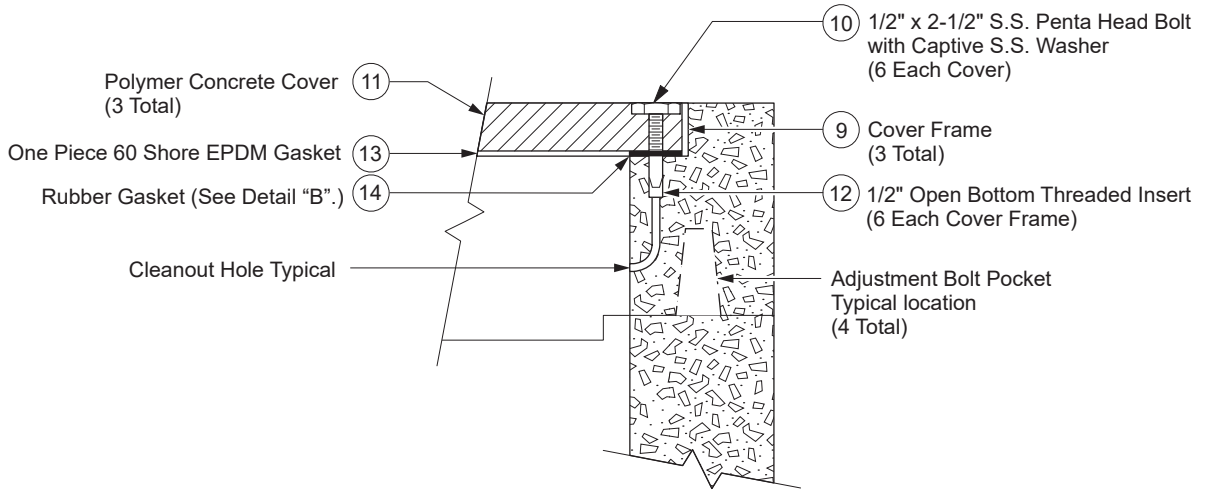
Effective Date:

UGS

10-24-2014

Scope SS 568.3 Cover Frame/Gasket Insert Detail

Figure SS 568-4: Cover Frame/Gasket Insert Detail



Cover Frame/Gasket Insert Detail

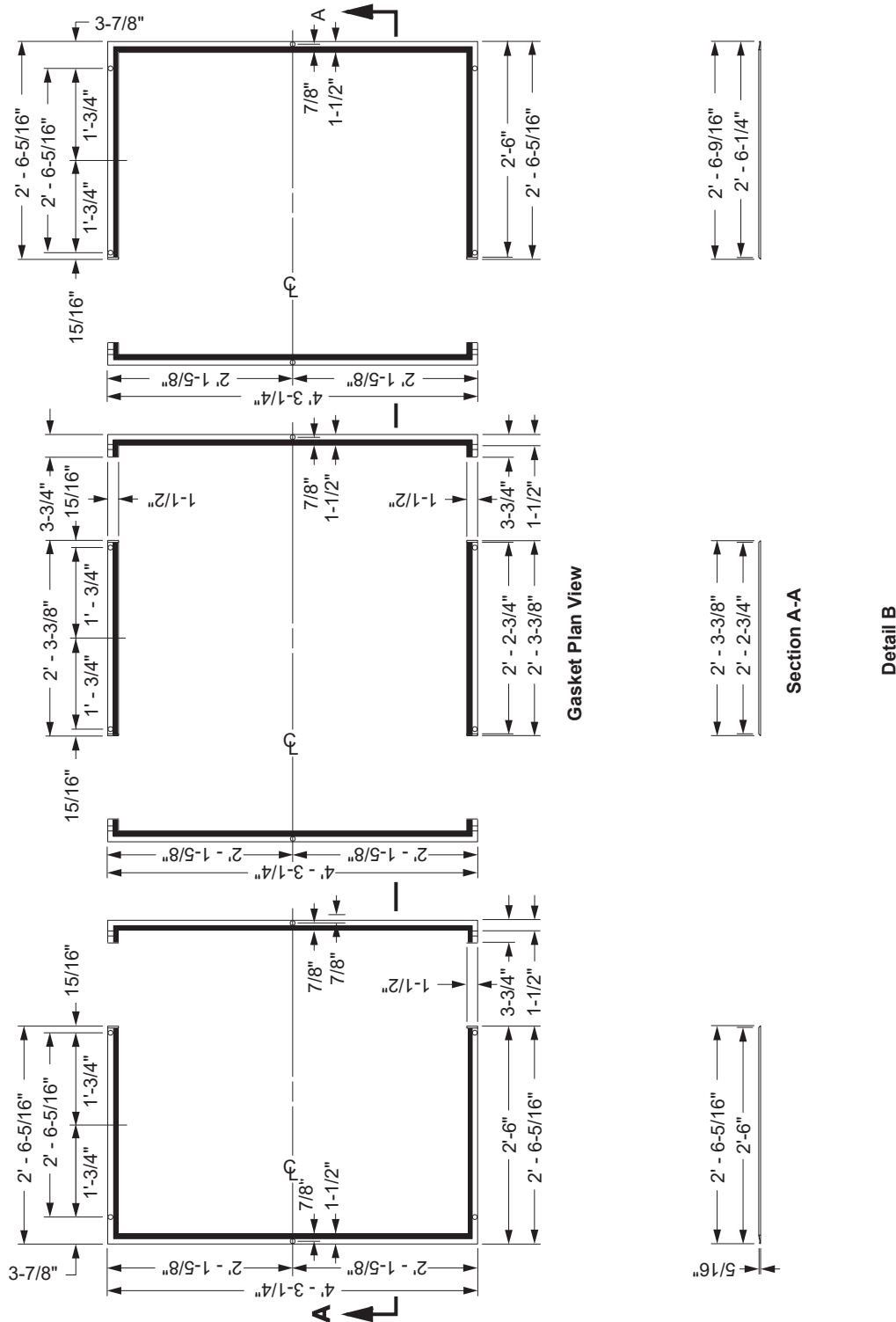
Note(s):

1. For list of materials and notes, see [Table SS 568-1 \(Sheet 7\)](#).

Approved by: <i>B.C.</i>	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'	SS 568
Effective Date: 10-24-2014	What's Changed?	Sheet 5 of 7
		UGS

Scope SS 568.4 Gasket Plan View for Precast Surface Operable Parkway Enclosure

Figure SS 568-5: Gasket Plan View for Precast Surface Operable Parkway Enclosure



SS 568

Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'

Approved by:

B.C.

Sheet 6 of 7

What's Changed?

Effective Date:

UGS

10-24-2014

Scope SS 568.5 List of Materials for Precast Surface Operable Parkway Enclosure

Table SS 568–1: List of Materials for Precast Surface Operable Parkway Enclosure

No.	Description	Qty.
1	10" Plastic Vent Terminator ^{a/}	2
2	1/2" Diameter Threaded Bronze Grounding Inserts ^{b/}	4
5	1/2" Diameter Richmond "Kohler" Threaded Insert or Equal	4
6	1/2" Diameter J-Bolts — AC 731	4
7	5" Diameter Plastic Conduit Terminators ^{c/}	16
8	Pull Irons 7/8" Diameter Vertical ^{d/}	4
9	Hot-Dipped Galvanized 30" x 48" Steel Pull Box Frame	3
10	1/2" x 2-1/2" Lg. S.S. Penta Hd. Bolt with Captive Free Spinning Round Flat S.S. Washer ^{e/}	18
11	30" x 48" Polymer Concrete Pull Box Cover ^{f/}	3
12	1/2" Diameter Open Bottom Threaded Insert — Star #P35T ^{g/}	18
13	30" x 48" One-Piece EPDM Gasket — R&D Co. #MBE-03-MOD ^{h/}	3
14	8-Piece Rubber Gasket, SAP 10117297	1
15	Concrete Slab, SAP 10117301	1

^{a/} 10-inch plastic vent terminators will be an Edison-approved design.

^{b/} 1/2-inch threaded bronze grounding inserts will be an Edison-approved design. A #2 solid copper wire will be permanently brazed to the insert and structure rebar.

^{c/} Plastic conduit terminators will be an Edison-approved one-piece design.

^{d/} 7/8-inch pull irons will be designed for a working tension of 20,000 pounds, plus a safety factor of 2.

^{e/} The pull box cover will be attached to cover frame/inserts with 1/2" x 2-1/2" long S.S. Penta head bolts with captive free spinning round flat S.S. washers.

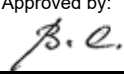
^{f/} The pull box will be constructed as shown in FC 618. In addition, bottom of cover will be flat and smooth with no surface pockets for a minimum of 2" back from the outer perimeter of cover.

^{g/} 1/2-inch open-bottom metal threaded inserts will be Star, part no. P35T or equal. A clean out hole will be provided under each insert.

^{h/} Each cover frame will be furnished with a 8-piece gasket, permanently glued in place prior to shipment. The gasket will be glued in place using 3M, Scotch-Grip brand #847 rubber and gasket adhesive. The gasket material will be Ethylene Propylene Dione Monomer (EPDM) material, 50 Shore from Research and Development Co., Part No. MBE-03-MOD. The gasket and frame will be cleaned prior to application of the glue. Glue will be applied to the gasket and frame surface.

Note(s):

- Design and construction of the surface operable enclosure will conform to GI 030 wherever applicable (specification for precast reinforced concrete vaults and manholes).
- Abbreviation "GRD" will be stenciled in red letters, 1-1/2-inch minimum height, adjacent to each grounding insert.
- Walls will be painted white.
- No lifting inserts or like devices will be installed in floor of base section or top outside slab surface of the enclosure.

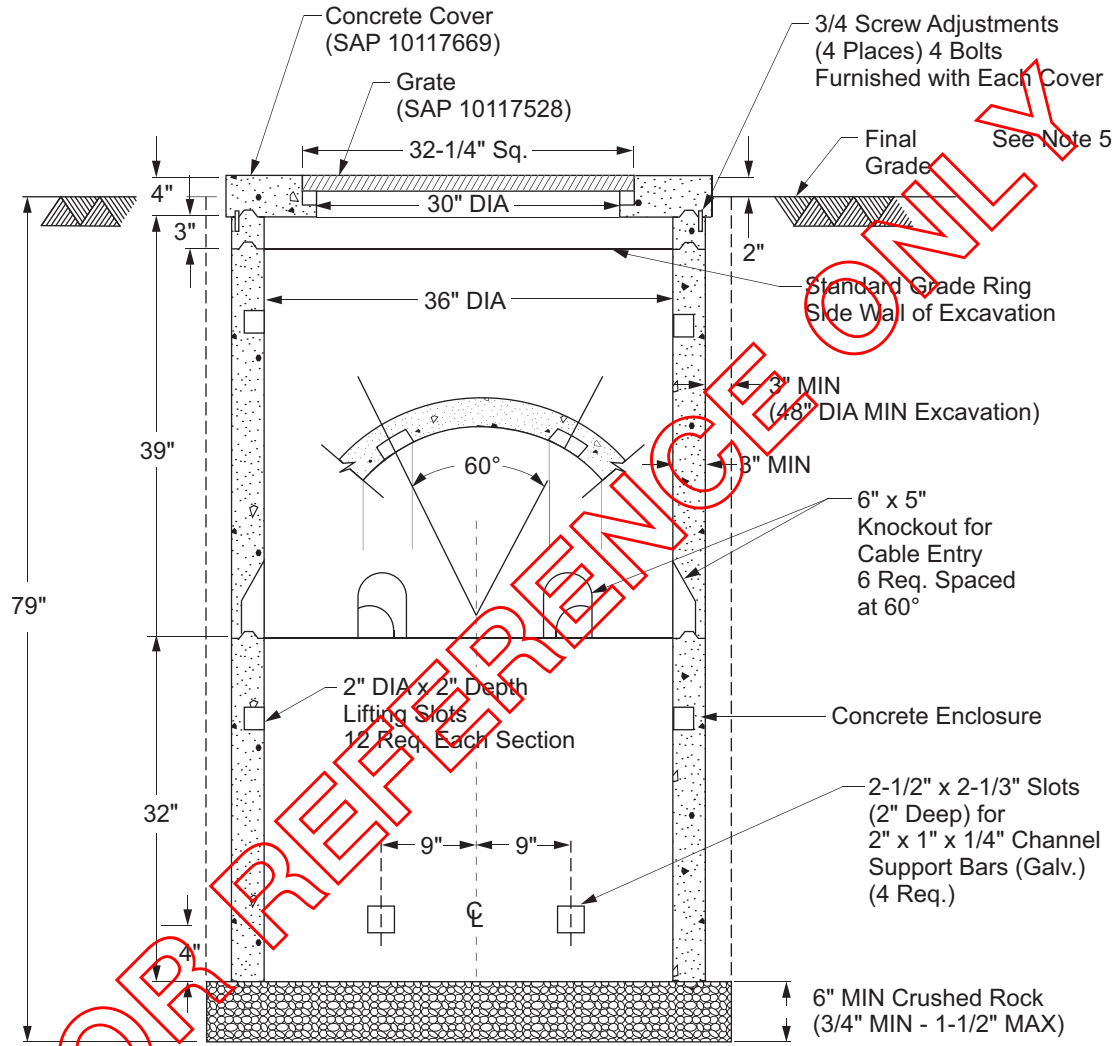
Approved by: 	Precast Surface Operable Parkway Enclosure — 5' x 8'-1/2" x 5'	SS 568
Effective Date: 10-24-2014	What's Changed? SAP Numbers added to Table SS 568–1.	Sheet 7 of 7
		UGS

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SS 575 Transformer Enclosure — 3' x 6' Concrete — BURD

Scope SS 575.1 Concrete Enclosure for 4-Wire BURD Transformers for Use in Rocky Areas Only (3' x 6')

Figure SS 575-1: Concrete Enclosure for 4-Wire BURD Transformers for Use in Rocky Areas Only



View through Centerline

Note(s):

1. Concrete enclosure for 4-wire BURD transformers for use in rocky areas only. (36" x 72") (SAP 10117685)
2. Each concrete component shall be furnished with adequate inserts or slots for handling during installation.
3. The complete enclosure is no longer available; replacement top caps, grates, and tamper vents are available.
4. This enclosure is not to be used in traffic areas.
5. Top of enclosure shall be placed flush with grade when adjacent to a sidewalk or curb. It shall be placed 2 inches above grade when in a planted or open area.
6. Tamper vent (SAP 10117529)

Approved by:

B.C.

Transformer Enclosure — 3' x 6' Concrete — BURD

SS 575

Sheet 1 of 3

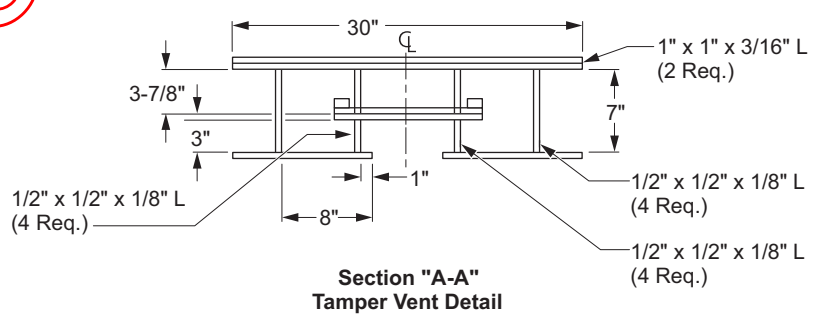
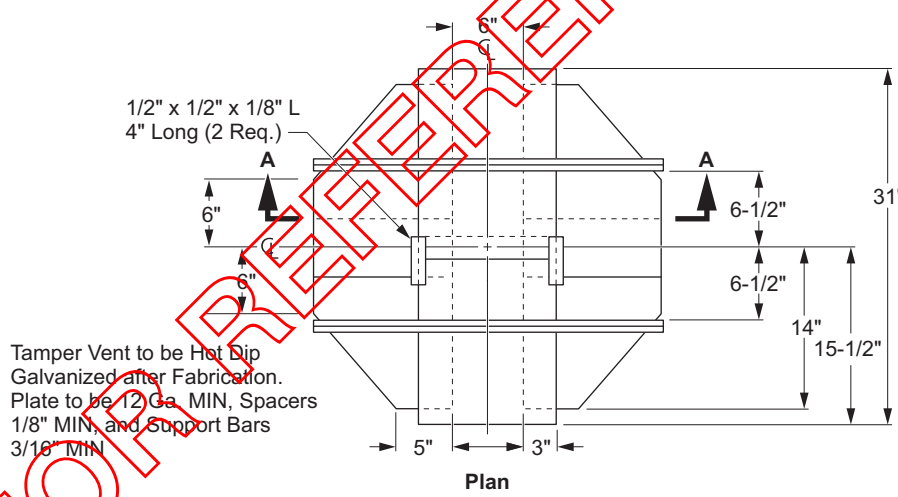
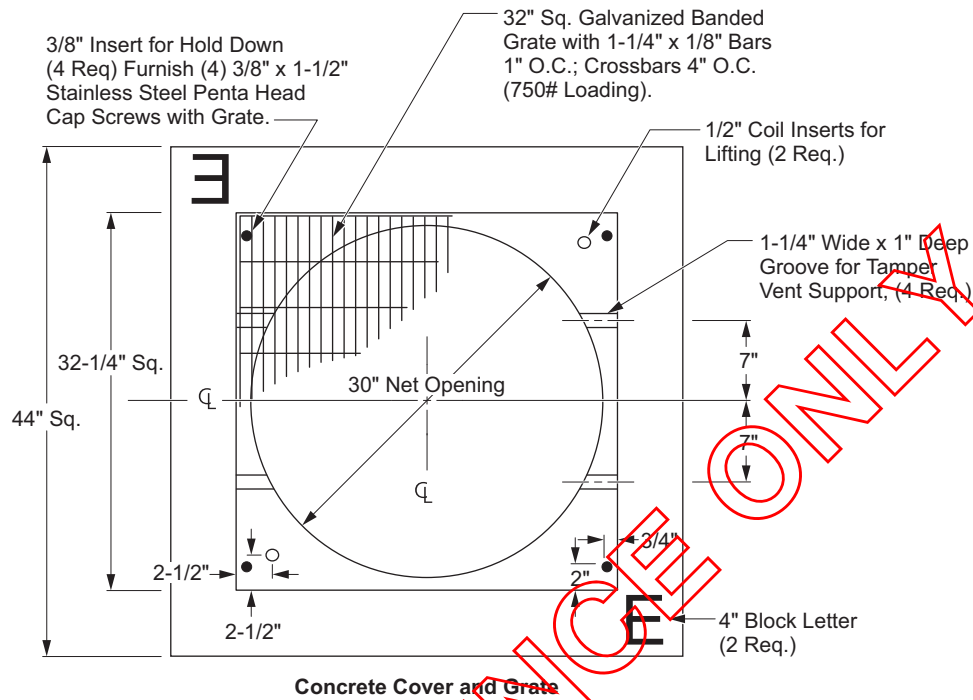
Effective Date:

07-29-2016

What's Changed?

UGS

Figure SS 575-2: Enclosure for BURD Transformer



SS 575

Transformer Enclosure — 3' x 6' Concrete — BURD

Approved by:

B. C.

Sheet 2 of 3

What's Changed?

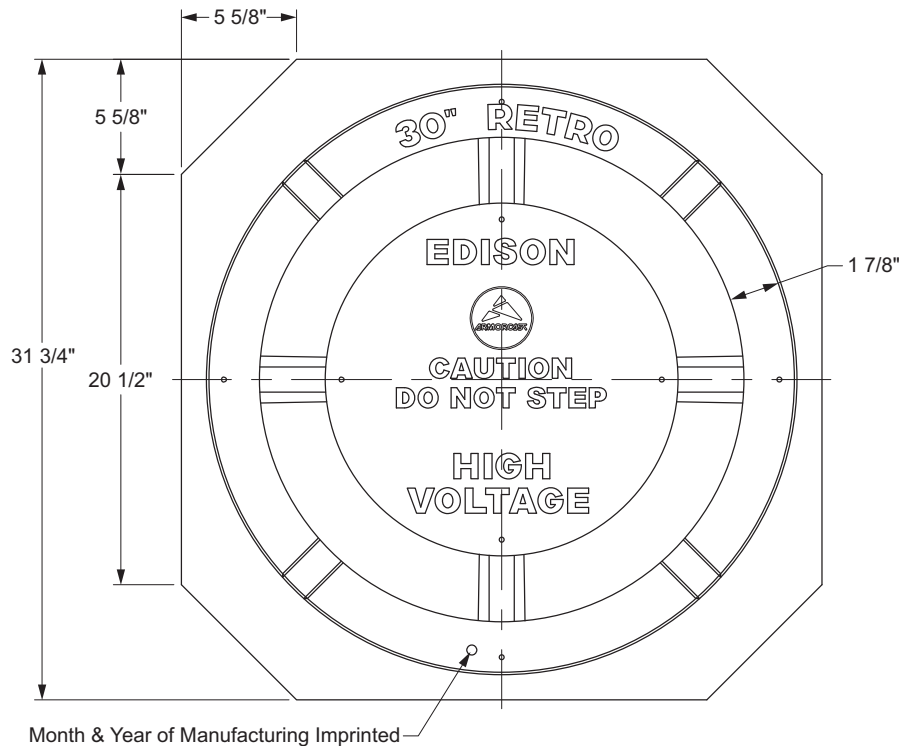
Effective Date:

UGS

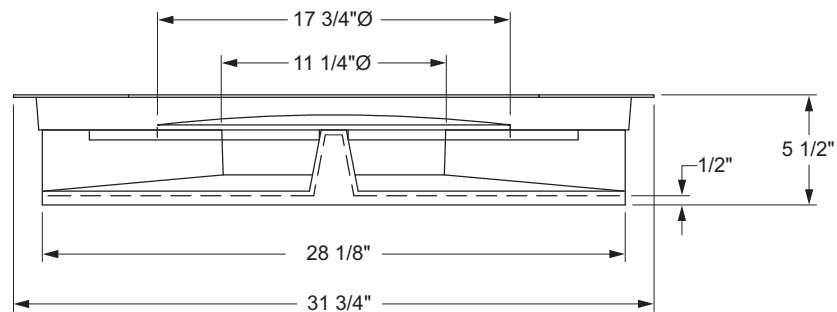
07-29-2016

Scope SS 575.2 Replacement Part for Steel Tamper Vent: Underground Retrofit Shield (URS)

Figure SS 575-3: Underground Retrofit Shield (URS)



Plan View
SAP 10178034



Section View
SAP 10178034

Note(s):

1. This is a replacement for the steel tamper vent (SAP 10117533).
2. The steel tamper vent (SAP 10117533) can be replaced with the underground retrofit shield (SAP 10178034) in conjunction with other work being performed in the transformer enclosure.
3. Transfer structure ID # to new vent.
4. The installation of this vent with embossed "HIGH VOLTAGE" does not require installing a high voltage sign, SAP 10135332.
5. The underground retrofit shield shall be Polyethylene (PE), Acrylonitrile Butadiene Styrene (ABS), or Fiberglass Reinforced Polyester (FRP).

Approved by:

B. C.

Transformer Enclosure — 3' x 6' Concrete — BURD

SS 575

Sheet 3 of 3

Effective Date:

07-29-2016

What's Changed? Figure SS 575-3 was updated to include Notes 3 and 4.

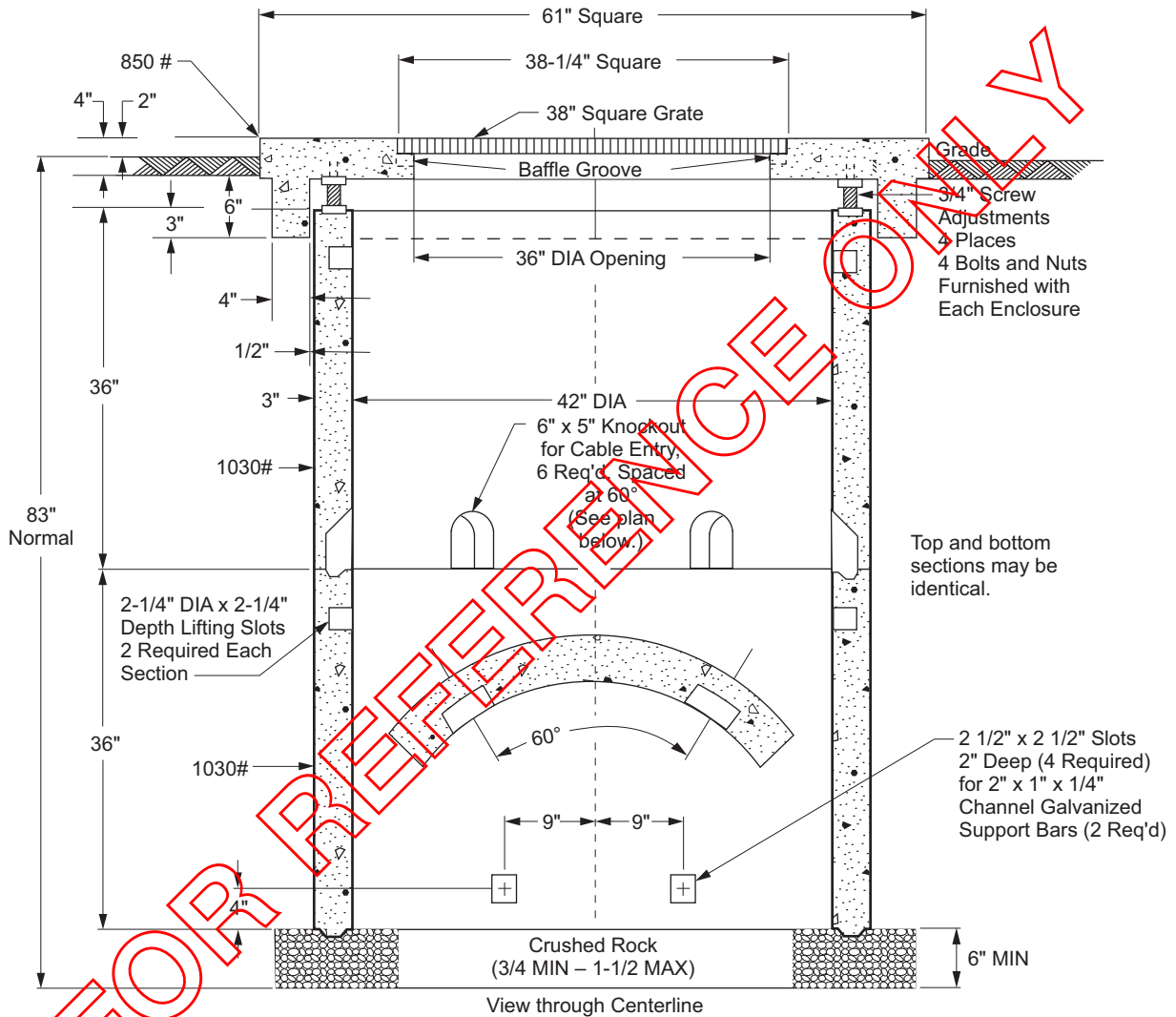
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SS 577 Transformer Enclosure — 3'-6" x 6' Concrete — BURD

Scope SS 577.1 Concrete Enclosure for 3-Wire BURD Transformers for Use in Rocky Areas Only (3'-6" x 6') (SAP 10117686)

Figure SS 577-1: Concrete Enclosure for 3-Wire BURD Transformers



Note(s):

1. Each concrete component shall be furnished with adequate inserts or slots for handling during installation.
2. Enclosure shall be furnished complete with grate, tamper vent, bolts, and support bars.
3. This enclosure is not to be used in traffic areas.
4. Set screw adjustments at 3 inches when installing. Top will then have a 3-inch up or down adjustment available at a future time.
5. Grade rings available: 3-inch ring (SAP 10118070)
6-inch ring (SAP 10118071)
6. Top of enclosure shall be placed flush with grade when adjacent to a sidewalk or curb. It shall be placed 2 inches above grade when in a planted or open area.

Approved by:

B.C.

Transformer Enclosure — 3'-6" x 6' Concrete — BURD

SS 577

Sheet 1 of 3

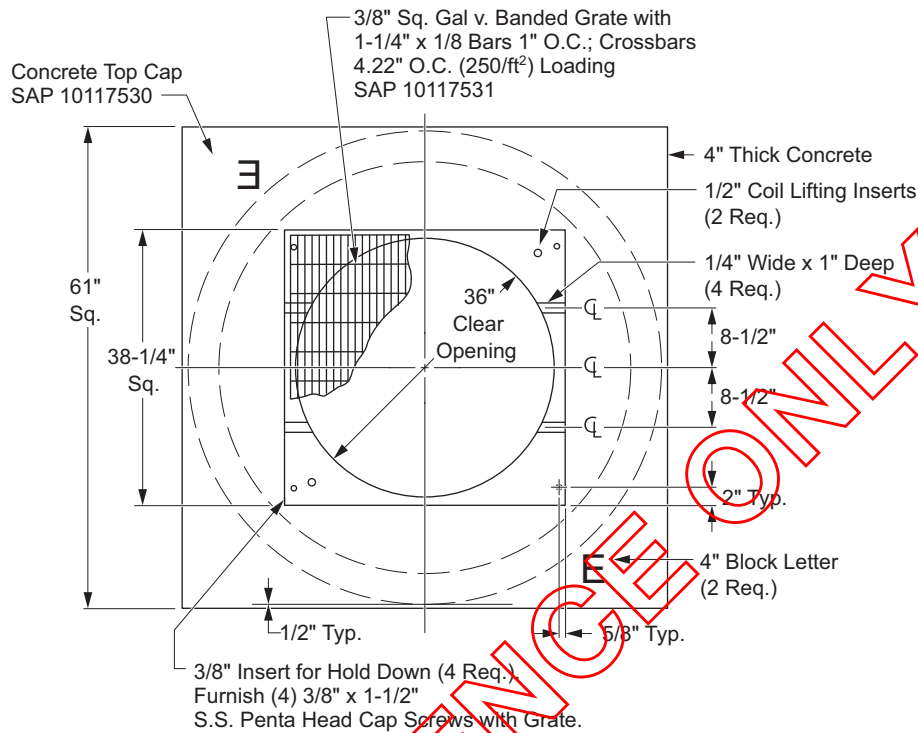
Effective Date:

01-31-2014

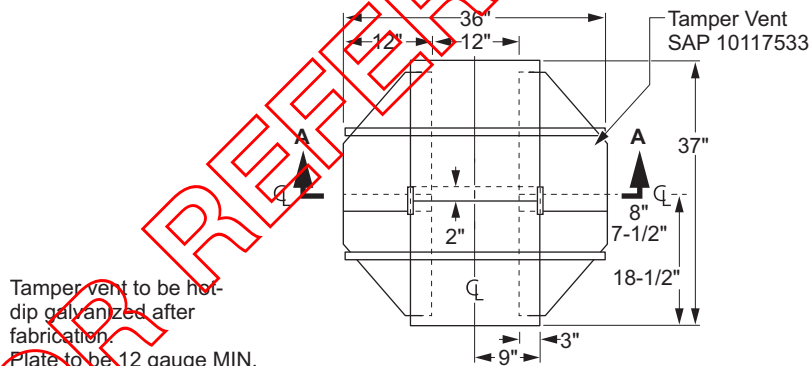
What's Changed?

UGS

Figure SS 577-2: Concrete Cover for 3-Wire BURD Transformers

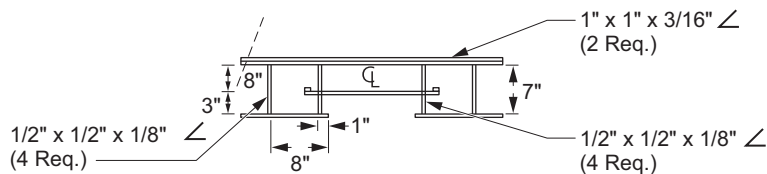


Concrete Cover and Grate



Tamper vent to be hot-dip galvanized after fabrication.
Plate to be 12 gauge MIN.
Spacers 1/8" MIN and Support Bars 3/16" MIN

Tamper Vent Plan



Section A-A

SS 577

Transformer Enclosure — 3'-6" x 6' Concrete — BURD

Approved by:

B. C.

Sheet 2 of 3

What's Changed?

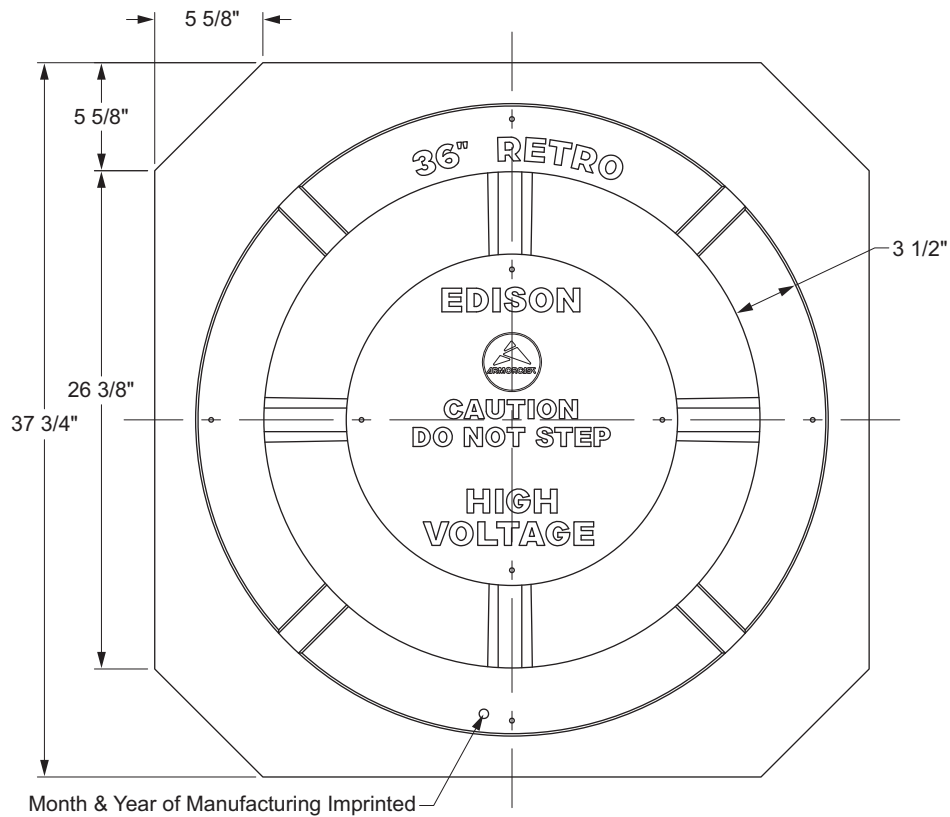
Effective Date:

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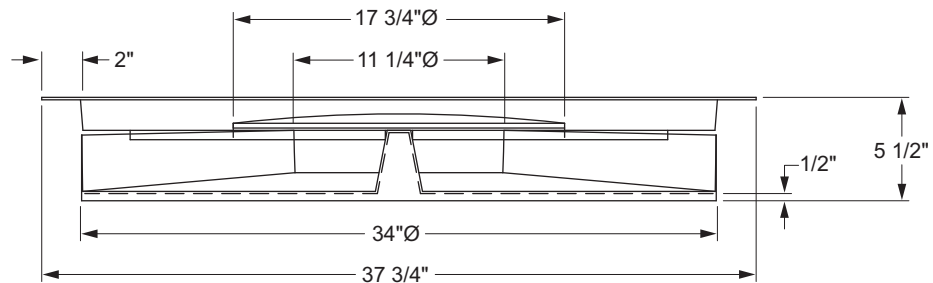
01-31-2014

Scope SS 577.2 Replacement Part for Steel Tamper Vent: Polyethylene Underground Retrofit Shield (PURS)

Figure SS 577-3: Polyethylene Underground Retrofit Shield (PURS)



PURS Plan View
SAP 10178036



PURS Section View
SAP 10178036

Note(s):

1. This is a replacement for the steel tamper vent (SAP 10117533).
2. The steel tamper vent (SAP 10117533) can be replaced with the polyethylene underground retrofit shield (SAP 10178036) in conjunction with other work being performed in the transformer enclosure.
3. Transfer structure ID # to new vent.
4. The installation of this vent with embossed "HIGH VOLTAGE" does not require installing a high voltage sign, SAP 10135332.

Approved by:

B. C.

Transformer Enclosure — 3'-6" x 6' Concrete — BURD

SS 577

Sheet 3 of 3

Effective Date:
01-31-2014

What's Changed? Figure SS 577-3 was updated to include Notes 3 and 4.

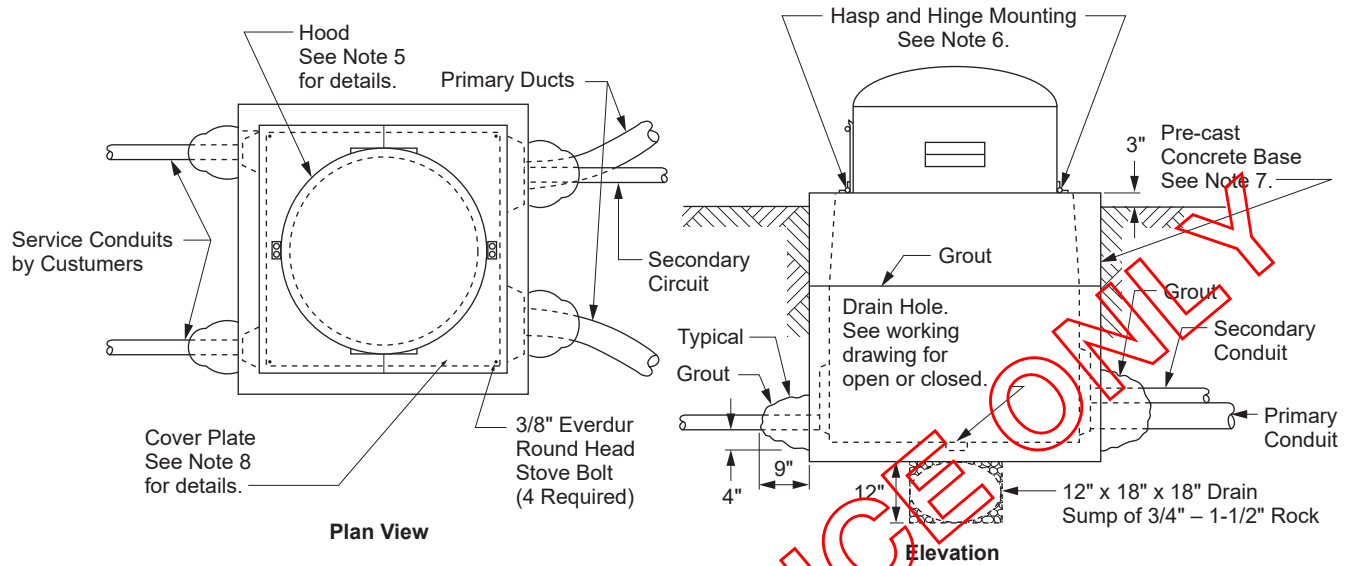
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SS 580 Transformer Housing — Semi-Buried — 4' x 4' x 4'

Scope SS 580.1 Transformer Housing — Semi-Buried — 4' x 4' x 4'

Figure SS 580-1: Typical Installation Details — Transformer Housing — Semi-Buried — 4' x 4' x 4'



FOR REFERENCE ONLY


Approved by: 	Transformer Housing — Semi-Buried — 4' x 4' x 4'	SS 580
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 6 <div style="font-size: 36px; font-weight: bold; margin-top: 5px;">UGS</div>

Figure SS 580-2: Pre-Cast Concrete Base

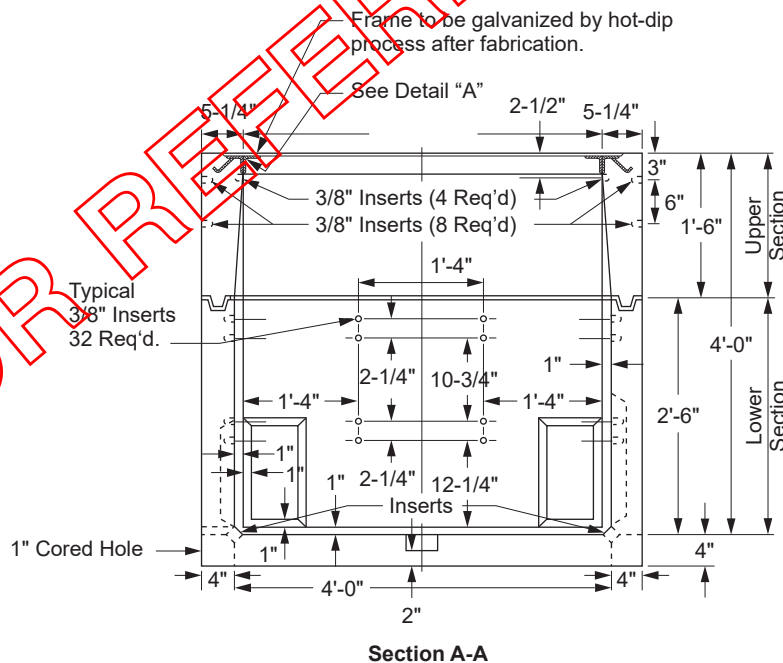
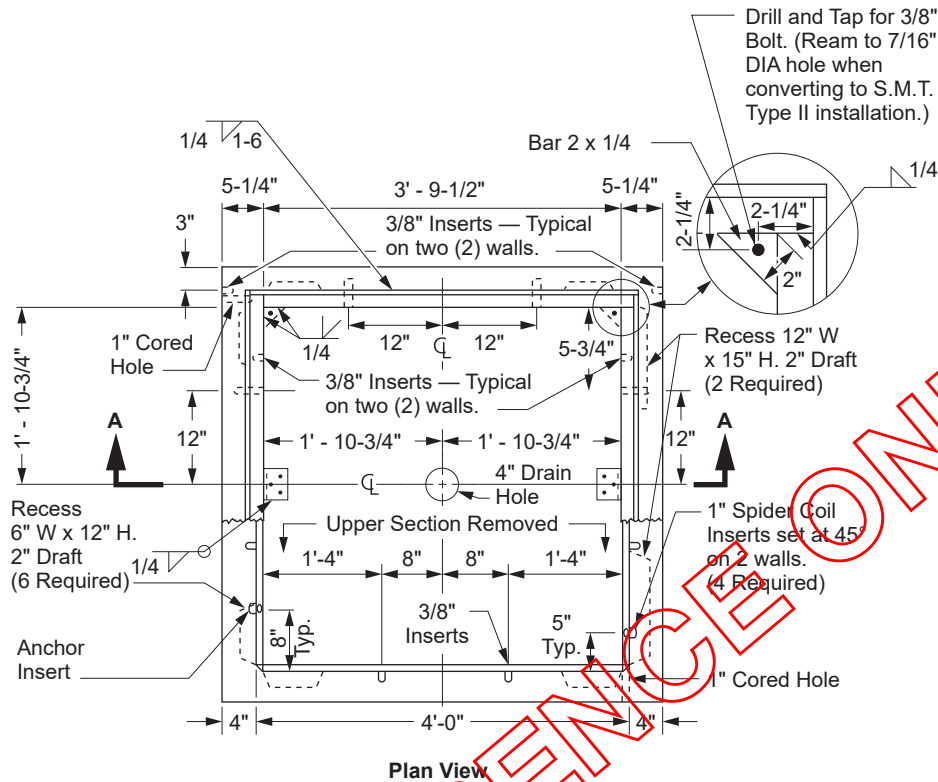


Figure SS 580-2.1

SS 580

Transformer Housing — Semi-Buried — 4' x 4' x 4'

Approved by:

PHH

Sheet 2 of 6

What's Changed?

Effective Date:

UGS

01-26-2007

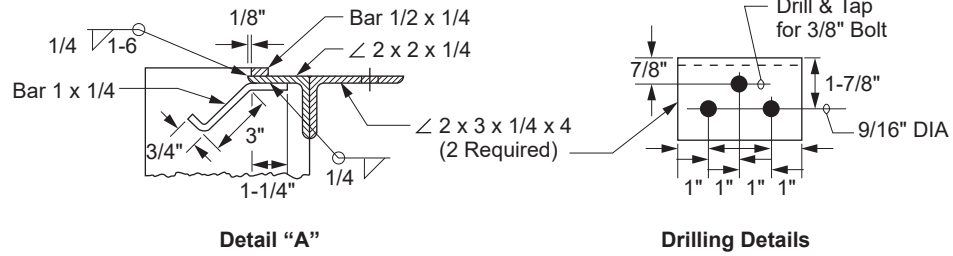



Figure SS 580-2.2

Note(s):

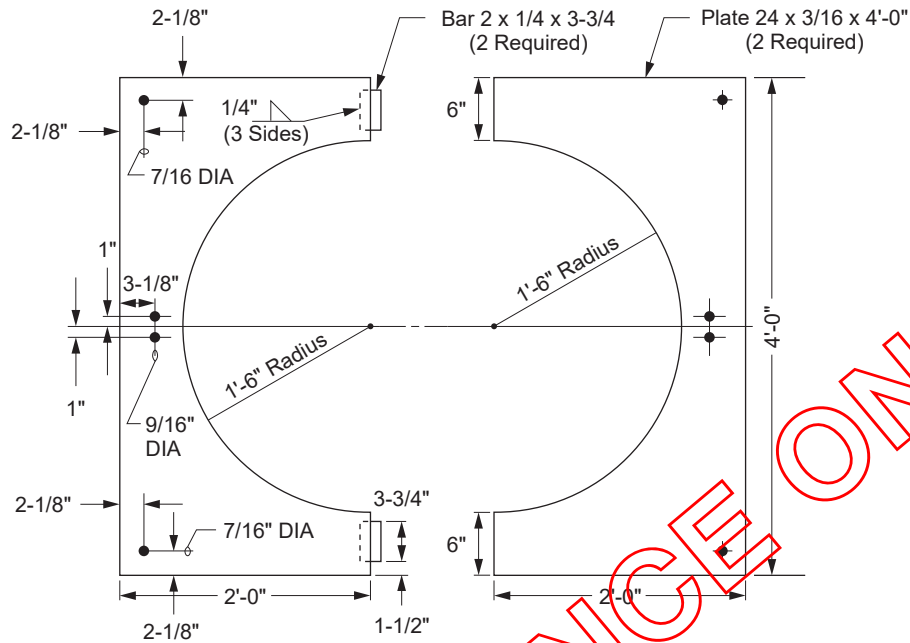
1. Minimum 28th day concrete strength requirements = 3,000 psi.
2. See working drawings and/or specifications for conduit details.
3. Grout entire joint between upper and lower sections.
4. Terminate ducts in the following manner:
 - a. Non-ferrous conduits with end bells.
 - b. Galvanized electrical conduits with galvanized conduit bushings.
5. See [Figure SS 580-3 \(Sheet 4\)](#) for details.
6. See [Figure SS 580-5 \(Sheet 5\)](#).
7. See [Figure SS 580-2 \(Sheet 2\)](#) for details.
8. See [Figure SS 580-4 \(Sheet 4\)](#) for details.

FOR REFERENCE ONLY

Approved by: 	Transformer Housing — Semi-Buried — 4' x 4' x 4'	SS 580
Effective Date: 01-26-2007	What's Changed?	Sheet 3 of 6 UGS

Scope SS 580.2 Hood Details

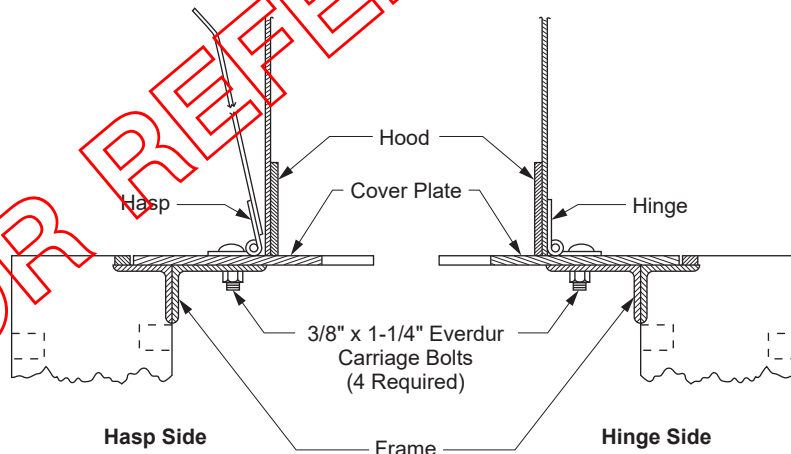
Figure SS 580-3: 4' x 4' x 4' Hood Details



Note(s):

1. The location and size of all holes are to be identical on both pieces.
2. All material to be galvanized by hot drip process after fabrication.

Figure SS 580-4: Hood Mounting Details



Note(s):

1. See Figure SS 580-1 (Sheet 1) for typical installation details.

SS 580

Transformer Housing — Semi-Buried — 4' x 4' x 4'

Approved by:

PHH

Sheet 4 of 6

What's Changed?

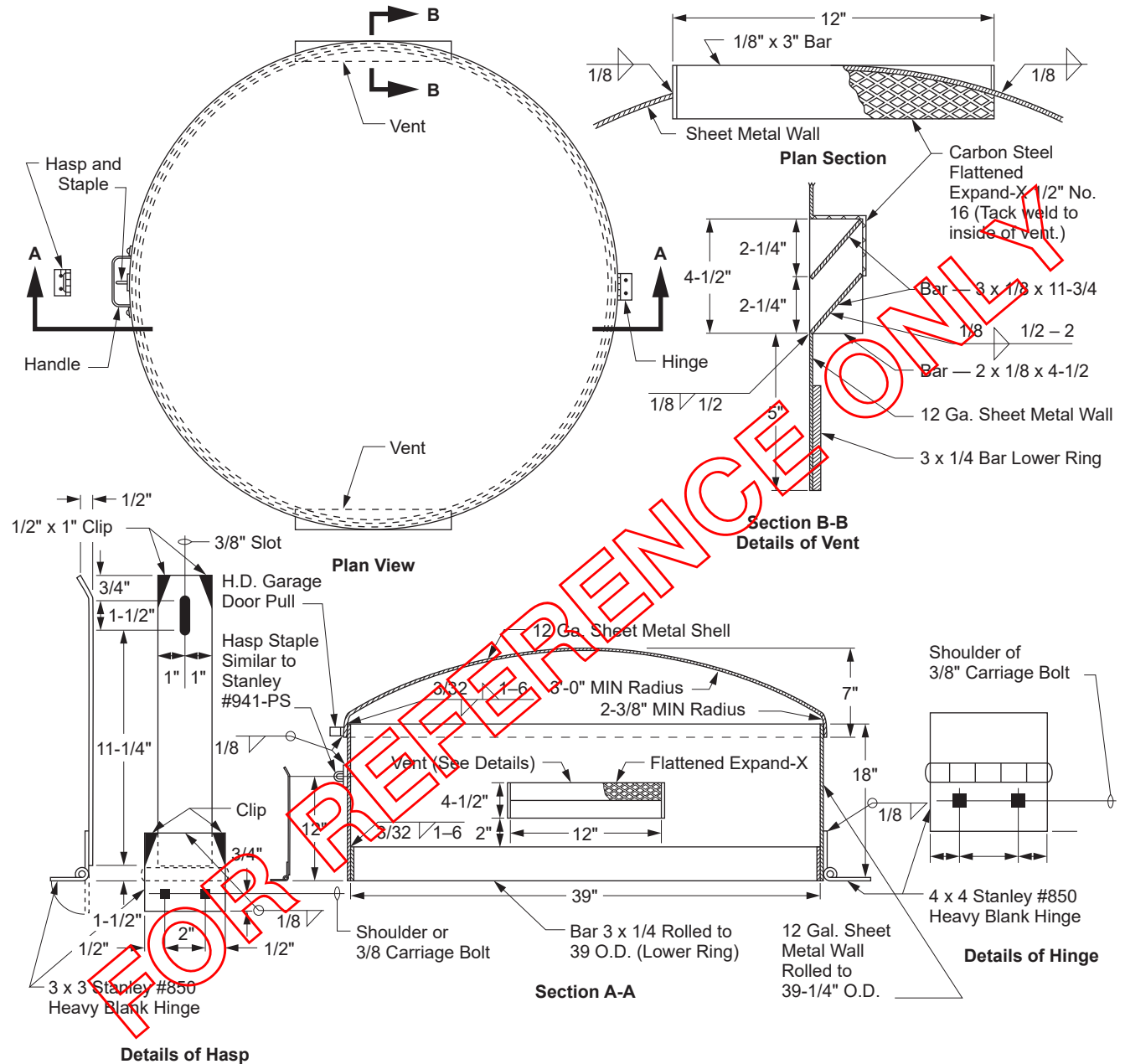
Effective Date:

UGS

01-26-2007

Scope SS 580.3 Cover Details

Figure SS 580-5: 4' x 4' x 4' Cover Details



Note(s):

1. See Figure SS 580-1 (Sheet 1) for typical installation details.
2. Hood Finishing Procedure:
Finish is to be applied to all inside and outside surfaces.
Refer to manufacturer's (Subox, Inc) recommendations for application and drying methods.
 - a. Initial Preparation:
Galvanized metal surfaces: Wash with a 5% phosphoric acid solution. Rinse with water and allow to dry.
Black metal or rusted surfaces: remove all rust flakes, mill scale, and so on with wire brush. Rinse water and allow to dry.

Approved by:

PHH

Transformer Housing — Semi-Buried — 4' x 4' x 4'

SS 580

Effective Date:

01-26-2007


What's Changed?

Sheet 5 of 6

UGS

- b. Paint Application
 - Step 1 — Apply one coat of Subox #11 red primer.
 - Step 2 — Apply one coat of Subalox #521 (dust)
 - Step 3 — Apply one coat of Subalox #521 (dust)

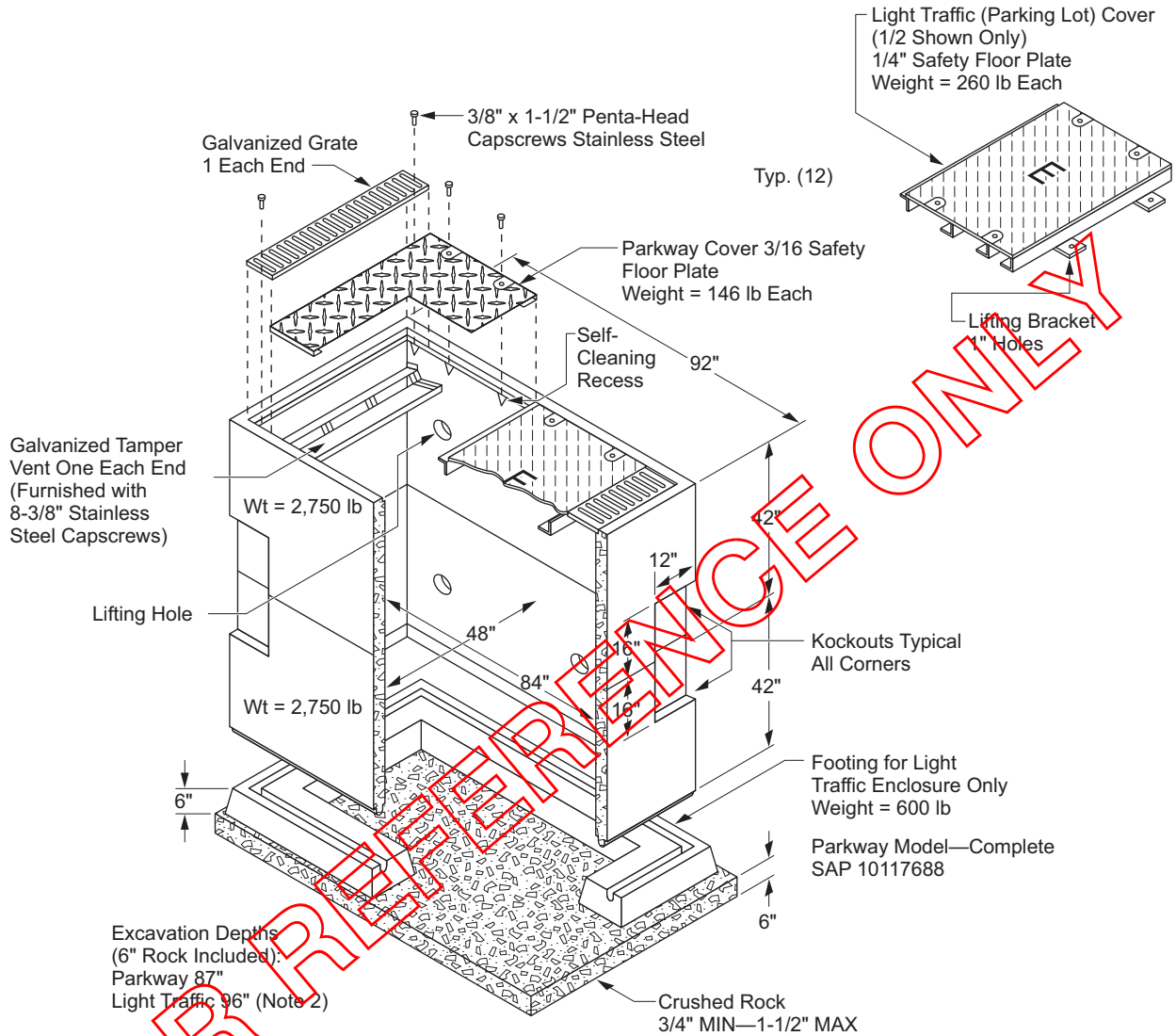
FOR REFERENCE ONLY

SS 580	Transformer Housing — Semi-Buried — 4' x 4' x 4'	Approved by: 
Sheet 6 of 6	What's Changed?	Effective Date: 01-26-2007
UGS		

SS 585 3Ø Subsurface Transformer Enclosure

Scope SS 585.1 3Ø Subsurface Transformer Enclosure

Figure SS 585-1: 3Ø Subsurface Transformer Enclosure



Note(s):

1. Each enclosure is furnished completely with covers, grates, tamper vents, and all capscrews. The light traffic enclosure only is furnished with the shown footing.
2. Each enclosure to be set on 6 inches minimum crushed rock. Set the light traffic enclosure flush with grade and the parkway enclosure 3 inches above grade.
3. There are four lifting holes in each section. Two BURD enclosure lifting bars are used to set each section.
4. All covers, grates, and vents must be securely fastened in place using all capscrews. Use Penta-head type for exposed locations.
5. To remove the light traffic covers, first remove both grates; this will reveal two lifting brackets on each cover. Lift and slide each cover off the end of the enclosure.
6. It is not necessary to remove the grates to remove the parkway covers. They may be slid over the grates using the bolt downs as lifting holes.

Approved by:

PHH

3Ø Subsurface Transformer Enclosure

SS 585

Effective Date:
04-27-2007

What's Changed? This is a new standard: 3Ø Subsurface Transformer Enclosure. The standard absorbed DUG US 185. It is FRO.

Sheet 1 of 1

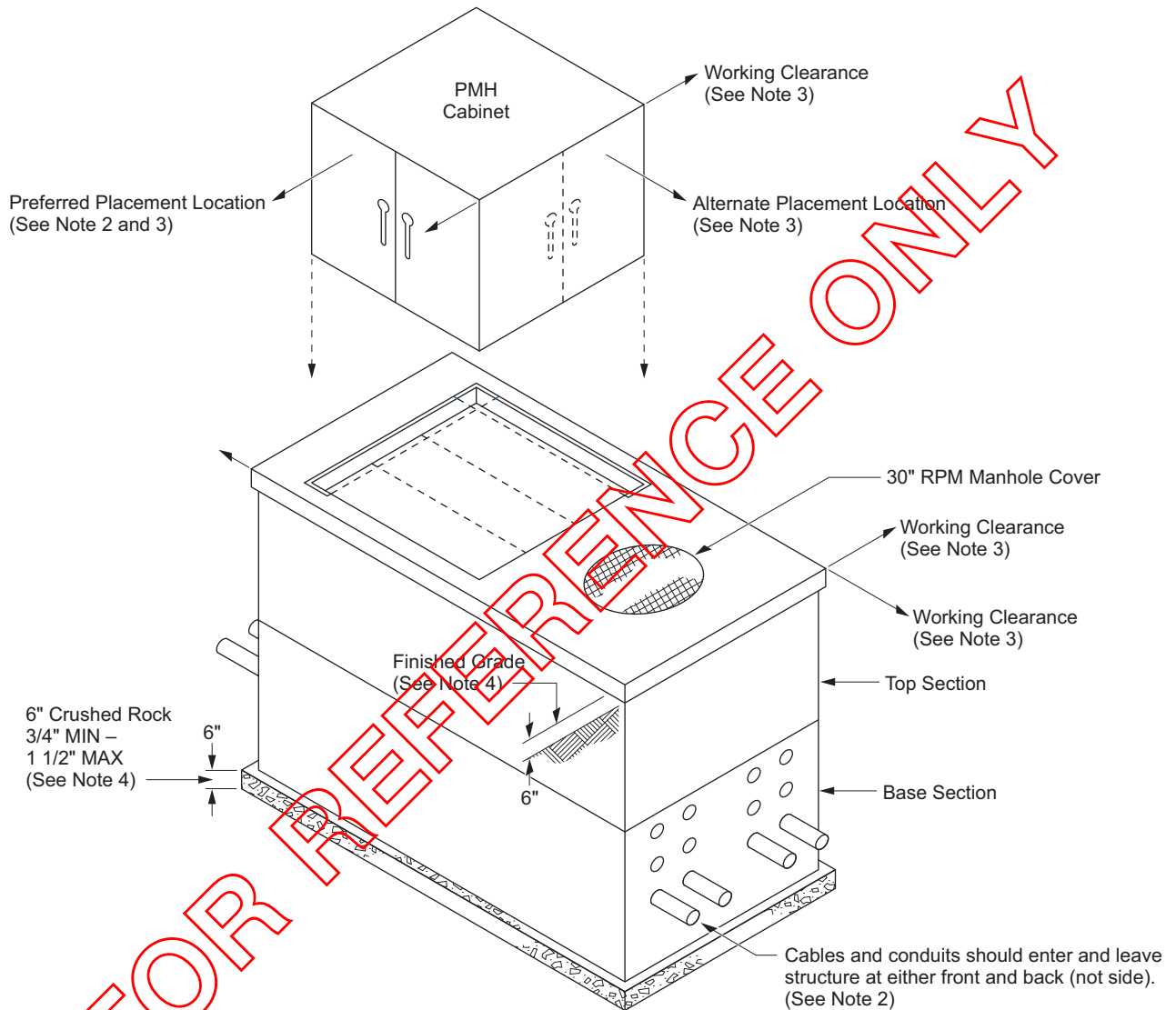
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SS 586 PMH Concrete Enclosure


Scope SS 586.1 PMH Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'

Figure SS 586-1: PMH Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'



Note(s):

1. Enclosure is delivered with a steel adapter plate to be used only with S&C cabinet. Plate can be placed in one of two recess locations to allow alternate placement of cabinet. Secure plate with two flathead screws provided. See [Figure SS 586-1 \(Sheet 1\)](#).
2. To allow for shaping and termination of cables, it is recommended that cables and conduits be installed into structure and cabinet be placed in the preferred location (as shown on drawing) whenever possible.
3. An 8 foot minimum working clearance is required directly in front and back of pad-mounted cabinet doors, and 3 feet from side or ends of enclosure top surface at nondoor side of cabinet.
4. Enclosure to be placed on a minimum of 6 inches crushed rock. Top surface of enclosure shall be 6 inches above finish grade.
5. Four sets of 1/2 inch threaded plastic inserts are cast-in to both sides of base section for attachment of 30 inch cable racks.
6. See [Scope SS 586.2 \(Sheet 2\)](#) for installation procedures of barrier plates.

Approved by: 	PMH Concrete Enclosure	SS 586
Effective Date: 01-30-2009	What's Changed? Changed the callout for PME cabinet to PMH cabinet in Figure SS 586.1 for clarity.	Sheet 1 of 3
		UGS

Scope SS 586.2 Moisture Barrier Plates

Figure SS 586-2: Moisture Barrier Plates

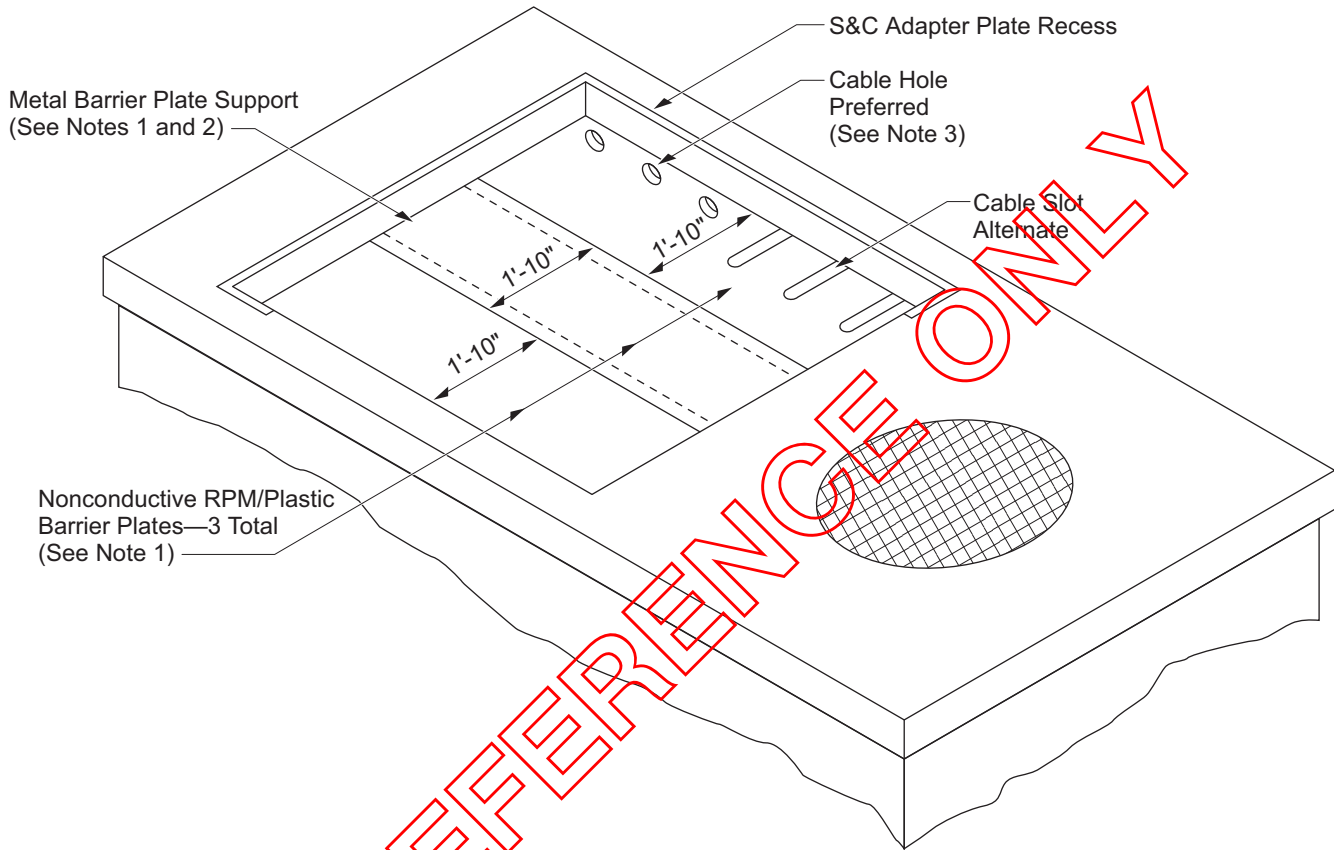


Figure SS 586-2.1

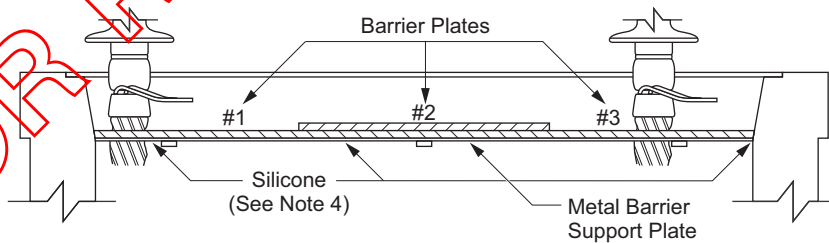


Figure SS 586-2.2

SS 586

Sheet 2 of 3

UGS

PMH Concrete Enclosure

What's Changed?

Approved by:

RK

Effective Date:

01-30-2009

Note(s):

1. PMH enclosure is supplied with three nonconductive RPM/plastic barrier plates, 22" (width) x 6" (length). Barriers are supported by two metal support plates bolted to bottom of ceiling, see [Figure SS 586-2 \(Sheet 2\)](#).
2. Position barrier plates No. 1 and 3 on top of two metal support plates with long sides tight against adjacent concrete. Center plate No. 2 on top of plates No. 1 and 3, see [Figure SS 586-2.2 \(Sheet 2\)](#).
3. To terminate cables to PMH, it is necessary to cut holes or slots in the barrier plates. Locate and mark center terminating locations of individual cables onto barriers. Holes should be utilized over slots whenever possible to provide better cable sealing capability. Barrier holes/slots can be cut by using a 1/2 inch drill with a hole saw (SAP 10145256 mandrel and SAP 10145946 carbide hole saw), or a skill saw with a concrete abrasive blade (6 inch — SAP 10063807 or 7 inch — SAP 10063808).
4. After placing cable through barriers and terminating to PMH, seal around all cables, outside perimeter of barrier plates, and all joints with silicone (SAP 10117811). Cutout slots can be reinstalled by placing silicone along cut edges of barrier slots and pressing cutout material back into place. Tape can be used to hold the cutout material in place until the silicone has set.
5. If replacement moisture barriers are required, a set of three is available under SAP 10117329.

FOR REFERENCE ONLY

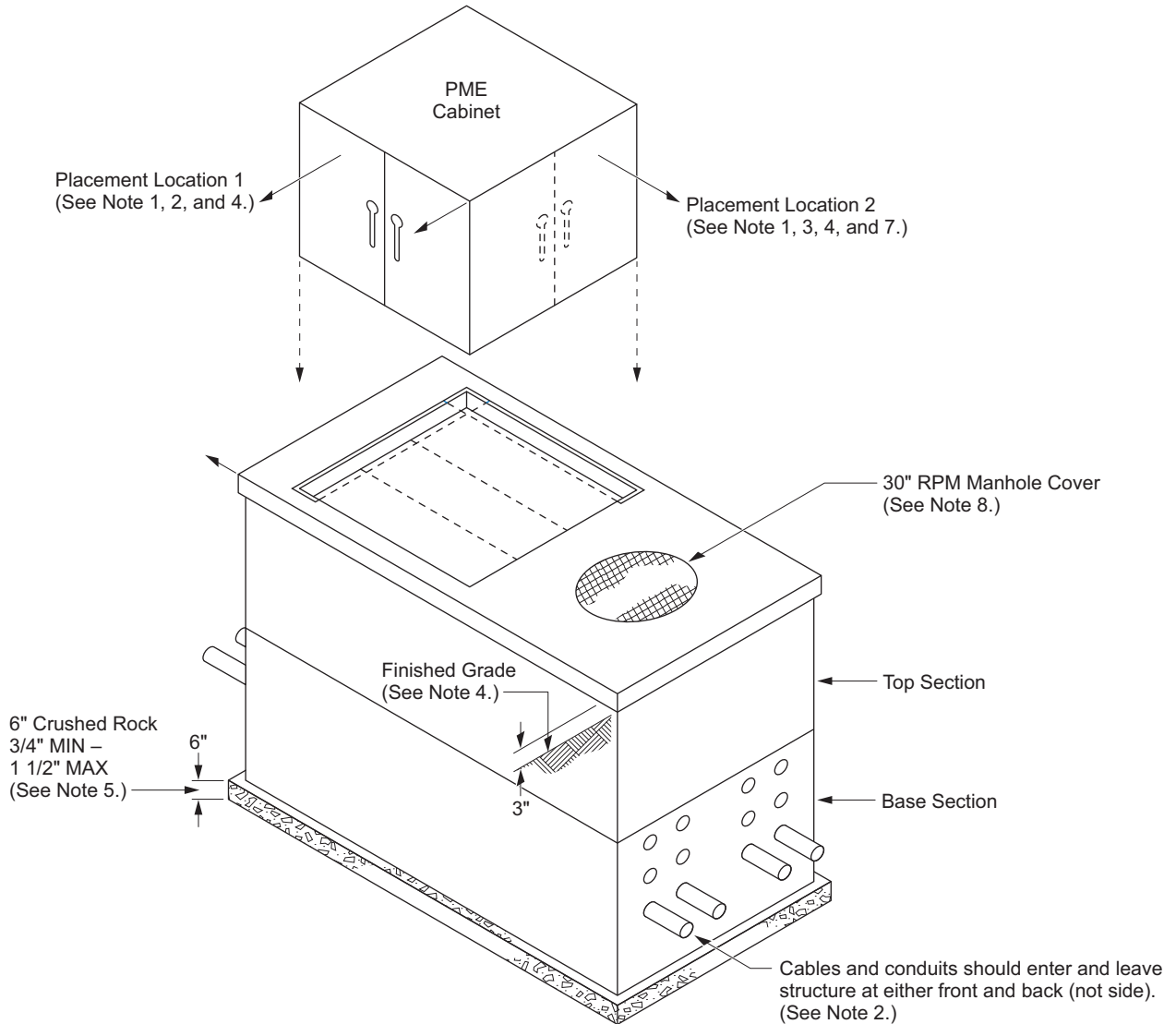
Approved by:	PMH Concrete Enclosure	SS 586
Effective Date:	What's Changed?	Sheet 3 of 3
01-30-2009		UGS

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SS 587 PME Concrete Enclosure

Scope SS 587.1 PME Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'

Figure SS 587-1: PME Tub-Style Concrete Enclosure — 5' x 10'-6" x 7'

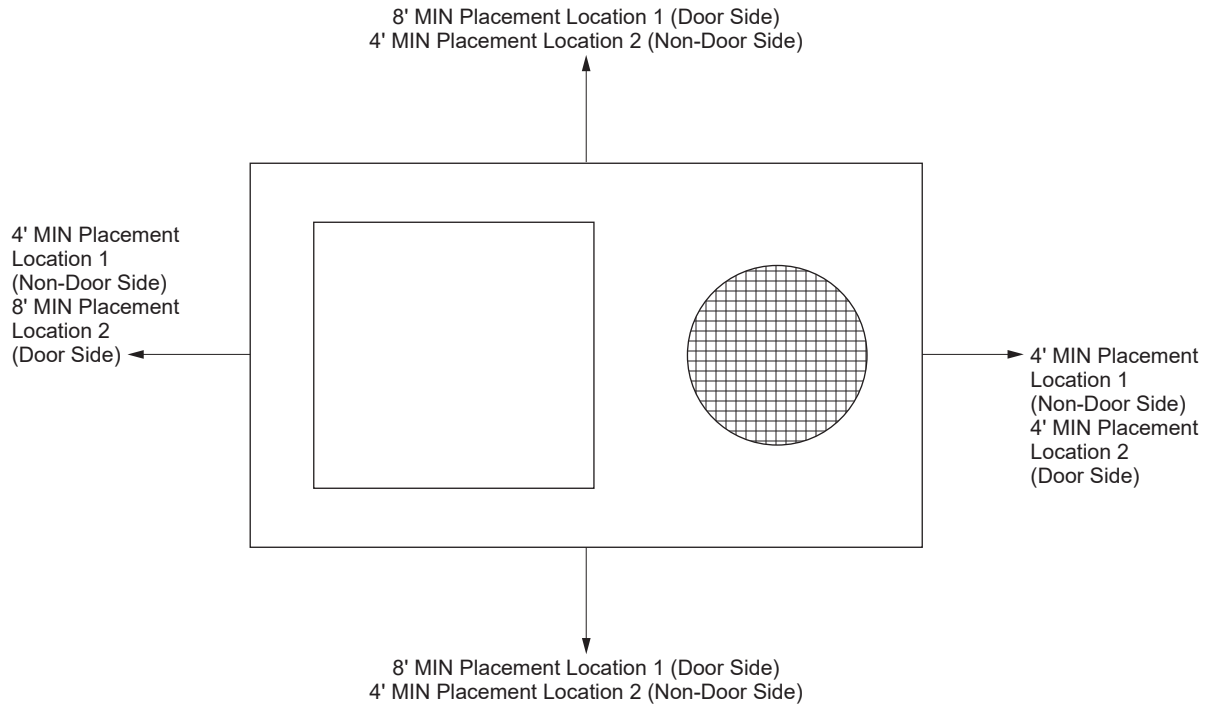


Note(s):

1. Placement of the PME enclosure is site-specific. The Design Organization will determine the placement of the switch door opening based on field conditions.
2. To allow for shaping and termination of cables, it is recommended the structure and cabinet be placed in location 1 (as shown on drawing) whenever possible.
3. When a PME switch is installed in placement location 2, cable steps or cable hooks shall be used to shape cable to maximize working space in the structure.
4. Refer to [Figure SS 587-2 \(Sheet 2\)](#) for working clearances.
5. Enclosure to be placed on a minimum of 6 inches crushed rock. Top surface of enclosure shall be 3 inches above finish grade.
6. Four sets of 1/2-inch threaded plastic inserts are cast-in to both sides of base section for attachment of 30-inch cable racks.
7. Placement location 2 shall not be used for PMH installations.
8. Composite manhole cover may be used for replacement. SAP 10205271

Approved by: <i>RR</i>	PME Concrete Enclosure	SS 587
Effective Date: 10-29-2021	What's Changed?	Sheet 1 of 2
		UGS

Figure SS 587–2: PME-6 Through 12 Concrete Encloser Working Clearance



Note(s):

1. The 4-foot clearance on the side of new PME installations will enable the placement of automated switching equipment (RCS). RCS retrofits on existing PME installations will keep the 3-foot side working clearance as long as the RCS cabinet door can be fully opened without being obstructed by any part of the retaining wall, building, or landscape.
2. Alternate position (Placement 2) is not approved for new construction.
3. Alternate position (Placement 2) requires District Manager approval.
4. Ground rods, clamps, and wire will be furnished and installed by the contractor. See [AC 703](#) for approved grounding materials. Ground wire to be a minimum of 2/0 bare copper.

SS 587

PME Concrete Enclosure

Approved by:

RR

Sheet 2 of 2

What's Changed? Added new Note 4.

Effective Date:

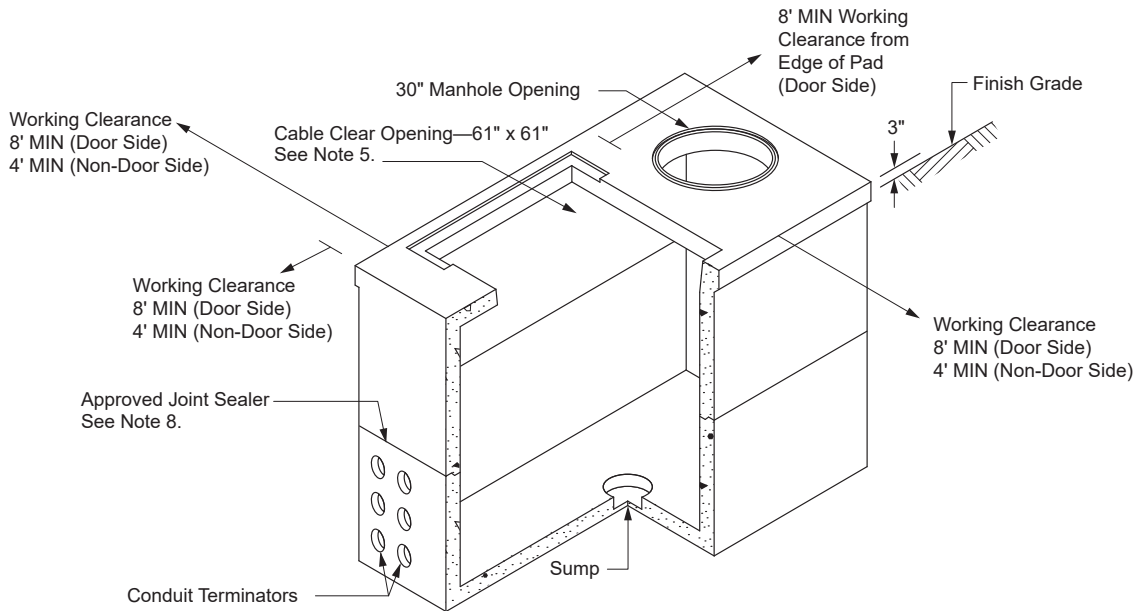
10-29-2021

UGS

SS 590 Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'

Scope SS 590.1 Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'

Figure SS 590-1: 5' x 10'-6" x 7' — Precast Tub-Type PMH/PME Structure



1.0 Excavation Size

Consult manufacturer's installation guides for exact excavation dimensions.

2.0 UGS Reference

[GI 030](#): General Specification for Precast Structures

[GI 035](#): Allowable Tolerances for Installed Precast Structures

[AC 711](#): Sump Drain and Detail

Note(s):

1. Conduit terminators to be located as shown on [Figure SS 590-3 \(Sheet 3\)](#). Standard conduit entrance will be a flatwall design. Slight variations by manufacturers may be allowable with Company approval.
2. For PMH/PME structural design criteria, see [Figure SS 590-2 \(Sheet 2\)](#), [Figure SS 590-3 \(Sheet 3\)](#), and [Figure SS 590-4 \(Sheet 4\)](#).
3. For list of material requirements and notes, see [Table SS 590-2 \(Sheet 5\)](#).
4. Top surface of PMH/PME structure will be set 3 inches above finish grade.
5. Cable clear opening will be covered with an Edison-approved cover at the time of structure placement.
6. Backfill around the structure will be with a minimum of one sack per yard sand cement slurry to within one foot of finished grade. The surface elevation of the slurry will not vary more than one foot around the perimeter of the structure as it is being placed.
7. [Table SS 590-1 \(Sheet 1\)](#) shows the approved PMH/PME enclosure manufacturers' names and catalog numbers. See [SS 500](#) for item number and SAP number.
8. See [GI 030](#).

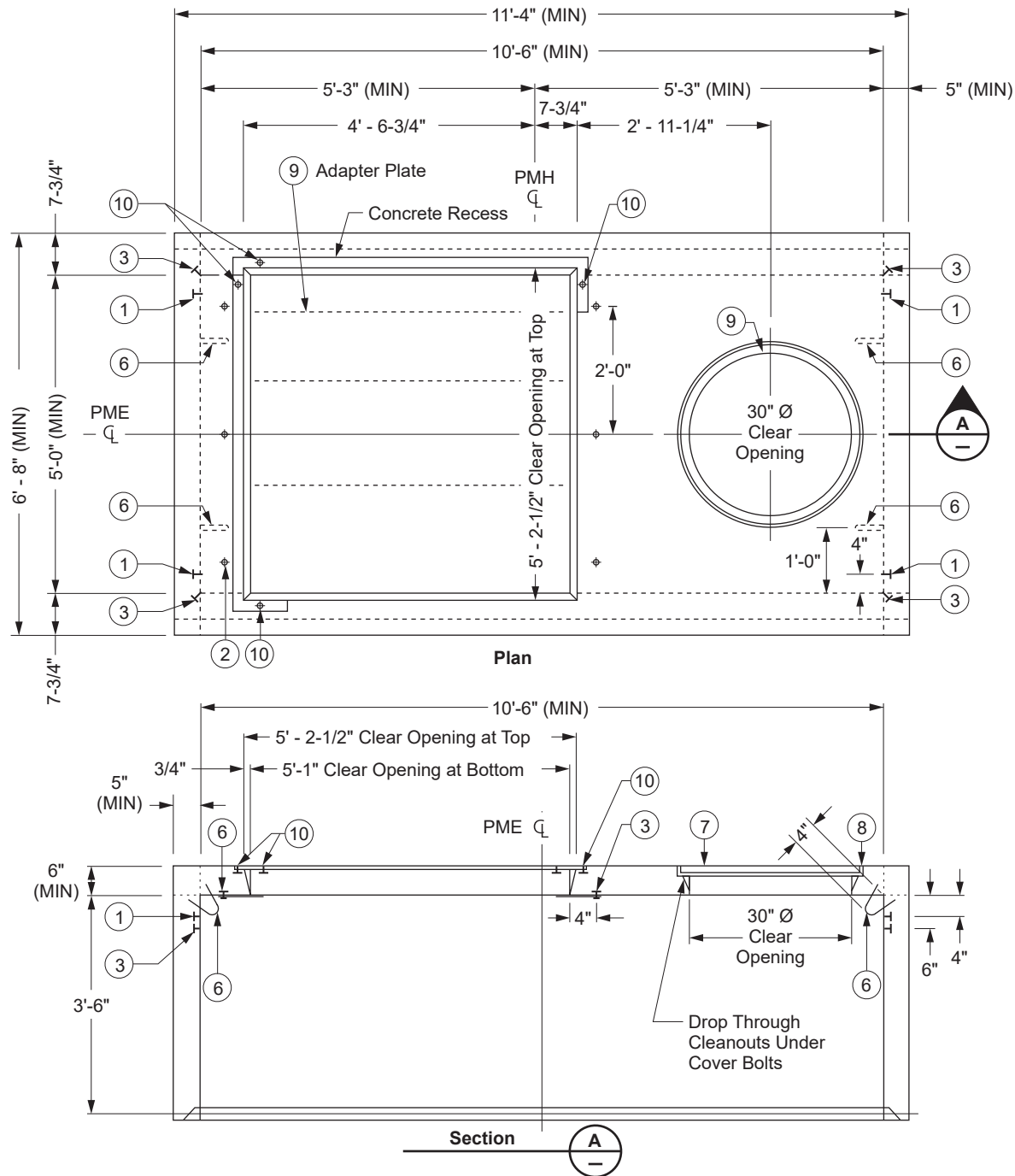
Table SS 590-1: Precast Concrete Manufacturers' Part Numbers

Jensen Precast	Oldcastle Infrastructure
K5106-PUV84-11	ED-5106-84-PMH

Approved by: <i>RR</i>	Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'	SS 590
Effective Date: 04-24-2020	What's Changed? Table SS 590-1: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure; parent company note removed.	Sheet 1 of 5
		UGS

Scope SS 590.2 Top Section for 5' x 10'-6" x 7' Precast Tub-Type Structure

Figure SS 590-2: Top Section for 5' x 10'-6" x 7' Precast Tub-Type Structure



Note(s):

1. For list of materials and notes, see [Table SS 590-2 \(Sheet 5\)](#).

SS 590

Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'

Approved by:

RR

Sheet 2 of 5

What's Changed?

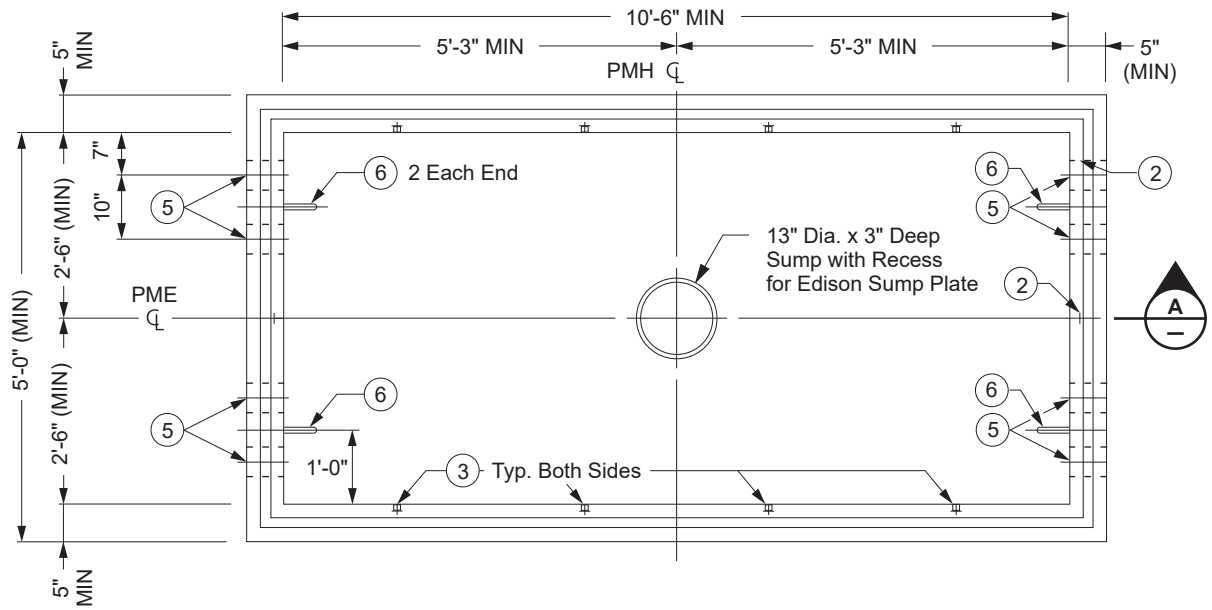
Effective Date:

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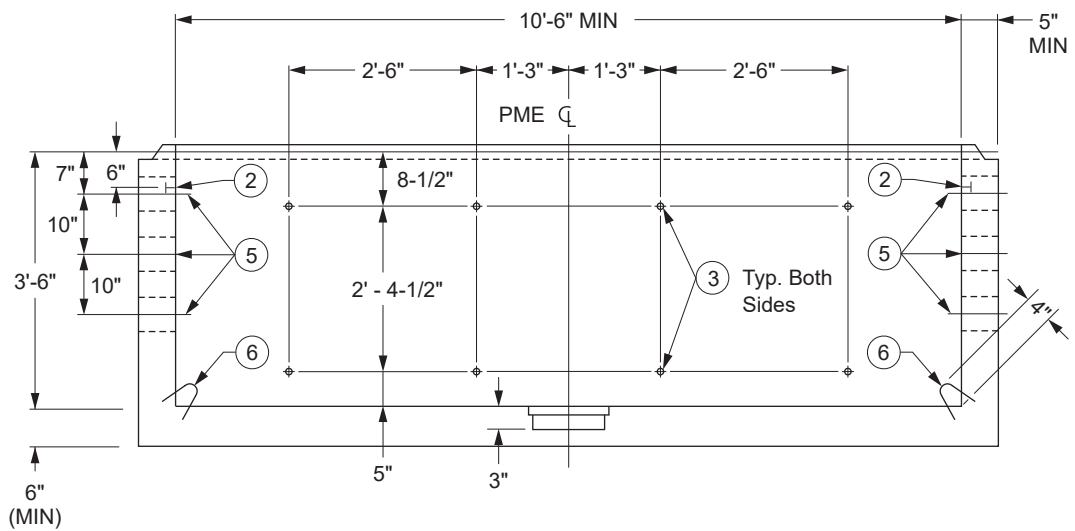
04-24-2020

Scope SS 590.3 Base for 5' x 10'-6" x 7' Precast Tub-Type Structure

Figure SS 590-3: Base for 5' x 10'-6" x 7' Precast Tub-Type Structure



Plan



Section

Note(s):

1. For list of materials and notes, see [Table SS 590-2 \(Sheet 5\)](#).

Approved by:

RR

Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred
Emergency Switch — 5' x 10'-6" x 7'

Effective Date:

04-24-2020

What's Changed?

SS 590

Sheet 3 of 5

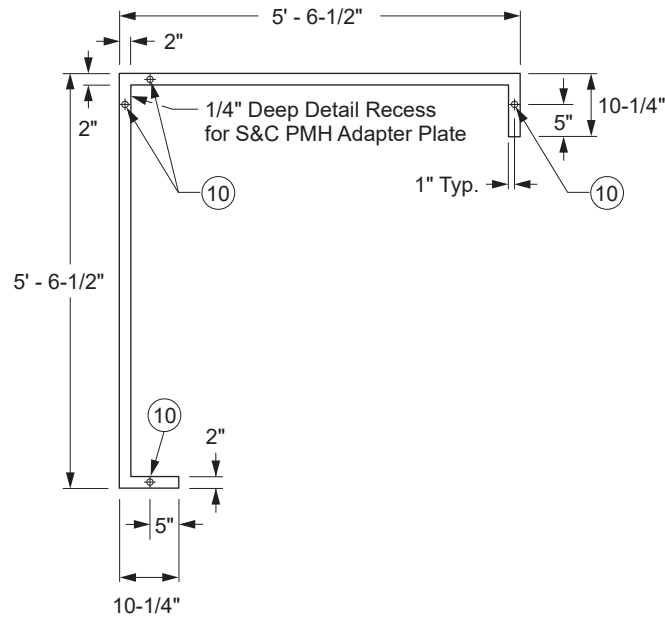
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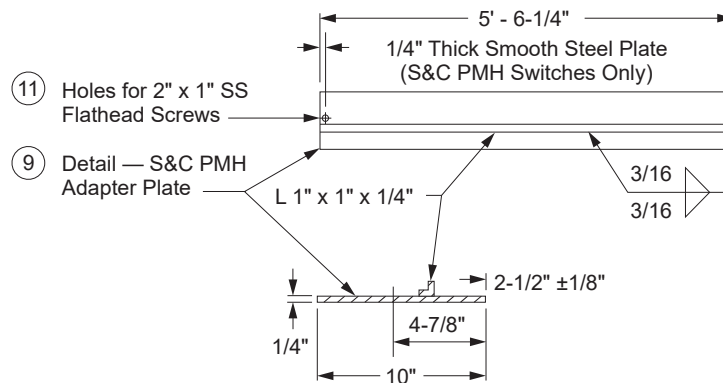
Scope SS 590.4 Detail Information for 5' x 10'-6" x 7' Precast Tub-Type Structure

Figure SS 590-4: Detail Information for 5' x 10'-6" x 7' Precast Tub-Type Structure

Concrete Recess Detail



Adapter Plate Detail



Note(s):

- For list of materials and notes, see [Table SS 590-2 \(Sheet 5\)](#).

SS 590

Sheet 4 of 5

UGS

► SCE Public ◀

Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred
Emergency Switch — 5' x 10'-6" x 7'

What's Changed?

Approved by:

RR

Effective Date:

04-24-2020


Scope SS 590.5 List of Materials for 5' x 10'-6" x 7' Precast Tub-Type Structure

Table SS 590-2: List of Materials for 5' x 10'-6" x 7' Precast Tub-Type Structure

Number	Description	Quantity
①	1/2" Diameter Threaded Bronze Grounding Inserts	6
②	1/2" Diameter Threaded Plastic Inserts Imperial Construction Products — 15,000	22
③	1/2" Diameter Richmond Kohler Threaded Inserts or Equal	4
④	1/2" Diameter J Bolts — AC 731	4
⑤	5" Diameter Plastic Conduit Terminators	24
⑥	Pull Irons 7/8" Vertical	8
⑦	30" Manhole Cover	1
⑧	30" Manhole Frames	1
⑨	Steel Adaptor Plate for S&C PMH Cabinets	1
⑩	3/8" Diameter Inserts	4
⑪	1" (Length) x 3/8" (Diameter) Stainless Steel Flathead Screw	2

Note(s):

- Design and construction of PMH top and base section will conform to [GI 030](#) wherever applicable (specification for precast reinforced concrete vaults and manholes).
- One-half inch threaded bronze grounding inserts will be an Edison-approved design (see ① above). A #2 solid copper wire will be permanently brazed to the insert and structure rebar.
- Abbreviation "GRD" will be stenciled in red letters, 1-1/2" minimum height, adjacent to each ground insert.
- The 7/8-inch pull irons will be designed for a tension load of 20,000 pounds, with a safety factor of 2 (see ⑥ above).
- Walls and ceiling will be painted white.
- One-half inch threaded plastic inserts will be Imperial Construction Products, Part Number 15,000 (see ② above).
- The 30-inch manhole frame and 30-inch manhole cover will be Alhambra Foundry, Part Number A-1106-MOD, per [FC 621](#). Composite manhole cover may be used for replacement, per [FC 623P](#). SAP 10205271
- Steel adapter plate will be covered with one coat of primer and one coat of paint as specified in [FC 600](#) (see ⑨ above). Plate will be attached to top section with 1" x 3/8" stainless steel flathead screws (see ⑪ above).
- No lifting inserts or like devices will be installed in the top outside surface of the top tub PMH section, or in the floor of the base section.
- Plastic conduit terminators will be an Edison-approved one-piece design (see ⑤ above).
- Structure design will be approved by the Los Angeles County Road and Bridge Department.

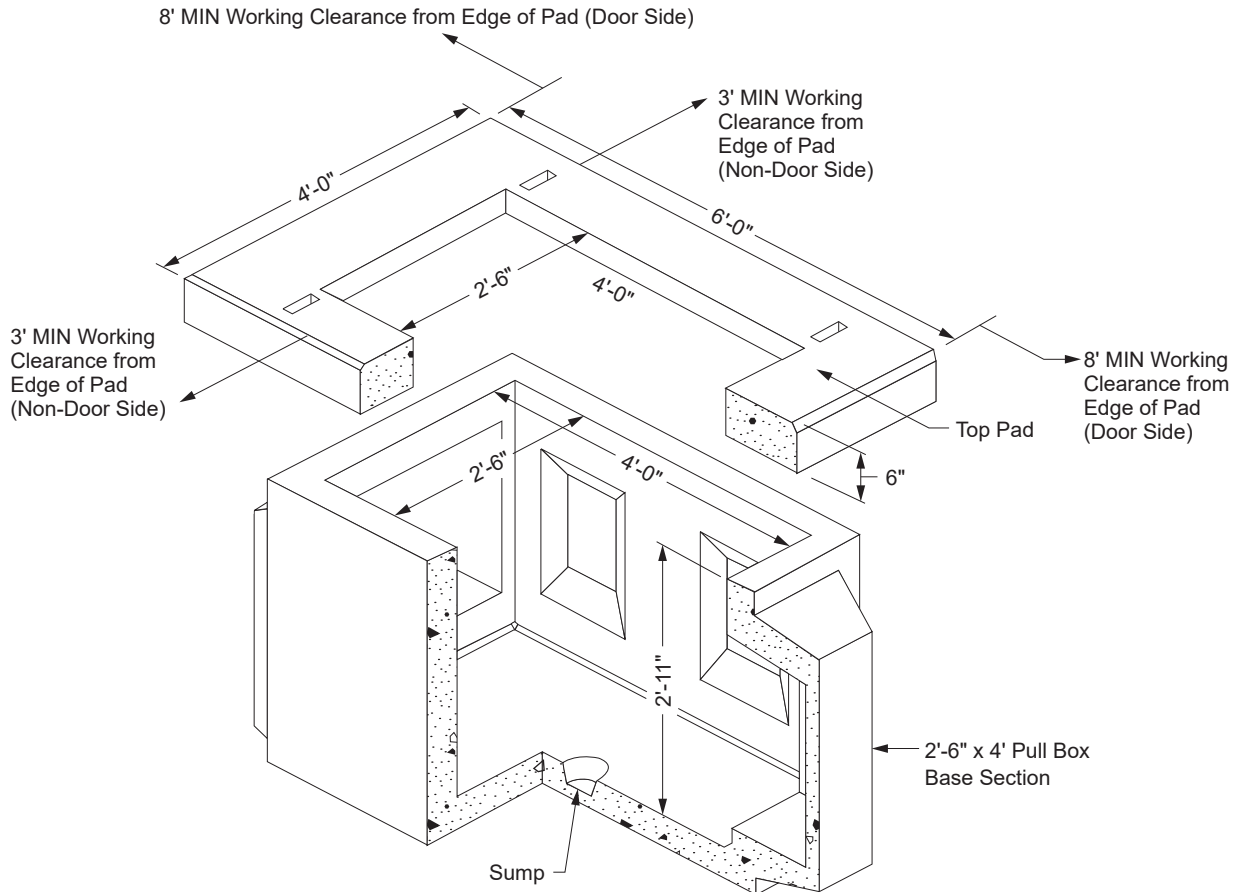
Approved by: 	Precast Tub-Type for PMH/PME, Primary Metering Cabinets, and Preferred Emergency Switch — 5' x 10'-6" x 7'	SS 590
Effective Date: 04-24-2020	What's Changed?	Sheet 5 of 5
		UGS

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SS 591 Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box

Scope SS 591.1 Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box for PME-3, PME-4, and PME-5 Switchgear

Figure SS 591-1: Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box



1.0 Excavation Size:

Minimum excavation for pullbox will be 46" x 83" x depth to suit job. Installing contractor will provide grade rings (6" minimum) as necessary in order to maintain cover over conduits per SCE requirements or permit agency/requirements, whichever is greater. Backfill will be well compacted to prevent subsidence.

2.0 UGS References:

[AC 700](#) Ground Rod — Ground Wires

[AC 703](#) Grounding Materials

[MC 830](#) Protection Barriers

3.0 Reference Drawing:

5227040-0: Equipment Slab Box 4' x 6' Pad w/2'-6" x 4' Pullbox for PMH-5 Switchgear.

Approved by: <i>RR</i>	Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box	SS 591
Effective Date: 04-24-2020	What's Changed?	Sheet 1 of 3
		UGS

4.0 Installation Notes:

- 4.1 Pad and pullbox will be set level. Pullbox will be placed on 6" (minimum) compacted rock base to ensure uniform distribution of soil pressure in floor.
- 4.2 Mastic sealant is required at joints.
- 4.3 Top surface of pad will be set 3" above finished grade.
- 4.4 One ground rod will be furnished and installed by contractor. Install ground rod through floor of box per [AC 700](#). Ground rod material will comply with [AC 703](#).
- 4.5 An 8' (minimum) clearance is required on door side of switch pad for operation.
- 4.6 Protection barriers will be installed if pad is exposed to vehicular traffic per [MC 830](#).


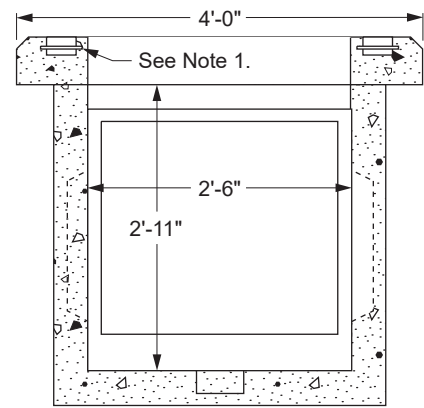
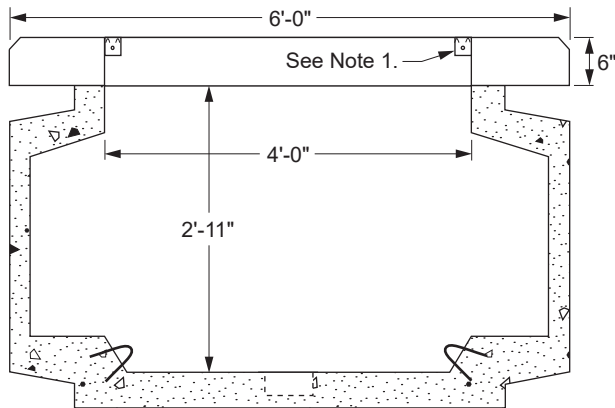
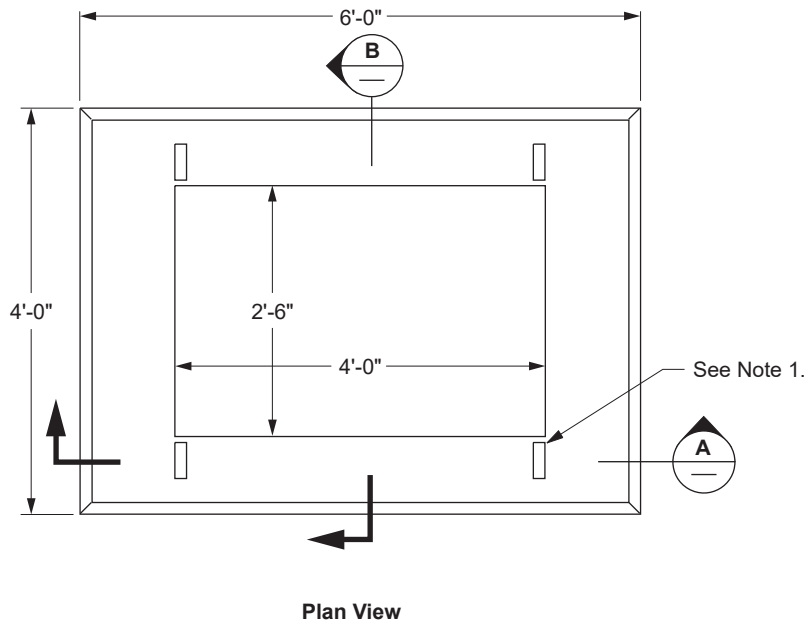
SS 591	Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box	Approved by: 
Sheet 2 of 3 UGS	What's Changed?	Effective Date: 04-24-2020

Figure SS 591-2: Precast Concrete Equipment Slab Box, Plan and Section Views — 4' x 6' Pad with 2'-6" x 4' Box for PME-3, PME-4, and PME-5 Switchgear



Note(s):

1. Galvanized unistrut channel for securing switch to pad. (4 total)
2. Pad is designed to accommodate Scott PMH-5 or S&C PMH-5 switchgear.
3. Switchgear can only be installed with cabinet doors facing ends of pad. Cabinet can be rotated 180 degrees.

Table SS 591-1: Precast Concrete Manufacturers' Reference Numbers

Nominal Size	Jensen Precast	Oldcastle Infrastructure
4' x 6' with 2'-6" x 4' Box	K3048-PUV36-11	ED-264-30-PMH-5

Approved by:

RR

Precast Concrete Equipment Slab Box — 4' x 6' Pad with 2'-6" x 4' Box

SS 591

Sheet 3 of 3

Effective Date:
04-24-2020

What's Changed? Table SS 591-1: The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure; parent company note removed.

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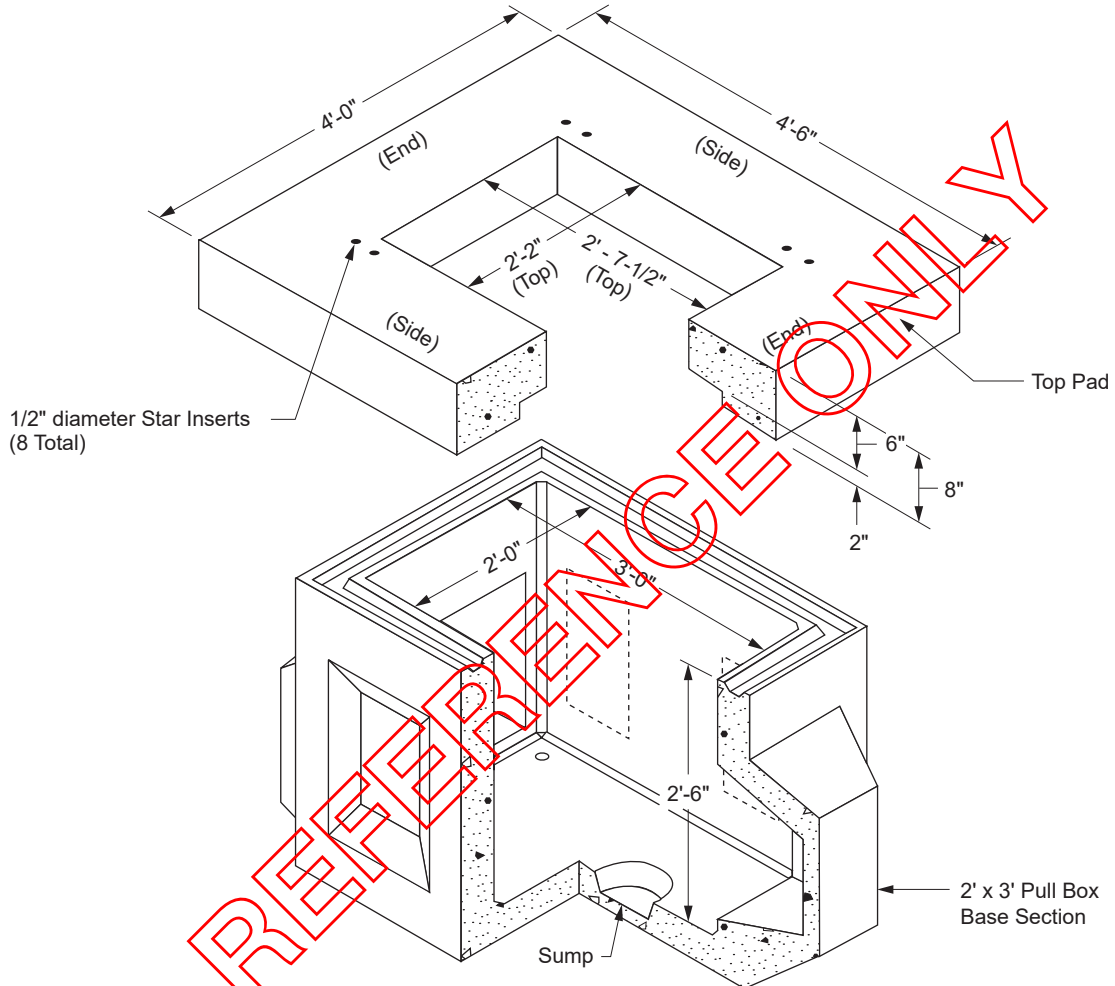
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SS 592 Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box

Scope SS 592.1 Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box for PMH-4 Switchgear

Figure SS 592-1: Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box



1.0 Excavation Size:

Minimum excavation for pull box will be 46" x 83" x depth to suit job. Installing contractor will provide grade rings (6" minimum) as necessary in order to maintain cover over conduits per SCE requirements or permit agency requirements, whichever is greater. Backfill will be well compacted to prevent subsidence.

2.0 UGS References:

- [SS 500](#) Slab Box Requirements — Approved Manufacturers
- [AC 700](#) Ground Rod – Ground Wire
- [AC 703](#) Ground Materials
- [MC 830](#) Protection Barriers

Approved by: 	Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box	SS 592
Effective Date: 10-26-2012	What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.	Sheet 1 of 3
		UGS

3.0 Installation Notes:

1. Pad and pull box will be set level. Pull box will be placed on 6" (minimum) compacted rock base to ensure uniform distribution of soil pressure in floor.
2. Mastic sealant is required at joints.
3. Top surface of pad will be set three inches above finished grade.
4. One ground rod will be furnished and installed by contractor. Install ground rod through floor of box per AC 700. Ground rod material will comply with AC 703.
5. An 8' (minimum) clearance is required at each end of pad for operation of switchgear.
6. Protection barriers will be installed if pad is exposed to vehicular traffic per MC 830.

FOR REFERENCE ONLY


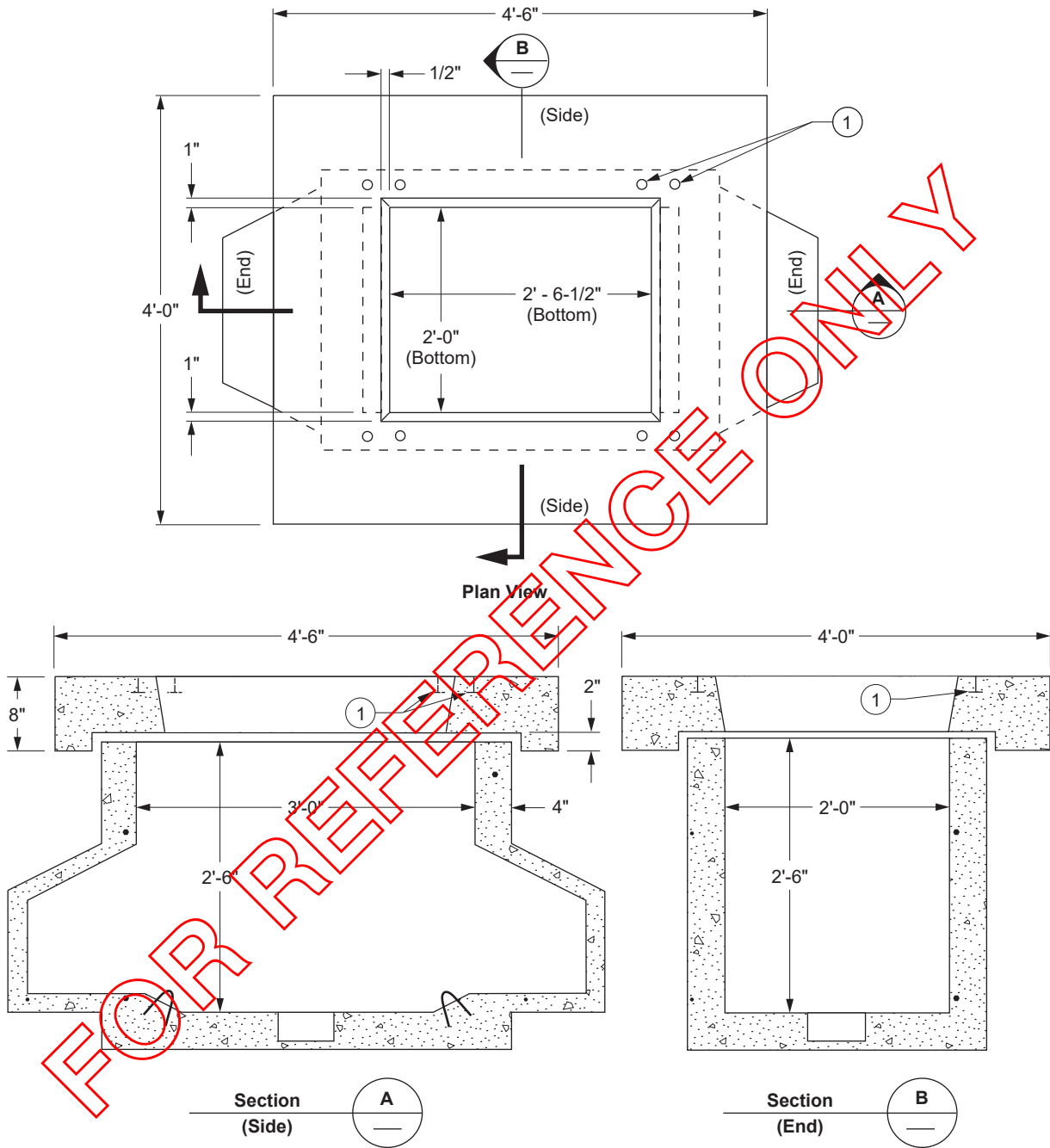
SS 592	Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box	Approved by: 
Sheet 2 of 3	What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.	Effective Date: 10-26-2012
UGS		

Figure SS 592-2: Precast Concrete Equipment Slab Box — Plan and Section Views — 4' x 4'-6" Pad with 2' x 3' Box for PMH-4 Switchgear



Note(s):

1. One-half inch diameter star inserts for securing switch to pad (8 total).
2. Pad is designed to accommodate Scott PMH-4 or S&C PMH-4 switchgear.
3. Switchgear must be installed with cabinet doors facing ends of pad.
4. See [SS 500](#) for approved manufacturers.

Approved by:

RK

Precast Concrete Equipment Slab Box — 4' x 4'-6" Pad with 2' x 3' Box

SS 592

Sheet 3 of 3

Effective Date:
10-26-2012

What's Changed?

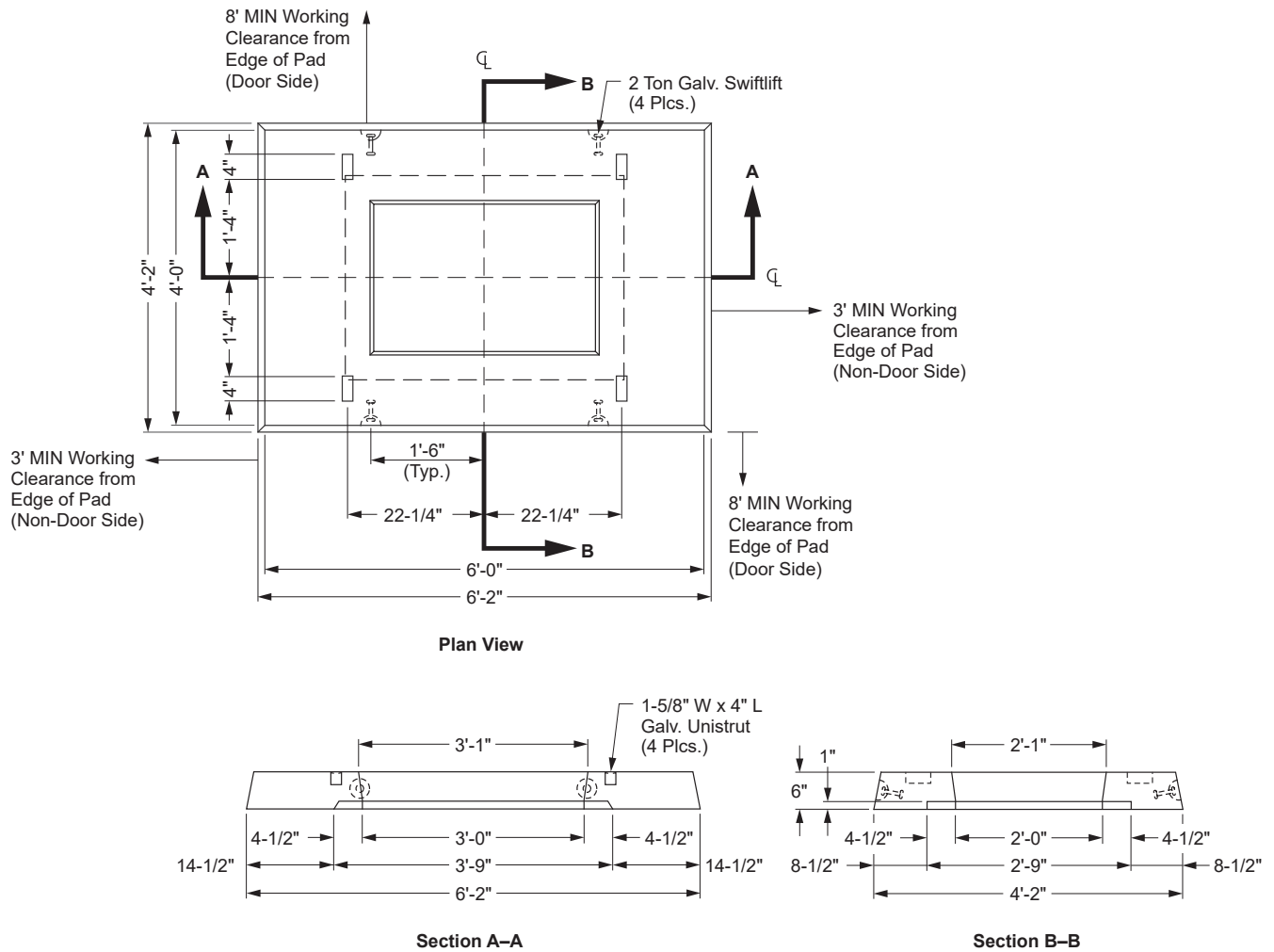
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SS 593 PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"

Scope SS 593.1 PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"

Figure SS 593-1: PME-4 Conversion Pad for PMH-4 Structures



1.0 Excavation Size:

[SS 592](#)

[Figure SS 592-2 \(Sheet 3\)](#)

2.0 Installation Notes:

- 2.1 Remove existing switch and 4'-0" x 4'-6" pad and remove from site.
- 2.2 Do not disturb or remove existing PMH box.
- 2.3 Clean residual sealing mastic from the old joint on box structure.

Approved by:

B. C.

PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"

SS 593

Sheet 1 of 2

Effective Date:

10-24-2014

What's Changed?

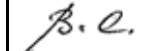
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- 2.4 Apply new mastic to joints.
- 2.5 Put the new conversion pad (SAP 10117287) in place.
- 2.6 An 8 foot (minimum) clearance is required at each end of pad for operation of switchgear.
- 2.7 Maintain the same protective barriers that were installed for the PMH switch.
- 2.8 See [SS 500](#) for approved manufacturers.

SS 593

PME-4 Conversion Pad for PMH-4 Structures — 4'-0" x 6'-0" x 0'-6"

Approved by:



Sheet 2 of 2

What's Changed? Added SAP Number to section 2.5.

Effective Date:

10-24-2014

UGS

SS 599 Perimeter Walls for Pad-Mounted Equipment and Underground Structures

Scope SS 599.1 Perimeter Walls for Pad-Mounted Equipment and Underground Structures

1.0 General Requirements

- 1.1 Perimeter walls are required wherever the grade rises up to the following:
 - A. 18 inches above the top of a subsurface enclosure at a distance of 5 feet from the edge of the enclosure.
 - B. 24 inches above the top of a pad at a distance of 5 feet from the edge of the pad.
 - C. 2 inches above the top of a subsurface enclosure at any point adjacent to the enclosure.
 - D. 6 inches above the top of a pad at any point adjacent to the pad.
- 1.2 For perimeter wall heights exceeding those heights in Section 1.1 or when the city/county requires engineering drawings to be submitted for review, the T&D Underground Structures Engineering Group shall be contacted to develop the perimeter wall design as needed.
- 1.3 A maximum of two inclined grade rings may be used with each concrete BURD enclosure before a perimeter wall is required. The perimeter wall should extend a minimum of 12 inches above the highest point in the grade at the outside surface of the wall.
- 1.4 The perimeter wall shall conform to local building ordinances.

2.0 Clearances Between Perimeter Wall and Pad-Mounted Equipment

- 2.1 The following minimum clearances shall be maintained between the perimeter wall and pad-mounted equipment. These clearances apply to new construction and upgrades to existing pad-mounted equipment.
 - 8 feet working clearance on the door side of pad-mounted equipment (typical), measured either from the edge of the pad or back of the access opening, as shown in [Figure SS 599-1 \(Sheet 2\)](#).
 - 3 feet clearance on the non-door side of pad-mounted equipment (typical), measured from the edge of pad, as shown in [Figure SS 599-1 \(Sheet 2\)](#).
 - 4 feet clearance on the side of pad-mounted equipment with automation measured from the edge of pad, as shown in [Figure SS 599-2 \(Sheet 2\)](#).
 - 4 feet clearance on the side of pad-mounted multi-position switches, measured from the edge of the pad with the access opening, as shown in [Figure SS 599-3 \(Sheet 3\)](#).


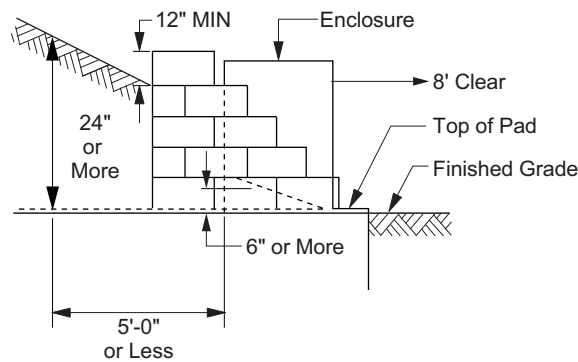
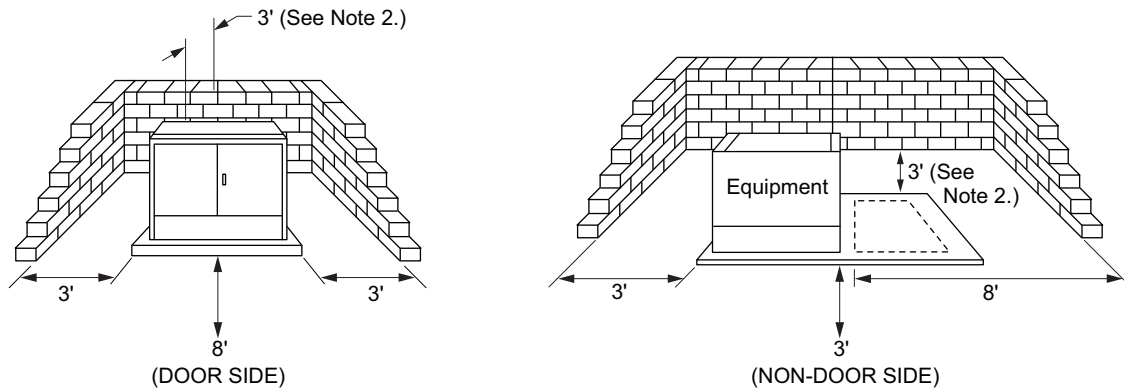
Approved by: 	Perimeter Walls for Pad-Mounted Equipment and Underground Structures	SS 599
Effective Date: 07-28-2017	What's Changed? Section 1.2: Updated "TDBU Civil/Structural and Geotechnical Engineering" to "T&D Underground Structures Engineering" as contact group	Sheet 1 of 4 UGS

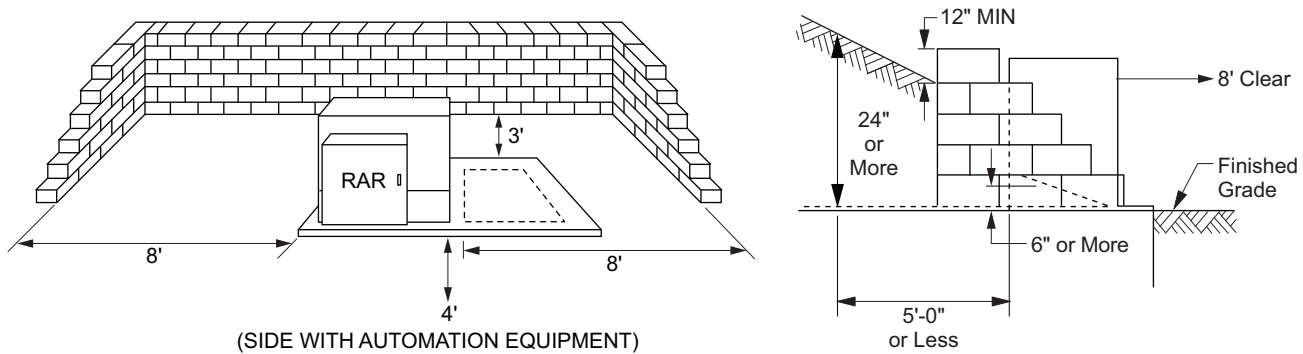
Figure SS 599-1: Perimeter Wall for Pad-Mounted Equipment (Typical) Installed on a Concrete Pad or Slab Box



Note(s):

1. For existing installations, maintain a minimum clearance of 18 inches.
2. For existing installations, maintain a minimum clearance of 12 inches.

Figure SS 599-2: Perimeter Wall for Remote Control Automatic Recloser (RAR)



SS 599

Perimeter Walls for Pad-Mounted Equipment and Underground Structures

Approved by:

B. C.

Sheet 2 of 4

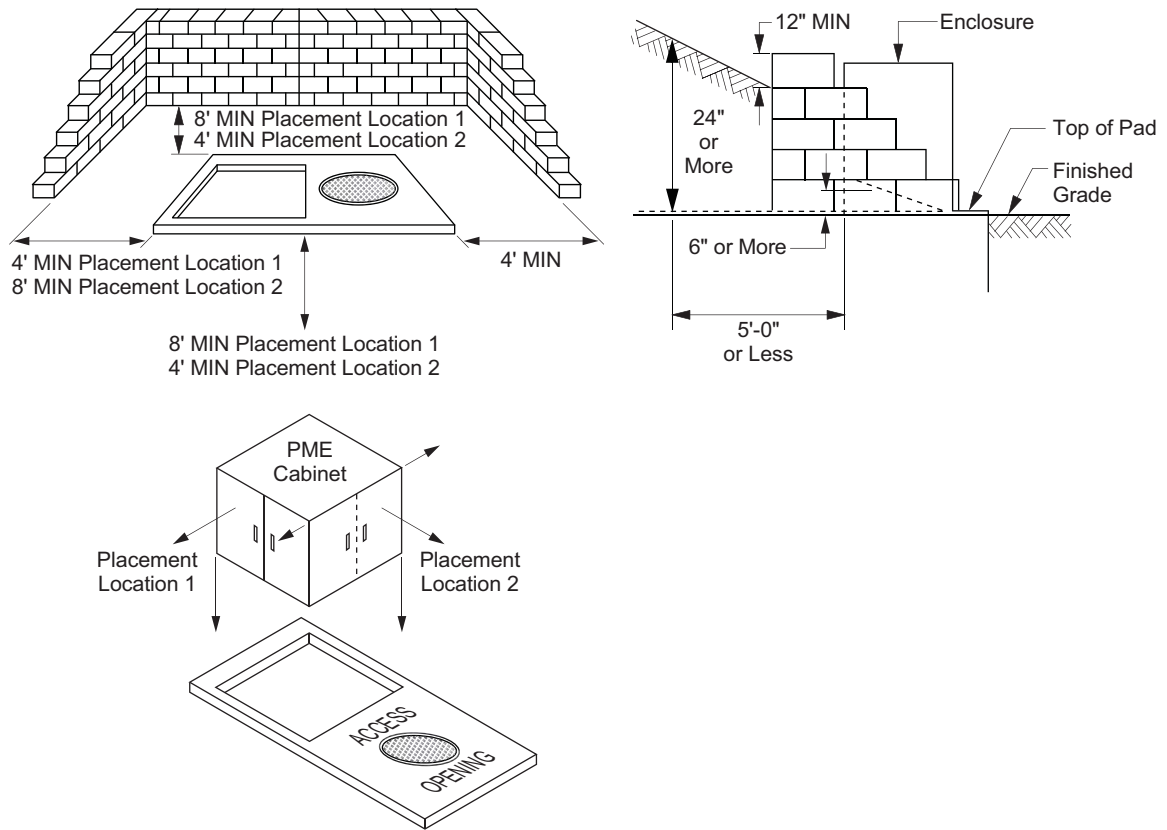
What's Changed?

Effective Date:

UGS

07-28-2017

Figure SS 599-3: Perimeter Wall for Multi-position Switches (i.e. PME 6 through PME 12 or Primary Metering Cabinets)



Note(s):

1. Placement of the PME enclosures is site-specific. The Design Organization will determine the placement of the switch door opening based on field conditions.
2. The 4-foot clearance on the side of new PME installations will enable the placement of automated switching equipment (RCS). RCS retrofits on existing PME installations will keep the 3-foot side working clearance as long as the RCS cabinet door can be fully opened without being obstructed by any part of the retaining wall.

Approved by:

B.C.

Perimeter Walls for Pad-Mounted Equipment and Underground Structures

SS 599

Sheet 3 of 4

Effective Date:

07-28-2017

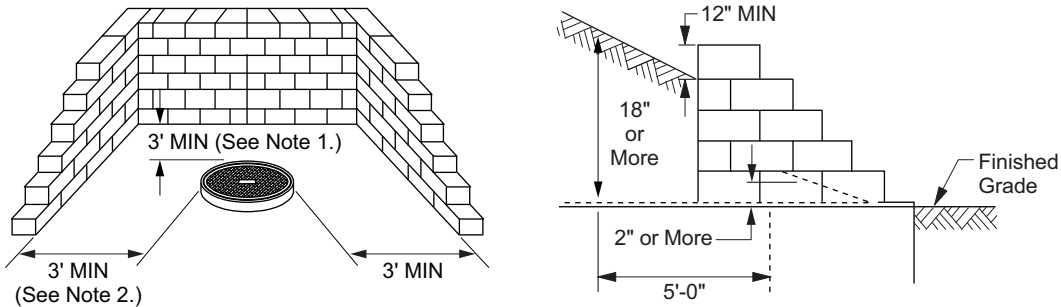
What's Changed?

UGS

3.0 Clearances Between Perimeter Wall and BURD Enclosures, Vaults, or Manholes:

3.1 A minimum clearance of 3 feet shall be maintained between the perimeter wall and BURD enclosure, vault lid, or manhole lid. See [Figure SS 599-4 \(Sheet 4\)](#), [Figure SS 599-5 \(Sheet 4\)](#), and [Figure SS 599-6 \(Sheet 4\)](#) for details.

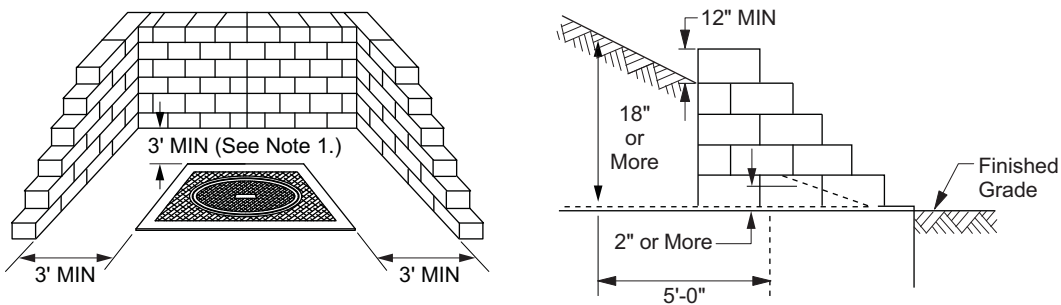
Figure SS 599-4: Perimeter Wall for BURD Enclosures



Note(s):

1. For existing installations, maintain a minimum clearance of 12 inches.
2. For existing installations, maintain a minimum clearance of 18 inches.

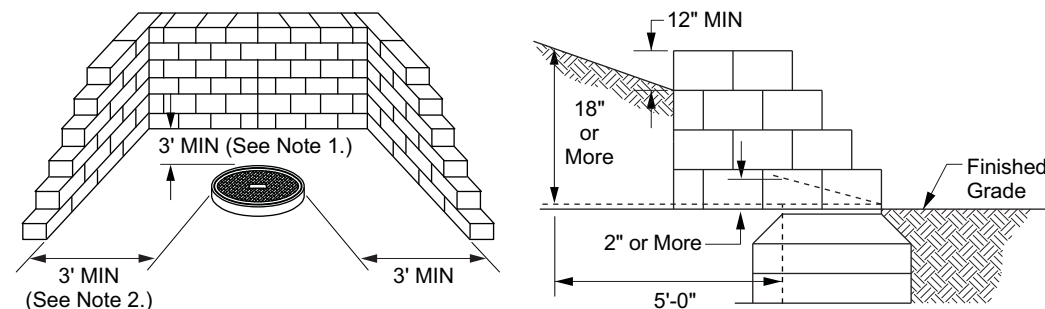
Figure SS 599-5: Perimeter Wall for Vault



Note(s):

1. For existing installations, maintain a minimum clearance of 24 inches.

Figure SS 599-6: Perimeter Wall for Manhole



Note(s):

1. For existing installations, maintain a minimum clearance of 24 inches.

SS 599

Perimeter Walls for Pad-Mounted Equipment and Underground Structures

Approved by:

B. C.

Sheet 4 of 4

What's Changed?

Effective Date:

07-28-2017

UGS

SS 600 Protection Wall

Scope SS 600.1 Protection Wall for Replacement of Single-Phase, Mini-Pad-Mounted Transformers

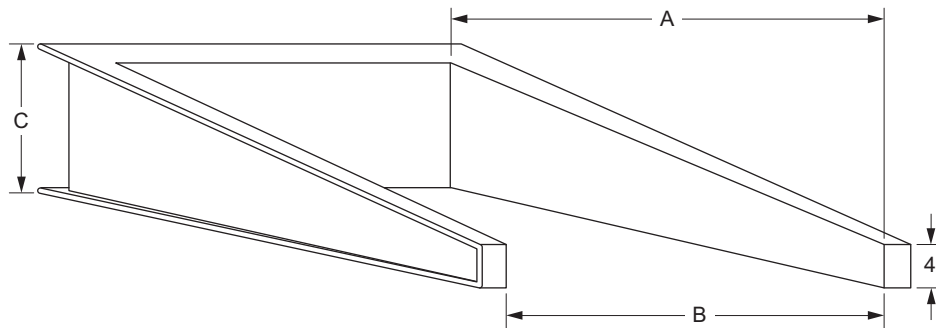
The protection wall prevents corrosion and other damage by blocking dirt, rocks, water runoff, and/or other debris from falling on or against a single-phase, mini-pad-mounted transformer.

The protection wall is for existing transformers only and to be installed only when replacing single-phase or mini-pad-mounted transformers and pads located in areas where dirt, rocks, water runoff, and/or other debris may make contact with the transformer. The protection wall is to be installed on the sides and rear of the pad leaving the transformer door area unobstructed. Bury the protection wall a minimum of 2 inches deep to the top of the front lip when replacing the pad.

The size of the protection wall shall be determined based upon the height of the debris behind the single-phase, mini-pad-mounted transformer.

NOTE: The protection wall is not a perimeter wall engineered for restraining Earth movement nor is it to be used as such. Refer to UGS SS 599 for perimeter walls.

Figure SS 600-1: Protection Wall Dimensions



A	B	C	SAP Number
48"	48.5"	16"	10176752
48"	48.5"	18"	10176753
48"	48.5"	22"	10176754
48"	48.5"	24"	10176755

Approved by:



Protection Wall

SS 600

Sheet 1 of 2

Effective Date:
02-24-2012

What's Changed? New standard for "Protection Wall".

UGS

Figure SS 600–2: Example Installation of a Protection Wall



Figure SS 600–3: Side View of an Example Installation of a Protection Wall



SS 602 Landscaping Around Pad-Mounted Equipment

Scope SS 602.1 Landscaping Around Pad-Mounted Equipment

1.0 General Information:

- 1.1 This standard provides guidelines for landscaping around pad-mounted equipment.
- 1.2 Shrubs, trees, low vegetation grass or fences installed by Edison customers shall be maintained by the customer owner to meet the required working clearances specified Section 2.0. Shrubs, trees or fences that are located too close to equipment will be trimmed or removed in order to operate, inspect and perform maintenance to the equipment.
- 1.3 Landscape irrigation systems shall be installed clear of the required minimum clearances and shall be maintained by the customer owner. Irrigation water will cause accelerated deterioration of the equipment enclosure which results in premature failure and service interruption. Irrigation water shall not be sprayed onto the pad-mounted equipment and concrete pad/slab box and shall be away from the equipment maintaining minimum clearances.
- 1.4 Shrubs, trees or fences shall not be placed over handholes and pullboxes that may be adjacent to the pad

2.0 Clearances Between Landscape and Pad-Mounted Equipment:

- 2.1 The following clearances shall be maintained when landscaping around pad-mounted equipment or structures. Refer to [Figure SS 602-1 \(Sheet 2\)](#) and [Figure SS 602-2 \(Sheet 2\)](#) for details.
 - 8-foot working clearance on each door side of the pad-mounted equipment, measured either from the edge of the slab or the back of the access opening.
 - 3-foot working clearance on each non-door side of the pad-mounted equipment, measured from the edge of pad or slab.
 - 4-foot working clearance on the sides of the pad-mounted equipment with automation and all pad-mounted multi-position switches measured from the edge of pad or slab.


Approved by: 	Landscaping Around Pad-Mounted Equipment	SS 602
Effective Date: 07-31-2009	What's Changed? New standard for landscaping around pad-mounted equipment using shrubs, trees, low vegetation grass or fences.	Sheet 1 of 4 UGS

Figure SS 602-1: Clearances Between Landscape and Pad-Mounted Equipment (Typical) Installed on a Concrete Pad

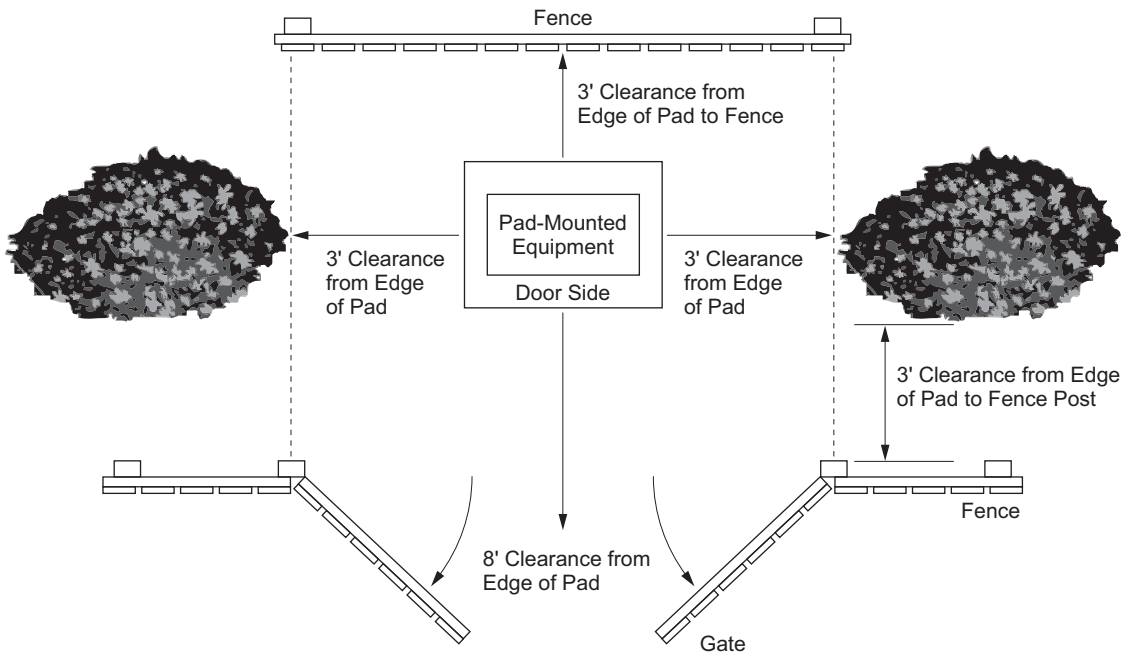
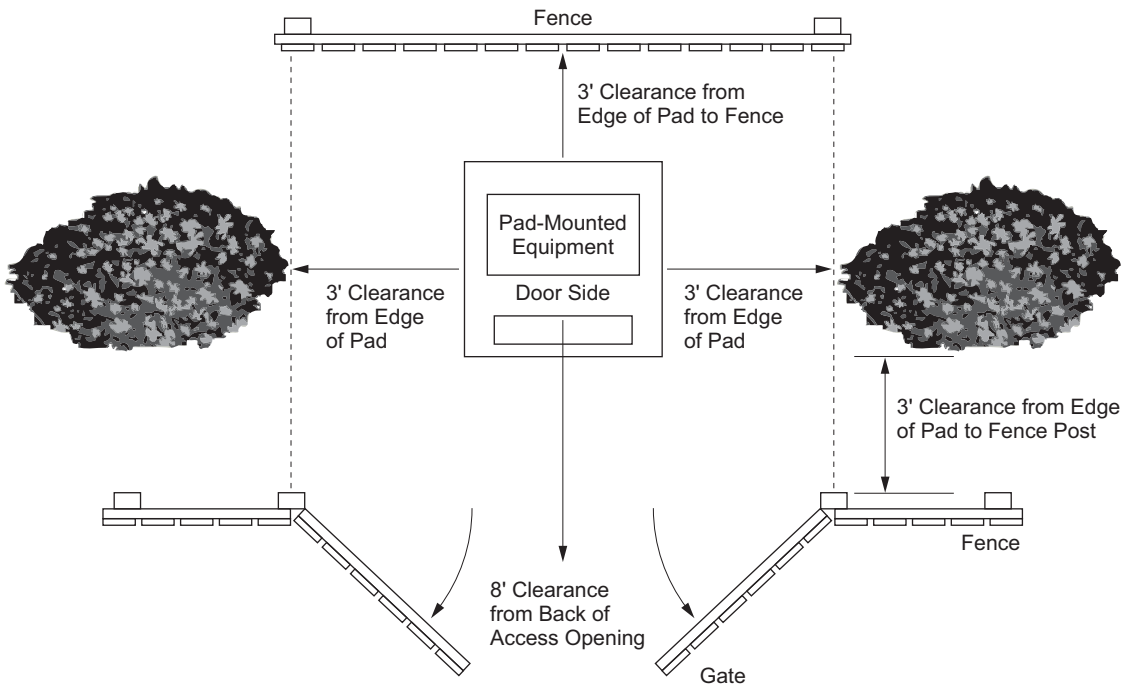


Figure SS 602-2: Clearances Between Landscape and Pad-Mounted Equipment (Typical) Installed on a Slab Box



SS 602

Landscaping Around Pad-Mounted Equipment

Approved by:

[Signature]

Sheet 2 of 4

What's Changed? New standard for landscaping around pad-mounted equipment using shrubs, trees, low vegetation grass or fences.

Effective Date:

07-31-2009

UGS

2.2 Refer to [Table SS 602–1 \(Sheet 3\)](#) for additional information on the working clearances and structure information of various types of pad-mounted equipment:

Table SS 602–1: Standards Showing Clearances for Pad-Mounted Equipment


Pad-Mounted Equipment Type	UGS Standard
Single Phase Transformer	SS 504, SS 506
Three Phase Transformer	SS 504, SS 530, SS 535
Load Break Fuse Cabinet	SS 506
PME-1 & PME-2 Switch	SS 506
Capacitor Cabinet	SS 520
Pad-Mounted Gas Switch	SS 536, SS 537
PME-3, PME-4 or PME-5	SS 540, SS 591
PME-6 through PME-12	SS 587, SS 590
Primary Metering Cabinet	SS 590
VFI-4	SS 530
VFI-9, VFI-12 or Bypass Switch	SS 538
RAR	SS 530

3.0 Landscaping Around Pad-Mounted Equipment Using Shrubs, Trees or Fences:


- 3.1 The developer or customer owner can contact the local nursery or arborist for information on popular shrubs or trees grown in the area.
- 3.2 California State Law requires contacting Dig Alert (811) 48 hours prior to digging for marking underground utility facilities.
- 3.3 The size and spread that a shrub or tree will reach at maturity shall be considered when selecting the proper shrub or tree for landscaping. Customers should select landscaping plants whose roots, vines, and branches will not grow under or into Edison structures or equipment. Contact local nursery or arborist for guidance.

The examples shown are shrubs which can be planted near the pad-mounted equipment but are not limited to the following:

- Abelia Grandiflora (Common name: Abelia)
- Acanthus Mollis (Common name: Bear's Breeches)
- Agapanthus 'Midnight Blue' (Common name: Lily of the Nile)
- Lavandula Augustifolia (Common name: Lavender)
- Nanadina Domestica (Common name: Heavenly Bamboo)
- Phormium Tenax (Common name: New Zealand Flax)
- Rosmarius Officinalis (Common name: Rosemary)
- Salvia Greggii (Common name: Autumn Sage)

Approved by: 	Landscaping Around Pad-Mounted Equipment	SS 602
Effective Date: 07-31-2009	What's Changed? New standard for landscaping around pad-mounted equipment using shrubs, trees, low vegetation grass or fences.	Sheet 3 of 4
		UGS


- 3.4 Fences shall not block the door side of the pad-mounted equipment. An 8-foot clearance shall be maintained of the door side of the pad-mounted equipment, measured from edge of concrete pad/back of access opening to the fence gate swung wide open. See [Figure SS 602-1 \(Sheet 2\)](#) & [Figure SS 602-2 \(Sheet 2\)](#) for details.
- 3.5 Contact Edison for approved locks on fence gate.

SS 602	Landscaping Around Pad-Mounted Equipment	Approved by: 
Sheet 4 of 4	What's Changed? New standard for landscaping around pad-mounted equipment using shrubs, trees, low vegetation grass or fences.	Effective Date:
UGS		07-31-2009

Frames and Covers

Table of Contents


Standard	Title
FC 600	Handhole Covers
FC 600.1	Replacement Handhole Covers
FC 601	24" x 36" Steel Pull Box Cover — Light Traffic
FC 601.1	Fabricated 24" x 36" Steel Pull Box Cover for Light Traffic Installations
FC 602	24" x 36" Steel Pull Box Cover — Parkway
FC 602.1	24" x 36" Steel Pull Box Cover — Parkway
FC 603	24" x 36" Steel Pull Box Frame
FC 603.1	24" x 36" Steel Pull Box Frame for Cover FC 601 (Steel: Light-traffic) — FC 618 (RPM Parkway)
FC 606	30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)
FC 606.1	30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)
FC 607	30" x 48" Steel Pull Box Cover — Parkway
FC 607.1	30" x 48" Steel Pull Box Cover — Parkway
FC 608	30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)
FC 608.1	30" x 48" Steel Pull Box Frame
FC 612	36" x 60" Steel Pull Box Cover — Light Traffic (Two Piece)
FC 612.1	Fabricated 36" x 60" Steel Pull Box Cover for Light Traffic Installations (Two Piece)
FC 613	36" x 60" Steel Pull Box Cover — Parkway (Two Piece)
FC 613.1	36" x 60" Steel Pull Box Cover — Parkway (Two Piece)
FC 614	36" x 60" Steel Pull Box Frame for Covers UGS 612 (Steel Light — Traffic) — FC 618 (RPM Parkway)
FC 614.1	36" x 60" Steel Pull Box Frame
FC 615	36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic
FC 615.1	36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic
FC 616	48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic
FC 616.1	48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic

Approved by: 	Frames and Covers Table of Contents	FC
Effective Date: 07-30-2021		Sheet i
		UGS

Standard	Title
FC 618	Polymer Concrete (RPM) Pull Box Covers — Parkway
FC 618.1	Polymer Concrete (RPM) Pull Box Covers — Parkway
FC 619	Pull Box Cover and Frame: Manufacturers' and SAP Numbers
FC 619.1	Pull Box Cover and Frame: Manufacturers' and SAP Numbers
FC 620	27" and 30" Round Manhole Cover and Ring
FC 620.1	27" and 30" Round Manhole Cover and Ring
FC 621	30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading
FC 621.1	30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading
FC 622	30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading
FC 622.1	30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading
FC 623	30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading
FC 623.1	30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading
FC 625	Concrete-Filled Manhole Cover
FC 625.1	Concrete-Filled Manhole Cover
FC 627	30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading
FC 627.1	30" Round Swiveloc Manhole Cover – Ductile Iron — HS-20 Loading
FC 627.2	Manhole Frames - Gray Iron — HS-20 Loading
FC 627.3	Vault Frame – Ductile Iron — HS-20 Loading
FC 630	Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault
FC 630.1	Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault
FC 631	Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault
FC 631.1	Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault
FC 632	Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault
FC 632.1	Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault
FC 640	48" Square Precast Concrete (Traffic-Type) Vault Cover
FC 640.1	48" Square Precast Concrete (Traffic-Type) Vault Cover
FC 641	48" x 60" Precast Concrete Vault Cover (Traffic-Type)

FC	Frames and Covers Table of Contents	Approved by: <i>RR</i>
Sheet ii		Effective Date: 07-30-2021
UGS		

Standard	Title
FC 641.1	48" x 60" Precast Concrete Vault Cover (Traffic-Type)
FC 642	5" x 8" Two Piece — Vault Cover (Traffic-Type)
FC 642.1	5" x 8" Two Piece — Vault Cover (Traffic-Type)
FC 643	6' x 8' Two Piece — Vault Cover — H-20 Loading
FC 643.1	6' x 8' Two Piece — Vault Cover — H-20 Loading
FC 644	5'-6" x 8'-0" Vault Frame — Traffic
FC 644.1	5'-6" x 8'-0" Vault Frame — Traffic
FC 650	Slab Cover Details — Pouring and Framing
FC 650.1	Slab Cover Details — Pouring and Framing
FC 655	5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault
FC 655.1	5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault
FC 660	4' x 5' Precast Concrete Vault Cover (Traffic Type)
FC 660.1	4' x 5' Precast Concrete Vault Cover (Traffic Type)
FC 661	4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame
FC 661.1	4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame
FC 670	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation
FC 670.1	Existing Vault – Type 1 Installation
FC 670.2	Existing Vault – Type 2 Installation
FC 670.3	Existing Vault – Type 3 Installation
FC 670.4	Existing Vault – Type 4 Installation
FC 670.5	Existing Vault – Type 5 Installation
FC 670.6	Existing Vault – Type 6 Installation
FC 670.7	Existing Vault – Type 7 Installation
FC 670.8	Existing Vault – Type 8 Installation
FC 670.9	Existing Vault – Type 9 Installation
FC 670.10	Existing Vault – Type 10 Installation
FC 670.11	Existing Vault – Type 11 Installation
FC 670.12	Existing Manhole – Type 1 Installation

Approved by: 	Frames and Covers Table of Contents	FC
Effective Date: 07-30-2021		Sheet iii
		UGS

Standard	Title
FC 670.13	Existing Manhole – Type 2 Installation
FC 670.14	Existing Manhole Type 3 Installation
FC 670.15	Existing Manhole – Type 4 Installation
FC 670.16	Existing Manhole – Type 5 Installation
FC 670.17	Existing Manhole – Type 6 Installation
FC 670.18	Existing Manhole – Type 7 Installation
FC 670.19	Details
FC 670.20	General Notes
FC 680	Replacement of Deteriorated Concrete Vault Covers
FC 680.1	Replacement of Deteriorated Concrete Vault Covers
FC 690P	Vault and Manhole Lid Tethers
FC 690P.1	Vault and Manhole Lid Tethers
FC 700P	Subsurface Equipment Enclosure (PILOT)
FC 700P.1	Subsurface Equipment Enclosure – Retrofits Only

FC	Frames and Covers Table of Contents	Approved by: <i>RR</i>
		Effective Date: 07-30-2021

Sheet iv

UGS

FC 600 Handhole Covers

Scope FC 600.1 Replacement Handhole Covers

Table FC 600–1: Concrete — Cover

Item Number	Nominal Size (Inside)	Manufacturers' Reference Numbers			SAP
		Brooks Products ^{a/}	Christy Concrete Products ^{b/}	J&R Concrete Products	
HC-1 ^{c/}	10'-6" x 17"	36PBCC238	N09T72	E3 1/2-C-ED	10117468
HC-2	13" x 24"	38PBCC238	N30T72	E5-2-C-ED	10117478
HC-3	17" x 30"	66PBCC238	N36T72	E6B-C-ED	10117670

^{a/} Brooks Products (formerly Carson-Brooks)

^{b/} Old Castle Enclosure Solutions is the parent company of Christy Concrete

^{c/} Limited to streetlight use

Table FC 600–2: Plastic (HDPE) — Cover

Item Number	Nominal Size (Inside)	Manufacturers' Reference Numbers		SAP
		New Basis ^{a/}	Carson Industries ^{b/}	
HC-4 ^{c/}	10'-6" x 17"	SEC1419EDEH0	1419**-4HYE60OU0	10117477
HC-5	13" x 24"	SEC1324EDAA0	1324**-3AYE60GU0	10117485
HC-6	17" x 30"	SEC1730EDAA0	1730**-3AYE60GU0	10117671

^{a/} New Basis (formerly Associated Plastics)

^{b/} Old Castle Enclosure Solutions is the parent company of Carson Industries (formerly Carson-Brooks)

^{c/} Limited to streetlight use

Table FC 600–3: FPR and RPM — Cover

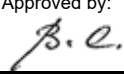
Fiberglass Reinforced Plastic (FRP), Polymer Concrete (RPM)						
Item Number	Nominal Size (Inside)	Rating	Manufacturers' Reference Numbers			SAP
			Armorcast Products	CDR Systems ^{a/}	Quazite Corp. ^{b/}	
HC-7	13" x 24"	Parkway	A6001866-ED	C10132402A0C4	PG1324CA00C4L	10117409
HC-8	17" x 30"	Parkway	A6001643-ED	C10173002A0C4	PG1730CA00C4L	10117414
HC-9	13" x 24"	Light Traffic	A6001969-ED	C12132402A0C4	–	10117486
HC-10	17" x 30"	Light Traffic	A6001947-ED	C12173002A0C4	–	10117469

^{a/} Hubbell Power Systems is the parent company of CDR Systems.

^{b/} Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company — P&C)

Note(s):

1. Due to variations between manufacturers, replacement covers should be chosen to match the manufacturer of the box or previous cover.

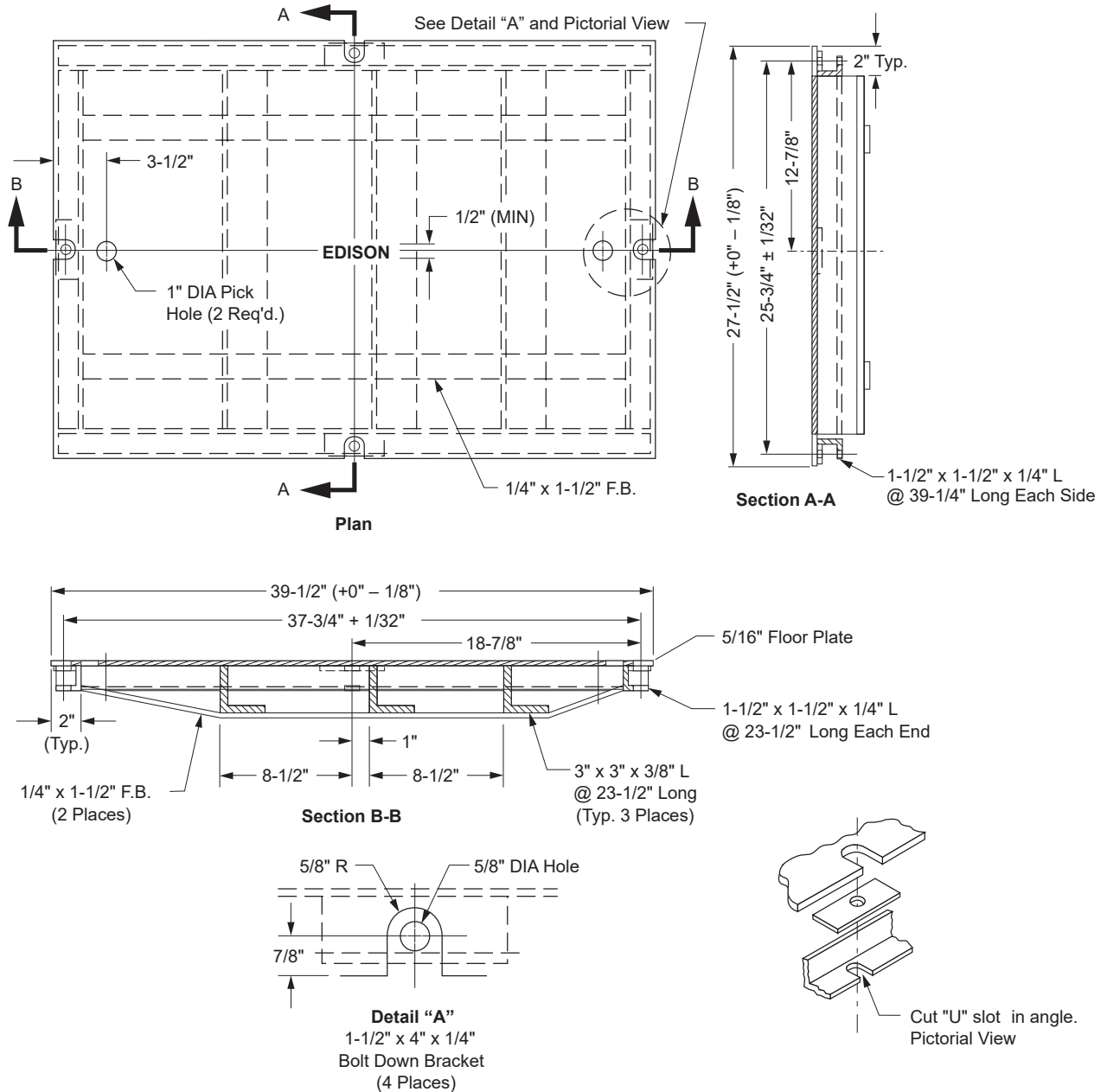
Approved by: 	Handhole Covers	FC 600
Effective Date: 10-24-2014	What's Changed? Table FC 600–1, Table FC 600–2, and Table FC 600–3 SAP Numbers added. Parent company notes also added.	Sheet 1 of 1 UGS

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FC 601 24" x 36" Steel Pull Box Cover — Light Traffic

Scope FC 601.1 Fabricated 24" x 36" Steel Pull Box Cover for Light Traffic Installations

Figure FC 601-1: Fabricated 24" x 36" Steel Pull Box Cover for Light Traffic Installations



Note(s):

1. Four 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable.
3. Cover to be hot dip galvanized per ASTM A123 after fabrication.
4. Cover to be marked with model number on underside.
5. Cover frame: See FC 603.
6. All welds will be designed to meet H-20 traffic loading.

Approved by:

B. C.

24" x 36" Steel Pull Box Cover — Light Traffic

FC 601

Sheet 1 of 1

Effective Date:

10-23-2015

What's Changed? Note 3 was updated for clarity.

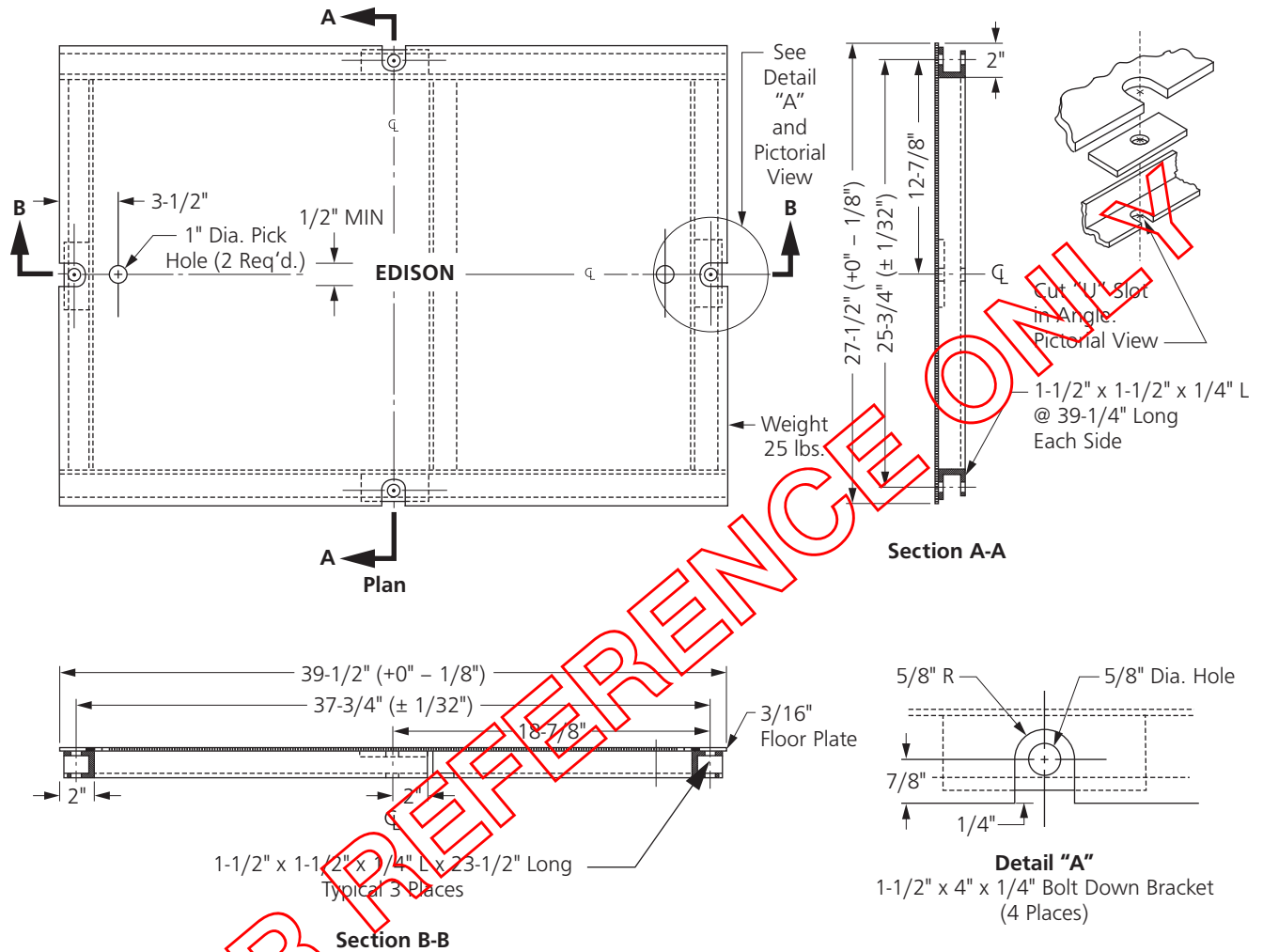
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FC 602 24" x 36" Steel Pull Box Cover — Parkway

Scope FC 602.1 24" x 36" Steel Pull Box Cover — Parkway

Figure FC 602-1: 24" x 36" Steel Pull Box Cover — Parkway



Note(s):

1. Four 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. Cover will be subjected to a degreasing, derusting, and etching process and then covered with one coat of Subalox #511FD primer and then one coat of Subox #5FD light gray paint. Paint of equal quality may be substituted if Company approval is obtained. The dip method is preferred. Hot dip galvanizing is an acceptable alternate to painting.
3. Cover to be marked with model number on underside.
4. Cover frame: See FC 603.

Approved by:

PhH

24" x 36" Steel Pull Box Cover — Parkway

FC 602

Sheet 1 of 1

Effective Date:

05-16-2005

What's Changed?

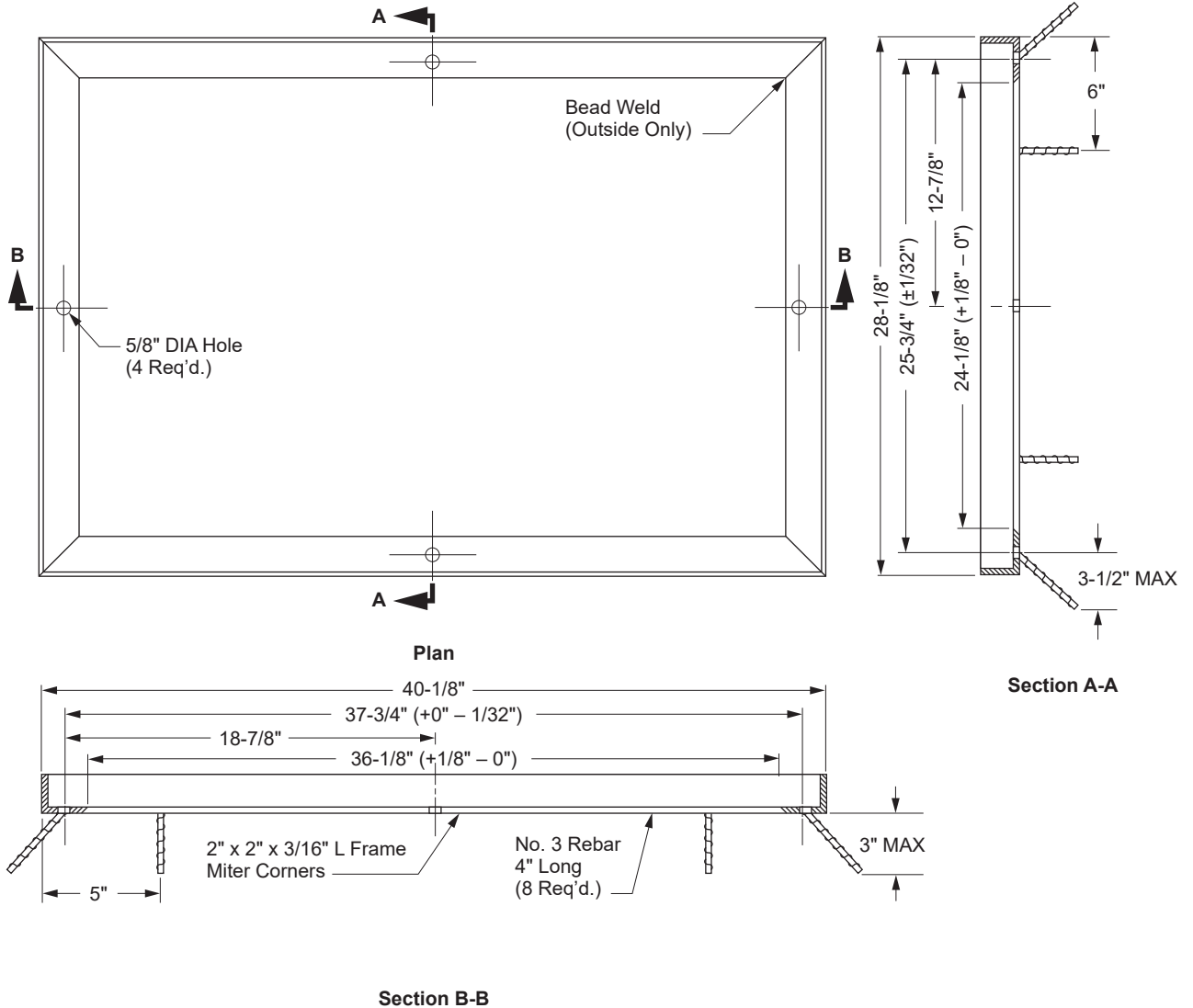
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FC 603 24" x 36" Steel Pull Box Frame

Scope FC 603.1 24" x 36" Steel Pull Box Frame for Cover FC 601 (Steel: Light-traffic) — FC 618 (RPM Parkway)

Figure FC 603-1: 24" x 36" Steel Pull Box Frame



Note(s):

1. Frame to be marked with model number.
2. Frame to be hot dipped galvanized after fabrication.
3. Frame for use with cover [FC 601](#) (Steel: Light-Traffic) and [FC 618](#) (RPM: Parkway).

Approved by:

PhH

24" x 36" Steel Pull Box Frame

FC 603

Sheet 1 of 1

Effective Date:

05-16-2005

What's Changed?

UGS

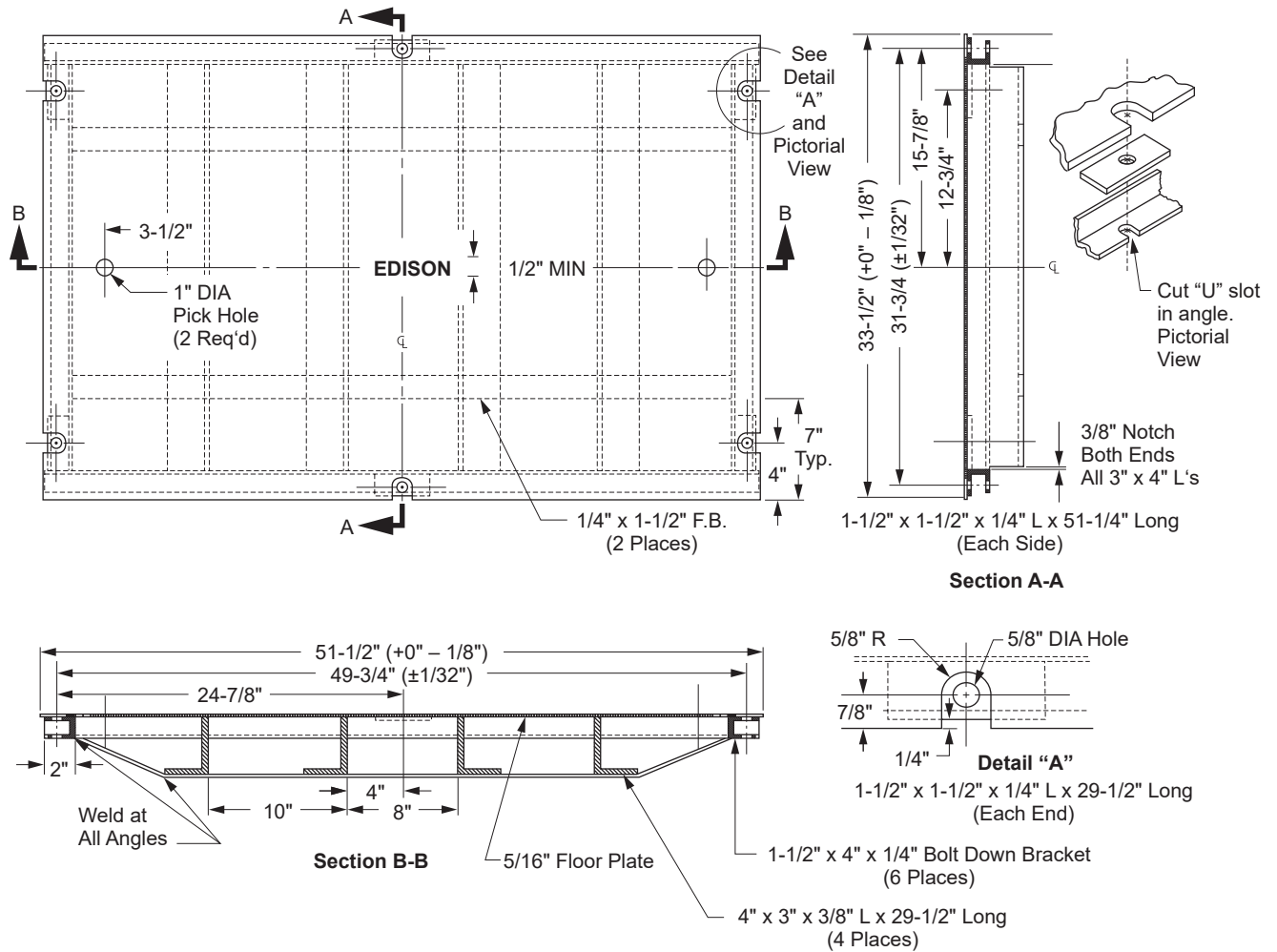
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FC 606 30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)

Scope FC 606.1 30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)

Figure FC 606-1: 30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)



Approved by:

B.C.

30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)

FC 606

Effective Date:

10-23-2015

What's Changed? Note 3 was updated for clarity.

Sheet 1 of 1

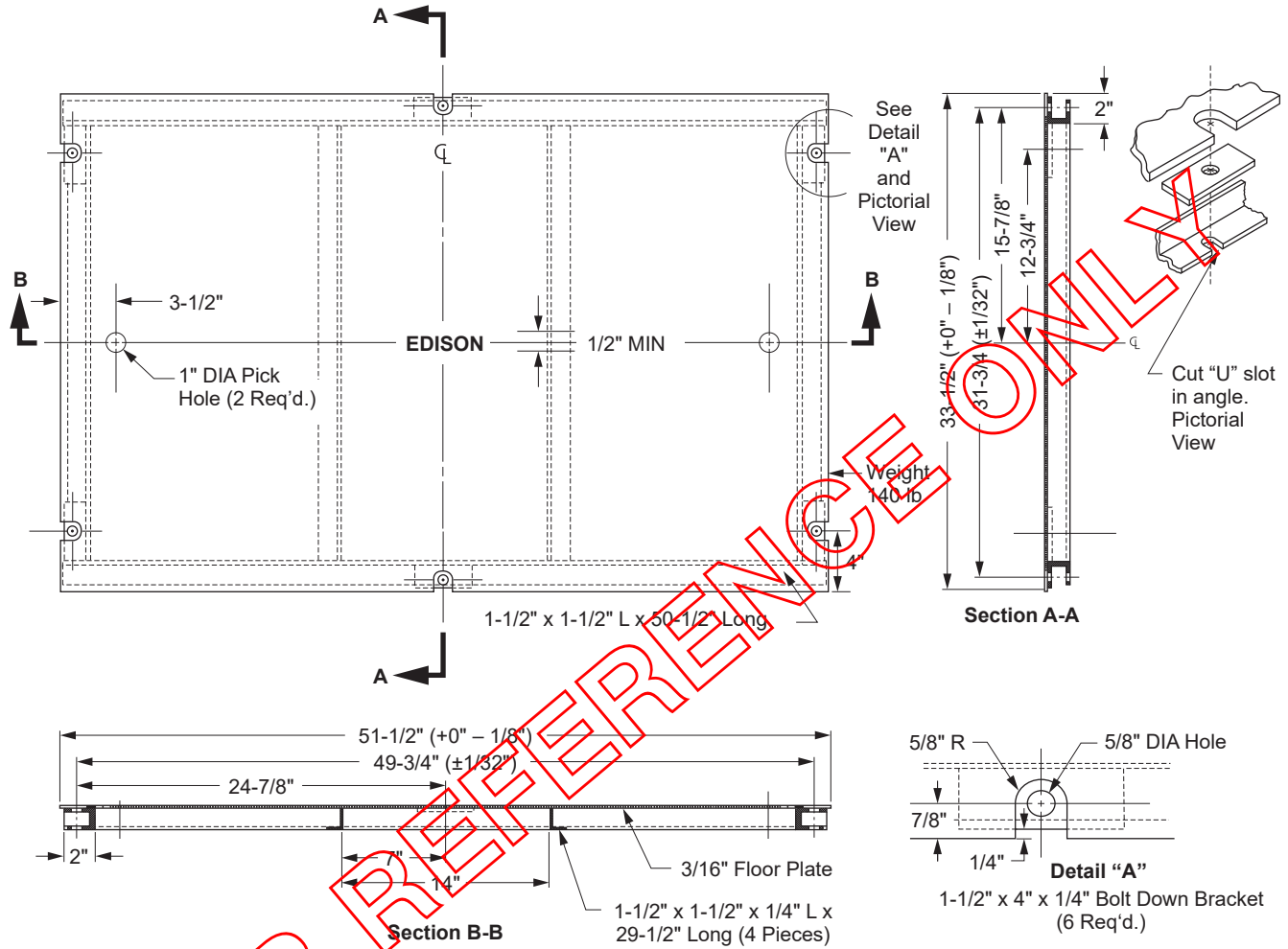
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FC 607 30" x 48" Steel Pull Box Cover — Parkway

Scope FC 607.1 30" x 48" Steel Pull Box Cover — Parkway

Figure FC 607-1: 30" x 48" Steel Pull Box Cover — Parkway



Note(s):

1. Six 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. Cover will be subjected to a degreasing, derusting, and etching process and then covered with one coat of Subalox #511FD primer and then one coat of Subox #5FD light gray paint. Paint of equal quality may be substituted if Company approval is obtained. The dip method is preferred. Hot dip galvanizing is an acceptable alternate to painting.
3. Cover to be marked with model number on underside.
4. Cover frame: See FC 608.

Approved by:

PhH

30" x 48" Steel Pull Box Cover — Parkway

FC 607

Sheet 1 of 1

Effective Date:
05-16-2005

What's Changed?

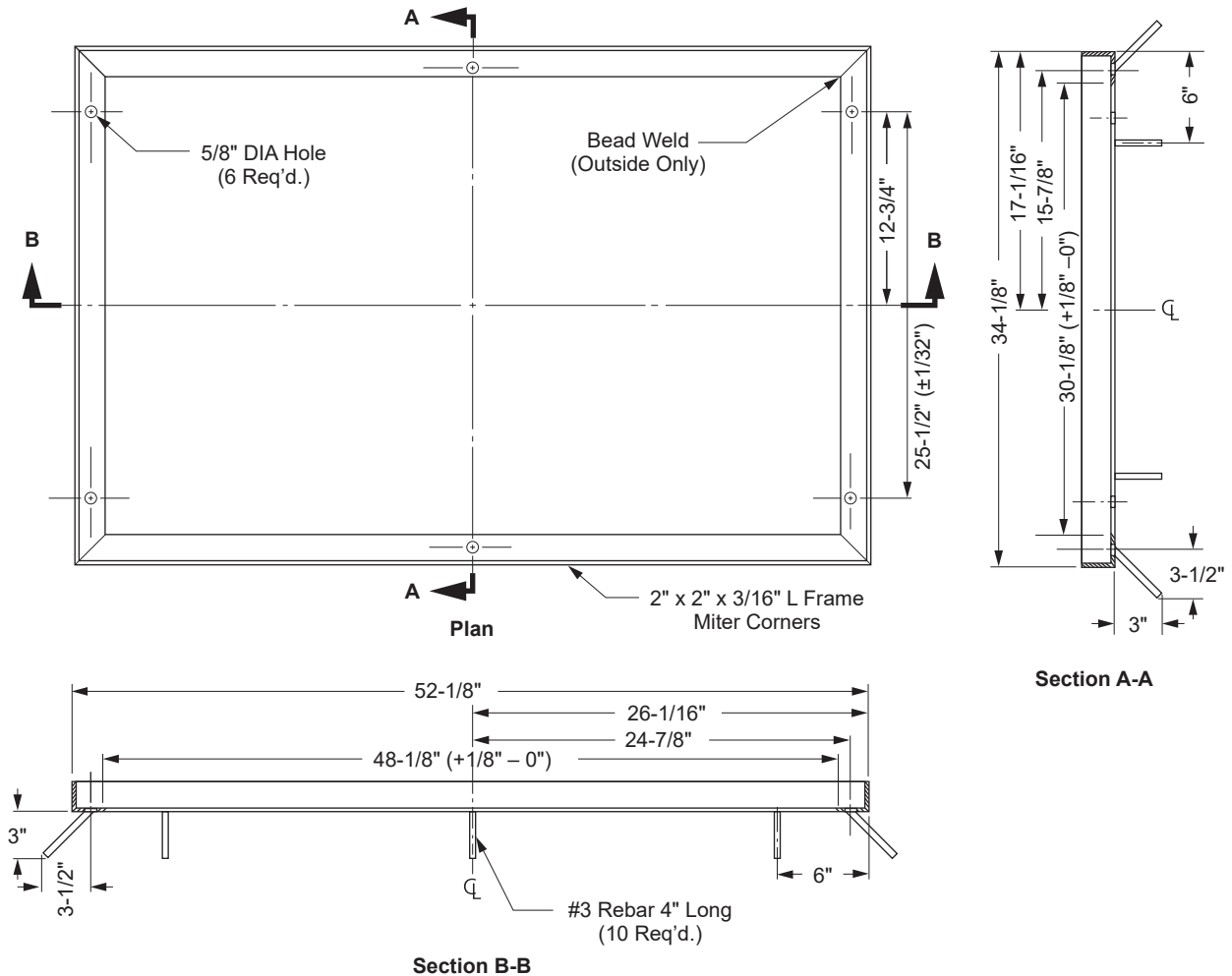
UGS

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FC 608 30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)

Scope FC 608.1 30" x 48" Steel Pull Box Frame

Figure FC 608-1: 30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)



Note(s):

1. Frames to be marked with model number
2. Frames to be hot dipped galvanized after fabrication

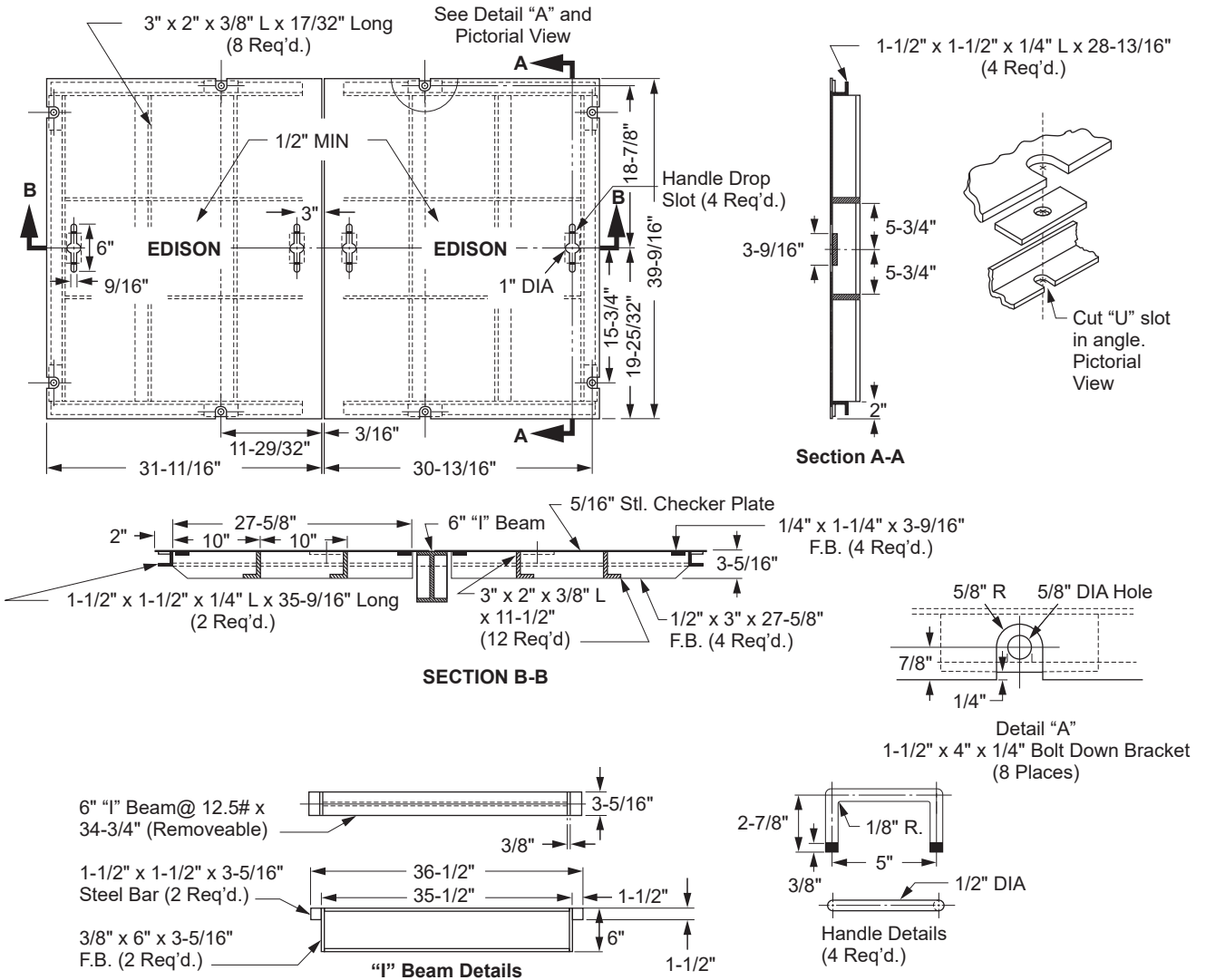
Approved by: <i>PhH</i>	30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)	FC 608
Effective Date: 05-16-2005	What's Changed?	Sheet 1 of 1
		UGS

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FC 612 36" x 60" Steel Pull Box Cover — Light Traffic (Two Piece)

Scope FC 612.1 Fabricated 36" x 60" Steel Pull Box Cover for Light Traffic Installations (Two Piece)

Figure FC 612–1: Fabricated 36" x 60" Steel Pull Box Cover for Light Traffic Installations (Two Piece)



Note(s):

1. Eight 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable.
3. Cover to be hot dip galvanized per ASTM A123.
4. Cover to be marked with model number on underside.
5. Cover frame: See FC 614.
6. All welds will be designed to meet H-20 traffic loading.

Approved by:

B.C.

36" x 60" Steel Pull Box Cover — Light Traffic (Two Piece)

FC 612

Sheet 1 of 1

Effective Date:

10-23-2015

What's Changed? Note 3 was updated for clarity.

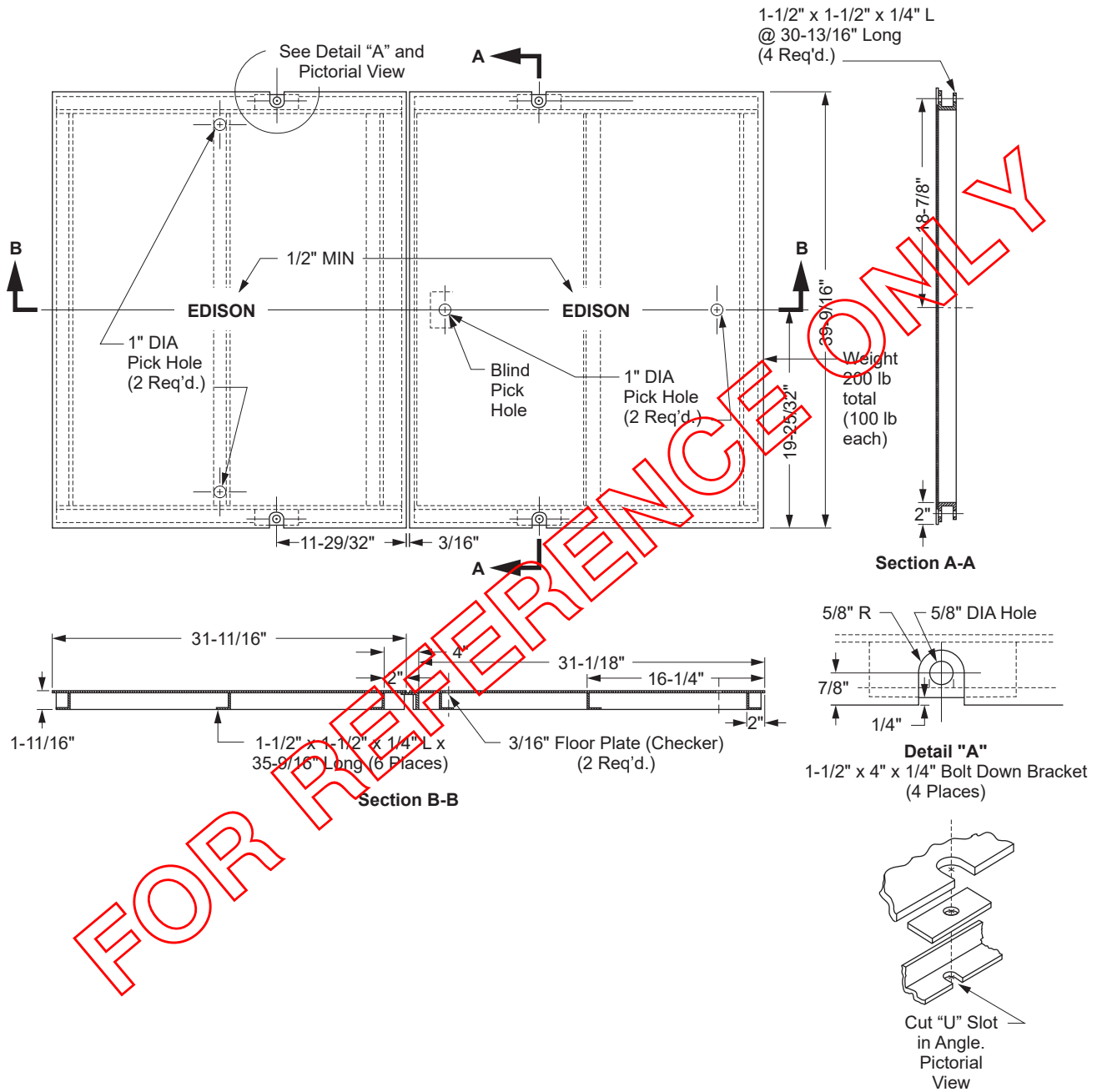
UGS

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FC 613 36" x 60" Steel Pull Box Cover — Parkway (Two Piece)

Scope FC 613.1 36" x 60" Steel Pull Box Cover — Parkway (Two Piece)

Figure FC 613-1: 36" x 60" Steel Pull Box Cover — Parkway (Two Piece)



Note(s):

1. Four 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable. (Fit either side).

Approved by:

PHH

36" x 60" Steel Pull Box Cover — Parkway (Two Piece)

FC 613

Sheet 1 of 2


Effective Date:
05-16-2005

What's Changed?

UGS

3. Cover will be subjected to a degreasing, derusting, and etching process and then covered with one coat of Subalox #511FD primer and then with one coat of Subalox #4 medium gray heavy duty paint. Paint of equal quality may be substituted if Company approval is obtained. The dip method is preferred. Hot dip galvanizing is an acceptable option to painting.
4. Covers to be marked with model numbers on underside.
5. Cover frame: See [FC 614](#)

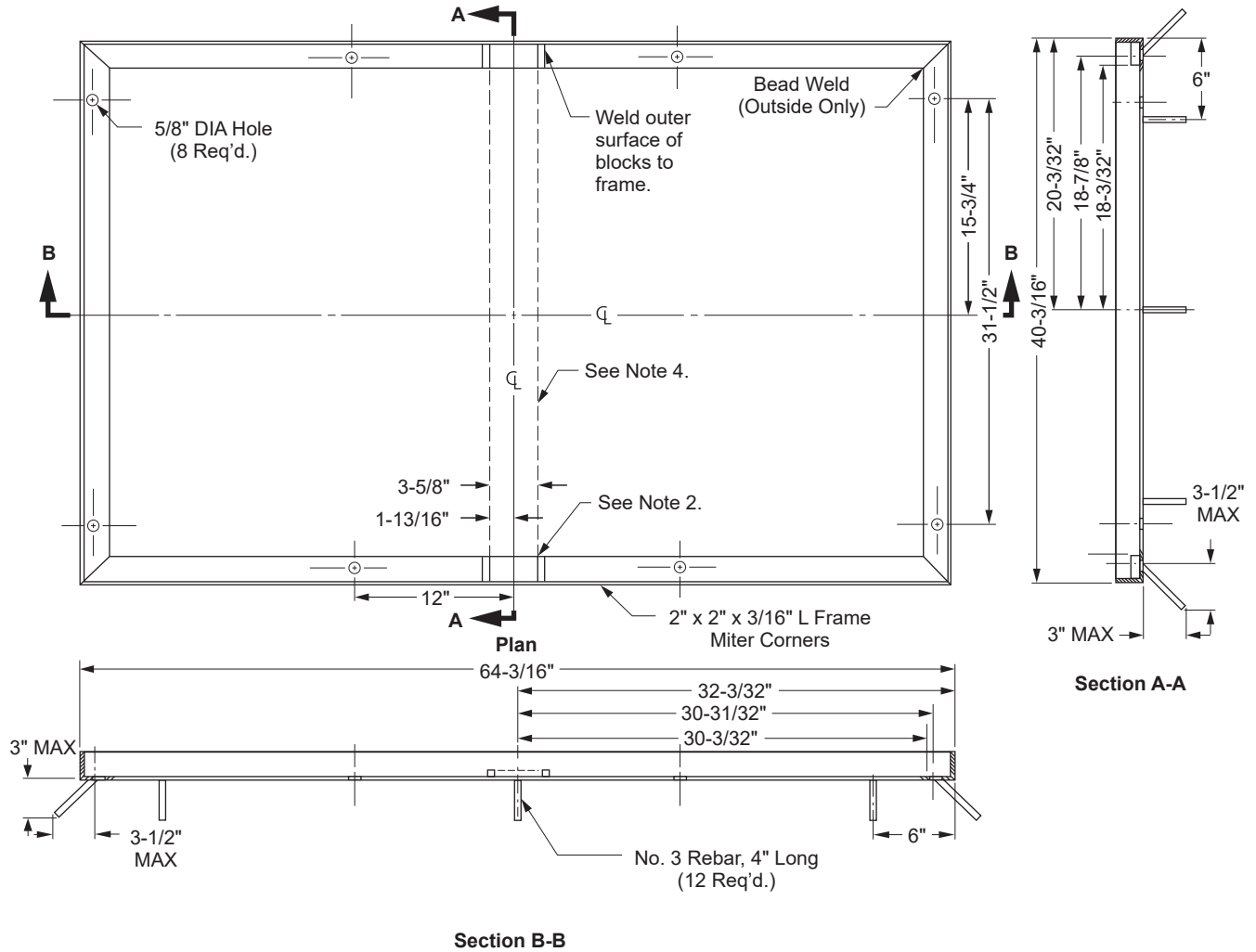
FOR REFERENCE ONLY

FC 613	36" x 60" Steel Pull Box Cover — Parkway (Two Piece)	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 05-16-2005
UGS		

FC 614 36" x 60" Steel Pull Box Frame for Covers UGS 612 (Steel Light — Traffic) — FC 618 (RPM Parkway)

Scope FC 614.1 36" x 60" Steel Pull Box Frame

Figure FC 614-1: 36" x 60" Steel Pull Box Frame for Covers UGS 612 (Steel Light — Traffic) — FC 618 (RPM Parkway)



Note(s):

1. Frames to be marked with model number
2. "I" beam guide blocks are 1/2" x 1/2" x 1-3/4" long. Guide blocks are to be used on frames furnished with light-traffic type covers or with RPM covers.
3. Frames to be hot dipped galvanized after fabrication.
4. Frames to be used with RPM covers must have a removable cross beam for center support.

Approved by:

PHH

36" x 60" Steel Pull Box Frame for Covers UGS 612 (Steel Light — Traffic) — FC 618 (RPM Parkway)

FC 614

Sheet 1 of 1

Effective Date:

05-16-2005

What's Changed?

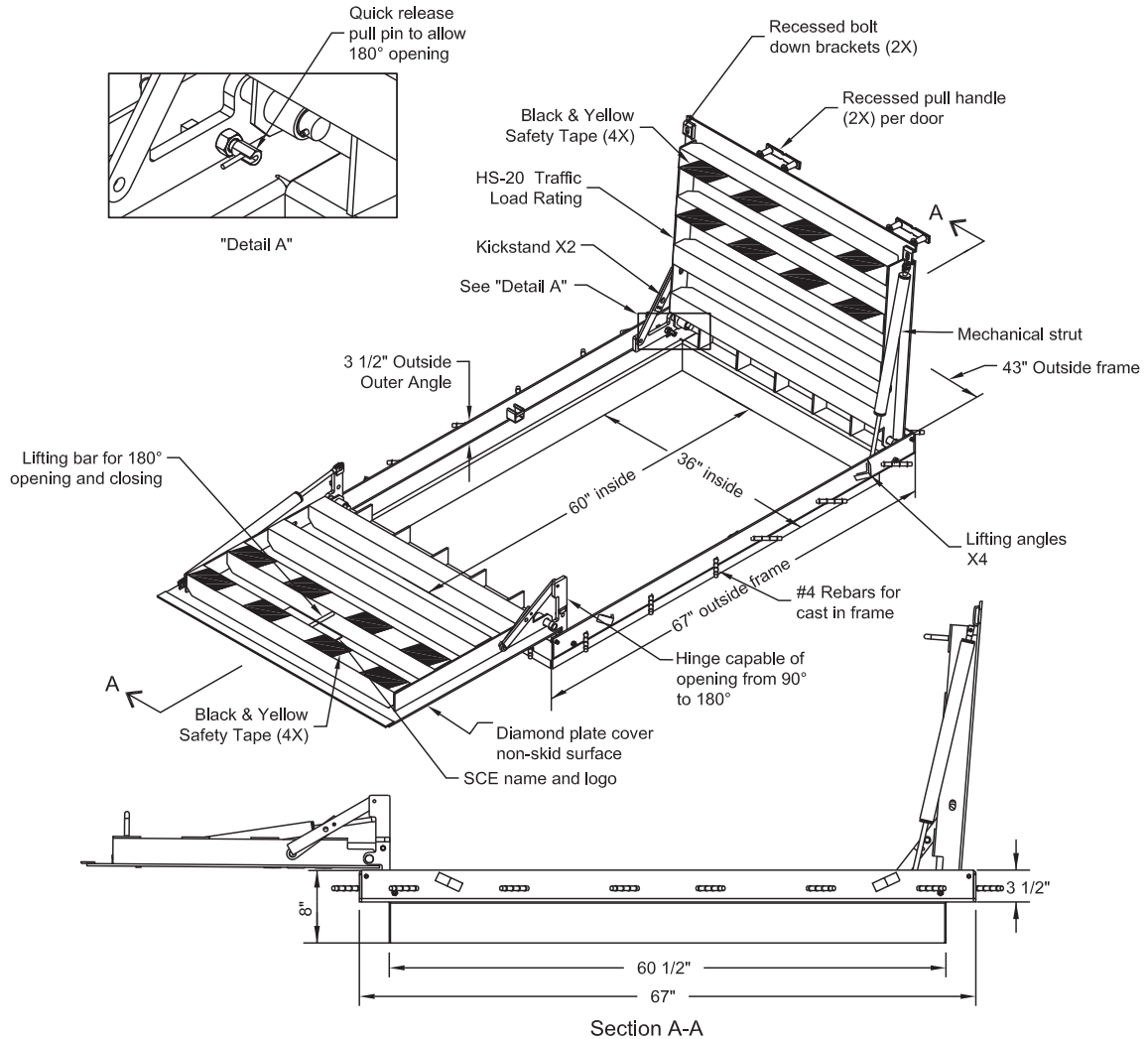
UGS

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FC 615 36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic

Scope FC 615.1 36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic

Figure FC 615-1: 36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic



Note(s):

1. Cover Notes:
 - a. Covers to be used with frame, clearance between cover and frame shall be 3/16" all around.
 - b. Four (4) 1/2-13 NC x 1-1/2" Penta Head stainless steel bolts per cover.
 - c. Steel cover plate shall be ASTM A-36 manufactured with 1/4" thick plate.
 - d. Cover is to be hot-dip galvanized after fabrication.
 - e. All manufacturer's cover to be interchangeable.
2. Frame Notes
 - a. Steel frames shall be ASTM A-36.
 - b. Frames shall be hot-dip galvanized after fabrication.
3. Design Criteria
 - a. All frames and shapes shall be ASTM A-36.
 - b. HS-20 load condition per AASHTO and ASTM C857.
 - c. Load impact: 30% minimum.
 - d. AWS ER70-6 CO gas shielding wire.

Approved by:

RR

36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic

FC 615

Sheet 1 of 1

Effective Date:
01-29-2021

What's Changed? 36" X 60" Lift Assist Steel Pullbox cover updates

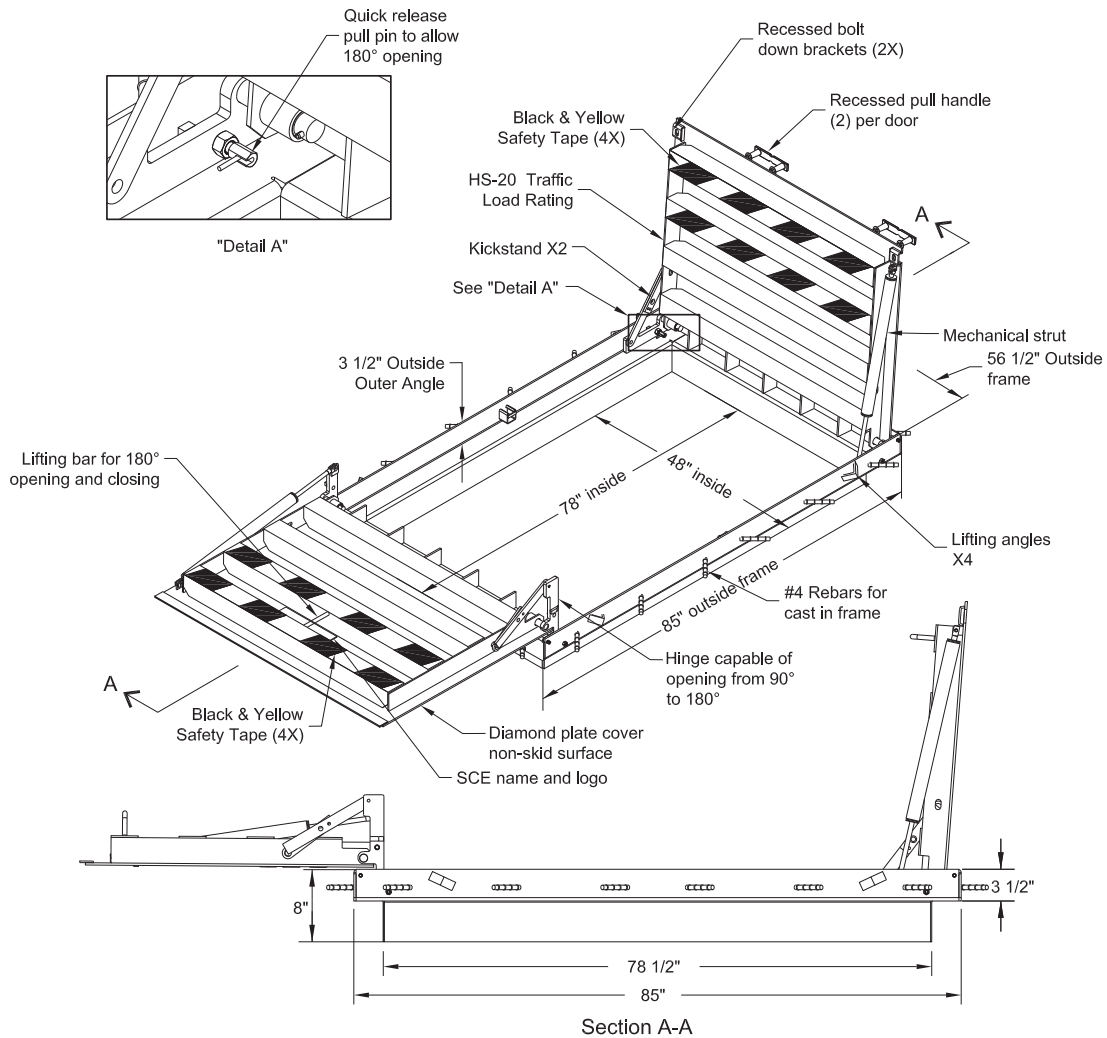
UGS

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FC 616 48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic

Scope FC 616.1 48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic

Figure FC 616-1: 48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic



Note(s):

1. Cover Notes:
 - a. Covers to be used with frame, clearance between cover and frame shall be 3/16" all around.
 - b. Four (4) 1/2-13 NC x 1-1/2" Penta Head stainless steel bolts per cover.
 - c. Steel cover plate shall be ASTM A-36 manufactured with 1/4" thick plate.
 - d. Cover is to be hot-dip galvanized after fabrication.
 - e. All manufacturer's cover to be interchangeable.
2. Frame Notes
 - a. Steel frames shall be ASTM A-36.
 - b. Frames shall be hot-dip galvanized after fabrication.
3. Design Criteria
 - a. All frames and shapes shall be ASTM A-36.
 - b. HS-20 load condition per AASHTO and ASTM C857.
 - c. ASTM C 1802-18b, Load Level 6.
 - d. Load impact: 30% minimum.
 - e. AWS ER70-6 CO gas shielding wire.

Approved by:

RR

48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic

FC 616

Sheet 1 of 1

Effective Date:
07-30-2021

What's Changed? Corrected Standard Number to FC 616.

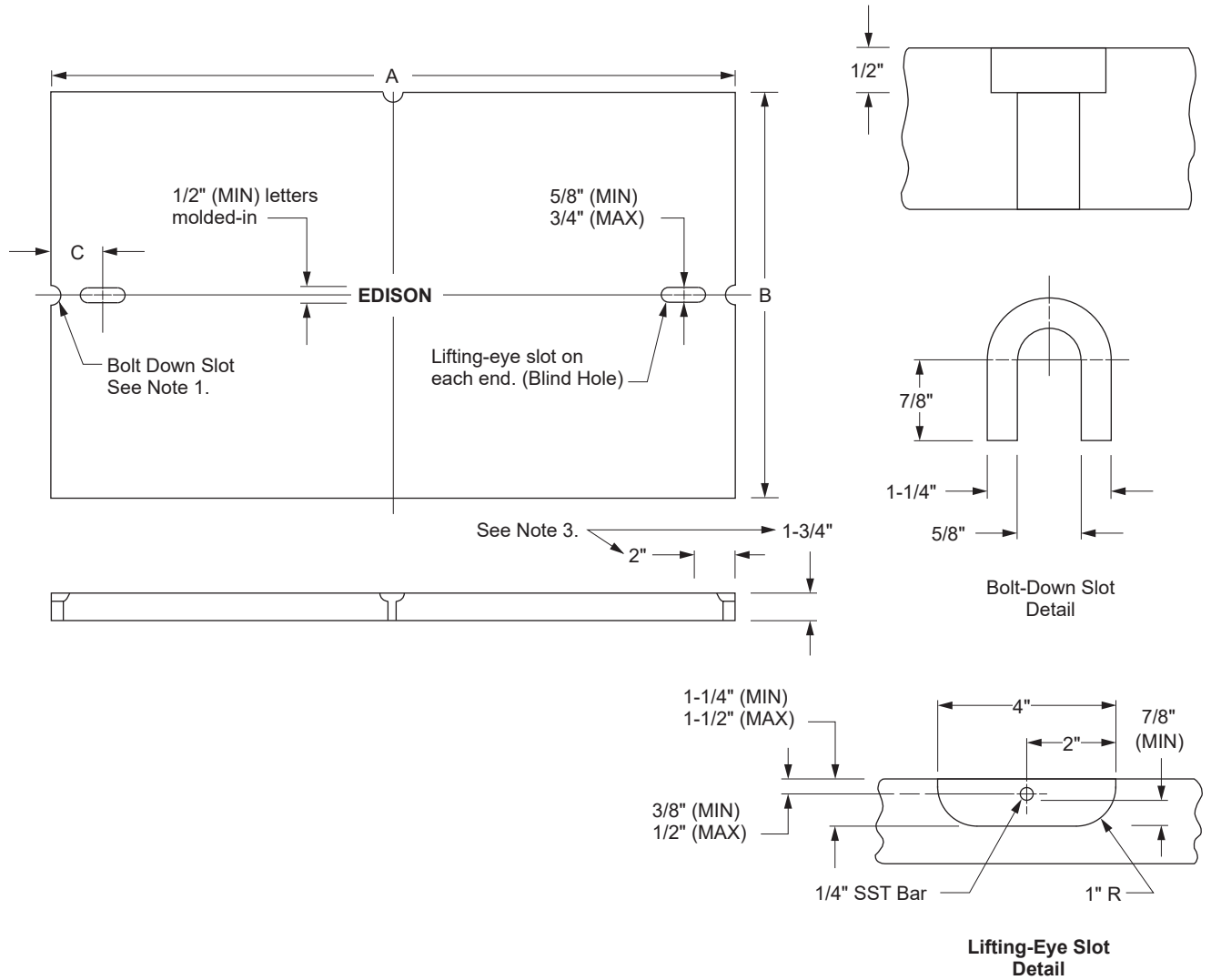
UGS

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FC 618 Polymer Concrete (RPM) Pull Box Covers — Parkway

Scope FC 618.1 Polymer Concrete (RPM) Pull Box Covers — Parkway

Figure FC 618-1: Polymer Concrete (RPM) Pull Box Cover



Approved by:

RR

Polymer Concrete (RPM) Pull Box Covers — Parkway

FC 618

Sheet 1 of 2

Effective Date:
04-24-2020

What's Changed?

UGS

Table FC 618–1: Polymer Concrete (RPM) Pull Box Cover Data

Size	A	B	C	MAX Wt. Lb	Cover Bolts
2' x 3'	39-1/2"	27-1/2"	5"	75	4
2-1/2' x 4'	51-1/2"	33-1/2"	5"	80	6
3' x 5' ^{a/}	63-9/16"	39-1/2"	5"	75	2 EA (4 Total)

^{a/} 3' x 5' cover is supplied in 2 pieces (31-3/4" x 39-1/2" ea.)
Lifting-eye slot should be in narrow end — 2 required in each piece. Covers to be designed to fit on removable cross beam in center. See FC 614. Quazite uses tongue and groove covers so their box does not need the center support beam.

Note(s):

1. Bolt down slots to be located the same as on parkway steel covers.
2. 1/2" x 2-1/2" SS penta head bolts with captive steel washers to be furnished with each cover.
3. All covers will be 1-3/4" thick at ends and sides for a minimum of 2" back from the outer cover perimeter.
4. Manufacturers' covers are to be interchangeable, except Quazite.
5. Approved Manufactures:
 - a. Armorcast Products Co.
 - b. Jensen Precast
 - c. Quazite
 - d. Oldcastle Infrastructure

FC 618

Polymer Concrete (RPM) Pull Box Covers — Parkway

Approved by:

RR

Sheet 2 of 2

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.

Effective Date:

04-24-2020

UGS

FC 619 Pull Box Cover and Frame: Manufacturers' and SAP Numbers

Scope FC 619.1 Pull Box Cover and Frame: Manufacturers' and SAP Numbers

Table FC 619-1: Pull Box — RPM Covers (Parkway)

Item Number	Nominal Size (Inside)	Manufacturers' Reference Numbers				SAP
		Oldcastle Infrastructure	Jensen Precast ^{a/}	Armorcast	Quazite ^{b/}	
PC-1	2' x 3'	23 Cover RPM	12-20-10	A6001670-ED	PG2436HA00C4L	10117496
PC-2	2'-6" x 4'	264 Cover RPM	12-20-23	A6001671-ED	PG3048HA00C4L	10117497
PC-3	3' x 5'	35 Cover RPM	12-20-42	A6001672-ED	PG3660HA00C4P	10117498

^{a/} Jensen Precast (formerly Brooks Products)

^{b/} Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company P&C)

Table FC 619-2: Pull Box — Steel and Cast Iron Covers (Light Traffic and Full Traffic)

Item Number	Nominal Size (Inside)	Rating ^{a/}	Manufacturers' Reference Numbers		SAP
			Oldcastle Infrastructure	Jensen Precast ^{b/}	
PC-4	2' x 3'	(LT)	23 Cover Steel	SC2436-TRG	10117513
PC-5	2'-6" x 4'	(LT)	264 Cover Steel	SC3048-TRG	10117499
PC-6	2'-6" x 4'	(FT)	264 Cover Cast	08-10-20, 08-10-21	10117501
PC-7	3' x 5'	(LT)	35 Cover Steel	SC3660-TRG	10117500


^{a/} (LT) — Light Traffic, (FT) — Full Traffic

^{b/} Jensen Precast (formerly Brooks Products)

Table FC 619-3: Replacement Pull Box Cover Frame — 6" Precast Concrete with Steel Frame

Item Number	Pull Box Size	Manufacturers' Reference Numbers		SAP
		Oldcastle Infrastructure	Jensen Precast ^{a/}	
PC-8	2' x 3'	23-06TX	PB2436-T6E	10117502
PC-9	2'-6" x 4'	264-06TX	PB3048-T6E	10117503
PC-10	3' x 5'	35-06TX	PB3660-T6E	10117504

^{a/} Jensen Precast (formerly Brooks Products)

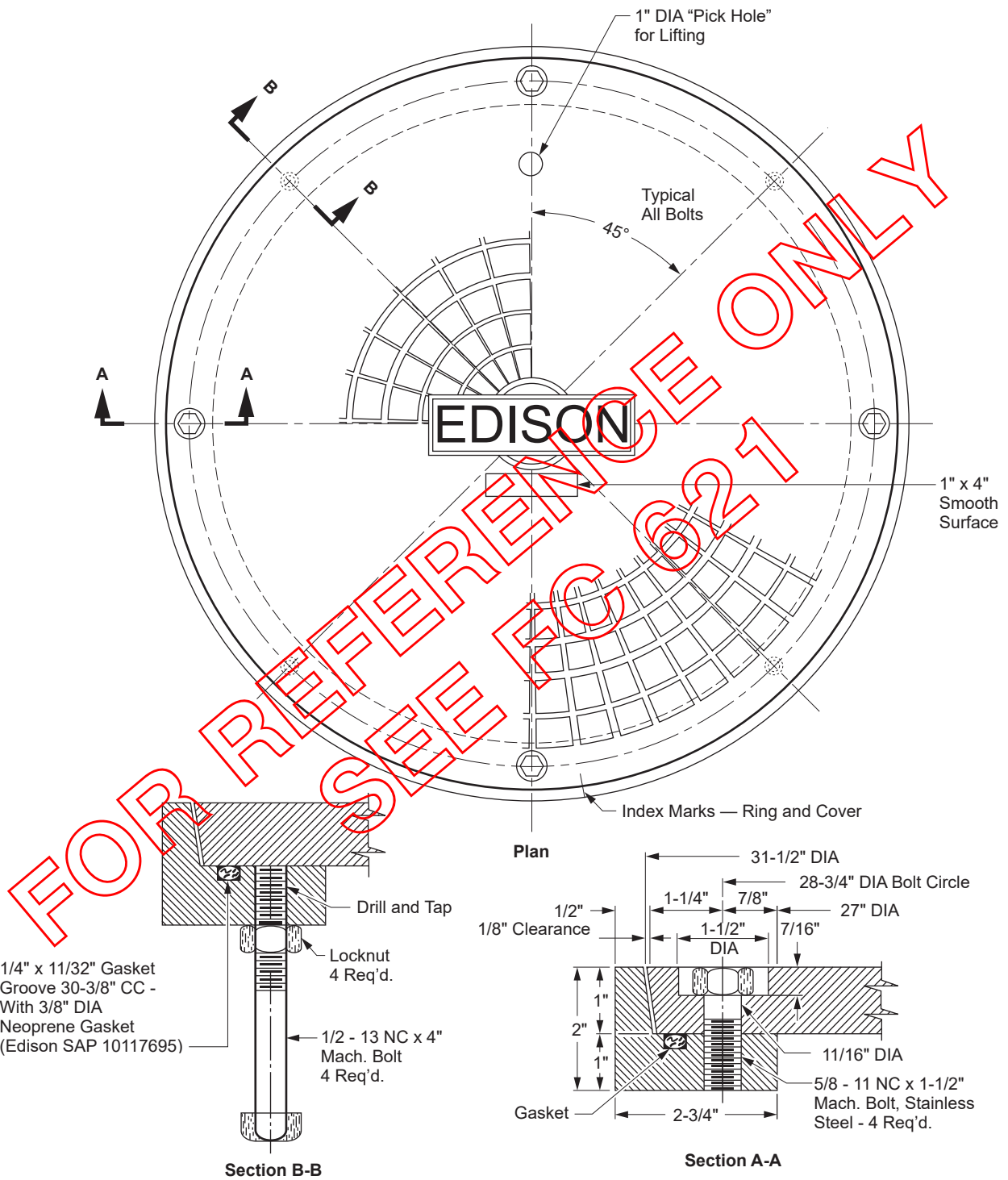
Approved by: 	Pull Box Cover and Frame: Manufacturers' and SAP Numbers	FC 619
Effective Date: 04-24-2020	What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure. Utility Vault Co. parent company note removed.	Sheet 1 of 1 UGS

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FC 620 27" and 30" Round Manhole Cover and Ring

Scope FC 620.1 27" and 30" Round Manhole Cover and Ring

Figure FC 620-1: 27" and 30" Round Manhole Cover and Ring



Approved by:

PhH

27" and 30" Round Manhole Cover and Ring

FC 620

Effective Date:

What's Changed?

Sheet 1 of 1

05-16-2005

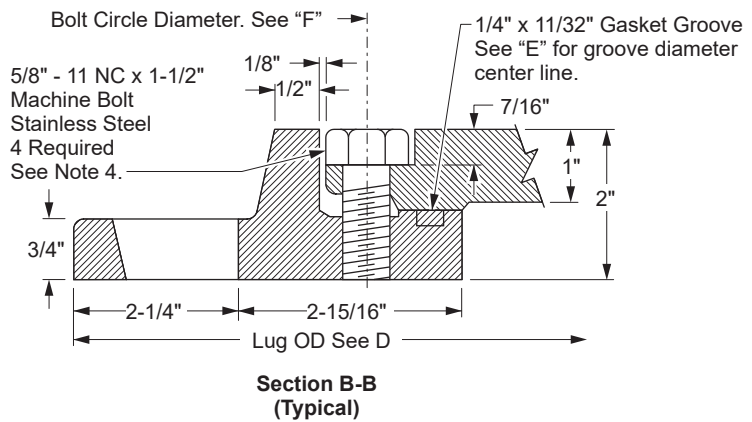
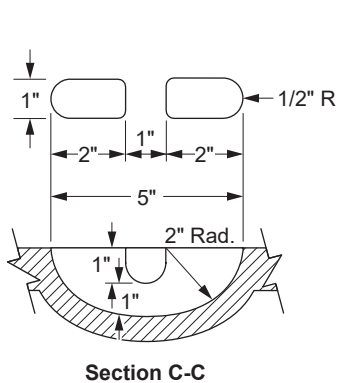
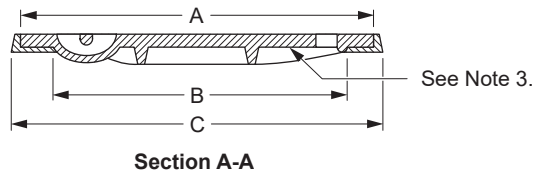
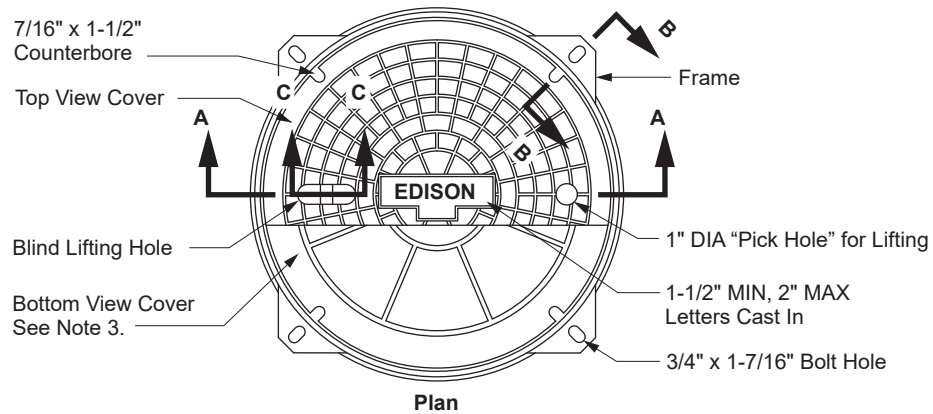
UGS

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FC 621 30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading

Scope FC 621.1 30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading

Figure FC 621-1: 30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading



Note(s):

1. Standard manhole cover/frame size is 30".
2. 27" cast-iron manhole covers are only available for replacement purposes.
3. All cast-iron manhole covers shall have ribs.
4. Covers will be furnished with: stainless steel bolts, gasket, and pick hole plug. All items will be Edison approved. O-Ring gasket will be 3/8" diameter rubber material conforming to the material and physical requirements of ASTM C443 standard gaskets. Pick hole plugs (R&D Co. #PHP002) are available from Wesco, Santa Fe Springs, CA

Approved by:

PhH

30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading

FC 621

Sheet 1 of 2

Effective Date:
04-27-2007

What's Changed? Note 3 changed to reflect that all manhole covers shall be ribbed.

UGS

► SCE Public ◀

Table FC 621–1: Cast Iron Manhole Covers

Manhole Cover Size	Dimensions — Inches						Cover Weights	Alhambra Foundry Catalog No.	Hern Iron Works Catalog No.	Neeah Foundry Co.	D&L Foundry Inc.
	A	B	C	D	E	F					
27"	31-1/8	27-1/8	33	37-1/2	28-5/16	29-7/8	205 lb	A-1105-MOD	—	—	—
30"	34-1/8	30-1/8	36	40-1/2	31-5/16	32-7/8	290 lb	A-1106-MOD	2777	R-1581	A-1108

= For Reference Only

FC 621

30" Round Cast Iron Manhole Cover and Frame — HS-20 Loading

Approved by:

PHH

Sheet 2 of 2

What's Changed? The table referencing cast iron manhole covers is also updated to reflect that flat manhole covers are FRO.

Effective Date:

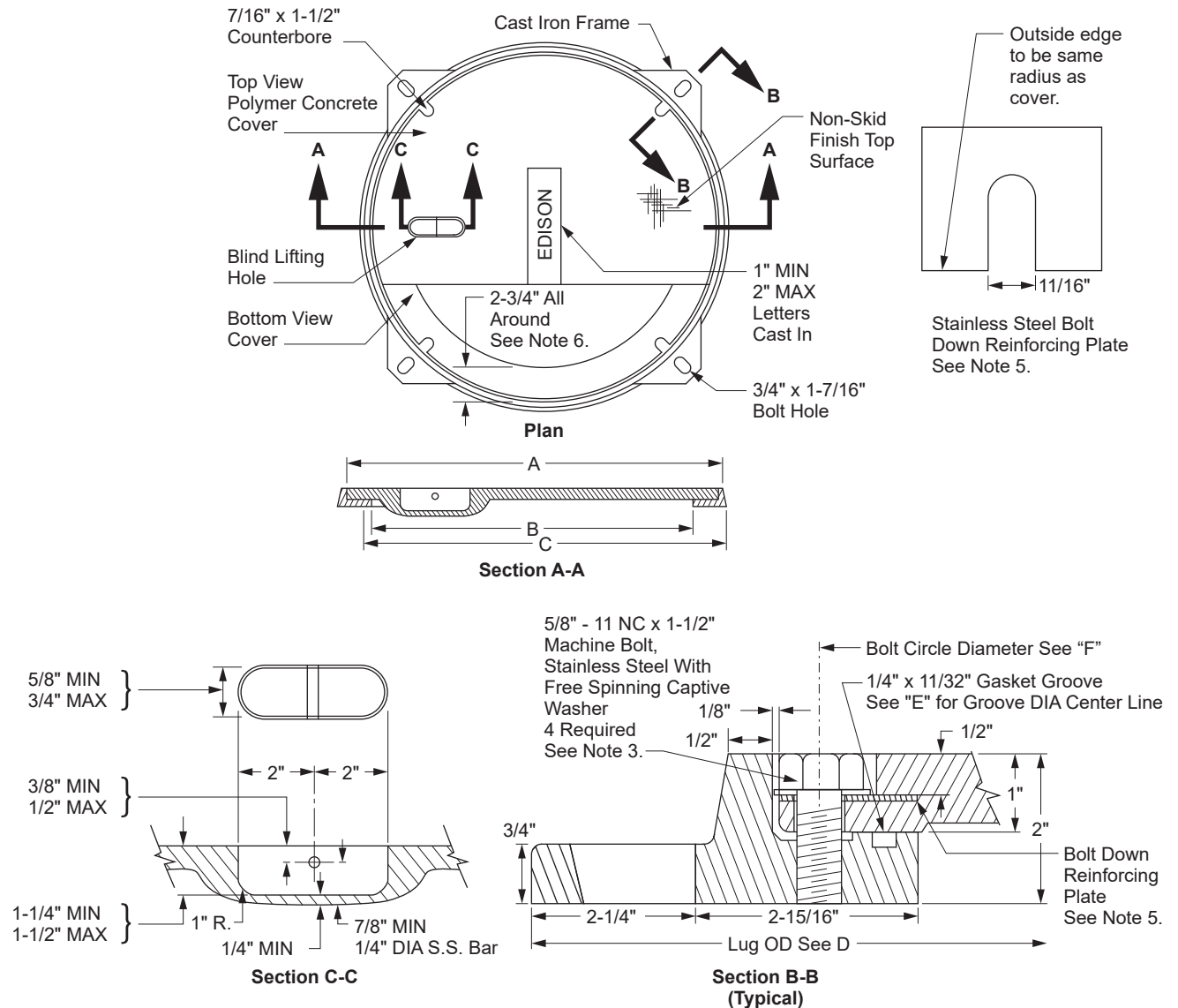
04-27-2007

UGS

FC 622 30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading

Scope FC 622.1 30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading

Figure FC 622-1: 30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading



Note(s):

1. Standard manhole cover/frame size is 30".
2. 27" polymer concrete manhole covers are only available for replacement purposes.
3. Covers will be furnished with stainless steel bolts with captive washers and "T" style gasket. All items will be Edison approved. Stainless steel bolts with captive washers are available from Inwesco Co., Azusa, CA (Cat. #85A84). "T" style gasket (R&D Co. #TG101) is available from Maydwell & Hartzell Co., Los Angeles, CA.
4. Covers will be medium gray in color, similar to natural concrete.
5. Stainless steel reinforcing plates are to be embedded into cover at each bolt down location.
6. Area around perimeter on bottom side of cover will be smooth, flat, and free of any pockets or imperfections.

Approved by: <i>PhH</i>	30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading	FC 622
Effective Date: 05-16-2005	What's Changed?	Sheet 1 of 2
		UGS

Table FC 622-1: Polymer Concrete Manhole Covers

Manhole Cover Size	Dimensions — Inches						Cover Weights	Armorcast
	A	B	C	D	E	F		
27"	31-1/8	27-1/8	33	37-1/2	28-5/16	29-7/8	60 lb	6001951
30"	34-1/8	30-1/8	36	40-1/2	31-5/16	32-7/8	70 lb	6001674

= For Reference Only

FC 622

30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

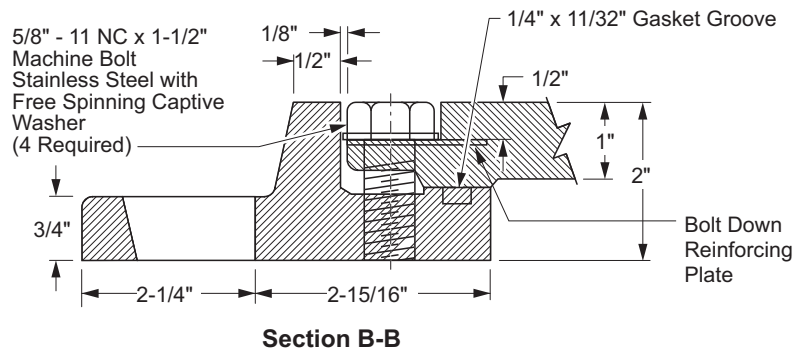
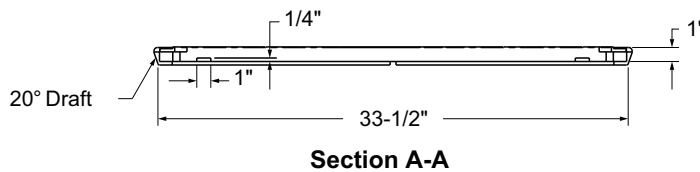
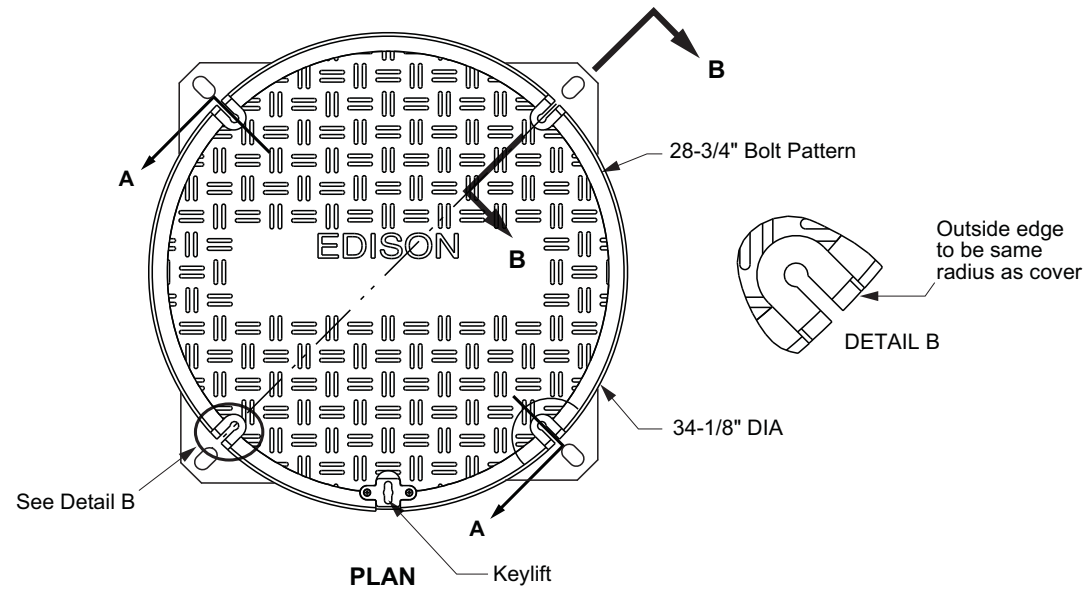
05-16-2005

UGS

FC 623 30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading

Scope FC 623.1 30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading

Figure FC 623–1: 30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading



Note(s):

1. Standard manhole cover/frame size is 30 inches.
2. Covers will be black color, similar to asphalt.
3. Covers may be used in parkways (Non-Traffic) for the following structures: SS 541, SS 564, SS 587, SS 590. (SAP 10205271)

Approved by:

B.C.

30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading

FC 623

Sheet 1 of 1

Effective Date:

10-27-2017

What's Changed? Standard was updated for clarity.

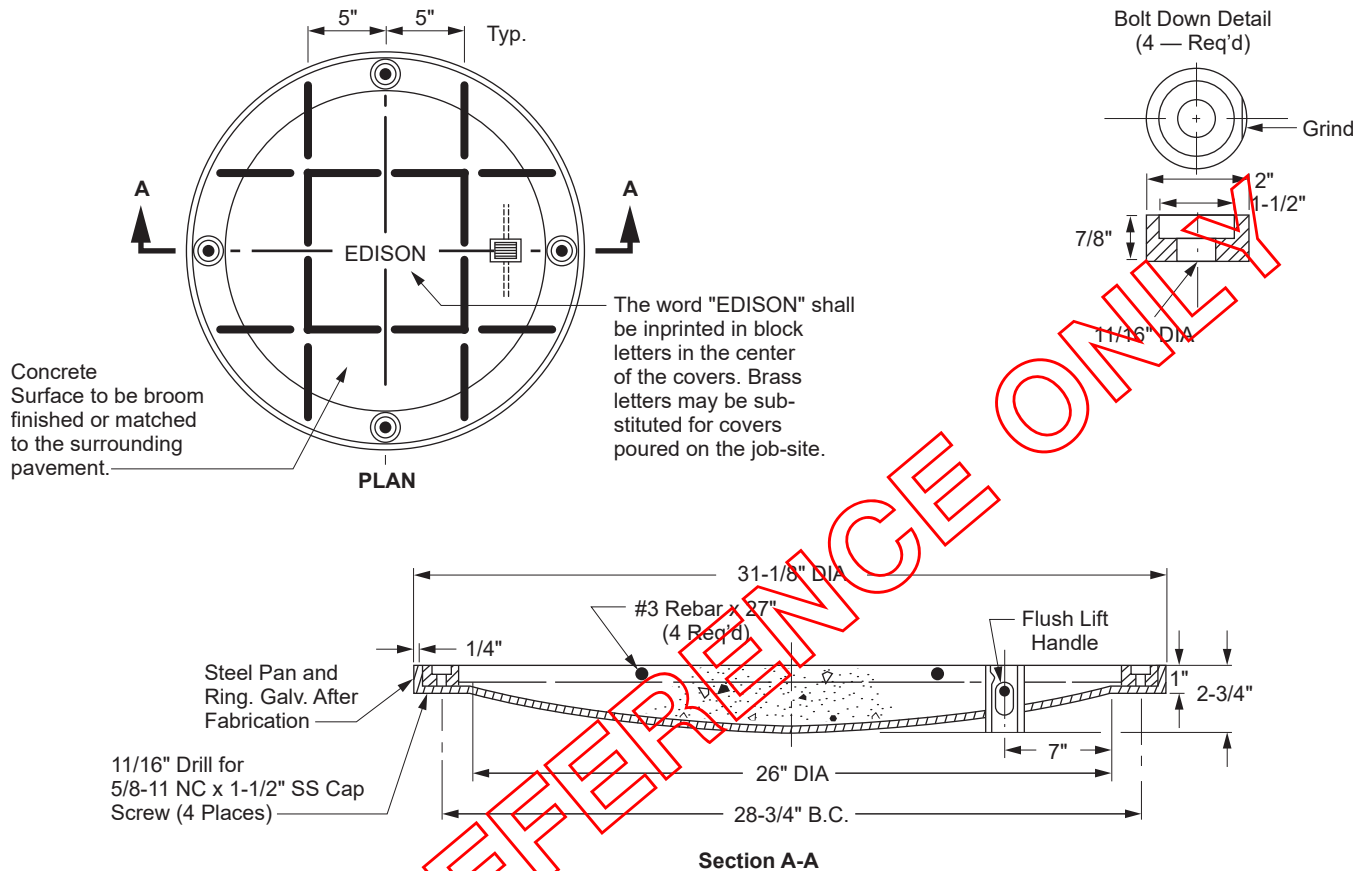
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FC 625 Concrete-Filled Manhole Cover

Scope FC 625.1 Concrete-Filled Manhole Cover

Figure FC 625-1: Concrete-Filled Manhole Cover (Parkway Use Only)



Note(s):

1. Cover designed for Alhambra Foundry frame No. A-1105 or equal.
2. Concrete may be poured on job-site or cover may be purchased pre-poured. If poured on job-site, the cover must be in place at time of pouring and index marks (notches) cut in the cover edge and outside frame.
3. 28-day concrete compressive strength to equal 3000 psi.
4. Total weight = 185 lb
5. Parking use only.

Approved by:

PhH

Concrete-Filled Manhole Cover

FC 625

Sheet 1 of 1

Effective Date:
05-16-2005

What's Changed?

UGS

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FC 627 30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading

Scope FC 627.1 30" Round Swiveloc Manhole Cover – Ductile Iron — HS-20 Loading

Figure FC 627–1: 30" Round Swiveloc Manhole Cover – Ductile Iron — HS-20 Loading

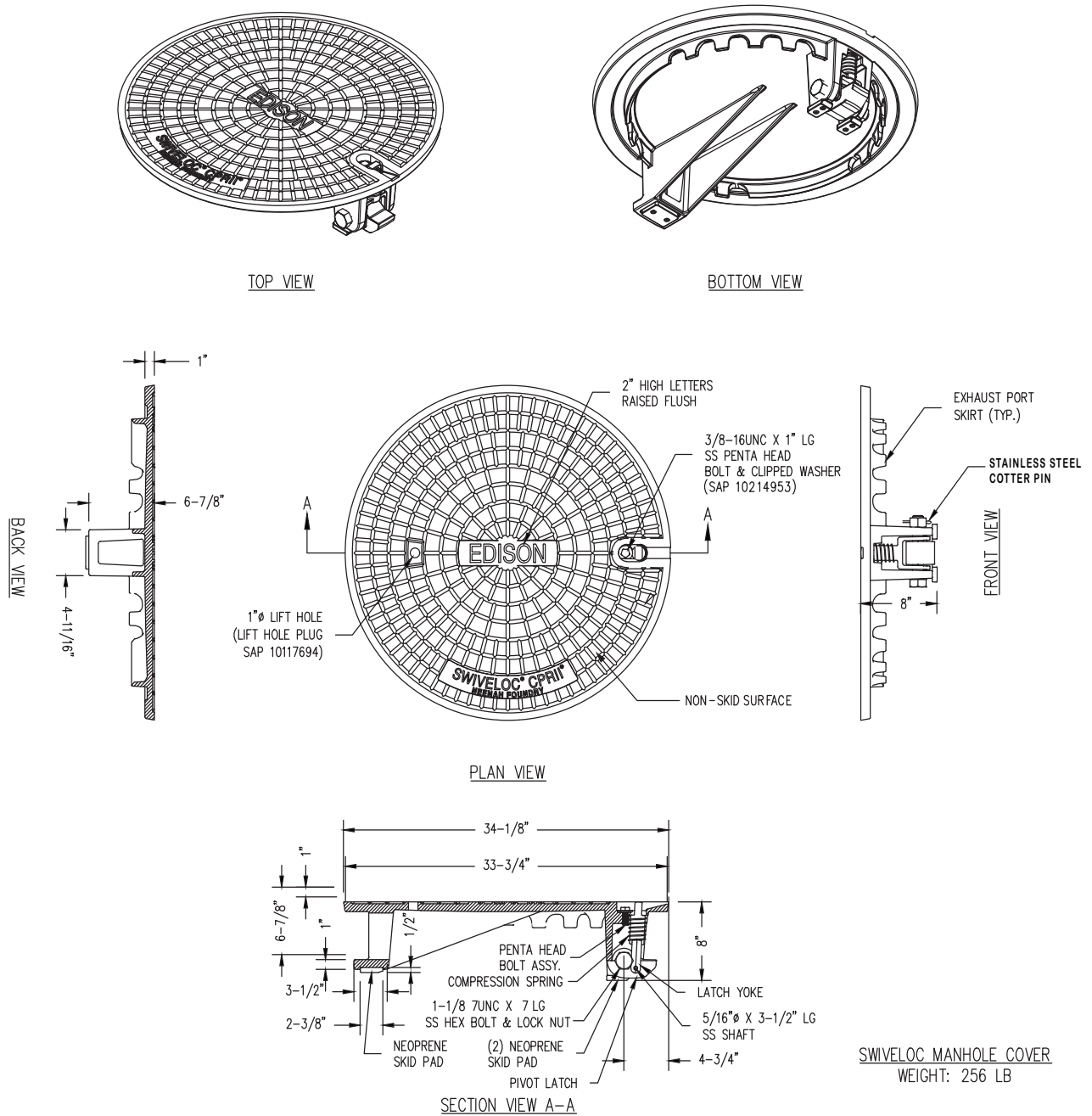


Table FC 627–1: Swiveloc Cover- Ductile Iron (Traffic)

Manufacturer	Part Number	SAP
Neenah Foundry	0150T102	10209895

Approved by:

RR

30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading

Effective Date:
04-24-2020

What's Changed? Updated Figure FC 627-1 with non-skid surface call out.

FC 627

Sheet 1 of 4

UGS

Scope FC 627.2 Manhole Frames - Gray Iron — HS-20 Loading

Figure FC 627-2: Manhole Frames - Gray Iron— HS-20 Loading

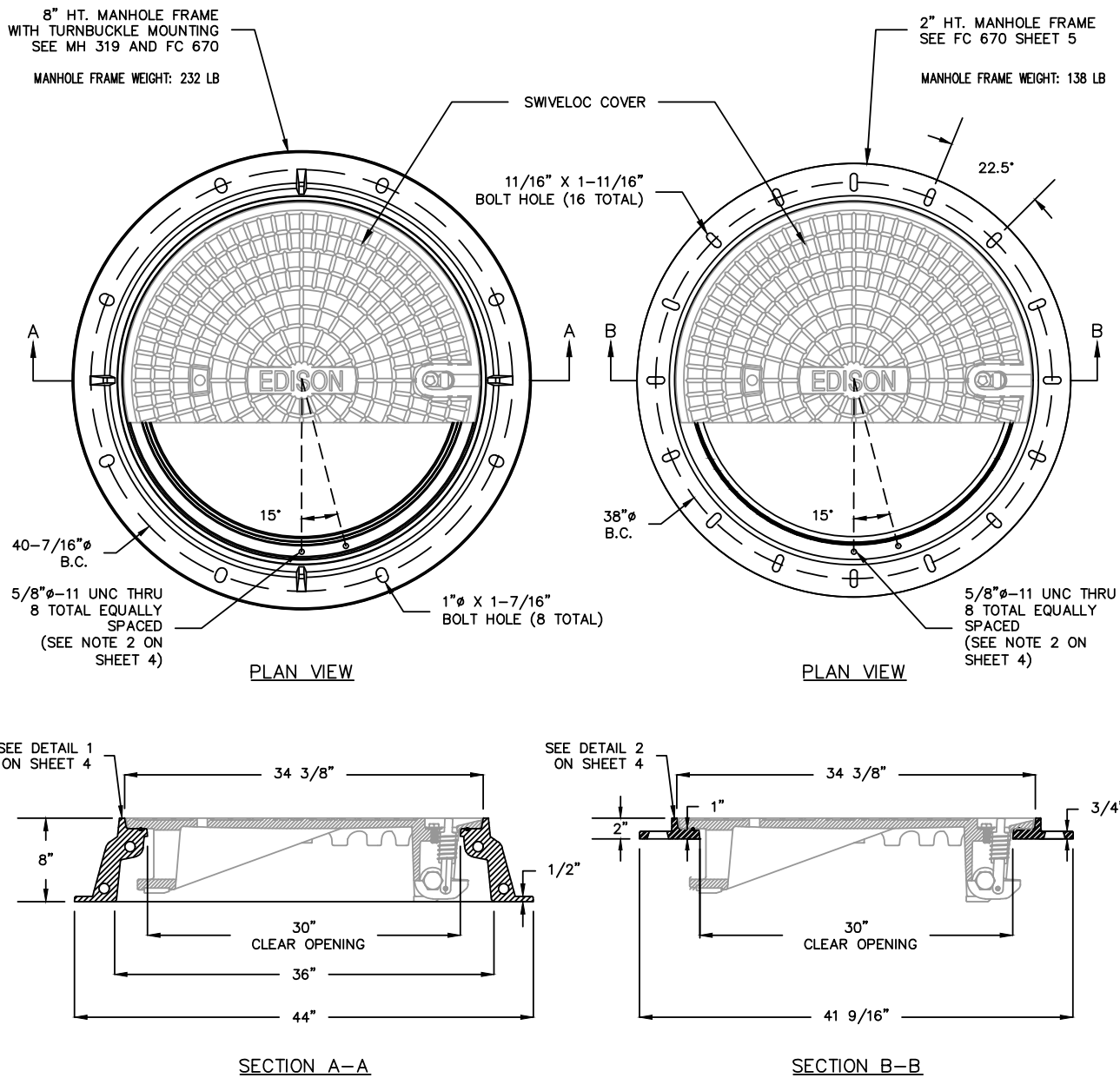


Table FC 627-2: Manhole Frames – Gray Iron — HS-20 Loading

Manhole Frames	Manufacturer	Part Number	SAP
8"	Neenah Foundry	NF-0150T132F	10209493
2"	Neenah Foundry	NF-158T109	10209896

FC 627

30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading

Approved by:

RR

Sheet 2 of 4

What's Changed?

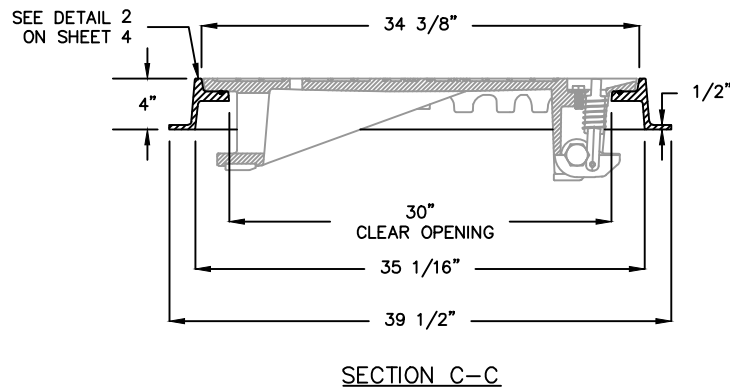
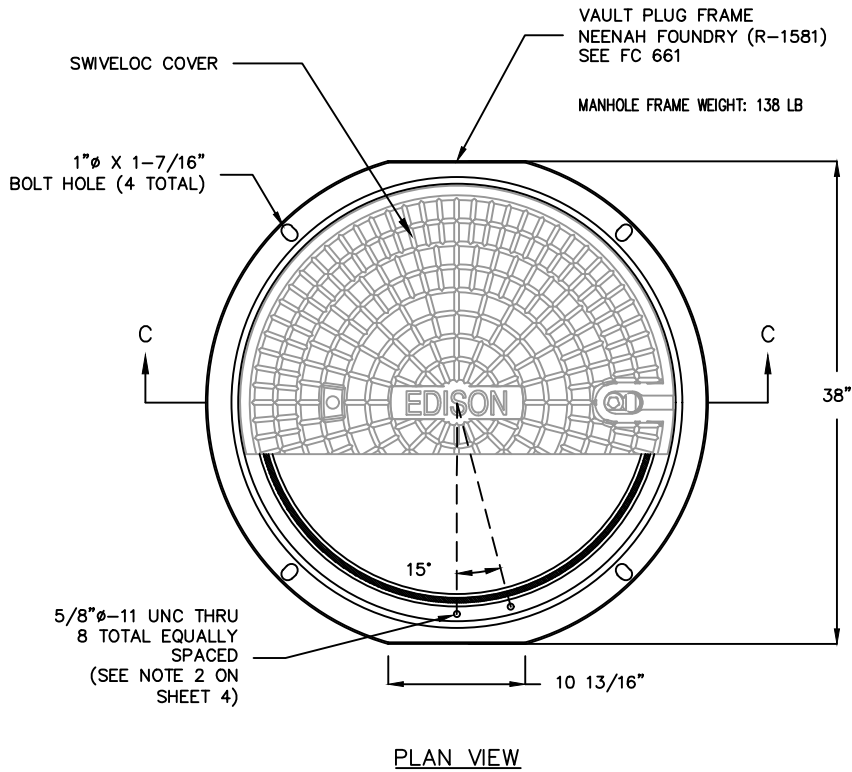
Effective Date:

UGS

04-24-2020

Scope FC 627.3 Vault Frame – Ductile Iron — HS-20 Loading

Figure FC 627-3: Vault Frame – Ductile Loading — HS-20 Loading



Note(s):

1. This frame is for the 4' x 5' vault cover only. See FC 661.

Approved by:

RR

30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading

FC 627

Sheet 3 of 4

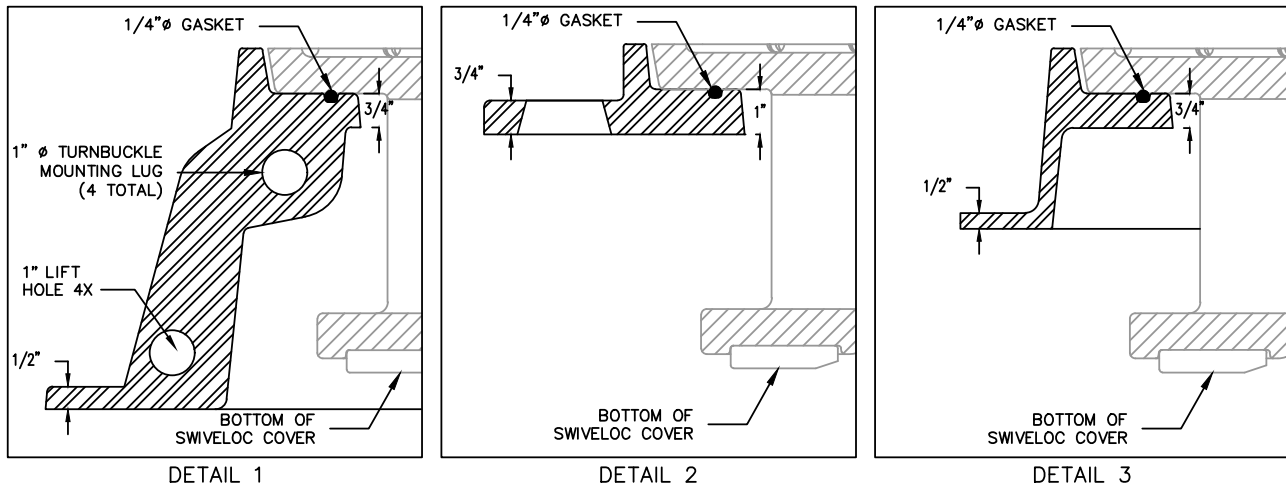
Effective Date:
04-24-2020

What's Changed?

UGS

► SCE Public ◀

Figure FC 627-4: Manhole and Vault Frame - Details — HS-20 Loading



Note(s):

1. Covers shall be furnished with: Penta head security bolt and washer, gasket, and pick hole plug. All items shall be Edison approved. O-Ring gasket shall be 1/4" diameter rubber material conforming to the material and physical requirements of ASTM C443 standard gaskets. Pick hole plugs (SAP 10117694) are available from Wesco, Santa Fe Springs, CA.
2. Manhole and vault frames are compatible with manhole cover FC 621.

FC 627

30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading

Approved by:

RR

Sheet 4 of 4

What's Changed?

Effective Date:

04-24-2020

UGS

FC 630 Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

Scope FC 630.1 Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

Figure FC 630-1: Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

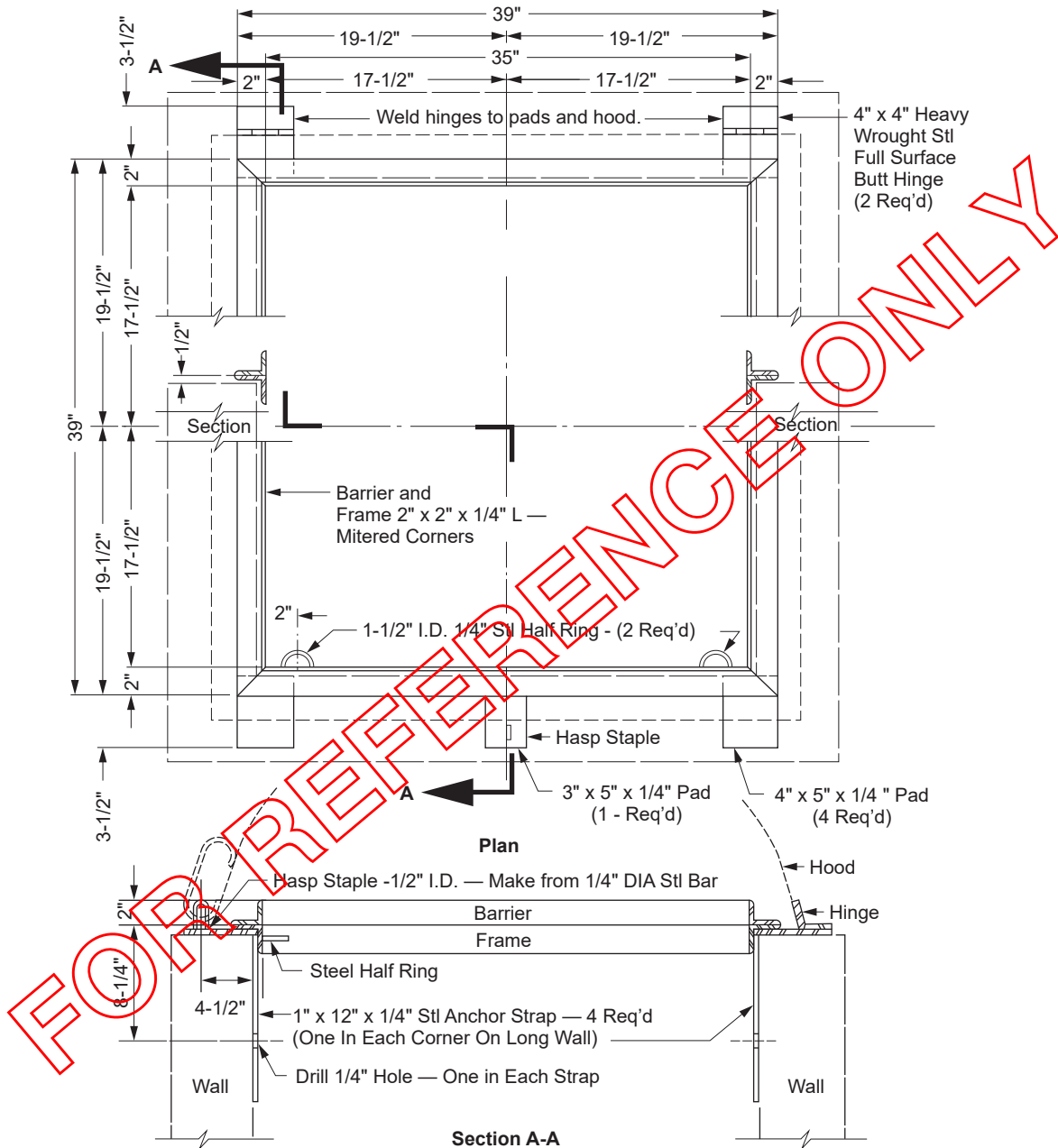


Figure FC 630-1.1: Plan and Section A-A

Approved by:

PhH

Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

FC 630

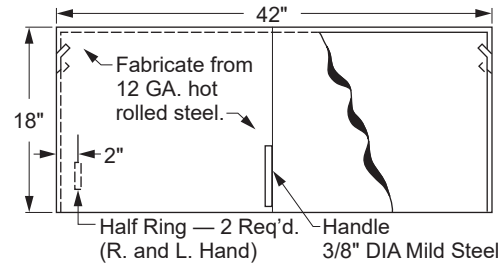
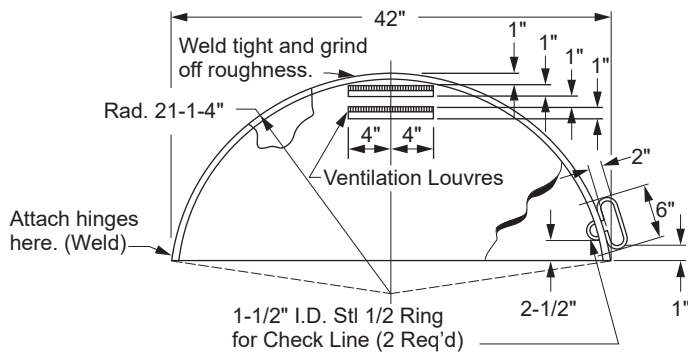
Sheet 1 of 2

Effective Date:
05-16-2005

What's Changed?

UGS

Fabrication Instructions
Fabricate Frame and Cover by Continuous Welds



Front View Cut-Away

Finish: 2 coats of "farbertite" on all parts: applied as recommended by the manufacturer.

Hood Cover — End View

Figure FC 630-1.2: Hood Cover — End View and Front View Cut-Away

FOR REFERENCE ONLY

FC 630

Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

05-16-2005

FC 631 Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault

Scope FC 631.1 Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault

Figure FC 631-1: Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault

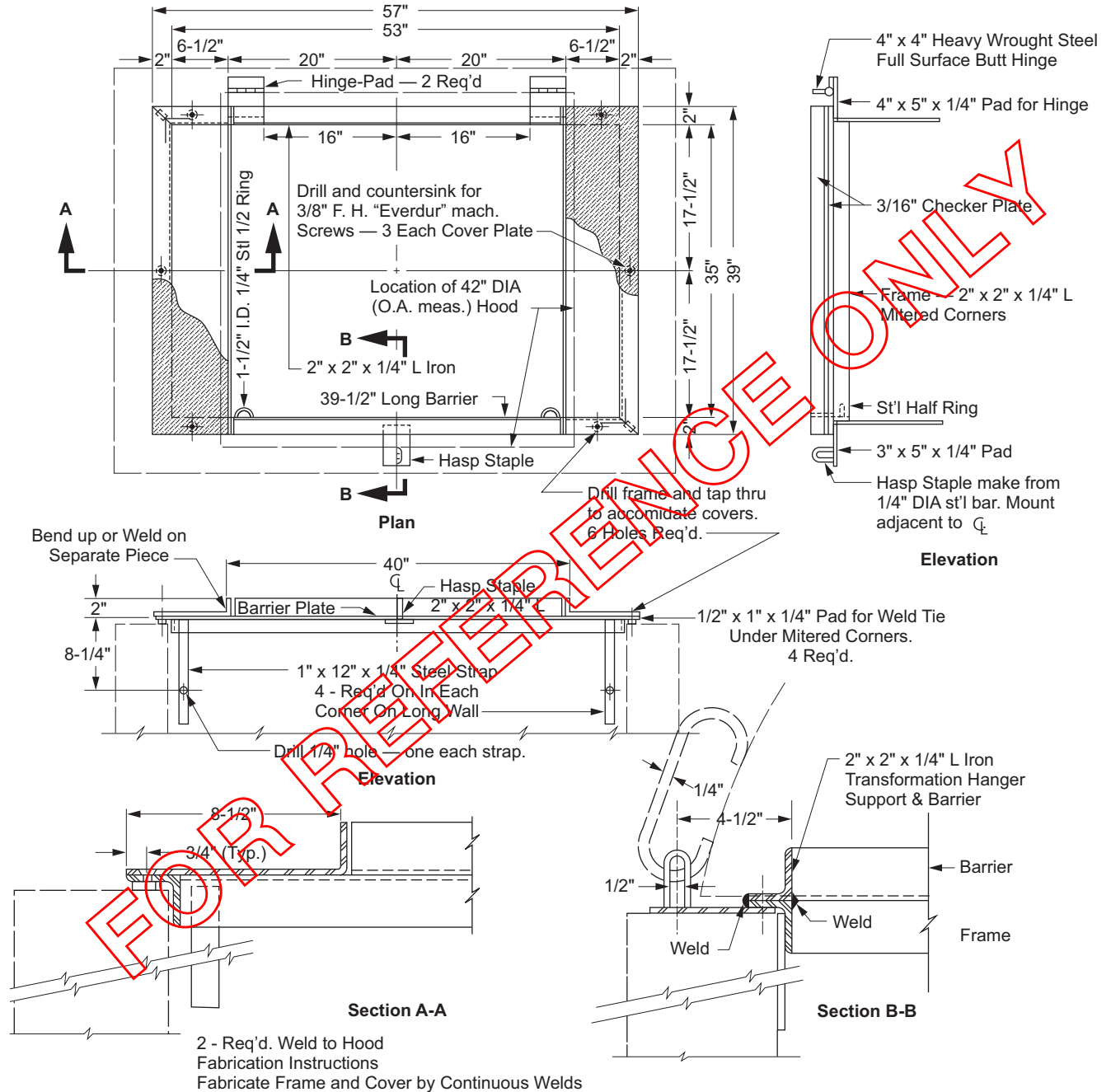
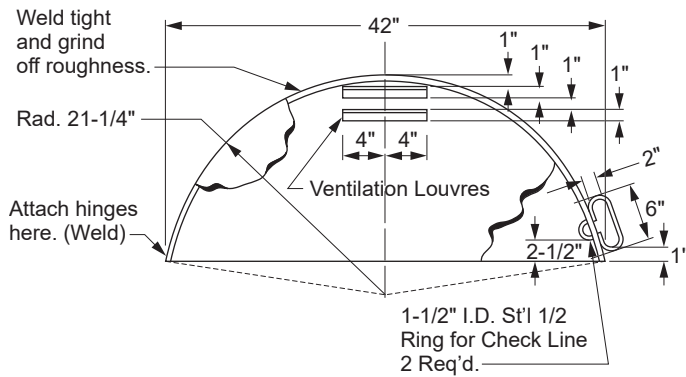
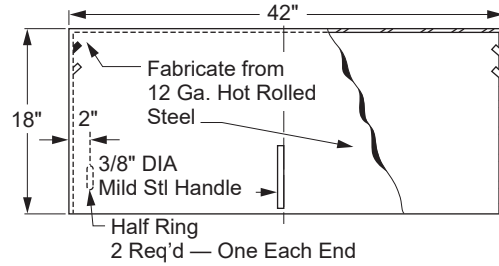


Figure FC 631-1.1: Plan, Elevation, Section A-A, and Section B-B

Approved by: <i>PhH</i>	Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault	FC 631
Effective Date: 05-16-2005	What's Changed?	Sheet 1 of 2
		UGS



Hood Cover — End View



Front View Cut-Away

Finish: 2 coats of farbertite on all parts: applied as recommended by the manufacturer.

Figure FC 631-1.2: Hood Cover — End View and Front View Cut-Away

FOR REFERENCE ONLY

FC 631

Frame and Cover (Fabricated) for 3' x 4'-1/2" x 3' Residential Vault

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

05-16-2005

FC 632 Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

Scope FC 632.1 Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

Figure FC 632-1: Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

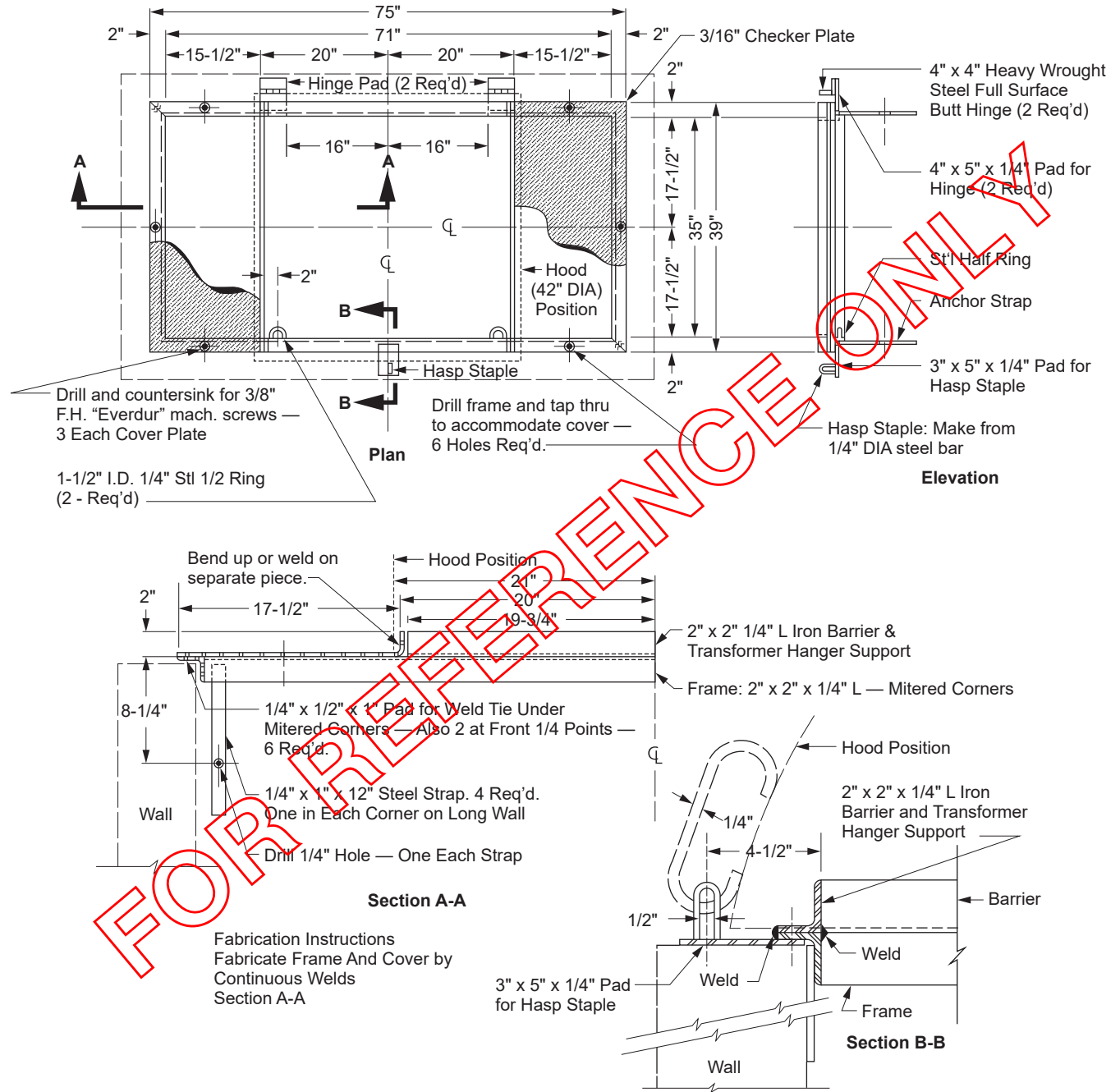


Figure FC 632-1.1: Plan, Elevation, Section A-A, and Section B-B

Approved by:

PHH

Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

FC 632

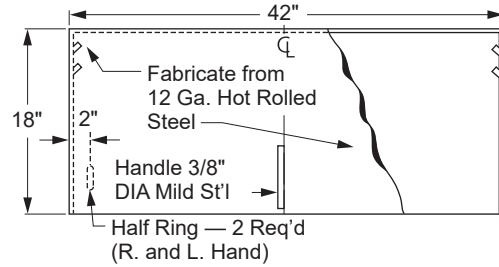
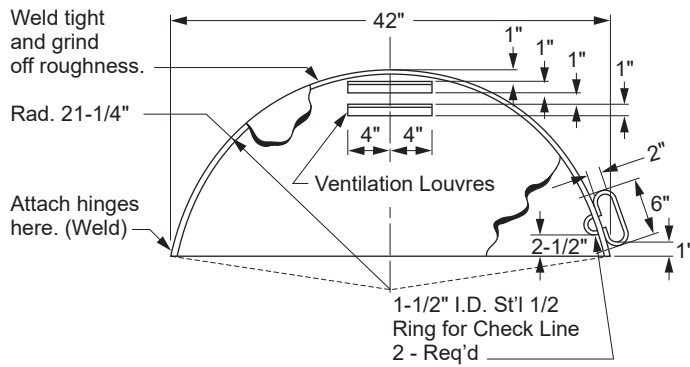
Effective Date:

05-16-2005

What's Changed?

Sheet 1 of 2

UGS



Front View Cut-Away

Finish: 2 coats of "farbertite" on all parts: applied as recommended by the manufacturer.

Hood Cover — End View

Figure FC 632-1.2: Hood Cover — End View and Front View Cut-Away

FOR REFERENCE ONLY

FC 632

Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

Approved by:



Sheet 2 of 2

What's Changed?

Effective Date:

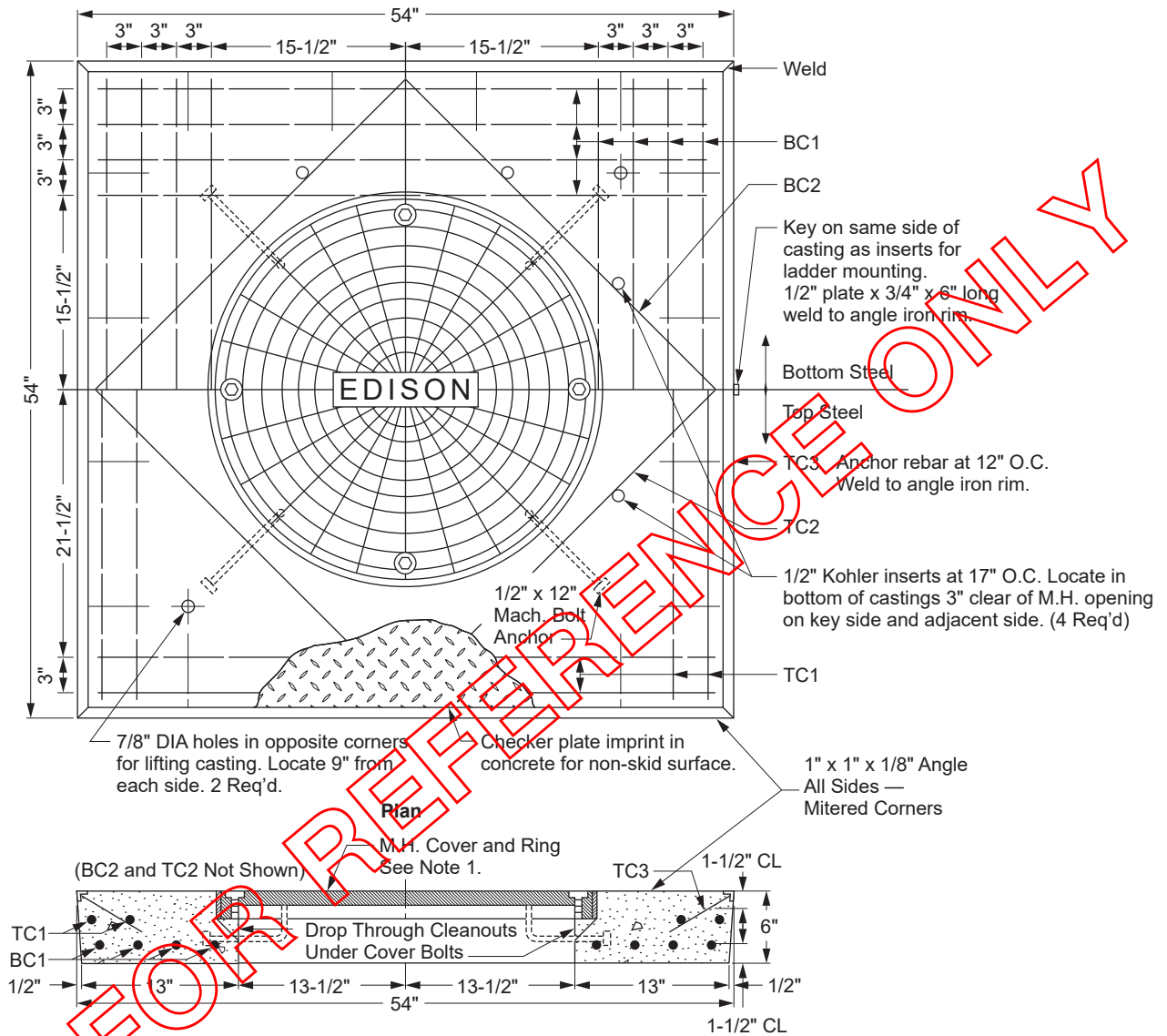
UGS

05-16-2005

FC 640 48" Square Precast Concrete (Traffic-Type) Vault Cover

Scope FC 640.1 48" Square Precast Concrete (Traffic-Type) Vault Cover

Figure FC 640-1: Typical Center Line Section



Note(s):
1. See FC 620.

Approved by:

PhH

48" Square Precast Concrete (Traffic-Type) Vault Cover

FC 640

Sheet 1 of 2

Effective Date:
05-16-2005

What's Changed?

UGS

Table FC 640-1: Bill of Materials — 48" Square Precast Concrete (Traffic-Type) Vault Cover

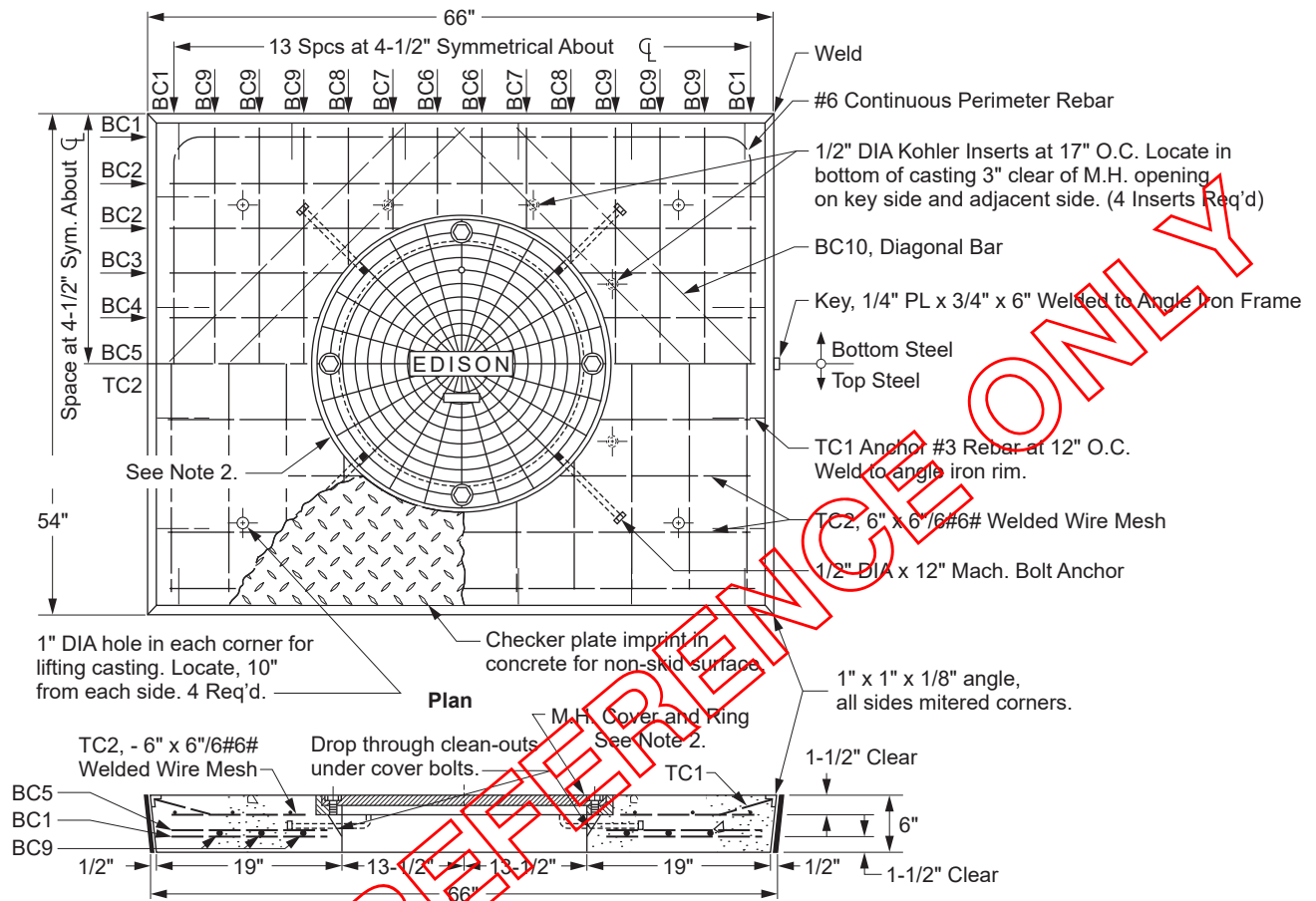
Concrete	Reinf.	Straight Rebar			
		Mark	No.	Lgth.	Size
0.30 Cu. Yd. Concrete 3750 PSI	113.4 Lb	BC1	16	4'-2"	5
		BC2	4	3'-0"	4
		TC1	8	4'-2"	4
		TC2	4	3'-0"	4
		TC3	16	0'-6"	3
<p>1/2" x 12" machine bolt (13 threads per inch). Bend 90° at 9" below bolt head. 4 Req'd.</p> <p>1" x 1" x 1/8" Angle x 54" Long 4 Req'd.</p> <p>1/4" x Plate x 3/4" x 6" Long — Key 1 Req'd.</p>					

FOR REFERENCE ONLY

FC 641 48" x 60" Precast Concrete Vault Cover (Traffic-Type)

Scope FC 641.1 48" x 60" Precast Concrete Vault Cover (Traffic-Type)

Figure FC 641-1: 48" x 60" Precast Concrete Vault Cover (Traffic-Type)



Note(s):

- 3/8" x 6" expansion felt required around perimeter of cover. Attach to neck and grease between felt and cover (see VA 470).
- See FC 620.

Approved by:

PhH

48" x 60" Precast Concrete Vault Cover (Traffic-Type)

FC 641

Sheet 1 of 2

Effective Date:

What's Changed?

05-16-2005

UGS

Table FC 641-1: Bill of Material

Concrete	Rebar	Rebar Schedule				
		Mark	Shape	Size	Length	Pcs. Req'd.
0.48 Cu. Yd. (3000 PSI)	175 Lb	BC1	Perimeter	#6	20'-9"	1
		BC2	Straight	#6	5'-3"	4
		BC3	Straight	#6	1'-9"	4
		BC4	Straight	#6	1'-6"	4
		BC5	Straight	#6	1'-5"	2
		BC6	Straight	#6	11"	4
		BC7	Straight	#6	13"	4
		BC8	Straight	#6	18"	4
		BC9	Straight	#6	4'-3"	6
		BC10	Straight	#6	3'-2"	8
		TC1	Straight	#3	6"	20
		TC2	Welded Wire Mesh	6" x 6"/6# x 6#	4'-3" x 5'-3"	1

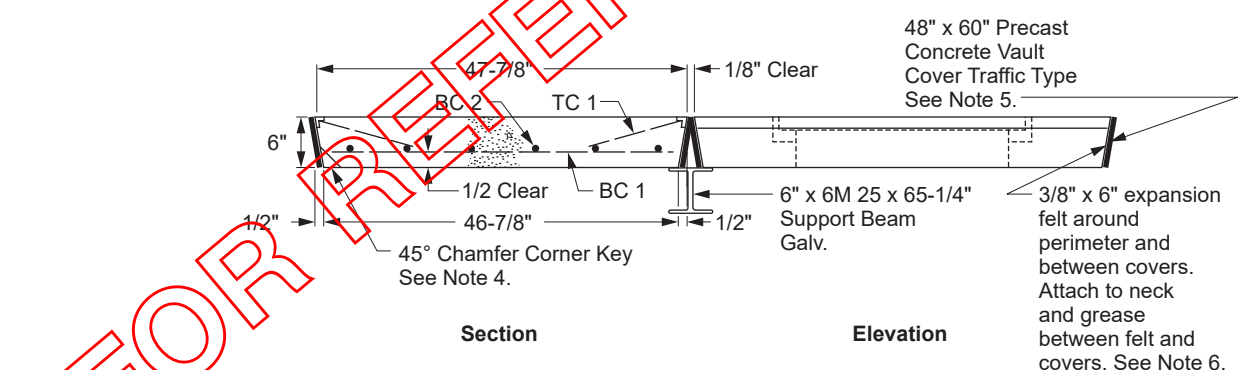
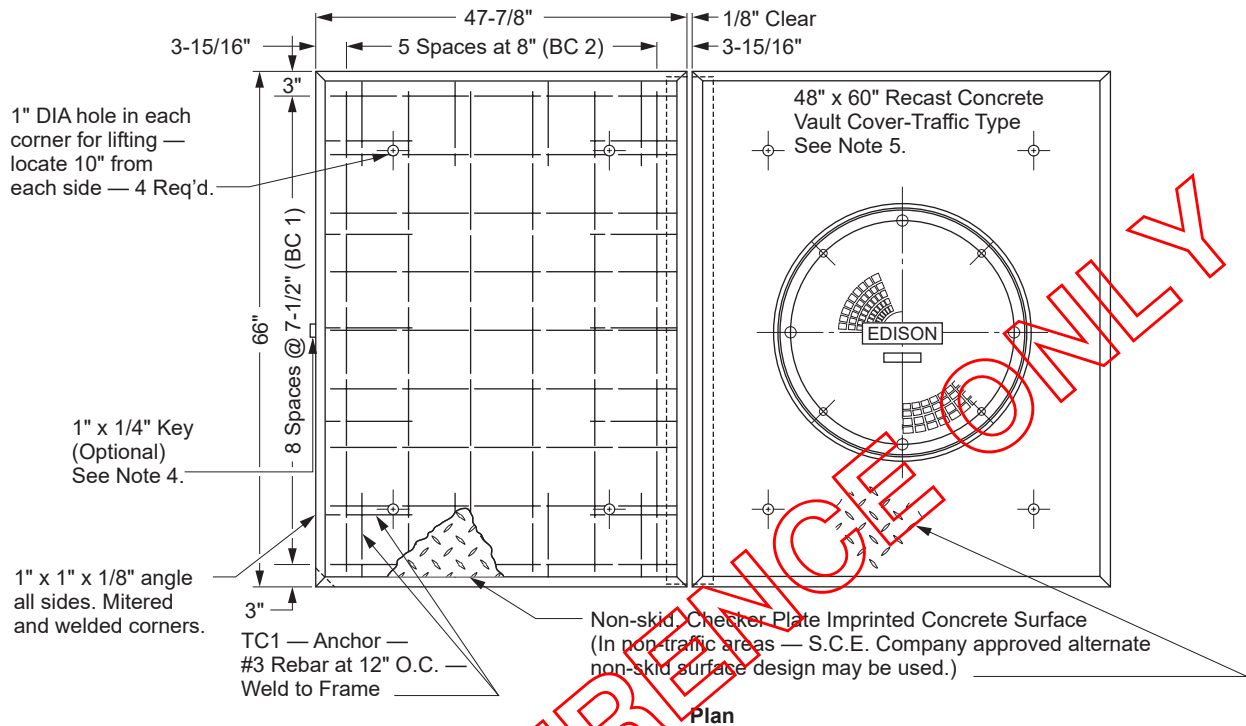
1/2" Dia. x 12" machine bolt (13 th'ds. per inch). Bend 90° at 9" below bolt head — 4 req'd.
 1" x 1" x 1/8" Angle x 54" Long — 2 req'd.
 1" x 1" x 1/8" Angle x 66" Long — 2 req'd.
 1/4" PL x 3/4" x 6" Long — Key — 1 req'd.
 1/2" "Star Holzin" Inserts — 4 req'd.
 Manhole Cover and Ring — Per FC 620.

FOR REFERENCE

FC 642 5" x 8" Two Piece — Vault Cover (Traffic-Type)

Scope FC 642.1 5" x 8" Two Piece — Vault Cover (Traffic-Type)

Figure FC 642-1: 5" x 8" Two Piece — Vault Cover (Traffic-Type)



Note(s):

1. Concrete: 3000 PSI — See [GI 020](#)
2. All reinforcing steel to have minimum of 1-1/2" concrete cover.

Approved by:

PhH

5" x 8" Two Piece — Vault Cover (Traffic-Type)

FC 642

Sheet 1 of 2

Effective Date:
05-16-2005

What's Changed?

UGS

3. Reinforcing steel to be as follows:

Table FC 642-1: Reinforcing Steel Data for 5" x 8" Two Piece — Vault Cover

Mark	Pcs. Req'd.	Size	Length	Shape
BC1	9	#5	44"	Straight
BC2	6	#5	62-1/2"	Straight
TC1	18	#3	12"	Straight

- 4. One key only required. Corner key is preferred installation.
- 5. See FC 641.
- 6. See VA 470.

FOR REFERENCE ONLY

FC 642

5" x 8" Two Piece — Vault Cover (Traffic-Type)

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

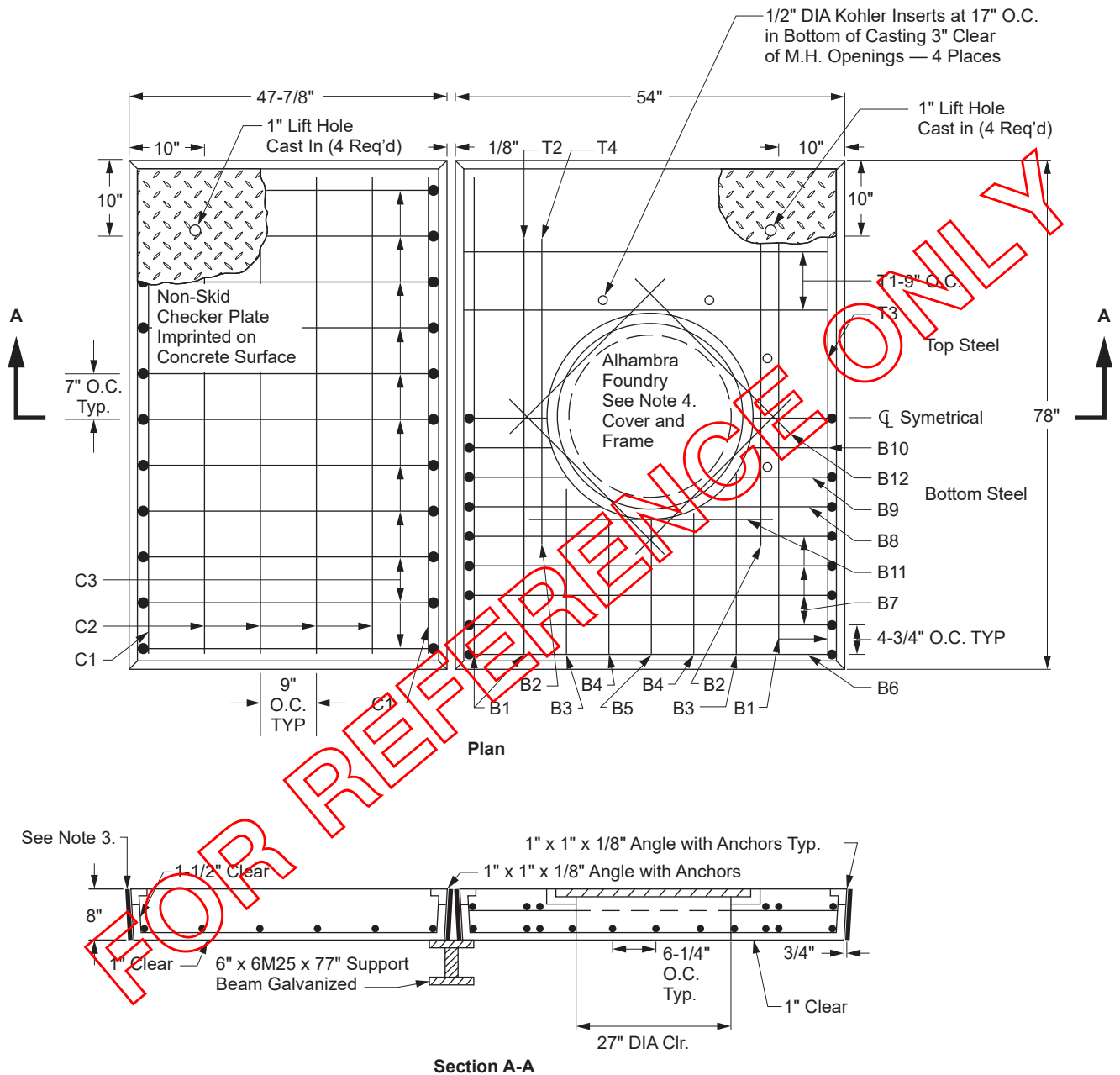
UGS

05-16-2005

FC 643 6' x 8' Two Piece — Vault Cover — H-20 Loading

Scope FC 643.1 6' x 8' Two Piece — Vault Cover — H-20 Loading

Figure FC 643-1: 6' x 8' Two Piece — Vault Cover — H-20 Loading



Approved by:

PHH

6' x 8' Two Piece — Vault Cover — H-20 Loading

FC 643

Sheet 1 of 2

Effective Date:
05-16-2005

What's Changed?

UGS


Table FC 643-1: Bill of Materials — 6' x 8' Two Piece — Vault Cover — H-20 Loading

Mark	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	T1	T2	T3	T4	C1	C2	C3
Size	#5	#4	#5	#5	#5	#5	#6	#6	#6	#6	#4	#4	#4	#5	#5	#4	#5	#4	#5
Length	75"	40"	30"	25"	23"	61"	61"	23"	17"	14"	32"	30"	51"	60"	40"	60"	75"	75"	58"
Pieces Req'd	4	4	4	4	2	2	8	4	4	6	2	8	4	2	2	2	2	4	11

Note(s):

1. All concrete to be 3000 PSI ([GI 020](#)).
2. Checker plate finish imprinted in concrete surface (non-skid) or S.C.E. approved alternate.
3. 3/8" thick by 8" expansion felt around perimeter and between covers. Attach to neck and grease between felt and covers (see [VA 470](#)).

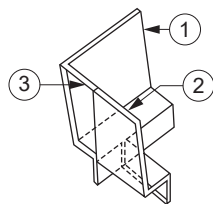
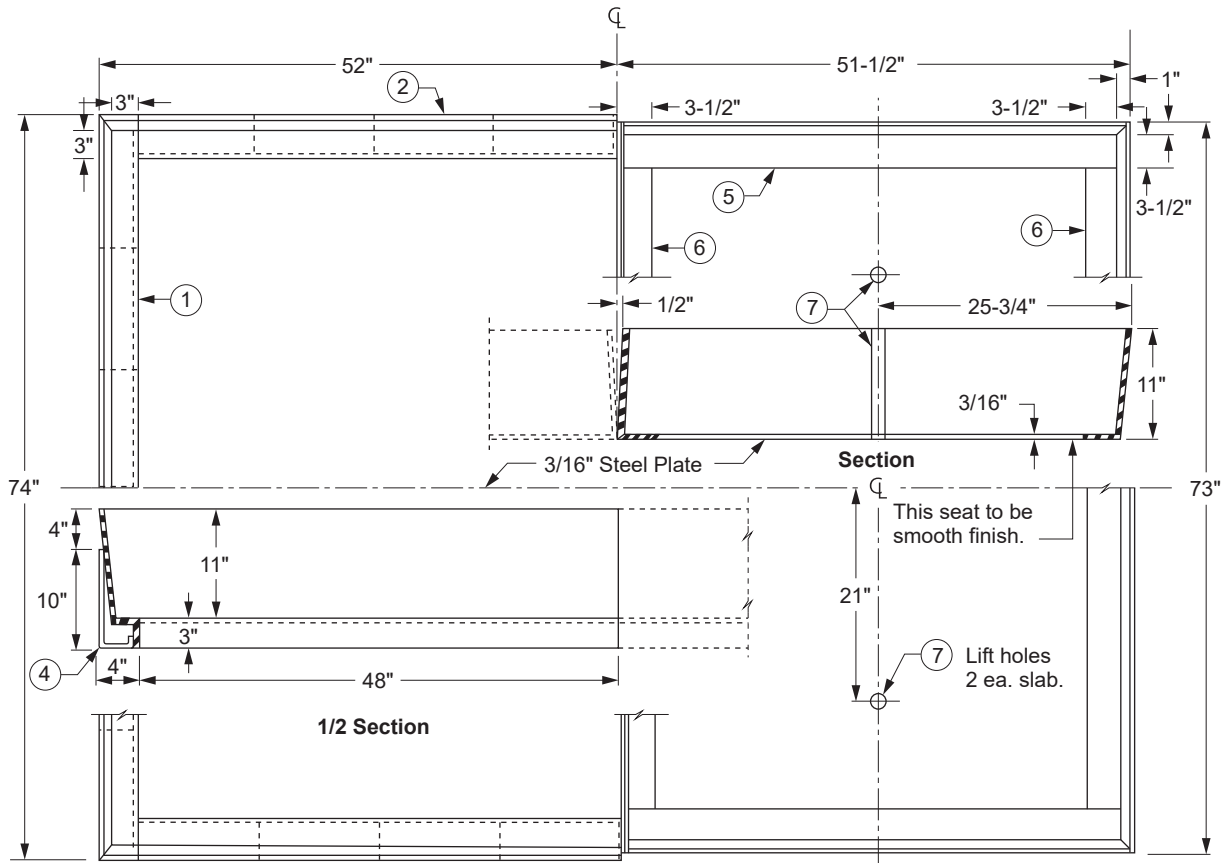
FOR REFERENCE ONLY

FC 643	6' x 8' Two Piece — Vault Cover — H-20 Loading	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 05-16-2005
UGS		

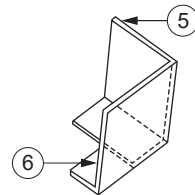
FC 644 5'-6" x 8'-0" Vault Frame — Traffic

Scope FC 644.1 5'-6" x 8'-0" Vault Frame — Traffic

Figure FC 644-1: 5'-6" x 8'-0" Vault Frame — Traffic



Corner Construction



Inner Frames (Make 2)

Outer Frame

Note(s):

1. For placement for steel see [FC 650](#).
2. For installation of manhole coating in this cover see [FC 655](#).

Approved by:

PhH

5'-6" x 8'-0" Vault Frame — Traffic

FC 644

Sheet 1 of 2

Effective Date:
05-16-2005

What's Changed?

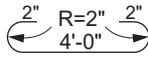
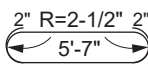
UGS

► SCE Public ◀

Table FC 644-1: List of Materials — 5'-6" x 8'-0" Vault Frame — Traffic

Item	Quan.	Outer Frame — To be Primed and Painted after Welding
①	2 Ea.	3/16" Sheet Steel Bent to Shape 74" Long.
②	2 Ea.	3/16" Sheet Steel Bent to Shape 96" Long — Welded to Item No. 1.
③	4 Ea.	3/16" Sheet Steel — Cut to Shape and Tack Welded in Corner Gaps.
④	24 Ea.	#3 Rebar x 17" Bent to Shape and Welded to Frame — Space 12" from center line.
Inner Frames (2). To be Primed and Painted after Welding		
⑤	4 Ea.	3/16" Sheet Steel Bent to Shape 51-1/2" Long.
⑥	4 Ea.	3/16" Sheet Steel Bent to Shape and Ends Coped Out to Fit Item No. 5. 73" Long. Weld to Item No. 5.
⑦	4 Ea.	1" Diameter x 11" Galvanized Iron Pipe. (Furnish)


Table FC 644-2: Reinforcing Schedule — 5'-6" x 8'-0" Vault Frame — Traffic

Mark	Quan.	Type	Size	Length Each	Weight in Lb.
A1	12		5/8" Dia.	5'-1/2"	62.90
B1	12		5/8" Dia.	18' - 5-1/2"	230.38

Note(s):

1. For method of dimensioning shapes see [GI 025](#).

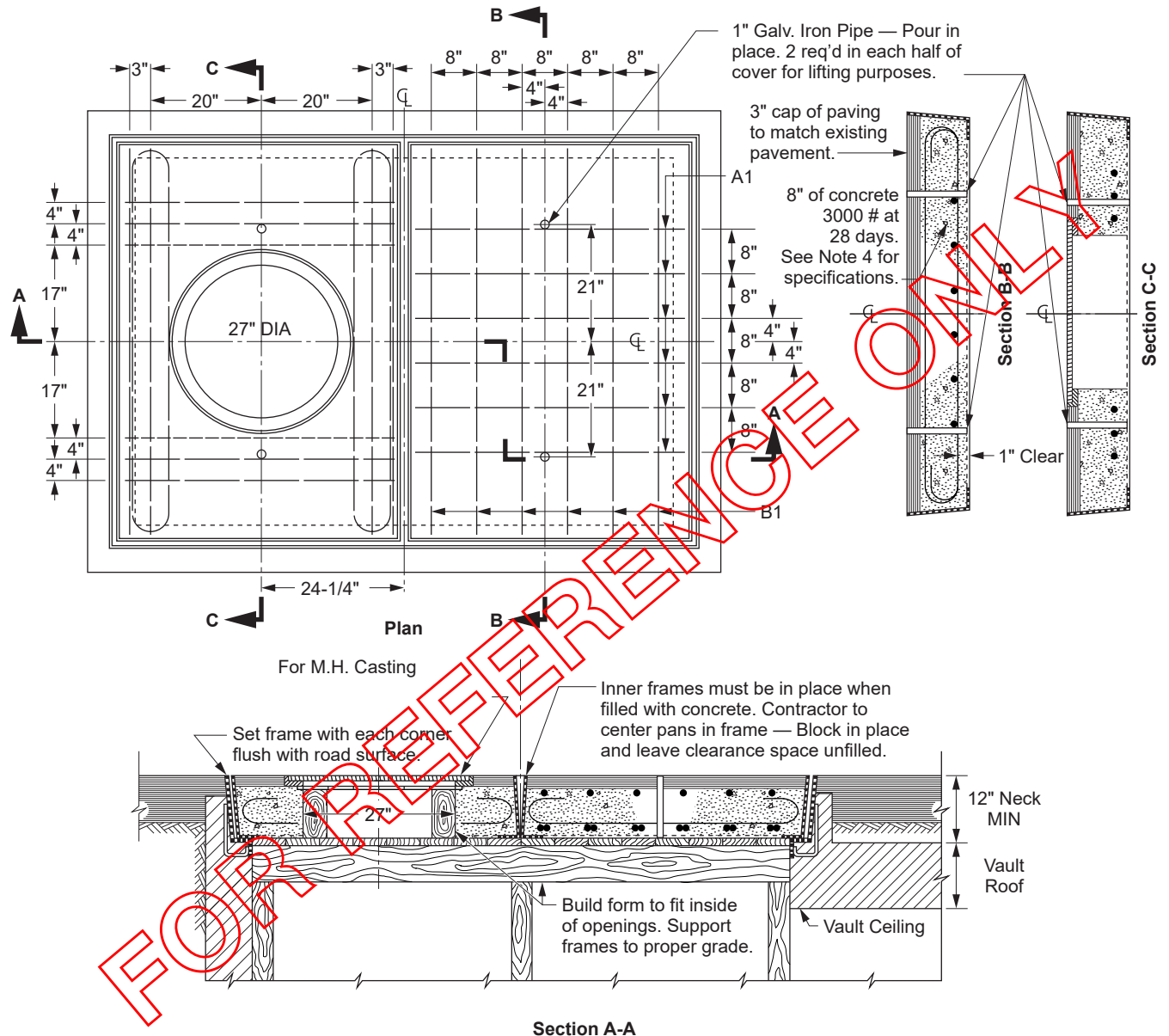
FOR REFERENCE ONLY

FC 644	5'-6" x 8'-0" Vault Frame — Traffic	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date: 05-16-2005
UGS		

FC 650 Slab Cover Details — Pouring and Framing

Scope FC 650.1 Slab Cover Details — Pouring and Framing

Figure FC 650-1: Slab Cover Details — Pouring and Framing



Pans require:
1.29 cu. yd. of concrete
0.48 cu. yd. of paving mat'l.
1.77 total for normal installation (without M.H. casting)

Note(s):

1. Same number of steel reinforcing shapes are used in each half of cover.
2. For steel schedule see FC 644.
3. Manhole casting shown is FC 620 — a traffic type iron casting — to be installed as shown only when specified.
4. See GI 020.

Approved by:

PhH

Slab Cover Details — Pouring and Framing

FC 650

Sheet 1 of 1

Effective Date:
05-16-2005

What's Changed?

UGS

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FC 655 5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

Scope FC 655.1 5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

Figure FC 655-1: 5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

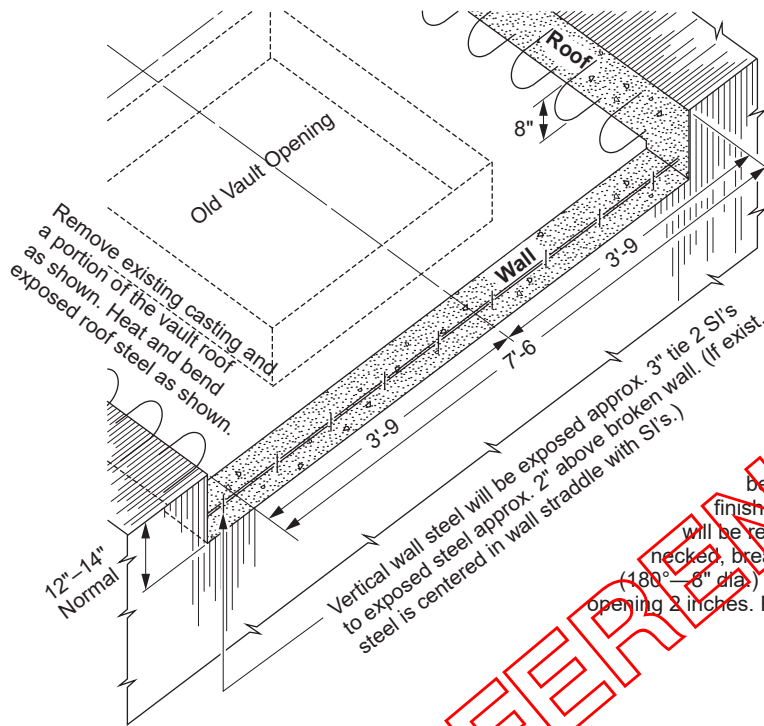


Figure FC 655-1.1: Air View — Typical Vault

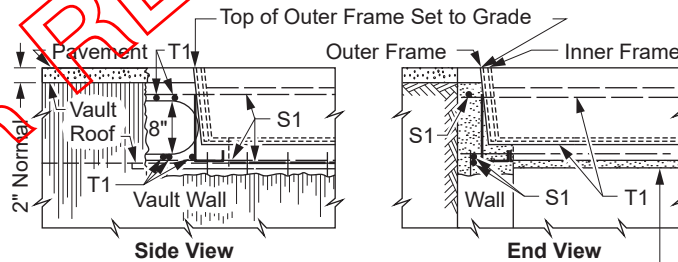


Figure FC 655-1.2: Side View and End View

Lower ceiling in breakout area, if necessary, to allow 1" clearance between steel and finished ceiling surface.

Notes: Replace concrete around new slab cover to original roof thickness. If necessary, ceiling may be lowered to provide 1" clearance between steel and finished ceiling surface. Conduit, when encountered in roof, will be rerouted around opening (over wall). For vault that is necked, break out to same dimensions. Cut, heat, and bend back (180° - 8" dia.) exposed roof steel. Steel to clear finished side of new opening 2 inches. For neck slab, see Note 1.

FOR REFERENCE ONLY

Approved by: 	5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault	FC 655
Effective Date: 05-16-2005	What's Changed?	Sheet 1 of 2
		UGS

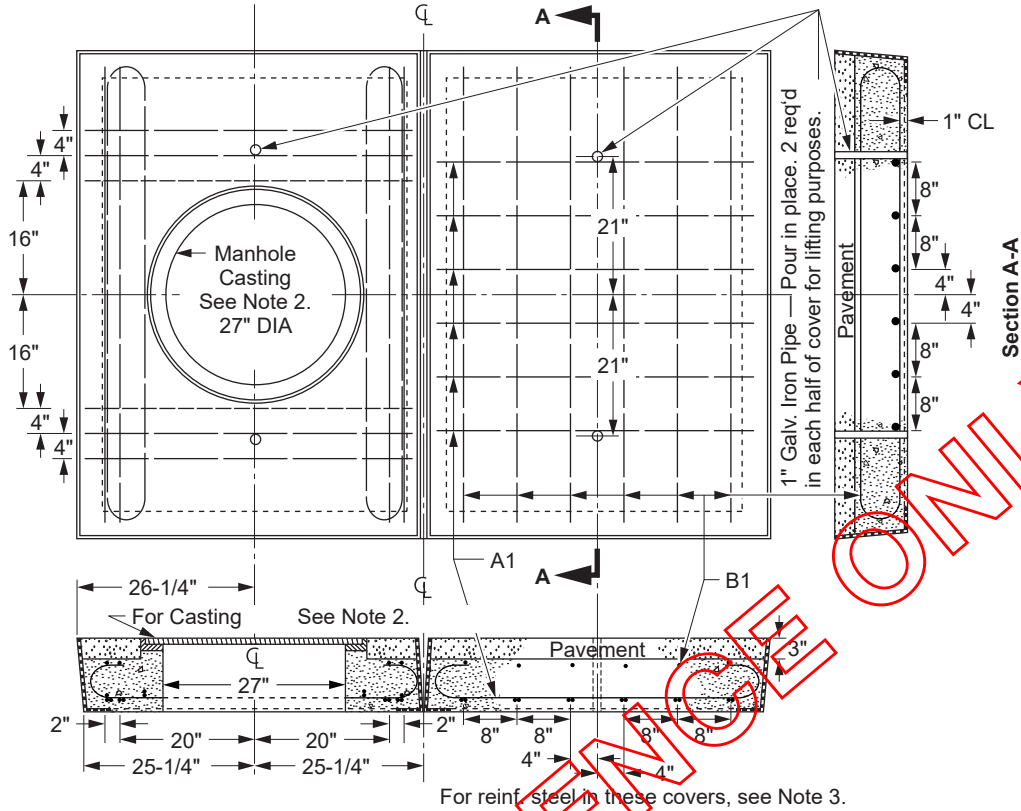


Figure FC 655-1.3: Section at Center Line

Note(s):

1. Neck slab to grade as shown in VA 446.
2. See FC 620.
3. See FC 644.

Table FC 655-1: List of Material

Quantity	Description
1 - 2 Piece	5'-6" x 8'-0" Slab Cover. FC 644
1 Only	27" Manhole Casting FC 620
2 Cu. Yds. ±	Concrete. See GI 020.

Table FC 655-2: Reinforced Steel for Vault Roof

Mark	Quan.	Type	Size	Lgth. Each	Wgt. Lb
T1	10	Straight	5/8" Dia.	9'-0"	93.6
S1	6	Straight	5/8" Dia.	7'-6"	46.8

FC 655

5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

UGS

05-16-2005

FC 660 4' x 5' Precast Concrete Vault Cover (Traffic Type)

Scope FC 660.1 4' x 5' Precast Concrete Vault Cover (Traffic Type)

Figure FC 660-1: 4' x 5' Precast Concrete Vault Cover (Traffic Type)

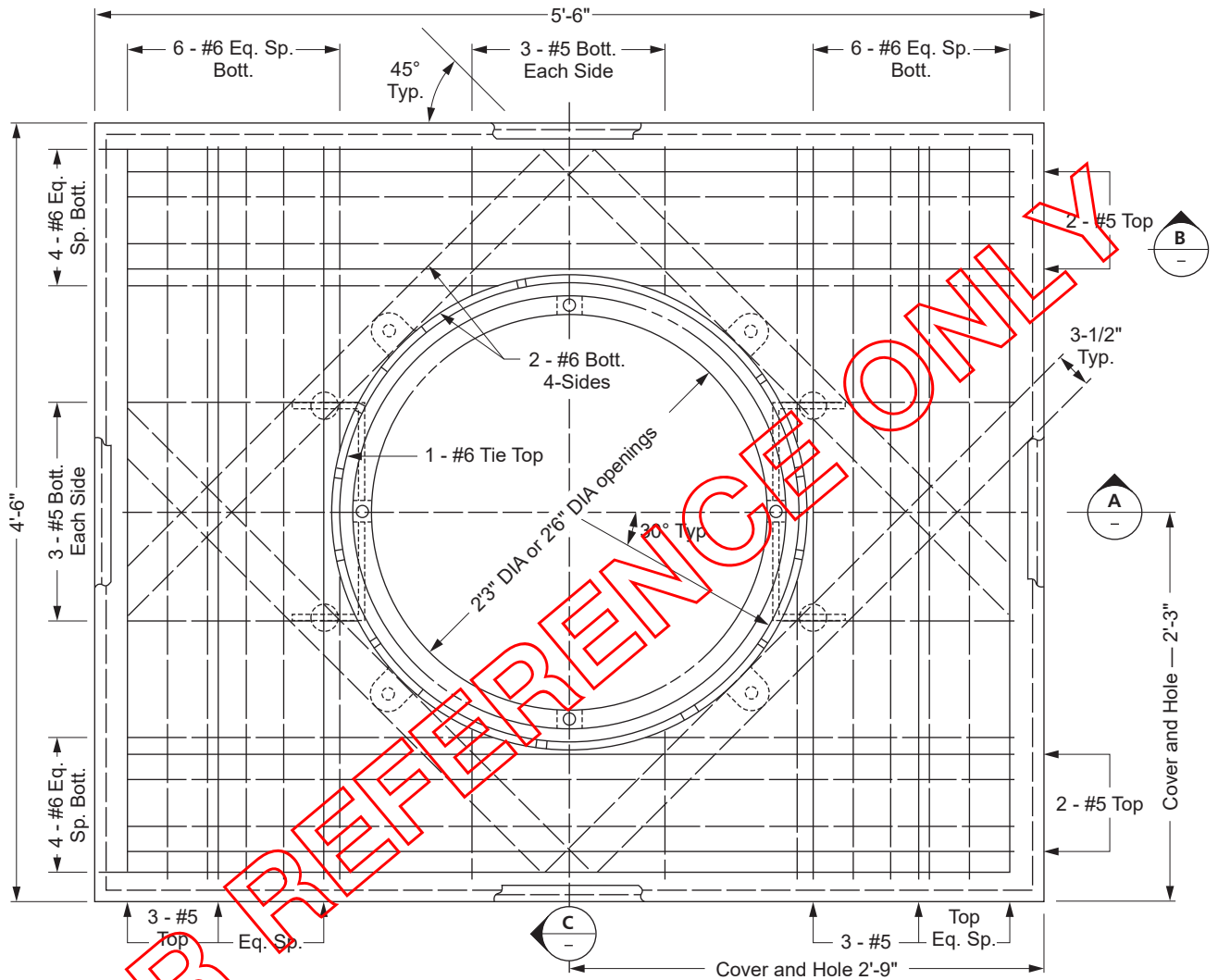


Figure FC 660-1.1: Plan

Note(s):

1. Solid lines indicate top bars. Dashed lines indicate bottom bars.

Approved by:

B.C.

4' x 5' Precast Concrete Vault Cover (Traffic Type)

FC 660

Sheet 1 of 3

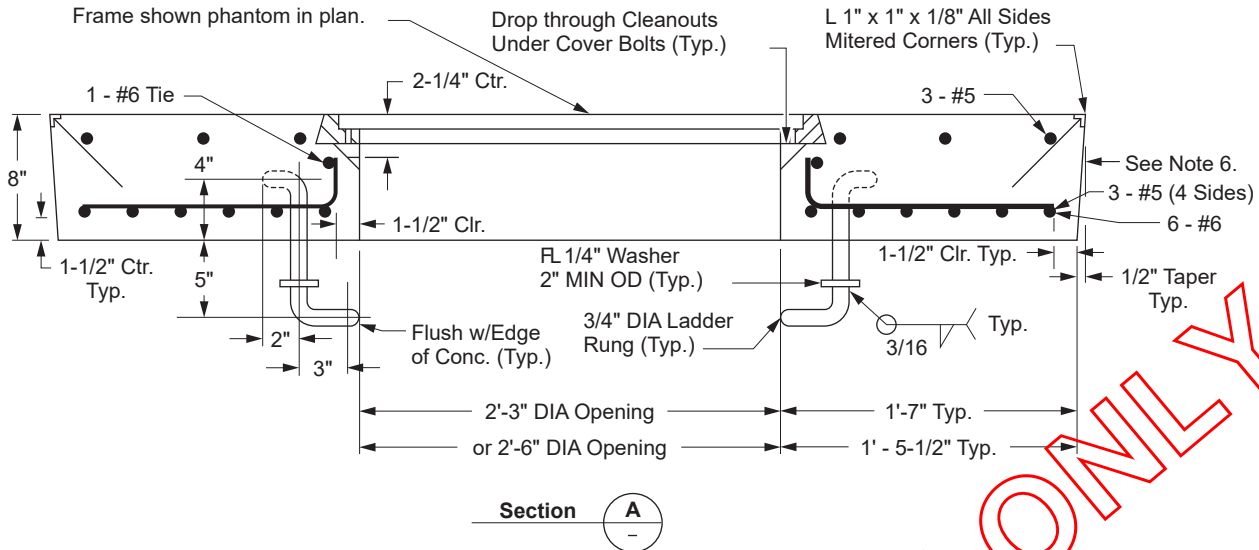
Effective Date:

10-27-2017

What's Changed?

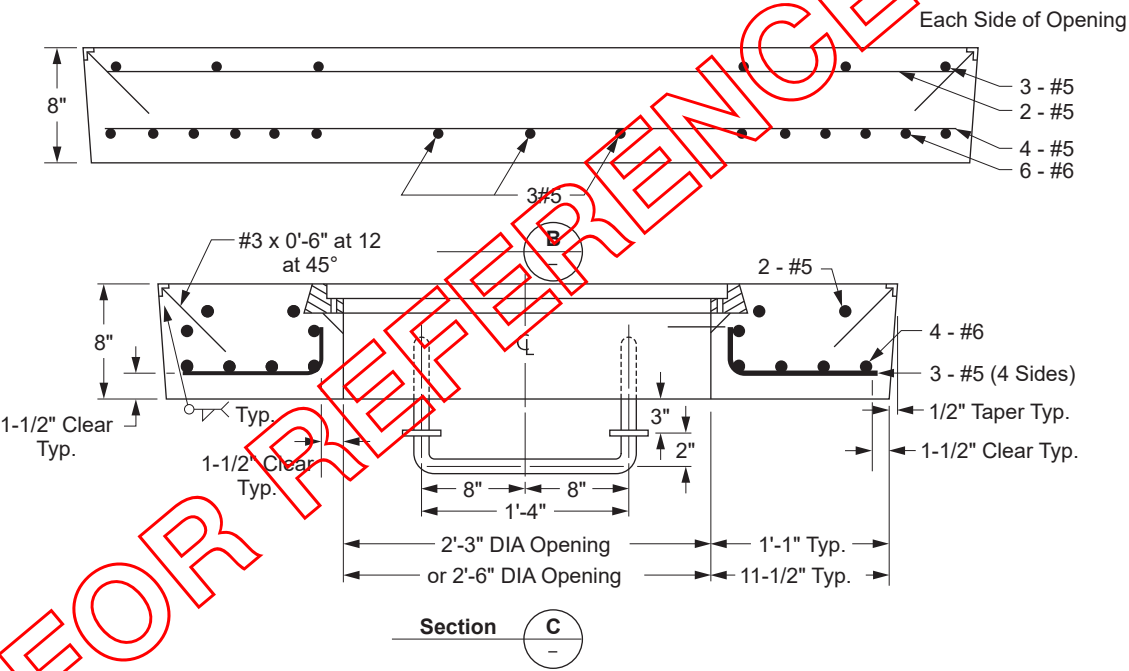
UGS

For Manhole Cover and Frame.
See Note 1.
Frame shown phantom in plan.



Section **A**

Figure FC 660-1.2: Section A



Section **C**

Figure FC 660-1.3: Sections B and C

Note(s):

1. See FC 621.

FC 660

4' x 5' Precast Concrete Vault Cover (Traffic Type)

Approved by:

B.C.

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

10-27-2017

Table FC 660–1: Bill of Material — Rebar Schedule

Qty.	Size	Rebar Length for 2'–3' MH Opening	Rebar Length for 2'–6' MH Opening
6	#5	4'-2"	4'-2"
4	#5	5'-2"	5'-2"
12	#6	4'-2"	4'-2"
8	#6	5'-2"	5'-2"
2	#5 Bent	1' - 3-1/2" 3-1/2"	1' - 2" 3-1/2"
4	#5 Bent	1' - 5-1/2" 3-1/2"	1' - 4" 3-1/2"
2	#5 Bent	0' - 9-1/2" 4-1/4"	0' - 8" 4-1/4"
4	#5 Bent	0' - 11-1/2" 4-1/2"	0' - 10" 4-1/4"
1	#6 Tie	8' - 10-1/2" (2' - 6-5/8" I.D.)	9'-8" (2' - 9-5/8" I.D.)
4	#6	3'-5"	3'-2"
4	#6	4'-0"	3'-9"
22	#3	0'-6"	0'-6"
1" x 1" x 1/8" Angle x 4'-6" Long — (2 Required)			
1" x 1" x 1/8" Angle x 5'-6" Long — (2 Required)			
Manhole Cover and Frame Per UGS 621 — (1 Each Required)			

= For Reference Only

Note(s):

1. Concrete minimum $f_c = 3,000$ psi (28 days).
2. All rebar to be Grade 60.
3. Welding of reinforcing bar will conform to AWS D1.4-79.
4. Cover will conform to Specification for Precast Reinforced Concrete Vaults and Manholes. (See [GI 030](#).)
5. Concrete cover top will have a checker plate imprint for a nonskid surface.
6. 3/8" x 0'-8" expansion felt is required around perimeter of cover. Attach to neck and grease between felt and cover.
7. Covers constructed by the same manufacturer will be interchangeable in all necking designed for the same size cover.
8. Standard manhole cover/frame size is 30". The 27" cover/frame detail is shown "For Reference Only." Manufacturer will furnish plastic sealing cap for cast iron cover pickhole (1).
9. Bottom of cover will have a smooth float finish.
10. Ladder rung assembly will be fabricated from A-36 steel and hot-dipped galvanized after washers have been welded and stress has been relieved.
11. Manufacturers will indicate their company name with a 2" maximum letter, molded into the cover top surface, adjacent to a corner.
12. Approximate weight and concrete volume of covers:
 - a. 27" opening weight = 2,087 lb/Vol. = .52 CY
 - b. 30" opening weight = 1,994 lb/Vol. = .49 CY

Approved by:

B.C.

4' x 5' Precast Concrete Vault Cover (Traffic Type)

FC 660

Sheet 3 of 3

Effective Date:

10-27-2017

What's Changed?

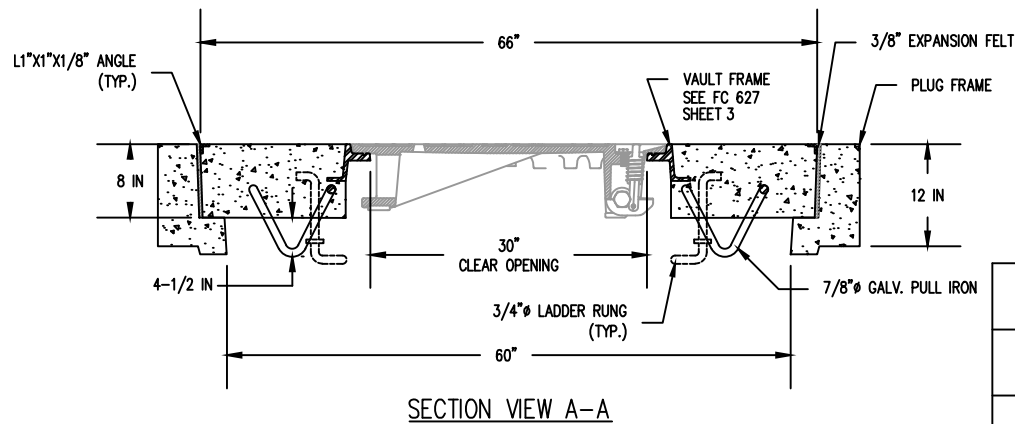
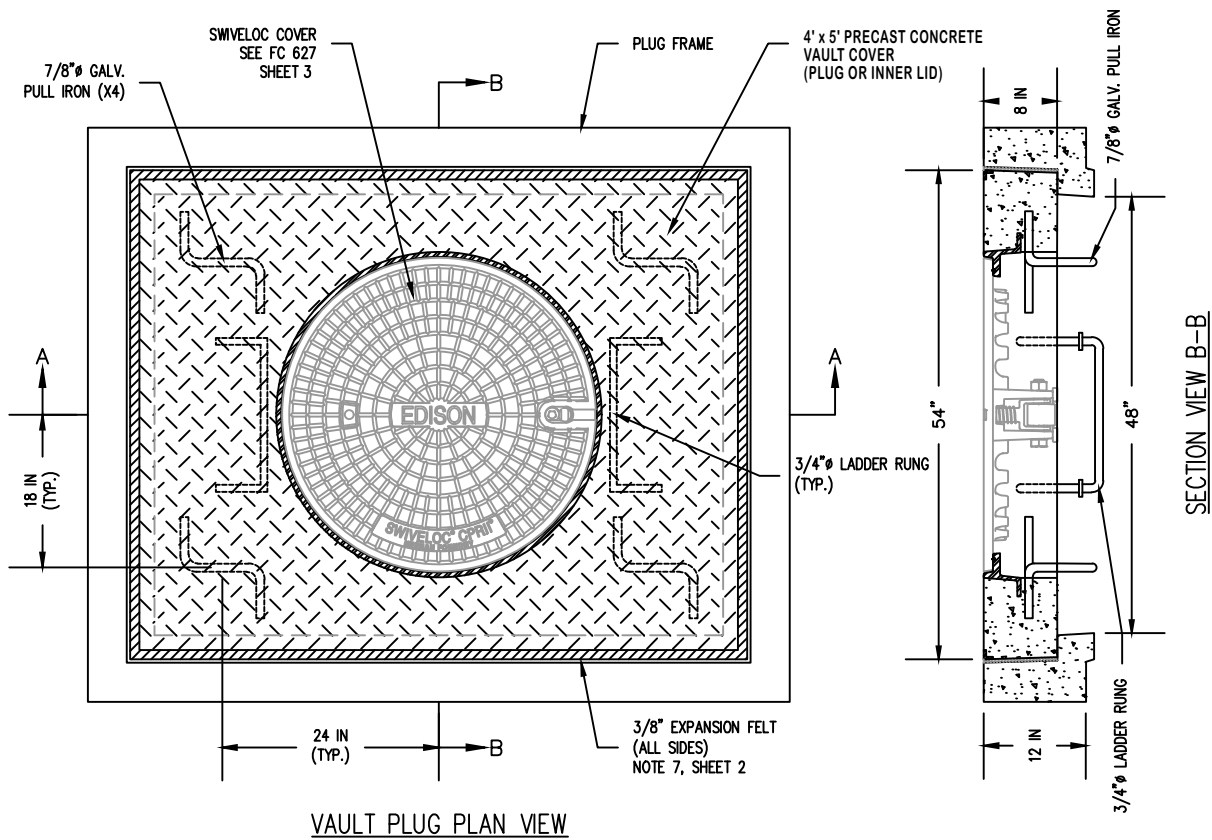
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FC 661 4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

Scope FC 661.1 4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

Figure FC 661-1: 4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame



	APPROX. WEIGHT
4'x5' PRECAST CONCRETE VAULT COVER (PLUG)	2,000 LB
PLUG FRAME	1,850 LB

Approved by:

ajf

4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

FC 661

Sheet 1 of 2


Effective Date:
04-27-2018

What's Changed? Figure FC 661-1, updated reference to FC 627 Sheet 3 for Swiveloc Cover.

UGS

Note(s):

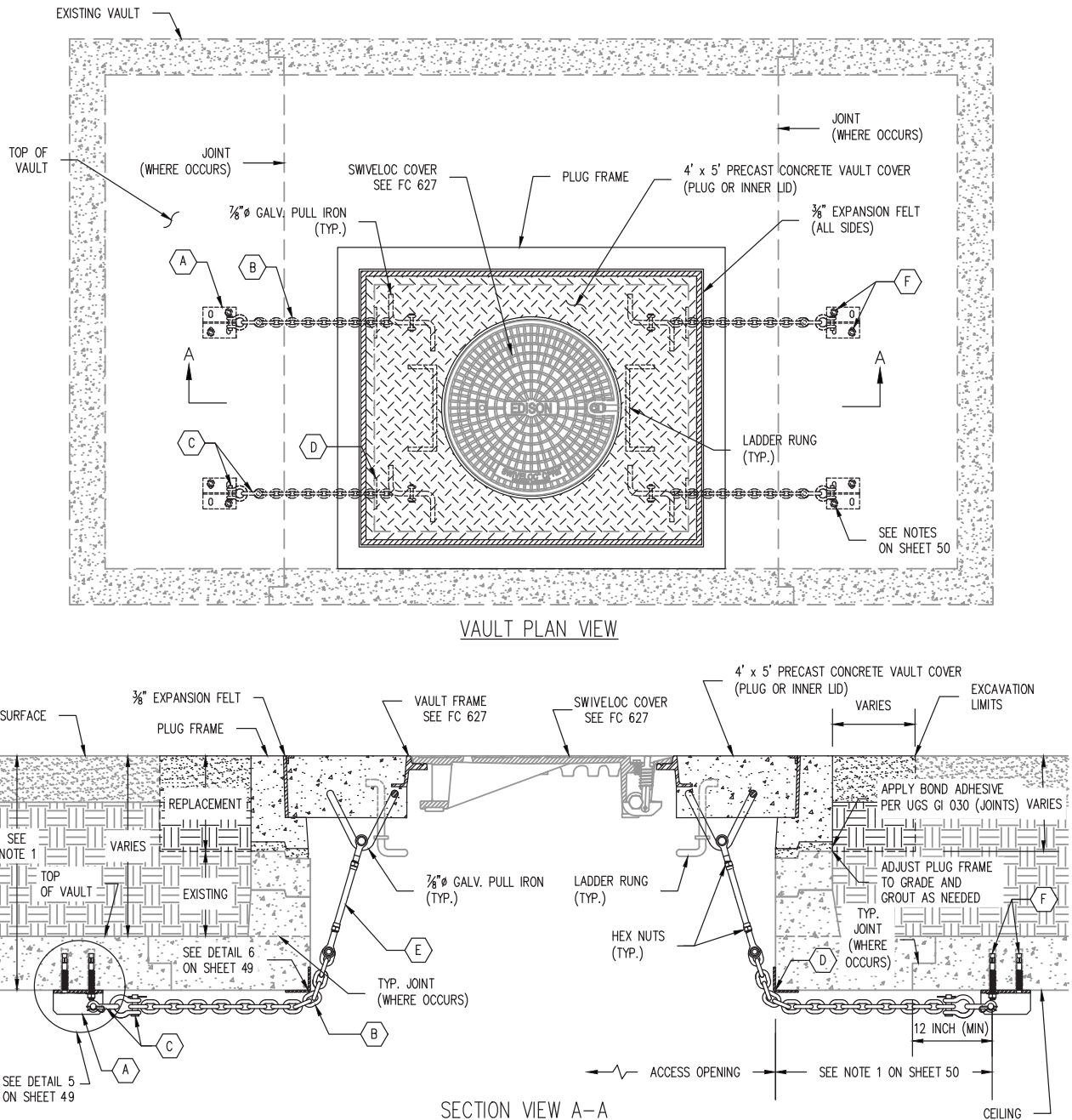
1. Meets HS-20 Loading Requirements.
2. Concrete minimum $f_c = 3,000$ psi (28 days).
3. All rebar to be Grade 60.
4. Welding of reinforcing bar will conform to AWS D1.4-11.
5. Cover will conform to Specification for Precast Reinforced Concrete Vaults and Manholes. (See [GI 030](#).)
6. Concrete cover top will have a diamond plate imprint for a nonskid surface.
7. 3/8" x 0'-8" expansion felt is required around perimeter of cover. Attach to neck and grease between felt and cover.
8. Covers constructed by the same manufacturer will be interchangeable in all necking designed for the same size cover.
9. Standard manhole cover/frame size is 30". The 27" cover/frame detail is shown "For Reference Only." Manufacturer will furnish rubber sealing plug for 1" diameter pickhole (1) on Swiveloc venting cover (See [FC 627](#)).
10. Bottom of 4'x5' plug will have a smooth float finish.
11. Ladder rung assembly will be fabricated from A-36 steel and hot-dipped galvanized after washers have been welded and stress has been relieved.
12. Manufacturers will indicate their company name with a 2" maximum letter, molded into the cover top surface, adjacent to a corner.
13. Approximate weight of 4'x5' plug: 2000 lb.
14. 7/8" Diameter galvanized pull irons are for restraining the cover resulting from a high pressure event. Pull irons shall be designed for a minimum of 15 psi pressure. In addition, the pull irons shall allow enough clearance from surface of concrete to allow a turnbuckle or shackle to be connected shown in [FC 670](#).

FC 661	4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date:
UGS		04-27-2018

FC 670 Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Scope FC 670.1 Existing Vault – Type 1 Installation

Figure FC 670–1: Existing Vault – Type 1 Installation



Note(s):

1. Existing Vault Type 1 installation used only when distance from surface to ceiling of vault is 30 inches or greater.
2. See [Scope FC 670.20](#) for General notes and [Table FC 670–1](#) for Key notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:

01-29-2021

What's Changed?

Sheet 1 of 50

UGS

Table FC 670–1: Key Notes – Existing Vault Type 1 Restraint Assembly Kit

Key Notes: Existing Vault Type 1 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 1)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	4' x 5' Plug and Frame (per UGS FC 661)	—	1
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	8
D	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	4
F	5/8" Ø x 6" Length Anchor Bolt (316 Stainless Steel)	Hilti HIT-HY 200-R HAS-R 316 SS 10214883 10214884	8
Manufacturer			Vault Restraint Kit (Type 1)
Jensen Precast			K45-VN12-R1-11
Oldcastle Precast			Edison Vault Restraint System 1
SAP			10210063

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 2 of 50

What's Changed? Updated bracket size and type of anchor bolt.

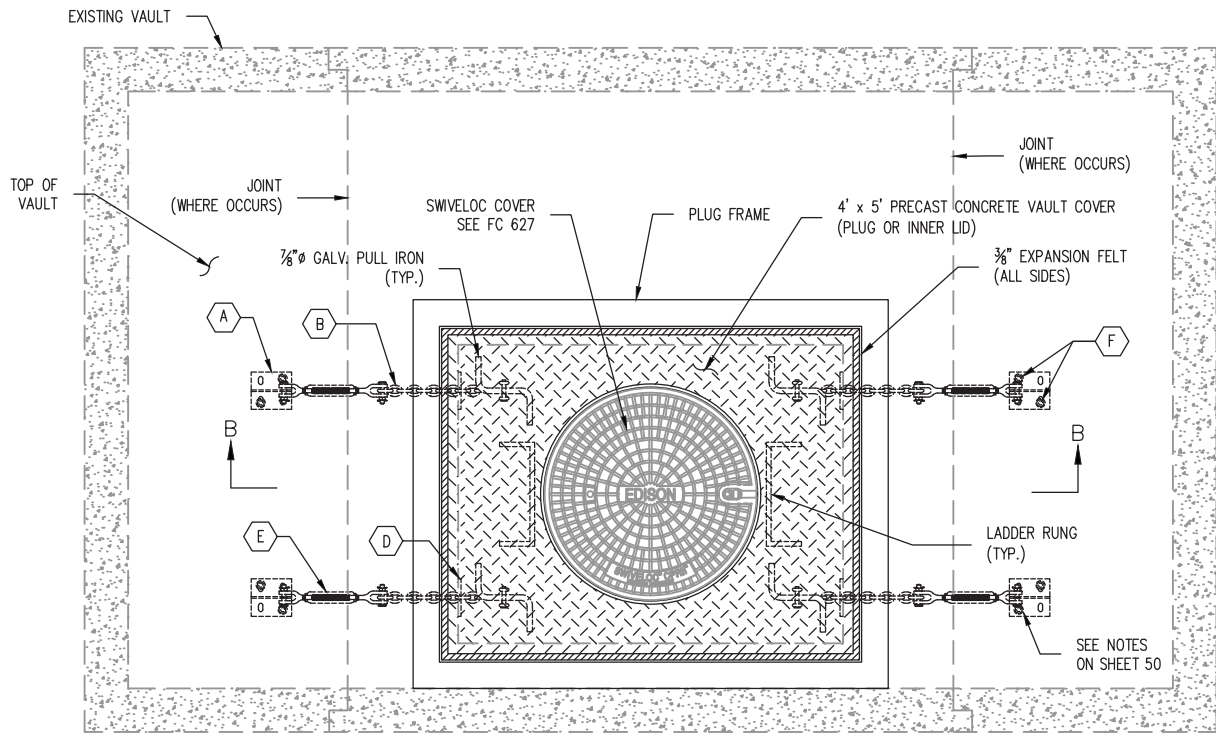
Effective Date:

01-29-2021

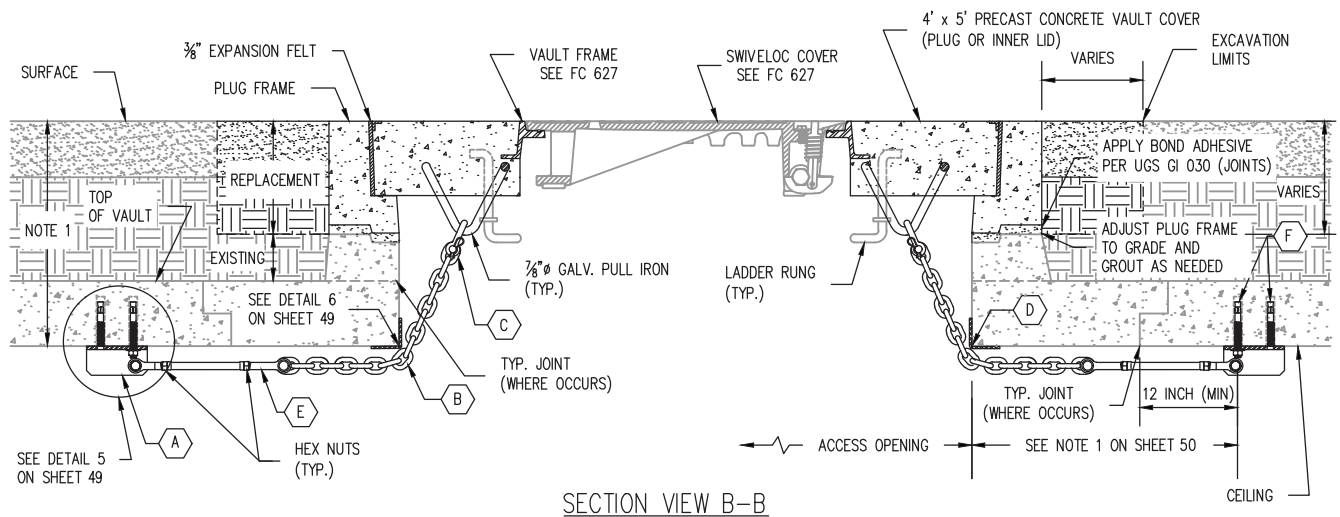
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Scope FC 670.2 Existing Vault – Type 2 Installation

Figure FC 670–2: Existing Vault – Type 2 Installation



VAULT PLAN VIEW



SECTION VIEW B-B

Note(s):

1. Type 2 installation used only when distance from surface to ceiling of vault is 30 inches or less.
2. See [Scope FC 670.20](#) for General notes and [Table FC 670–2](#) for Key notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

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Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Effective Date:
01-29-2021

What's Changed?

FC 670

Sheet 3 of 50

UGS

Table FC 670–2: Key Notes – Existing Type 2 Restraint Assembly Kit

Key Notes: Existing Vault Type 2 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 2)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	4' x 5' Plug and Frame (per UGS FC 661)	—	1
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	8
D	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	4
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R 10214883	8
		HAS-R 316 SS 10214884	
Manufacturer			Vault Restraint Kit (Type 2)
Jensen Precast			K45-VN12-R1-11
Oldcastle Precast			Edison Vault Restraint System 2
SAP			10210063

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 4 of 50

What's Changed? Updated bracket size and type of anchor bolt.

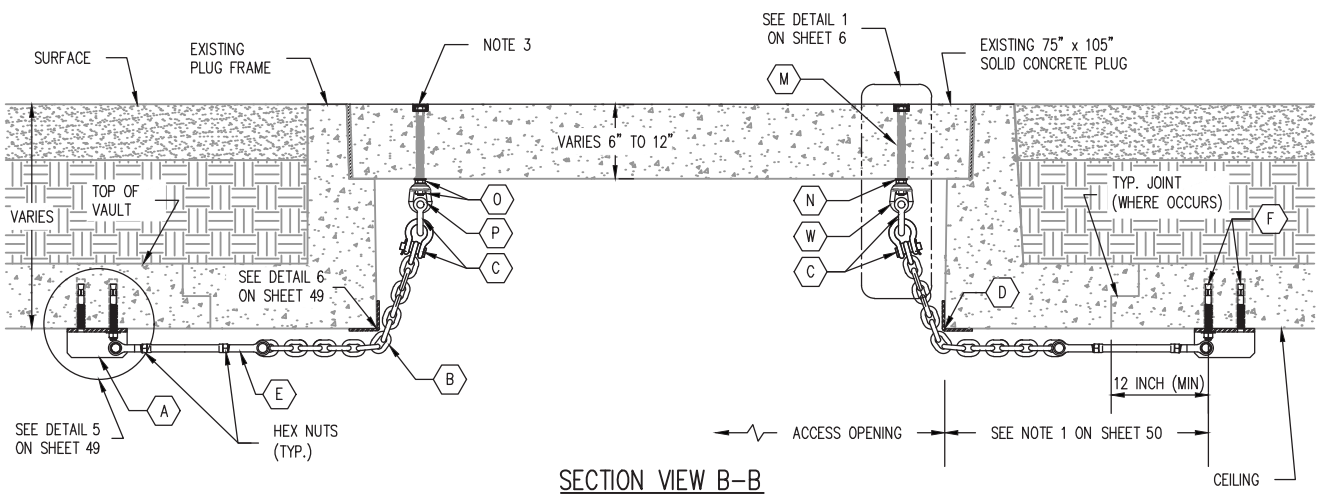
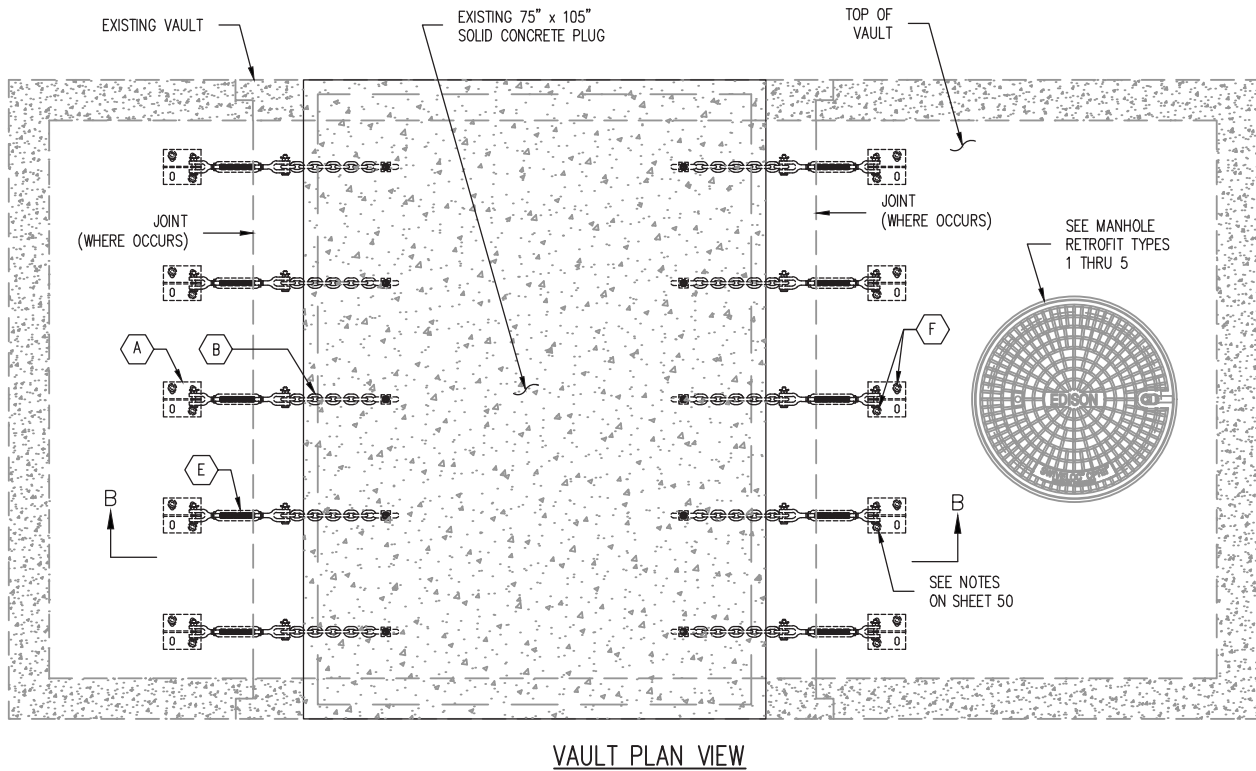
Effective Date:

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Scope FC 670.3 Existing Vault – Type 3 Installation

Figure FC 670–3.1: Existing Vault – Type 3 Installation



Note(s):

1. See [Scope FC 670.20](#) for General notes and [Table FC 670–3](#) for Key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
3. After hardware installation, fill and level gaps around bolt with Sika Concrete Sealer.
4. When removing cover plug, do not damage bolts.

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Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:

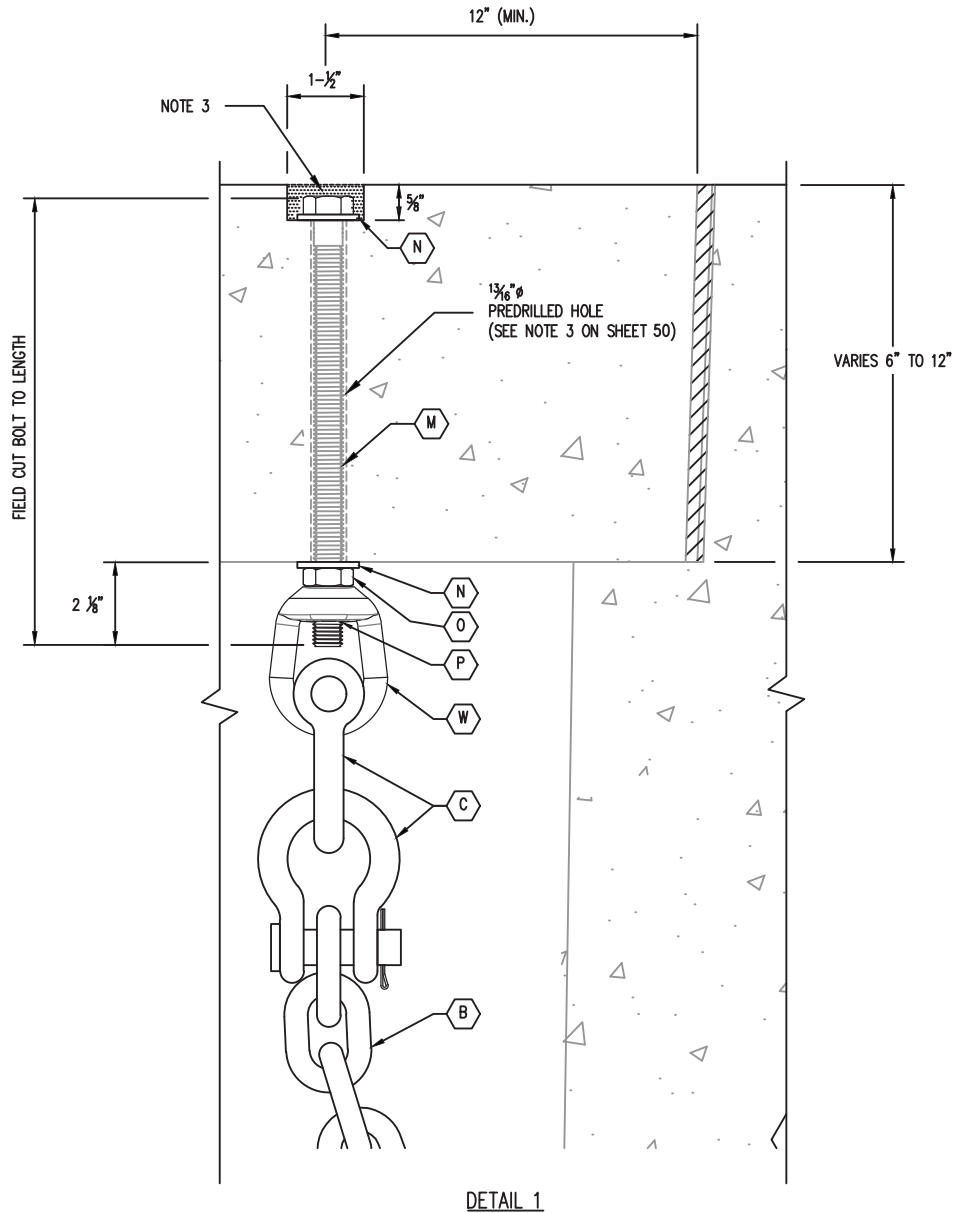
01-29-2021

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Sheet 5 of 50

UGS

Figure FC 670-3.2 Existing Vault - Type 3 Installation: Restraint Connection to Ceiling Installation Details



Note(s):

1. See [Scope FC 670.20](#) for General Notes and [Table FC 670-3](#) for Key Notes.
2. If an event (such as electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the cover(s) and restraints can be reused or will require replacement.
3. After hardware installation, fill and level gaps around bolt with Sikaflex.
4. When removing cover plug, do not damage bolts.

FC 670

Sheet 6 of 50

UGS

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

What's Changed?

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Effective Date:

01-29-2021

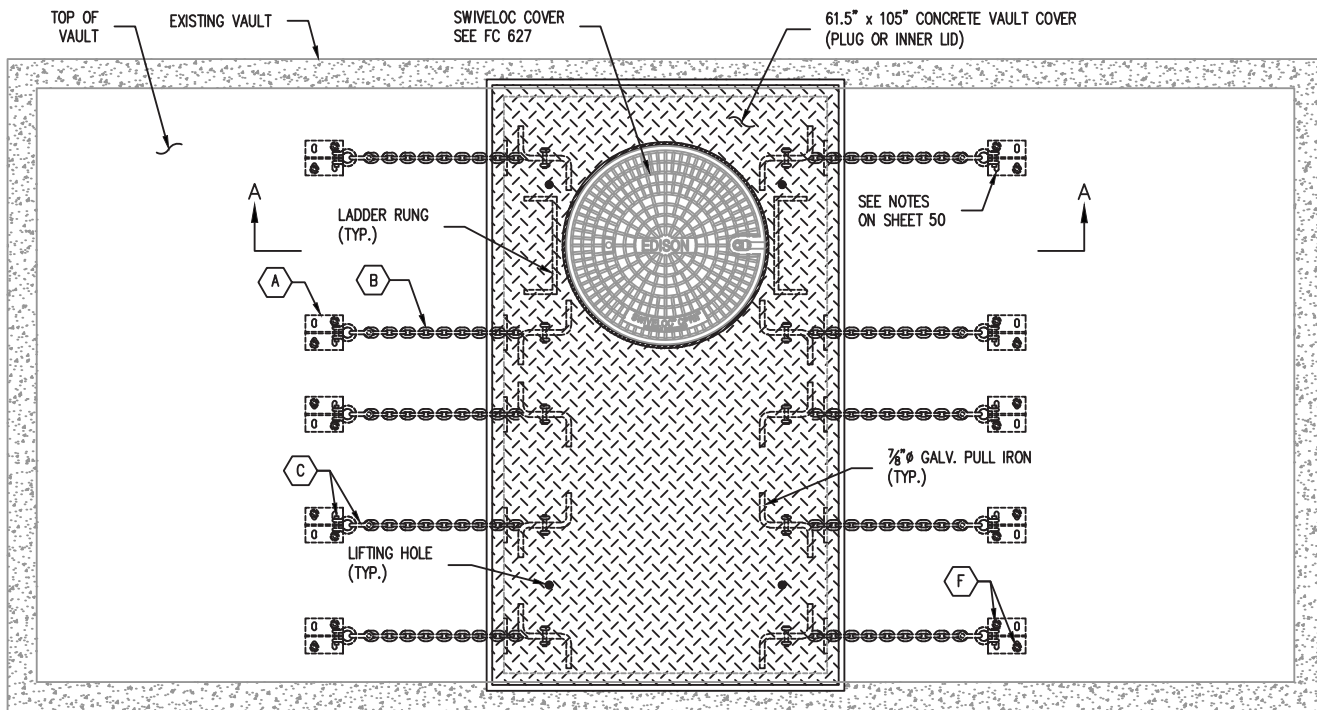
Table FC 670-3: Key Notes – Existing Vault Type 3 Restraint Assembly Kit

Key Notes: Existing Vault Type 3 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 3)
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	10
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	80 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	20
D	304 Stainless Steel Angle L 3 X 3 X 1/4 –6" Length	10209812	10
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	10
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R HAS-R 316 SS 10214883 10214884	20
H	5/8" Ø – 11 x 24" Thread Length – Stainless Steel Hex Bolt (Field Cut)	10209997	20
N	5/8" Flat Washer (Stainless Steel)	10209821	10
O	5/8" – 11 Hex Nut (Stainless Steel)	10209822	20
P	Hairpin Cotter Pin (3/32" Wire Diameter, Stainless Steel)	—	10
W	5/8" Ø Eye Nut (Stainless Steel) McMaster # 3061T45	—	10
Manufacturer			Vault Restraint Kit (Type 3)
Jensen Precast			K-VN12-R3-11
Oldcastle Precast			EDISON VAULT RESTRAINT SYTEM 3
SAP			10211579

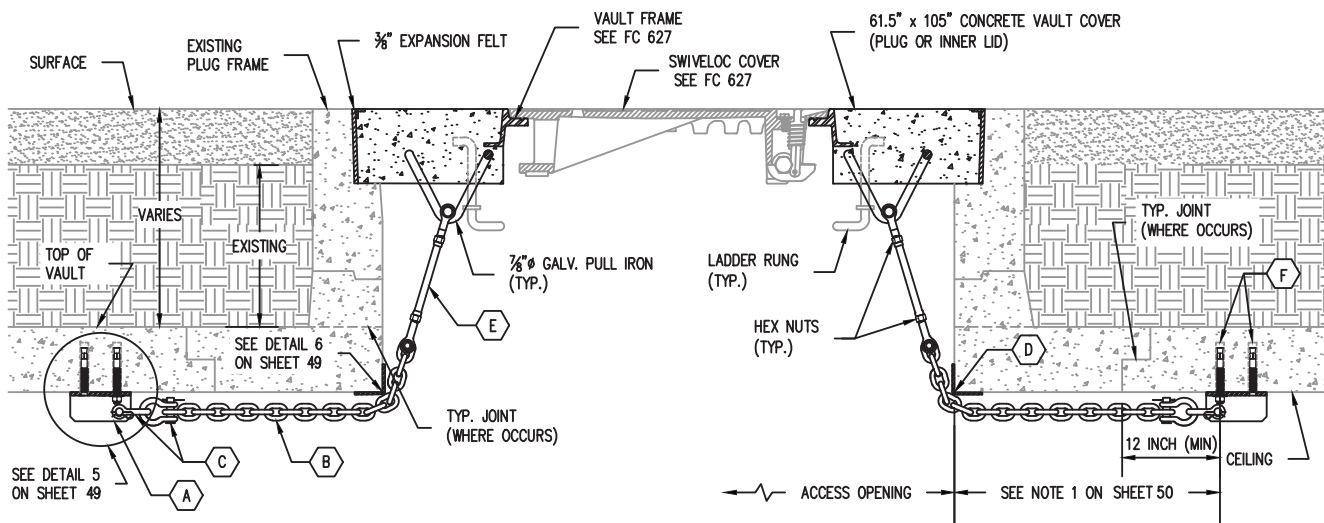
Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 7 of 50
		UGS

Scope FC 670.4 Existing Vault – Type 4 Installation

Figure FC 670–4: Existing Vault – Type 4 Installation



VAULT PLAN VIEW



SECTION VIEW A-A

Note(s):

1. See [Scope FC 670.20](#) for General notes and [Table FC 670–4](#) for Key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 8 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

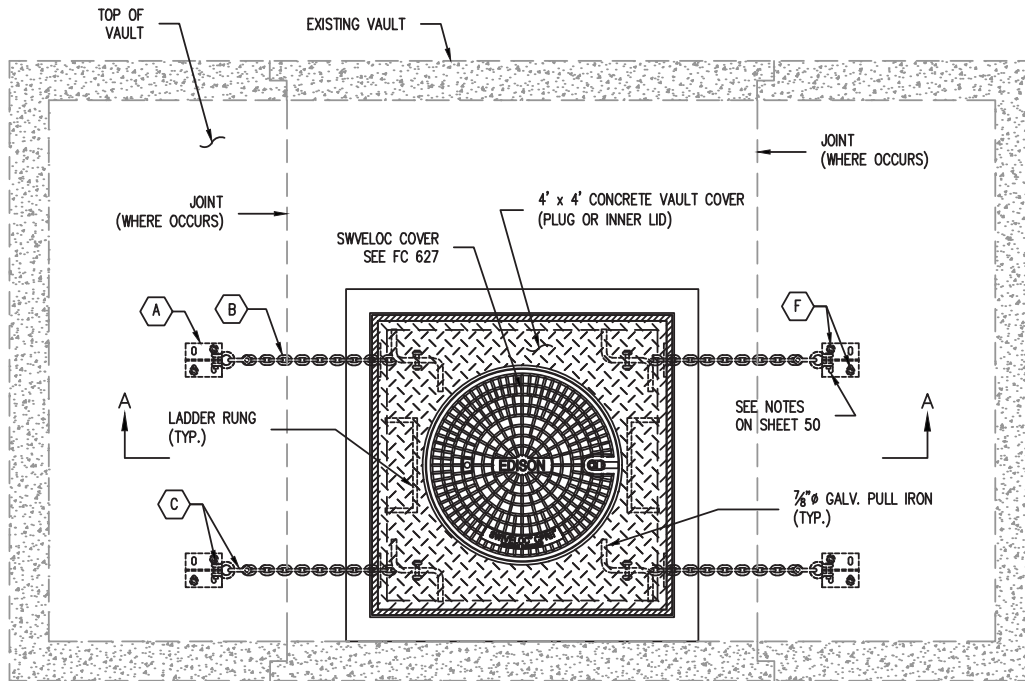
Table FC 670-4: Key Notes – Existing Vault Type 4 Restraint Assembly Kit

Key Notes: Existing Vault Type 4 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 4)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	61.5" x 105" Plug and Frame	—	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	10
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	80 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	20
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	10
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	10
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R 10214883 HAS-R 316 SS 10214884	20
Manufacturer			Vault Restraint Kit (Type 4)
Jensen Precast			K586-VN12-R4-11
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 4
SAP			10211580

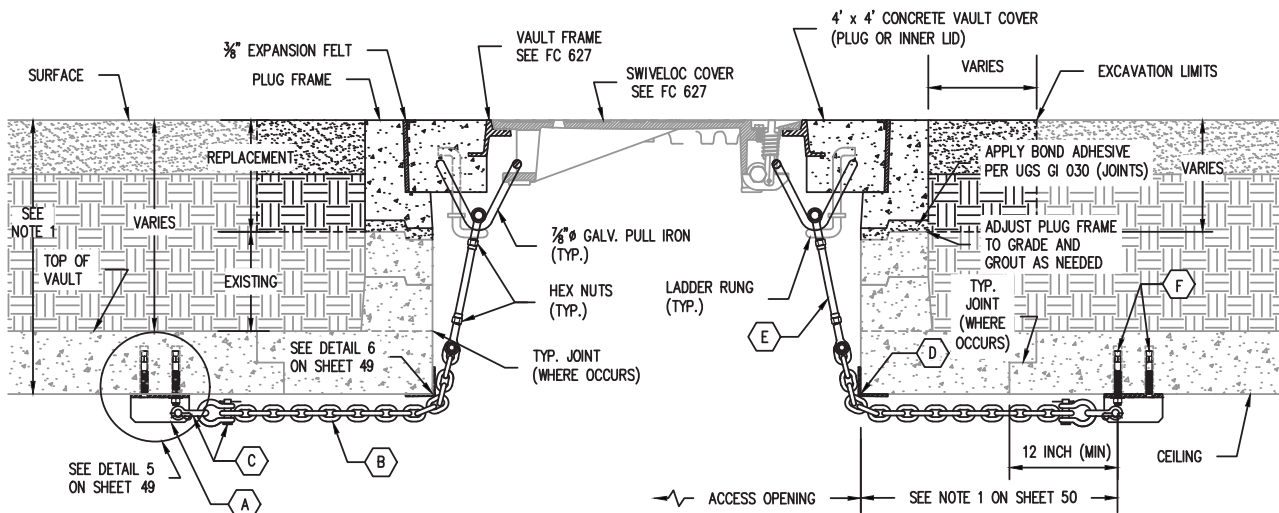
Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 9 of 50
		UGS

Scope FC 670.5 Existing Vault – Type 5 Installation

Figure FC 670–5: Existing Vault – Type 5 Installation



VAULT PLAN VIEW



SECTION VIEW A-A

Note(s):

- Existing Vault Type 5 Installation used only when distance from surface to vault ceiling is 30 inches or greater.
- See [Scope FC 670.20](#) for General notes and [Table FC 670–5](#) for Key notes.
- If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 10 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

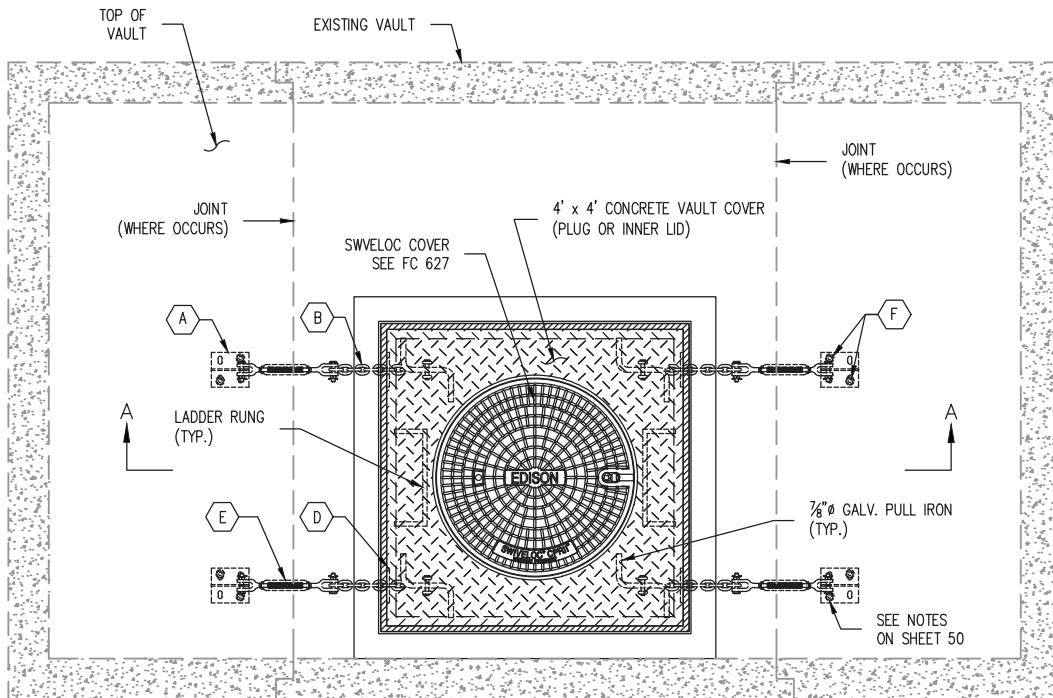
Table FC 670-5: Key Notes – Existing Vault Type 5 Restraint Assembly Kit

Key Notes: Existing Vault Type 5 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 5)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	4' x 5' Plug and Frame	—	1
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	8
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	4
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R 10214883 HAS-R 316 SS 10214884	8
Manufacturer			Vault Restraint Kit (Type 5)
Jensen Precast			K44-VN12-R5-11
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 5
SAP			10211581

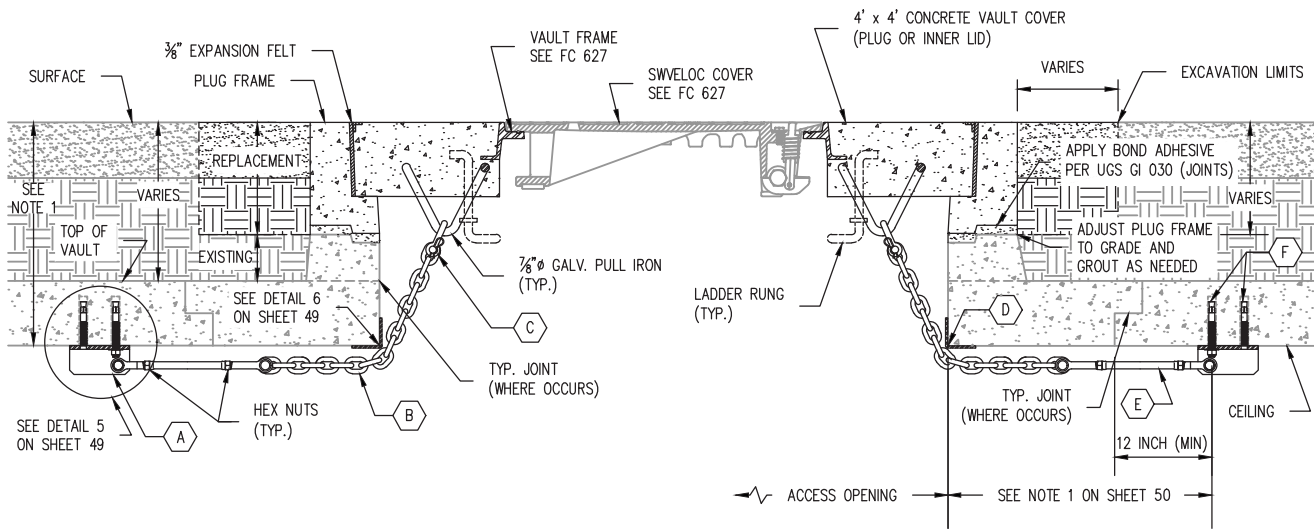
Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 11 of 50
		UGS

Scope FC 670.6 Existing Vault – Type 6 Installation

Figure FC 670–6: Existing Vault – Type 6 Installation



VAULT PLAN VIEW



SECTION VIEW A-A

Note(s):

- Existing Vault Type 6 Installation used only when distance from surface to vault ceiling is 30 inches or less.
- See [Scope FC 670.20](#) for General notes and [Table FC 670–6](#) for Key Notes.
- If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 12 of 50

What's Changed?


Effective Date:

01-29-2021

UGS

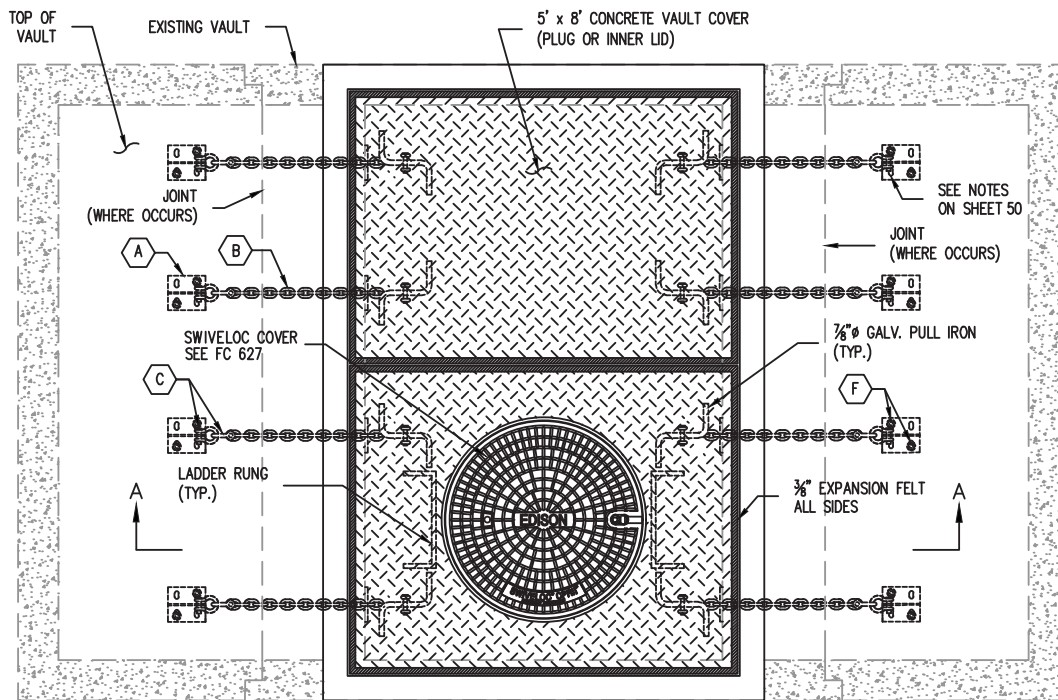
Table FC 670–6: Key Notes – Existing Vault Type 6 Restraint Assembly Kit

Key Notes: Existing Vault Type 6 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 6)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	4' x 4' Plug and Frame	—	1
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	8
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	4
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R HAS-R 316 SS 10214883 10214884	8
Manufacturer			Vault Restraint Kit (Type 6)
Jensen Precast			K44-VN12-R5-11
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 6
SAP			10211581

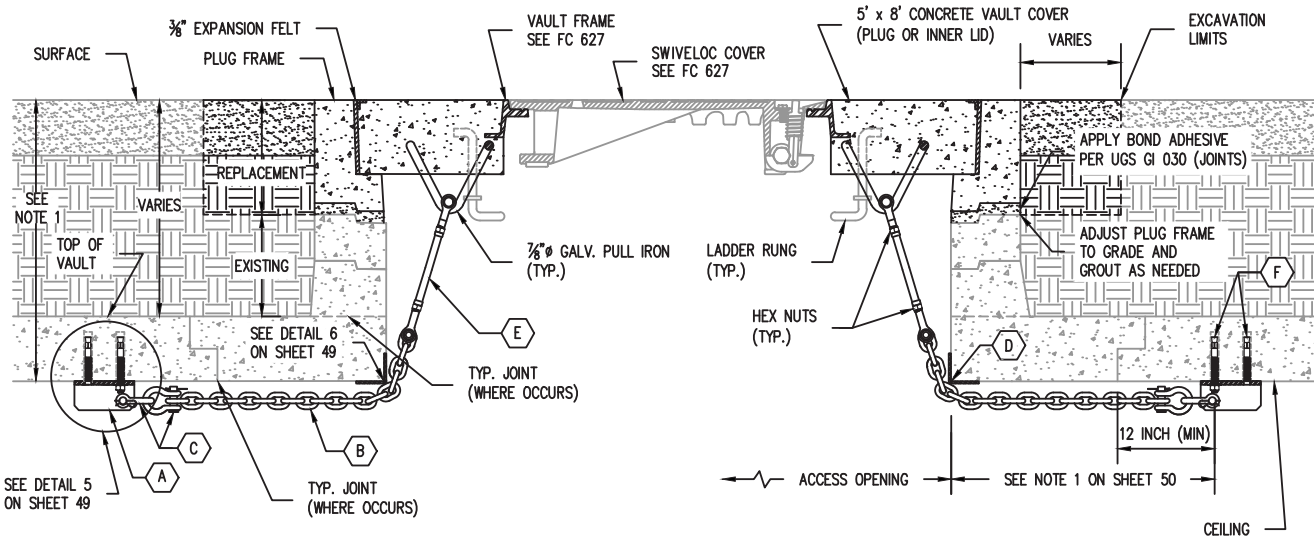
Approved by: 	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 13 of 50
		UGS

Scope FC 670.7 Existing Vault – Type 7 Installation

Figure FC 670–7: Existing Vault – Type 7 Installation



VAULT PLAN VIEW



SECTION VIEW A-A

Note(s):

1. Existing Vault Type 7 Installation used only when distance from surface to vault ceiling is 30" or greater.
2. See [Scope FC 670.20](#) for General Notes and [Table FC 670–7](#) for Key Notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 14 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

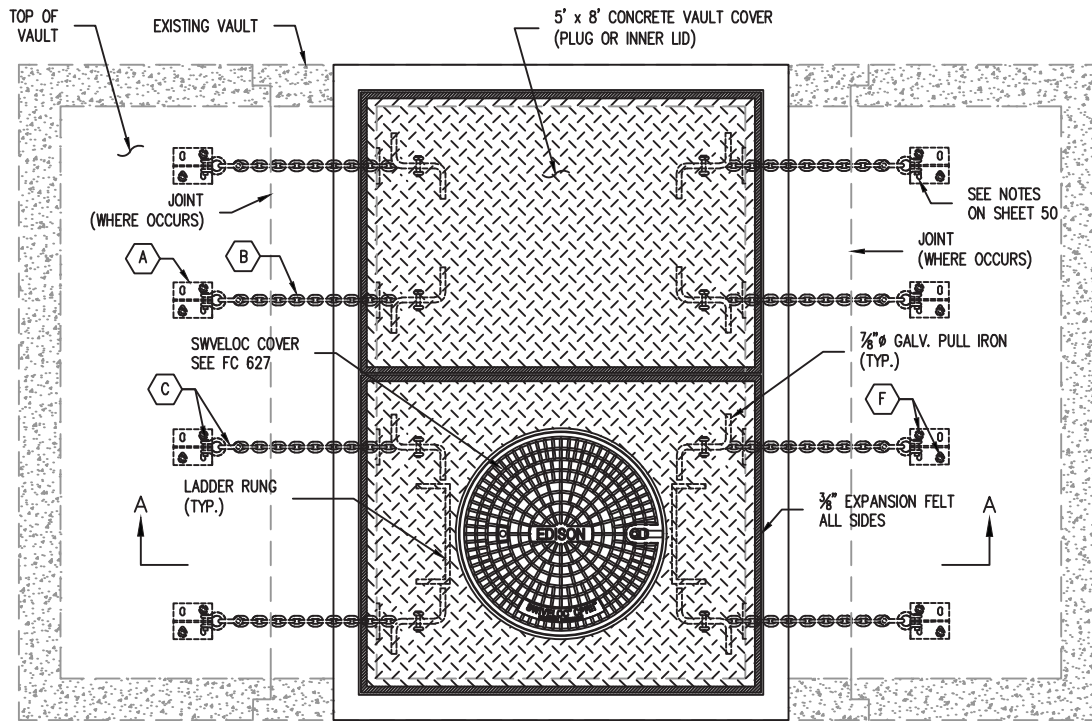
Table FC 670-7: Key Notes – Existing Vault Type 7 Restraint Assembly Kit

Key Notes: Existing Vault Type 7 Restraint Assembly Kit				
Item	Description	SAP	Qty. Required Per Installation	
			Vault (Type 7)	
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1	
	5' x 8' Plug and Frame	—	1	
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4	
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	60 ft.	
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	16	
D	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	8	
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	8	
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R HAS-R 316 SS	10214883 10214884	16
Manufacturer			Vault Restraint Kit (Type 7)	
Jensen Precast			K58-VN12-R7-11	
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 7	
SAP			10211583	

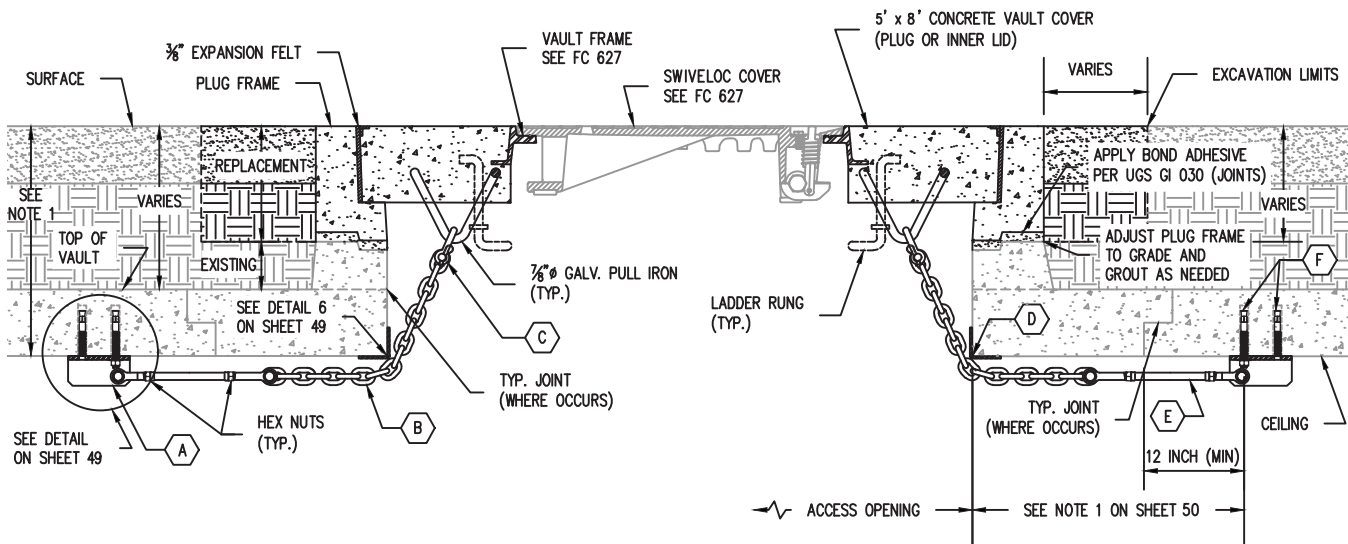
Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 15 of 50
		UGS

Scope FC 670.8 Existing Vault – Type 8 Installation

Figure FC 670–8: Existing Vault – Type 8 Installation



VAULT PLAN VIEW



SECTION VIEW A-A

Note(s):

- Existing Vault Type 8 Installation used only when distance from surface to vault ceiling is 30" or less.
- See [Scope FC 670.20](#) for General Notes and [Table FC 670–9 \(Sheet 22\)](#) for Key Notes.
- If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 16 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

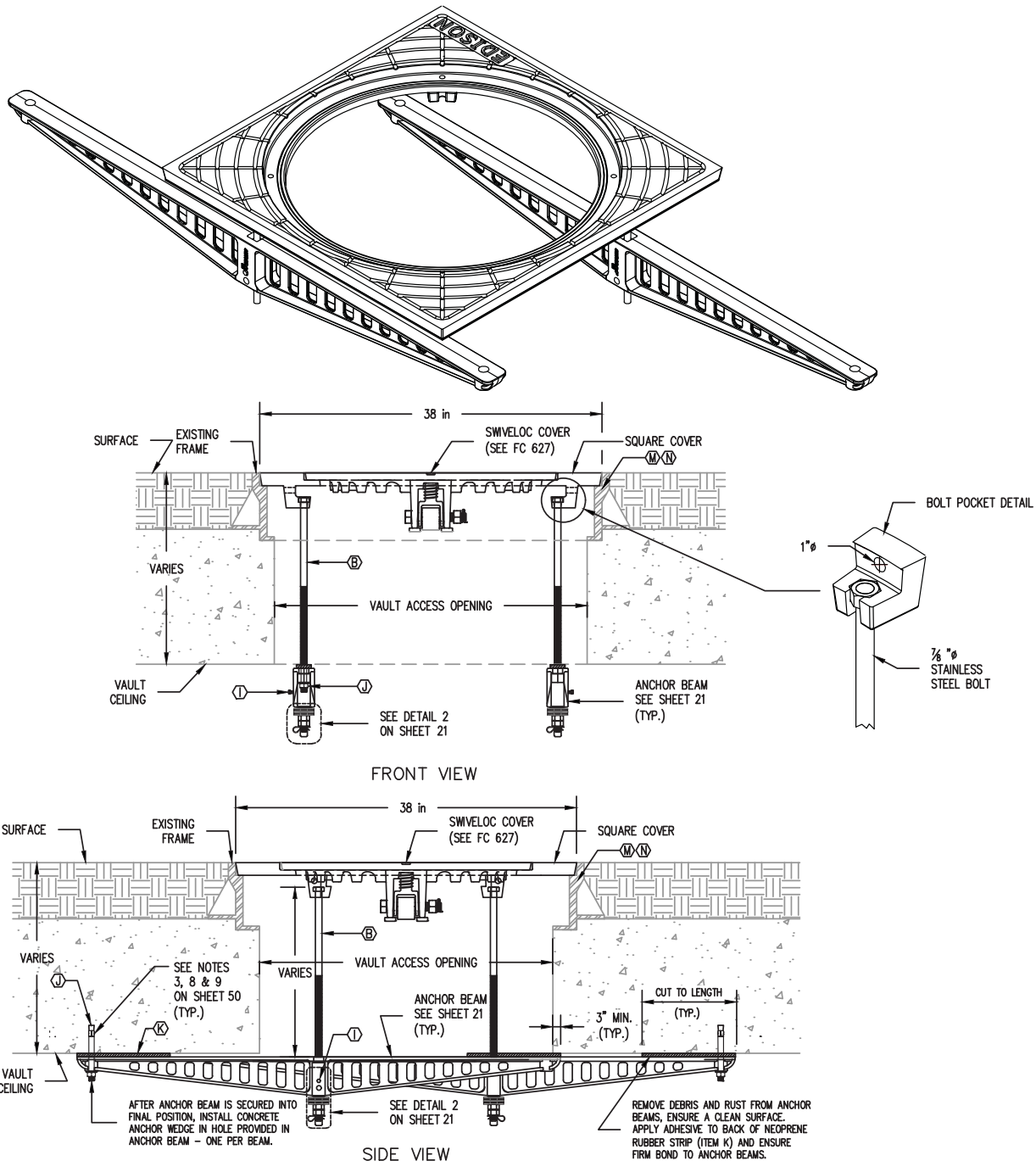
Table FC 670–8: Key Notes – Existing Vault Type 8 Restraint Assembly Kit

Key Notes: Existing Vault Type 8 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 8)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	5' x 8' Plug and Frame	—	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 41 for details.)	10209809	4
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	60 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	16
D	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	8
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	8
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R 10214883 HAS-R 316 SS 10214884	16
Manufacturer			Vault Restraint Kit (Type 8)
Jensen Precast			K58-VN12-R8-11
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 8
SAP			10211583

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Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 17 of 50
		UGS

Scope FC 670.9 Existing Vault – Type 9 Installation

Figure FC 670–9.1: Existing Vault – Type 9 Installation
(38" x 38" Square Ductile Iron Retrofit Cover and Anchor Beam Assembly Details)



Note(s):

1. See [Scope FC 670.20](#) for General Notes and [Table FC 670–9](#) for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Sheet 18 of 50

UGS

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Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

What's Changed?

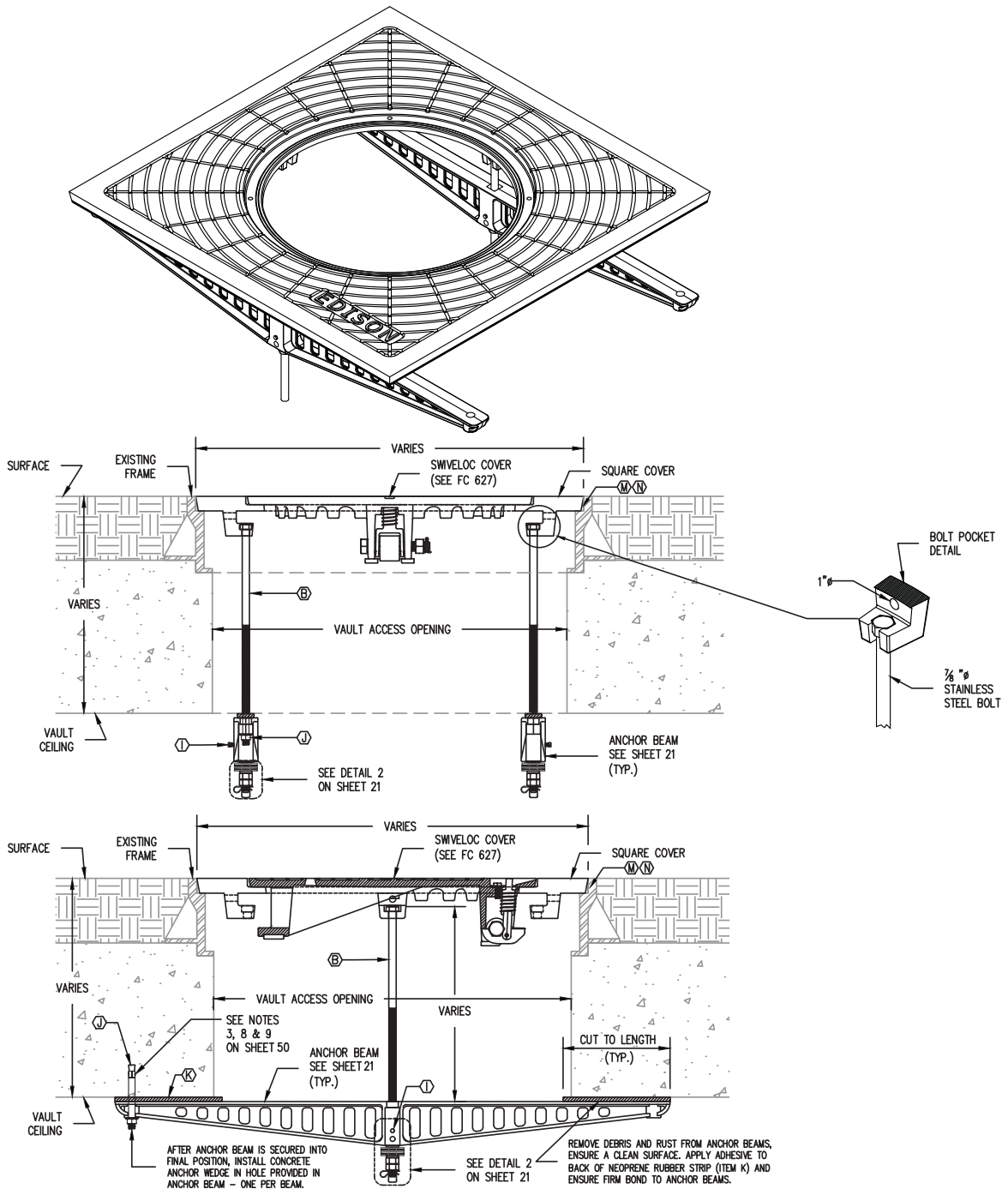
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Effective Date:

01-29-2021

**Figure FC 670-9.2: Existing Vault – Type 9 Installation
(42" x 42" through 53" x 53" Square Ductile Iron Retrofit Cover and Anchor Beam Assembly Details)**



Note(s):

1. See [Scope FC 670.20](#) for General Notes and [Table FC 670-9](#) for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

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Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Sheet 19 of 50

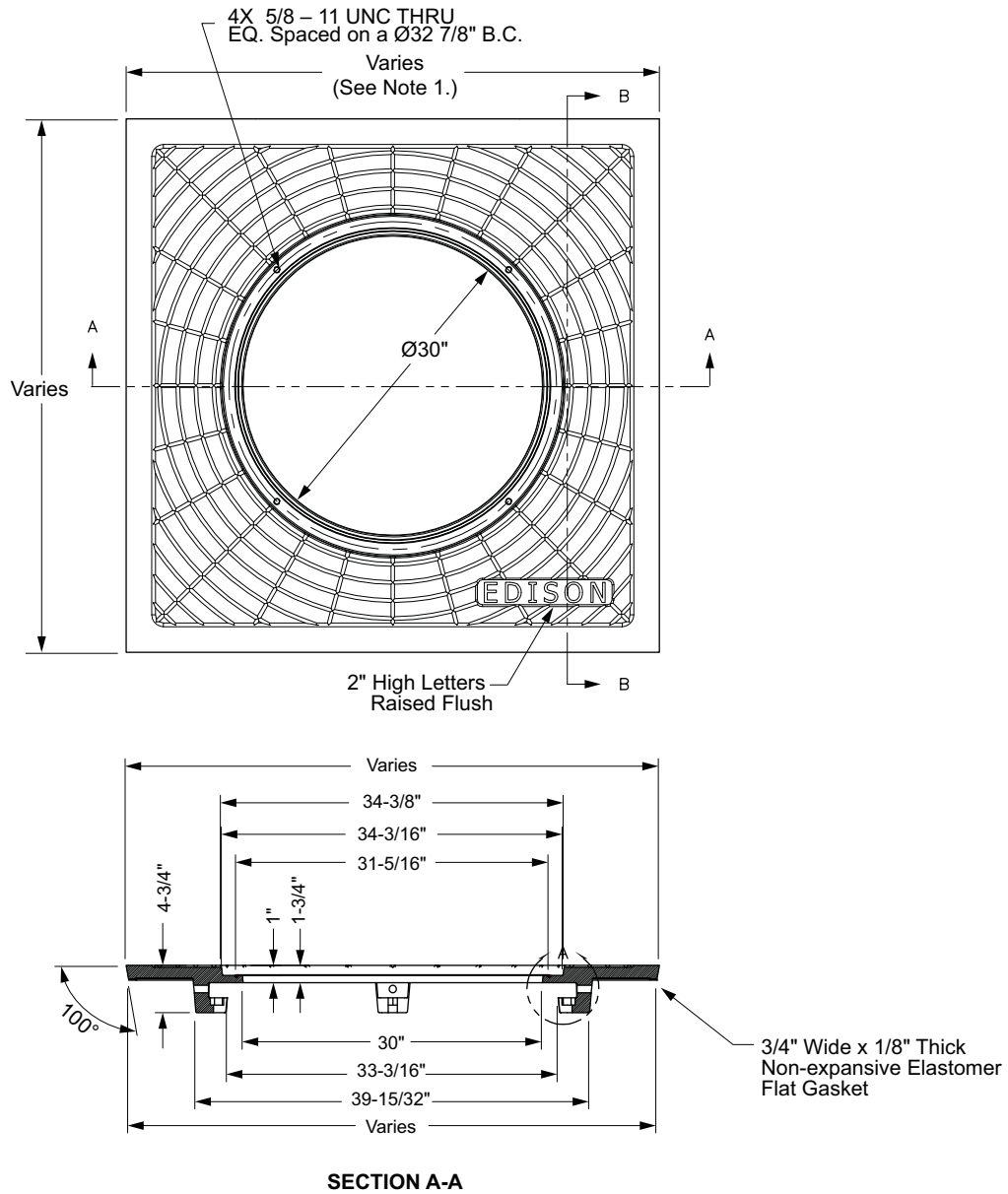
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**Figure FC 670-9.3: Existing Vault – Type 9 Installation
(Square Ductile Iron Retrofit Cover)**



Note(s):

1. Dimensions range from 38" to 53-1/2" square. Existing Vault Frames shall be measured by material supplier for retrofits.
2. Weight ranges from 224 lb. to 679 lb.
3. Square Retrofit Cover will accept Edison 30" Round Cast Iron Manhole Cover (See FC 621).
4. This has been approved for system-wide use.

FC 670

**Existing Vault and Manhole – Frame and Cover Replacement and Restraint
Installation**

Approved by:

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Sheet 20 of 50

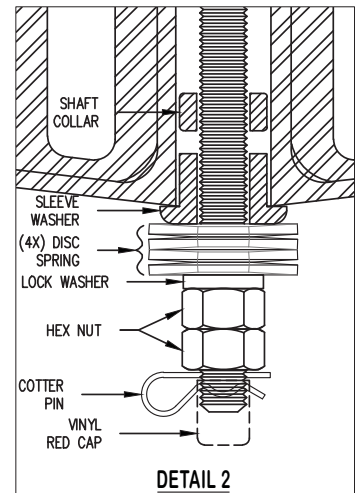
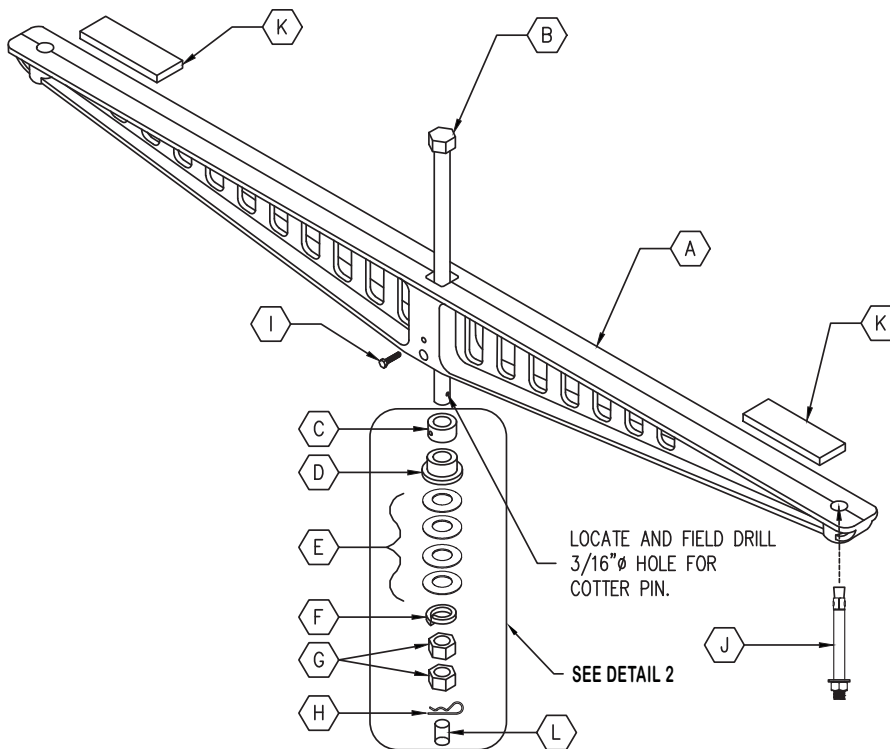
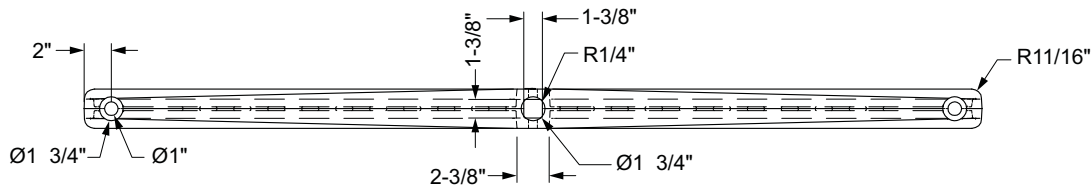
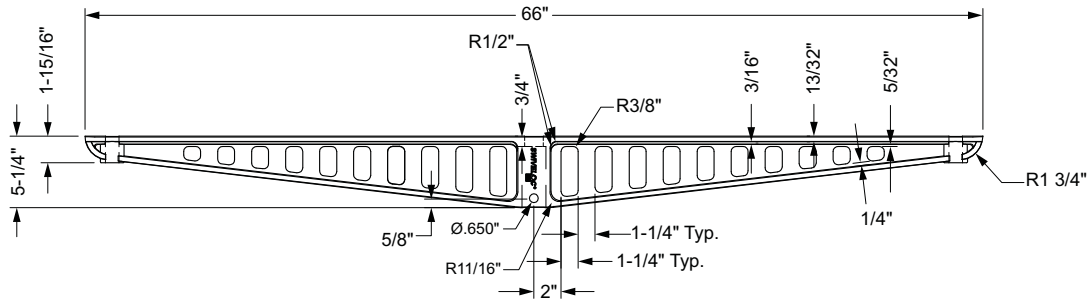
What's Changed?

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01-29-2021

**Figure FC 670-9.4: Existing Vault – Type 9 Installation
(Retrofit Plate Anchor Beam)**



Note(s):

1. Anchor Beam Material: Ductile Iron, ASTM A-536, 55 + KSI Yield.
2. This has been approved for installation in the following districts: Long Beach
3. See [Scope FC 670.20](#) for General Notes and [Table FC 670-9](#) for Key Notes.
4. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:

01-29-2021

What's Changed?

Sheet 21 of 50

UGS

Table FC 670–9: Key Notes – Existing Vault Type 9 Restraint Assembly Kit

Key Notes: Existing Vault Type 9 Restraint Assembly Kit		
Item	Description	Qty. Required Per Installation
		Vault (Type 9)
	Swiveloc Round Manhole Cover (UGS FC 627)	1
	38" x 38" Square Cover, or 46" x 46" Square Cover, or 53" x 53" Square Cover	1
A	66-inch Long Anchor Beam – 49 lb/Ea.	2
B	7/8" – 9 Stainless Steel Bolt	2
C	Shaft Collar	2
D	Sleeve Washer	2
E	Belleville Disc Spring - Stainless Steel 0.88 in. I.D., 1.75 O.D., 0.057 in. Thick	8
F	Lock Washer – Stainless Steel	2
G	7/8" – 9 Stainless Steel Hex Nut	4
H	Hairpin Cotter Pin (3/32" Wire Diameter) - Stainless Steel	2
I	5/16" 18 - Stainless Steel (Shaft Collar Bolt)	4
J	1/2" Ø x 6" Lg. Stainless Steel Concrete Wedge Anchors (Install one per anchor beam as shown)	2
K	Neoprene Rubber Strip (2" x 36" x 1/2" Thick) – Field Cut to Fit	2
L	Vinyl Red Protective Cap	4
M	Adhesive	1
N	Gasket	—
Manufacturer		
Neenah Foundry		SAP
	38" x 38" Square Cover	10211489
	38" x 38" Square Cover w/ Lip	10211491
	46" x 46" Square Cover	10211492
	46" x 46" Square Cover w/ Lip	10211493
	53" x 53" Square Cover	10211494
	53" x 53" Square Cover w/ Lip	10211495

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 22 of 50

What's Changed?

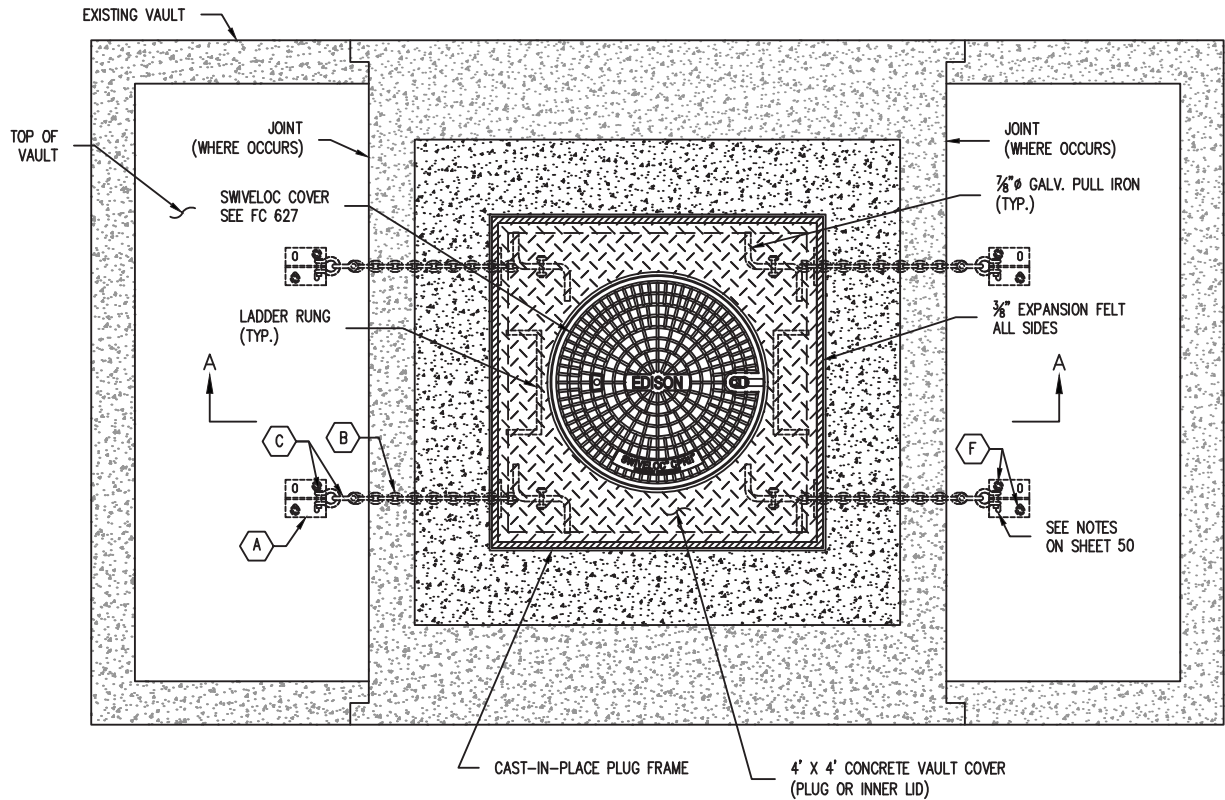
Effective Date:

UGS

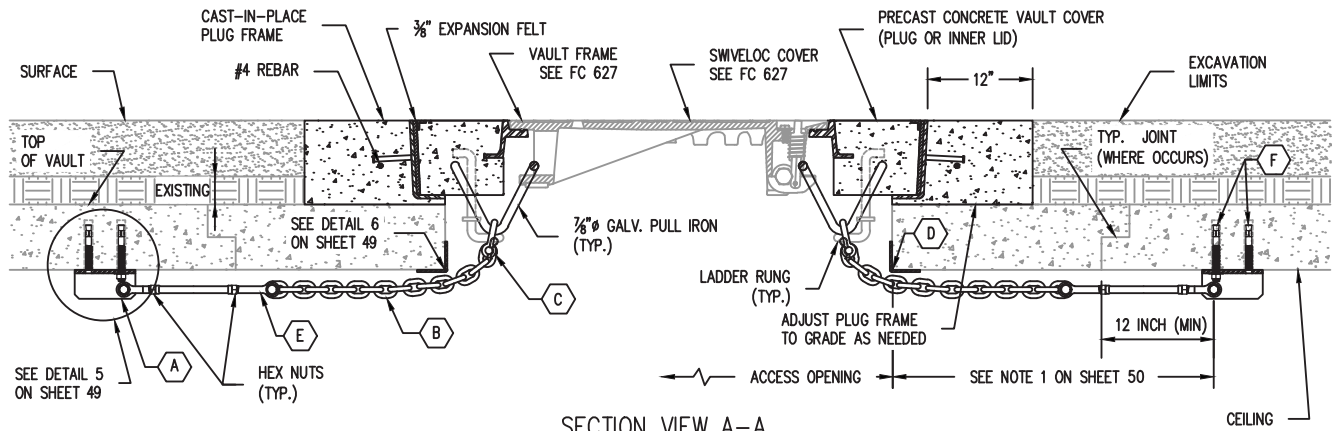
01-29-2021

Scope FC 670.10 Existing Vault – Type 10 Installation

Figure FC 670–10.1: Existing Vault - Type 10 Installation



VAULT PLAN VIEW



SECTION VIEW A-A

Note(s):

1. See [Scope FC 670.20](#) for General Notes and [Table FC 670–10.7](#) for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

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RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:

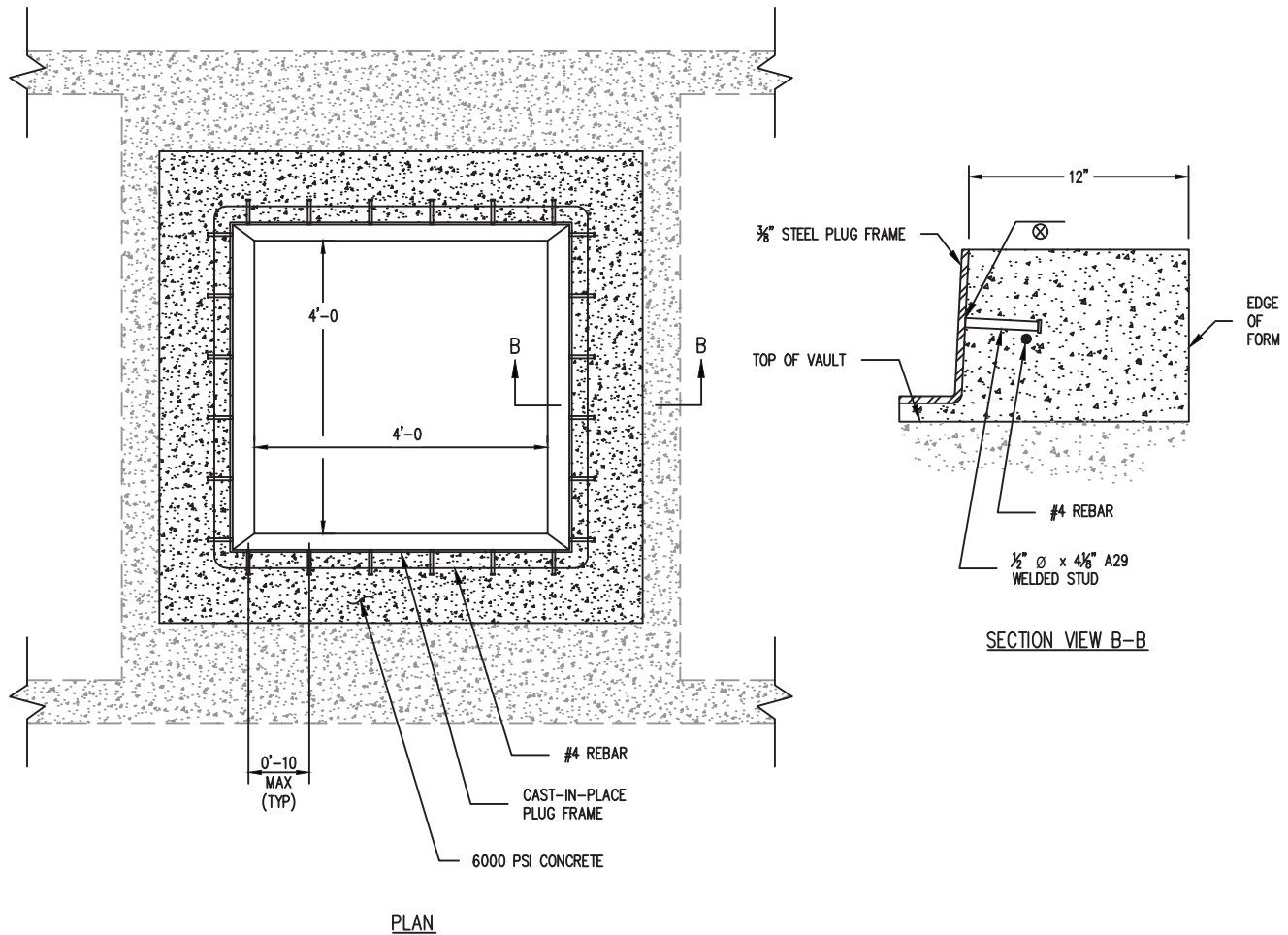
01-29-2021

What's Changed?

Sheet 23 of 50

UGS

Figure FC 670-10.2: Existing Vault – Type 10 – Cast-in-Place Plug Frame



Note(s):

1. A 1/8" tolerance shall be included in the fabrication of the steel frame.
2. Steel frame shall be ASTM A36. Edges shall be formed with a 1/4" fillet weld in accordance with AWS D1.1.
3. Steel frame including welded studs shall be hot dipped galvanized in accordance with ASTM A123.
4. Steel frame shall be installed flush with surrounding grade.
5. Concrete shall be placed with a form or barrier on all sides. The inside surfaces of forms shall be clean of dirt and foreign material. Forms shall be coated with form release agent prior to their use.
6. Bottom of excavation shall be clean of dirt and free of foreign material.
7. Reinforcing bars shall conform to ASRM A615 or A706 Grade 60.
8. Rebar shall be placed with a minimum cover of 1.5" on all sides.
9. Concrete shall be mixed, placed, consolidated and finished in accordance with the applicable ACI standards.
10. Finished surface shall receive a broom finish.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 24 of 50

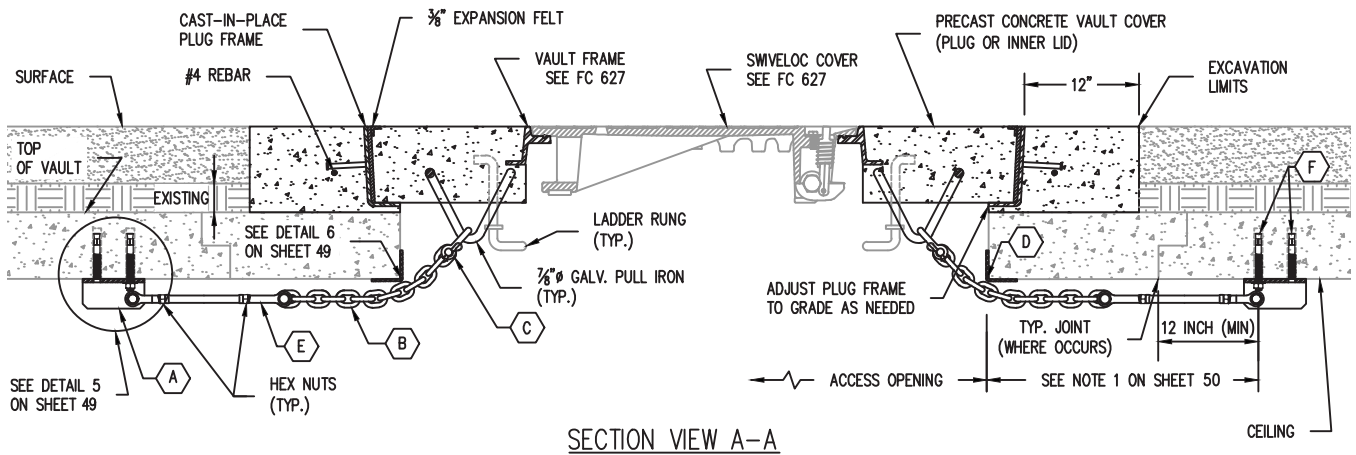
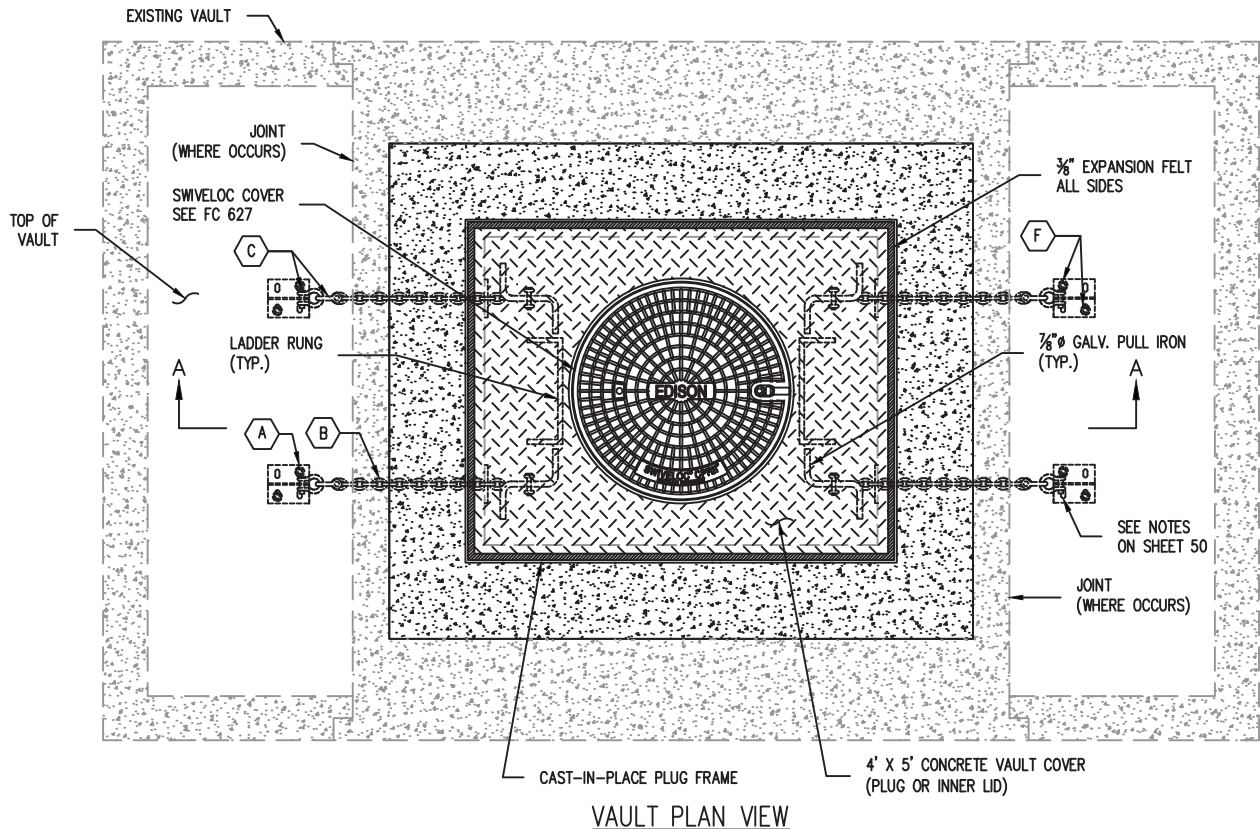
What's Changed?

Effective Date:

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01-29-2021

Figure FC 670-10.3: Existing Vault – Type 10 Installation



Note(s):

1. See [Scope FC 670.20](#) for General Notes and [Table FC 670-10.7](#) for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:

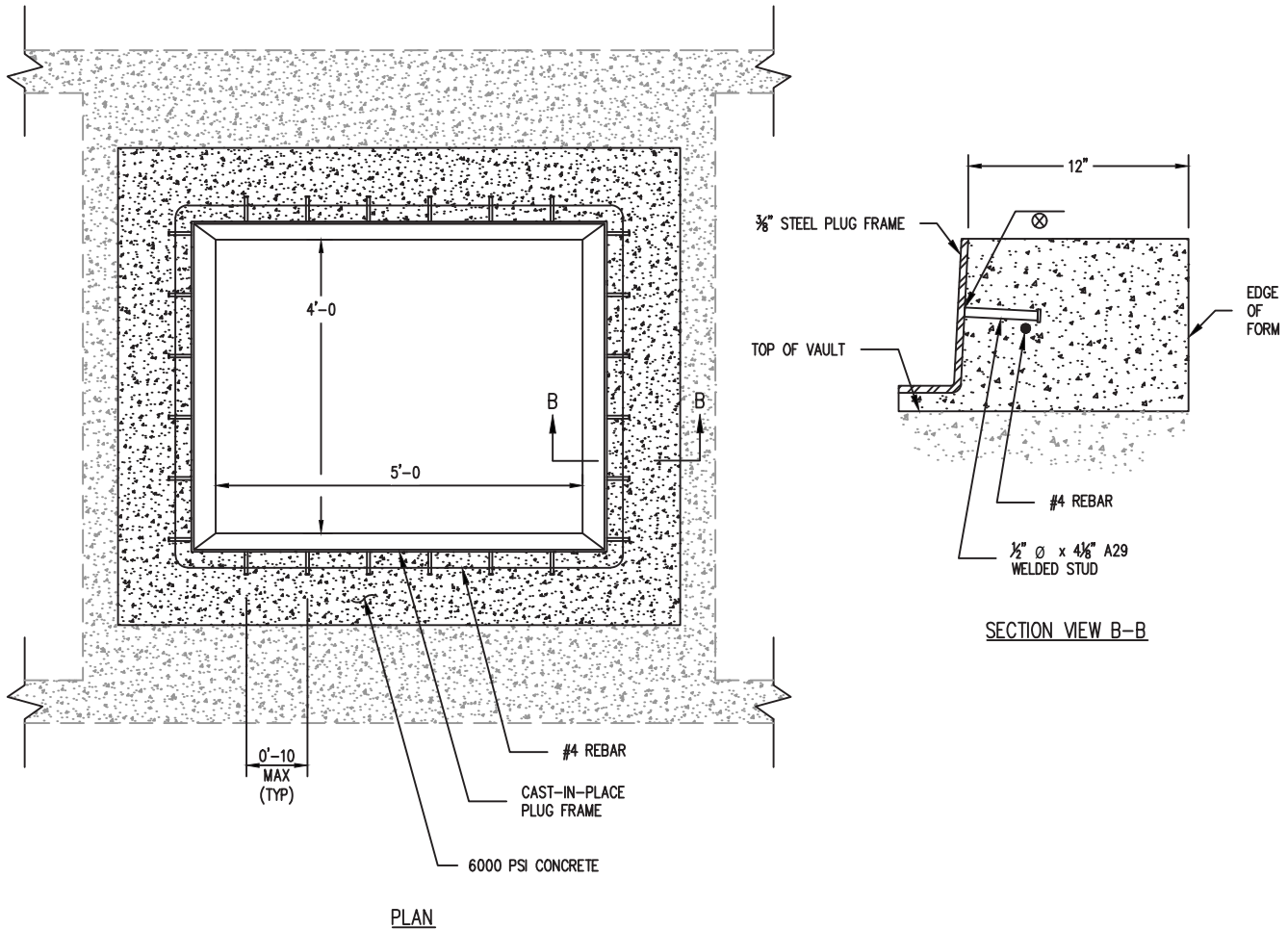
01-29-2021

What's Changed?

Sheet 25 of 50

UGS

Figure FC 670-10.4: Existing Vault – Type 10 – Cast-in-Place Plug Frame



Note(s):

1. A 1/8" tolerance shall be included in the fabrication of the steel frame.
2. Steel frame shall be ASTM A36. Edges shall be formed with a 1/4" fillet weld in accordance with AWS D1.1.
3. Steel frame including welded studs shall be hot dipped galvanized in accordance with ASTM A123.
4. Steel frame shall be installed flush with surrounding grade.
5. Concrete shall be placed with a form or barrier on all sides. The inside surfaces of forms shall be clean of dirt and foreign material. Forms shall be coated with form release agent prior to their use.
6. Bottom of excavation shall be clean of dirt and free of foreign material.
7. Reinforcing bars shall conform to ASRM A615 or A706 Grade 60.
8. Rebar shall be placed with a minimum cover of 1.5" on all sides.
9. Concrete shall be mixed, placed, consolidated and finished in accordance with the applicable ACI standards.
10. Finished surface shall receive a broom finish.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 26 of 50

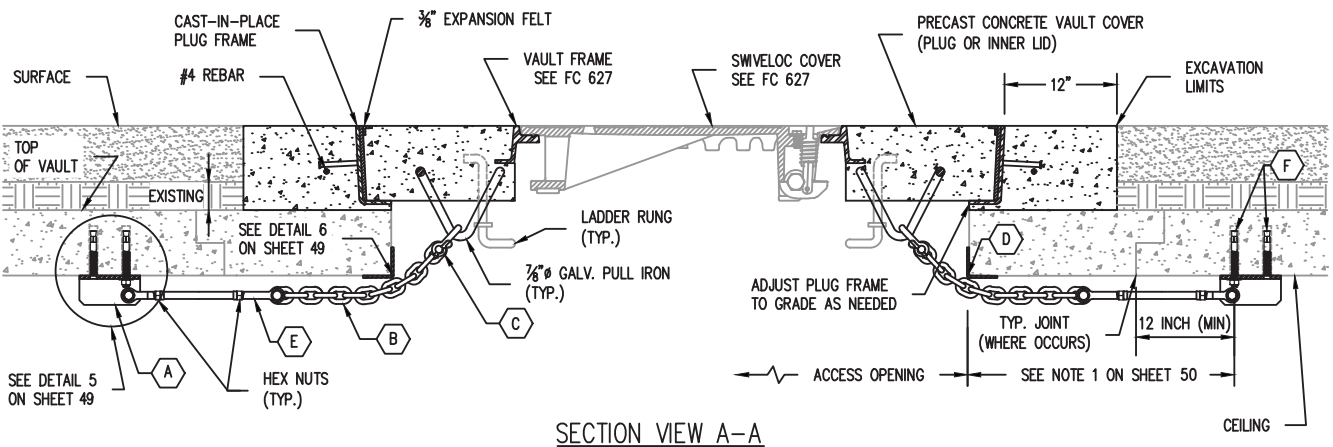
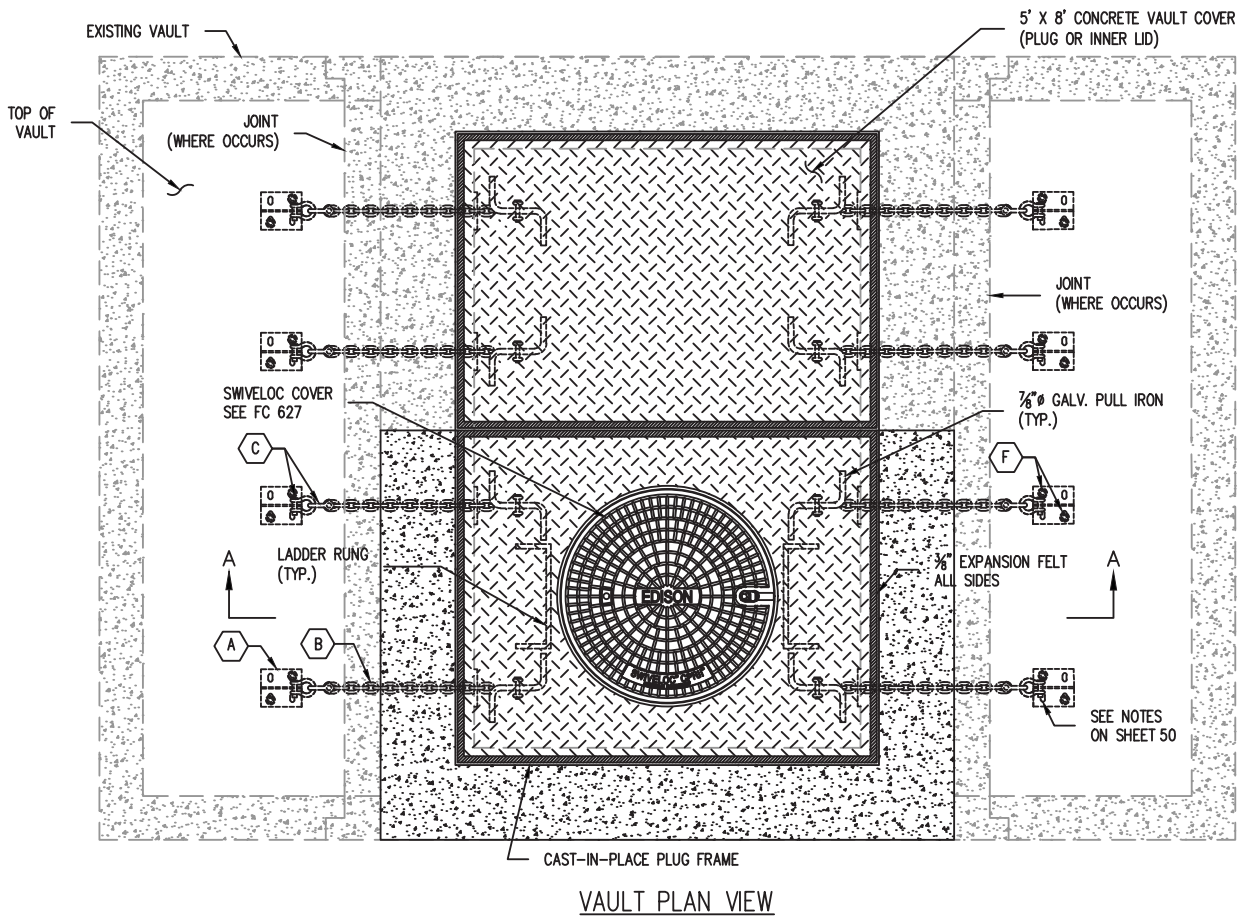
What's Changed?

Effective Date:

UGS

01-29-2021

Figure FC 670-10.5: Existing Vault – Type 10 Installation



Note(s):

1. See [Scope FC 670.20](#) for General Notes and [Table FC 670-10.8](#) for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

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Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:

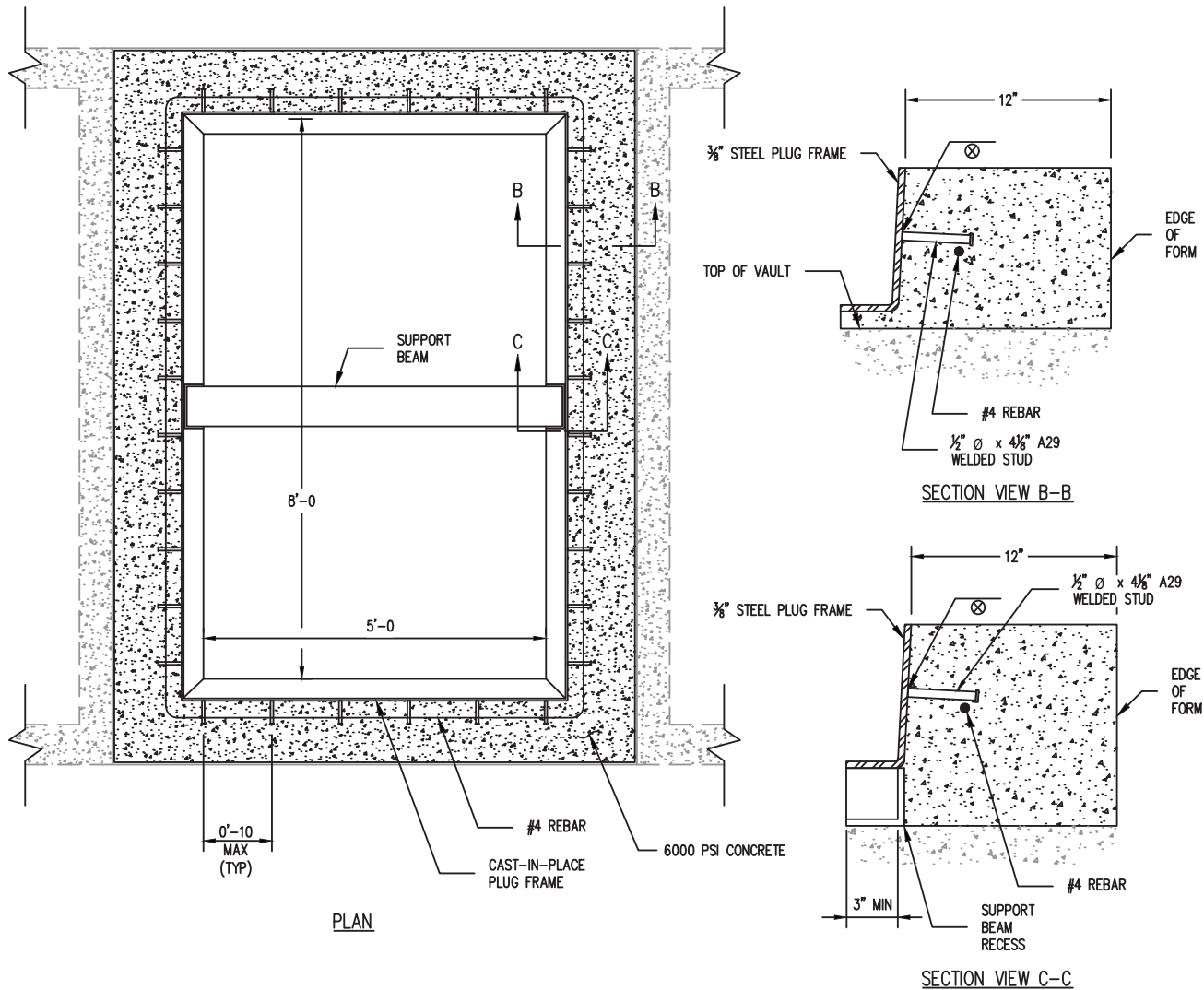
01-29-2021

What's Changed?

Sheet 27 of 50

UGS

Figure FC 670-10.6: Existing Vault – Type 10 – Cast-in-Place Plug Frame



Note(s):

1. A 1/8" tolerance shall be included in the fabrication of the steel frame.
2. Steel frame shall be ASTM A36. Edges shall be formed with a 1/4" fillet weld in accordance with AWS D1.1.
3. Steel frame including welded studs shall be hot dipped galvanized in accordance with ASTM A123.
4. Steel frame shall be installed flush with surrounding grade.
5. Concrete shall be placed with a form or barrier on all sides. The inside surfaces of forms shall be clean of dirt and foreign material. Forms shall be coated with form release agent prior to their use.
6. Bottom of excavation shall be clean of dirt and free of foreign material.
7. Reinforcing bars shall conform to ASRM A615 or A706 Grade 60.
8. Rebar shall be placed with a minimum cover of 1.5" on all sides.
9. Concrete shall be mixed, placed, consolidated and finished in accordance with the applicable ACI standards.
10. Finished surface shall receive a broom finish.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 28 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

Table FC 670–10.7: Key Notes – Existing Type 10 Restraint Assembly Kit

Key Notes: Existing Vault Type 10 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 10)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	4' x 4' Plug 4' x 5' Plug (per UGS FC 661)	—	1
(A)	WT 4 x 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4
(B)	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	30 ft.
(C)	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	8
(D)	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	4
(E)	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	4
(F)	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R 10214883 HAS-R 316 SS 10214884	8
Manufacturer			Vault Restraint Kit (Type 10)
Jensen Precast			EDISON VAULT RESTRAINT SYSTEM 10
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 10
SAP			—

Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 29 of 50
		UGS

Table FC 670–10.8: Key Notes – Existing Type 10 Restraint Assembly Kit

Key Notes: Existing Vault Type 10 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 10)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	5' x 8' Plug	—	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	8
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	60 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	16
D	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	8
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	8
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R	10214883
		HAS-R 316 SS	10214884
Manufacturer			Vault Restraint Kit (Type 10)
Jensen Precast			EDISON VAULT RESTRAINT SYSTEM 10
Oldcastle Precast			EDISON VAULT RESTRAINT SYSTEM 10
SAP			—

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 30 of 50

What's Changed? Updated bracket size and type of anchor bolt.

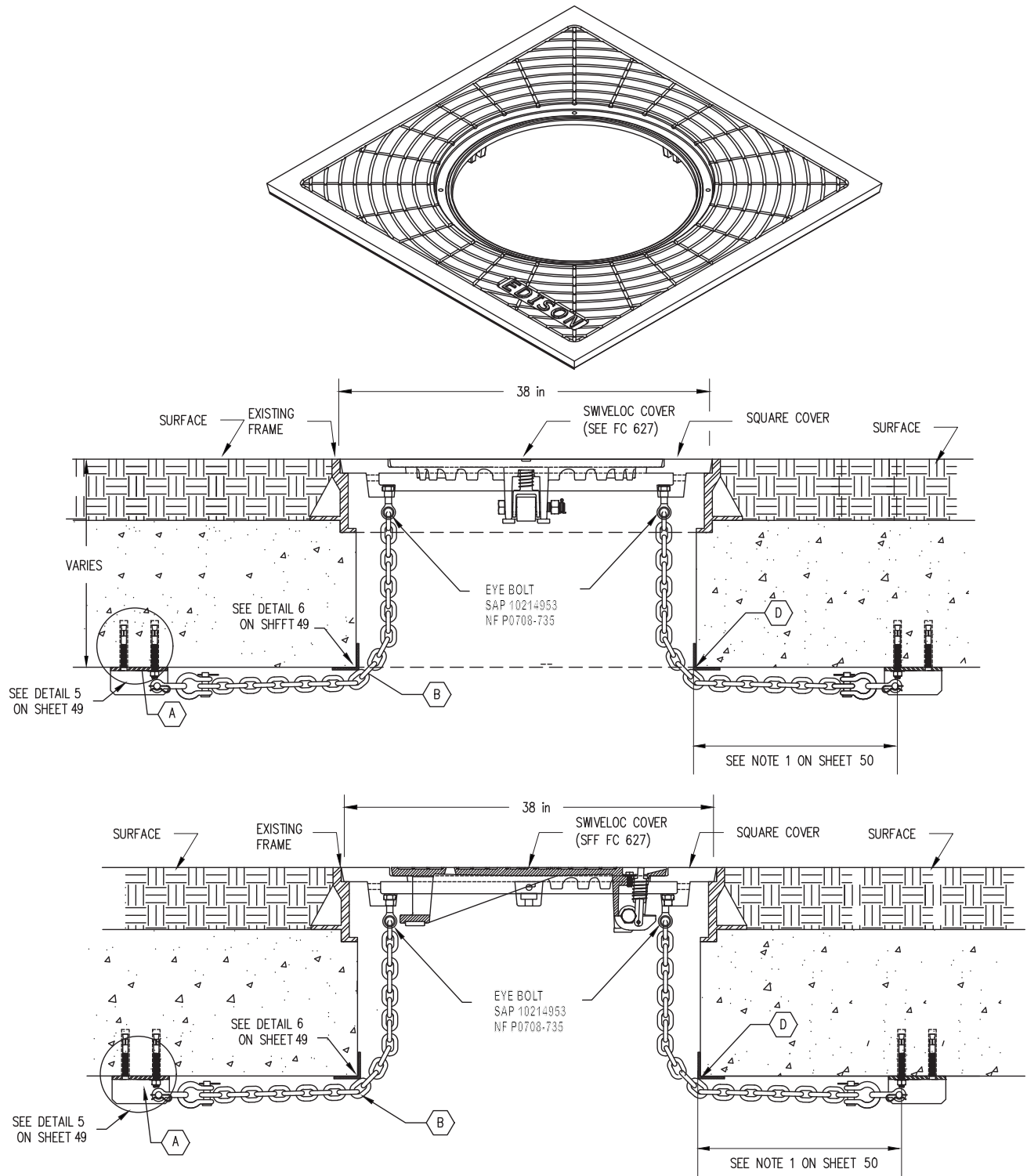
Effective Date:

01-29-2021

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Scope FC 670.11 Existing Vault – Type 11 Installation

Figure FC 670–11.1 Existing Vault - Type 11 Installation



Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

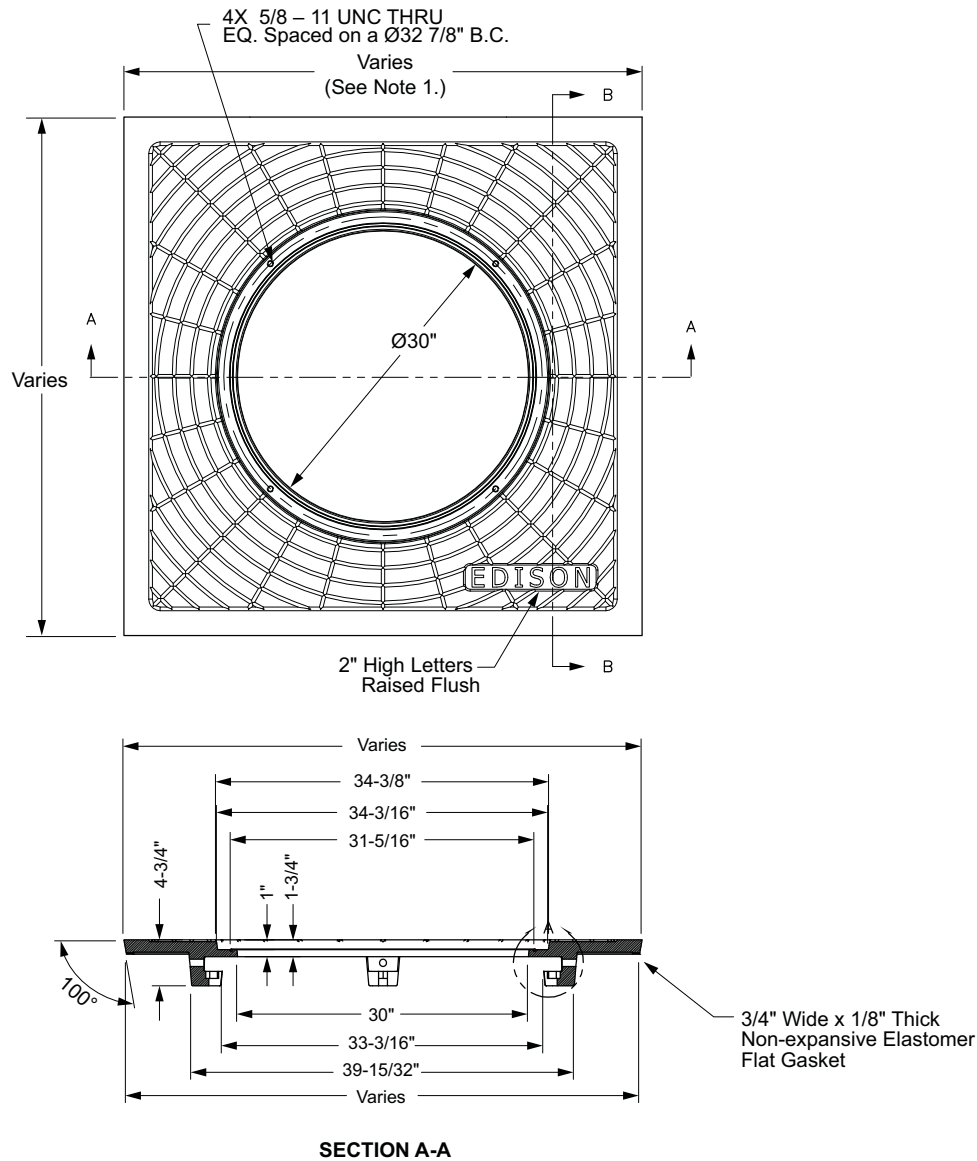
Effective Date:
01-29-2021

What's Changed? Added new scope and figures for existing Type 11 installations.

Sheet 31 of 50

UGS

**Figure FC 670–11.2 Existing Vault – Type 11 Installation
(Square Ductile Iron Retrofit Cover)**



Note(s):

1. Dimensions range from 38" to 53-1/2" square. Existing Vault Frames shall be measured by material supplier for retrofits.
2. Weight ranges from 224 lb. to 679 lb.
3. Square Retrofit Cover will accept Edison 30" Round Cast Iron Manhole Cover (See FC 621).
4. This has been approved for system-wide use.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 32 of 50

What's Changed? Added new scope and figures for existing Type 11 installations.

Effective Date:

01-29-2021

UGS

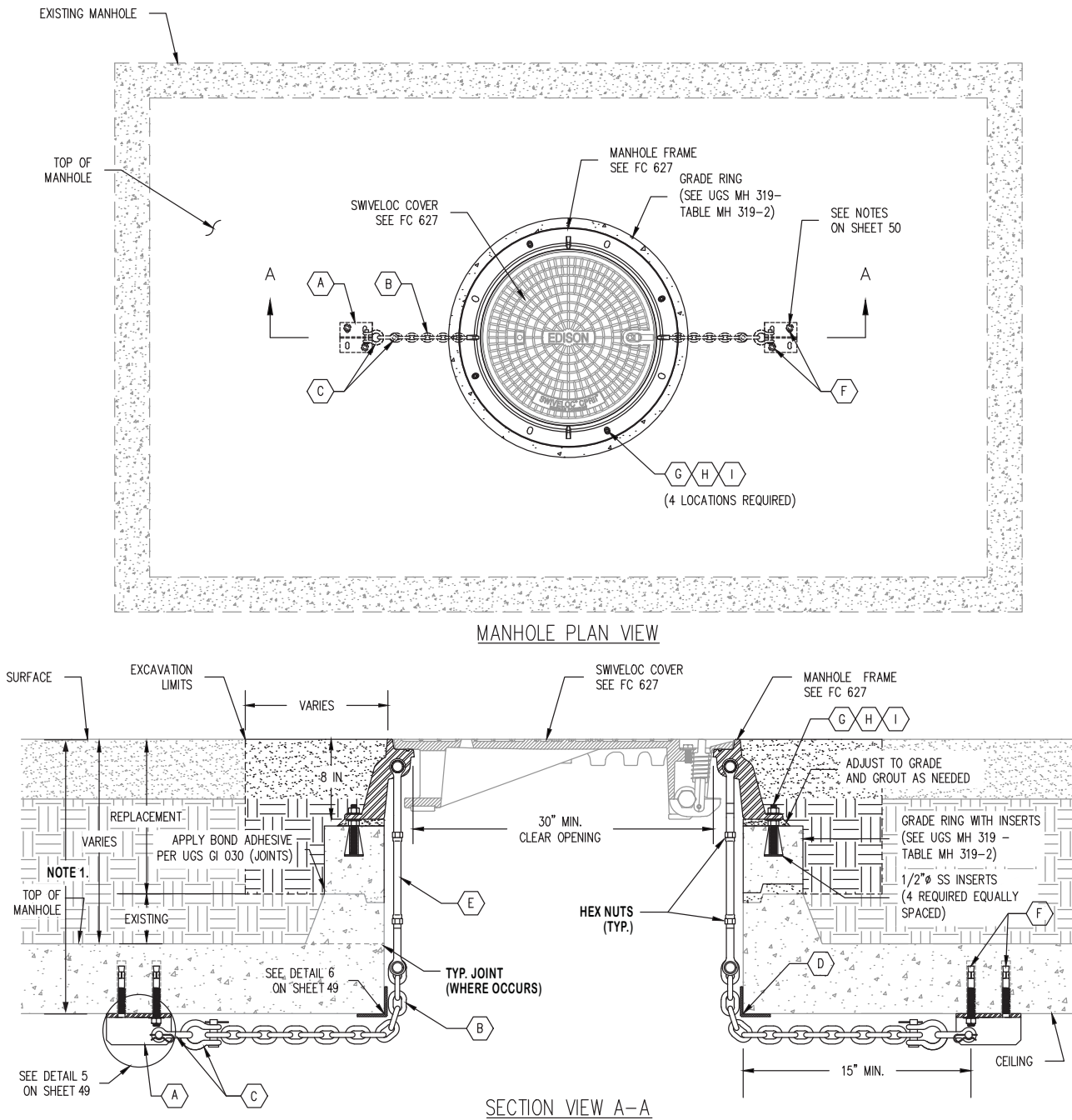
Table FC 670–11: Key Notes – Existing Vault Type 11 Restraint Assembly Kit

Key Notes: Existing Vault Type 1 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Vault (Type 1)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	4' x 5' Plug and Frame (per UGS FC 661)	—	1
A	WT 4 X 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	4
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	30 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	8
D	Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	4
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	4
F	5/8" Ø x 6" Length Anchor Bolt (316 Stainless Steel)	Hilti HIT-HY 200-R HAS-R 316 SS 10214883 10214884	8
Manufacturer			Vault Restraint Kit (Type 1)
Jensen Precast			K45-VN12-R1-11
Oldcastle Precast			Edison Vault Restraint System 1
SAP			10210063

Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Added new scope and Key Notes for existing Type 11 installations.	Sheet 33 of 50
		UGS

Scope FC 670.12 Existing Manhole – Type 1 Installation

Figure FC 670–12: Existing Manhole – Type 1 Installation



Note(s):

1. Existing Manhole Type 1 Installation used only when distance from surface to manhole ceiling is 30 inches or greater.
2. See [Scope FC 670.20](#) for General Notes and [Table FC 670–12](#) for Key Notes.
3. Remove existing manhole cone and grade rings (as needed). Install 8 inch tall Neenah frame and grade ring (with inserts).
4. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Table FC 670–12: Key Notes – Existing Manhole Type 1 Restraint Assembly Kit

Key Notes: Existing Manhole Type 1 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 1)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	8" Tall Manhole Frame (Per UGS FC 627)	10209439	1
	6" Grade Ring (UGS MH 319, Table MH 319–2)	—	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	2
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	15 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	4
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	2
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	2
F	5/8" Ø x 6" Length Hilti HIT-HY200-R (316 Stainless Steel) HAS-R 316 SS	10214883 10214884	4
G	1/2" Ø – 13 x 8" Length – All Thread Rod (Grade 8 Steel)	10209815	4
H	1/2" – 13 Hex Nut (Grade 8 Steel)	10209816	8
I	1/2" Flat Washer (Grade 8 Steel)	10209817	8
Y	Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel	—	1
			Manhole Restraint Kit (Type 1)
Manufacturer			
Jensen Precast			K36-MH1-11
Oldcastle Precast			Edison Manhole Restraint System 1
SAP			10210064

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:
01-29-2021

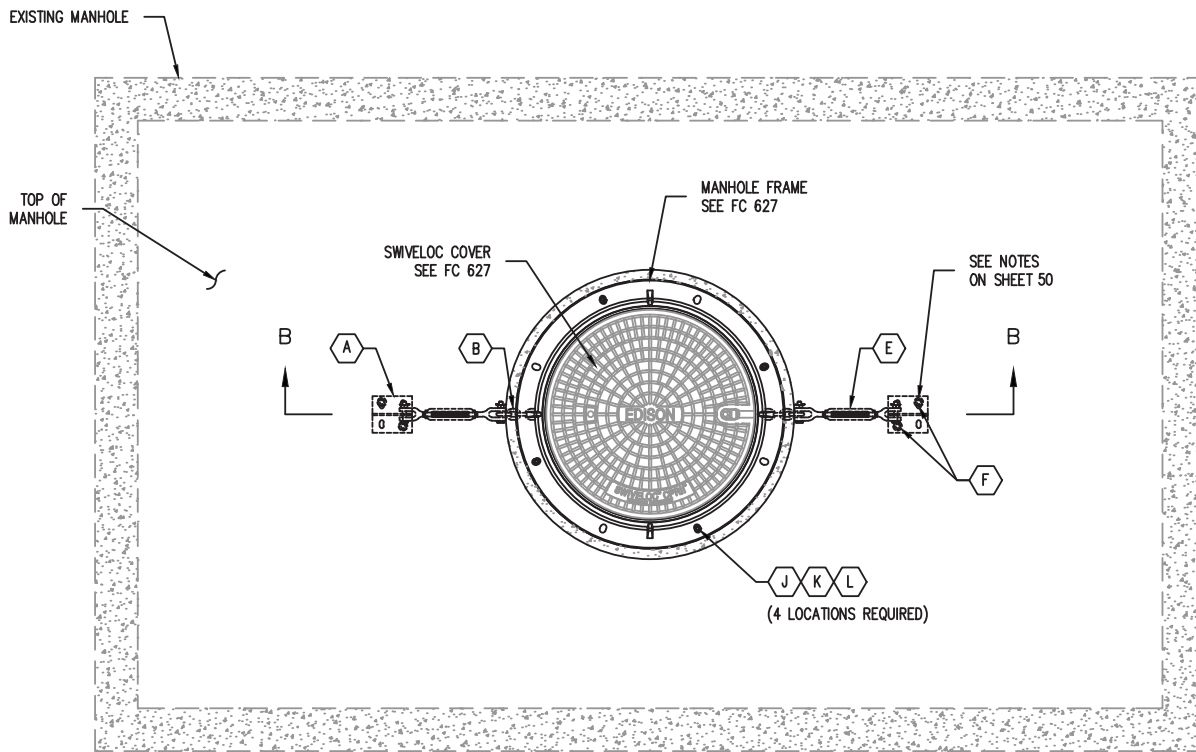
What's Changed? Updated bracket size and type of anchor bolt.

Sheet 35 of 50

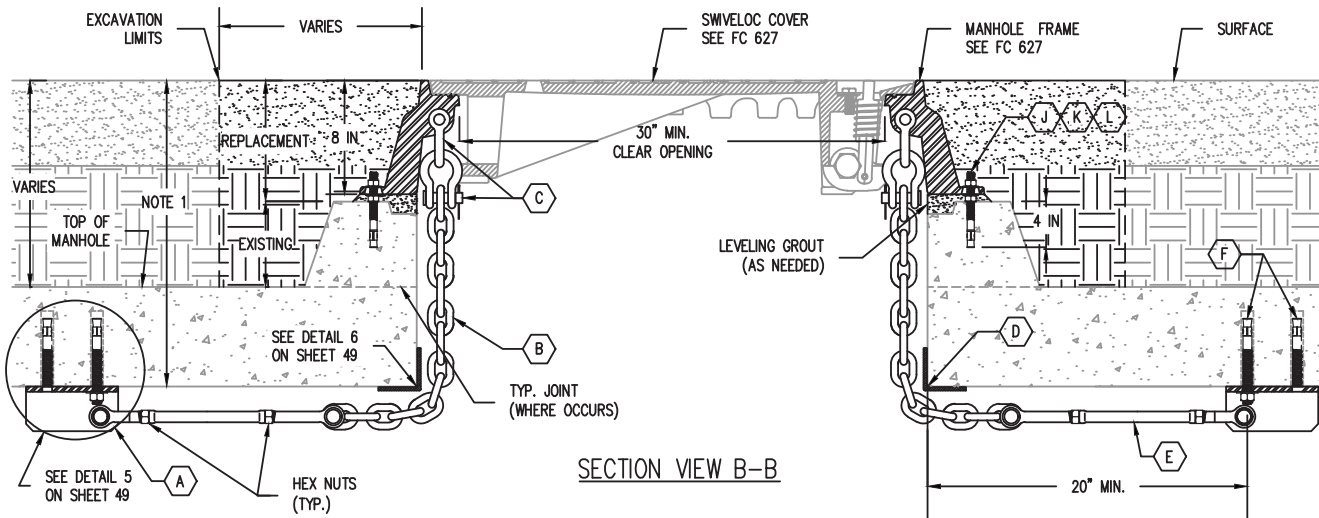
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Scope FC 670.13 Existing Manhole – Type 2 Installation

Figure FC 670–13: Existing Manhole – Type 2 Installation



MANHOLE PLAN VIEW



SECTION VIEW B-B

Note(s):

1. Existing Manhole Type 2 Installation used only when distance from surface to manhole ceiling is 30 inches or less.
2. See [Scope FC 670.20](#) for General Notes and [Table FC 670–13](#) for Key Notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

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Sheet 36 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

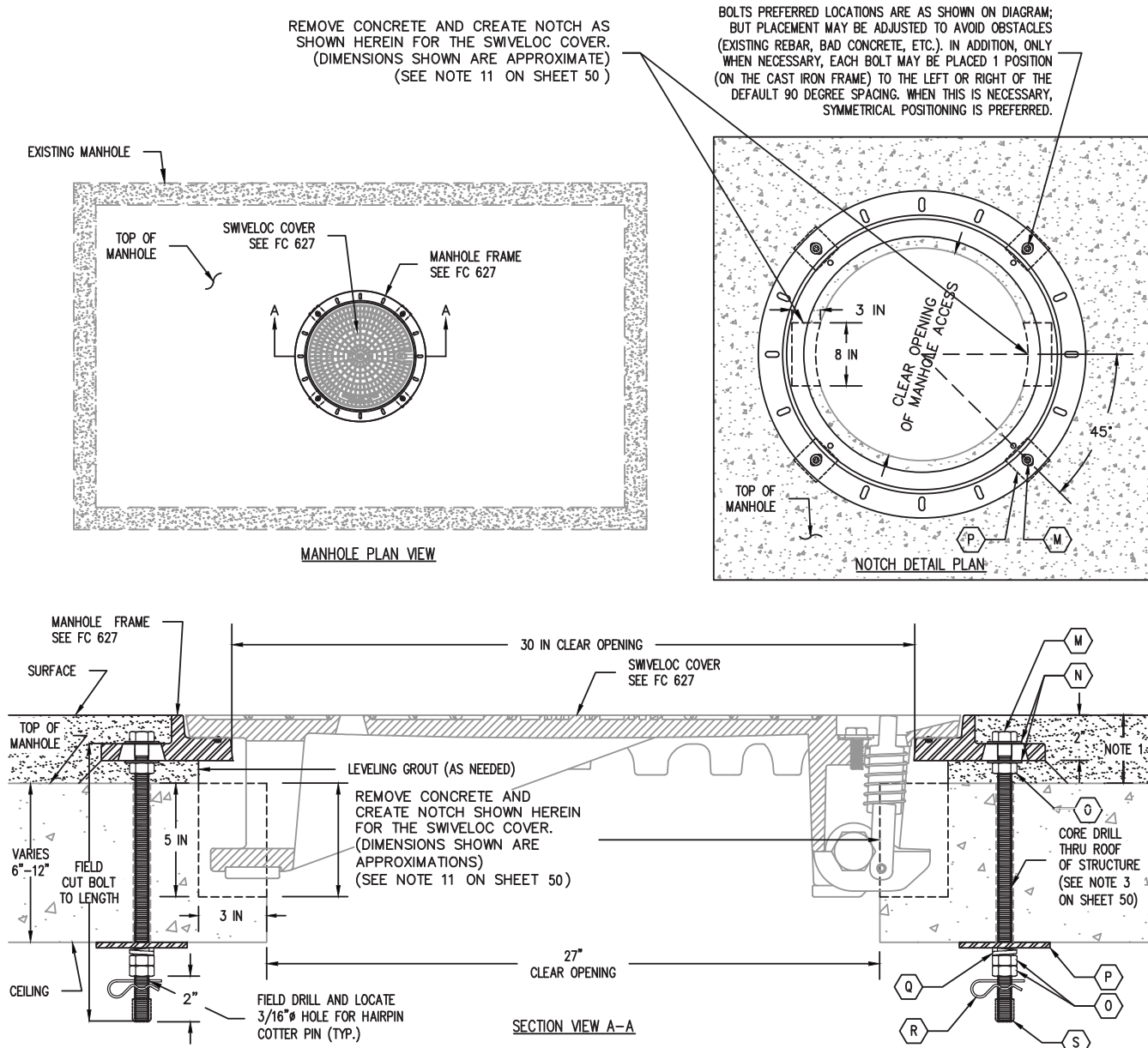
Table FC 670–13: Key Notes – Existing Manhole Type 2 Restraint Assembly Kit

Key Notes: Existing Manhole Type 2 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 2)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	8" Tall Manhole Frame (Per UGS FC 627)	10209439	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	2
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	15 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	4
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	2
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	2
F	5/8" Ø x 6" Length Hilti HIT-HY200-R (316 Stainless Steel) HAS-R 316 SS	10214883 10214884	4
J	1/2" Ø 13 x 7" Length – Stainless Steel Expansion Anchor (For Leveling)	10209818	8
K	1/2" – 13 Stainless Steel Hex Nut (For Leveling)	10209819	8
L	1/2" Stainless Steel Flat Washer (For Leveling)	10209820	8
Y	Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel	—	1
Manufacturer			Manhole Restraint Kit (Type 2)
Jensen Precast			K36-MH1-11
Oldcastle Precast			Edison Manhole Restraint System 2
SAP			10210064

Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 37 of 50
		UGS

Scope FC 670.14 Existing Manhole Type 3 Installation

Figure FC 670-14: Existing Manhole – Type 3 Installation



Note(s):

- Existing Manhole Type 3 Installation used only when distance from surface to ceiling is less than 8 inches.
- Contractor performing work shall ensure notch dimensions allow cover to function freely.
- Rebar exposed as a result of performing the work shall be patched with epoxy.
- See [Scope FC 670.20](#) for General Notes and [Table FC 670-14](#) for Key Notes.
- If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 38 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

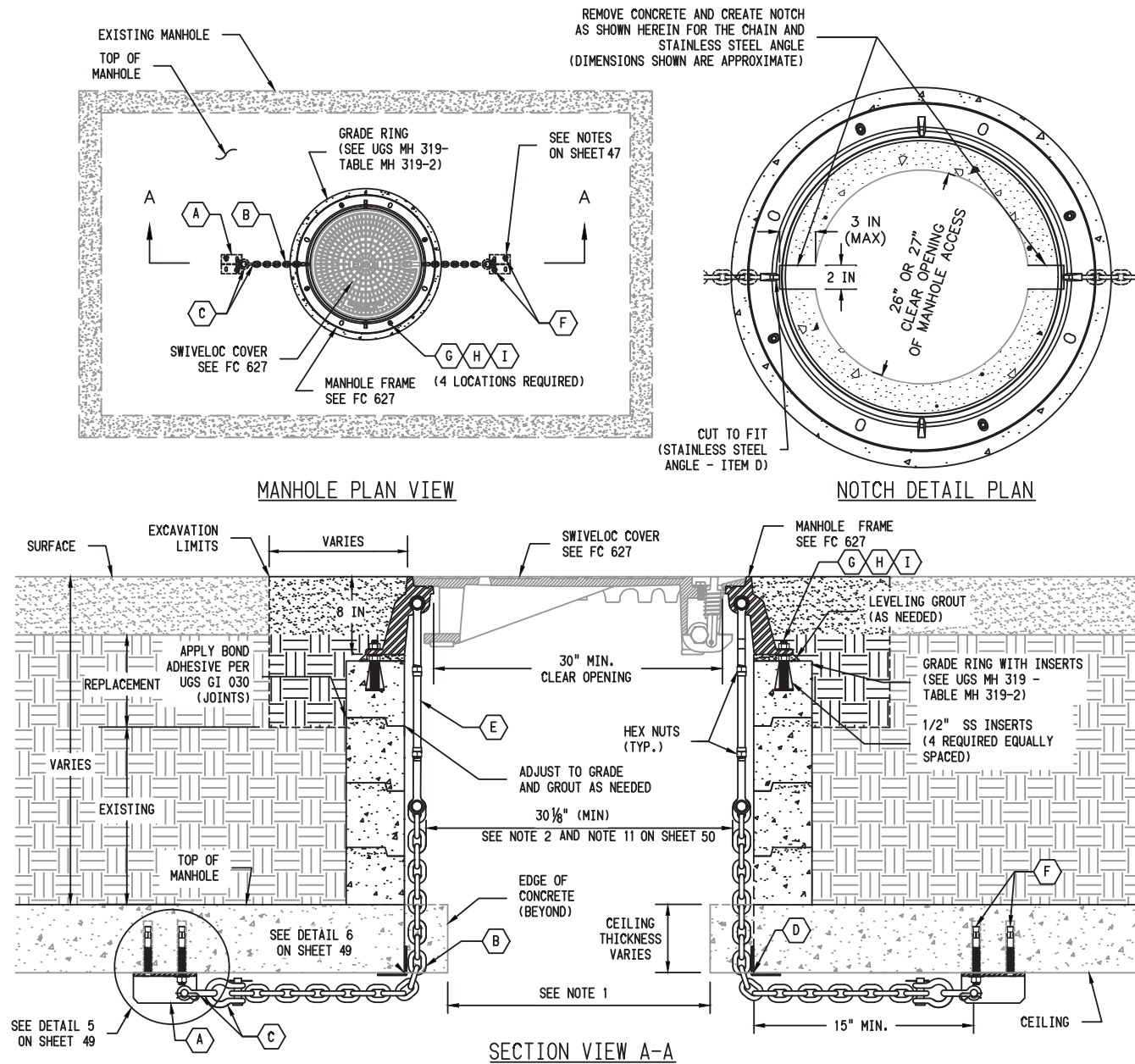
Table FC 670–14: Key Notes – Existing Manhole Type 3 Restraint Assembly Kit

Key Notes: Existing Manhole Type 3 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 3)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	2" Tall Manhole Frame (Per UGS FC 627)	10209896	1
M	5/8" Ø – 11 x 24" Thread Length – Stainless Steel Hex Bolt (Field Cut)	10209997	4
N	5/8" Flat Washer (Stainless Steel)	10209821	12
O	5/8" – 11 Hex Nut (Stainless Steel)	10209822	16
P	4" x 4" x 3/8" Galv. Plate Washer (for 5/8" Ø Bolt)	10209823	4
Q	5/8" Lock Washer (Stainless Steel)	10209824	4
R	316 Stainless Steel Hairpin Cotter Pin (11/64" Wire Gauge)	10209825	4
S	Flexible Vinyl High-Temp Push-On Round Caps for 5/8" – 11/16" O.D. Bolts	10209826	4
Manufacturer			Manhole Restraint Kit (Type 3)
Jensen Precast			K36-MH1-11
Oldcastle Precast			Edison Manhole Restraint System 3
SAP			10210065

Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed? Updated bracket size and type of anchor bolt.	Sheet 39 of 50
		UGS

Scope FC 670.15 Existing Manhole – Type 4 Installation

Figure FC 670–15: Existing Manhole – Type 4 Installation



Note(s):

1. Existing Manhole Type 3 Installation used only when clear access is less than 36 inches.
2. Contractor performing work shall ensure notch dimensions allow 30-1/8" clearance from face of chain to face of opposite chain. Field to cut angle to fit in notch.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See [Scope FC 670.20](#) for General Notes and [Table FC 670–15](#) for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

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Sheet 40 of 50

What's Changed?

Effective Date:

UGS

01-29-2021

Table FC 670–15: Key Notes – Existing Manhole Type 4 Restraint Assembly Kit

Key Notes: Existing Manhole Type 4 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 4)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	8" Tall Manhole Frame (Per UGS FC 627)	10209439	1
	6" Grade Ring (UGS MH 319, Table MH 319–2)	—	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 49 for details.)	10209809	2
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	15 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	4
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	2
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	2
F	5/8" Ø x 6" Length Hilti HIT-HY200-R (316 Stainless Steel) HAS-R 316 SS	10214883 10214884	4
G	1/2" Ø – 13 x 8" Length – All Thread Rod (Grade 8 Steel)	10209815	4
H	1/2" – 13 Hex Nut (Grade 8 Steel)	10209816	8
I	1/2" Flat Washer (Grade 8 Steel)	10209817	8
Y	Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel	—	1
Manufacturer			Manhole Restraint Kit (Type 4)
Jensen Precast			K36-MH1-11
Oldcastle Precast			EDISON MANHOLE RESTRAINT SYSTEM 4
SAP			10210064

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Sheet 41 of 50

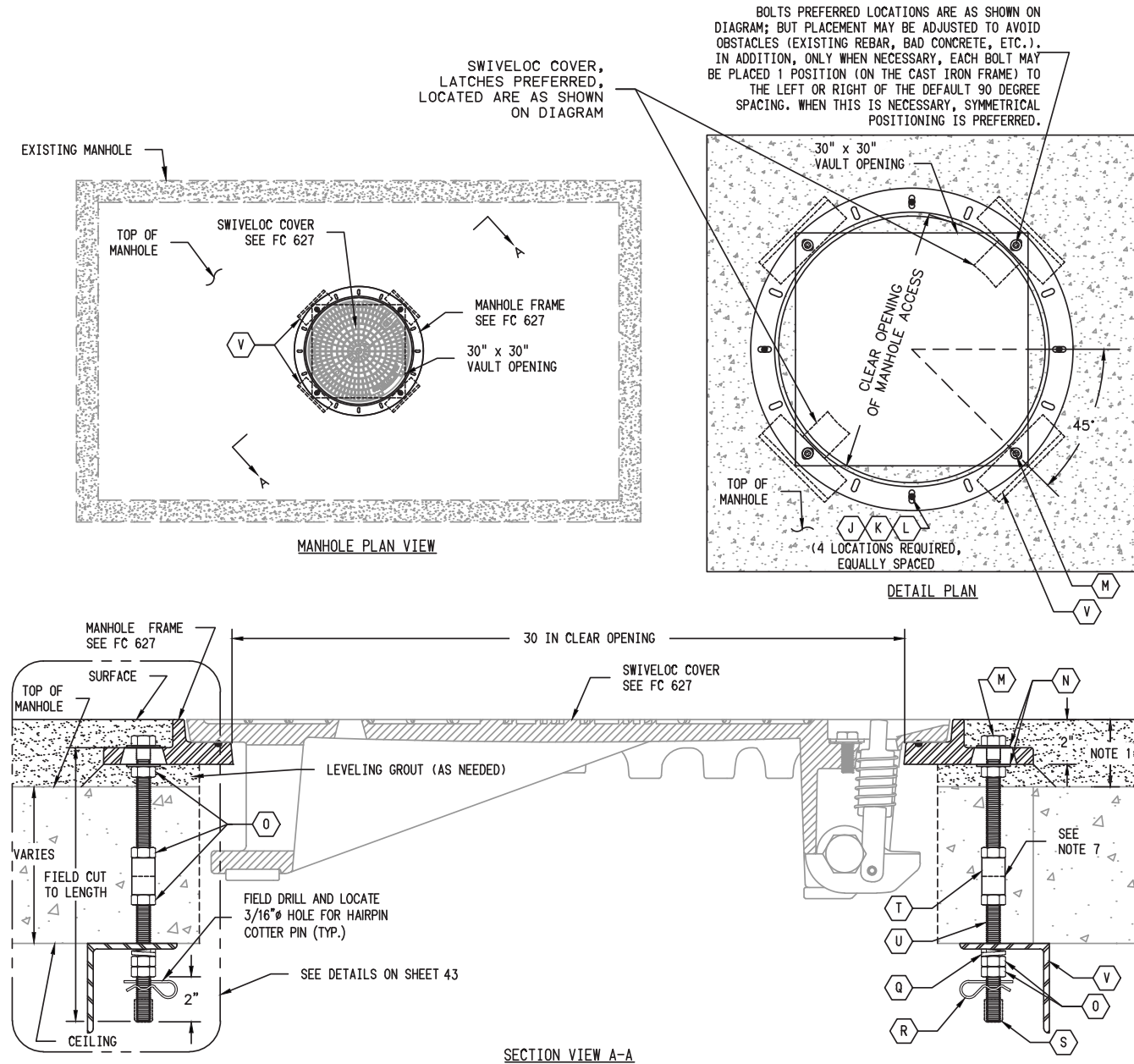
Effective Date:
01-29-2021

What's Changed? Updated bracket size and type of anchor bolt.

UGS

Scope FC 670.16 Existing Manhole – Type 5 Installation

Figure FC 670–16.1: Existing 30" x 30" Square Shaft Manhole – Type 5 Installation



Note(s):

1. This detail shall be used for 30" x 30" square manhole access opening.
2. Contractor performing work shall ensure dimensions allow cover to function freely.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See [Scope FC 670.20](#) for General Notes and [Table FC 670–16](#) for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
6. Rotate angle brackets to miss existing rebar.
7. Each 5/8" Ø threaded rod shall extend 1-1/16" into 5/8" Ø coupler nut.

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 42 of 50

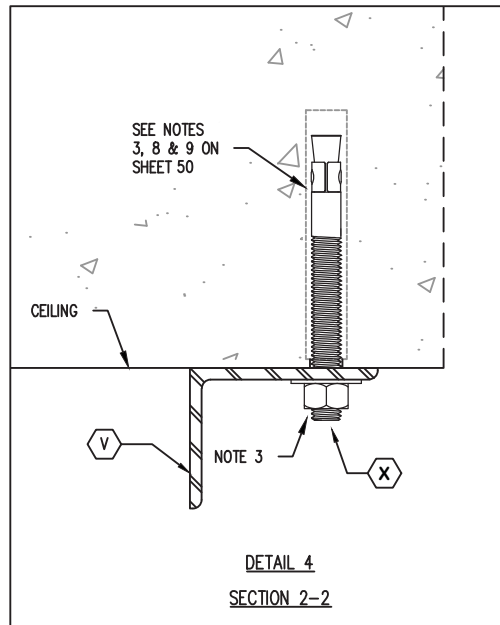
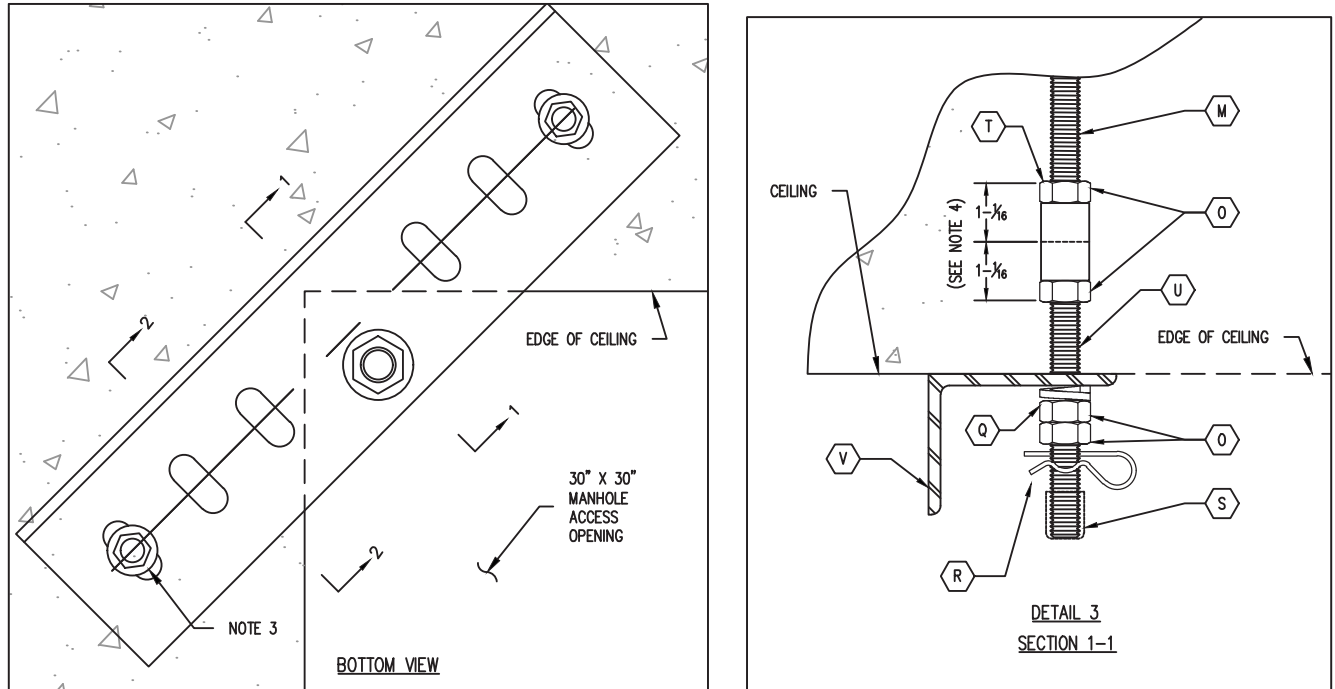
What's Changed?

Effective Date:

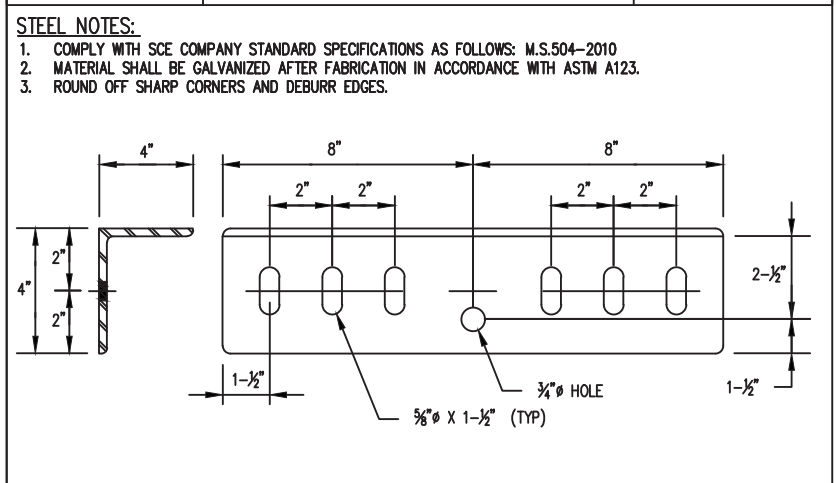
01-29-2021

UGS

Figure FC 670-16.2: Existing Vault and Manhole – Restraint Connection to Ceiling Installation Details



QTY. PER STRUCTURE	DESCRIPTION	BLACK WEIGHT
MANHOLE		
4	L 4 x 4 x 5/8 - 16" LENGTH - GALV.	18 LB



Note(s):

1. Slotted holes provided for anchor bolts and to avoid existing steel reinforcement in structure during installation.
2. It is recommended to scan and locate the steel reinforcement prior to drilling.
3. Preferred anchor locations at angle bracket end slots.
4. Each 5/8" Ø threaded rod shall extend 1-1/16" into 5/8"Ø coupler nut.
5. See [Scope FC 670.20](#) for General Notes and [Table FC 670-16](#) for Key Notes.

Approved by:
RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

FC 670

Effective Date:
01-29-2021

What's Changed? Updated bracket size and type of anchor bolt.

Sheet 43 of 50

UGS

Table FC 670–16: Key Notes – Existing Manhole Type 5 Restraint Assembly Kit

Key Notes: Existing Manhole Type 5 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 5)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	2" Tall Manhole Frame (Per UGS FC 627)	10209896	1
J	1/2" Ø – 13 x 7" Length – Stainless Steel Expansion Anchor	10209818	8
K	1/2" – 13 Hex Nut (Stainless Steel)	10209819	8
L	1/2" Flat Washer (Stainless Steel)	10209820	8
M	5/8" Ø – 11 x 24" Thread Length – Stainless Steel Hex Bolt (Field Cut)	10209997	4
N	5/8" Flat Washer (Stainless Steel)	10209821	8
O	5/8" – 11 Hex Nut (Stainless Steel)	10209822	20
Q	5/8" Lock Washer (Stainless Steel)	10209824	4
R	316 Stainless Steel Hairpin Cotter Pin (11/64" Wire Gauge)	10209825	4
S	Flexible Vinyl High-Temp Push-On Round Caps for 5/8" – 11/16" O.D. Bolts	10209826	4
T	5/8" Ø – 11 Coupler Nut (Stainless Steel) McMaster # 90104A020		4
U	5/8" Ø – 11 x 24" Length, Threaded Rod (Stainless Steel) McMaster # 98250A480		4
V	Angle 4" x 4" x 5/8" x 16" Long, Galv. (for 5/8" Ø Bolt)		4
X	1/2" x 5 1/2" Long concrete wedge anchors (316 Stainless Steel)		8
Manufacturer			Manhole Restraint Kit (Type 5)
Jensen Precast			K30-MH5-11
Oldcastle Precast			EDISON MANHOLE RESTRAINT SYSTEM 5
SAP			10211585

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 44 of 50

What's Changed?

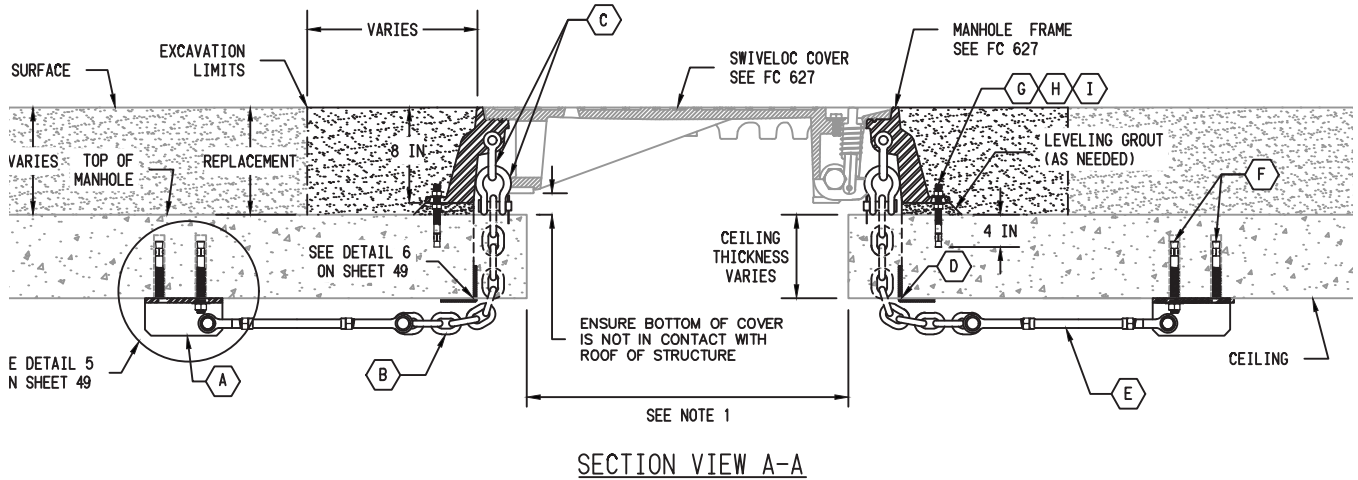
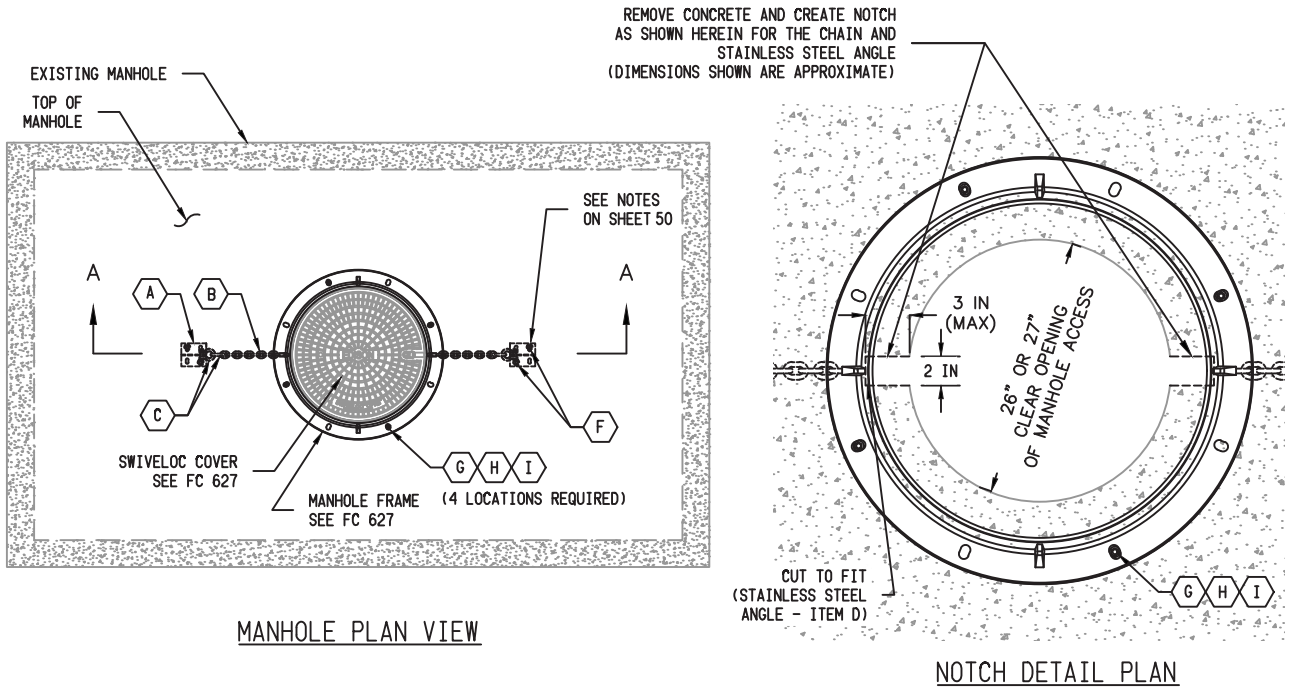
Effective Date:

UGS

01-29-2021

Scope FC 670.17 Existing Manhole – Type 6 Installation

Figure FC 670–17: Existing Manhole – Type 6 Installation



Note(s):

1. Existing Manhole Type 6 Installation used only when clear access opening is less than 36".
2. Contractor performing work shall ensure notch dimensions allow 30-1/8" clearance from face of chain to face of opposite chain. Field to cut angle to fit in notch.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See [Scope FC 670.20](#) for General Notes and [Table FC 670–17](#) for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Approved by: <i>RR</i>	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	FC 670
Effective Date: 01-29-2021	What's Changed?	Sheet 45 of 50
		UGS

Table FC 670–17: Key Notes – Existing Manhole Type 6 Restraint Assembly Kit

Key Notes: Existing Manhole Type 6 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 6)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	8" Tall Manhole Frame (Per UGS FC 627)	10209439	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 41 for details.)	10209809	2
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	15 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	4
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	2
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	2
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R 10214883	4
		HAS-R 316 SS 10214884	
G	1/2" Ø – 13 x 8" Length – All Thread Rod (Grade 8 Steel)	10209818	4
H	1/2" – 13 Hex Nut (Grade 8 Steel)	10209819	4
I	1/2" Flat Washer (Grade 8 Steel)	10209820	4
Y	Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel	—	1
Manufacturer			Manhole Restraint Kit (Type 6)
Jensen Precast			K36-MH6-11
Oldcastle Precast			EDISON MANHOLE RESTRAINT SYSTEM 6
SAP			10210064

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 46 of 50

What's Changed? Updated bracket size and type of anchor bolt.

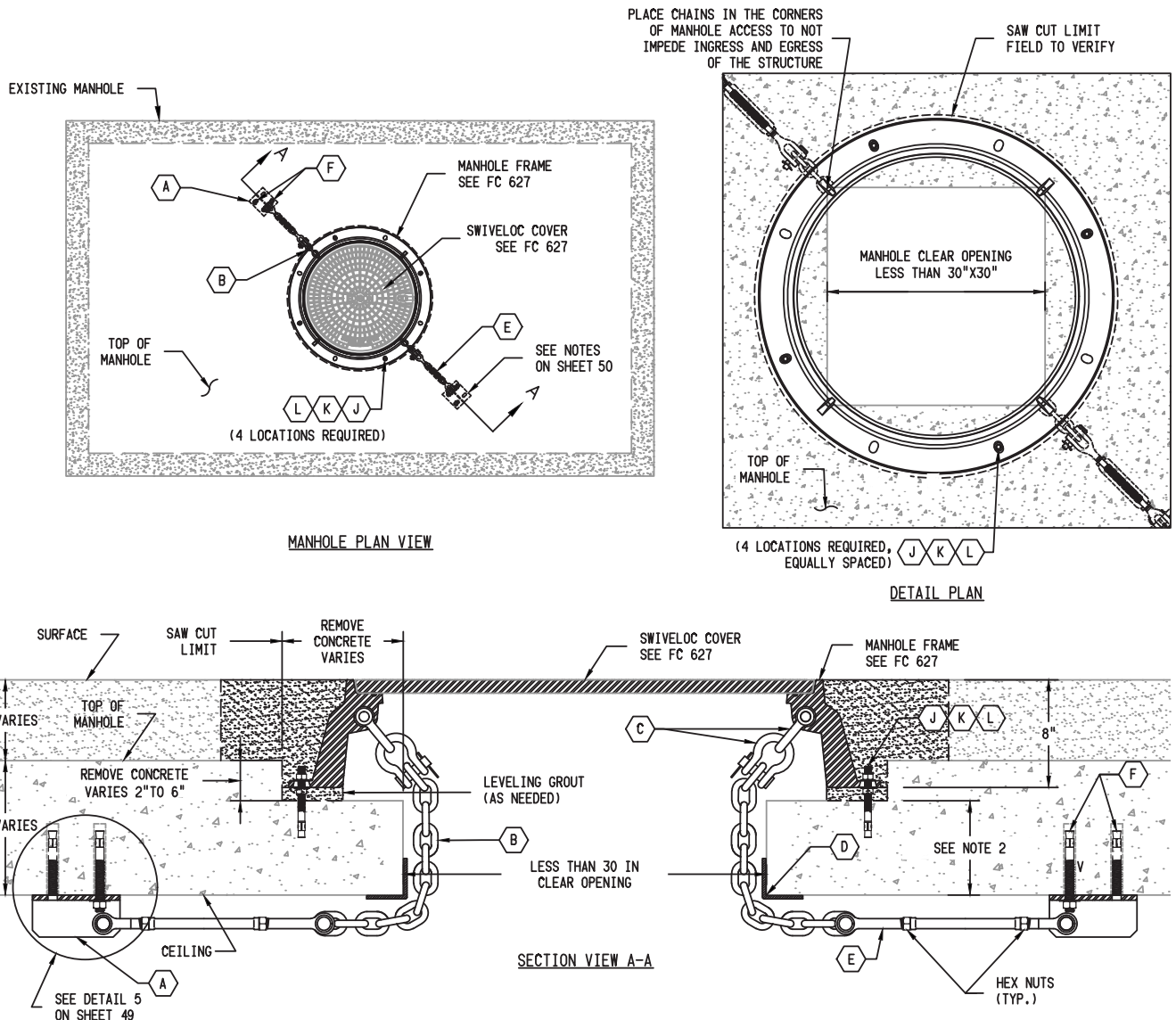
Effective Date:

01-29-2021

UGS

Scope FC 670.18 Existing Manhole – Type 7 Installation

Figure FC 670–18: Existing 30" x 30" Square Shaft Manhole – Type 7 Installation



Note(s):

1. This detail shall be used for manhole with access opening less than 30" x 30".
2. The minimum ceiling thickness shall be 8" after saw cutting.
3. Contractor performing work shall ensure dimensions allow cover to function freely.
4. Rebar exposed as a result of performing the work shall be patched with epoxy.
5. See [Scope FC 670.20](#) for General Notes and [Table FC 670–18](#) for Key Notes.
6. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Effective Date:

01-29-2021

What's Changed?

FC 670

Sheet 47 of 50

UGS

► SCE Public ◀

Table FC 670–18: Key Notes – Existing Manhole Type 7 Restraint Assembly Kit

Key Notes: Existing Manhole Type 7 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 7)
	Swiveloc Round Manhole Cover (UGS FC 627)	10209895	1
	8" Tall Manhole Frame (Per UGS FC 627)	10209439	1
A	WT 4 x 20 – 8.5" Length Galv. (See Sheet 32 for details.)	10209809	2
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	15 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	4
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	2
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	2
F	5/8" Ø x 6" Length Hilti HIT-HY200-R (316 Stainless Steel) HAS-R 316 SS	10214883 10214884	4
G	1/2" Ø – 13 x 8" Length – All Thread Rod (Grade 8 Steel)	10209818	8
H	1/2" – 13 Hex Nut (Grade 8 Steel)	10209819	8
I	1/2" Flat Washer (Grade 8 Steel)	10209820	8
Y	Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel	—	1
Manufacturer			Manhole Restraint Kit (Type 7)
Jensen Precast			K36-MH1-11
Oldcastle Precast			EDISON MANHOLE RESTRAINT SYSTEM 7
SAP			10210064

FC 670

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Approved by:

RR

Sheet 48 of 50

What's Changed? Updated bracket size and type of anchor bolt.

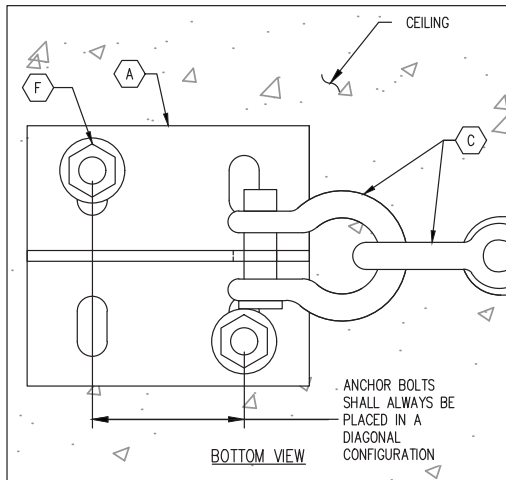
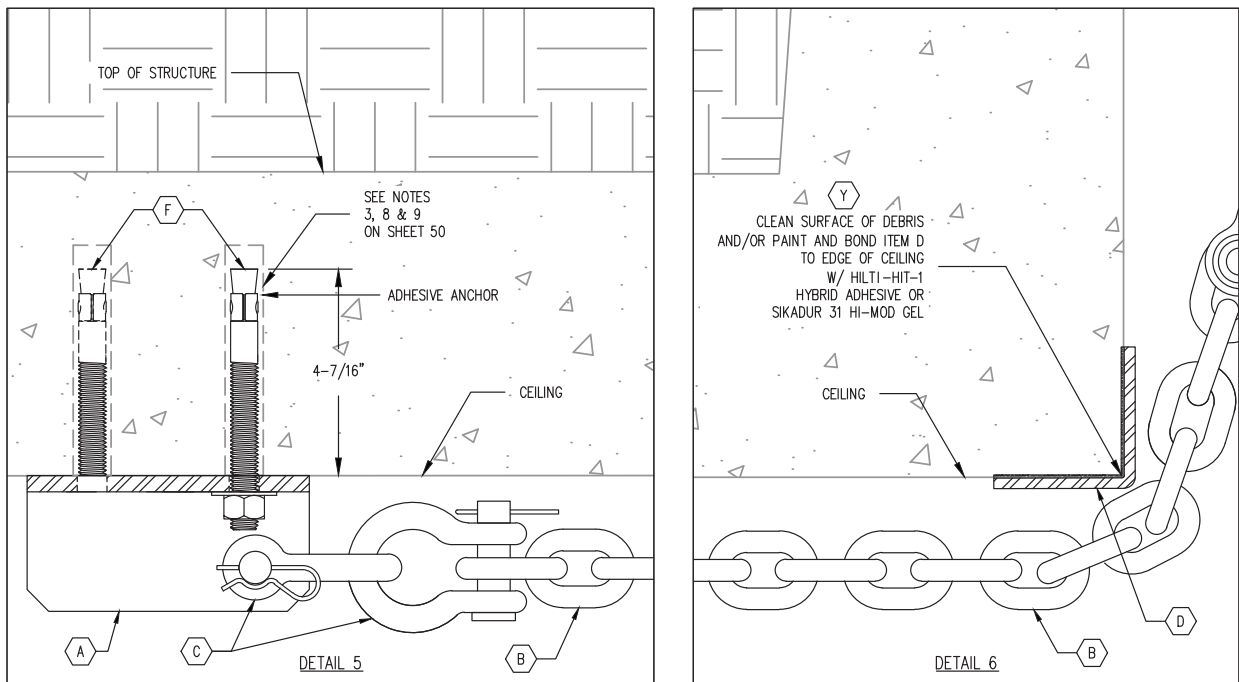
Effective Date:

01-29-2021

UGS

Scope FC 670.19 Details

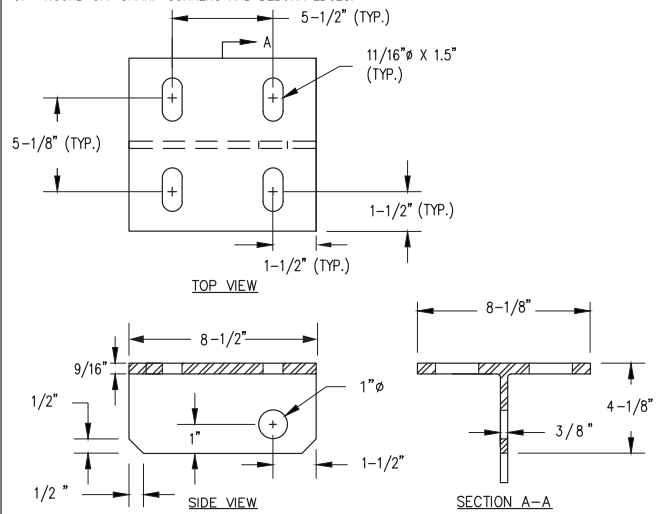
Figure FC 670-19: Existing Vault and Manhole - Restraint Connection to Ceiling Installation Details



QTY. PER STRUCTURE		DESCRIPTION	BLACK WEIGHT
VAULT	MANHOLE		
VARIES	2	WT4X10 - 8.5" LENGTH - GALV.	5.5 LB

STEEL NOTES:

1. COMPLY WITH SCE COMPANY STANDARD SPECIFICATIONS AS FOLLOWS: M.S.504-2010
2. MATERIAL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.
3. ROUND OFF SHARP CORNERS AND DEBURR EDGES.



Note(s):

1. Slotted holes provided for anchor bolts and to avoid existing steel reinforcement in structure during installation.
2. It is recommended to scan and locate the steel reinforcement prior to drilling.

Approved by:

RR

Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Effective Date:
01-29-2021

What's Changed? Updated bracket size and type of anchor bolt.

FC 670

Sheet 49 of 50

UGS

Scope FC 670.20 General Notes

General Notes:

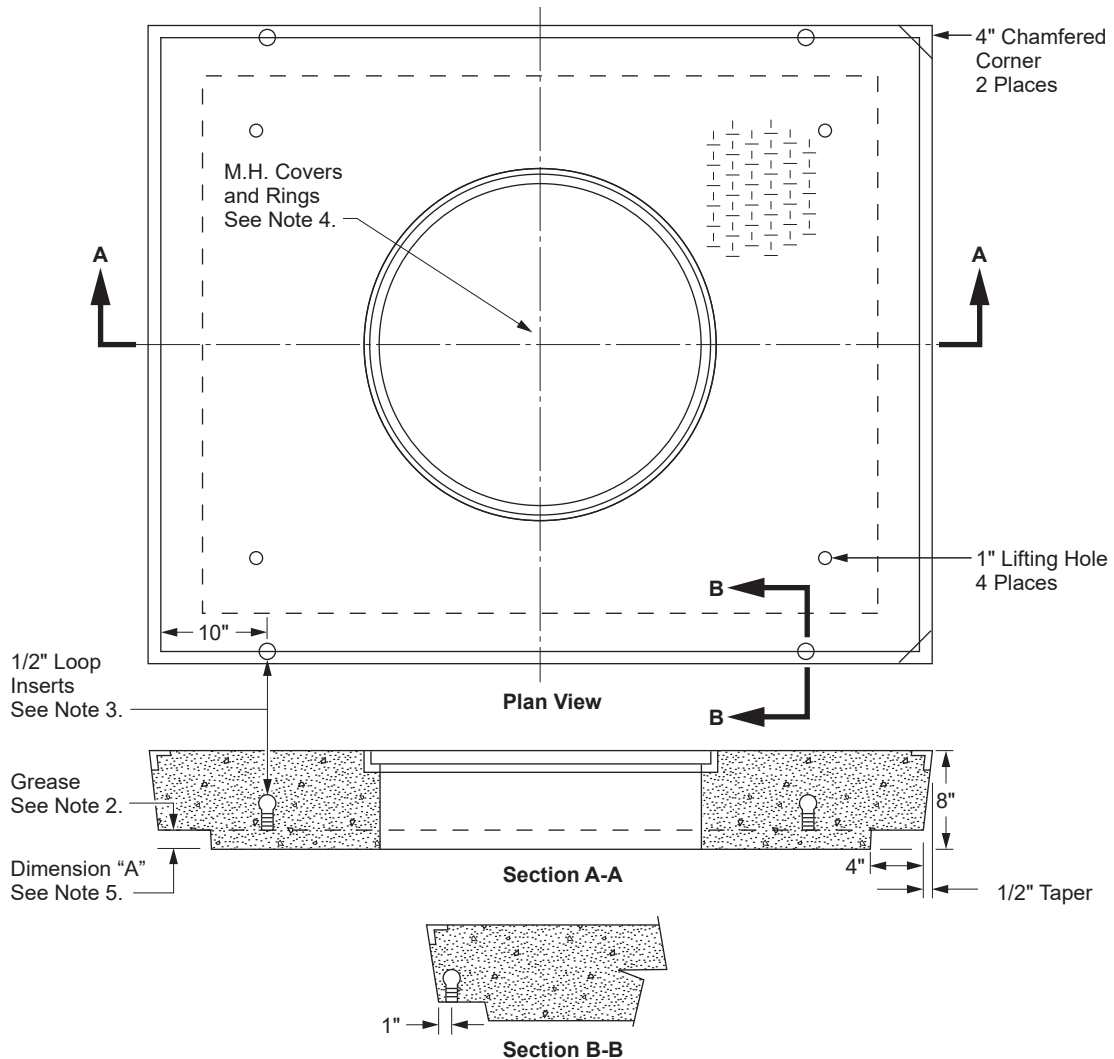
1. Anchor bolts installed on ceiling and walls shall be a minimum of 24 inches from edge of access opening and a minimum of 12 inches from joint.
2. Anchor bolts shall be installed in sound concrete.
3. Rebar scanning is required prior to drilling holes into existing concrete. Drilling rebar is prohibited. Drill bits intended to drill through rebar (e.g. diamond and core bits) are not allowed. Cover drilled holes with tape and fill the holes with adhesive by following manufacturer's recommendation or any other methods to minimize dripping. Insert anchor bolts and allow 90 minutes to cure if ambient temperature is at 51°F, 60 minutes if ambient temperature is at 69°F. Clean excess adhesives after the cure time.
4. All core drilled holes not used shall be clean of debris and filled with epoxy, flush with existing surface.
5. Anchor bolts shall be installed in-line with restraint attachment at opposite end.
6. All restraints shall be installed taut with no slack in any of the components (turnbuckle, shackle, chain, etc.).
7. Chains shall be in their normal position and not twisted while making restraints taut.
8. Installation of expansion anchors shall be in accordance with the Manufacturer's Published Installation Instructions (MPII). Anchors must be installed in holes drilled into concrete using carbide-tipped drill bits. For on-site training of expansion anchor installation, contact Simpson Strong-Tie (800-999-5099) or Hilti (800-879-8000).
9. SCE will perform periodic inspections to ensure compliance with standard.
10. Torque wrench shall be certified by an accredited testing laboratory and results are to be kept on file at contractor's facility and available upon request. Torque wrench shall be stored according to manufacturer's specifications.
11. Actual orientation of frame, cover and notches are to be field verified and located. Prior to notching, the concrete shall be scanned. Notching shall avoid damaging or cutting existing rebar. Exposed reinforcing steel shall be epoxy treated with Sikagard 62, in accordance with manufacturer's installation instructions. Cutting of rebar is prohibited, unless approved by Structural Engineering.

FC 670	Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation	Approved by: <i>RR</i>
Sheet 50 of 50	What's Changed? Updated General Note 1 and Note 3.	Effective Date:
UGS		01-29-2021

FC 680 Replacement of Deteriorated Concrete Vault Covers

Scope FC 680.1 Replacement of Deteriorated Concrete Vault Covers

Figure FC 680-1: Replacement of Deteriorated Concrete Vault Covers



1.0 Modified Precast Concrete Vault Cover Requirements

1. Modified vault covers are utilized for replacement of deteriorated covers when existing vault necking is employed.
2. Covers will be furnished with grease applied to sides and cast in recesses.
3. Four 1/2-inch loop inserts will be located as shown in Plan View and Section B-B. To be furnished with four installed 1/2" x 2" hex head cap bolts.
4. For size and placement of cover lifting holes and ladder inserts, manhole covers and rings, see [FC 621](#), [FC 640](#), [FC 641](#), and [FC 642](#).
5. Bottom perimeter of covers will be provided with a cast-in recess to the dimensions shown in [Table FC 680-1 \(Sheet 2\)](#).

Approved by:

RR

Replacement of Deteriorated Concrete Vault Covers

FC 680

Sheet 1 of 3

Effective Date:
04-24-2020

What's Changed?

UGS

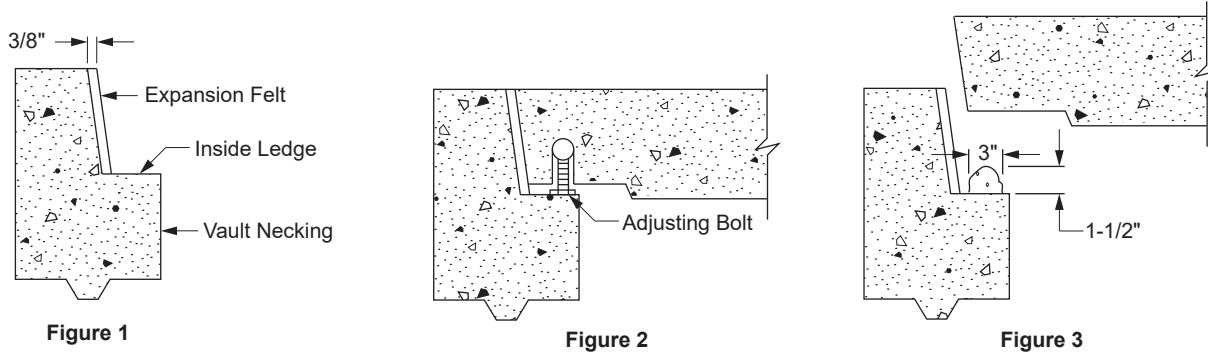
Table FC 680–1: Concrete Vault Cover Measurements

Cover Size	4' x 4'	4' x 5'	5' x 8' ^{a/}
Dimension A	1/2"	2-1/2"	2-1/2"

^{a/} Recess is not provided on sides of 5' x 8' two piece covers in contact with center support beam (FC 642).

2.0 Replacement Vault Cover Installation Instructions

Figure FC 680–2: Replacement Vault Cover



2.1 Remove deteriorated cover from existing vault necking.



CAUTION

Wire brush and remove **all** damaged concrete, dirt, oil, grease or any other bond-inhibiting materials from the inside ledge of cover necking. Replace any damaged 3/8-inch expansion felt as required. (Figure 1)

2.2 Level replacement cover to top of vault necking by adjusting the four 1/2" x 2" bolts, one at each corner of bottom cast-in recess. (Figure 2)

2.3 Mix the “SikaTop” No. 122 repair mortar kit (component A and B) per manufacturers’ instructions. Mortar must be mixed to a uniform consistency. Do not over mix (3 minute maximum).

SikaTop No. 122 is available from:

- A. Edison (SAP Key 30)
- B. The Burke Company — Address:
1625 W. Washington Blvd.
Montebello, CA 90640

2.4 Moisten inside ledge of vault necking with clean water, using a brush or fine spray. Surface should be damp with **no** glistening water. Place mixed mortar on inside ledge to dimensions shown (Figure 3).



CAUTION

Minimum ambient and structure surface temperature before applying mortar will be 50°F. For maximum adhesion of mortar to neck ledge, mortar should be applied no longer than 15 minutes after initial mixing. Remove mortar from neck area where the four cover adjusting bolts will rest.

- 2.5 Covers should be barricaded to prevent pedestrian/traffic contact for a minimum of **8 hours** for nontraffic covers and **24 hours** for traffic covers. At end of this time, adjust the 1/2-inch bolts upward to remove their contact with necking.
- 2.6 Modified replacement vault covers are available as shown in [Table FC 680–2 \(Sheet 3\)](#).

Table FC 680–2: Replacement Vault Cover Catalog Numbers

Vault Cover Size	Manhole Cover 30"		SAP
	Jensen Precast	Oldcastle Infrastructure	
4' x 4'	K44-VN9-11T	44 Neck and Plug	10117548
4' x 5'	K45-VN12-11T	ED 45 Neck and Plug Traffic	10117549
5' x 8'	K58-VN12-11	–	10117573

Approved by:

RR

Replacement of Deteriorated Concrete Vault Covers

FC 680

Sheet 3 of 3

Effective Date:
04-24-2020

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure. Utility Vault Co. parent company note removed.

UGS

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FC 690P Vault and Manhole Lid Tethers
Scope FC 690P.1 Vault and Manhole Lid Tethers

Figure FC 690P-1: Vault and Manhole Lid Tether

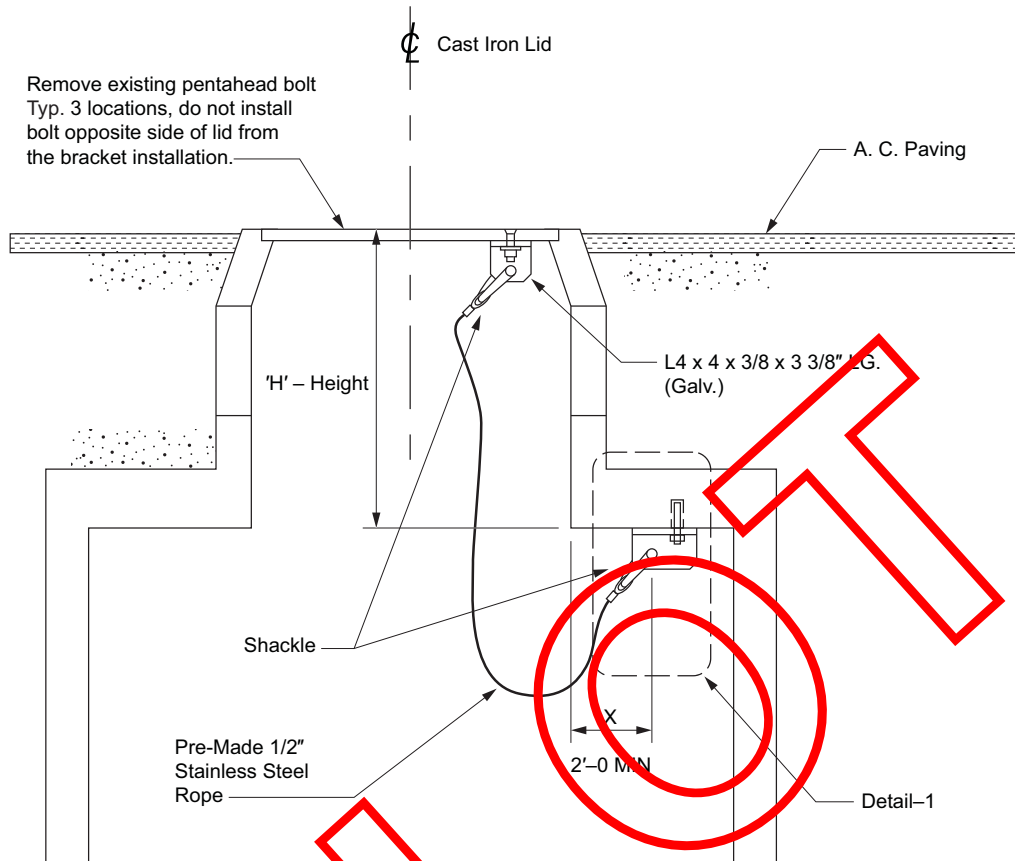
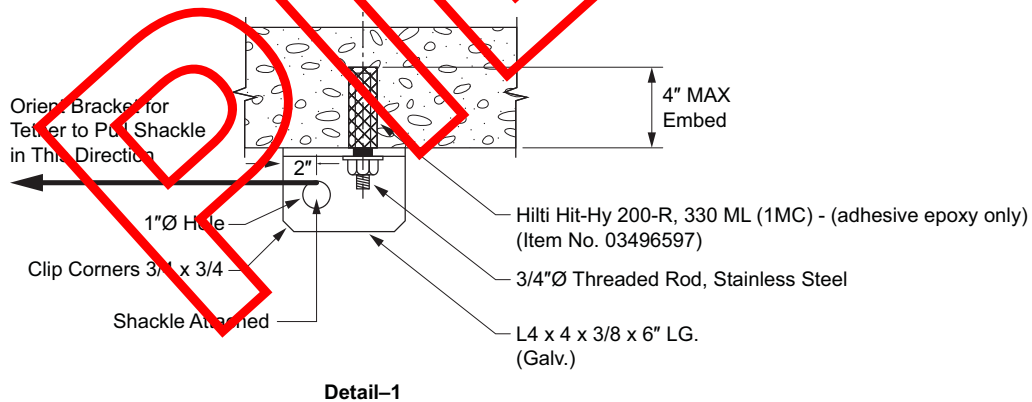


Figure FC 690P-2: Structure Connection Detail



Note(s):

1. Use an approved method for the opening and closing of tethered structure lids.

Approved by:

B.C.

Vault and Manhole Lid Tethers

FC 690P

Sheet 1 of 4

Effective Date:

10-23-2015

What's Changed?

UGS

1.0 Lid Tether Requirements

- 1.1 Tethers shall only be installed on lids of structures on the Long Beach Secondary network.
- 1.2 Round type lids shall have one tether installed (see Figure FC 690P-4). Square type lids shall have two tethers installed per half (see Figure FC 690P-4).

Figure FC 690P-3: Round Type Lid Typical Tether Location

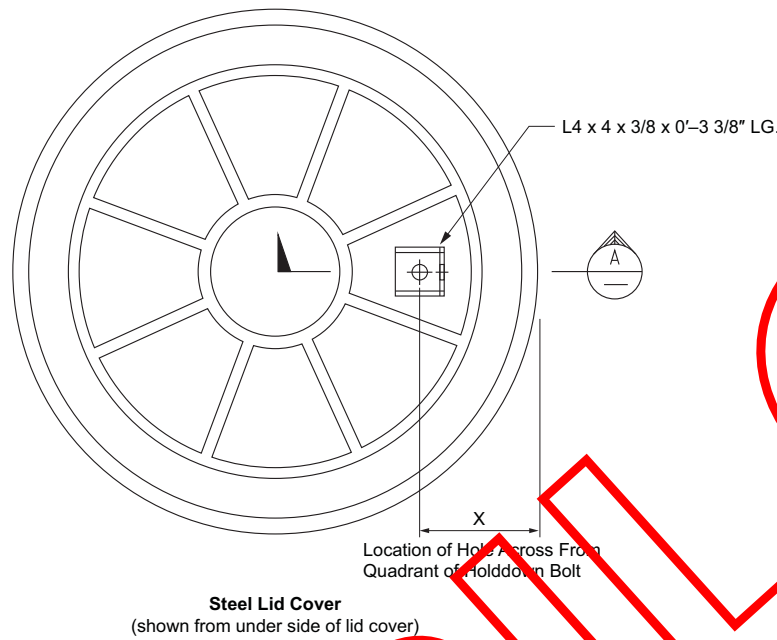
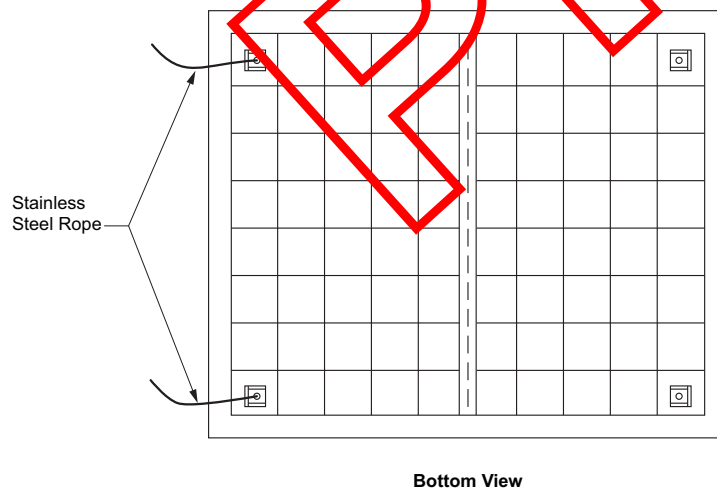


Figure FC 690P-4: Square Type Lid Typical Tether Locations



FC 690P

Vault and Manhole Lid Tethers

Approved by:

B.C.

Sheet 2 of 4

What's Changed?

Effective Date:

UGS

10-23-2015

Table FC 690P-1: Parts List for Lid Connection

Quantity	Details
1	3/4" Dia. SS304 Stainless Steel Flat-Head Bolt (1-3/8" Longer than Lid Thickness) 70ksi Min. Tensile Strength
1	1-3/4" Dia. Washer
2	3/4" Lock Washer
1	3/4" Dia. Hex Nut
1	5/8" Shackle
1	L4" x 4" x 3/8" x 3-3/8" Lg. Galvanized Angle Bracket

Table FC 690P-2: Parts List for Structure Connection

Quantity	Details
1	3/4" Dia. Stainless Steel Threaded Rod (Cut to Fit)
1	3/4" Lock Washer
1	3/4" Dia. Hex Nut
1	5/8" Shackle
1	L4" x 4" x 3/8" x 6" Lg. Galvanized Angle Bracket
1	Adhesive Epoxy

2.0 Lid Tether Installation Details

1. Remove structure lid and place bottom side up.
2. Remove inner pan and return it to service center upon completion of installation.
3. Place angle bracket on the bottom of the structure lid with the vertical leg towards the outside of the lid.
 - Install bracket opposite side of lid from "pick hole".
 - Ensure angle bracket with shackle does not interfere with the installation of the lid.
4. Mark location for angle bracket and drill pilot hole in structure lid using a hand drill with a 1/8 inch - 5/16 inch drill bit. Use cutting oil to aid drilling.
5. Flip structure lid (top-side up).
6. Drill a 3/4 inch hole through the lid at drill pilot location, using cutting oil as necessary.
7. Drill chamfer in top of structure lid in the 3/4" through hole.
8. Flip structure lid (bottom-side up).
9. Align hole on angle bracket with hole on structure lid.
10. Insert bolt in angle bracket.
11. Insert flat washer then lock washer and then nut on bolt.
12. Make nut snug tight with wrench to compress washer.

Note: Angle bracket hole can be located anywhere around the structure opening. It is best to locate for easy access and where no equipment or cable is below the drilling operation.
13. Orient structure lid to match quadrant in structure ceiling.

Approved by:

B. C.

Vault and Manhole Lid Tethers

FC 690P

Sheet 3 of 4

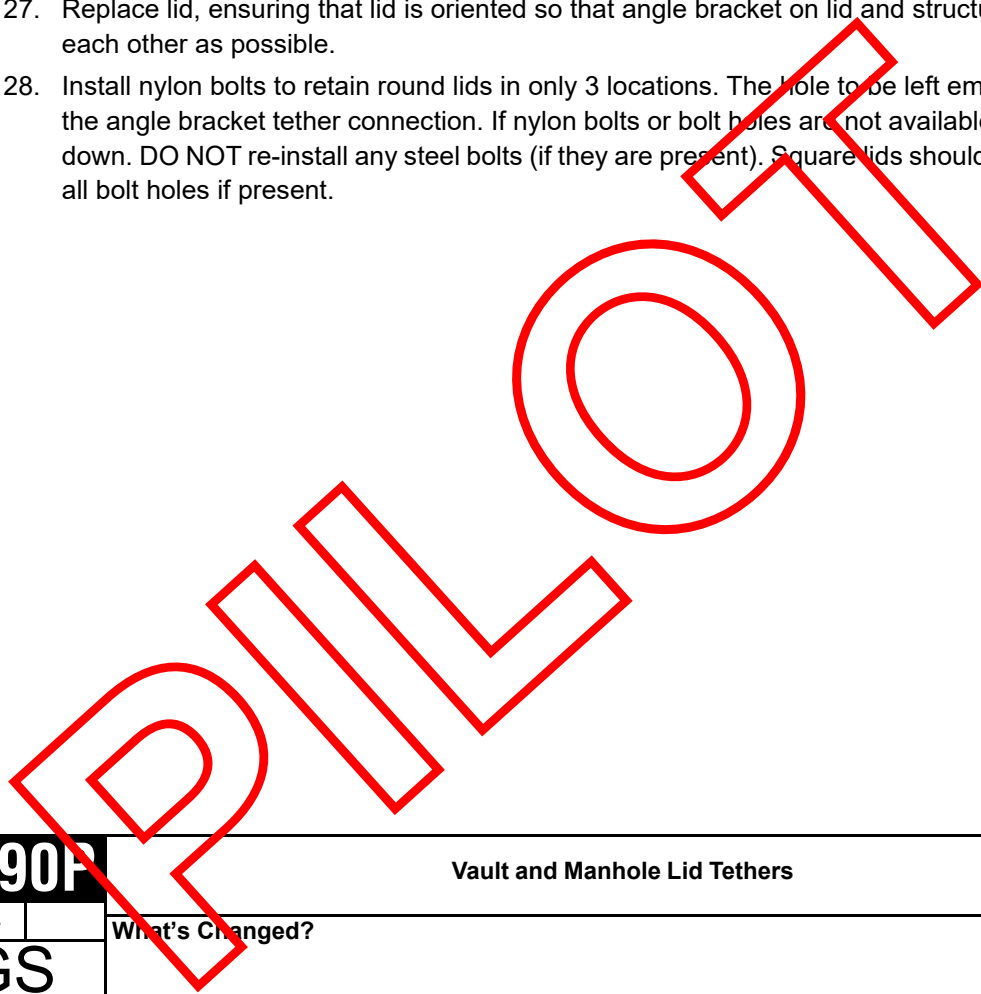
Effective Date:

10-23-2015

What's Changed?

UGS

14. Set one end of the stainless steel rope 3 feet away from structure opening.
15. Drop remainder of stainless steel rope inside hole.
16. Pull end of stainless steel rope across ceiling and mark hole location for angle bracket attachment.
 - It is important to choose a location where the stainless steel rope will not hang down into energized equipment. Be sure the rope will not become entangled on any obstructions (ladders, etc.) that would prevent future removal of the lid.
 - Desired hole location must be a minimum of 2 feet from opening.
 - Stainless steel rope should allow the lid a maximum 3 foot travel outside of the structure.
17. Drill a 4.5 inch deep, 7/8 inch diameter hole in structure ceiling.
18. Apply adhesive epoxy into structure ceiling hole per manufacturer instructions.
19. Insert threaded rod into hole, twist rod while inserting to allow for air to escape.
20. Hold threaded rod in place by hand or mechanical means for a minimum of 5 minutes. Wait 30 minutes for epoxy to cure before placing any load on the threaded rod.
21. Place angle bracket on threaded rod in the proper orientation so that cable pulls shackle perpendicular to hinge keyed bolt, not in line with hinge keyed bolt.
22. Install flat washer then lock washer and then nut on threaded rod.
23. Make nut snug tight with wrench to compress washer.
24. Connect end of stainless steel rope to shackle and then to angle bracket.
25. Attach shackle to stainless steel rope.
26. Bolt shackle through angle bracket hole.
27. Replace lid, ensuring that lid is oriented so that angle bracket on lid and structure are as close to each other as possible.
28. Install nylon bolts to retain round lids in only 3 locations. The hole to be left empty shall be opposite the angle bracket tether connection. If nylon bolts or bolt holes are not available, DO NOT bolt the lid down. DO NOT re-install any steel bolts (if they are present). Square lids should use all nylon bolts for all bolt holes if present.



FC 690F

Vault and Manhole Lid Tethers

Approved by:

B. C.

Sheet 4 of 4

What's Changed?

Effective Date:

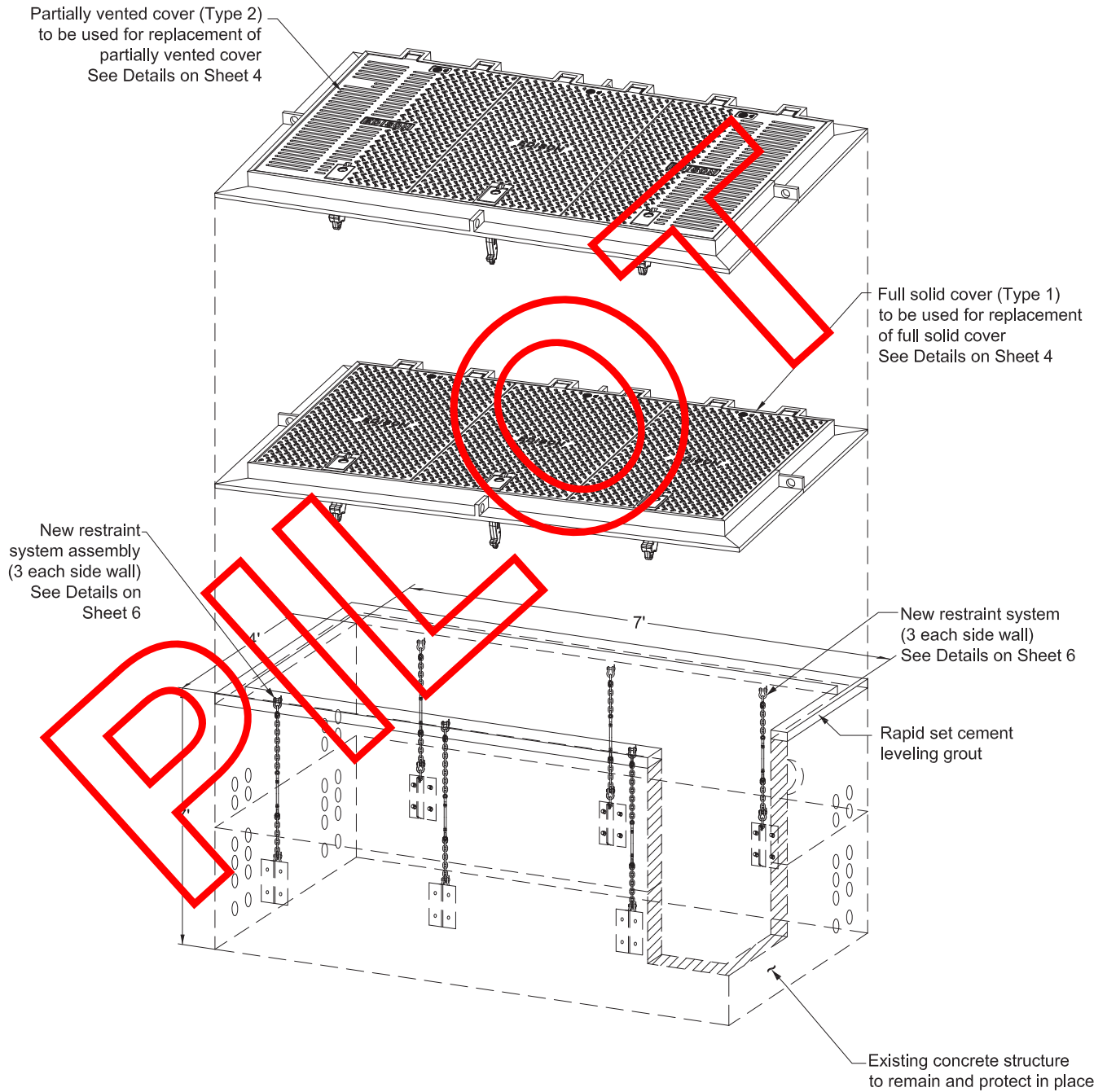
10-23-2015

UGS

FC 700P Subsurface Equipment Enclosure (PILOT)

Scope FC 700P.1 Subsurface Equipment Enclosure – Retrofits Only

Figure FC 700P-1: 4' x 7' x 7' Enclosure



Approved by:

RR

Subsurface Equipment Enclosure (PILOT)

FC 700P

Sheet 1 of 8

Effective Date:
01-29-2021

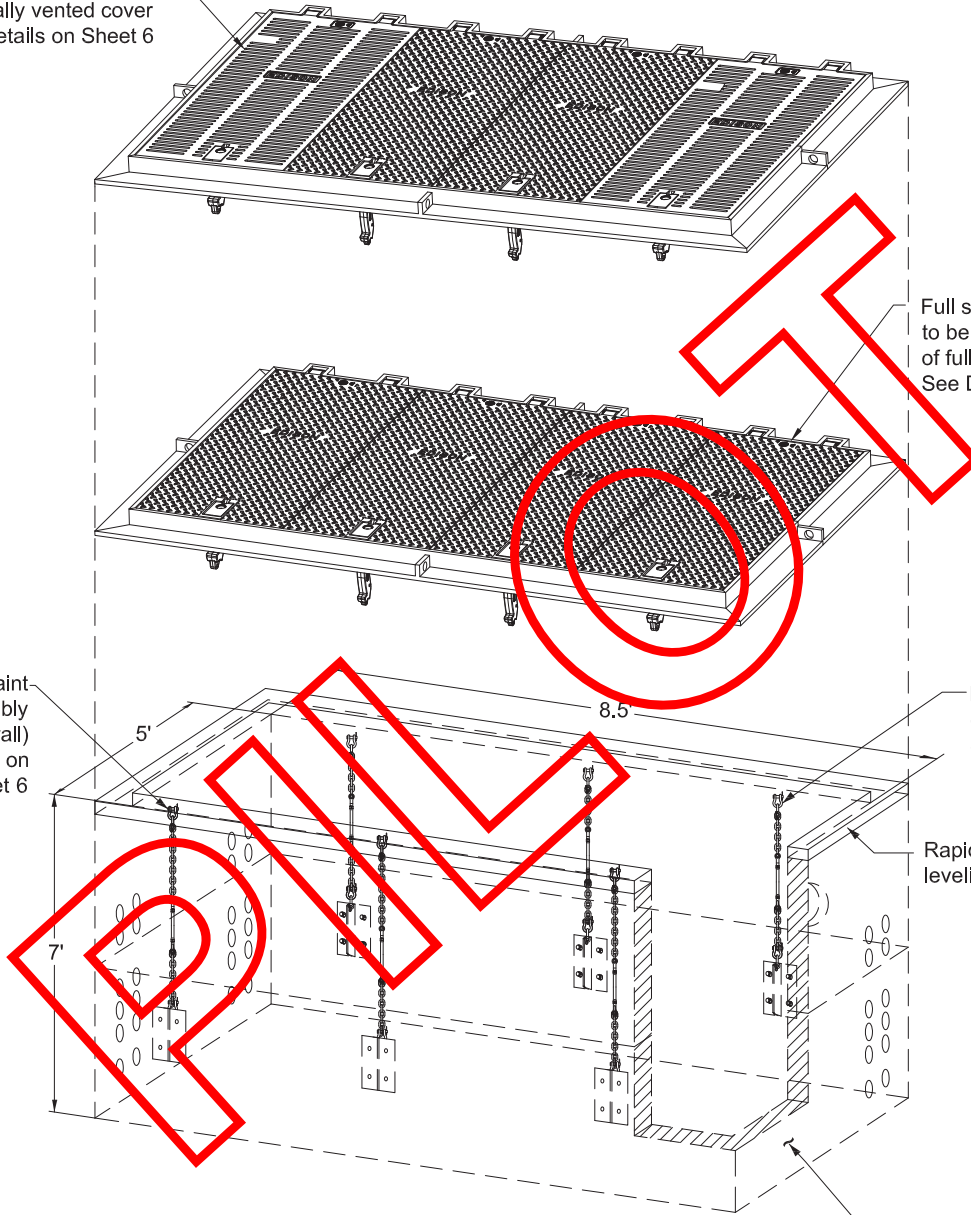
What's Changed? Initial issue of Subsurface Enclosure Pilot.

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Figure FC 700P-2: 5' x 8'-6" x 7' Enclosure

Partially vented cover (Type 2)
to be used for replacement of
partially vented cover
See Details on Sheet 6



Full solid cover (Type 1)
to be used for replacement
of full solid cover
See Details on Sheet 6

New restraint
system assembly
(3 each side wall)
See Details on
Sheet 6

New restraint system
(3 each side wall)
See Details on Sheet 6

Rapid set cement
leveling grout

Existing concrete structure
to remain and protect in place

FC 700P

Subsurface Equipment Enclosure (PILOT)

Approved by:

RR

Sheet 2 of 8

What's Changed? Initial issue.

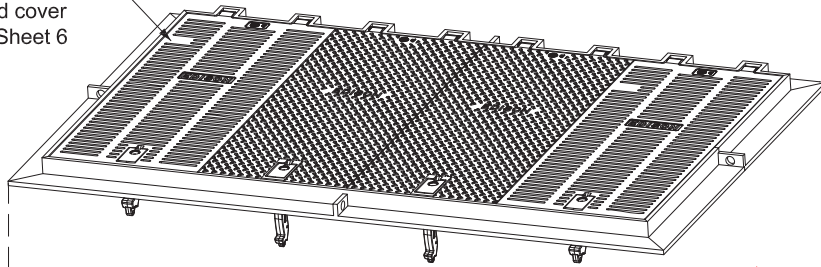
Effective Date:

01-29-2021

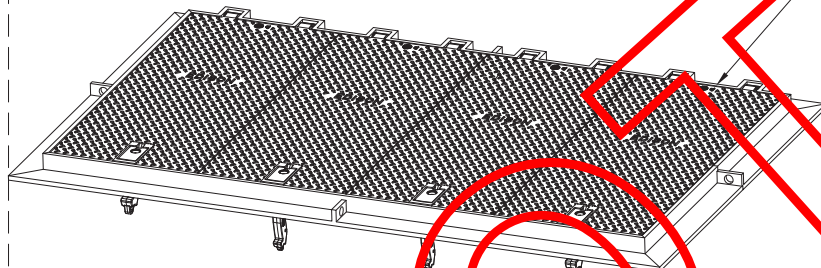
UGS

Figure FC 700P-3: 5' x 8'-6" x 5' Enclosure

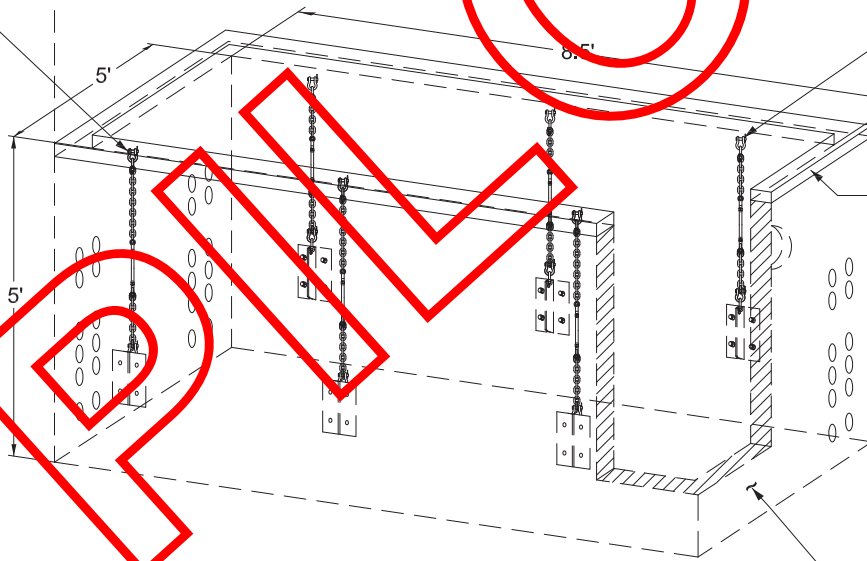
Partially vented cover (Type 2)
to be used for replacement of
partially vented cover
See details on Sheet 6



Full solid cover (Type 1)
to be used for replacement
of full solid cover
See Details on Sheet 6



New restraint
system assembly
(3 each side wall)
See Details on
Sheet 6



New restraint system
(3 each side wall)
See Details on Sheet 6

Rapid set cement
leveling grout

Existing concrete structure
to remain and protect in place

Approved by:

RR

Subsurface Equipment Enclosure (PILOT)

FC 700P

Sheet 3 of 8

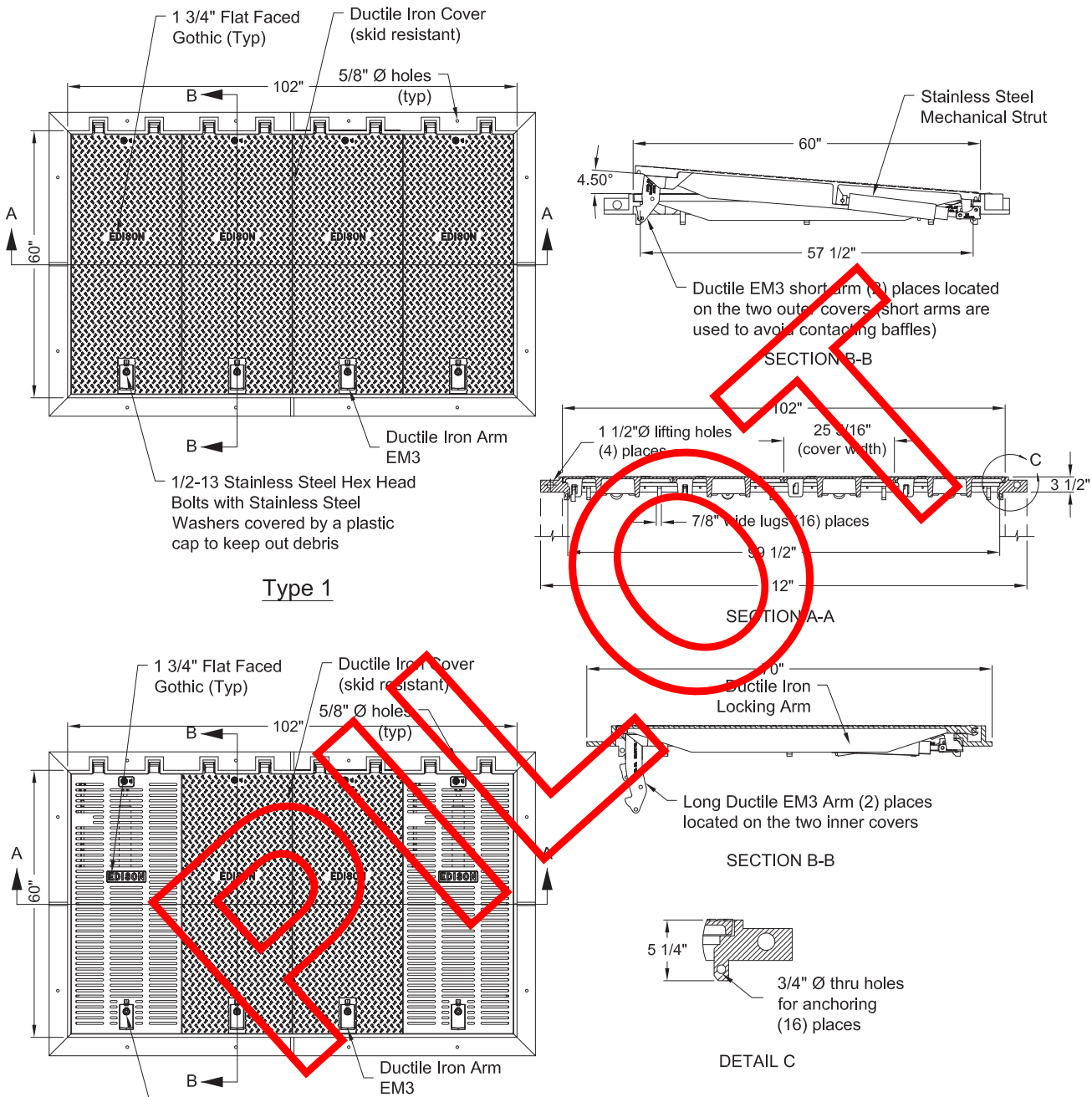
Effective Date:
01-29-2021

What's Changed? Initial issue.

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Figure FC 700P-4: 5' x 8'-6" Cover Details



Cover Type	Material	Traffic Rating	Weight (lbs)
1 (Full Solid)	Frame: Cold Roller Steel Grate: Ductile Iron Accessory: Ductile Iron	HS-20	325 lbs ea panel
2 (Partially vented)	Frame: Cold Roller Steel Grate: Ductile Iron Accessory: Ductile Iron	HS-20	325 lbs ea panel

FC 700P

Subsurface Equipment Enclosure (PILOT)

Approved by:

RR

Sheet 4 of 8

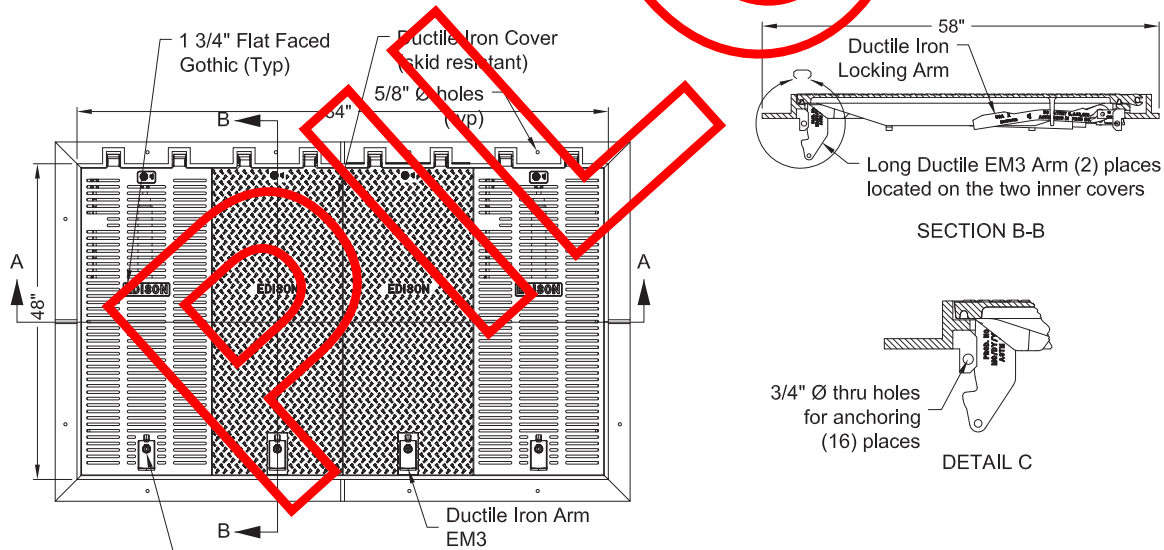
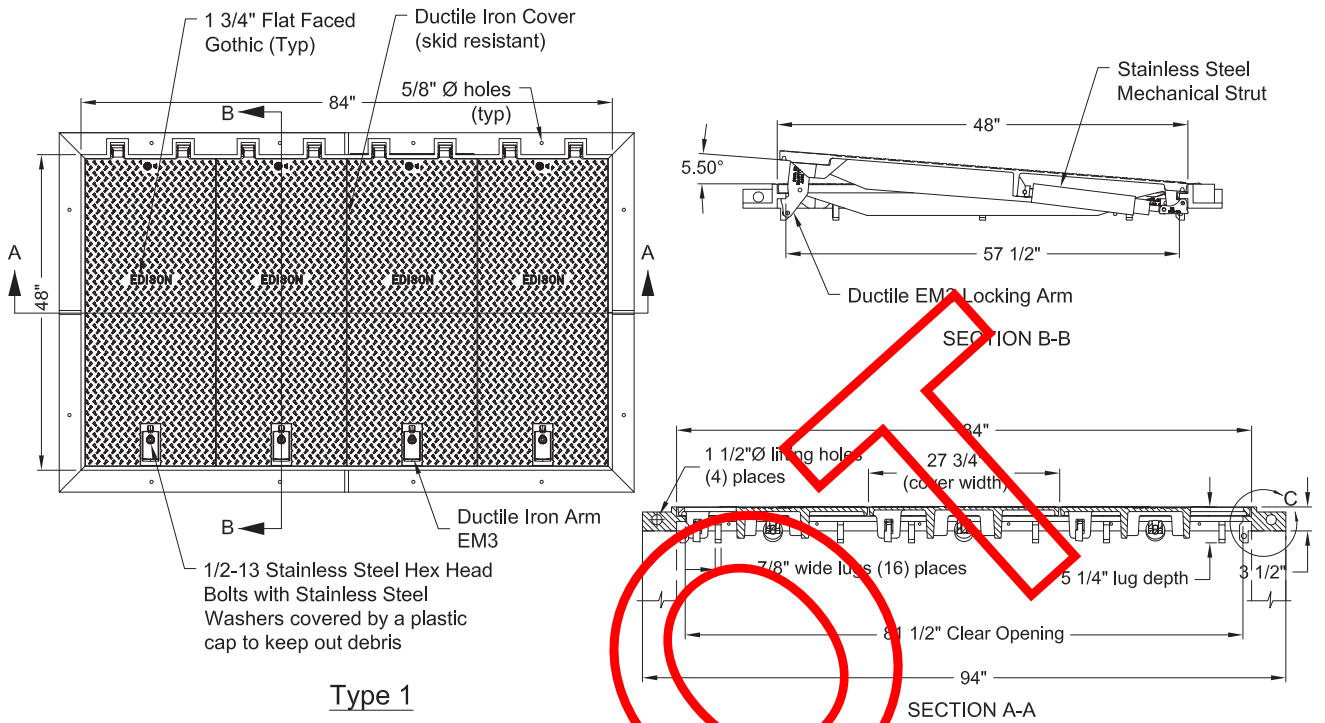
What's Changed? Initial issue.

Effective Date:

UGS

01-29-2021

Figure FC 700P-5: 4' x 7' Cover Details



Cover Type	Material	Traffic Rating	Weight (lbs)
1 (Full Solid)	Frame: Cold Roller Steel Cover: Ductile Iron Accessory: Ductile Iron	HS-20	280 lbs ea panel
2 (Partially vented)	Frame: Cold Roller Steel Cover: Ductile Iron Accessory: Ductile Iron	HS-20	280 lbs ea panel

Approved by:

RR

Subsurface Equipment Enclosure (PILOT)

FC 700P

Sheet 5 of 8

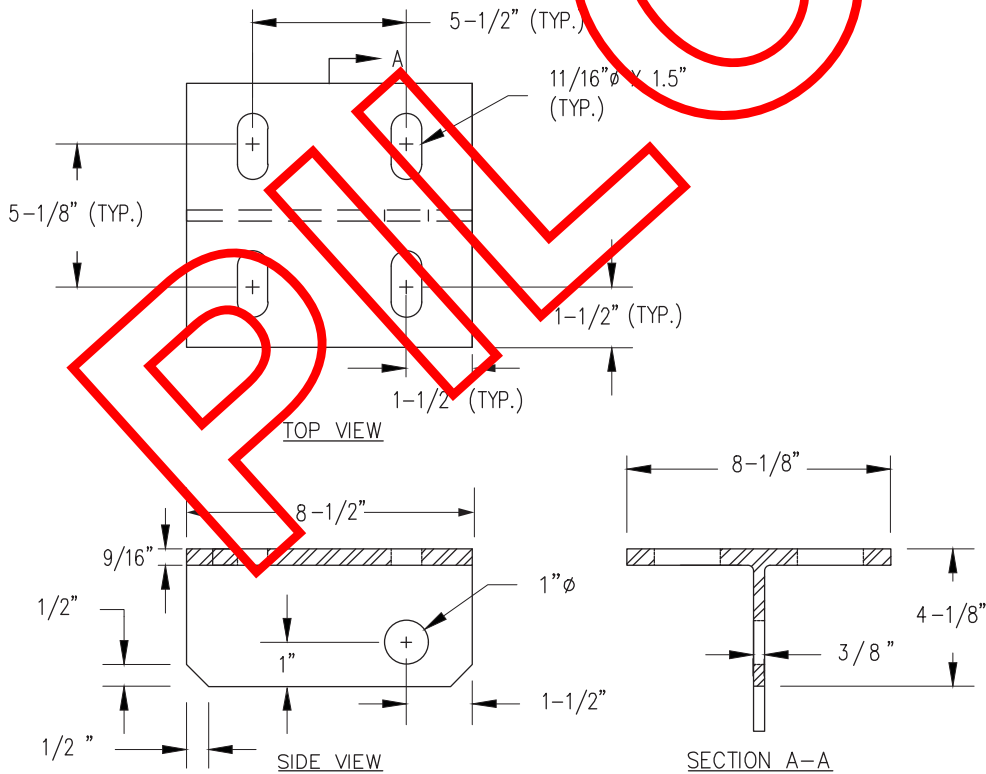
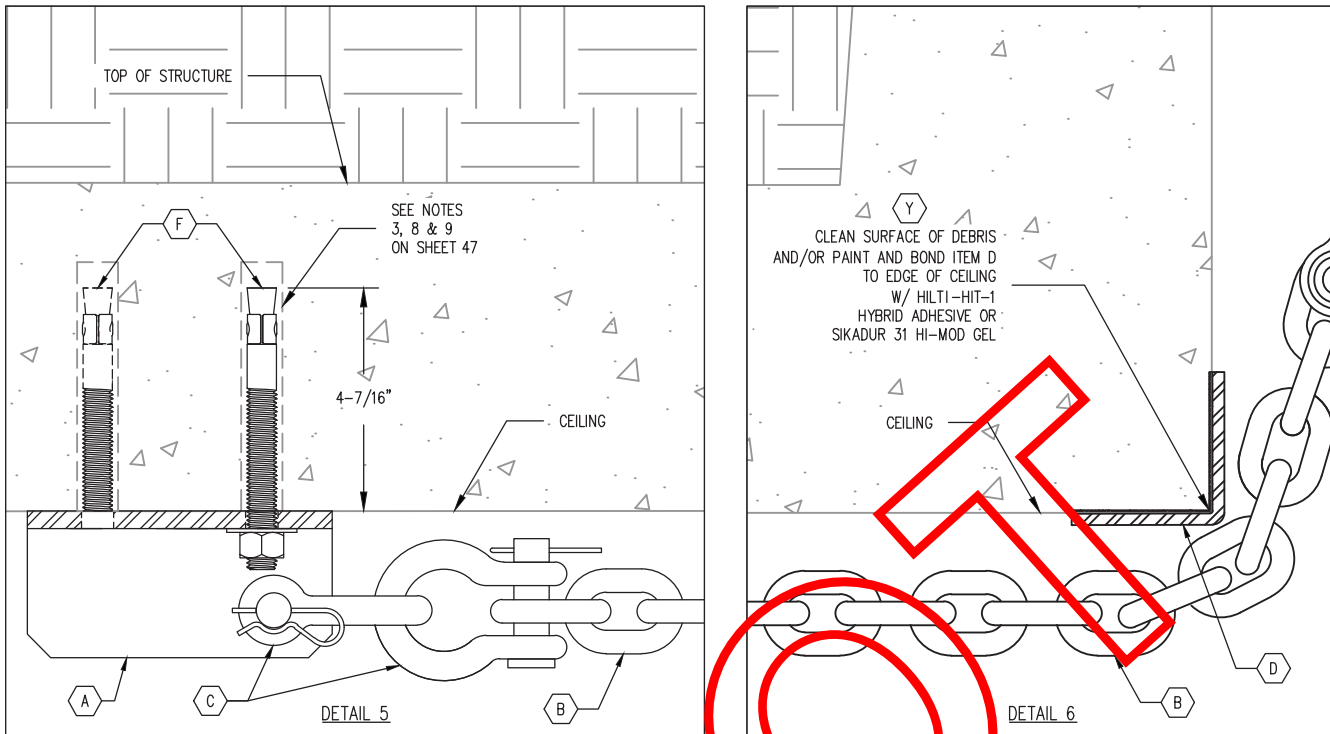
Effective Date:
01-29-2021

What's Changed? Initial issue.

UGS

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Figure FC 700P-6: Restraint Connection Detail



FC 700P

Subsurface Equipment Enclosure (PILOT)

Approved by:

RR

Sheet 6 of 8

What's Changed? Initial issue.

Effective Date:

01-29-2021

UGS

Table FC 700P-1: Key Notes – Subsurface Equipment Enclosure – Retrofits Only

Key Notes: Existing Manhole Type 1 Restraint Assembly Kit			
Item	Description	SAP	Qty. Required Per Installation
			Manhole (Type 1)
A	WT 4 X 20 – 8.5" Length Galv. (See Page 6)		2
B	1/2" Ø Galv. Chain – Grade 30 (Field cut to length)	10209810	15 ft.
C	5/8" Ø Galv. Shackle with 3/4" Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)	10209811	4
D	304 Stainless Steel Angle L 3 X 3 X 1/4–6" Length	10209812	2
E	3/4" Thread Size Galv. Clevis-to-Clevis (5/8" Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts	10209813	2
F	5/8" Ø x 6" Length (316 Stainless Steel)	Hilti HIT-HY200-R	10214883
		HAS-R 316 SS	10214884
G	1/2" Ø – 13 x 8" Length – All Thread Rod (Grade 8 Steel)	10209815	4
H	1/2" – 13 Hex Nut (Grade 8 Steel)	10209816	8
I	1/2" Flat Washer (Grade 8 Steel)	10209817	8

PROTECT

Approved by:

RR

Subsurface Equipment Enclosure (PILOT)

FC 700P

Sheet 7 of 8

Effective Date:
01-29-2021

What's Changed? Initial issue.

UGS

General Note:

1. Anchors bolts installed on ceiling shall be a minimum of 24 inches from edge of access opening and a minimum of 12 inches from joint.
2. Anchor bolts shall be installed in sound concrete.
3. Rebar scanning is required prior to drilling holes into existing concrete. Drilling rebar is prohibited. Drill bits intended to drill through rebar (e.g. diamond and core bits) are not allowed.
4. All core drilled holes not used shall be clean of debris and filled with epoxy, flush with existing surface.
5. Anchor bolts shall be installed in-line with restraint attachment at opposite end.
6. All restraints shall be installed taut with no slack in any of the components (turnbuckle, shackle, chain, etc.).
7. Chains shall be in their normal position and not twisted while making restraints taut.
8. Installation of adhesive anchors shall be in accordance with the Manufacturer's Published Installation Instructions (MPII). Anchors must be installed in holes drilled into concrete using carbide-tipped drill bits. For on-site training of adhesive anchor installation, contact Hilti at (800) 879-8000.
9. SCE will perform periodic inspections to ensure compliance with standard.
10. Torque wrench shall be certified by an accredited testing laboratory and results are to be kept on file at contractor's facility and available upon request. Torque wrench shall be stored according to manufacturer's specifications.
11. Restraint system shall be installed plumb and can be skewed from vertical axis to a maximum of 30deg angle.
12. End wall installation is not permitted.
13. Actual orientation of frame and cover is to be field located and approved. Cover venting shall be directed away from structures and pedestrian walkway paths.

PILOT

Accessories

Table of Contents

Standard	Title
AC 700	Ground Rod — Ground Wires
AC 700.1	Ground Rod — Ground Wires
AC 701	Ground Rod Installation for Pad-Mounted Transformers and Capacitors
AC 701.1	Ground Rod Installation for Pad-Mounted Transformers and Capacitors
AC 702	Riser Bend Grounding
AC 702.1	Riser Bend Grounding
AC 703	Grounding Materials — Ground Rod and Clamps
AC 703.1	Grounding Materials — Ground Rod and Clamps
AC 710	Sump Details for Poured-in-Field Substructures
AC 710.1	Sump Details for Poured-in-Field Substructures
AC 711	Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults
AC 711.1	Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults
AC 712	Sump Discharge Outlet for Underground Vaults
AC 712.1	Sump Discharge Outlet for Underground Vaults
AC 720	Coil Insert — Standard Installation for Precast and Poured-in-Place Structures
AC 720.1	Single-Threaded Coil Insert
AC 720.2	Double-Threaded Coil Insert
AC 722	Inserts Opposite Conduit Banks
AC 722.1	Inserts Opposite Conduit Banks
AC 723	Insert Schedule for Pull Boxes
AC 723.1	Insert Schedule for Pull Boxes
AC 725	Insert Installation Detail for Vaults
AC 725.1	Insert Installation Detail for Vaults
AC 727	Pull Box Insert Repair
AC 727.1	Pull Box Insert Repair

Approved by:	Accessories Table of Contents	AC
Effective Date:	04-27-2018	Sheet i
		UGS

Standard	Title
AC 729	Pull Iron for Pull Boxes
AC 729.1	Pull Iron for Pull Boxes
AC 731	Support for Ground Bus
AC 731.1	Support for Ground Bus Using Ground Anchor Bracket (Preferred Method)
AC 731.2	Support for Ground Bus Using J Bolt (Alternate Method)
AC 733	Cable Pulling Attachments
AC 733.1	Cable Pulling Attachments
AC 740	Ladder Installation for Manholes
AC 740.1	Ladder Installation for Manholes
AC 742	Ladder for Vaults and Manholes (Edison SAP 10117761)
AC 742.1	Ladder for Vaults and Manholes
AC 742.2	Ladder Installation for Vaults
AC 750	Standpipe Vent Placement
AC 750.1	Standpipe Vent Placement
AC 751	Vent Locations on Vault and Manhole Walls
AC 751.1	Vent Locations on Vault and Manhole Walls
AC 752	Polyethylene Standpipe Vents
AC 752.1	Polyethylene Standpipe Vents
AC 753	PVC Standpipe Vents — 8 Inches and 10 Inches
AC 753.1	PVC Standpipe Vents — 8 Inches and 10 Inches
AC 754	Steel Standpipe Vent — 18 Inches
AC 754.1	Steel Standpipe Vent — 18 Inches
AC 756	Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches
AC 756.1	Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches
AC 758	Standpipe Vent Installation
AC 758.1	Standpipe Vent Installation
AC 758.2	PVC Standpipe Vent Installation
AC 758.3	Polyethylene Standpipe Vent Installation

AC	Accessories Table of Contents	Approved by: <i>afj</i>
	Sheet ii	Effective Date: 04-27-2018
UGS		

Standard	Title
AC 759	Wall Stand Vent Detail and Installation
AC 759.1	Wall Stand Vent Detail and Installation
AC 760	Installation of a Ground Wire in a Vent
AC 760.1	Installation of a Ground Wire in a PVC Vent
AC 760.2	Installation of a Ground Wire in a Polyethylene Standpipe Vent
AC 765	Flush Vent Grates and Frames
AC 765.1	Flush Vent Grates and Frames
AC 765.2	Flush Vent Installation
AC 765.3	Flush Vent Installation with Trash Pit
AC 765.4	Flush Vault Roof Vents

Approved by:	Accessories Table of Contents	AC
Effective Date:		Sheet iii
04-27-2018		UGS

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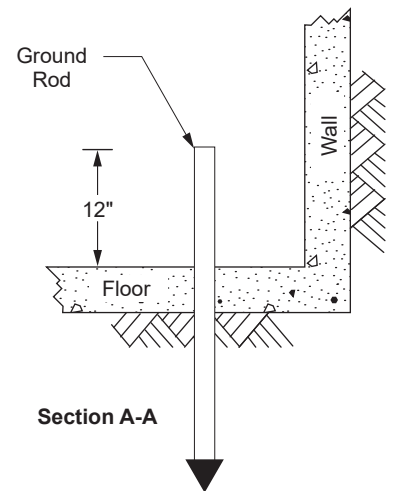
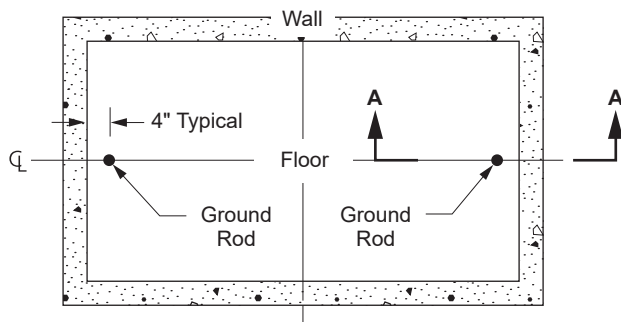
AC 700 Ground Rod — Ground Wires

Scope AC 700.1 Ground Rod — Ground Wires

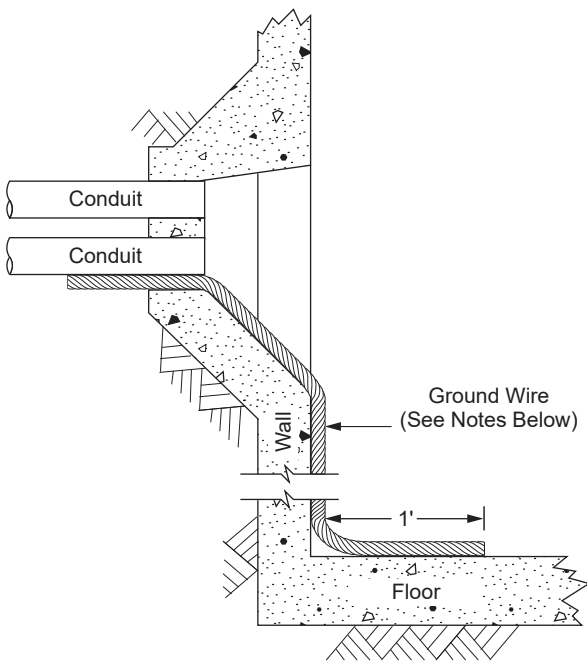
Precast tunnel-style vaults (7' x 8' and 8' x 9'-4") are furnished with two one-half-inch bronze grounding inserts on each end section. Other styles (stacked and so on) of precast vaults and manholes are normally furnished with grounding bars (two per vault/one per manhole). Grounding bars are five-eighths-inch (minimum diameter) copperclad steel bars. Both the grounding inserts and bars are welded to the reinforcing mats of the structures. No ground rods are required where grounding inserts or bars are present.

Where grounding inserts or bars are not present (and in field-poured structures), install 5/8" x 8' copperclad steel ground rods as shown in [Figure AC 700-1 \(Sheet 1\)](#).

Figure AC 700-1: Ground Rod Location for Vaults and Manholes

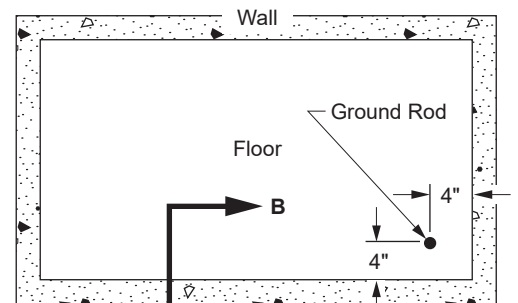


Two ground rods are required in any vault that does not have a ground wire in the conduit bank. One ground wire is required in any manhole that does not have a ground wire in the conduit bank

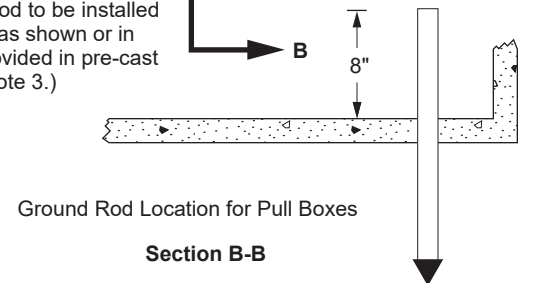


Ground Wire Entrance See Note 1.

Ground Rods — Pull Boxes



One ground rod to be installed in pull boxes as shown or in knock-out provided in pre-cast units. (See Note 3.)



Ground Rod Location for Pull Boxes

Section B-B

Approved by:

PhH

Ground Rod — Ground Wires

AC 700

Sheet 1 of 2


Effective Date:
10-28-2005

What's Changed?

UGS

Note(s):

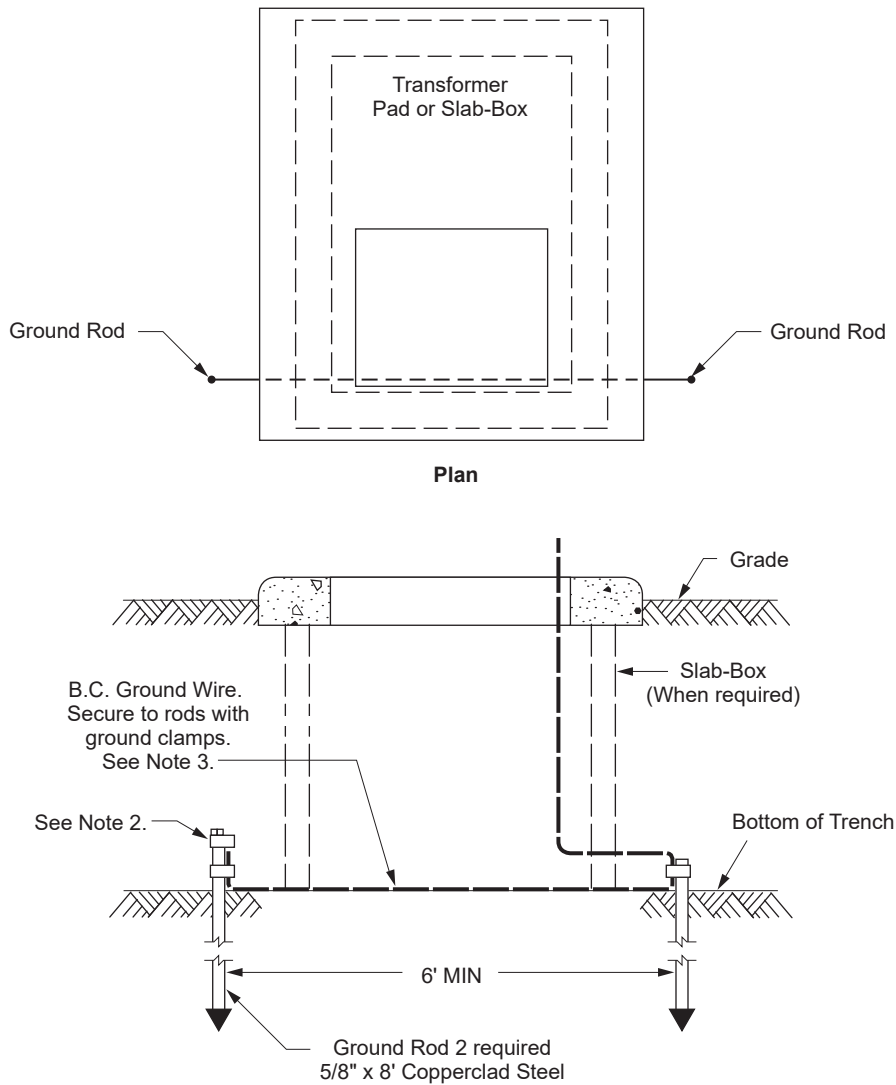
1. Install ground wire only where specified on the working drawing.
2. When specified on working drawing, bring telephone company bond wire into structure the same as shown for ground wire. Extend bond wire to ground rod or bar and attach. (Telephone company to furnish bond wire and clamp.)
3. One ground rod is required only in pull boxes where primary cables are installed.
4. Ground rods and ground wire, when required, are furnished by the contractor. Contractor will install all grounding materials required.

AC 700	Ground Rod — Ground Wires	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date:
UGS		10-28-2005

AC 701 Ground Rod Installation for Pad-Mounted Transformers and Capacitors

Scope AC 701.1 Ground Rod Installation for Pad-Mounted Transformers and Capacitors

Figure AC 701-1: Ground Rod Installation for Pad-Mounted Transformers and Capacitors



Approved by:

RK

Ground Rod Installation for Pad-Mounted Transformers and Capacitors

AC 701

Sheet 1 of 2

Effective Date:
04-25-2008

What's Changed?

UGS

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Table AC 701-1: Minimum Ground Conductor Size

Structure Type	Structure Size	Ground Wire Size
Transformers		
Pads	4' x 4'-6"	#6
	6' x 5'-6"	#2
	7'-10" x 6'	2/0
Slab Box	6' x 8"	2/0
	8' x 10'	2/0
	10' x 12'	2/0
Capacitors/Ground Fault Detector		
Pad	7'-10" x 6'	#6

Note(s):

1. When driving ground rods, care should be taken not to drive rod through buried cable or duct.
2. When specified on working drawing, telephone company #6 tinned copper bondwire is to be attached to ground rod with clamp. Wire and clamp furnished and installed by telephone company.
3. Ground rods, clamps, and ground wire furnished by the contractor. See [Table AC 701-1 \(Sheet 2\)](#) for minimum transformer and capacitor bare copper ground wire size. Contractor will install all grounding material.

AC 701

Ground Rod Installation for Pad-Mounted Transformers and Capacitors

Approved by:



Sheet 2 of 2

What's Changed? Information in Table AC 701-1 was updated to include ground fault detectors.

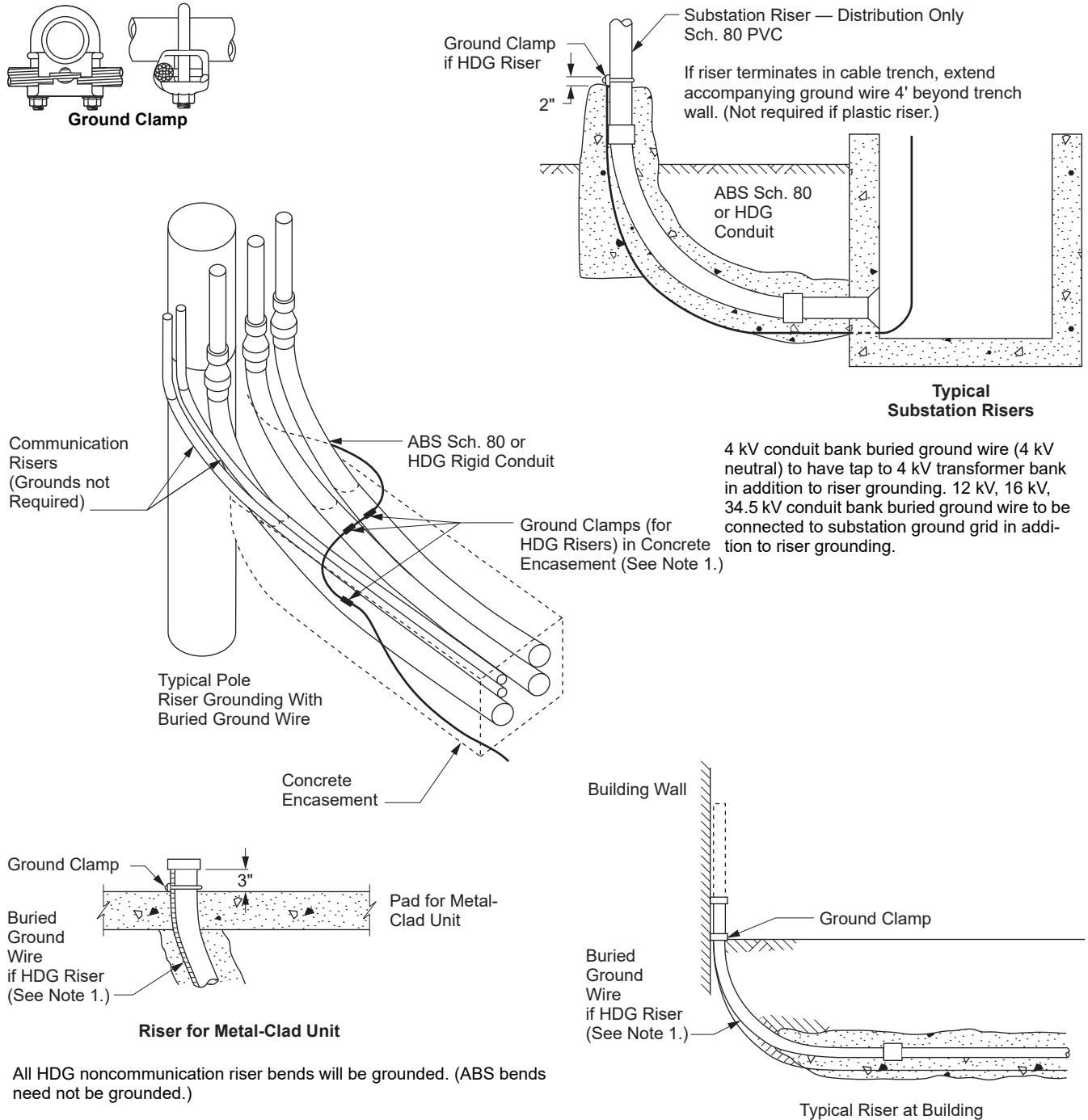
Effective Date:

UGS

04-25-2008

AC 702 Riser Bend Grounding
Scope AC 702.1 Riser Bend Grounding

Figure AC 702-1: Riser Bend Grounding



Note(s):

1. Exception: HDG conduit does not require ground when 10' or more is buried in ground.

Approved by:

B. C.

Riser Bend Grounding

AC 702

Sheet 1 of 2

Effective Date:

10-24-2014

What's Changed?

UGS

Table AC 702-1: Ground Clamps

Rod or Pipe Size	Wire Size		Code No.	SAP
	From	To		
3/4" I.P.S.	#4 SOL.	2/0 STR.	606-22602	10111612
1" I.P.S.	#4 SOL.	2/0 STR.	606-22800	10111613
1-1/4" I.P.S.	#4 SOL.	2/0 STR.	606-23006	10111614
1-1/2" I.P.S.	#4 SOL.	2/0 STR.	606-23204	10111615
2" I.P.S.	#4 SOL.	2/0 STR.	606-23402	10111616
2-1/2" I.P.S.	#4 SOL.	2/0 STR.	606-23600	10111617
3" I.P.S.	#4 SOL.	2/0 STR.	606-23808	10111618
3-1/2" I.P.S.	#4 SOL.	2/0 STR.	606-24004	10111619
4" I.P.S.	2/0 SOL.	250 kcmil	606-24202	10111620
5" I.P.S.	2/0 SOL.	250 kcmil	606-24400	10111621
6" I.P.S.	2/0 SOL.	250 kcmil	606-24608	10111622

AC 702

Riser Bend Grounding

Approved by:

B. C.

Sheet 2 of 2

What's Changed? SAP Numbers added.

Effective Date:

10-24-2014

UGS

AC 703 Grounding Materials — Ground Rod and Clamps

Scope AC 703.1 Grounding Materials — Ground Rod and Clamps

Figure AC 703–1: Copper-Clad Steel Ground Rod

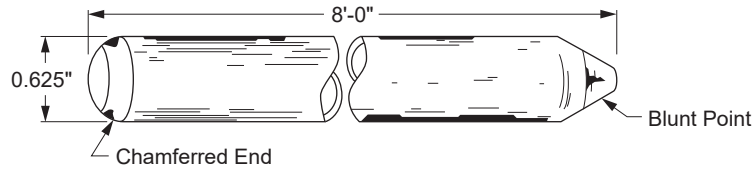


Table AC 703–1: Ground Rod

Manufacturer	Catalog No.
Blackburn	6258
Joslyn	J-8338

Figure AC 703–2: Heavy-Duty Bronze Ground Clamp

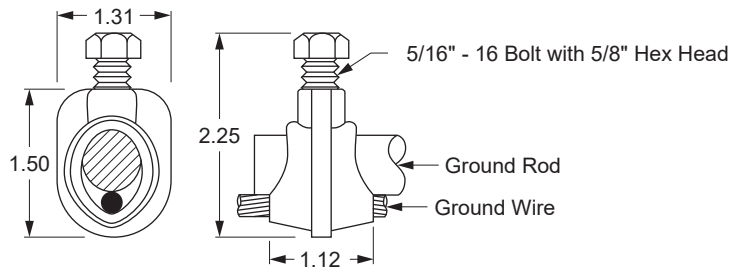


Table AC 703–2: Heavy-Duty Bronze Ground Clamp

Manufacturer	Catalog No.
Blackburn	J-AB5/8H
Burndy	GRC58
Connector Mfg. Co.	WB58
Dossert	GN62
Joslyn	J8492AB
Penn-Union	CAB-2

Approved by:

PhH

Grounding Materials — Ground Rod and Clamps

AC 703

Sheet 1 of 2

Effective Date:
10-28-2005

What's Changed?

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Figure AC 703-3: U-Bolt Bronze Ground Clamp

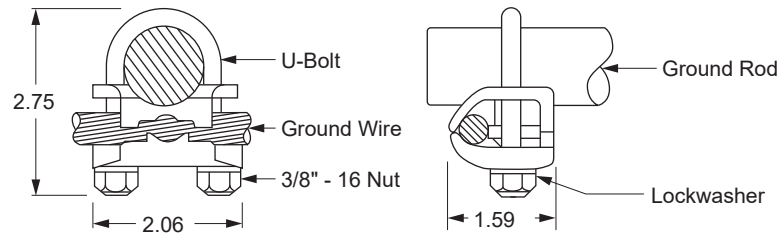


Table AC 703-3: U-Bolt Bronze Ground Clamp

Manufacturer	Catalog No.
Burndy	GAR6426SE
Dossert	GPC38-13
Penn-Union	GPL-5

Note(s):

1. Copper-clad steel ground rods will be 5/8" diameter by 8' long (Figure AC 703-1 [Sheet 1]). Rods are to be driven in undisturbed earth and will be a minimum of 8' in the ground. See Table AC 703-1 (Sheet 1) for approved manufacturers and catalog numbers.
2. Bronze grounding clamp has a ground wire range from #6 to #2 AWG. Clamp dimensions shown in Figure AC 703-2 [Sheet 1] are approximate. See Table AC 703-2 (Sheet 1) for approved manufacturers and catalog numbers.
3. Bronze U-bolt grounding clamp has a ground wire range from #4 to 2/0 AWG. Clamp dimensions shown in Figure AC 703-3 [Sheet 2] are approximate. See Table AC 703-3 (Sheet 2) for approved manufacturers and catalog numbers.

AC 703

Grounding Materials — Ground Rod and Clamps

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

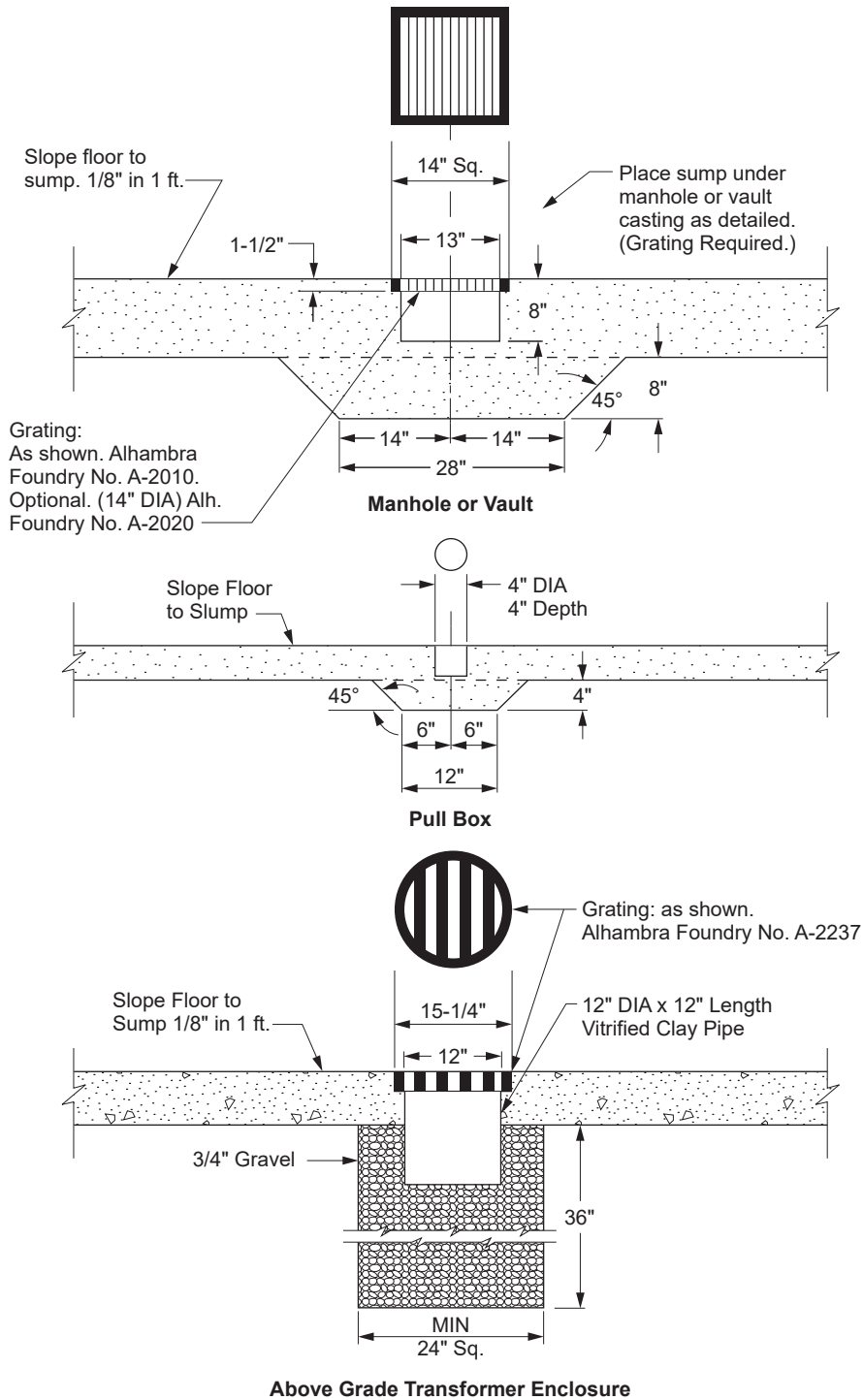
UGS

10-28-2005

AC 710 Sump Details for Poured-in-Field Substructures

Scope AC 710.1 Sump Details for Poured-in-Field Substructures

Figure AC 710-1: Sump Details for Poured-In Field Substructures



Approved by:

PhH

Sump Details for Poured-in-Field Substructures

AC 710

Sheet 1 of 1

Effective Date:
10-28-2005

What's Changed?

UGS

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AC 711 Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults

Scope AC 711.1 Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults

1.0 Sumps

All pull boxes are required to have a sump 6" in diameter and 3" deep, centered in the floor area.

All manholes and vaults are required to have a sump 13" in diameter and 5" deep. Generally, this sump is to be located directly below the man entry.

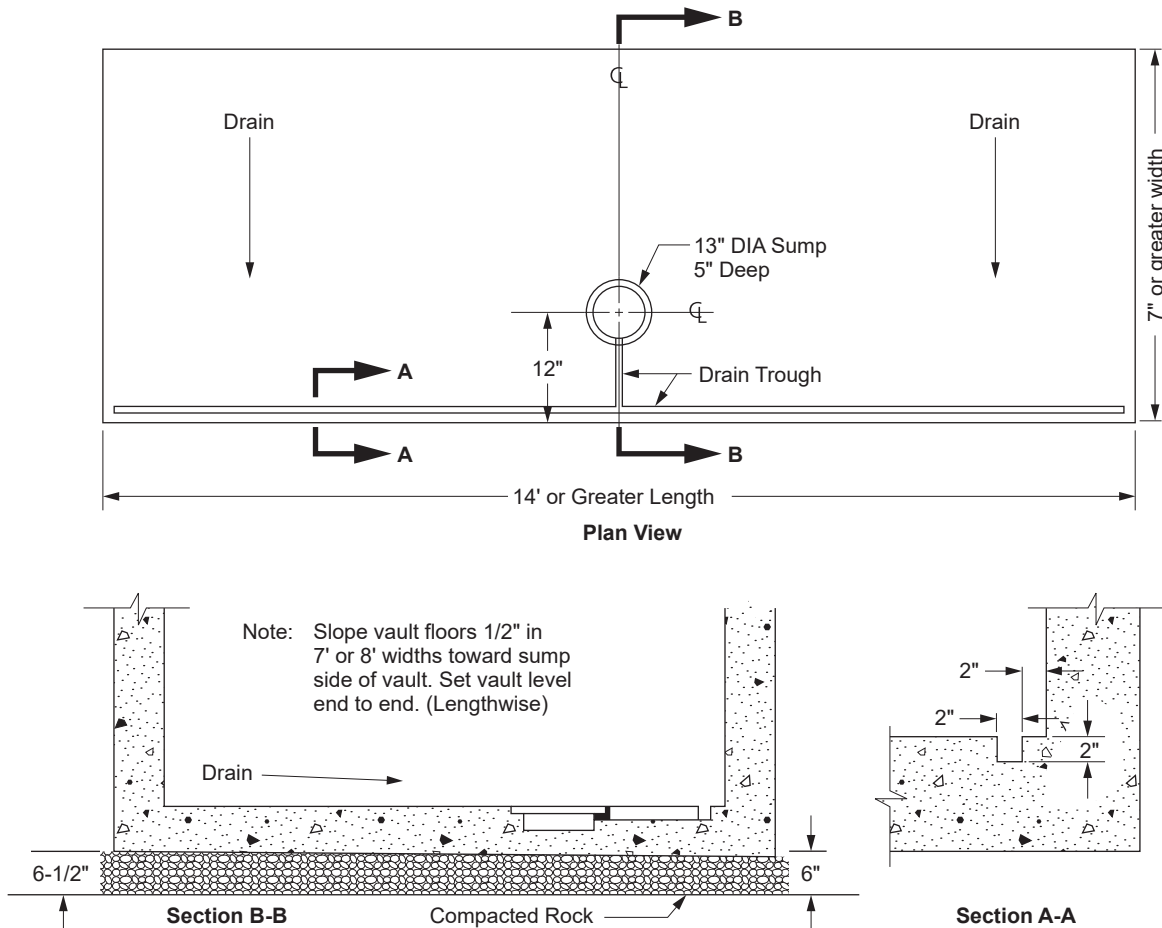
All sumps in manholes and vaults will be designed to accept a flush fitting 15" diameter by 1/4" thick sump cover.

It is not necessary to furnish a sump cover with any structure.

2.0 Drains

In addition to a sump, vaults 7' x 14', 8' x 14' and larger are required to have a drain trough as shown below:

Figure AC 711-1: Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults



Note(s):

1. With prior approval, slight variation in design may be allowed precasters.

Approved by:

PHH

Sump and Drain Details for Precast Pull Boxes, Manholes, and Vaults

AC 711

Sheet 1 of 1

Effective Date:
10-28-2005

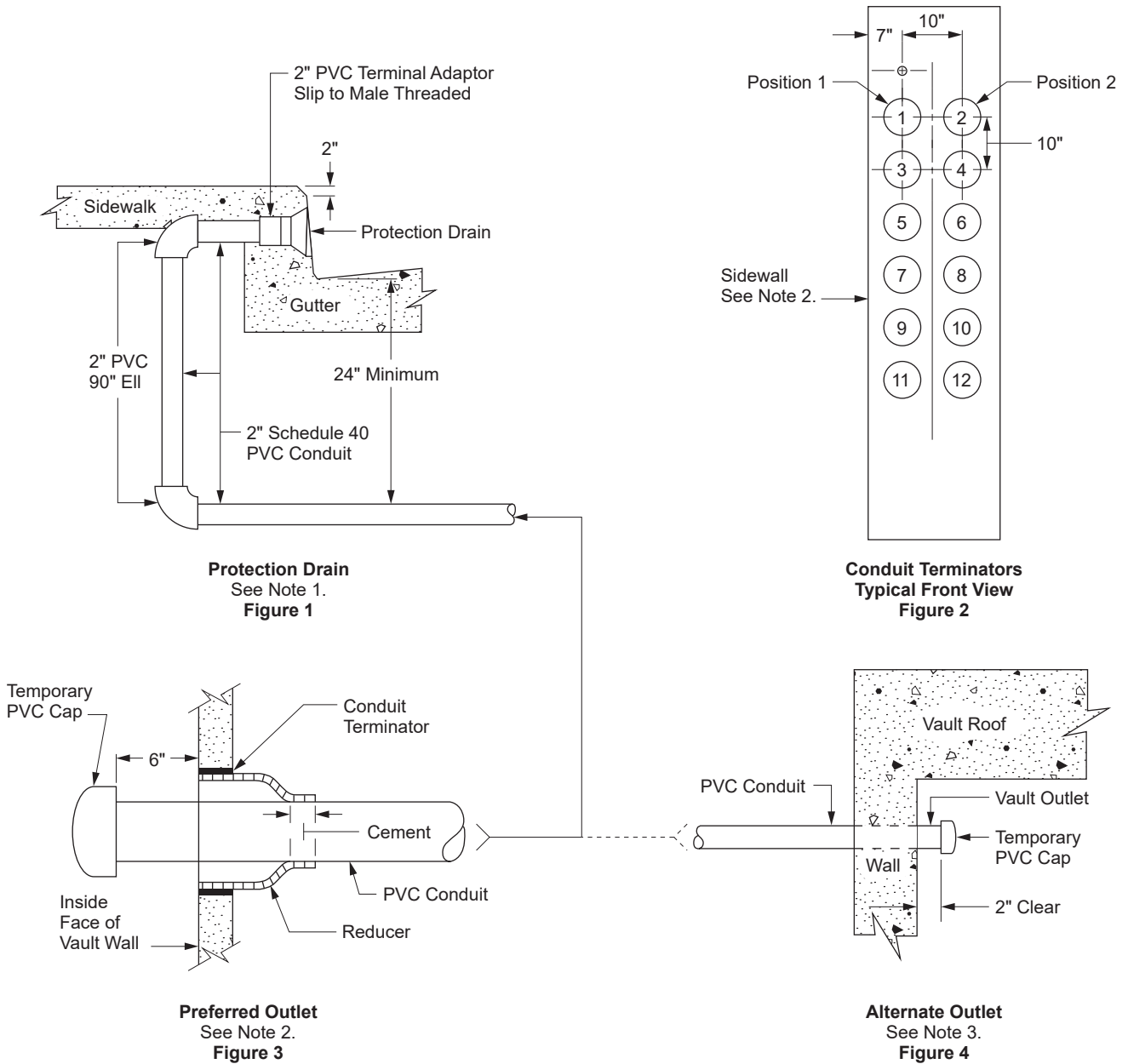
What's Changed?

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AC 712 Sump Discharge Outlet for Underground Vaults
Scope AC 712.1 Sump Discharge Outlet for Underground Vaults

Figure AC 712-1: Discharge Outlet for Underground Vaults



Note(s):

1. The 2" protection drain, 2" Schedule 40 PVC conduit, and related PVC fittings should be installed into the curb face to the dimensions as shown in Figure 1.
2. Preferred outlet applications for vault sump discharge is utilizing conduit termination position #1 or #2 (Figure 2) whichever is closest to vault sidewall. Conduit to be attached to terminator utilizing method as shown in Figure 3.
3. If the alternate outlet method as shown in Figure 4 is employed, the vault sidewall will be core drilled for conduit placement.

Approved by:

PHH

Sump Discharge Outlet for Underground Vaults

AC 712

Sheet 1 of 2

Effective Date:
10-28-2005

What's Changed?

UGS



4. Following are the approved protection drain manufacturers and supplier.
 - a. Manufacturers:
 - Connecticut Brass Co.
(Brass Type) Part #1171
 - Plumbing Products
(Cast-Iron Type) Part #9A 2" IPS
 - b. Supplier:
 - Cal-Duct Inc.
2522 Lee Avenue
South El Monte, CA 91733
5. Protection drains are also available from most retail/commercial plumbing supply distributors.

AC 712

Sump Discharge Outlet for Underground Vaults

Approved by:

Sheet 2 of 2

What's Changed?

Effective Date:

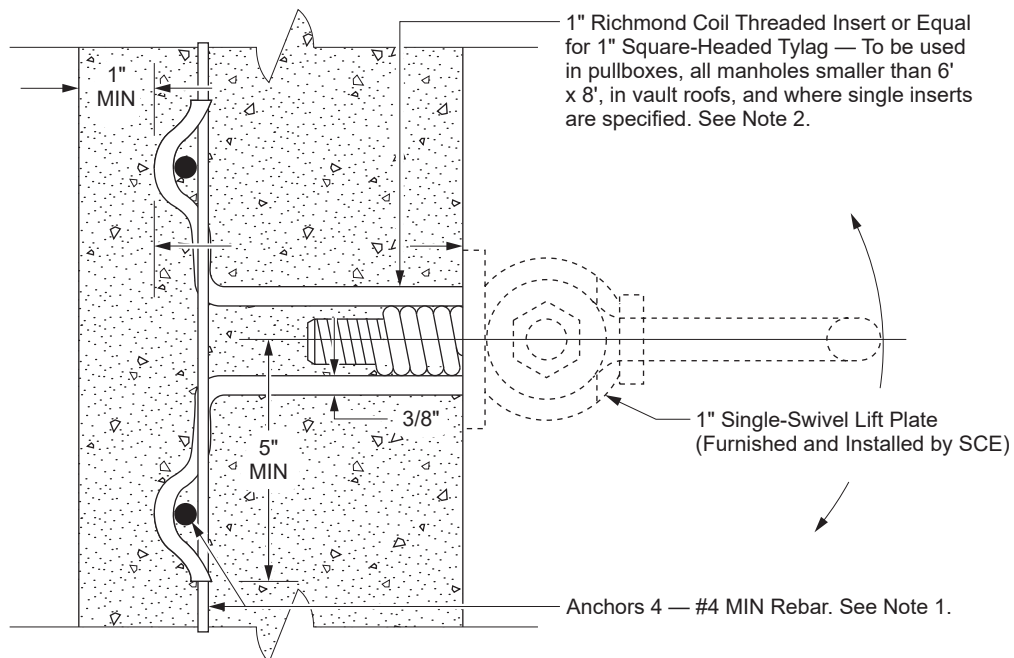
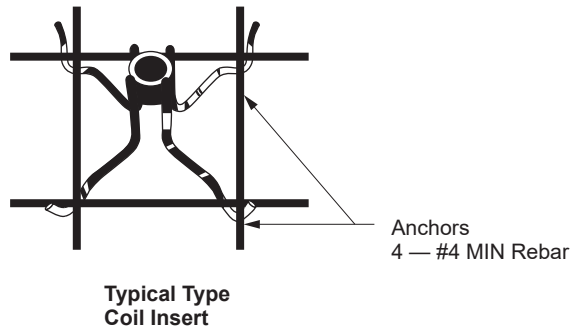
10-28-2005

UGS

AC 720 Coil Insert — Standard Installation for Precast and Poured-in-Place Structures

Scope AC 720.1 Single-Threaded Coil Insert

Figure AC 720-1: Single-Threaded Coil Insert



Note(s):

1. Anchor steel to be a minimum of 12" in length if not interlocked with reinforcing steel. Anchors may be shorter if interlocked (1" lap minimum) to reinforcing steel.
2. Alternate pull iron: [AC 729](#).
3. During installation, all inserts must be sealed to prevent the entrance of concrete.
4. All inserts must be galvanized.
5. Inserts:
 - a. Will be capable of sustaining minimum loading of 10,000 pounds at direct in-line and 90° to direct in-line.
 - b. Installed in vault roofs are restricted to 2,000 pounds in direct pull.

Approved by: 	Coil Insert — Standard Installation for Precast and Poured-in-Place Structures	AC 720
Effective Date: 10-28-2005	What's Changed?	Sheet 1 of 4
		UGS



6. Available from:

- Dayton Superior
9415 Sorensen Avenue
Santa Fe Springs, CA 90670
- Meadow Steel Products, Inc
12762 Monarch Street
Garden Grove, CA 92641
- Richmond Screw Co.
17051 Green Drive
Industry Hills, CA 91745

AC 720

Coil Insert — Standard Installation for Precast and Poured-in-Place Structures

Approved by:

Sheet 2 of 4

What's Changed?

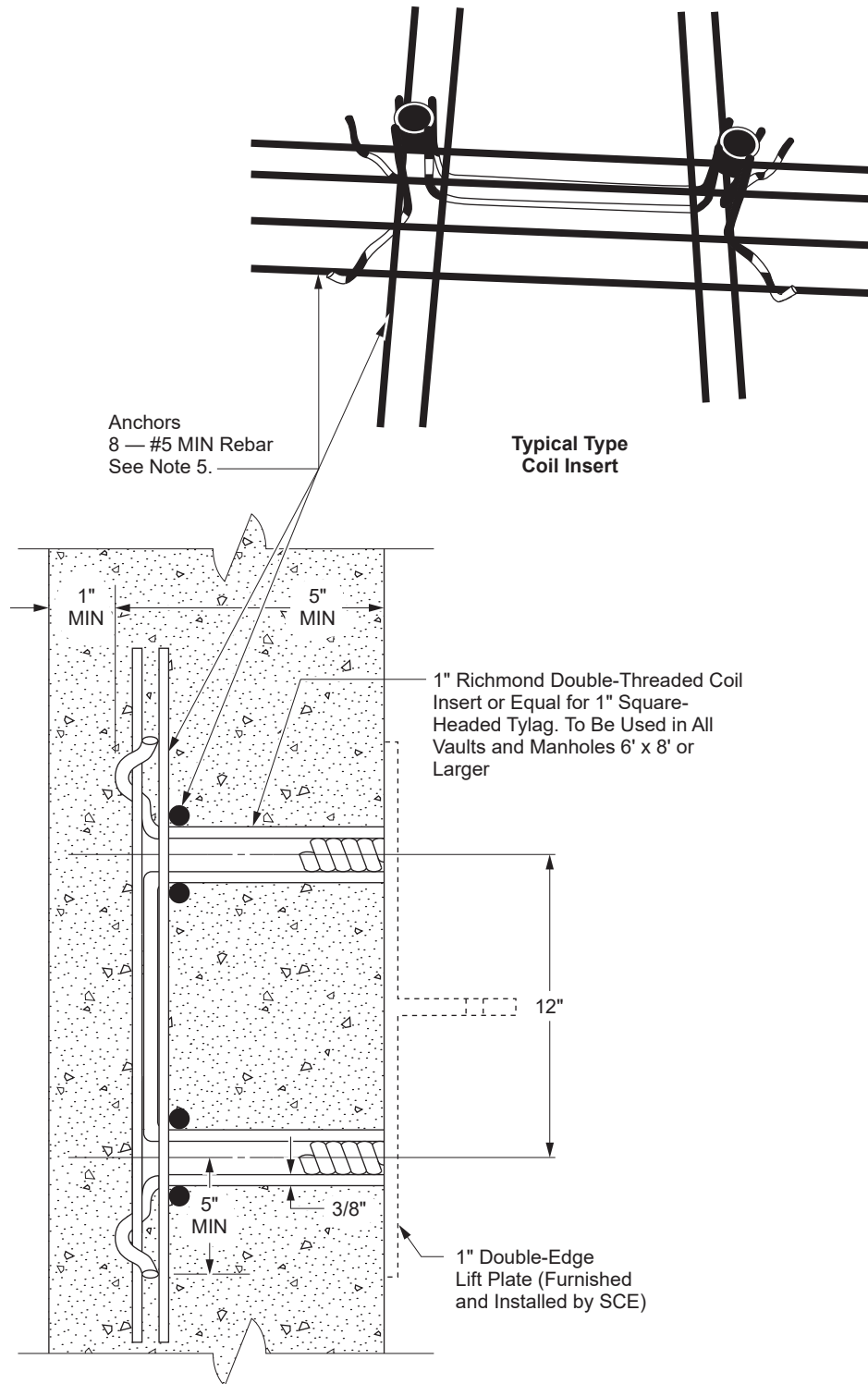
Effective Date:

10-28-2005

UGS

Scope AC 720.2 Double-Threaded Coil Insert

Figure AC 720-2: Double-Threaded Coil Insert



Approved by:

PhH

Coil Insert — Standard Installation for Precast and Poured-in-Place Structures

AC 720

Effective Date:

10-28-2005

What's Changed?

Sheet 3 of 4

UGS

► SCE Public ◀

Note(s):

1. During installation, all inserts must be sealed to prevent the entrance of concrete.
2. All inserts must be galvanized.
3. Each individual insert will be capable of sustaining minimum loading of 10,000 pounds at direct in-line and 90° to direct in-line.
4. Available from:
Dayton Superior
9415 Sorensen Avenue
Santa Fe Springs, CA 90670

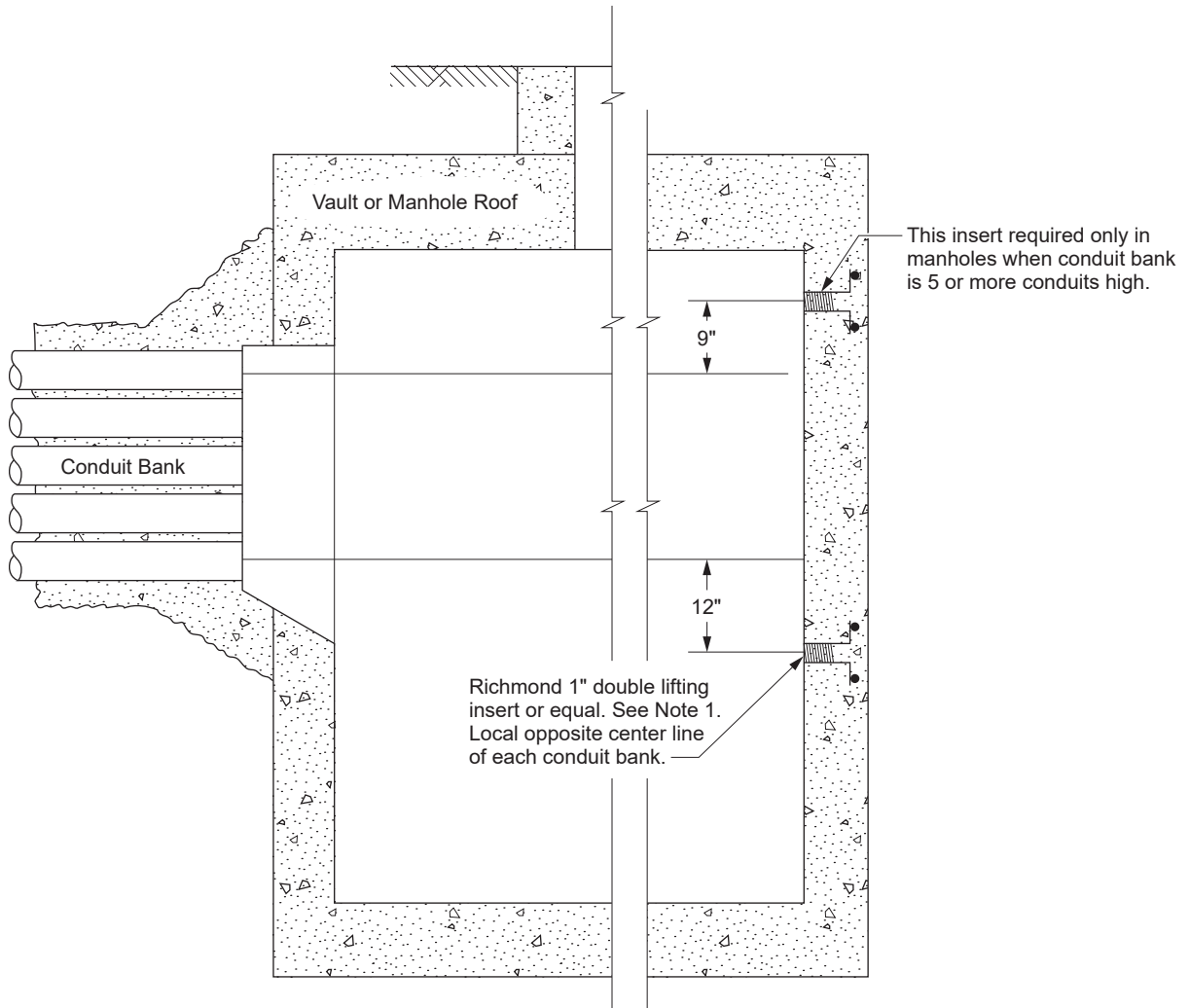
Meadow Steel Products, Inc.
12762 Monarch Street
Garden Grove, CA 92641

Richmond Screw Co.
17051 Green Drive
Industry Hills, CA 91745
5. Anchor steel to be a minimum of 24" in length if not interlocked with reinforcement steel. Anchors may be shorter if interlocked (1" DAP minimum) to reinforcement steel.

AC 720	Coil Insert — Standard Installation for Precast and Poured-in-Place Structures	Approved by: <i>PHH</i>
Sheet 4 of 4	What's Changed?	Effective Date:
UGS		10-28-2005


AC 722 Inserts Opposite Conduit Banks
Scope AC 722.1 Inserts Opposite Conduit Banks

Figure AC 722-1: Inserts Opposite Conduit Banks



Note(s):

1. All inserts must be galvanized for installation. See AC 720.

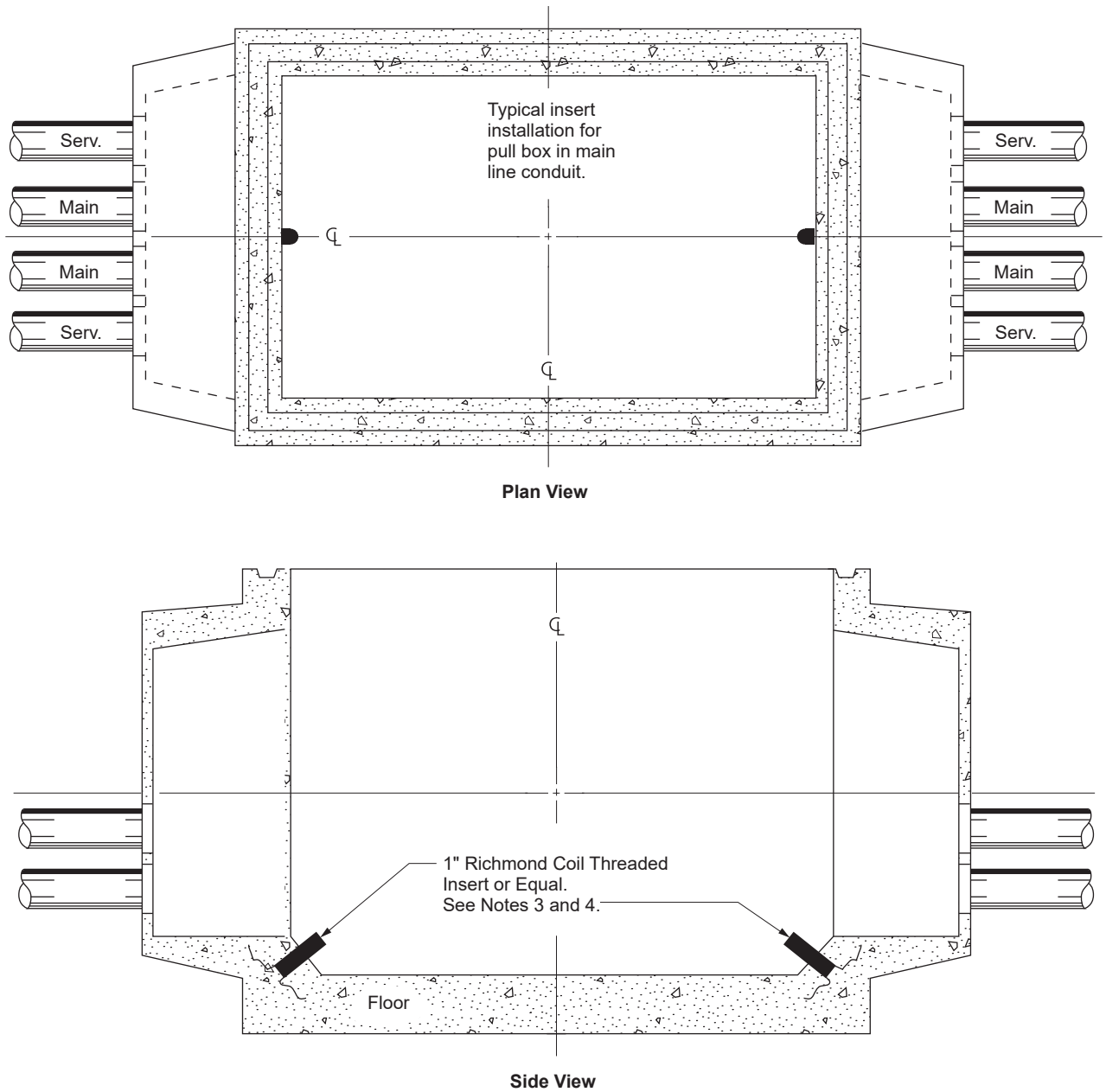
Approved by: 	Inserts Opposite Conduit Banks	AC 722
Effective Date: 10-28-2005	What's Changed?	Sheet 1 of 1 UGS

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AC 723 Insert Schedule for Pull Boxes

Scope AC 723.1 Insert Schedule for Pull Boxes

Figure AC 723-1: Insert Schedule for Pull Boxes



Note(s):

1. 2 inserts are required for each pull box regardless of size or number of conduits entering. One insert at each end wall above highest conduit.
2. All inserts must be galvanized.
3. See AC 720.
4. See AC 729.

Approved by:

PhH

Insert Schedule for Pull Boxes

AC 723

Sheet 1 of 1

Effective Date:

What's Changed?

10-28-2005

UGS

► SCE Public ◀

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AC 725 Insert Installation Detail for Vaults

Scope AC 725.1 Insert Installation Detail for Vaults

Figure AC 725-1: Insert Installation Detail for Vaults

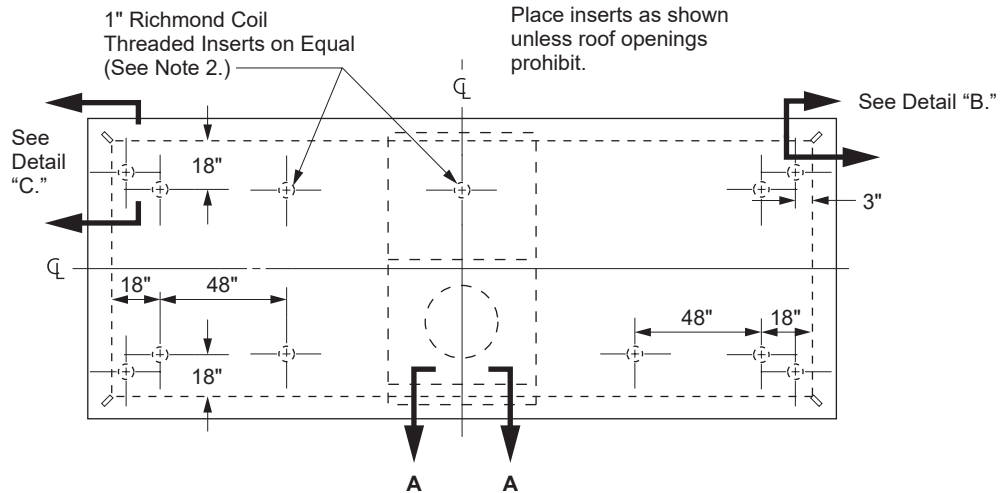


Figure AC 725-1.1: Vault Plan (Roof)

Note(s):

1. One-inch single coil threaded insert to be spaced at 48" intervals for larger vaults. The roof inserts are restricted to 2,000 pounds in direct pull. Use swivel plate pull eye (AC 733) for other than direct pull applications.
2. See AC 720.

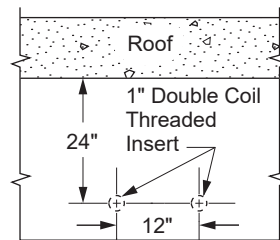


Figure AC 725-1.2: Section A-A

Note(s):

1. Section A-A to be located adjacent to and on centerline of 48" x 60" vault opening. This insert is essential for pulling cable.

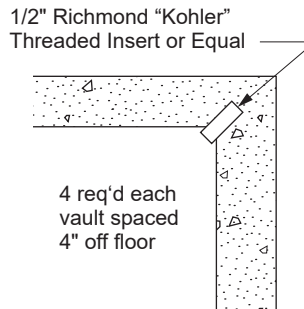


Figure AC 725-1.3: Detail "B"

Approved by:

PhH

Insert Installation Detail for Vaults

AC 725

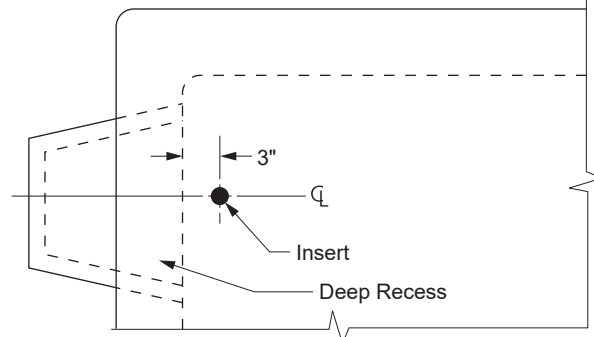
Sheet 1 of 2

Effective Date:
10-28-2005

What's Changed?

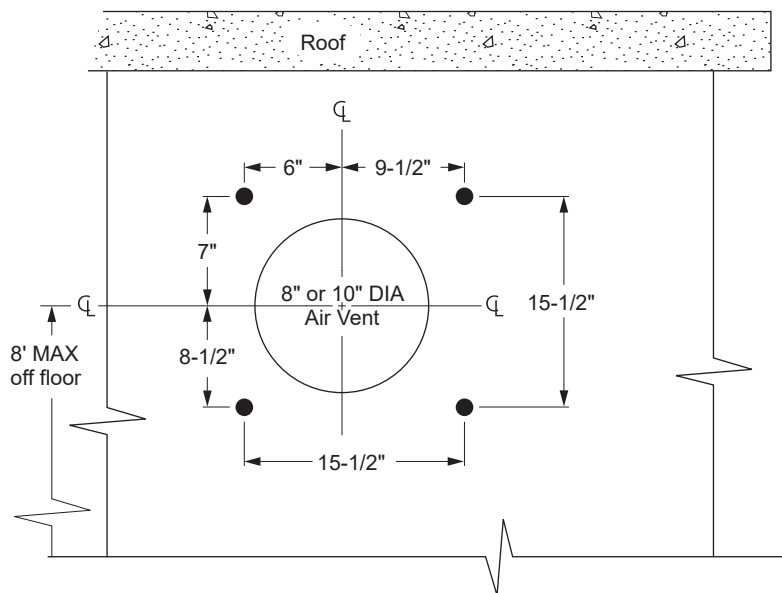
UGS

► SCE Public ◀



1/2" insert to be located in roof on \bar{C} of each deep recess. Not required in 6' width (or smaller) structures.

Figure AC 725-1.4 Detail "C"



For 1/2" Richmond "Kohler" threaded inserts (or equal) to be installed at each vent as shown above. Not required in 6' width (or smaller) structures.

Figure AC 725-1.5: Air Vent

Note(s):

1. One-inch Richmond coil threaded insert or equal to be used in all vaults as tabulated on [AC 720](#) and [AC 722](#).
2. During installation, all inserts must be sealed to prevent concrete from entering.
3. All inserts must be galvanized.

AC 725

Insert Installation Detail for Vaults

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

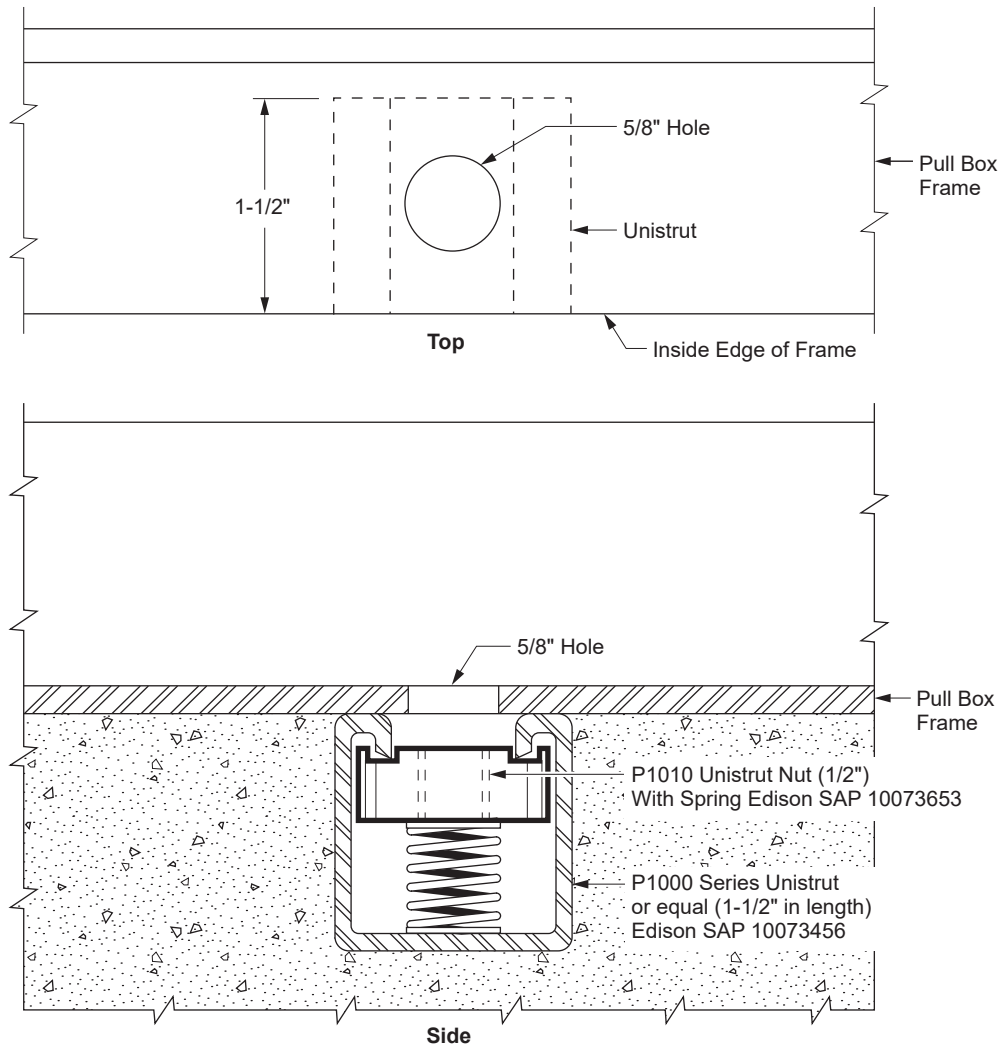
UGS

10-28-2005

AC 727 Pull Box Insert Repair

Scope AC 727.1 Pull Box Insert Repair

Figure AC 727-1: Pull Box Insert Repair



Views of Repaired Bolt-Down

1.0 Procedure:

- 1.1 Remove broken inserts from under the frame.
- 1.2 Chip out concrete under each bolt hole in frame until 1-1/2-inch length of Unistrut fits flush with inside edge of frame.
- 1.3 Hold Unistrut directly under frame hole, tight against frame bottom (see sketch) and flush with frame edge. Grout all around with concrete.

Approved by:

PhH

Pull Box Insert Repair

AC 727

Sheet 1 of 2

Effective Date:
10-28-2005

What's Changed?

UGS

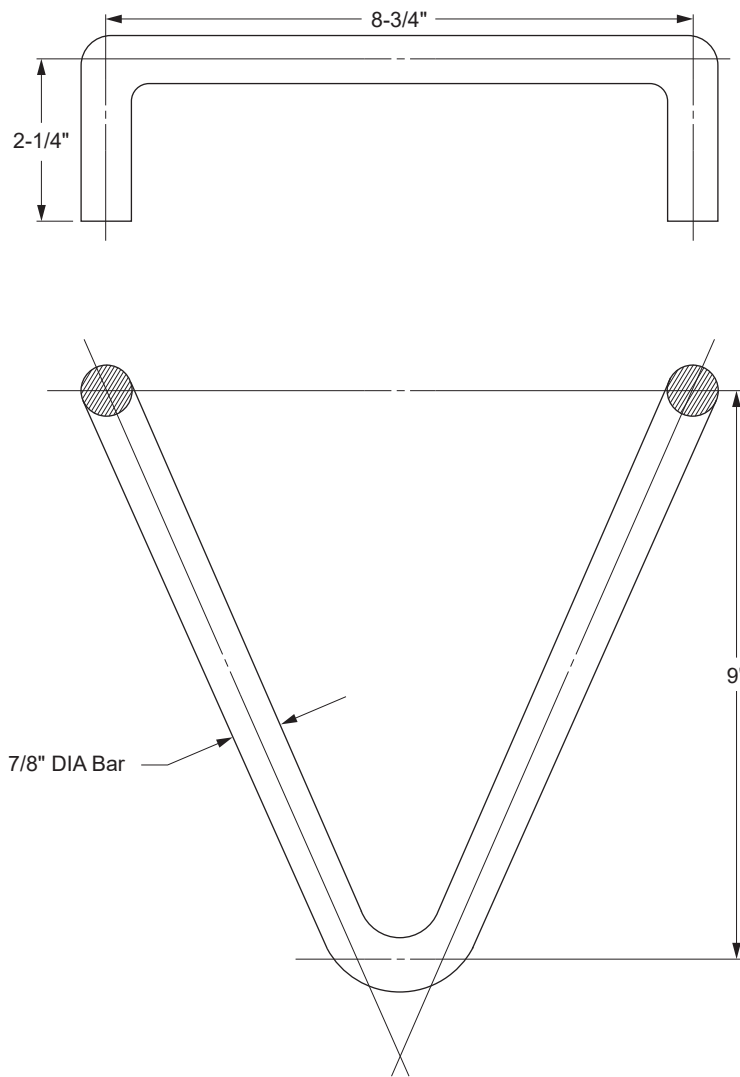


- 1.4 Care should be taken to insure that the inside and end of the Unistrut is kept free of grout to permit bolt to enter.
- 1.5 When concrete has set, install 1/2-inch nut with spring and bolt cover down.

AC 729 Pull Iron for Pull Boxes


Scope AC 729.1 Pull Iron for Pull Boxes

Figure AC 729-1: Pull Iron for Pull Boxes



Note(s):

1. Bar to be mild steel, galvanized after fabrication.
2. Two pull irons to be placed in pull boxes (2' x 3', 2-1/2' x 4' and 3' x 5' sizes). (See AC 720 Alternate)
3. Legs may be bent in same or opposite direction.
4. Minimum strength requirement 10,000 # (+ safety factor).
5. Variations in design to accommodate manufacturing processes are acceptable with prior approval.

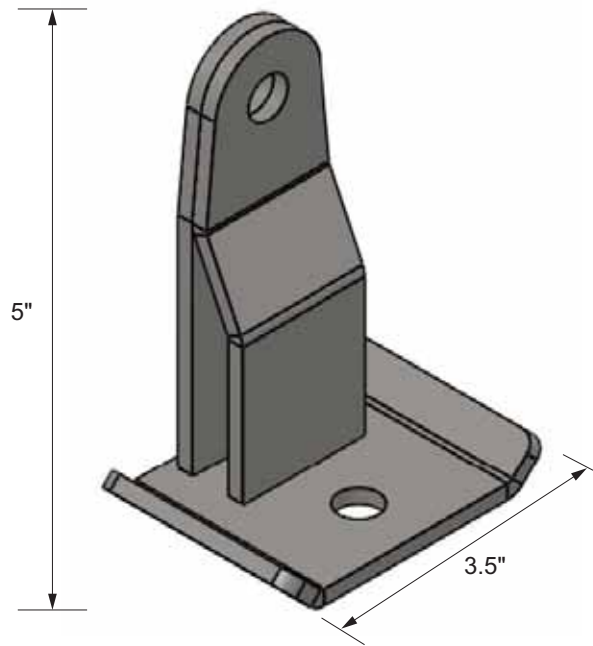
Approved by: 	Pull Iron for Pull Boxes	AC 729
Effective Date: 10-28-2005	What's Changed?	Sheet 1 of 1
		UGS

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AC 731 Support for Ground Bus


Scope AC 731.1 Support for Ground Bus Using Ground Anchor Bracket (Preferred Method)

Figure AC 731-1: Ground Anchor Bracket (SAP 10205786)



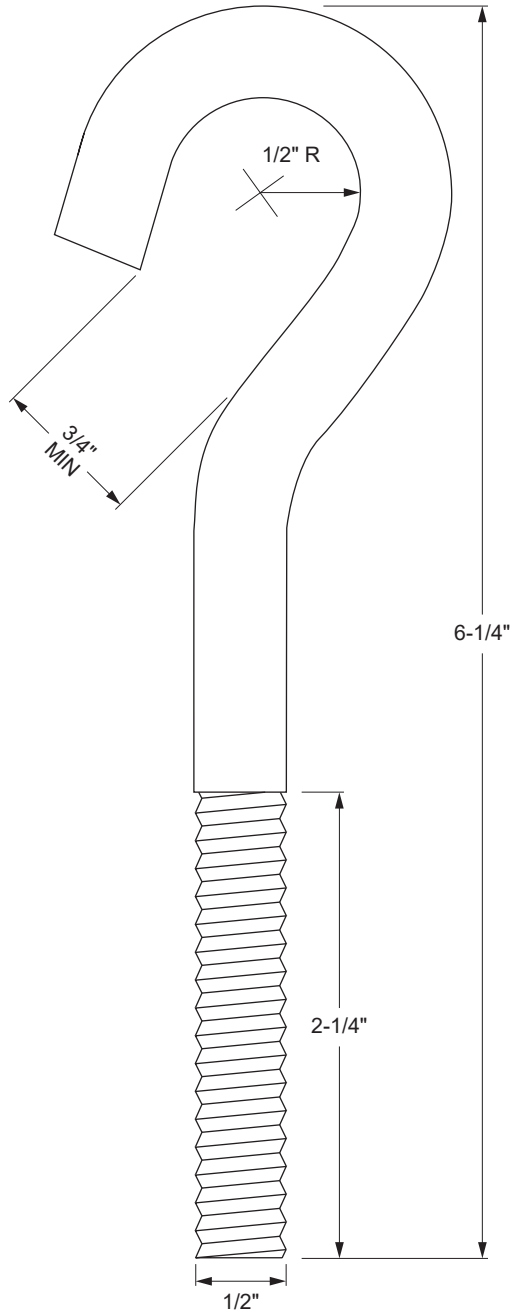
Note(s):

1. Four anchors to be supplied with each vault.

Approved by: 	Support for Ground Bus	AC 731
Effective Date: 04-27-2018	What's Changed? Added new preferred method for supporting ground bus using ground anchor bracket.	Sheet 1 of 2 UGS

Scope AC 731.2 Support for Ground Bus Using J Bolt (Alternate Method)

Figure AC 731-2: J Bolt (Support for Ground Bus)



Note(s):

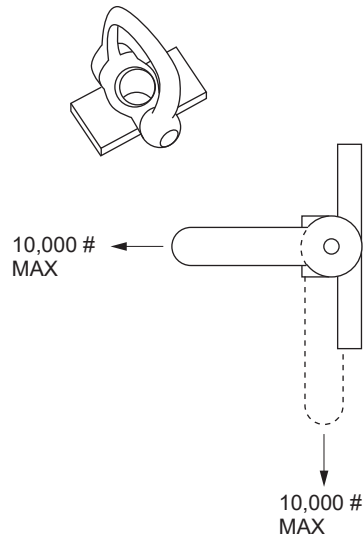
1. J bolt to be hot dip galvanized after fabrication.
2. Four J bolts to be supplied with each vault.

<p>AC 731</p>	<p>Support for Ground Bus</p>	<p>Approved by: <i>ajf</i></p>
<p>Sheet 2 of 2</p>	<p>What's Changed? J bolt is now alternate method .</p>	<p>Effective Date:</p>
<p>UGS</p>		<p>04-27-2018</p>

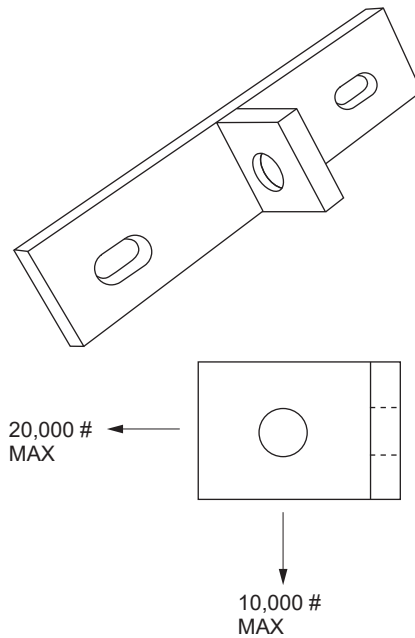
AC 733 Cable Pulling Attachments

Scope AC 733.1 Cable Pulling Attachments


Figure AC 733-1: Cable Pulling Attachments



**Figure AC 733-1.1: 1" Swivel Lift Plate — Side View
Item 1**



**Figure AC 733-1.2: 1" Double Edge Lift Plate — Side View
Item 2**


Approved by: 	Cable Pulling Attachments	AC 733
Effective Date: 10-28-2005	What's Changed?	Sheet 1 of 2 UGS



**Figure AC 733-1.3: 4" Tyrag
Item 3**

Note(s):

1. The above items may be obtained from:
 - a. Burke Concrete Accessories Inc.
1625 West Washington Blvd.
Montebello, CA 90604
 - b. Superior Concrete Accessories Inc.
9415 Sorenson Street
Santa Fe Springs, CA 90670
2. 1" Swivel Lift Plate (Item 1) may be used at any angle up to a maximum pull of 10,000 pounds. For attachment, it requires 1-4" tyrag (Item 3) which should be tightened snugly but not tight.
3. 1" Double Edge Lift Plate (Item 2) has a maximum loading of 20,000 pounds for direct in-line pulls, and is reduced to 10,000 pounds at 90° to direct in-line pulls. For attachment it requires 2-4" tylags (Item 3) and can only be used where a double threaded coil insert is available (see AC 720). Tylags should be tightened securely.

AC 733	Cable Pulling Attachments	Approved by: 
Sheet 2 of 2	What's Changed?	Effective Date:
UGS		10-28-2005

AC 740 Ladder Installation for Manholes

Scope AC 740.1 Ladder Installation for Manholes

Figure AC 740-1: Ladder Installation for Manholes

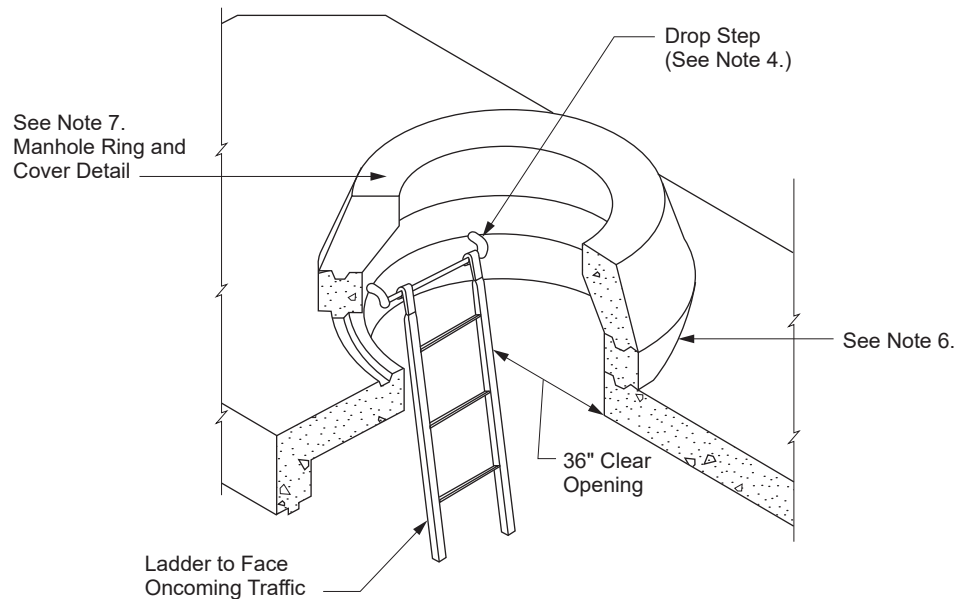


Figure AC 740-1.1: Ladder Mounted Detail for Precast Manholes

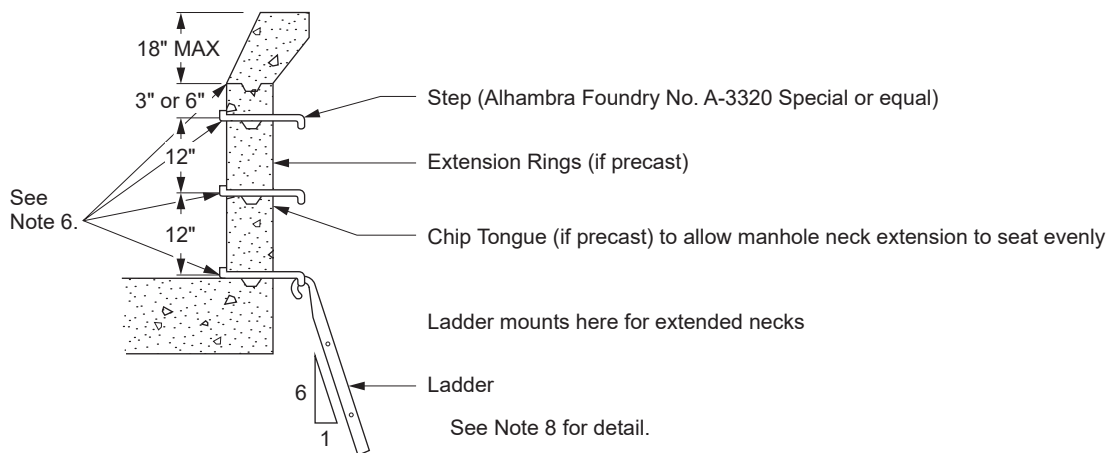


Figure AC 740-1.2: Typical Cross Section Step Installation for Extended Manhole Neck

Note(s):

1. Ladders required only for manholes in excess of 10' (from floor to manhole cover). Ladders not required for manholes 10' or less in height.
2. Offset base of ladder one foot for each six feet of vertical rise.
3. Spacing of steps will be the same as shown above if neck is poured in place.
4. Install additional steps at 12" intervals.
5. When specified, contractor is to install ladder and leave in permanent position at completion of contract.
6. Bonding adhesive per [GI 030](#).
7. See [FC 621](#).
8. See [AC 742](#).

Approved by: <i>PhH</i>	Ladder Installation for Manholes	AC 740
Effective Date: 10-28-2005	What's Changed?	Sheet 1 of 1
		UGS

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AC 742 Ladder for Vaults and Manholes (Edison SAP 10117761)

Scope AC 742.1 Ladder for Vaults and Manholes

Figure AC 742-1: Ladder for Vaults and Manholes

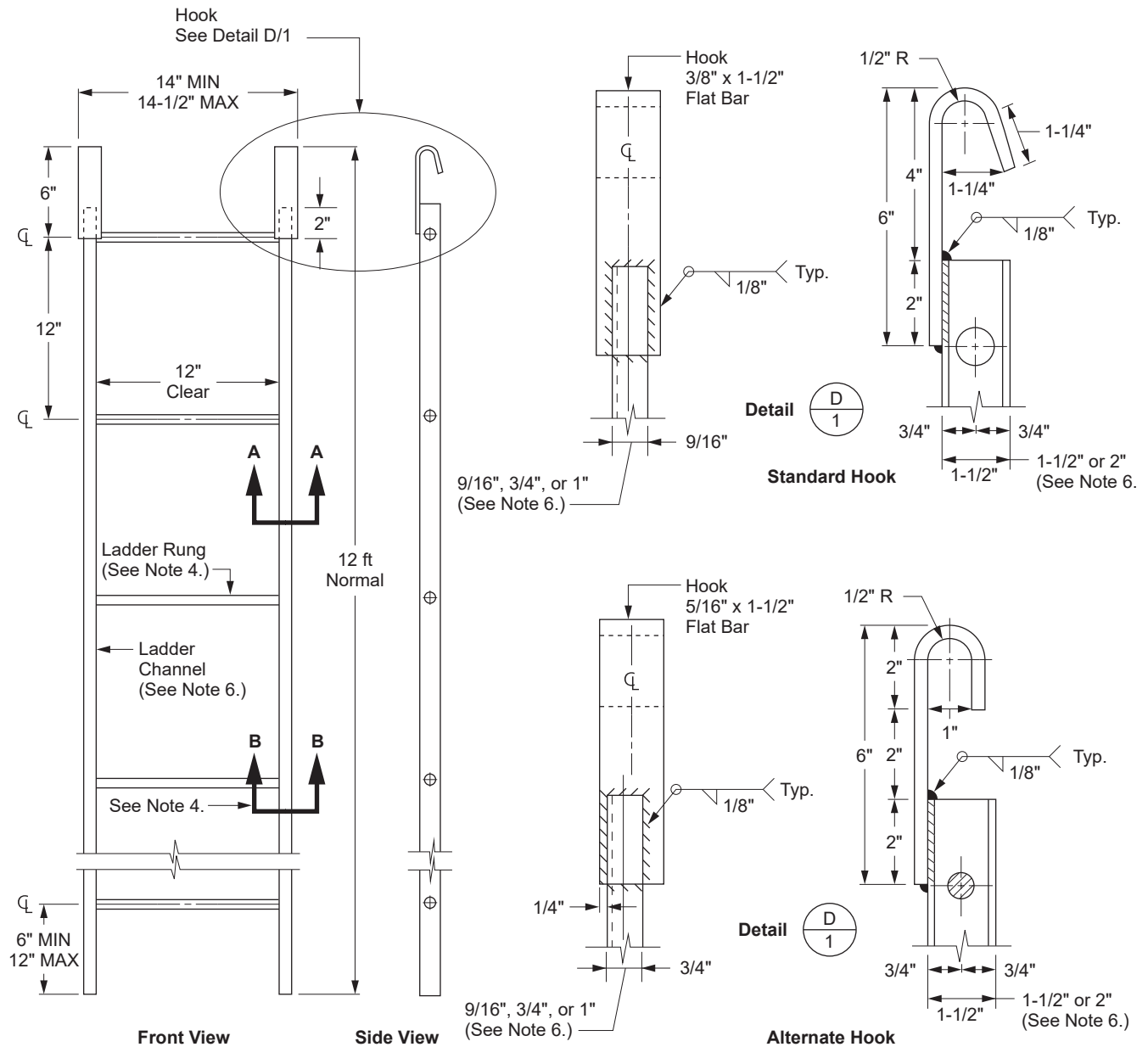


Figure AC 742-1.1: Front View, Side View, Standard Hook, and Alternate Hook

Approved by:

B. C.

Ladder for Vaults and Manholes (Edison SAP 10117761)

AC 742

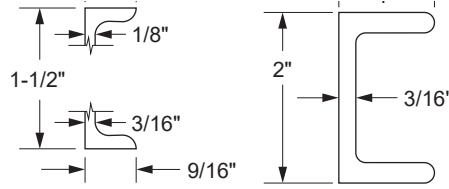
Sheet 1 of 5

Effective Date:

10-24-2014

What's Changed? SAP Number added to title.

UGS



(Channel Detail)
See Note 6.

Figure AC 742-1.2: Section A-A

Note(s):

1. Ladder and support hardware will be ASTM A-575 mild steel.
2. Ladder to be hot dipped galvanized after fabrication per ASTM A-153.
3. Standard ladder length 12 feet. Other lengths available in one-foot increments
4. See ladder rung details on [Figure AC 742-2 \(Sheet 2\)](#).
5. See [AC 740](#) for manhole ladder installation details and [Figure AC 742-5 \(Sheet 4\)](#) for vault ladder installation details.
6. Channel will be either 1-1/2" x 3/4" x 1/8" typ., or 1-1/2" x 9/16" x 3/16" typ. stock for ladder lengths 12 feet or less. Channel will be 2" x 1" x 3/16" typ. for ladders exceeding 12 feet in length.

Figure AC 742-2: Ladder Rung and Channel

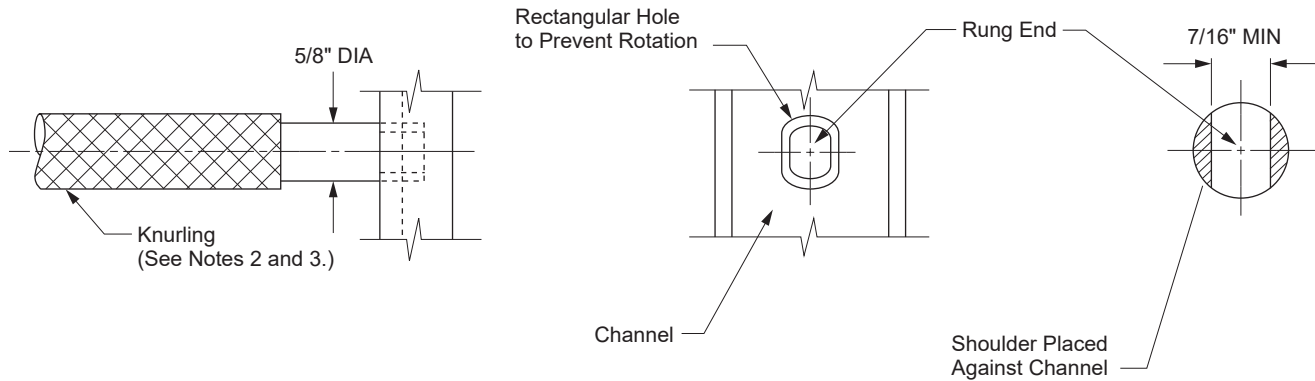
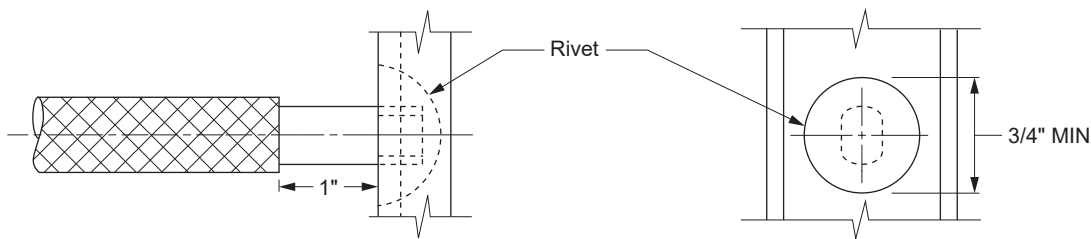


Figure AC 742-3: Standard Rung Attachment — Rivet



AC 742

Ladder for Vaults and Manholes (Edison SAP 10117761)

Approved by:

B. C.

Sheet 2 of 5

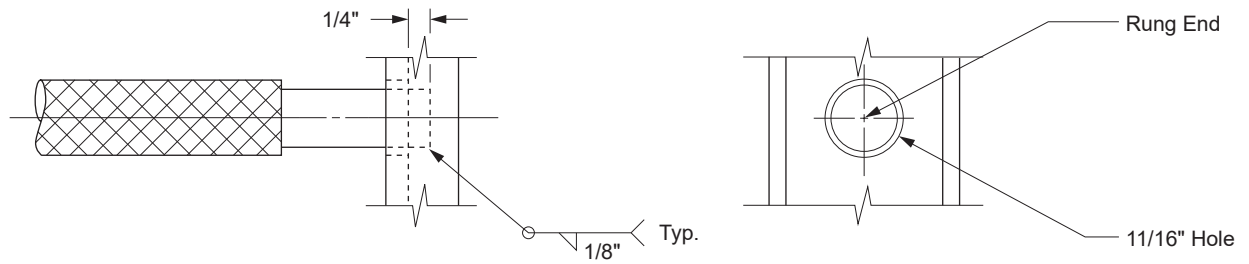
What's Changed?

Effective Date:

UGS


10-24-2014

Figure AC 742-4: Alternate Rung Attachment — Weld — Section B-B



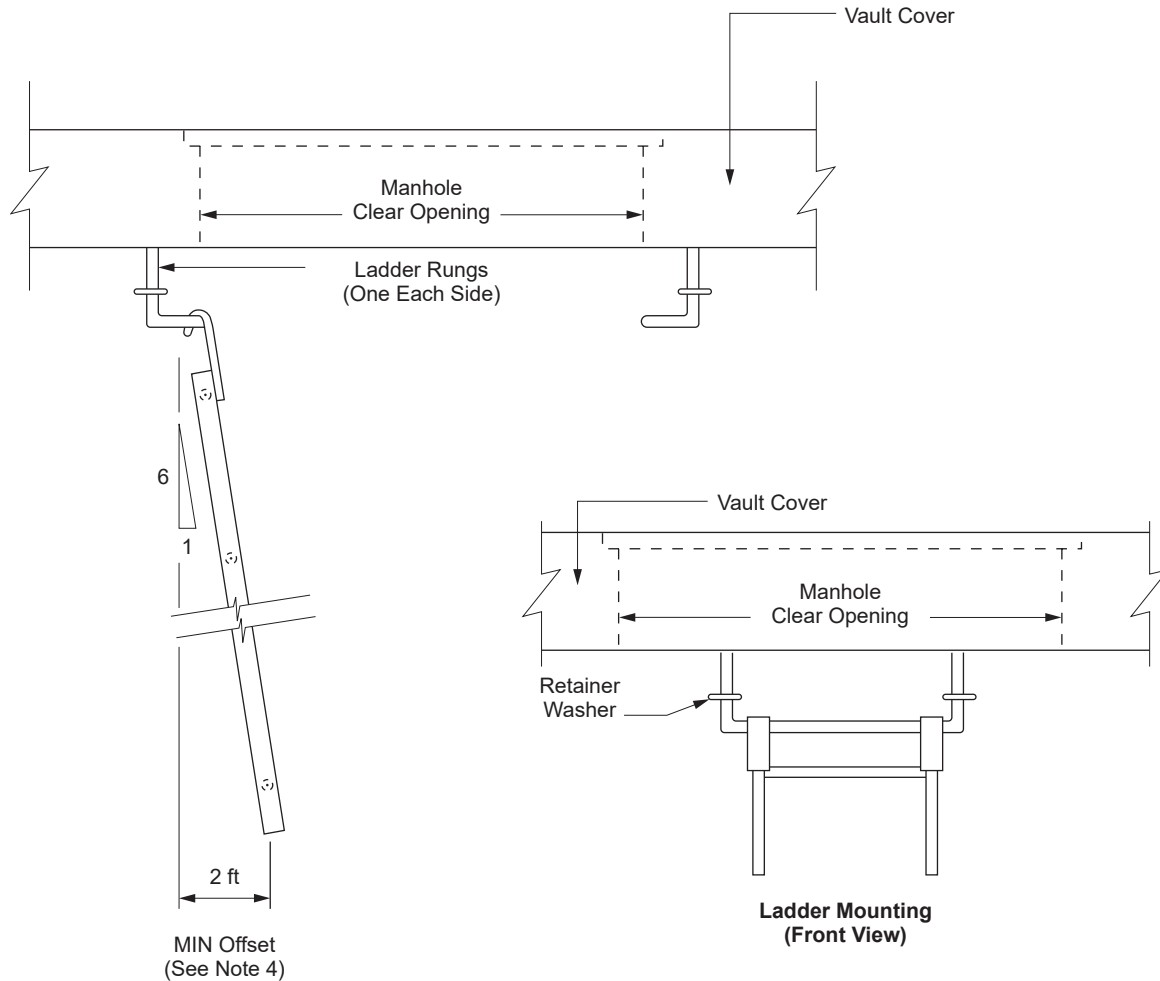
Note(s):

1. Design of rungs and attachment to ladder channels will be in conformance to the methods and dimensions shown.
2. Ladder rungs will have an approved nonslip knurled surface. Knurling lengths on rung to be a minimum of ten inches.
3. Depth of knurling on rungs will be a minimum of 0.046 inch to a maximum of 0.093 inch, with four to six points per one inch of length.
4. Standard method of rung attachment to ladder channel will be riveting. Welding is an approved alternate method of rung attachment.

Approved by: 	Ladder for Vaults and Manholes (Edison SAP 10117761)	AC 742
Effective Date: 10-24-2014	What's Changed?	Sheet 3 of 5 UGS

Scope AC 742.2 Ladder Installation for Vaults

Figure AC 742-5: Ladder Installation for Vaults



Note(s):

1. See [Figure AC 742-1 \(Sheet 1\)](#) through [Figure AC 742-4 \(Sheet 3\)](#) for ladder details.
2. See [FC 660](#) for vault cover and ladder rung details.
3. Ladder to face oncoming traffic.
4. Offset base of ladder two feet (minimum) from vertical.
5. Ladders required in all vaults unless otherwise specified on working drawings.
6. Contractor will install ladder and leave in permanent position at completion of contract.

AC 742

Ladder for Vaults and Manholes (Edison SAP 10117761)

Approved by:

B. C.

Sheet 4 of 5

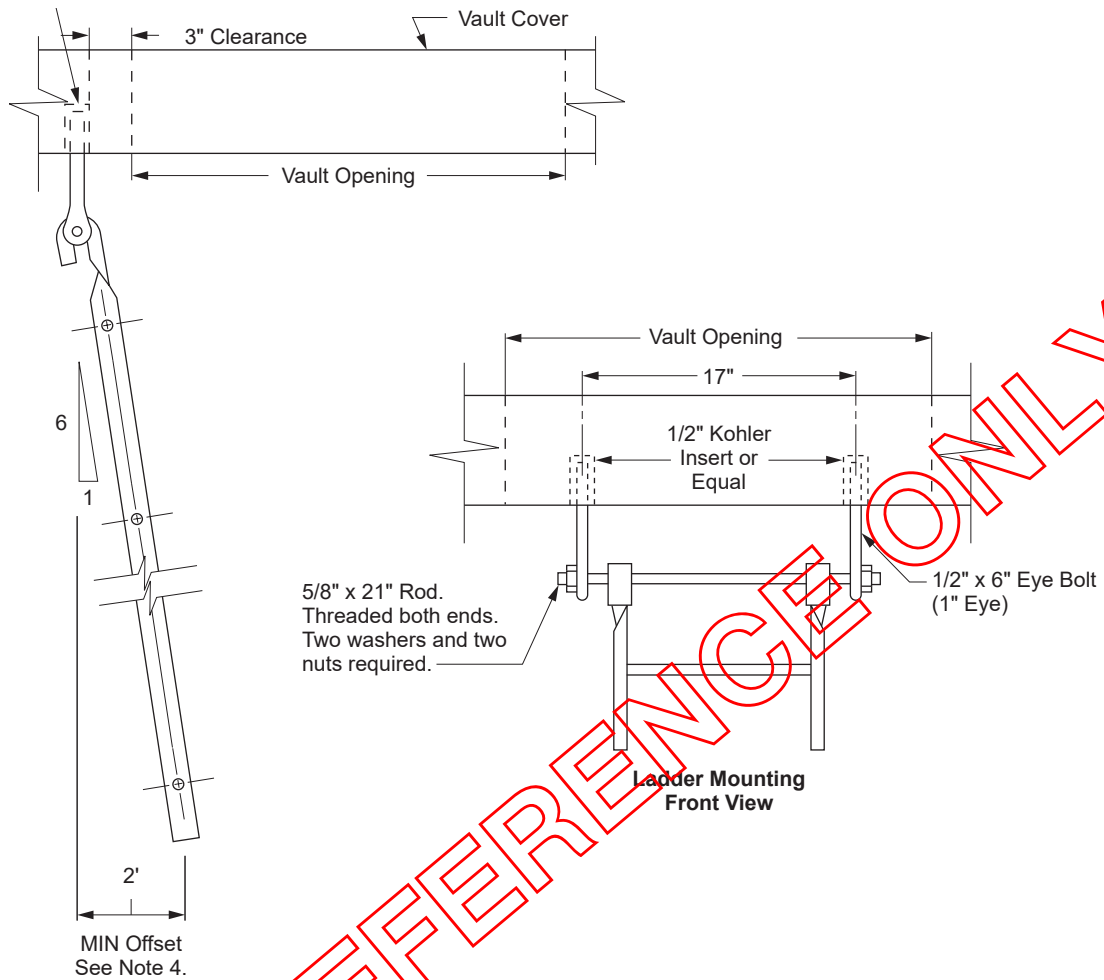
What's Changed?

Effective Date:

UGS

10-24-2014

Figure AC 742-6: Ladder Installation for Vaults — For Reference Only



Note(s):

1. See [Scope AC 742.1 \(Sheet 1\)](#) for ladder details.
2. See [FC 641](#) for insert and vault cover details.
3. Ladder to face oncoming traffic.
4. Offset base of ladder two feet (minimum) from vertical.
5. Contractor will install ladder and leave in permanent position at completion of contract.

FOR REFERENCE ONLY

Approved by:

B.C.

Ladder for Vaults and Manholes (Edison SAP 10117761)

AC 742

Sheet 5 of 5

Effective Date:

10-24-2014

What's Changed?

UGS

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AC 750 Standpipe Vent Placement

Scope AC 750.1 Standpipe Vent Placement

1.0 Standpipe Vents

Standpipe vents should be placed in unobtrusive locations where right-of-way permits. They should also be placed to provide maximum ventilation of the underground structure.

For new installations approved PVC, steel, or polyethylene standpipe vents may be used. PVC should be used for most field installations. To help blend with new construction designs, decorative polyethylene standpipes are available for 8-inch and 10-inch structure ventilation duct, see AC 755. HDG and steel may be used only in areas where vents are exposed to vehicular damage, such as alleys and driveways. Do not paint standpipe vents.

When automating equipment in vaults where an antenna is to be placed into the standpipe vent, use decorative polyethylene standpipe vents.


When replacing broken standpipe vents, keep the same style of standpipe for both the intake and exhaust vents, refer to Distribution Underground Construction Standards (DUG), VE 225 for more details. For instructions on mounting fault indicator LED's and fiber optics, refer to DUG TD 100.

Typical installations include:

- 1.1 Where sidewalk is adjacent to curb and sidewalk width is 6' or more from curb face to outside edge of sidewalk, place vent in the sidewalk approximately 24" from the curb face to vent centerline. For PVC vents install a sprinkler guard(s) when exposed to sprinklers (refer to DUG VE 230). Locations close to the outside edge of concrete can be used when damage from vehicles is likely.
- 1.2 Where sidewalk is adjacent to curb and sidewalk width is less than 6' from curb face to outside edge of sidewalk, place vent approximately 10" from the outside edge of sidewalk to vent centerline.
- 1.3 Where a planted parkway is present (adjacent to curb), Install PVC vent with sprinkler guard(s) per DUG VE 230, approximately 24 inches from curb face to centerline.
- 1.4 In state highway rights-of-way, place vent a minimum of 24" from curb face to vent edge.
- 1.5 When no sidewalk or curb is present, place vent well clear of area where vehicles or pedestrians may travel. Install barriers if necessary.

Note(s):

- 1. Keep vents a minimum of 4' from the points where curbs begin to slope to driveways. Keep vents a minimum of 5' from all fire hydrants. The total straight lengths of each vent pipe entering a vault should be limited to approximately 20'. No more than two 90° elbows should be utilized in an air duct run.
- 2. Where two vents are present, they should exit the structure at opposite ends and be placed a minimum of 5' apart at the surface.
- 3. Never paint any standpipe vent.
- 4. For PVC standpipe install the sprinkler guard(s) (DUG VE 230) when exposed to sprinkler systems. Polyethylene pipes do not require sprinkler guards, but should be placed out of the direct spray path of sprinklers whenever possible.

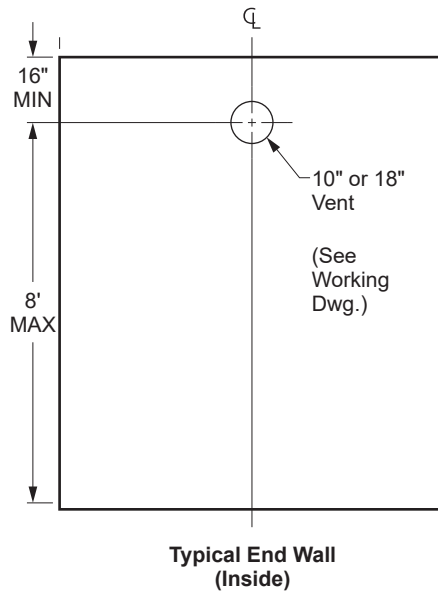
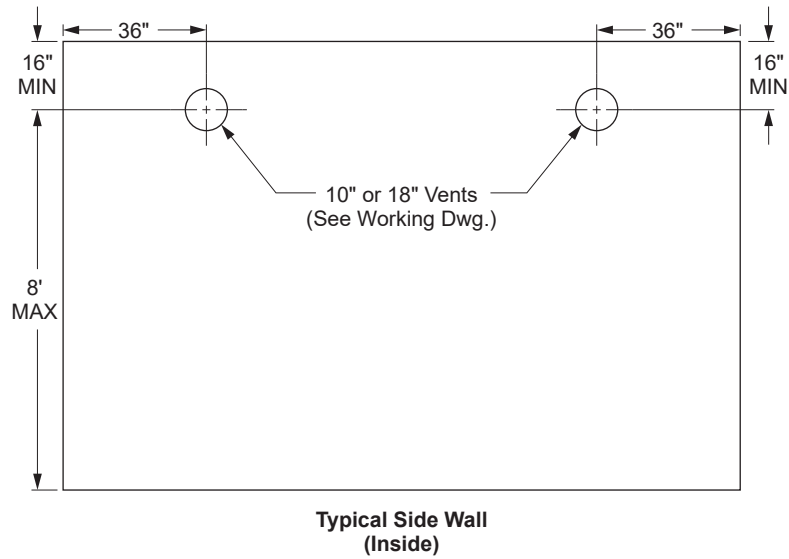
Approved by: 	Standpipe Vent Placement	AC 750
Effective Date: 07-28-2017	What's Changed? Added statement to use polyethylene standpipe vents when using automated equipment.	Sheet 1 of 1 UGS

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AC 751 Vent Locations on Vault and Manhole Walls


Scope AC 751.1 Vent Locations on Vault and Manhole Walls

Figure AC 751-1: Vent Locations on Vault and Manhole Walls



Note(s):

1. 6 vent hole knockouts required in precast vaults and manholes greater than 12 foot length.
2. Variation in vent hole locations allowed on precast vaults and manholes with prior approval of the Edison Company.
3. 2 vent holes are required in poured-in-place vaults and manholes. For vent position and size refer to working drawings.
4. For structures of 12 foot length or less 1 vent hole knockout centered in each wall.

Approved by: 	Vent Locations on Vault and Manhole Walls	AC 751
Effective Date: 10-28-2005	What's Changed?	Sheet 1 of 1 UGS

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AC 752 Polyethylene Standpipe Vents

Scope AC 752.1 Polyethylene Standpipe Vents

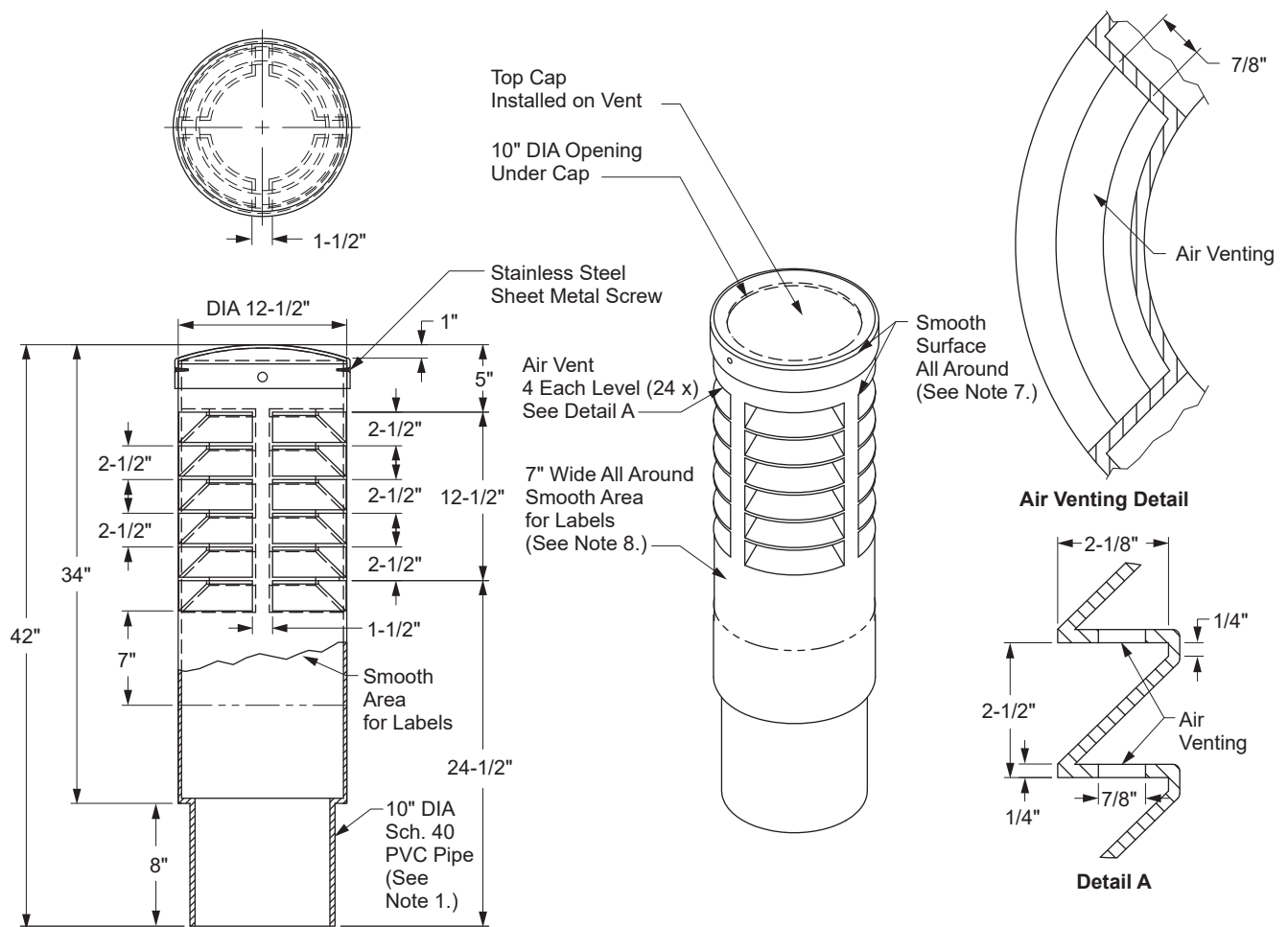
1.0 Application

Protection standpipe for air ventilation of structures. For use on 8-inch and 10-inch ventilation duct. Polyethylene standpipes should be ordered directly from the manufacturer.

Table AC 752-1: Polyethylene Standpipe Information

Standpipe Application	Duct Sizes (in)	Armorcast Part Number	SAP
New	8	P6002708-GRT	10117598
New	10	P6002710-SND	10117599

Figure AC 752-1: Polyethylene Standpipe Vents



Note(s):

- The bottom section is designed with a schedule 40 PVC pipe that will couple to standard PVC fittings. (Refer to Distribution Underground Construction Standards [DUG], VE 225 for replacement details.)
- Material: Linear medium-density polyethylene.

Approved by:

B. C.

Polyethylene Standpipe Vents

AC 752

Sheet 1 of 2

Effective Date:
10-24-2014

What's Changed? SAP Numbers added.

UGS

3. The sandstone finish is supplied for 10-inch ventilation duct standpipe vents. The granite finish is supplied for 8-inch ventilation duct standpipe vents.
4. Install per [AC 750](#) and [AC 758](#). Refer to Distribution Underground Construction Standards (DUG), VE 225 for replacement installation instructions.
5. Air venting: 125 square inches minimum open area per standpipe.
6. See [AC 760](#) for installing a ground wire.
7. Smooth surface section provided for stickers to label fault indicators and inspection dates.
8. Smooth surface section provided for structure and equipment numbers.
9. Four stainless steel sheet metal screws, "one way" head. Use tool, SAP 10145894

Manufacturer:

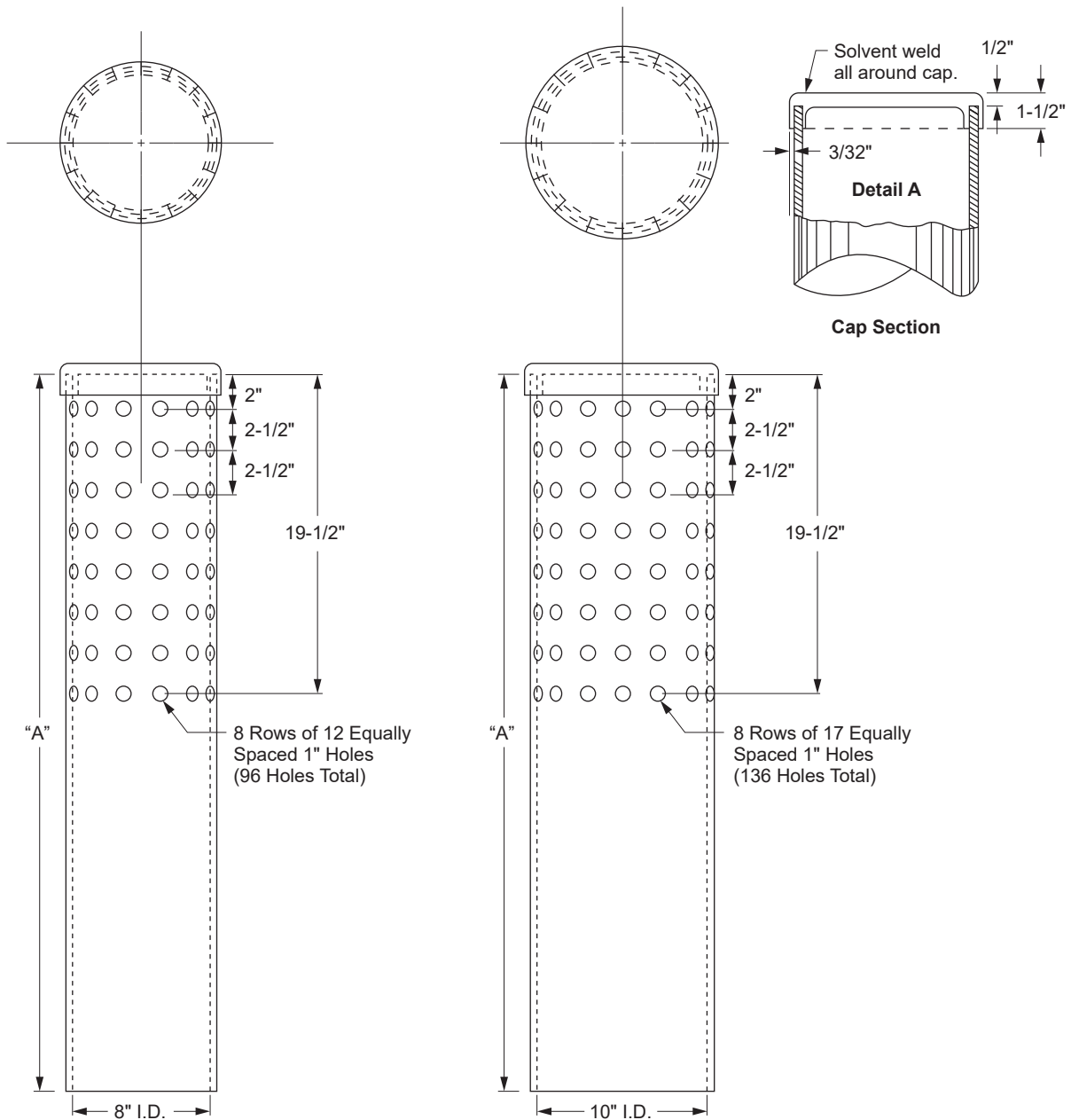
Armorcast Products Company
 13230 Saticoy st. North Hollywood, Ca 91605
 Phone: (818) 982-3600
 Fax: (818)982-7747

AC 752	Polyethylene Standpipe Vents	Approved by: <i>B. C.</i>
Sheet 2 of 2	What's Changed? SAP Number added to Note 9.	Effective Date:
UGS		10-24-2014

AC 753 PVC Standpipe Vents — 8 Inches and 10 Inches

Scope AC 753.1 PVC Standpipe Vents — 8 Inches and 10 Inches

Figure AC 753-1: PVC Standpipe Vents — 8 Inches and 10 Inches



Note(s):

1. Dimension "A" to be 40" (minimum) unless otherwise shown on working drawing.
2. Material: PVC (Polyvinyl Chloride) Type II, Grade 1. ASTM D-1784 with 0.365" wall
3. Finish: Goodrich Gray #260 or equivalent. Painted vents are not acceptable.
4. Install per [AC 758](#).

Approved by:

PhH

PVC Standpipe Vents — 8 Inches and 10 Inches

AC 753

Sheet 1 of 1

Effective Date:
10-28-2005

What's Changed?

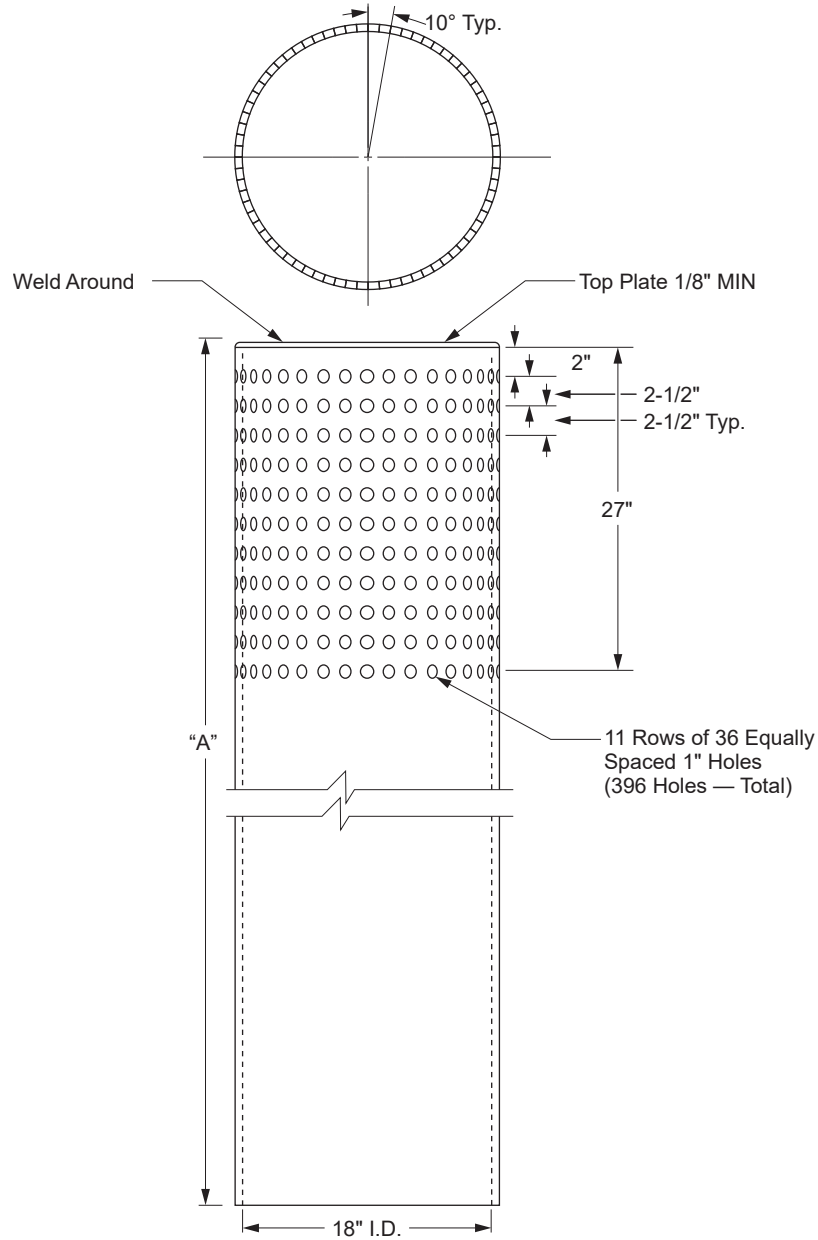
UGS

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AC 754 Steel Standpipe Vent — 18 Inches

Scope AC 754.1 Steel Standpipe Vent — 18 Inches

Figure AC 754-1: Steel Standpipe Vent — 18 Inches



Note(s):

1. Dimension "A" to be 40" (minimum) unless otherwise specified on working drawing.
2. Material will be steel or iron-pipe or casing — 1/8" minimum thickness.
3. Finish to be hot dip galvanized unless otherwise specified on working drawing.
4. Install per AC 758 **except** use 18-inch air duct and 30-inch square concrete around vent from grade to horizontal duct.

Approved by:

PhH

Steel Standpipe Vent — 18 Inches

AC 754

Sheet 1 of 1

Effective Date:

What's Changed?

10-28-2005

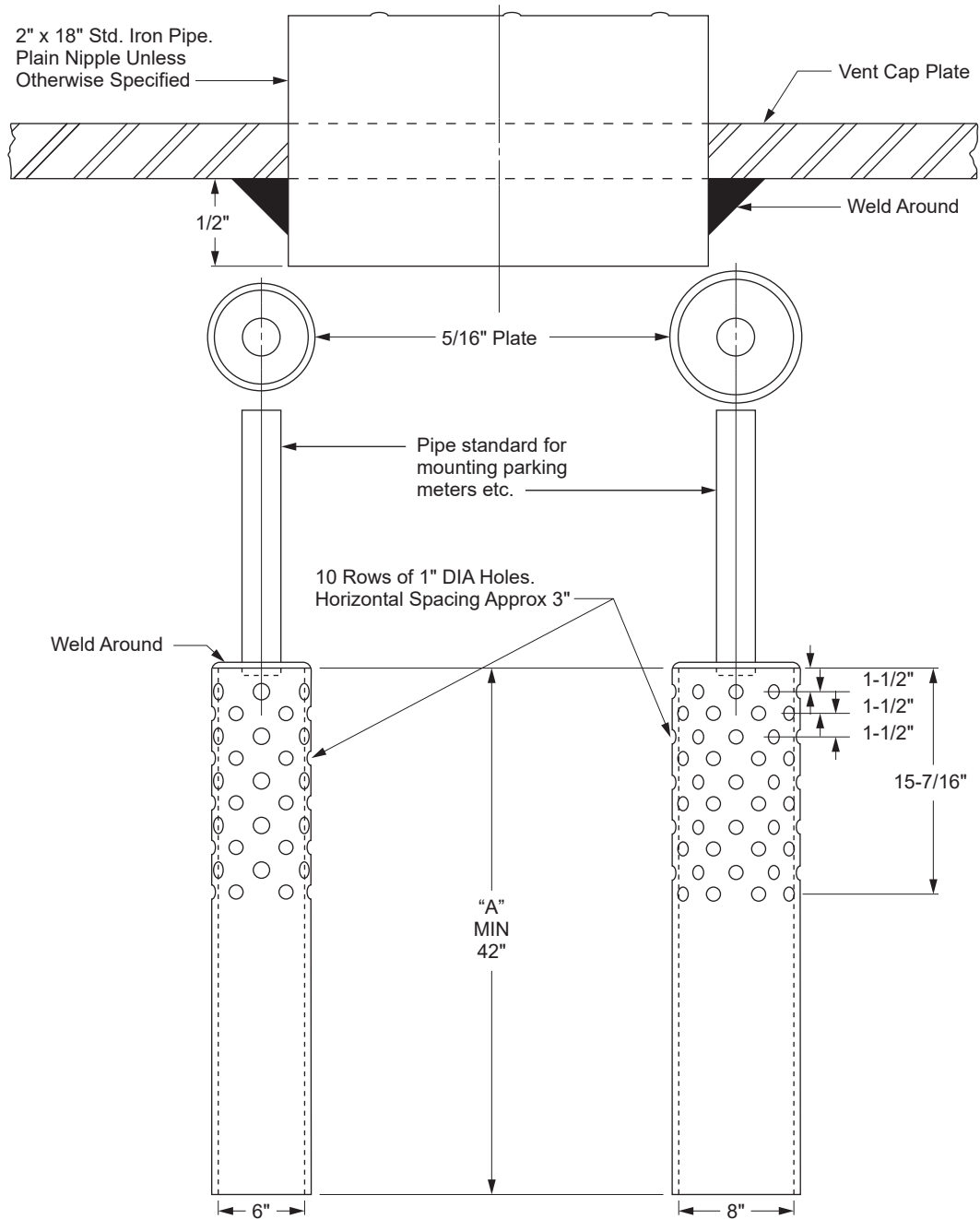
UGS

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AC 756 Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches

Scope AC 756.1 Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches

Figure AC 756-1: Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches



Note(s):

1. Dimension "A" to be 42" unless otherwise shown on working drawing.
2. Material: steel or iron, pipe or casing.
3. Finish: hot dip galv. unless otherwise shown on working drawings.

Approved by:

PhH

Steel Standpipe Vents with Meter Pipe — 6 Inches and 8 Inches

AC 756

Sheet 1 of 1

Effective Date:

10-28-2005

What's Changed?

UGS

► SCE Public ◀

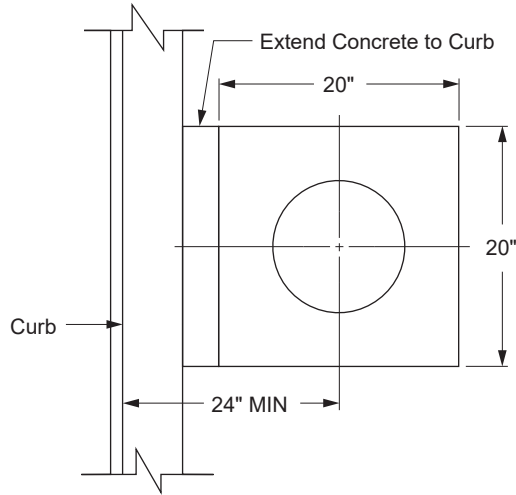
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AC 758 Standpipe Vent Installation

Scope AC 758.1 Standpipe Vent Installation

Refer to Working Drawing for Specific Details

Figure AC 758-1: Standpipe Vent Installation — Vertical View Detail

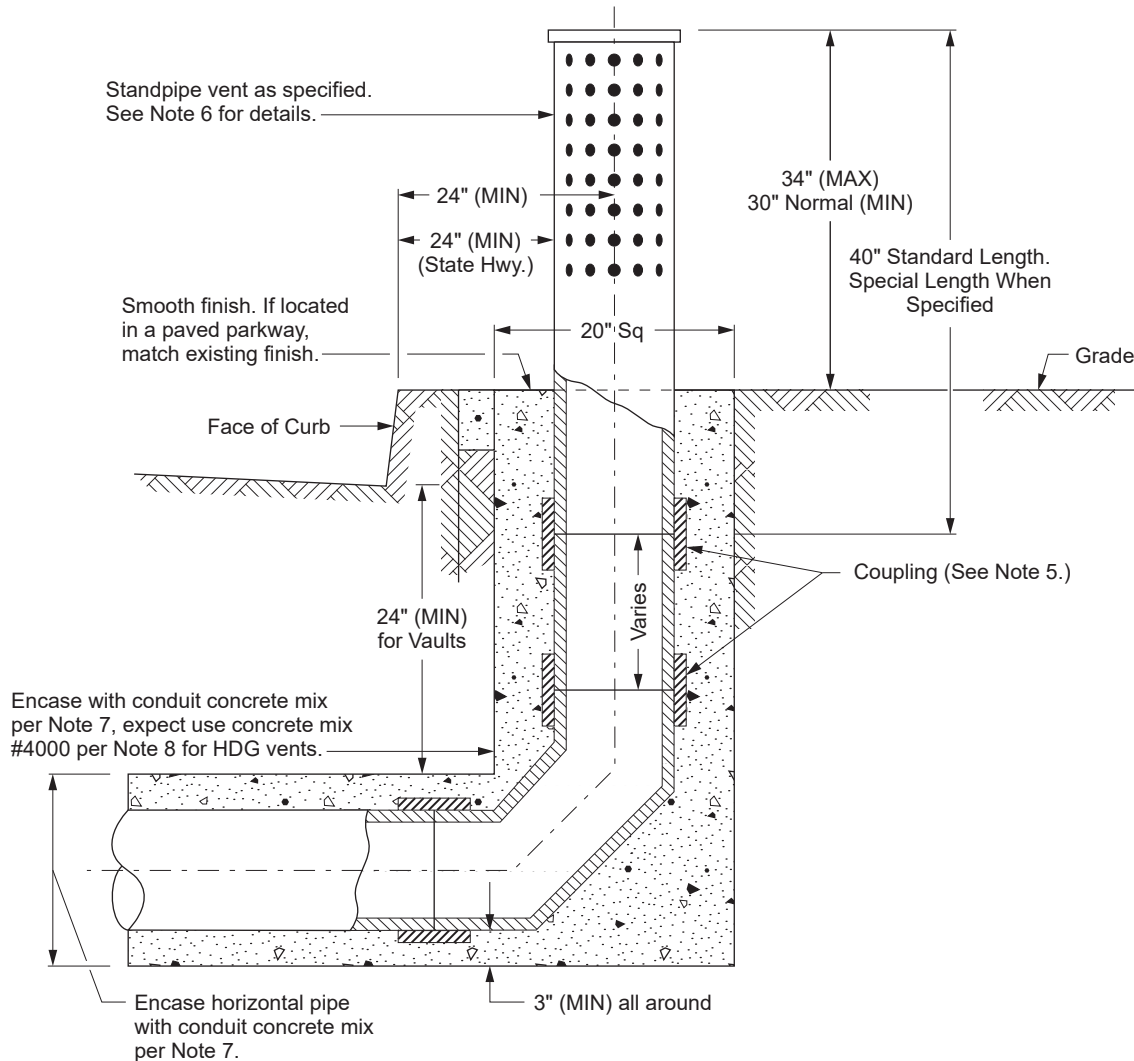


Approved by: <i>p.e.</i>	Standpipe Vent Installation	AC 758
Effective Date: 07-26-2013	What's Changed?	Sheet 1 of 3 UGS

Scope AC 758.2 PVC Standpipe Vent Installation

Refer to Working Drawing for Specific Details

Figure AC 758-2: PVC Standpipe Vent Installation



Note(s):

1. Vents shall be placed as shown on working drawings. See AC 750 for details.
2. Vents shall be 10" I.D. PVC unless specified otherwise on the working drawings. Air duct shall be PVC plastic 0.200" minimum wall.
3. Where curbs and grades are not established, bottom holes of vents must be 10" minimum above surface of the ground.
4. Vents must be placed a minimum of five feet apart unless otherwise shown on working drawings.
5. All joints are to be sealed against water infiltration in conformance with conduit manufacturers' recommendations and are to be made in presence of Edison Inspector.
6. See AC 753.
7. See CD 100.
8. See GI 020.

AC 758

Standpipe Vent Installation

Approved by:

B.E.

Sheet 2 of 3

What's Changed?

Effective Date:

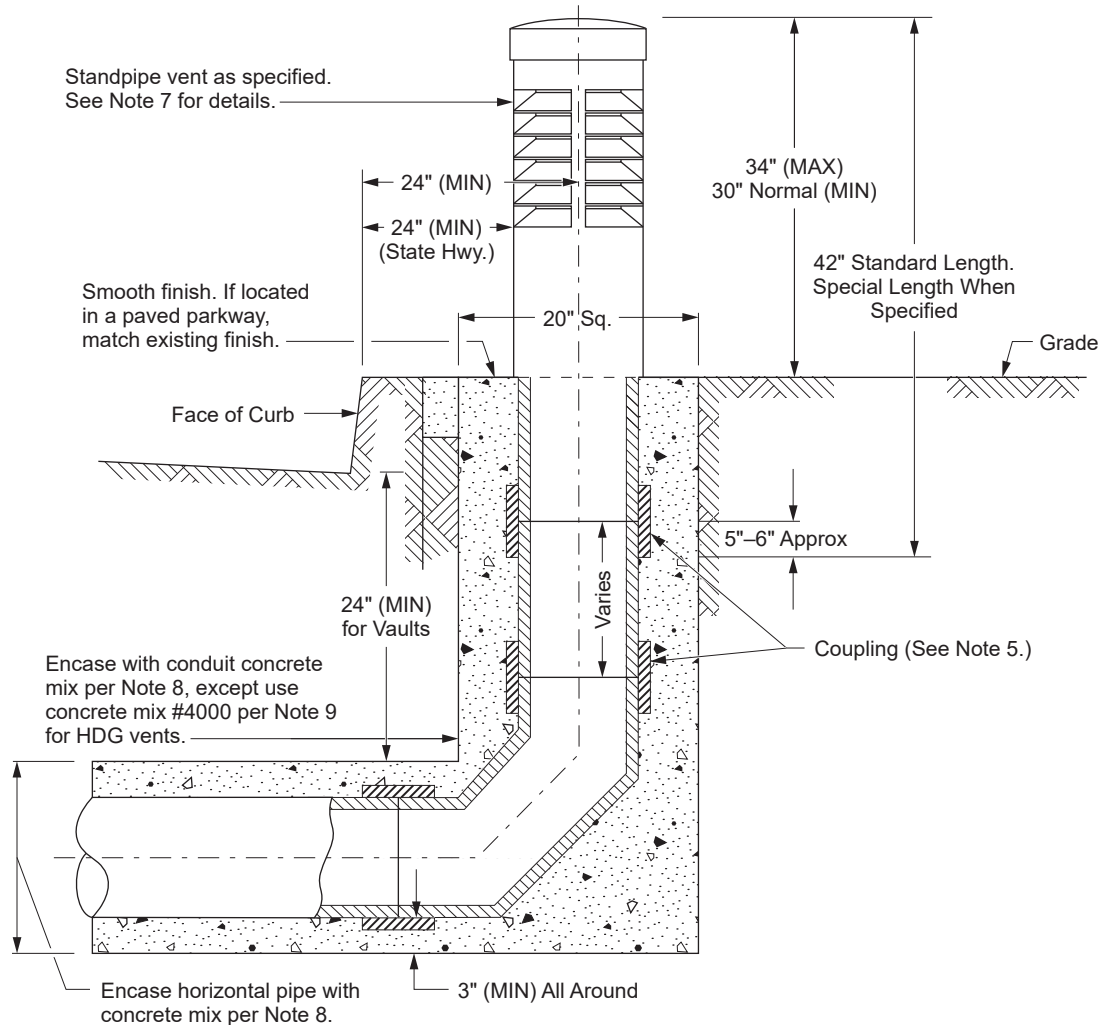
UGS

07-26-2013

Scope AC 758.3 Polyethylene Standpipe Vent Installation

Refer to Working Drawing for Specific Details

Figure AC 758-3: Polyethylene Standpipe Vent Installation



Note(s):

1. Vents shall be placed as shown on working drawings. See AC 750 for details.
2. Vents shall be Edison approved polyethylene standpipes unless specified otherwise on the working drawings. Air duct shall be PVC plastic 0.200" minimum wall.
3. Where curbs and grades are not established, bottom opening of vents must be 10" minimum above surface of the ground.
4. Vents must be placed a minimum of five feet apart unless otherwise shown on working drawings.
5. All joints are to be sealed against water infiltration in conformance with conduit manufacturers' recommendations and are to be made in presence of Edison Inspector.
6. For use only with 8-inch and 10-inch structure ventilation duct.
7. See AC 752.
8. See CD 100.
9. See GI 020.

Approved by:

p.e.

Standpipe Vent Installation

AC 758

Sheet 3 of 3

Effective Date:
07-26-2013

What's Changed? Figure AC 758-3 was updated for clarity.

UGS

► SCE Public ◀

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AC 759 Wall Stand Vent Detail and Installation

Scope AC 759.1 Wall Stand Vent Detail and Installation

Figure AC 759-1: Wall Stand Vent Detail and Installation

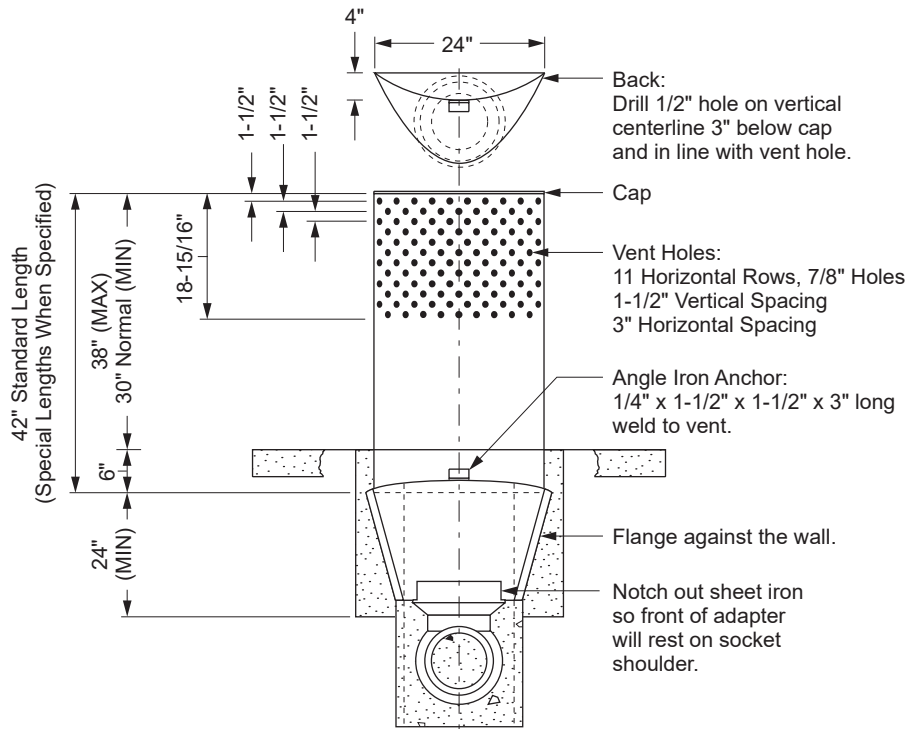


Figure AC 759-1.1: Front View

Approved by:

PhH

Wall Stand Vent Detail and Installation

AC 759

Sheet 1 of 2

Effective Date:

10-28-2005

What's Changed?

UGS

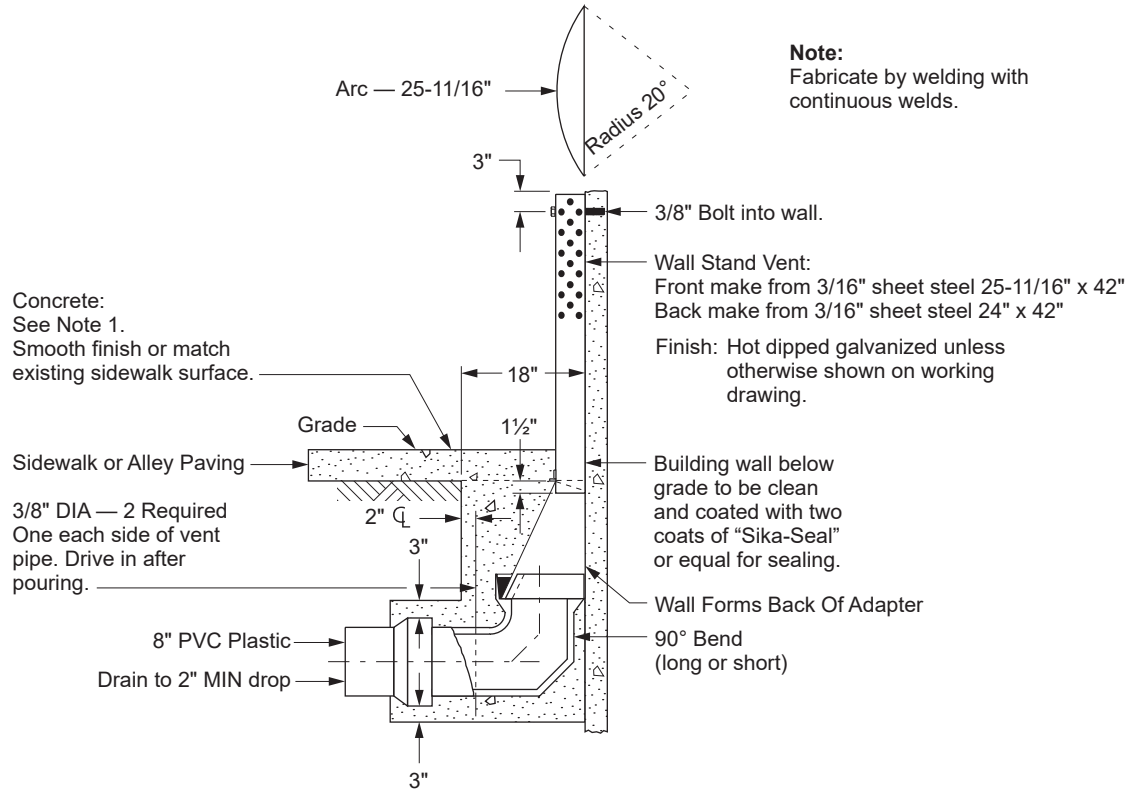


Figure AC 759-1.2: Side View (with Cut-Away Section)

Note(s):

1. See GI 020.

AC 759

Wall Stand Vent Detail and Installation

Approved by:

PHH

Sheet 2 of 2

What's Changed?

Effective Date:

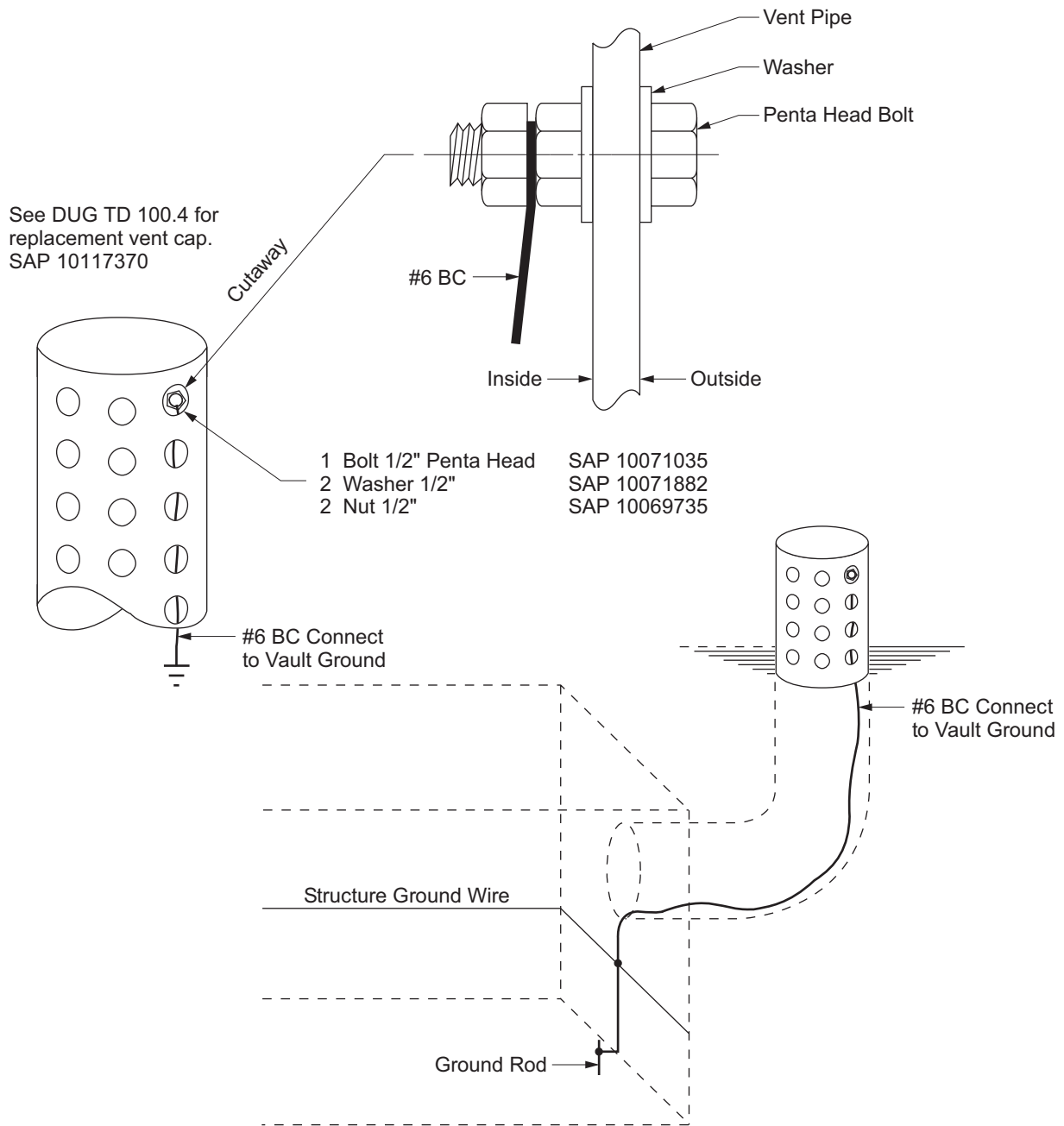
UGS

10-28-2005

AC 760 Installation of a Ground Wire in a Vent

Scope AC 760.1 Installation of a Ground Wire in a PVC Vent

Figure AC 760-1: Installation of a Ground Wire in a PVC Vent



Note(s):

- To assist in underground structure locating from the surface, install a #6 bare copper wire from inside the vent pipe to the structure ground system. This installation will allow a single person crew to tie into the system ground and locate the facilities unaided. The installation should be made during new construction, added to the appropriate structures during the routine maintenance cycle, or as the need arises by request for assistance from the contract cable locating company.

Approved by:

B.C.

Installation of a Ground Wire in a Vent

AC 760

Sheet 1 of 2

Effective Date:

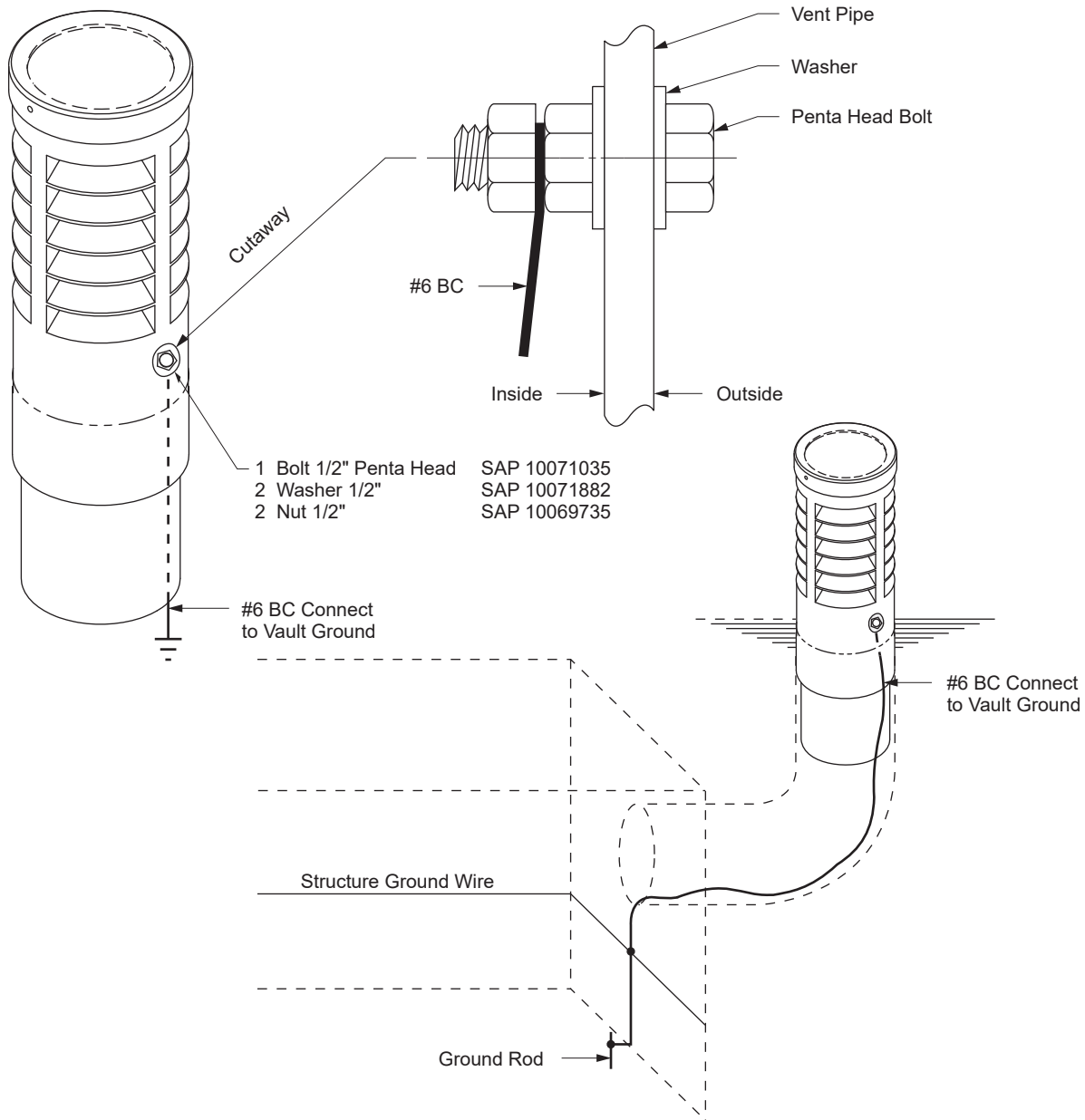
10-24-2014

What's Changed? Figure AC 760-1 SAP Numbers added.

UGS

Scope AC 760.2 Installation of a Ground Wire in a Polyethylene Standpipe Vent

Figure AC 760-2: Shows Installation of a Ground Wire in a Polyethylene Standpipe Vent



Note(s):

1. To assist in underground structure locating from the surface, install a #6 bare copper wire from inside the vent pipe to the structure ground system. This installation will allow a single person crew to tie into the system ground and locate the facilities unaided. The installation shall be made to a minimum of one vent per vault during new construction, added to the appropriate structures during the routine maintenance cycle, or as the need arises by request for assistance from the contract cable locating company.
2. Drill a 9/16" hole for grounding bolt approximately one inch below the lowest ventilation fin slot. The ground connection should be attached on the side of the vent facing away from the street. This is done to maintain a flat surface for attaching structure identification stickers.

AC 760

Installation of a Ground Wire in a Vent

Approved by:

B. C.

Sheet 2 of 2

What's Changed? Figure AC 760-2 SAP Numbers added.

Effective Date:

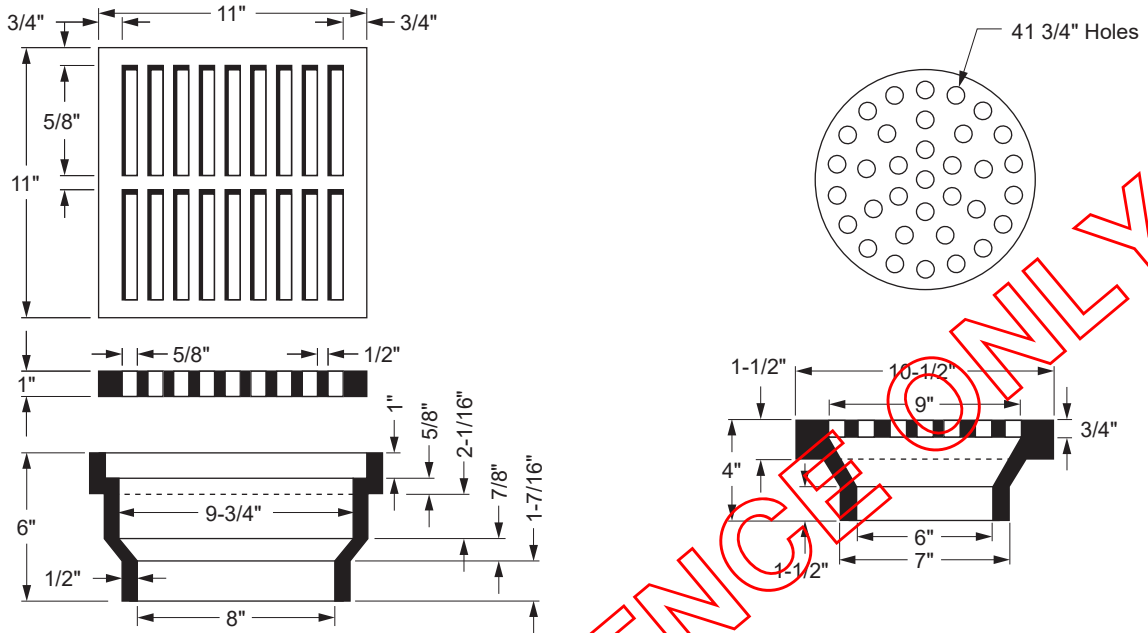
UGS

10-24-2014

AC 765 Flush Vent Grates and Frames

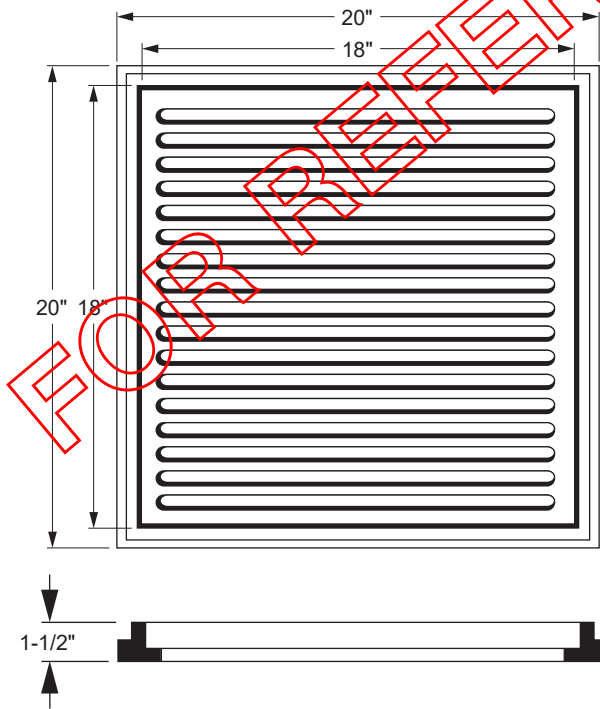
Scope AC 765.1 Flush Vent Grates and Frames

Figure AC 765-1: Flush Vent Grates and Frames



Square Type for Light Traffic
6" — Alh. Fdy. A-2122
8" — Alh. Fdy. A-2121

Round Type for Heavy Traffic
8" — Alh. Fdy. A-2130



Square Type for Use with Trash Pit

18" x 18" Grate { Sidewalk Type — Alh. Fdy. A-2010
Traffic Type — Alh. Fdy. A-2012

Approved by:

PhH

Flush Vent Grates and Frames

AC 765

Sheet 1 of 9

Effective Date:
10-28-2005

What's Changed?

UGS

Note(s):

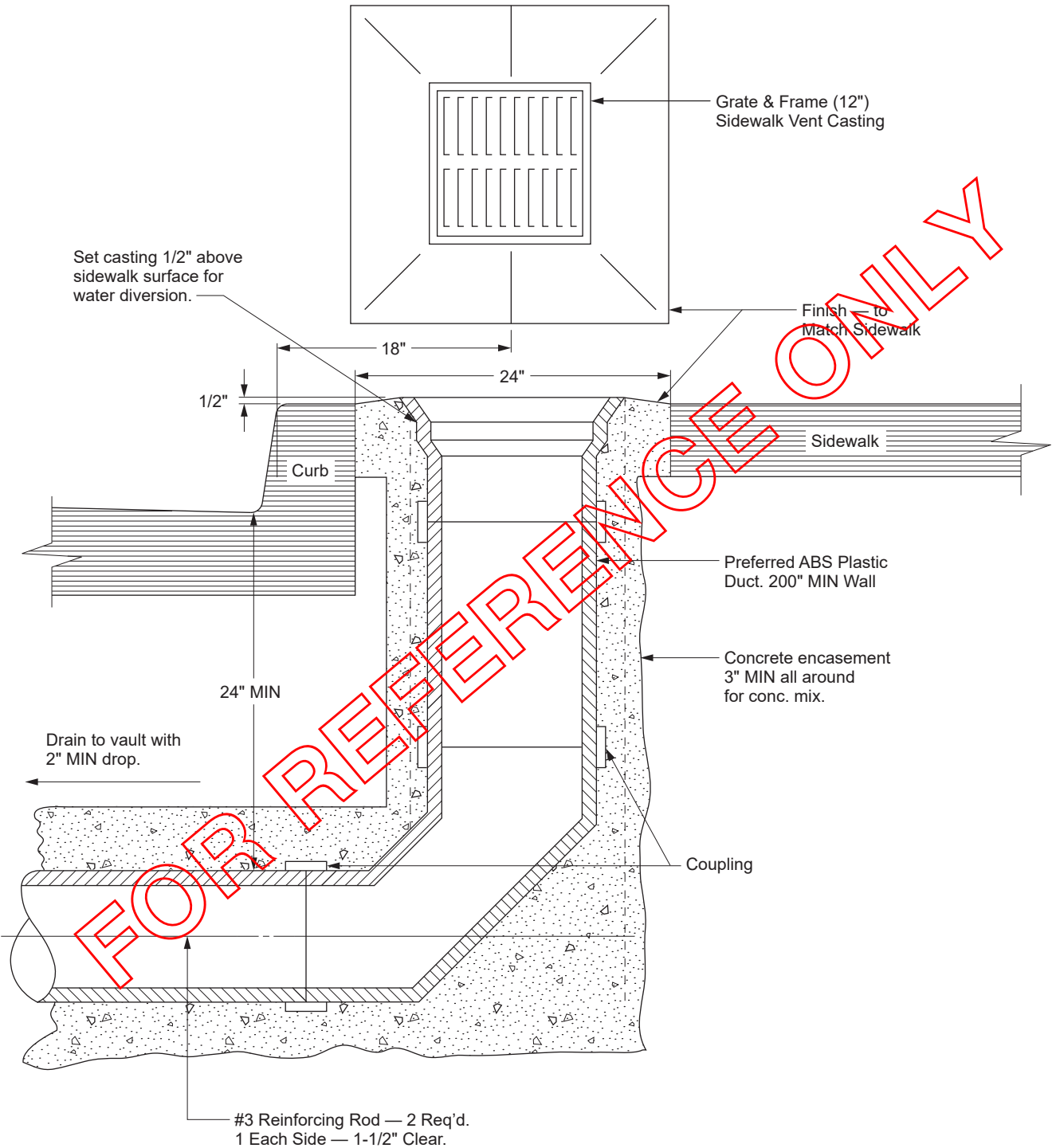
1. Finish to be black unless otherwise specified.
2. Foundry number and size to be shown with working drawings.

FOR REFERENCE ONLY

AC 765	Flush Vent Grates and Frames	Approved by: <i>PHH</i>
Sheet 2 of 9	What's Changed?	Effective Date: 10-28-2005
UGS		

Scope AC 765.2 Flush Vent Installation

Figure AC 765-2: Flush Vent Installation



FOR REFERENCE ONLY

Approved by:

PhH

Flush Vent Grates and Frames

AC 765

Sheet 3 of 9

Effective Date:
10-28-2005

What's Changed?

UGS

► SCE Public ◀

Note(s):

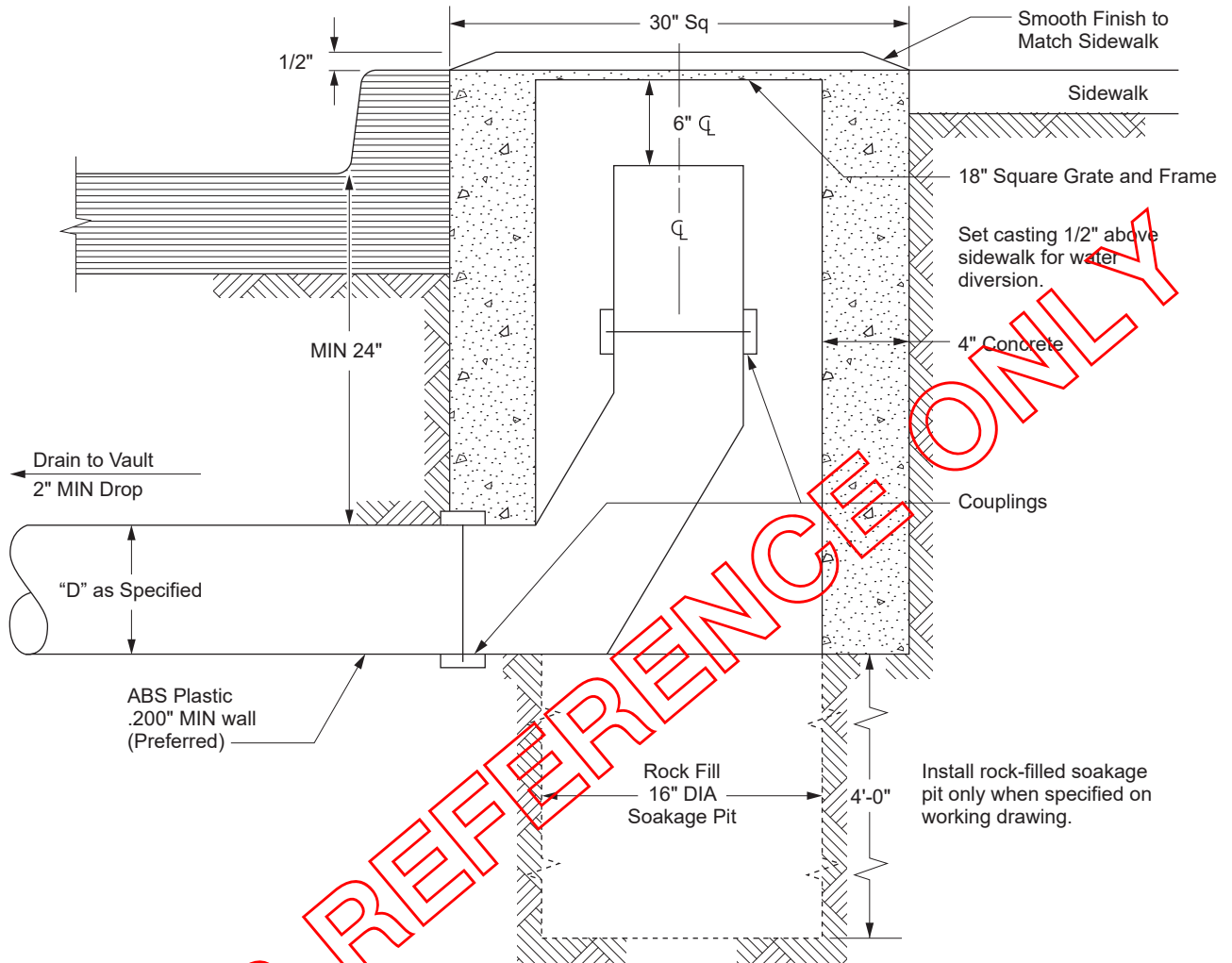
1. Air duct will be one of the following materials:
 - a. ABS plastic 200" minimum wall — preferred
 - b. Vitrified clay pipe, standard strength
 - c. Transite air duct, type (5)

FOR REFERENCE ONLY

AC 765	Flush Vent Grates and Frames	Approved by: <i>PHH</i>
Sheet 4 of 9	What's Changed?	Effective Date: 10-28-2005
UGS		

Scope AC 765.3 Flush Vent Installation with Trash Pit

Figure AC 765-3: Flush Vent Installation with Trash Pit



Note(s):

1. Air duct will be one of the following materials:
 - a. ABS plastic, 200" minimum wall — preferred
 - b. Vitrified clay pipe, standard strength
 - c. Transite air duct, type (5)

Approved by:

PHH

Flush Vent Grates and Frames

AC 765

Sheet 5 of 9

Effective Date:

10-28-2005

What's Changed?

UGS

► SCE Public ◀

Scope AC 765.4 Flush Vault Roof Vents

Figure AC 765-4: Flush Vault Roof Vents

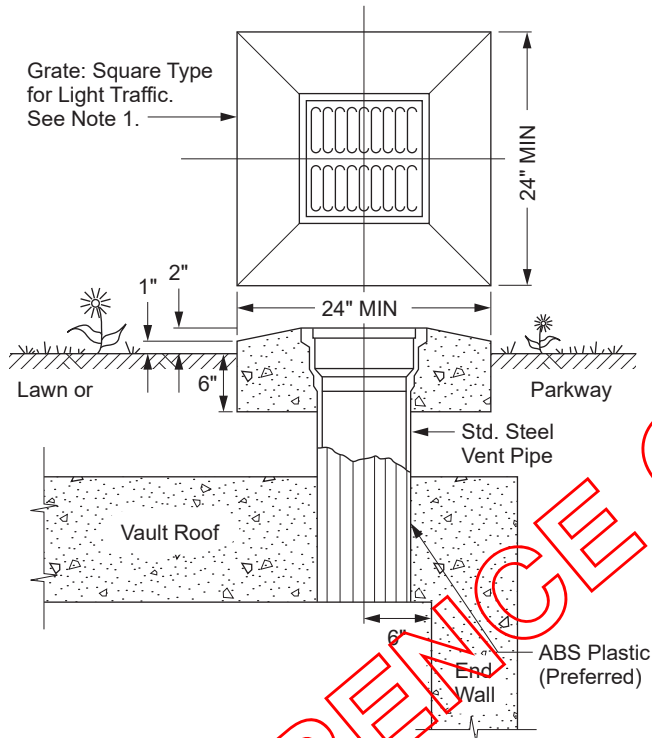


Figure AC 765-4.1

Note(s):

1. See [Scope AC 765.1 \(Sheet 1\)](#).

FOR REFERENCE ONLY

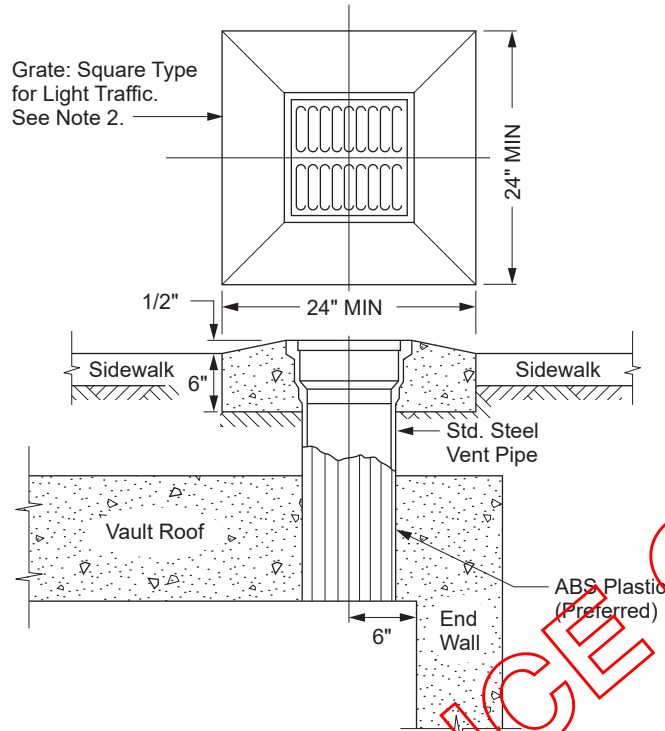



Figure AC 765-1.2

Note(s):

1. Size of vent pipe will be specified on working drawing.
2. See [Scope AC 765.1 \(Sheet 1\)](#).

FOR REFERENCE ONLY

Approved by: 	Flush Vent Grates and Frames	AC 765
Effective Date: 10-28-2005	What's Changed?	Sheet 7 of 9 UGS

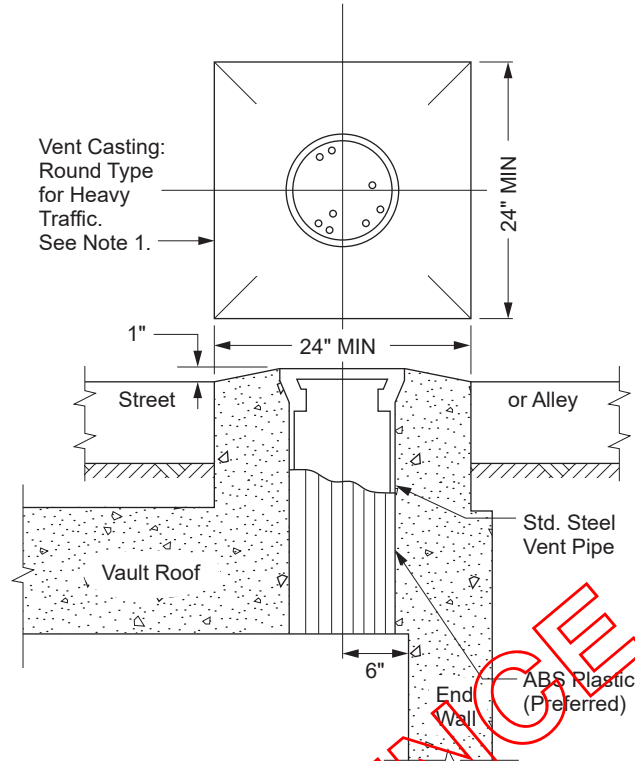
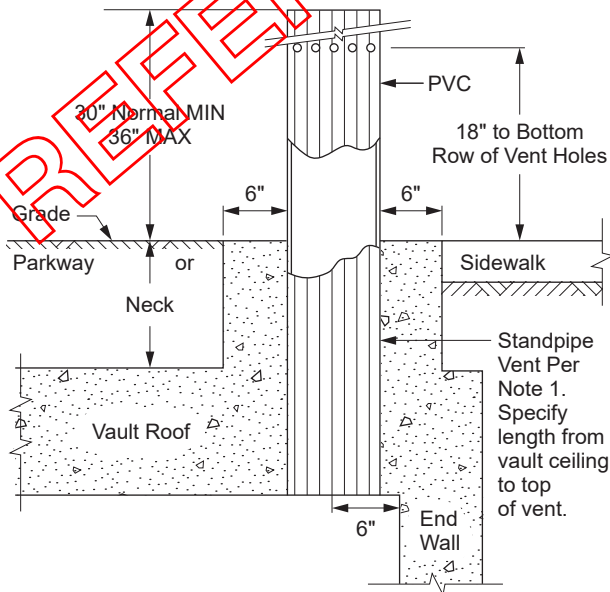


Figure AC 765-4.3

Note(s):

1. See [Scope AC 765.1 \(Sheet 1\)](#).



Note(s):

1. See [AC 753](#).

AC 765

Flush Vent Grates and Frames

Approved by:

PHH

Sheet 8 of 9

What's Changed?

Effective Date:

UGS

10-28-2005

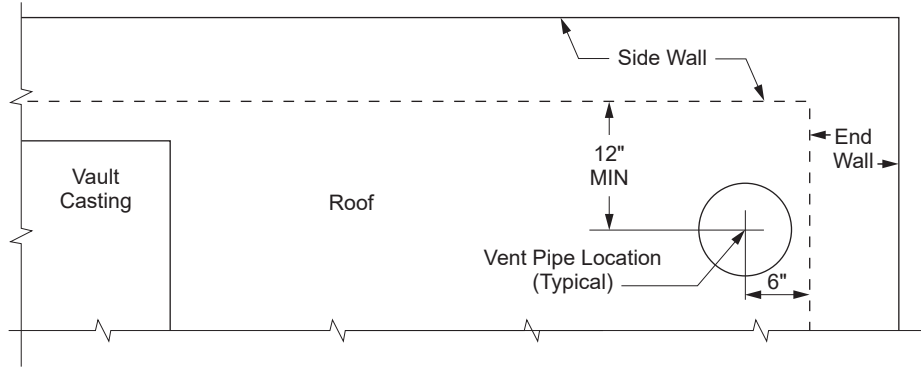



Figure AC 765-4.4: Plan

Note(s):

1. Air ducts will be one of the following materials:
 - a. ABS Plastic, 200" minimum wall — preferred
 - b. Vitrified clay pipe, standard strength
 - c. Transite air duct, type (5)

FOR REFERENCE ONLY

Approved by: 	Flush Vent Grates and Frames	AC 765
Effective Date: 10-28-2005	What's Changed?	Sheet 9 of 9 UGS

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Miscellaneous Table of Contents

Standard	Title
MC 800	Substation Power Cable Trench
MC 800.1	Substation Power Cable Trench — Precast (Preferred) or Poured (Non-Traffic)
MC 805	Distribution Power Cable Trench
MC 805.1	Distribution Power Cable Trench — Poured (Non-Traffic)
MC 810	Cold Joints (Approved for Use at Contractor's Request)
MC 810.1	Cold Joints (Approved for Use at Contractor's Request)
MC 820	Joining Old and New Structures
MC 820.1	Joining Old and New Structures
MC 830	Protective Barrier for Underground Distribution Structures
MC 830.1	Protective Barrier for Underground Distribution Structures
MC 840	Wheelchair Ramps
MC 840.1	Wheelchair Ramps
MC 850	Structure Offsets for Joint Construction
MC 850.1	Structure Offsets for Joint Construction
MC 860	Inspection Criteria for Concrete Vaults, Manholes, and Covers
MC 860.1	Inspection Criteria for Concrete Vaults, Manholes, and Covers
MC 870	Removable Curb for 4' x 5' Vault Covers and Manhole Covers
MC 870.1	Removable Curb for 4' x 5' Vault Covers and Manhole Covers
MC 870.2	Removable Curbing (Steel Cover Plates)
MC 880	Repair Specifications for Concrete Pad Structures
MC 880.1	Repair Specifications for Concrete Pad Structures
MC 890	Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers
MC 890.1	Electrolier Foundation Detail
MC 890.2	Marbelite Nostalgic Electrolier Foundation Detail
MC 890.3	Electrolier Foundation Requirements

Approved by:	Miscellaneous Table of Contents	MC
Effective Date:	10-25-2019	Sheet i
		UGS

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MC 800 Substation Power Cable Trench

Scope MC 800.1 Substation Power Cable Trench — Precast (Preferred) or Poured (Non-Traffic)

Figure MC 800-1: Substation Power Cable Trench — Precast or Poured — Entrance Detail and Trench Plan

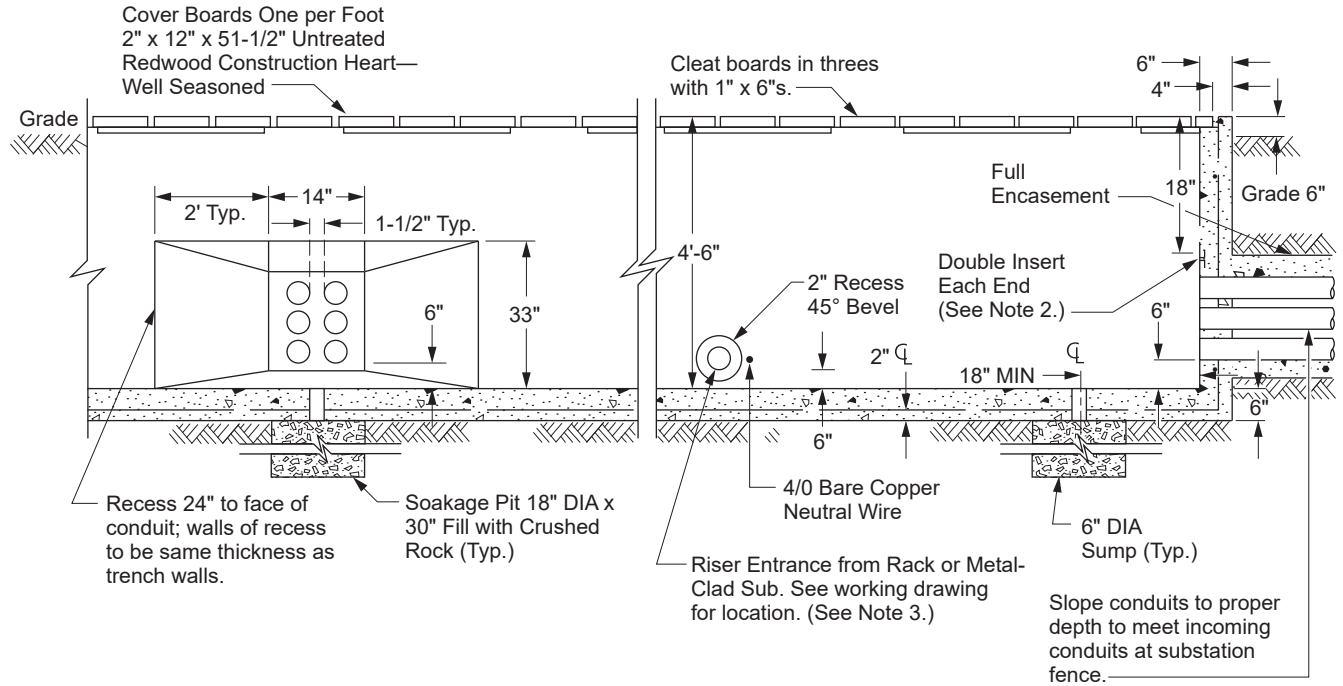


Figure MC 800-1.1: Side Entrance Detail

Figure MC 800-1.2: End Entrance Detail

Note(s):

1. A 1" double coil insert on trench center-line is required in each end wall as shown. One is also required directly opposite the side entrance 1'-6" from the trench floor.
2. See [AC 720](#).
3. See [CD 172](#).

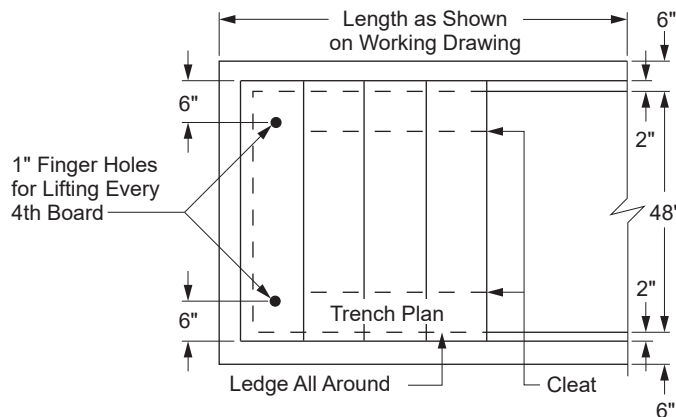


Figure MC 800-1.3: Trench Plan

Approved by:

RK

Substation Power Cable Trench

MC 800

Sheet 1 of 4

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

UGS

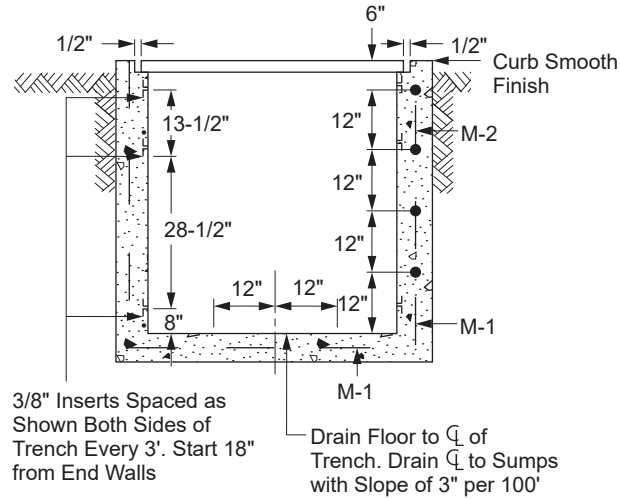


Figure MC 800-1.4: Typical Trench Section

Materials:

Concrete:
3000 psi @ 28 days (See Note 1.)
0.259 cu. yd. per lin. foot of trench.

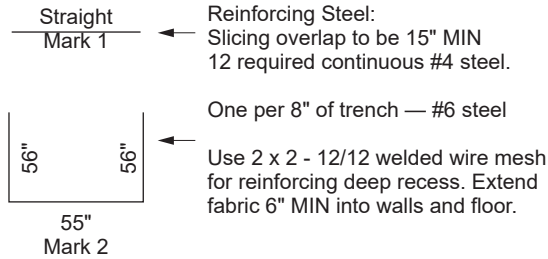


Figure MC 800-1.5: Mark 1 and Mark 2

Note(s):

1. See [GI 020](#).

MC 800

Substation Power Cable Trench

Approved by:

RK

Sheet 2 of 4

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Effective Date:

10-26-2012

UGS

Figure MC 800-2: Substation Power Cable Trench — Precast or Poured — Conduit Bank Exits, Trench End Walls, and Section View of Trench

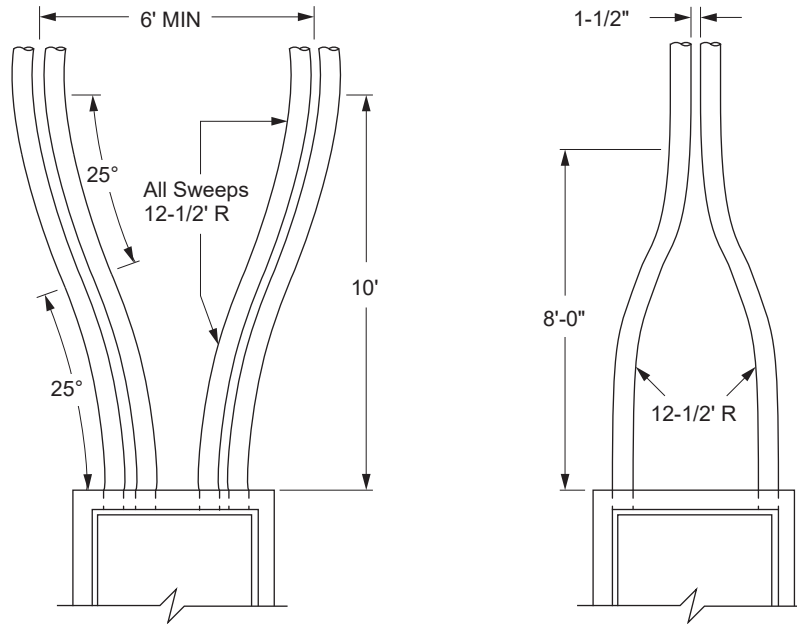


Figure MC 800-2.1: Conduit Bank Exits — Plan

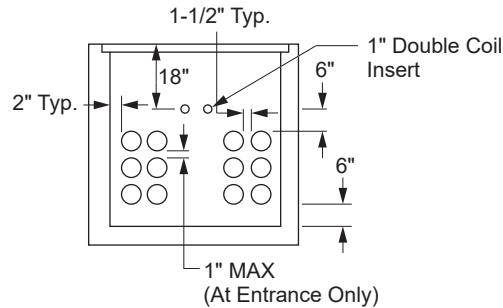


Figure MC 800-2.2: Trench End Wall (2 Conduit Banks)

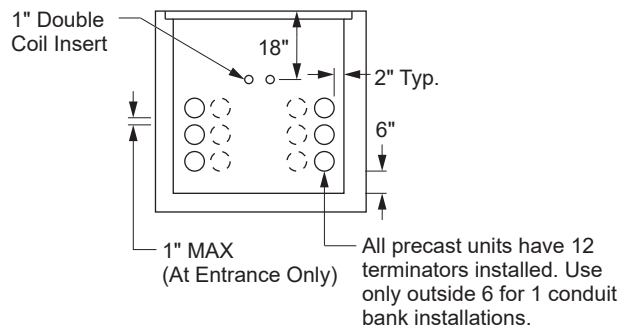


Figure MC 800-2.3: Trench End Wall (1 Conduit Bank)

Approved by:

RK

Substation Power Cable Trench

MC 800

Sheet 3 of 4

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

UGS

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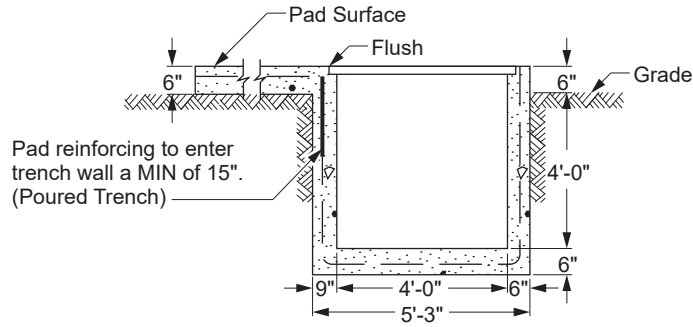


Figure MC 800-2.4: Section View of Trench Adjacent to Pad for Metal Clad Unit (Poured in Place)

Note(s):

1. Pouring of trench and pad to be monolithic. Trench to be finished smooth with drainage as indicated in MC 800. If precast trench is used, pour pad level with top of trench wall. Pad should butt against precast wall.

MC 800

Substation Power Cable Trench

Approved by:

RK

Sheet 4 of 4

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Effective Date:

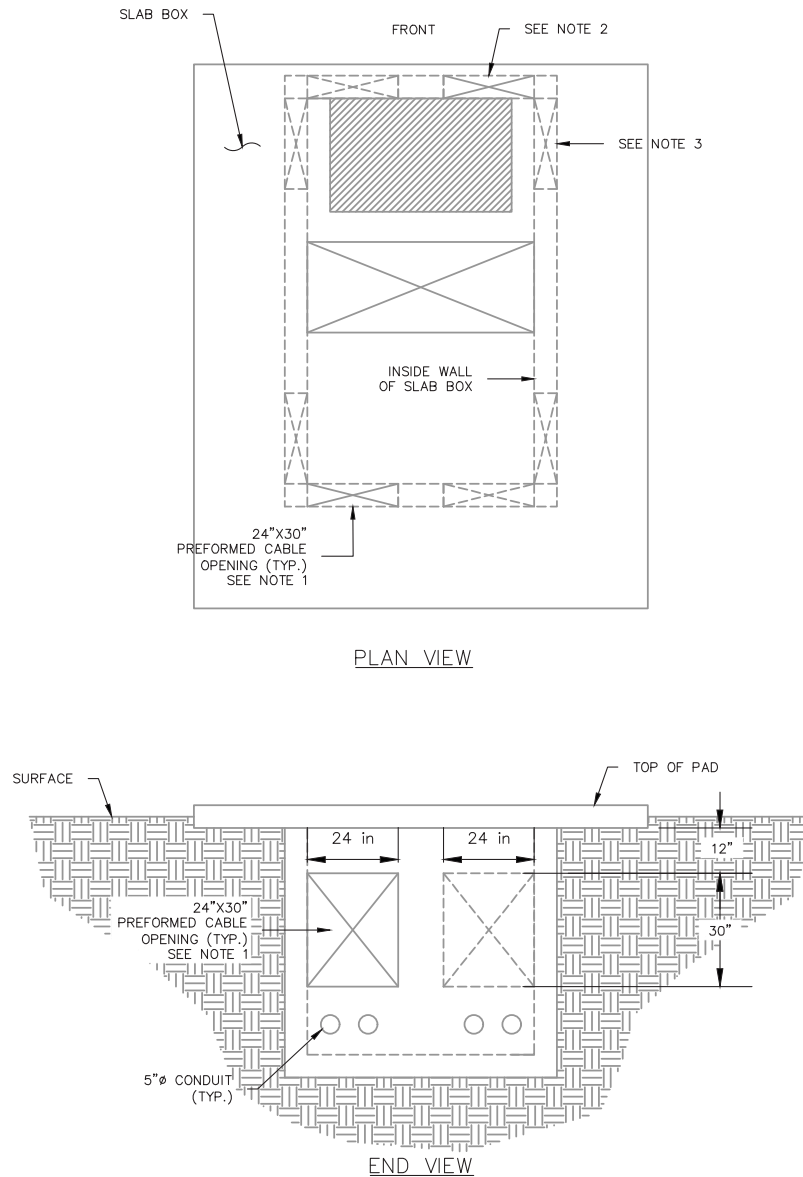
10-26-2012

UGS

MC 805 Distribution Power Cable Trench

Scope MC 805.1 Distribution Power Cable Trench — Poured (Non-Traffic)

Figure MC 805-1: Distribution Power Cable Trench — Slab Box Entrance Location(s)

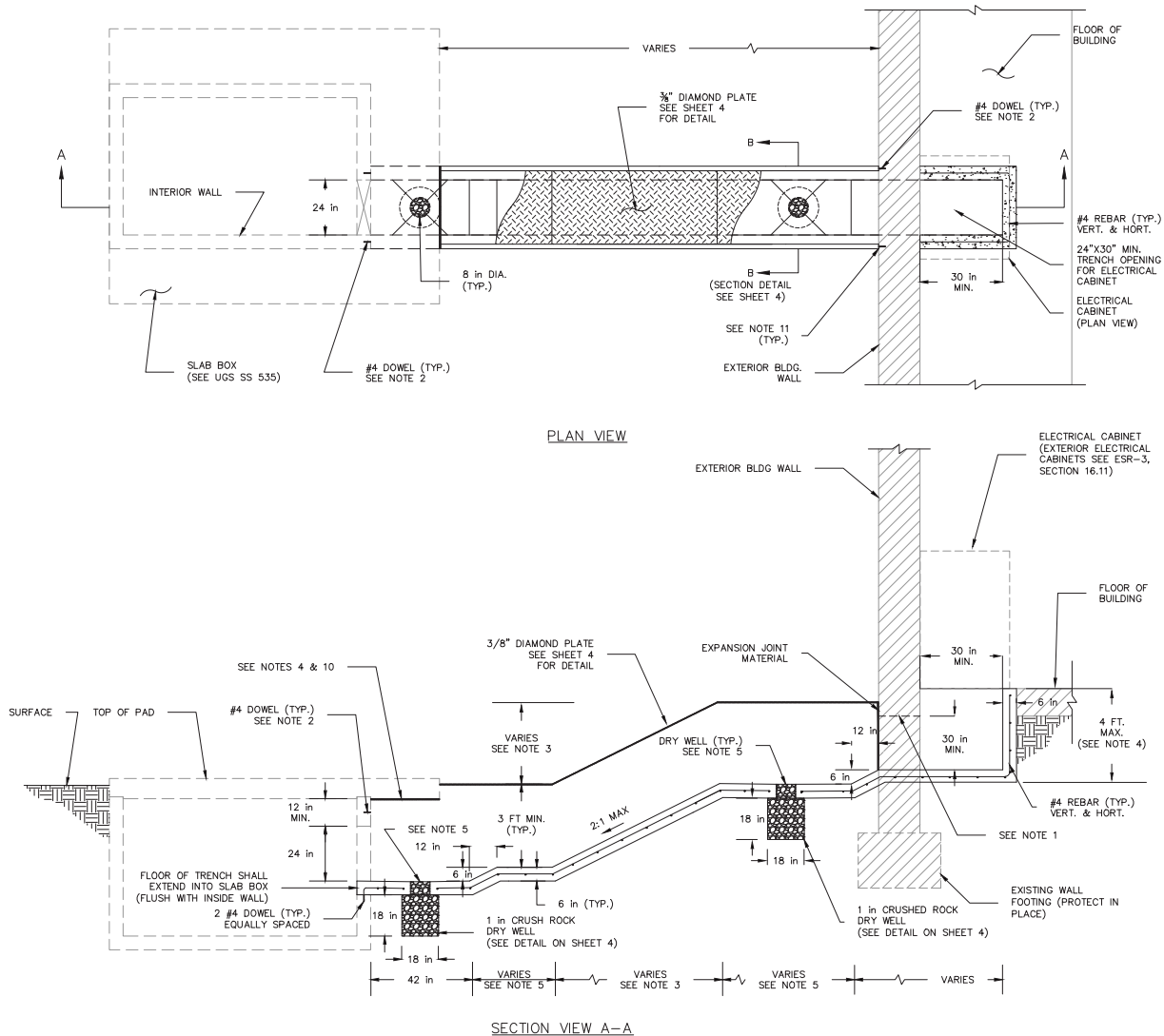


Note(s):

1. Contractor shall coordinate with precast concrete vendor to specify location(s) and quantity of cable opening(s) per Edison drawing(s). Refer to DDS-6, Section 4.0, Table 6-8, Table Footnote f.
2. The slab box shall have only one cable opening on the front and/or back.
3. Additional cable openings may be located on the side of the structure if needed as shown (see plan view).
4. No saw cutting allowed on any part of the slab box. Any modifications to slab box (new or existing) shall be approved by Underground Structural Engineering.
5. Precast trench allowed with Underground Structures Engineering approval.

Approved by: <i>a/j</i>	Distribution Power Cable Trench	MC 805
Effective Date: 10-25-2019	What's Changed? Updated Note 5 to show precast trenches allowed with Underground Structures Engineering approval.	Sheet 1 of 4
		UGS

Figure MC 805-2: Distribution Power Cable Trench — Trench Plan and Section Details



Note(s):

1. Contractor shall obtain approval from building owner prior to construction or any modifications to existing structure(s).
2. Dowel and epoxy #4 rebar at depth, 3-inch minimum to 4-inch maximum. Minimum of three locations equally spaced in trench wall.
3. Cable trench shall be inclined if a grade separation exists between the pad mount structure and cable trench termination.
4. Top of cable trench (under pad only) shall be flush to bottom of pad. Non-shrink grout (min. 3000 psi @ 28 days) may be used. Contractor shall ensure that there are no gaps or voids.
5. Dry wells shall be constructed as shown and at every 10 foot intervals for horizontal runs. Bottom of trench shall be sloped towards dry well where they occur.
6. All rebar lap splices shall be 24 inch minimum, staggered.
7. Cable trenches shall not be constructed in vehicle traffic areas.
8. All rebar shall be 60 ksi.
9. Use minimum 3000 psi concrete.
10. Joint sealer shall be one part polyurethane and shall conform to ASTM D1751.
11. Where new concrete poured against existing concrete, apply epoxy bonding agent (ex. Sikadur 32 Hi-Mod Adhesive) or equiv.
12. Contractor shall be responsible for grading and drainage. SCE not responsible for any water intrusion, flooding or similar.
13. All structures are customer owned.
14. Trenches deeper than 4 feet by SCE engineering approval only.

MC 805

Distribution Power Cable Trench

Approved by:

a/j

Sheet 2 of 4

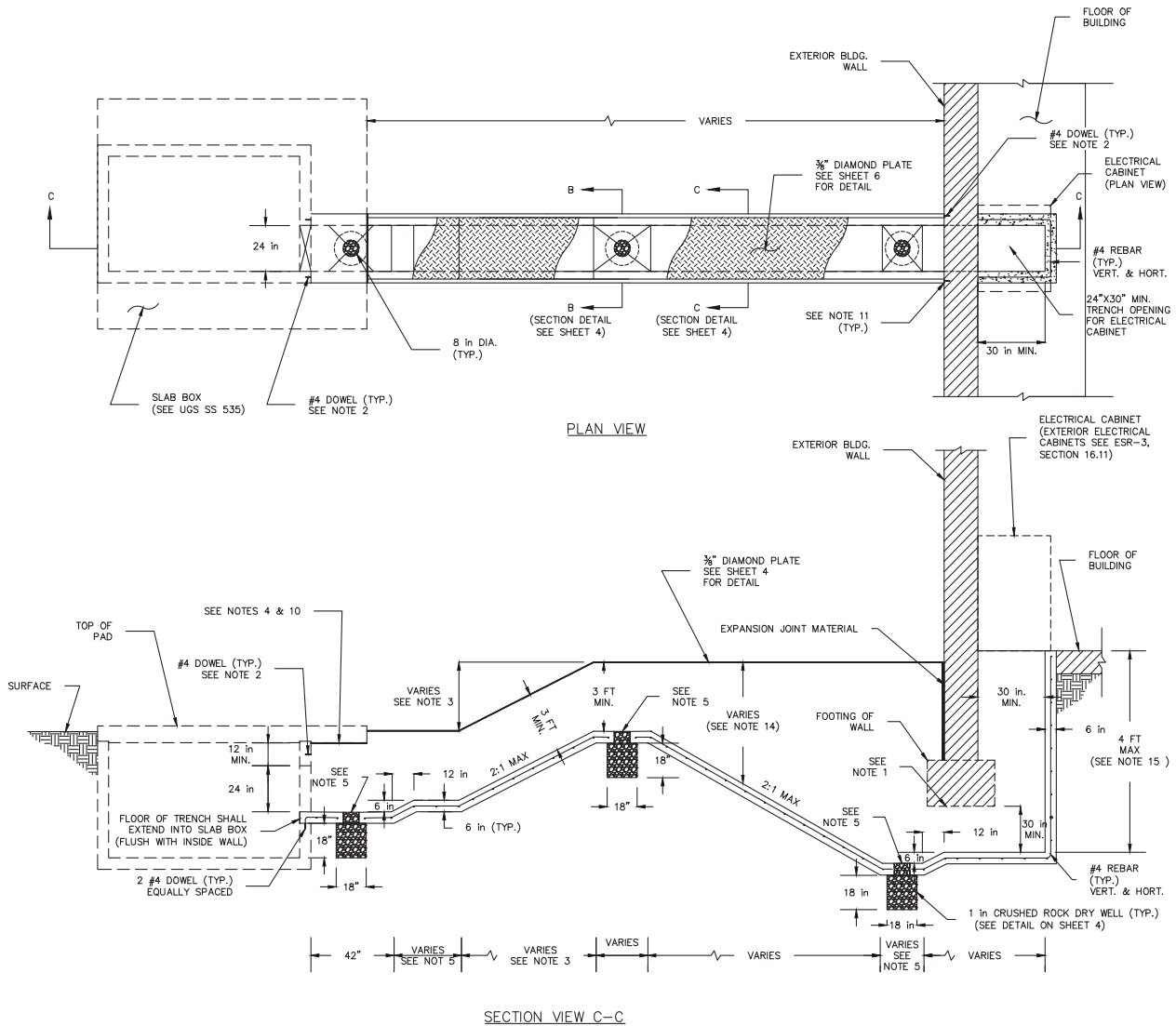
What's Changed? Updated Figure MC 805-2.

Effective Date:

UGS

10-25-2019

Figure MC 805-3: Distribution Power Cable Trench — Poured — Trench Plan and Section Details



Note(s):

1. Contractor shall obtain approval from building owner prior to construction or any modifications to existing structure(s).
2. Dowel and epoxy #4 rebar at depth, 3 inch minimum to 4 inch maximum. Minimum of three locations equally spaced in trench wall.
3. Cable trench shall be inclined if a grade separation exist between the pad mount structure and cable trench termination.
4. Top of cable trench (under pad only) shall be flush to bottom of pad. Non-shrink grout (min. 3000 psi @ 28 days) may be used. Contractor shall ensure that there are no gaps or voids.
5. Dry wells shall be constructed as shown and at every 10 foot intervals for horizontal runs. Bottom of trench shall be sloped towards dry well where they occur.
6. All rebar lap splice shall be 24 inch minimum, staggered.
7. Cable trenches shall not be constructed in vehicle traffic areas.
8. All rebar shall be 60 ksi.
9. Use minimum 3000 psi concrete.
10. Joint sealer shall be one part polyurethane and shall conform to ASTM D1751.
11. Where new concrete poured against existing concrete, apply epoxy bonding agent (ex. Sikadur 32 Hi-Mod Adhesive) or equivalent.
12. Contractor shall be responsible for grading and drainage. SCE not responsible for any water intrusion, flooding or similar.
13. All structures are customer owned.
14. Cable trench sections 4 feet deep shall be constructed per section detail "C-C" in [Figure MC 805-4 \(Sheet 4\)](#).
15. Trenches deeper than 4 feet by SCE engineering approval only.

Approved by:

a/j

Distribution Power Cable Trench

MC 805

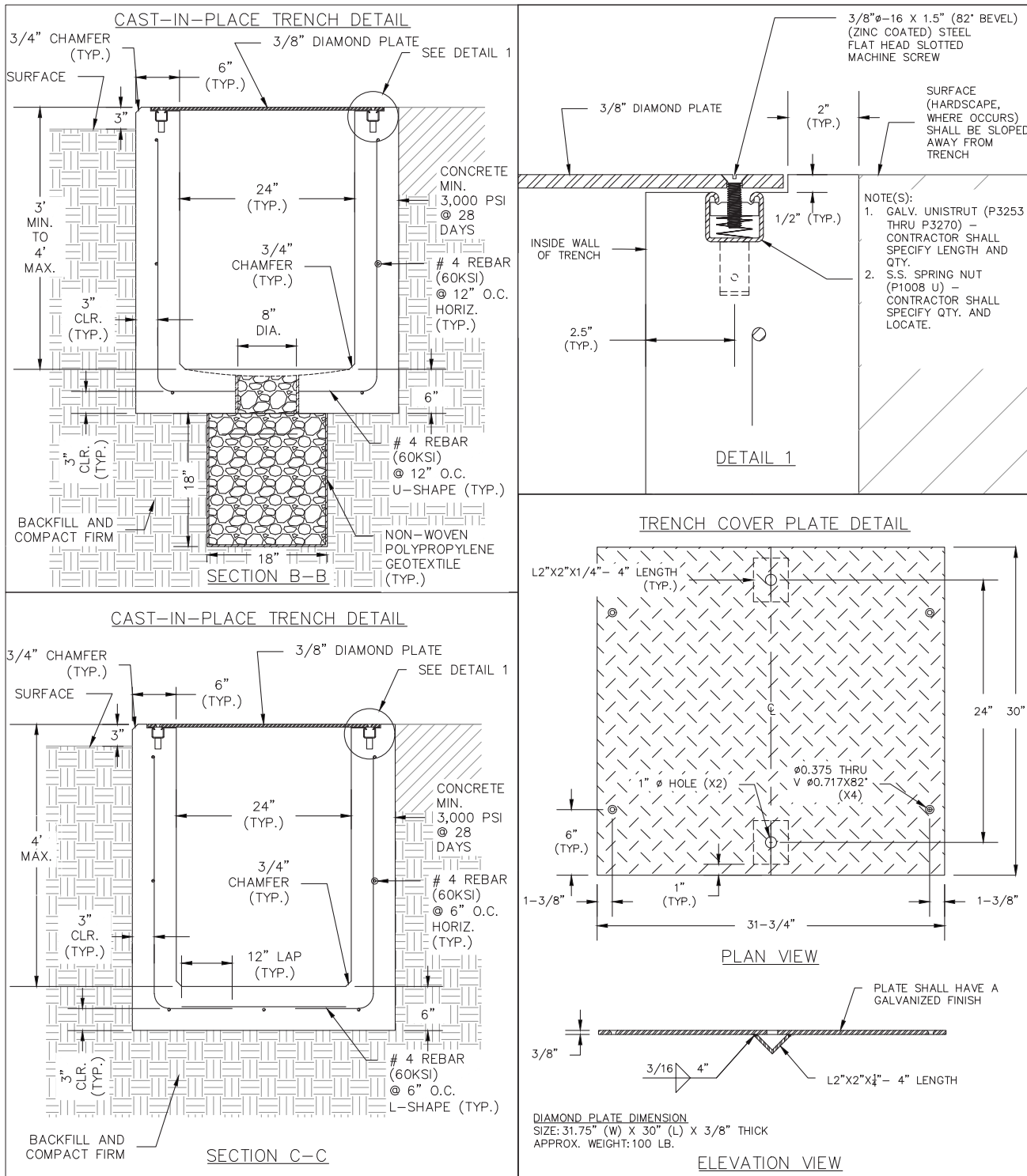
Sheet 3 of 4

Effective Date:
10-25-2019

What's Changed? Updated Figure MC 805-3.

UGS

Figure MC 805-4: Distribution Power Cable Trench — Poured — Section Detail and Plate Detail



MC 805

Distribution Power Cable Trench

Approved by:

a/j

Sheet 4 of 4

What's Changed?

Effective Date:

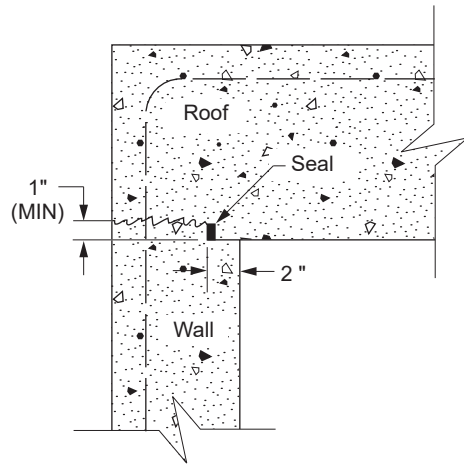
UGS

10-25-2019

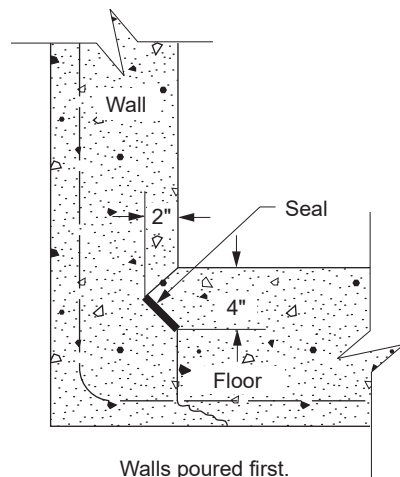
MC 810 Cold Joints (Approved for Use at Contractor's Request)

Scope MC 810.1 Cold Joints (Approved for Use at Contractor's Request)

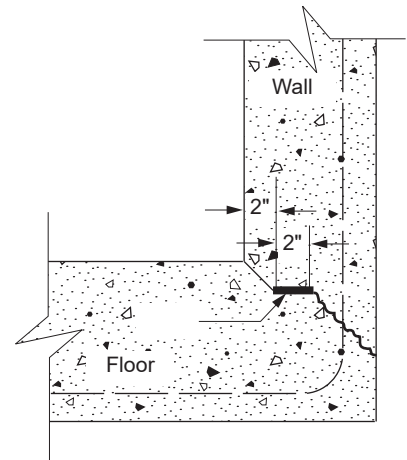
Figure MC 810-1: Cold Joints



Applicable to structures in general.
Joint may be formed after pouring.



Walls poured first.
Applicable where walls are poured against firm earth.
Form before pouring.



Floor poured first.
Applicable where walls are to be double formed.
May be formed as poured.

Note(s):

1. Dimensions are approximate. Sloped surfaces approximately 45° from vertical. Joint surface must be free of debris when second pour is made. Use 2 coats of "Sika-Seal" or equal for sealing.

Approved by:

PhH

Cold Joints (Approved for Use at Contractor's Request)

MC 810

Sheet 1 of 1

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

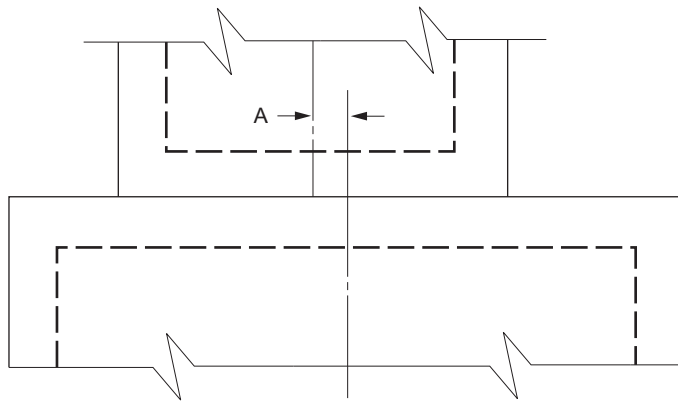
UGS

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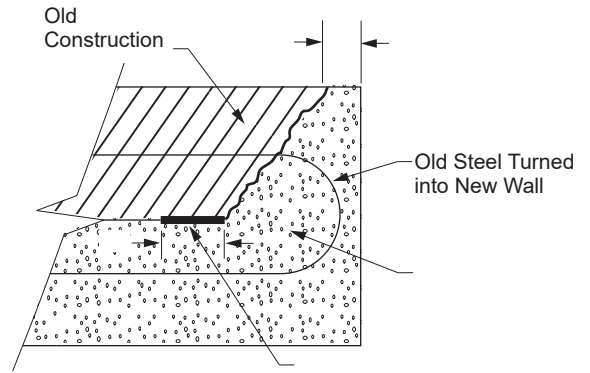
MC 820 Joining Old and New Structures

Scope MC 820.1 Joining Old and New Structures

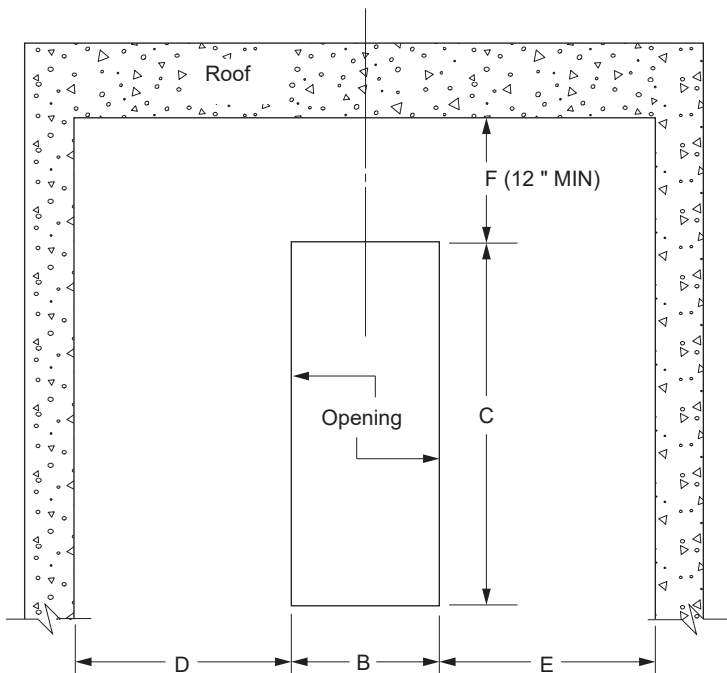
Figure MC 820-1: Joining Old and New Structures



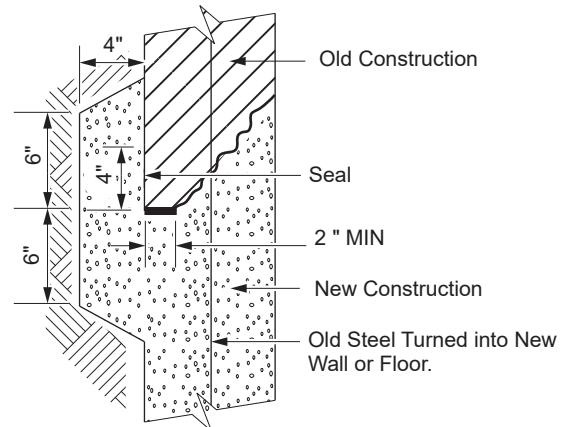
Plan



Typical Section at Edge of Opening



Elevation



Typical Section Where New Wall or Floor is in Line With Old

Note(s):

1. Dimensions indicated by letters will be tabulated on working drawings with same letters for identification.
2. Subscript "1" when used will indicate a dimension referenced to the existing wall; subscript "2" when used will indicate a dimension referenced to the new wall.
3. Cut existing steel near center line of opening and turn into new structure as shown. Move new steel, otherwise passing through opening, to nearest edge with 1-inch clearance and 1-inch spacing between pieces.
4. Turn ends of new steel coming around corners up or down when necessary to clear opening. Paint 4-inch-wide band on outer surface around opening broken in old structure, with 2 coats of Sika Seal (1 gallon) black liquid or equivalent bonding agent before pouring.

Approved by:

PhH

Joining Old and New Structures

MC 820

Sheet 1 of 1

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

UGS

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MC 830 Protective Barrier for Underground Distribution Structures

Scope MC 830.1 Protective Barrier for Underground Distribution Structures

Figure MC 830-1: Protective Barrier for Underground Distribution Structures

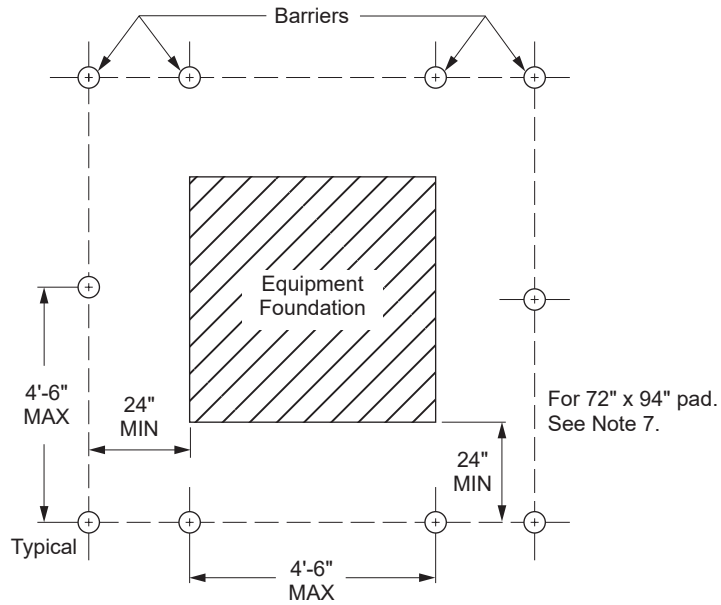


Figure MC 830-1.1: Plan Equipment Foundation

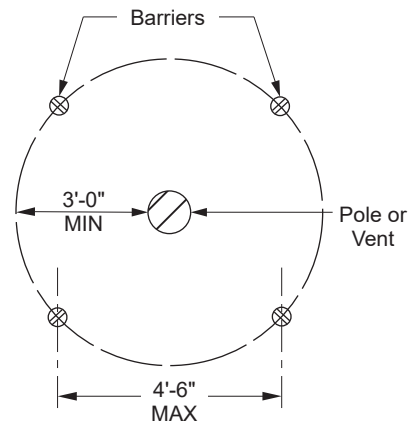


Figure MC 830-1.2: Plan Pole or Vent

Approved by:

ajf

Protective Barrier for Underground Distribution Structures

MC 830

Sheet 1 of 3

Effective Date:
10-26-2018

What's Changed?

UGS

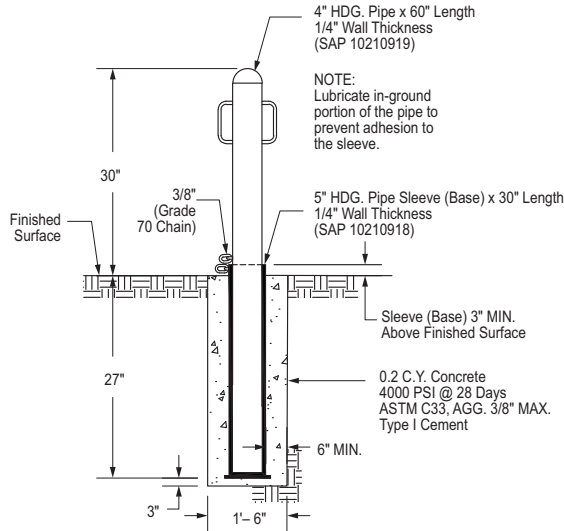


Figure MC 830-1.3: Removable Barrier Detail

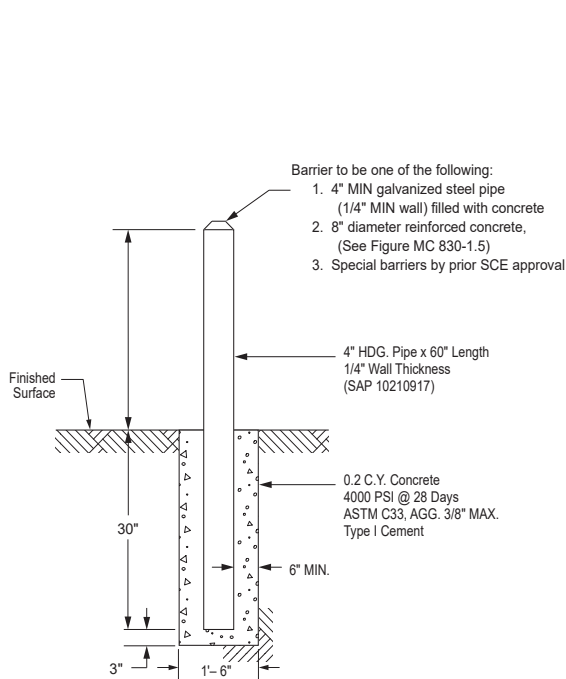


Figure MC 830-1.4: Protective Barrier Detail

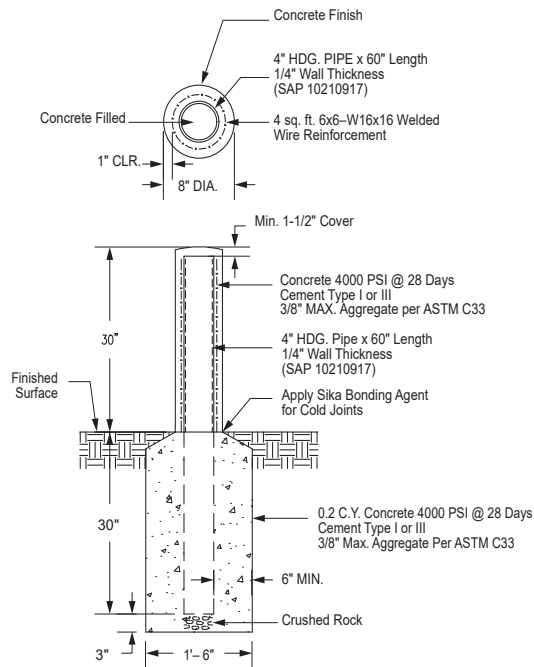


Figure MC 830-1.5: Cast-in-Place Concrete Barrier Detail

1. Structures will normally be installed only in nontraffic areas. Protective barriers are to be used where construction exposes equipment to traffic.
2. Tops of protective barriers are to be smooth cut and top edges are to be rounded.
3. At least one barrier is to be removable, with a means of lifting to support the weight of the barrier, when overhead obstacles prevent equipment removal or installation by crane. See [Figure MC 830-1.3 \(Sheet 2\)](#). The location of the removable barrier(s) shall be approved by the Underground Inspector.
4. Adequate clearance must be provided for doors, cooling radiators, and so forth.
5. Protective barriers, as shown above, indicate typical requirements. Field conditions will necessitate changes for adequate equipment protection. Application of protective barriers is site-specific.

MC 830

Sheet 2 of 3

UGS

Protective Barrier for Underground Distribution Structures

What's Changed? Revised Figure MC 830-1.3 to show a 27" vertical distance from grade to the bottom of the removable barrier.

Approved by:

afj

Effective Date:

10-26-2018

6. The Underground Inspector in the field must approve all protective barrier installations prior to construction. The Underground Inspector will determine (a) status of overhead obstructions, (b) the front and back of equipment foundations, and (c) the clearances required on doors, cooling radiators, and so forth.
7. When a 72" x 94" pad is being installed, (a) increase the distance to 36 inches minimum between the protective barriers and the front edge of the pad; and (b) increase the distance between the protective barriers and the back edge of the pad for capacitor bank (door side only) to 36 inches minimum. The Underground Inspector will determine the front and back of this equipment foundation.
8. With prior SCE approval, the following alternatives may be used in lieu of protective barriers for padmounted structures:
 - a. When specified on working drawing, a 6-inch (minimum vertical face) concrete curb may be installed in place of protective barriers. This curb must be at least 6 inches thick and its front face at least 60 inches (minimum spacing) from the equipment foundation.
 - b. When specified on working drawing for residential tract developments, protected barriers will not be required when there are rolled curbs or 6-inch vertical face curbs that have at least 60 inches (minimum spacing) from the curb to the edge of the equipment foundation.
 - c. Where equipment is located adjacent to a residential driveway, protective barriers may not be required when there is 30-inch (minimum) clearance from the equipment foundation to the edge of the driveway. In addition, a 60-inch clearance shall be maintained from a fire hydrant to a pole. Field conditions will necessitate changes for adequate equipment protection. If the minimum clearances cannot be obtained, protective barriers are required.
9. With prior SCE approval, the following alternatives may be used in lieu of protective barriers for primary surface or semi buried structures including BURD structures:
 - a. When specified on working drawing, a 6-inch (minimum vertical face) concrete curb, 8-feet in length may be installed in place of protective barriers. This curb must be at least 6 inches thick.
 - b. Where there are rolled curbs or curbs that have less than 6-inches of vertical face, protective barriers may not be required when there is at least 60 inches (minimum spacing) from the curb to the edge of the primary surface or semi buried structures. (See Figure MC 830-1.5)
 - c. Where equipment is located adjacent to a residential driveway, protective barriers may not be required when there is 30-inch (minimum) clearance from the equipment foundation to the edge of the driveway. (See Figure MC 830-1.5)
 - d. Field conditions will necessitate changes for adequate equipment protection. If the minimum clearances cannot be obtained or there is no curb, protective barriers shall be required.
 - e. In addition, a 60-inch clearance shall be maintained from a fire hydrant to a pole, transformers, PME switches, or any primary surface or semi buried structure.

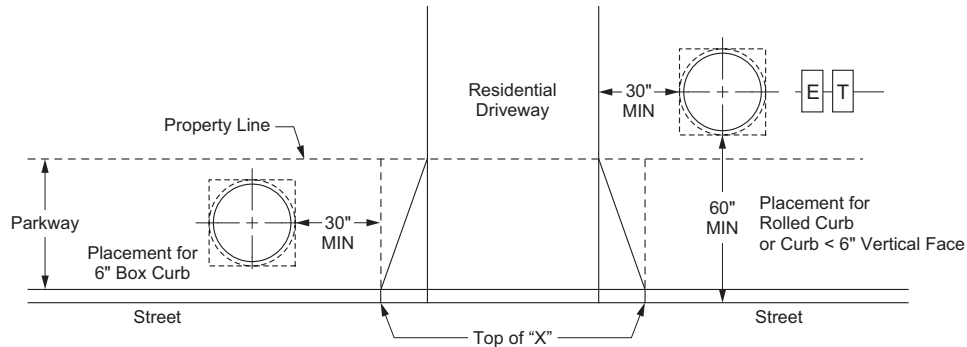


Figure MC 830-1.6: Placement of Primary or Semi-Buried Structure from Driveway

Approved by: <i>ajj</i>	Protective Barrier for Underground Distribution Structures	MC 830
Effective Date: 10-26-2018	What's Changed?	Sheet 3 of 3
		UGS

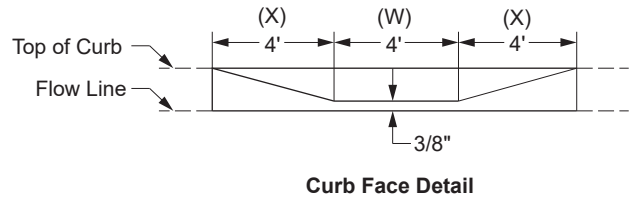
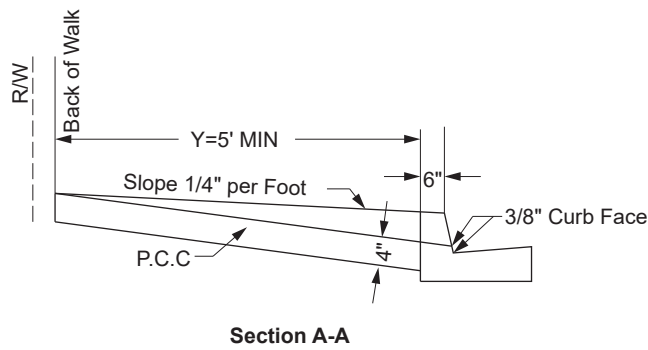
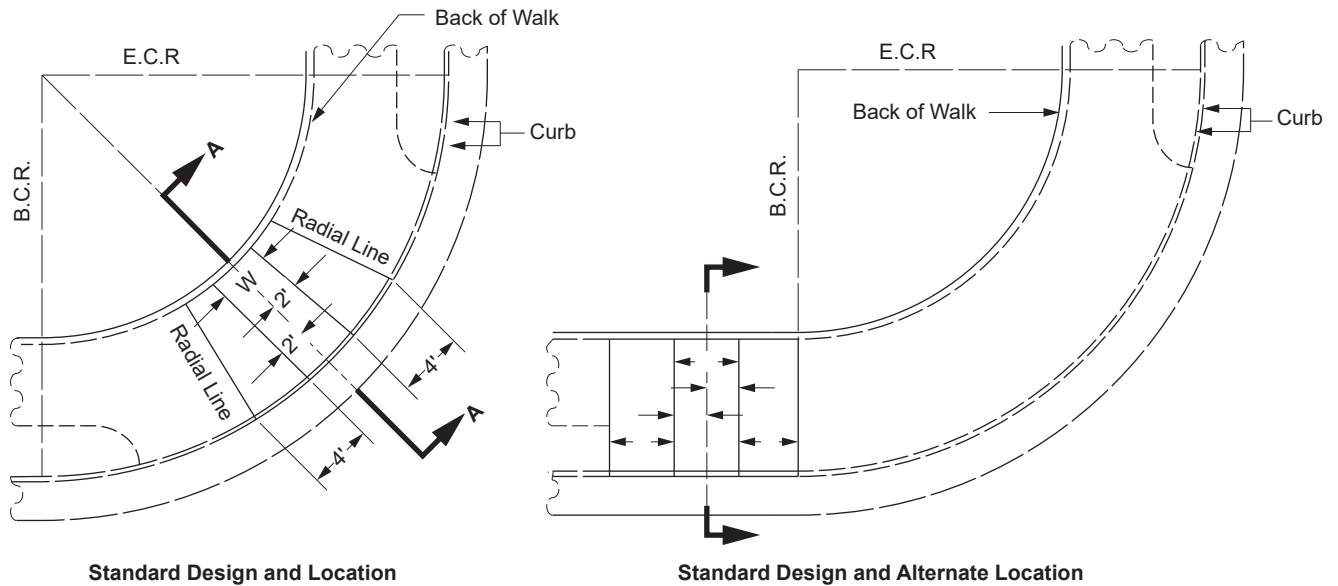
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MC 840 Wheelchair Ramps

Scope MC 840.1 Wheelchair Ramps

Wheelchair ramps are required only when specified on the working drawings. They shall be constructed as shown below in the location specified on the working drawings.

Figure MC 840-1: Wheelchair Ramps



Note(s):

1. Score lines are required at points "W" on all ramps.
2. Ramps shall have a rough broom finish transverse to the axis of the ramp. The finish must be rougher than the adjacent sidewalk.
3. Design may vary due to local regulations.

Approved by:

PHH

Wheelchair Ramps

MC 840

Sheet 1 of 1

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

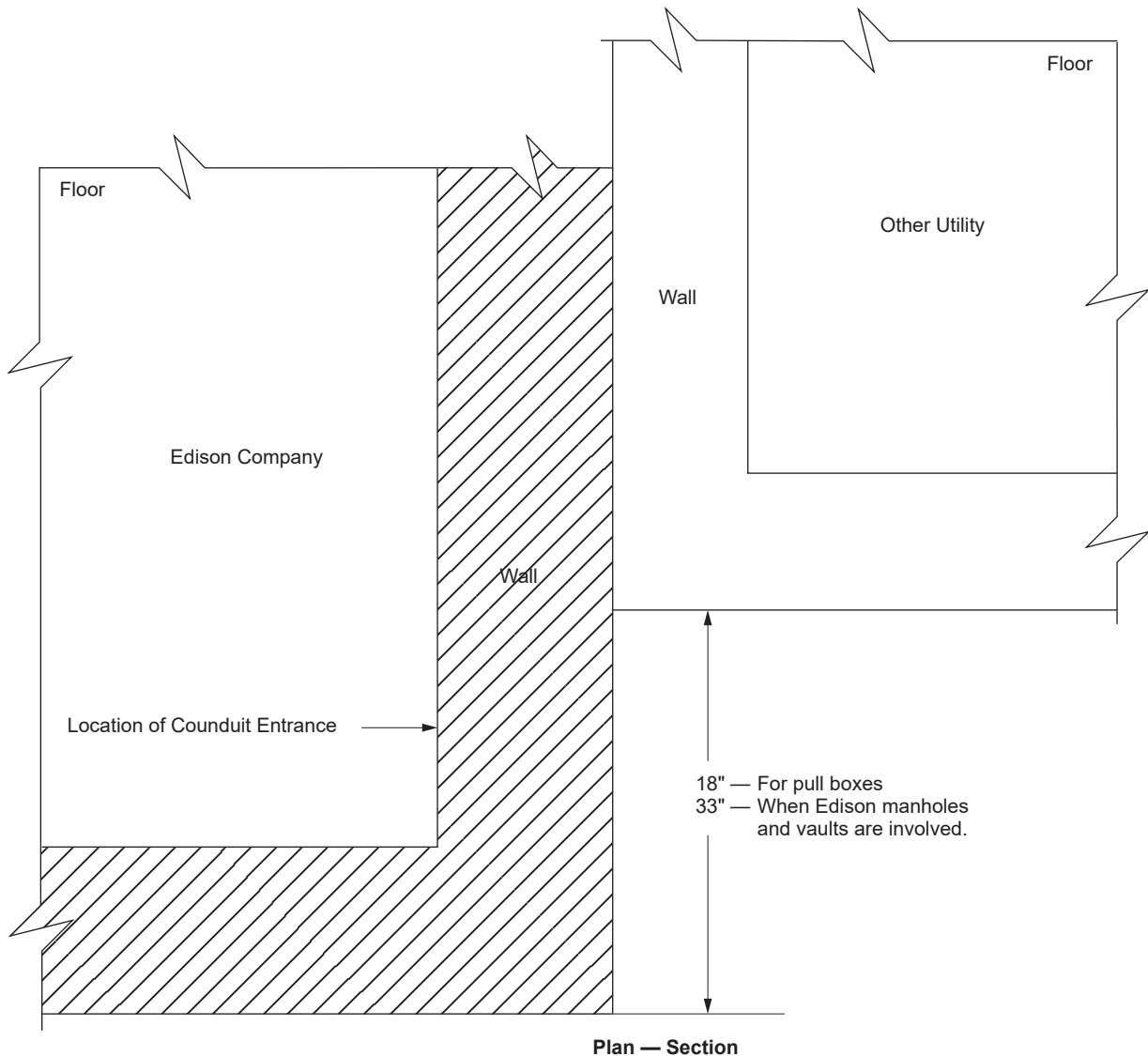
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MC 850 Structure Offsets for Joint Construction

Scope MC 850.1 Structure Offsets for Joint Construction

Figure MC 850-1: Structure Offsets for Joint Construction



Approved by:

PhH

Structure Offsets for Joint Construction

MC 850

Sheet 1 of 1

Effective Date:
10-26-2012

What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

UGS

► SCE Public ◀

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MC 860 Inspection Criteria for Concrete Vaults, Manholes, and Covers

Scope MC 860.1 Inspection Criteria for Concrete Vaults, Manholes, and Covers

1.0 General

This procedure defines criteria for UDI inspectors for concrete vaults, manholes, and covers.

2.0 Background

Vaults and Manhole Structures

Concrete structures have a limited life span of approximately 20-80 years. This variation is due to many factors including environmental, concrete mix design and loading conditions it has been subjected to. These factors cause structural deterioration including cracks, spalls, delamination, exposed reinforcing bars, and bulging. The extent of deterioration will affect structural integrity. Evaluating the extent of deterioration requires expertise. Therefore, a minimum criteria will be defined in this standard to determine when a Field Investigation (FI) is needed. This FI will be performed by a certified inspector and review by a licensed professional engineer.

Vault and Manhole Covers

Precast concrete covers in vaults typically have a life span less than the structure due to continuous traffic loads. Round iron covers typically have long life spans and rarely require replacement.

3.0 Definitions


1. Areas inside the structure – includes access, ceiling, side walls, end walls, and floor
2. Delamination – occurs when reinforcing steel beneath the surface is rusted and separated from the concrete layer
3. Spalling – delamination that has fallen off

4.0 UDI Inspection Criteria for Concrete Vaults and Manholes

Any of the following criteria found in the structure shall result in an FI.

1. A single crack is greater than 1/8 inch in width and 8 feet in continuous length. This includes continuous cracking from one area to another.
2. Total length of cracks (greater than 1/8 in width) is greater than 15 feet.
3. A total length of exposed steel reinforcing bars is greater than 5 feet.
4. Spalling or loose concrete is observed on 20% or more in one area (e.g. side wall and/or ceiling) of the structure.
5. Buckling, bulging, or displacing of concrete exceeds 1/2 inch from plumb. Do not include original deformities from concrete forming or similar.

If an FI is conducted, send notification to Deteriorated Vault and Manhole Program (DVMP).

Approved by: 	Inspection Criteria for Concrete Vaults, Manholes, and Covers	<div style="font-size: 2em; font-weight: bold; margin: 0;">MC 860</div> <div style="font-size: 0.8em; margin: 0;">Sheet 1 of 2</div>
Effective Date: 01-26-2018	What's Changed? Various verbiage additions and deletions for all major sections to clearly define inspection criteria for vaults, manholes, and covers.	<div style="font-size: 2em; font-weight: bold; margin: 0;">UGS</div> <div style="font-size: 0.8em; margin: 0;">▶ SCE Public ◀</div>

5.0 UDI Inspection Criteria for Structure Covers

The following criteria shall result in a replacement of a cover:

1. Cracks greater than 1/16 inch width found in the concrete portion of the vault cover.
2. Any cracks found in the round iron cover or frame



NOTE

Covers that meet the criteria above shall be replaced with the latest standard cover (See FC 623, FC 627, FC 660, FC 661, and FC 670)

MC 860

Inspection Criteria for Concrete Vaults, Manholes, and Covers

Approved by:

Sheet 2 of 2

What's Changed? Various verbiage additions and deletions for all major sections to clearly define inspection criteria for vaults, manholes, and covers.

Effective Date:

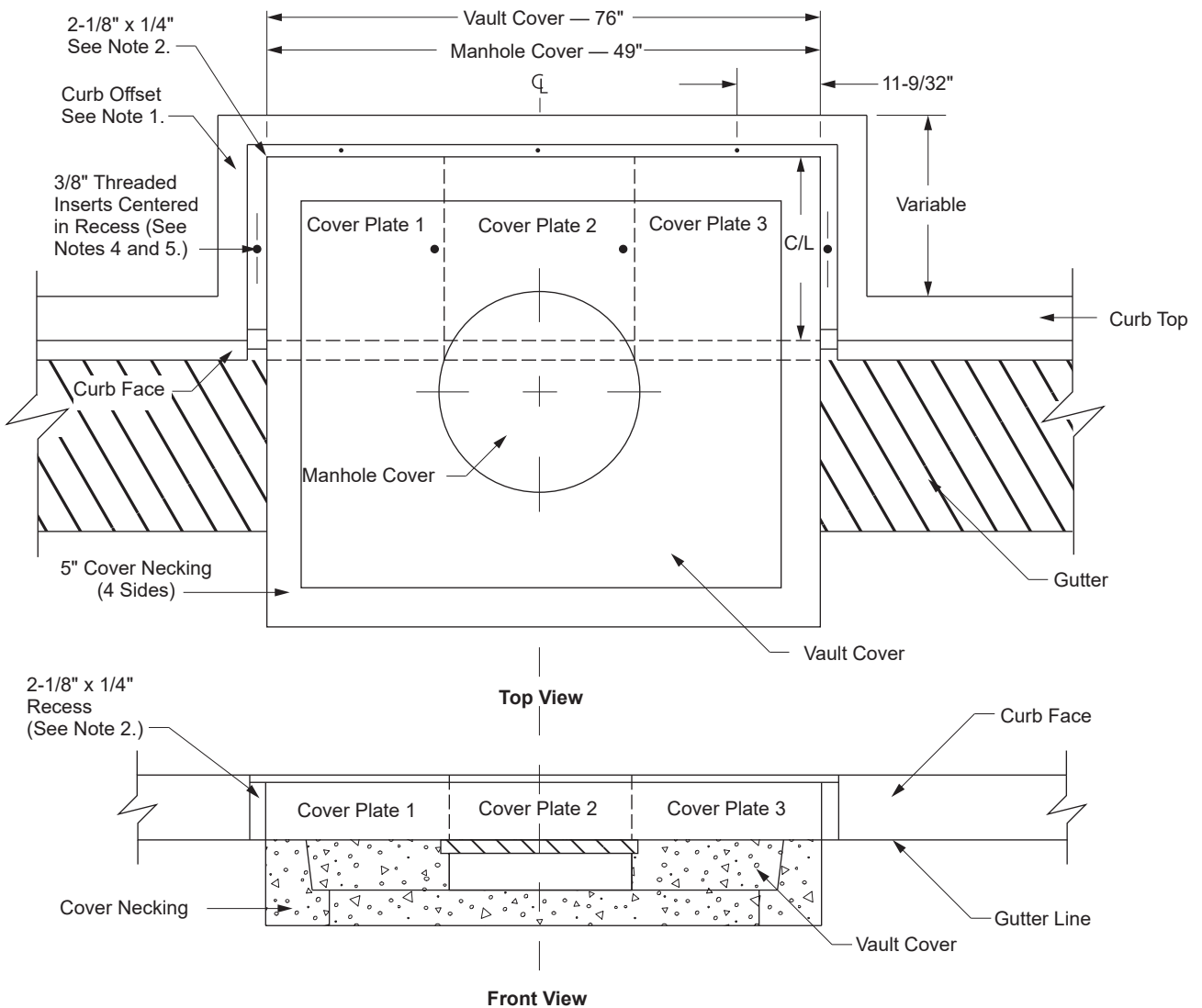
01-26-2018

UGS

MC 870 Removable Curb for 4' x 5' Vault Covers and Manhole Covers

Scope MC 870.1 Removable Curb for 4' x 5' Vault Covers and Manhole Covers

Figure MC 870-1: Removable Curb for 4' x 5' Vault Covers and Manhole Covers



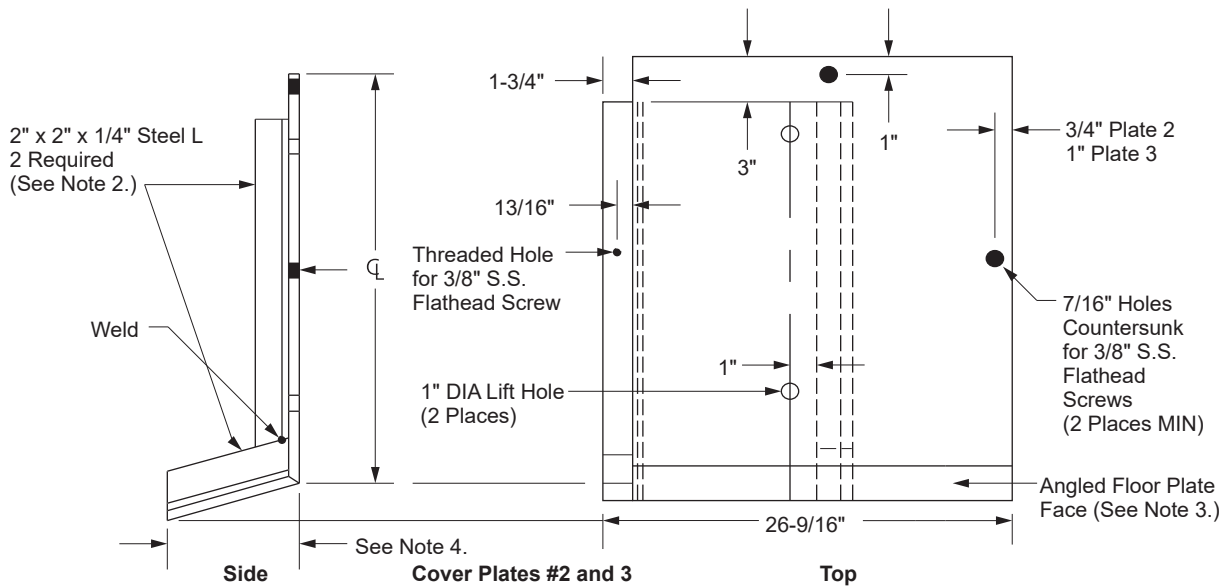
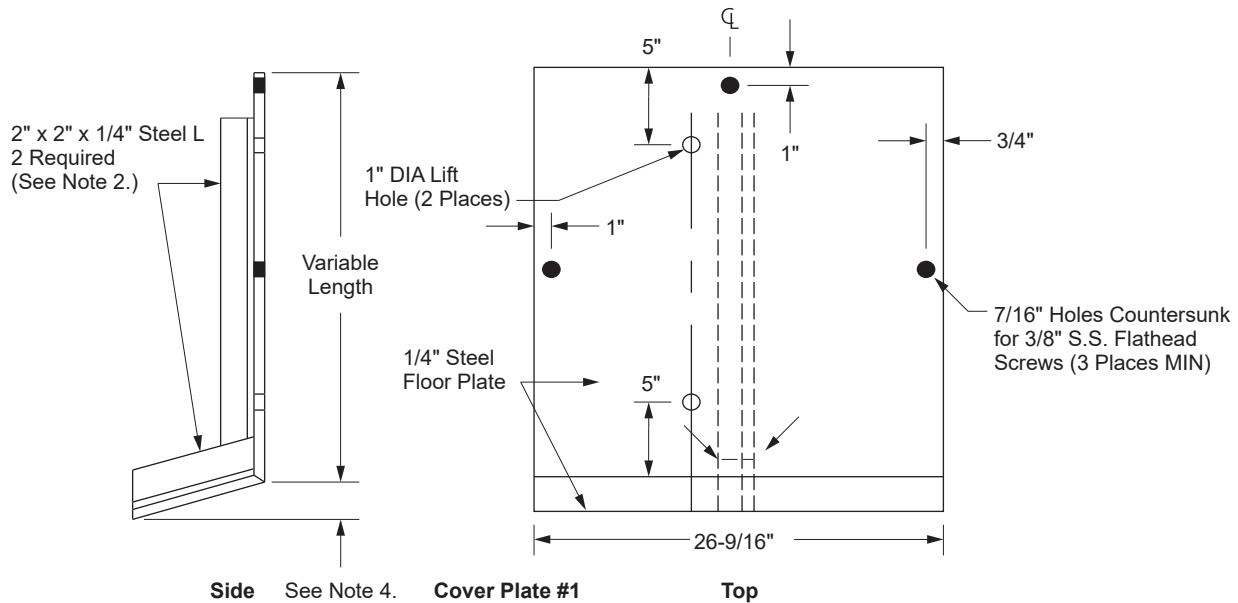
Note(s):

1. The three-sided offset curbing around the vault necking, or manhole necking, shall be constructed to the dimensions of the existing or proposed curbing.
2. A 2-1/8" wide by 1/4" deep recess shall be placed on top of the offset curb, and curb face, as shown on the drawing.
3. Three plate covers are required for 4' x 5' vault covers. Manhole covers require two plate covers (plate #1 and 3).
4. Threaded 3/8" inserts shall be placed in the 2-1/8" wide curb recesses, to the dimensions shown on the "Top View" drawing. A minimum of five inserts are required for the 4' x 5' vault cover, four for a manhole cover.
5. Whenever the plate depth exceeds 36", an additional insert, equally spaced, shall be placed into the recess of the offset curbing sides.
6. For steel cover plate details, see [Scope MC 870.2 \(Sheet 2\)](#).

Approved by: <i>B.C.</i>	Removable Curb for 4' x 5' Vault Covers and Manhole Covers	MC 870
Effective Date: 10-23-2015	What's Changed?	Sheet 1 of 2
		UGS

Scope MC 870.2 Removable Curbing (Steel Cover Plates)

Figure MC 870-2: Removable Curbing (Steel Cover Plates)



Note(s):

1. Nonskid 1/4" thick steel floor plates shall be constructed to the dimensions shown. See MC 860 for plate location sequence on curb offset.
2. The 2" x 2" x 1/4" steel L shall be welded to the top and angled floor plate face.
3. Angled floor plate face may be bent or welded in place to the top plate.
4. Angle and depth of floor plate face shall match standard curb.
5. A minimum of seven 3/8" stainless steel flathead screws are required for the 4' x 5' vault cover plates, and a minimum of five screws for the manhole plates.
6. Covers to be hot dip galvanized per ASTM A123 after fabrication.

MC 870

Removable Curb for 4' x 5' Vault Covers and Manhole Covers

Approved by:

B. C.

Sheet 2 of 2

What's Changed? Note 6 was updated for clarity.

Effective Date:

10-23-2015

UGS

MC 880 Repair Specifications for Concrete Pad Structures

Scope MC 880.1 Repair Specifications for Concrete Pad Structures

1.0 General

This procedure defines methods and materials for the repair of concrete pads in order to extend service life.

2.0 Repair Criteria

Structures shall be considered for repair if the following criteria are met:

Table MC 880–1: Exposed Rebar Remediation Guideline

	Length of Exposed Rebar ^{a/}	Length of Exposed Rebar ^{b/}	Recommended Time Frame
A - No Action	—	—	—
B - No Action	under 3"	—	—
C - Repair	under 12"	under 6"	up to 2 years
D - Repair	12" to 24"	6" to 12"	up to 1 year
E - Replace	24" to 36"	12" to 18"	up to 1 year
F - Replace	over 36"	Over 18"	up to 6 months

^{a/} Refer to Figure MC 880-1.1

^{b/} Refer to Figure MC 880-1.2

Figure MC 880–1: Rebar Exposure Depth (Section View)

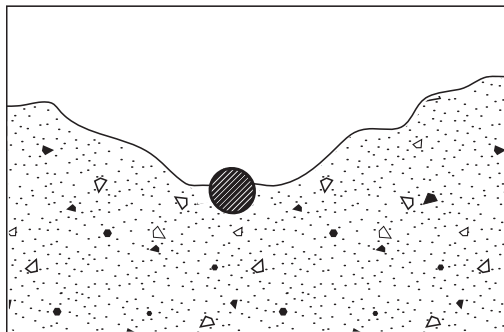


Figure MC 880–1.1

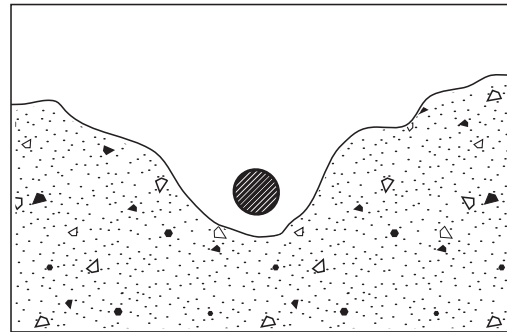


Figure MC 880–1.2

3.0 Repair Procedures

This procedure is intended for use on the exterior surface of a semi-surface buried structure. This procedure shall not be used for the interior portion of a semi-surface buried structure, vault or manhole. This procedure shall not be used on a frame or cover. FlexKRETE shall not be used if an outage is required to repair the concrete

Approved by:

B. C.

Repair Specifications for Concrete Pad Structures

MC 880

Sheet 1 of 5

Effective Date:

01-26-2018

What's Changed? Initial issue.

UGS

3.1 FlexKRETE (Preferred)

The repair of concrete shall be done using FlexKRETE and shall be in accordance with the latest version of the manufacturer's recommended application procedure.

Table MC 880–2: FlexKRETE Materials

Description	Amount	SAP Number
FlexKRETE Kit	1 Pint	10210023
	1 Quart	10210024
	1/2 Gallon	10210025
FlexPrime (Part A & B) Kit	2 Gallon	10210026
	2 Quart	10210027
	12 Ounces	10210028
FlexTemp Additive	5 Ounces	10210029

Table MC 880–3: List of Approved Tools for Preparation and Mixing

Tool Description	SAP Number
4-1/2" Grinder ^{a/}	10148461
Cold Chisel (7/8" Blade)	10143228
Small Sledge Hammer	10170841
1/2" Heavy Duty Drill Motor ^{b/}	10148363

^{a/} 1 steel grinder wheel and 1 stone grinder wheel needed for prep work and finish work, respectively.

^{b/} Mixing paddle needed for drill motor

A. Mixing and Application Procedures for FlexKRETE Pint, Quart and Half Gallon Kits

Tools Needed for successful mixing:

- Drill motor – 1/2" preferred
- Mixing paddle – Hamster Cage type
- One additional, clean 5-gallon bucket

Open Kit and verify contents:

- Plastic container containing FlexKRETE (Pint kit, pint container, Quart kit, quart container and so on).
- Sand
- 4 oz. bottle with appropriate amount of clear catalyst.
- Plastic container containing Fumed Silica (Pint kit, pint container, Quart kit, quart container and so on).
- Plastic Quart. mixing cup
- One pair gloves
- 2" and 6" plastic putty knives
- 2" wide chip brush
- Wood or plastic stir stick

Mixing:


1. Open container marked FlexKRETE and pour entire contents into the clean 5-gallon bucket.
2. Open 4 oz. bottle of catalyst and pour entire contents into the same 5-gallon bucket.
3. Mix both liquids together until thoroughly blended. (approx. 30 seconds). At this point the catalyzed FlexKRETE will be used as the primer.
4. Add sand from the 5-gallon pail that held the kit, into the blended mixture and blend until all sand is saturated with the catalyzed FlexKRETE. (Save 5-gallon bucket for the mixing of the next kit)
5. Open container of fumed silica and pour into bucket. Be careful not to breathe in the fumed silica. Mix until all signs of the fumed silica are gone. The fumed silica adds strength while reducing weight keeping the product from sagging or fall away when applying on vertical repairs.

Application Tips

The warmer and drier the air the quicker the mixture will cure. This product can cure in as little as 15 minutes in high temperatures. Do not apply this product unless the area to be repaired is free of any and all moisture, as the moisture will stop the curing process. This product cures by a chemical reaction causing a buildup of heat. This heat will draw moisture out of the concrete or air and stop the curing process.

Surface Preparation

The area to be repaired needs to be free of all oils, dirt, dust, organics, moisture and other contaminates. It may be necessary to clean the repair area with a grinder and or wire brush.

Approved by: 	Repair Specifications for Concrete Pad Structures	MC 880
Effective Date: 01-26-2018	What's Changed? Initial issue.	Sheet 3 of 5 UGS

Priming of Repair Area

The area to be repaired needs to be primed. Prime with the catalyzed product. After performing mixing procedure number 3, in the above mixing instructions, use the provided paint brush to apply the catalyzed FlexKRETE to the repair area paying close attention to the nooks and crannies. This allows the liquid to penetrate into the "bores" of the concrete assuring a complete and solid bond. Paint all concrete and rebar. Once the area is primed, proceed to step 4 of the mixing instructions.

Placing

Once the FlexKRETE, catalyst, sand and fumed silica have been thoroughly mixed it can be applied. Use the provided putty knives to pack, apply and finish the mixture to the damaged area. It is important to force the material into all the nooks and crannies to assure a strong bond. Do not worry if the primer has cured FlexKRETE will adhere to itself extremely well. If needed, a light grinding on the cured FlexKRETE will/can remove over pours, high spots, and other such imperfections.

Estimated Cure Rates

100°F and up	15 minutes or less
90°F – 100°F	15 minutes to 1/2 hour
70°F – 90°F	1/2 hour to 45 minutes
40°F – 70°F	45 minutes to 1-1/2 hours

These are only estimates. Other factors that will affect the cure rates are:

- Humidity
- Temperature of the concrete
- Temperature of the sand
- Temperature of the FlexKrete
- Size of the repair being made. A large repair will generate more heat quicker.

3.2 QuiKRETE (SAP 10205739) (Alternative)

When FlexKRETE is not available and if repair need to be done with urgency, QuiKRETE Quick-Setting Cement shall be used as an alternative to repair cracks and spalls on concrete pad structures.

3.3 Bullseye Quick Patch (Alternative)

This product is an ultraviolet light activated repair patch material that can be used for the repair of BURD rings, vent pipes, risers (secondary and primary), pads (fiberglass, corroded unistruts and hand holes).

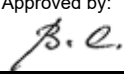
Table MC 880–4: Bullseye Quick Patch Details

Patch Size ^{a/}	SAP Number
6" x 9"	10185030
9" x 12"	10185031

^{a/} Each SAP code comes with 12 packages capable of repairing their respective patch size.

Note(s):

1. Bullseye Quick patch shall not be used for concrete repairs.

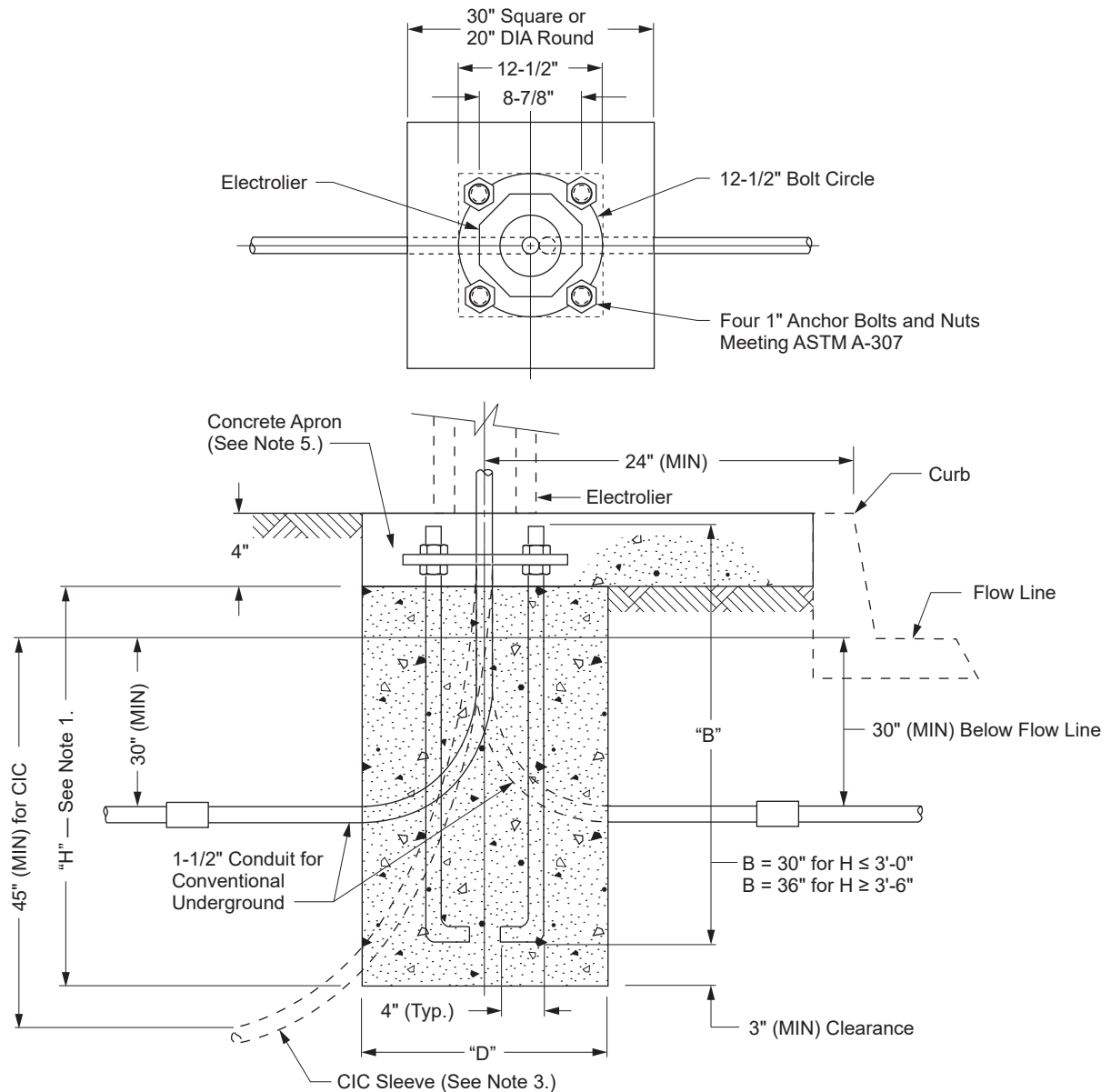
Approved by: 	Repair Specifications for Concrete Pad Structures	MC 880
Effective Date: 01-26-2018	What's Changed? Initial issue.	Sheet 5 of 5
		UGS

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MC 890 Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers

Scope MC 890.1 Electrolier Foundation Detail

Figure MC 890-1: Electrolier Foundation Detail



Note(s):

1. The footing depth will vary depending on the type of soil and wind loading requirements. See [Table MC 890-1 \(Sheet 3\)](#) through [Table MC 890-4 \(Sheet 4\)](#).
2. Foundation shall be installed after conduit or CIC (for Underground Service), curbs, and sidewalks are in place and grades are established.
3. 1-1/2" Plastic CIC Sleeve for UG Concrete Electrolier (tape both ends to prevent debris from entering the sleeve).
4. Concrete to reach a minimum compression strength of 2800 psi in 28 days. See UGS 20.3.
5. Place a minimum size concrete apron of 30" x 30" x 4" thick around the pole at the ground level to provide a constrained surface condition when required. Grout to be placed after pole is set and plumbed.

Approved by:

B.C.

Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers

MC 890

Sheet 1 of 4

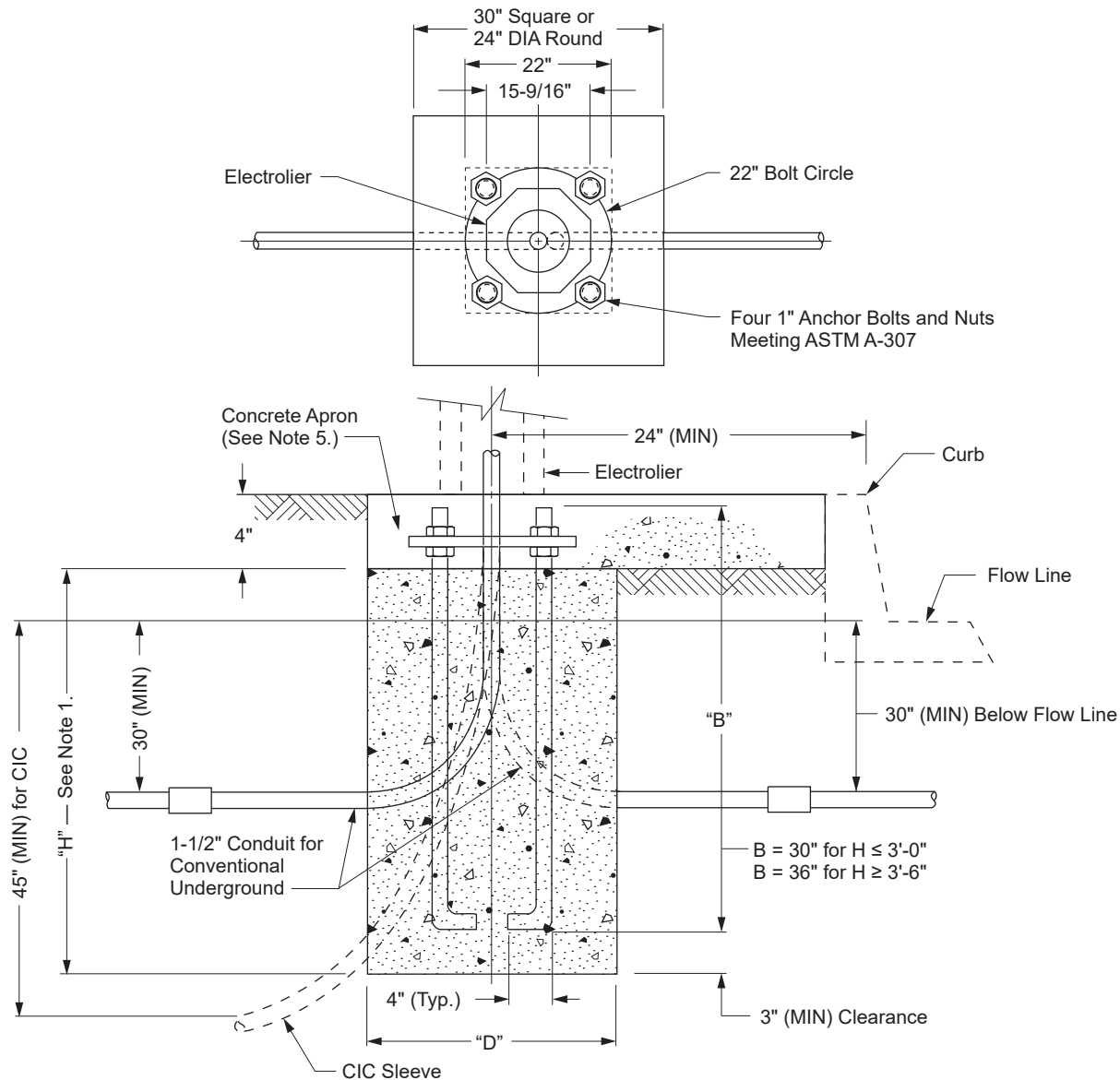
Effective Date:
01-26-2018

What's Changed? Figure MC 890-1, Note 1 was updated for clarity.

UGS

Scope MC 890.2 Marbelite Nostalgic Electrolier Foundation Detail

Figure MC 890-2: Marbelite Nostalgic Electrolier Foundation Detail



Note(s):

1. The footing depth will vary depending on the type of soil and wind loading requirements. See [Table MC 890-1 \(Sheet 3\)](#) through [Table MC 890-4 \(Sheet 4\)](#).
2. Foundation shall be installed after conduit or CIC (for Underground Service), curbs, and sidewalks are in place and grades are established.
3. 1-1/2" Plastic CIC Sleeve for UG Concrete Electrolier (tape both ends to prevent debris from entering the sleeve).
4. Concrete to reach a minimum compression strength of 2800 psi in 28 days. See UGS 20.3.
5. Place a minimum size concrete apron of 30" x 30" x 4" thick around the pole at the ground level to provide a constrained surface condition when required. Grout to be placed after pole is set and plumbed.

MC 890

Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers

Approved by:

B. C.

Sheet 2 of 4

What's Changed? Figure MC 890-2, Note 1 was updated for clarity.

Effective Date:

01-26-2018

UGS

Scope MC 890.3 Electrolier Foundation Requirements

Table MC 890-1: 70 MPH Wind Zone, Constrained Surface Condition

Electrolier Foundation Requirements								
	Soil Type Per UBC ^{a/}	Fiberglass, Concrete, or Steel				Nostalgic		
		23' Shaft		28' Shaft		All Poles	Fiberglass	Marbelite
		H	D	H	D	H	D	D
I.	Massive Crystalline Bedrock	2'-6"	20" dia.	2'-6"	20" dia.	2'-6"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
II.	Sedimentary and Foliated Rock	2'-6"	20" dia.	2'-6"	20" dia.	2'-6"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
III.	Sandy Gravel, Gravel	3'-0"	20" dia.	3'-0"	20" dia.	3'-0"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
IV.	Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel	3'-6"	20" dia.	3'-6"	20" dia.	3'-6"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
V.	Clay, Sands, Sandy Clay, Silty Clay, Clayey Silt	4'-0"	20" dia.	4'-6"	20" dia.	4'-0"	20" dia.	24" dia.
		2'-6"	30" x 30"	3'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"

^{a/} Uniform Building Code — 1991

Note(s):

1. H = Depth of footing
2. D = Diameter of round footing or the side dimension of square footing.

Table MC 890-2: 70 MPH Wind Zone, Non-Constrained Surface Condition

Electrolier Foundation Requirements								
	Soil Type Per UBC ^{a/}	Fiberglass, Concrete, or Steel				Nostalgic		
		23' Shaft		28' Shaft		All Poles	Fiberglass	Marbelite
		H	D	H	D	H	D	D
I.	Massive Crystalline Bedrock	2'-6"	20" dia.	2'-6"	20" dia.	2'-6"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
II.	Sedimentary and Foliated Rock	3'-0"	20" dia.	3'-6"	20" dia.	3'-0"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
III.	Sandy Gravel, Gravel	3'-6"	20" dia.	4'-0"	20" dia.	3'-6"	20" dia.	24" dia.
		3'-0"	30" x 30"	3'-0"	30" x 30"	3'-0"	30" x 30"	30" x 30"
IV.	Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel	4'-0"	20" dia.	4'-6"	20" dia.	4'-0"	20" dia.	24" dia.
		3'-0"	30" x 30"	3'-6"	30" x 30"	3'-0"	30" x 30"	30" x 30"
V.	Clay, Sands, Sandy Clay, Silty Clay, Clayey Silt	4'-6"	20" dia.	5'-0"	20" dia.	4'-6"	20" dia.	24" dia.
		3'-6"	30" x 30"	4'-0"	30" x 30"	3'-6"	30" x 30"	30" x 30"

^{a/} Uniform Building Code — 1991

Note(s):

1. H = Depth of footing
2. D = Diameter of round footing or the side dimension of square footing.

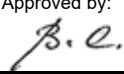
Approved by: 	Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers	MC 890
Effective Date: 01-26-2018	What's Changed?	
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Table MC 890-3: 90 MPH Wind Zone, Constrained Surface Condition

Electrolier Foundation Requirements								
	Soil Type Per UBC ^{a/}	Fiberglass, Concrete, or Steel				Nostalgic		
		23' Shaft		28' Shaft		All Poles	Fiberglass	Marbelite
		H	D	H	D	H	D	D
I.	Massive Crystalline Bedrock	2'-6"	20" dia.	2'-6"	20" dia.	2'-6"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
II.	Sedimentary and Foliated Rock	3'-0"	20" dia.	3'-6"	20" dia.	3'-0"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
III.	Sandy Gravel, Gravel	3'-0"	20" dia.	4'-0"	20" dia.	3'-6"	20" dia.	24" dia.
		3'-0"	30" x 30"	3'-0"	30" x 30"	3'-0"	30" x 30"	30" x 30"
IV.	Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel	4'-0"	20" dia.	4'-6"	20" dia.	4'-0"	20" dia.	24" dia.
		3'-0"	30" x 30"	3'-6"	30" x 30"	3'-0"	30" x 30"	30" x 30"
V.	Clay, Sands, Sandy Clay, Silty Clay, Clayey Silt	4'-6"	20" dia.	5'-0"	20" dia.	4'-6"	20" dia.	24" dia.
		3'-6"	30" x 30"	4'-0"	30" x 30"	3'-6"	30" x 30"	30" x 30"

^{a/} Uniform Building Code — 1991

Note(s):

1. H = Depth of footing
2. D = Diameter of round footing or the side dimension of square footing.

Table MC 890-4: 90 MPH Wind Zone, Non-Constrained Surface Condition

Electrolier Foundation Requirements								
	Soil Type Per UBC ^{a/}	Fiberglass, Concrete, or Steel				Nostalgic		
		23' Shaft		28' Shaft		All Poles	Fiberglass	Marbelite
		H	D	H	D	H	D	D
I.	Massive Crystalline Bedrock	2'-6"	20" dia.	3'-0"	20" dia.	2'-6"	20" dia.	24" dia.
		2'-6"	30" x 30"	2'-6"	30" x 30"	2'-6"	30" x 30"	30" x 30"
II.	Sedimentary and Foliated Rock	4'-0"	20" dia.	4'-0"	20" dia.	4'-0"	20" dia.	24" dia.
		3'-0"	30" x 30"	3'-0"	30" x 30"	3'-0"	30" x 30"	30" x 30"
III.	Sandy Gravel, Gravel	5'-0"	20" dia.	5'-6"	20" dia.	5'-0"	20" dia.	24" dia.
		3'-6"	30" x 30"	4'-0"	30" x 30"	3'-6"	30" x 30"	30" x 30"
IV.	Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel	5'-6"	20" dia.	6'-0"	20" dia.	5'-6"	20" dia.	24" dia.
		4'-0"	30" x 30"	4'-6"	30" x 30"	4'-0"	30" x 30"	30" x 30"
V.	Clay, Sands, Sandy Clay, Silty Clay, Clayey Silt	6'-0"	20" dia.	6'-6"	20" dia.	6'-0"	20" dia.	24" dia.
		4'-6"	30" x 30"	5'-0"	30" x 30"	4'-6"	30" x 30"	30" x 30"

^{a/} Uniform Building Code — 1991

Note(s):

1. H = Depth of footing
2. D = Diameter of round footing or the side dimension of square footing.

MC 890

Foundation Detail for Fiberglass Nostalgic, Fiberglass, Steel, or Concrete Electroliers

Approved by:



Sheet 4 of 4

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