

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>
		Effective Date: 04-30-2021

Sheet iv

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.

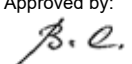
3.6 Special care will be taken to prevent damage to existing buried structures and facilities. Contractors will assume responsibility for proper notification and restitution to interested parties in the event of damage to existing structures.

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.

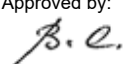
5.4 Concrete for conduit bank protection may have the following minimum proportions:

- 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

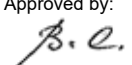
- A. Backfill will be considered as starting one foot (305 mm) above the pipe or conduit, or at the top of concrete bedding over the pipe or conduit. All material below this point will be considered bedding.
- B. All backfill will be placed as specified in Section 6.3 (Sheet 4) and compaction requirements 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:

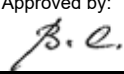
- 1. In upper three feet (914 millimeters), measured from the pavement surface (or finished grade where there is no pavement), within the existing or future traveled roadway, shoulders, and other paved areas (or areas to receive pavement);
- 2. Within engineered embankments;
- 3. Where lateral support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

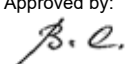
All surface pavement damaged or removed as a result of the excavation work will be reconstructed to the same dimensions, except for pavement thickness below, and with the same type material used in the original work. Resurfacing will be one inch (25 mm) greater in thickness than existing pavement.

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

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

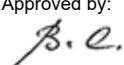
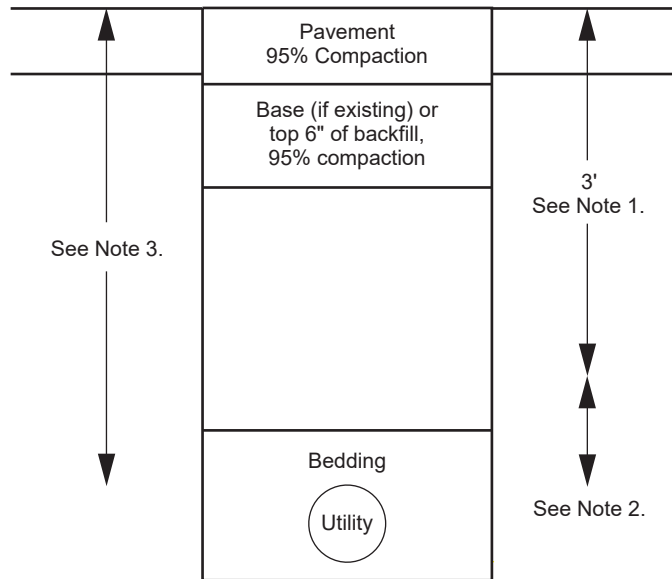
Approved by: 	Conduit Installation Standards	CD 100
Effective Date: 10-23-2015	What's Changed?	Sheet 7 of 9 UGS

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

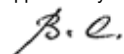
UGS

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


This page intentionally left blank.

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

This page intentionally left blank.

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:

Sheet 2 of 3

What's Changed?

Effective Date:


UGS

01-26-2007

Scope CD 110.2 Fittings

1.0 Fittings

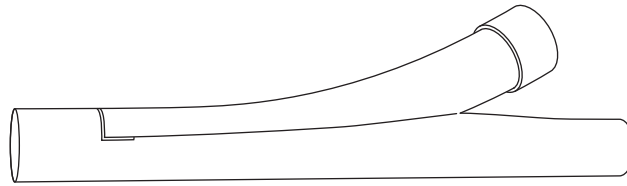
- 1.1 All couplings, adapters, segments, end bells, and so forth will be standard types recommended by the manufacturer or a Company-approved equal.
- 1.2 The couplings, sweeps, and other fittings are to be made of the same material as the conduit.
- 1.3 Offset couplings are not approved.
- 1.4 The spigot 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

This page intentionally left blank.

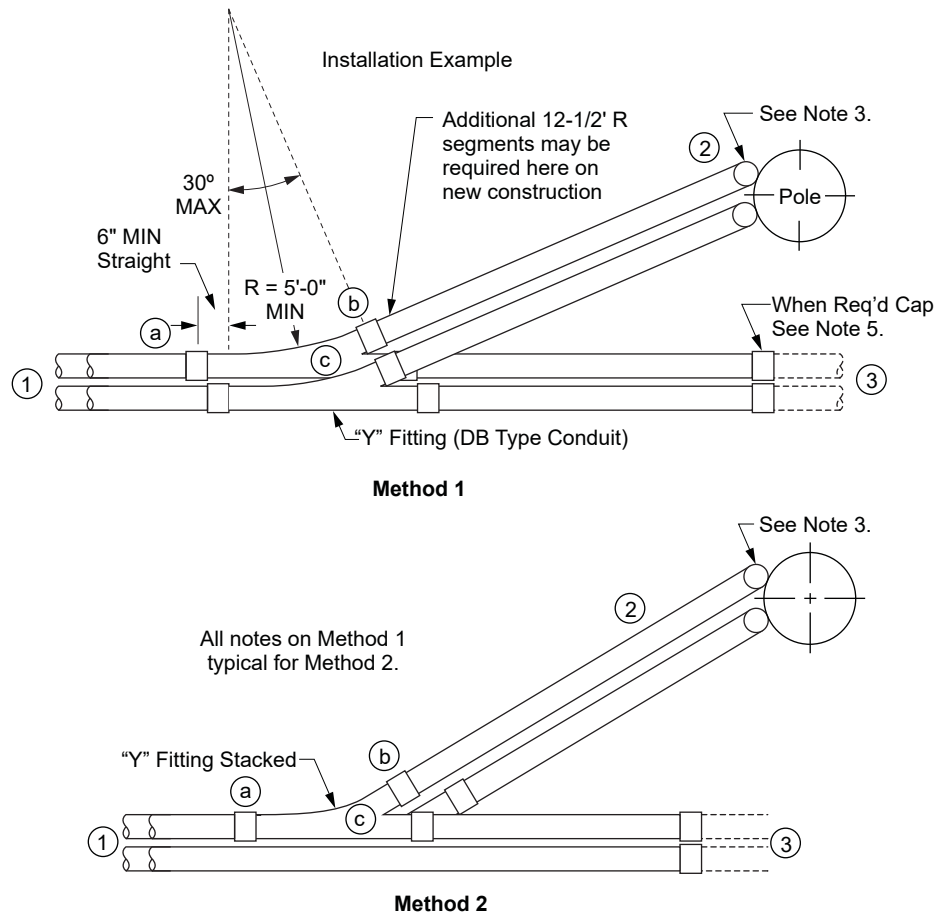
CD 111 "Y" Fittings
Scope CD 111.1 "Y" Fittings

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: <i>PhH</i>	"Y" Fittings	CD 111
Effective Date: 01-26-2007	What's Changed?	
		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:
UGS		01-26-2007

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](#).

<p>CD 112</p>	<p>Instructions for Solvent Welding and Installation of Semi-Rigid Plastic Conduit and Fittings</p>	<p>Approved by: <i>B. C.</i></p>
<p>Sheet 2 of 2</p>	<p>What's Changed?</p>	<p>Effective Date:</p>
<p>UGS</p>		<p>10-24-2014</p>

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:

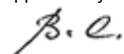
- A. Cantex Inc.
- B. Prime Conduit
- C. JM Manufacturing
- D. Heritage Plastics

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

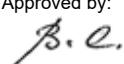
- 3.1 All conduit will be clearly marked with the manufacturer's name, PVC cell classification, size, type of conduit, the manufacturer's minimum wall thickness, code or control number, actual manufacture date, and the designation "ASTM F512" at intervals of 1.5 meters (5 feet) or less. Any additional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

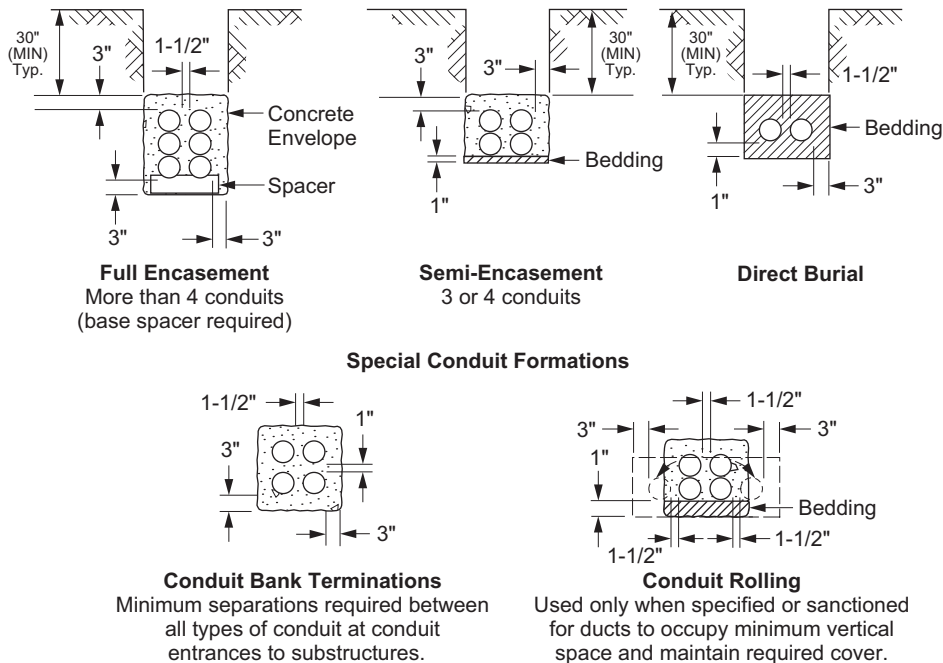
1. All inspections and tests will be performed per the requirements of ASTM F512-89a and the Underground Structures Book standards and will include the supporting documentation.
2. Documentation will be maintained by the manufacturer for a period of two years and will be available for review by SCE auditors.
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: <i>B. C.</i>
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

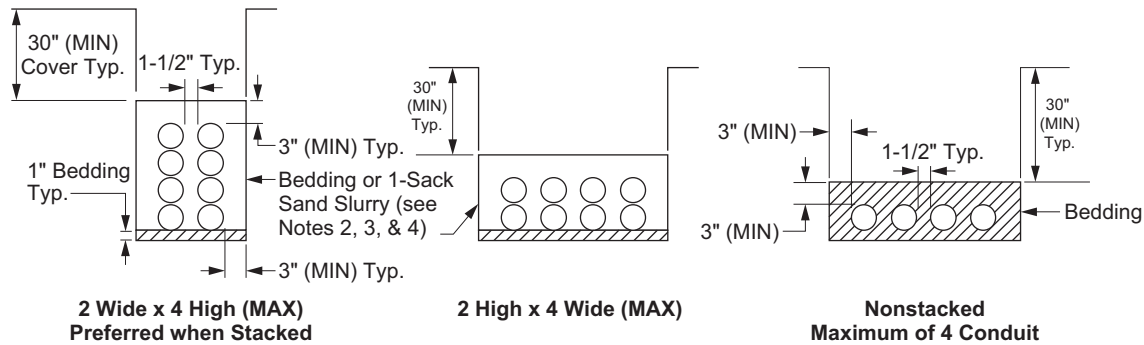
Effective Date:
04-30-2021

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

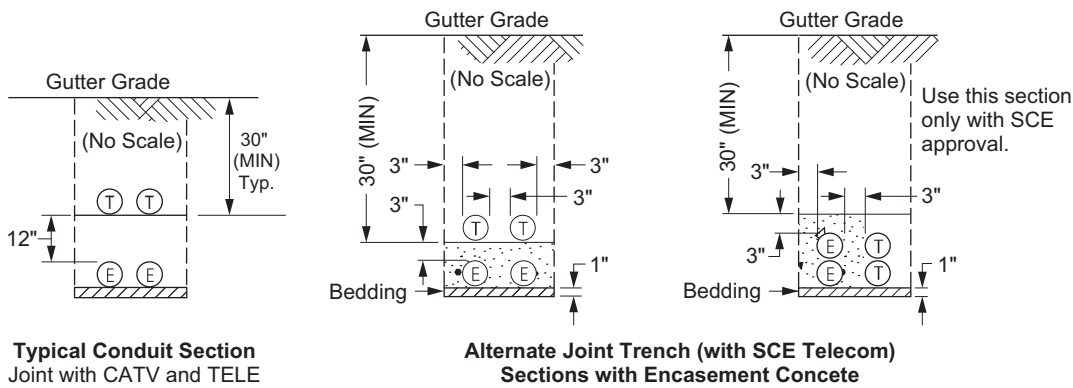
UGS

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.

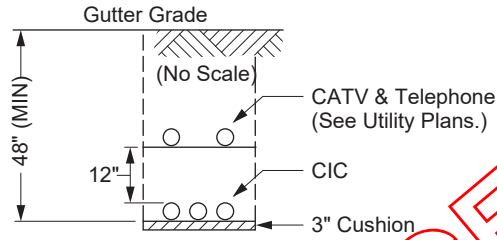
Effective Date:

UGS

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:

RR

Conduit Bank Requirements

CD 120

Sheet 3 of 3

Effective Date:

04-30-2021

What's Changed?

UGS

This page intentionally left blank.

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

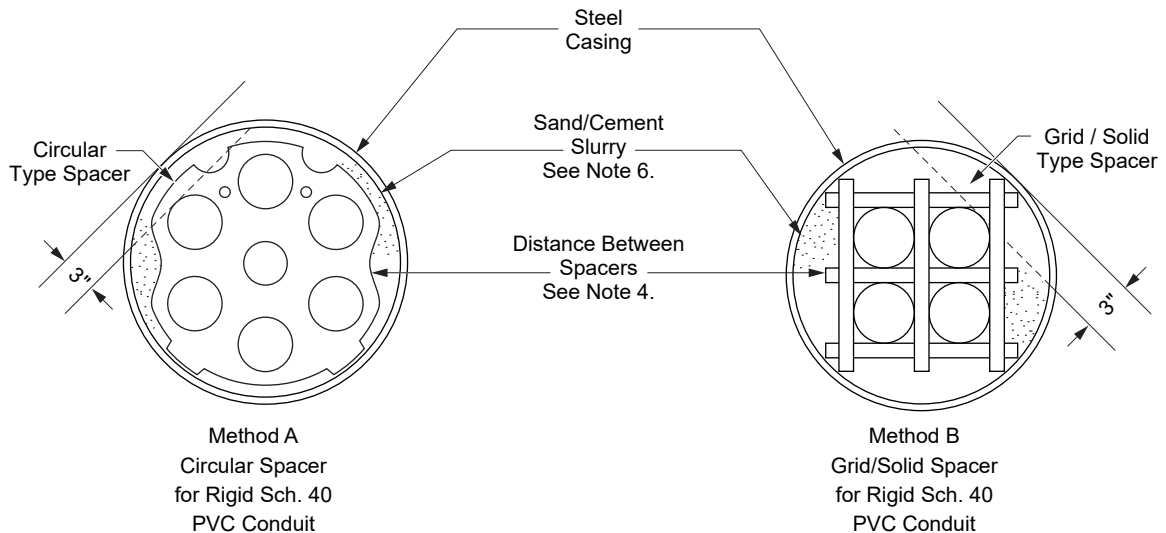


Table CD 121–1: Conduit Bank Requirements – Installation in a Bore

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

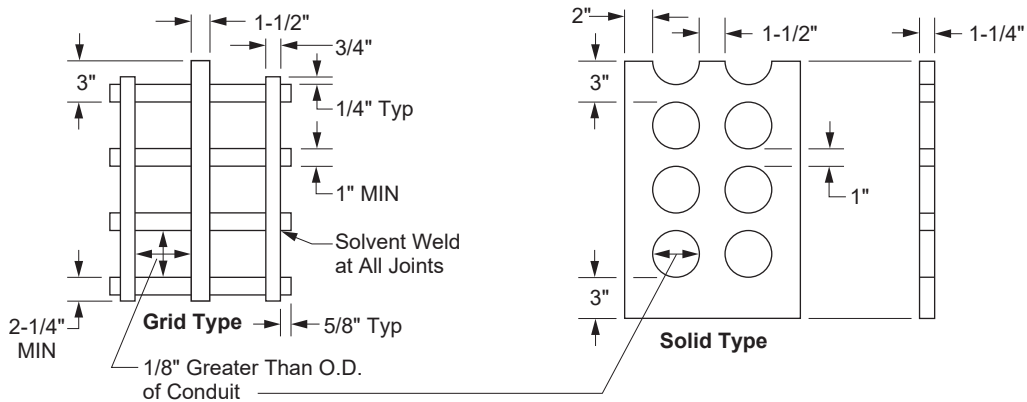
Effective Date:
04-30-2021

What's Changed?

UGS

Scope CD 121.2 Conduit Spacers

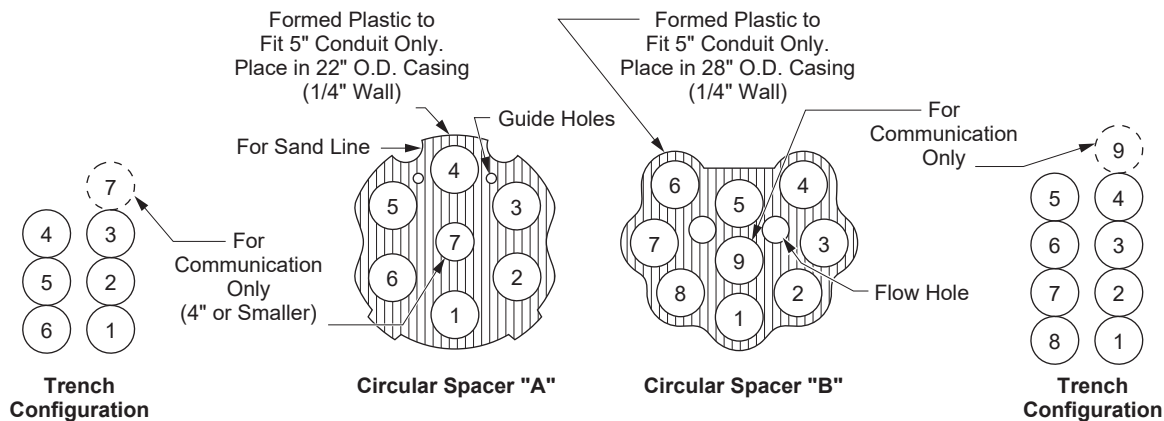
Figure CD 121-2: Conduit Spacers



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

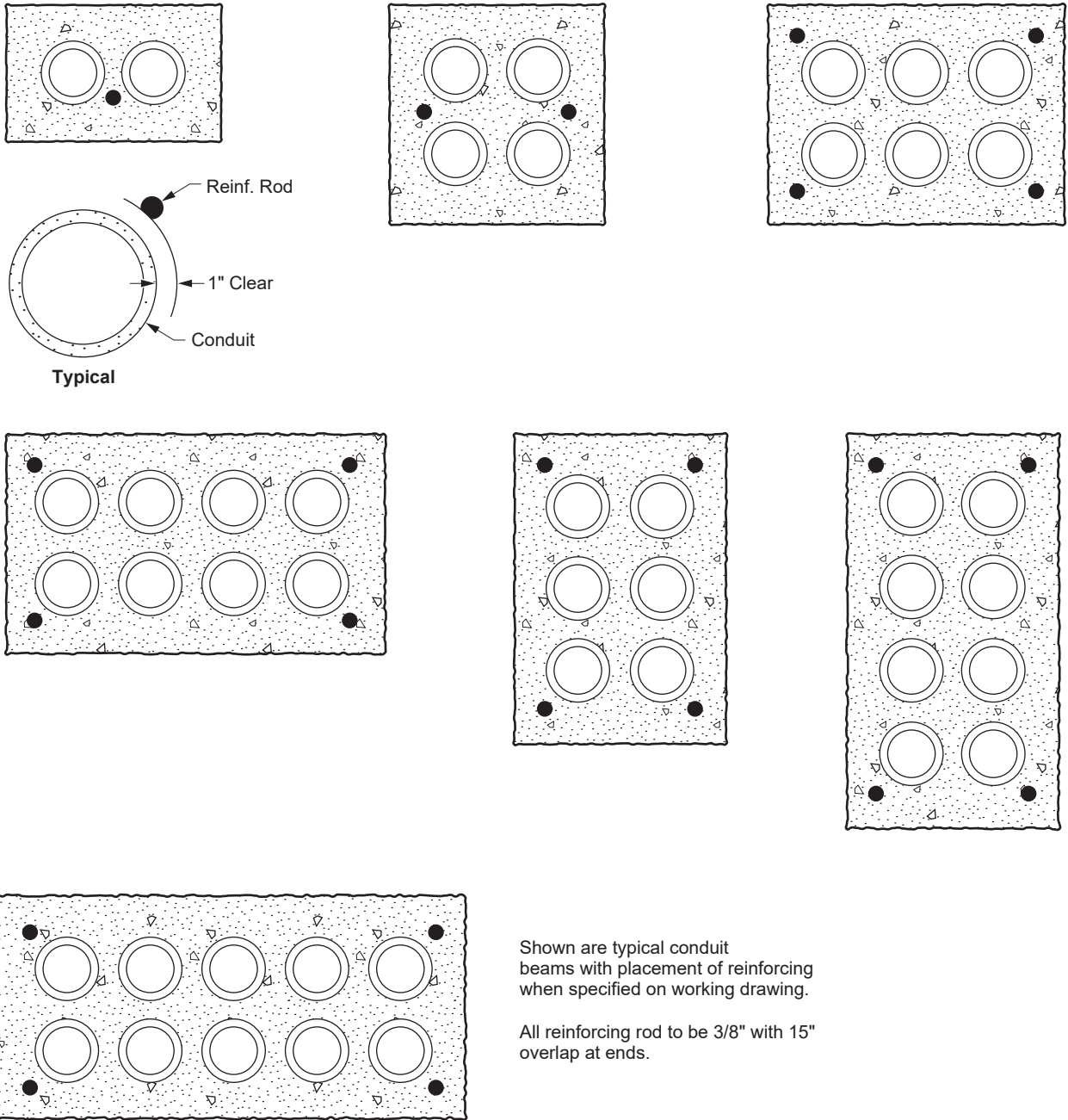
Suppliers Armorcast Products Company
 13230 Satcoy Street
 North Hollywood, CA 91605

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

This page intentionally left blank.

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

Sheet 1 of 1

Effective Date:
01-26-2007

What's Changed?

UGS

► SCE Public ◀

This page intentionally left blank.

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

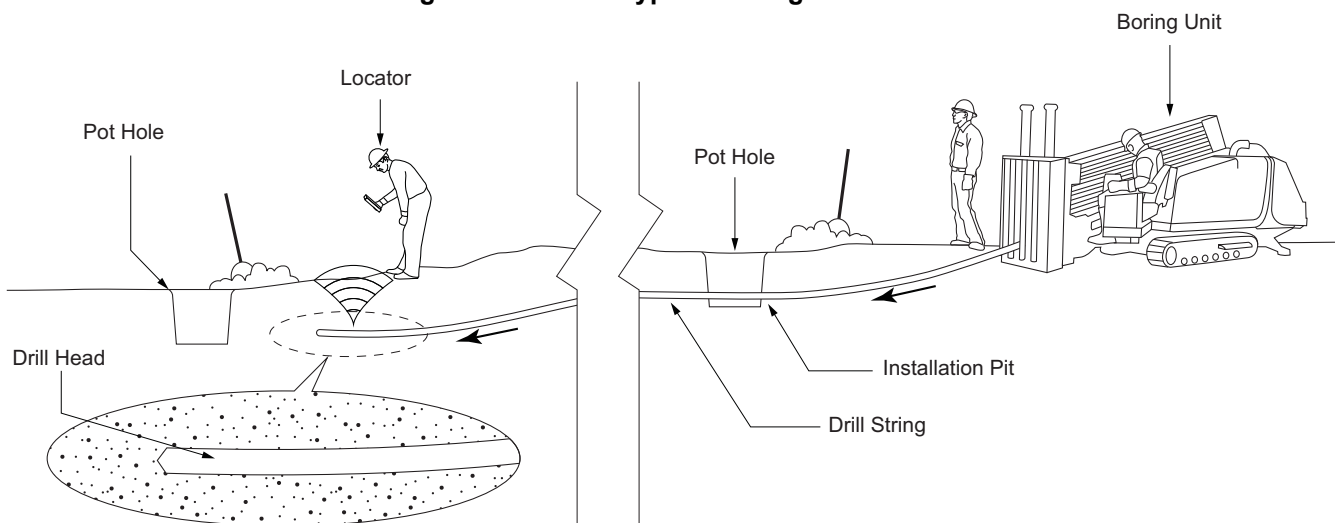
4.0 Construction Requirements for Directional Boring

- 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



CD 125

Directional Boring Installation Standards

Approved by:

a/j

Sheet 2 of 3

What's Changed? Section 4.1 updated for clarity..

Effective Date:

07-27-2018

UGS

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

This page intentionally left blank.

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

Figure CD 130-1: Standard Conduit Entrance Details

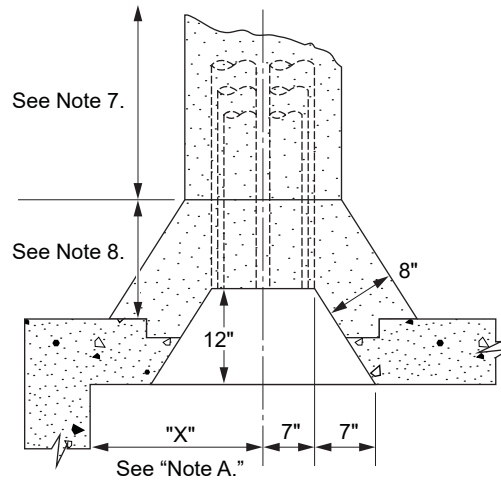


Figure CD 130-1.1: Plan Section

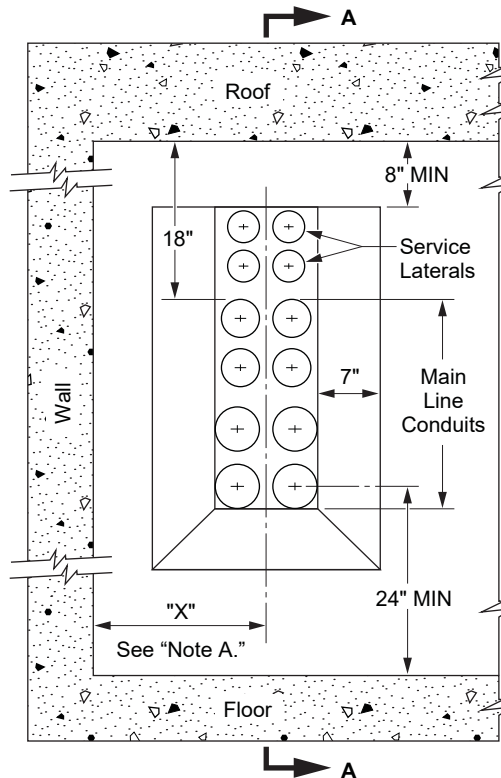


Figure CD 130-1.2: Elevation

Approved by:

PhH

Standard Conduit Entrance Details

CD 130

Sheet 1 of 2

Effective Date:
01-26-2007

What's Changed?

UGS

► SCE Public ◄

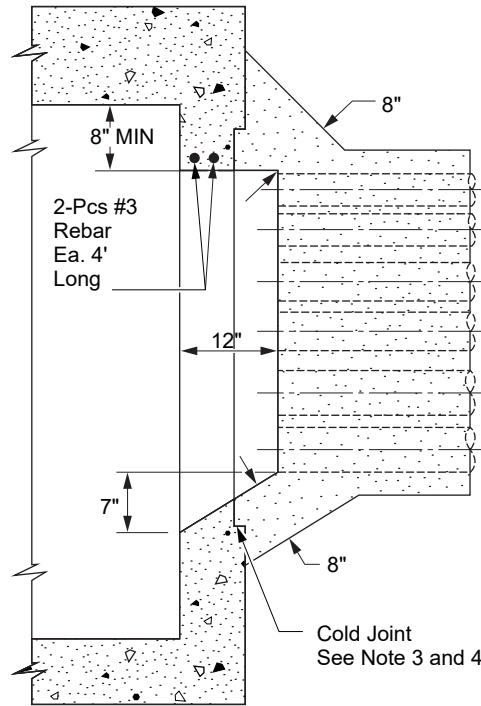


Figure CD 130-1.3: Section A-A

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

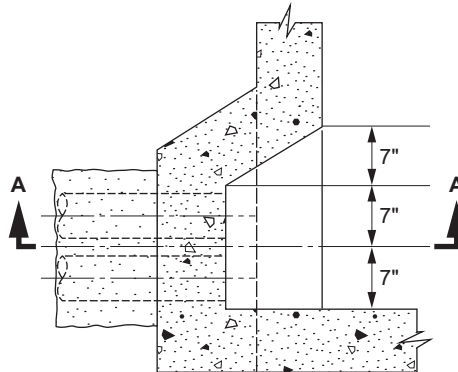


Figure CD 131-1.1: Plan Section

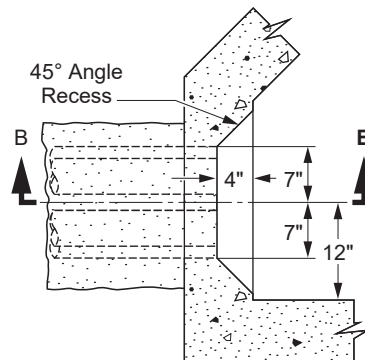



Figure CD 131-1.2: Plan Section

Approved by: 	Standard and Special Conduit Entrances	CD 131
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 3 UGS

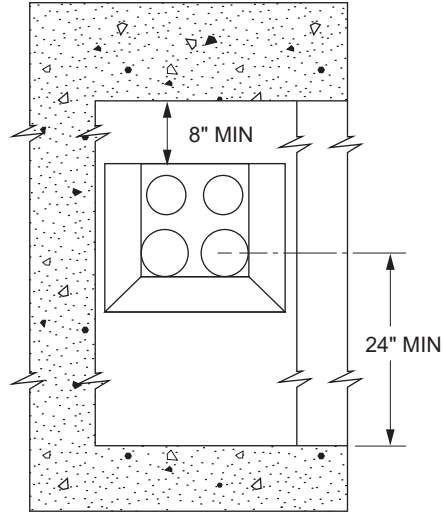


Figure CD 131-1.3: Elevation

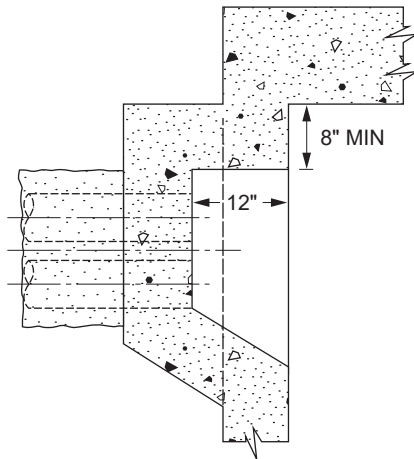


Figure CD 131-1.4: Section A-A

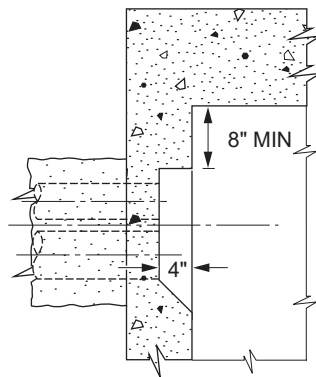


Figure CD 131-1.5: Section B-B

CD 131

Standard and Special Conduit Entrances

Approved by:

PHH

Sheet 2 of 3

What's Changed?

Effective Date:

UGS

01-26-2007

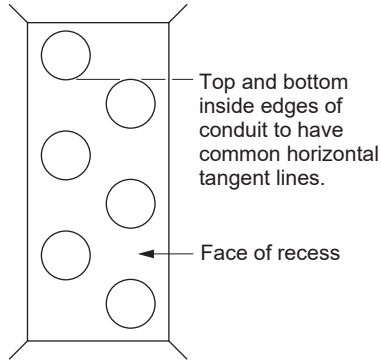


Figure CD 131-1.6: Staggered Conduit Entrance (Not Optional) — Use only when specified on working drawings.

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

This page intentionally left blank.

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

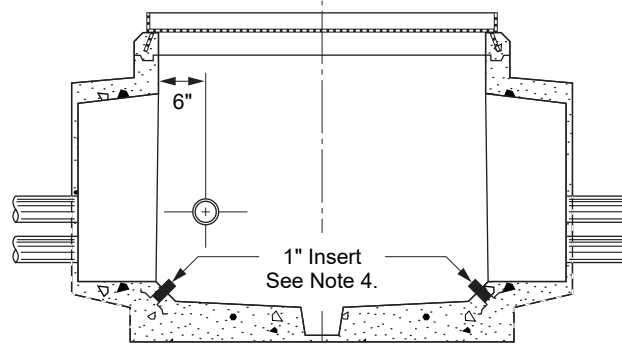


Figure CD 132-1.1: Cut Away Section

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

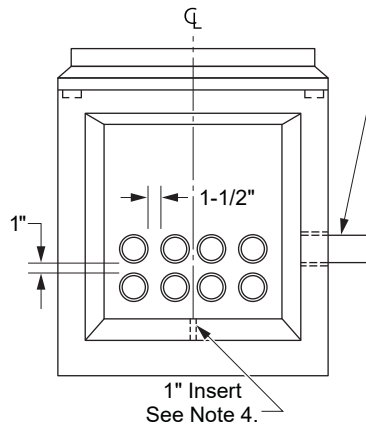


Figure CD 132-1.2: End Elevation

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

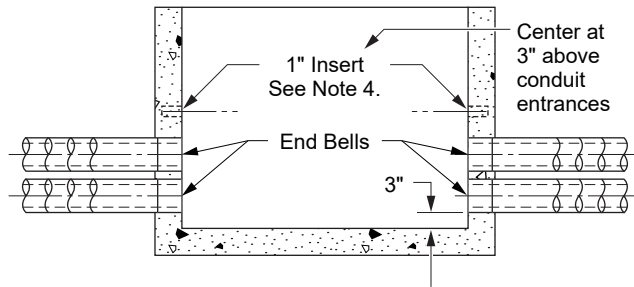


Figure CD 132-2.1: Cut Away Section

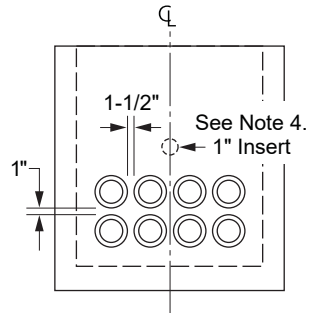


Figure CD 132-2.2: End Elevation

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

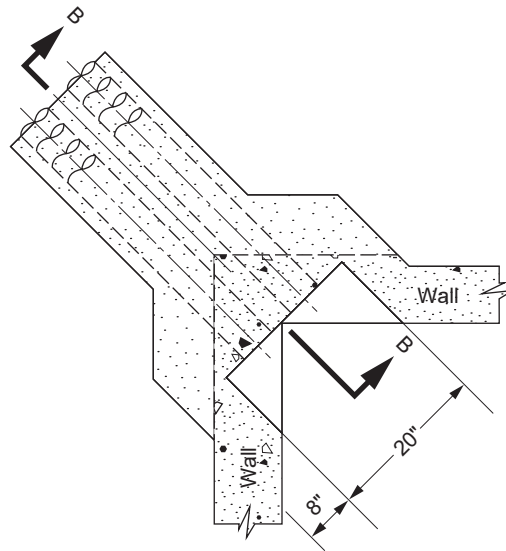


Figure CD 133-1.1: Section A-A — Corner Conduit Entrance when Conduit are Cast in Walls at Time of Vault Construction

Note(s):

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

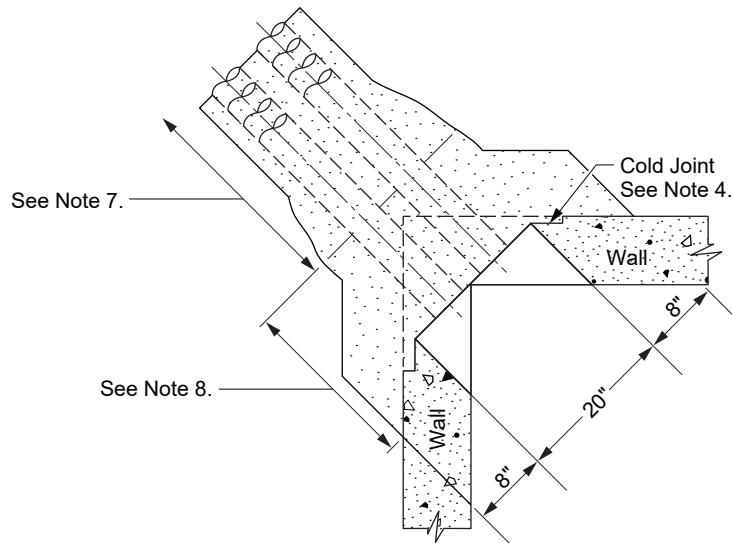



Figure CD 133-1.2: Section A-A — Corner Conduit Entrance when Window is Left at Time of Vault Construction

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

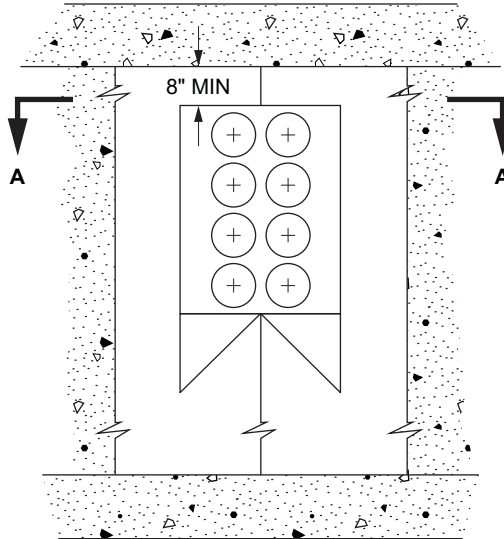


Figure CD 133-1.3: Elevation

Note(s):

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

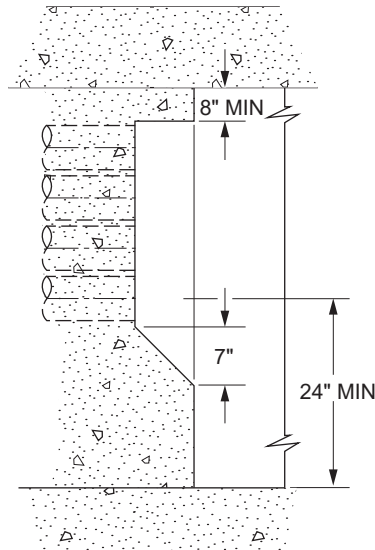


Figure CD 133-1.4: Section B-B

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:

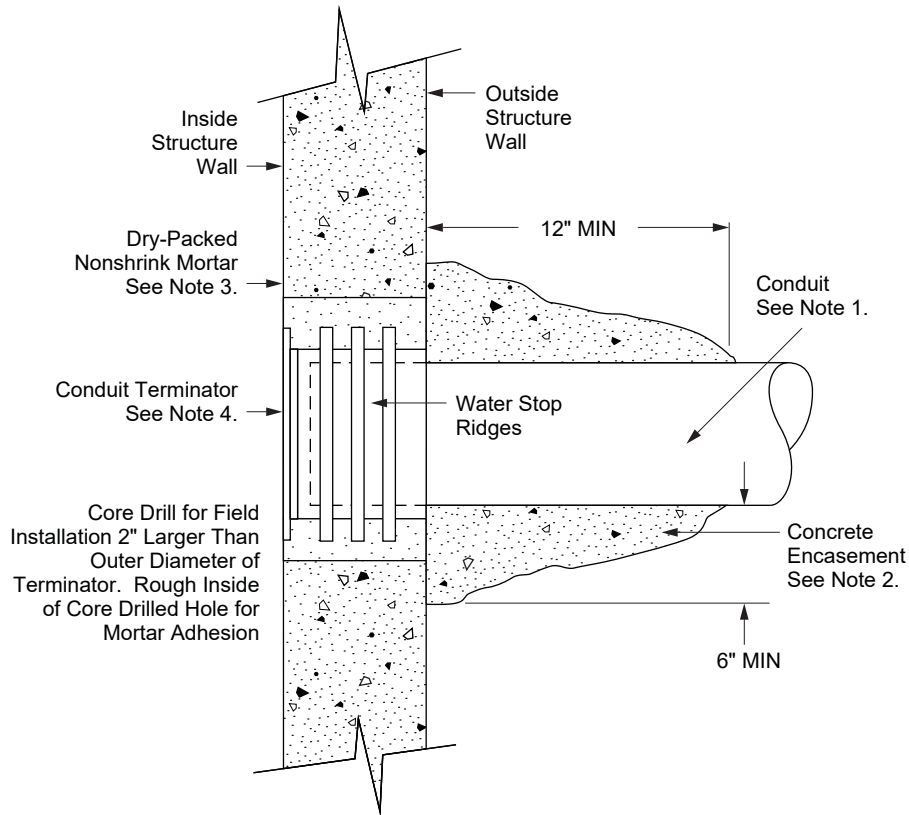
UGS

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

► SCE Public ◀

This page intentionally left blank.

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

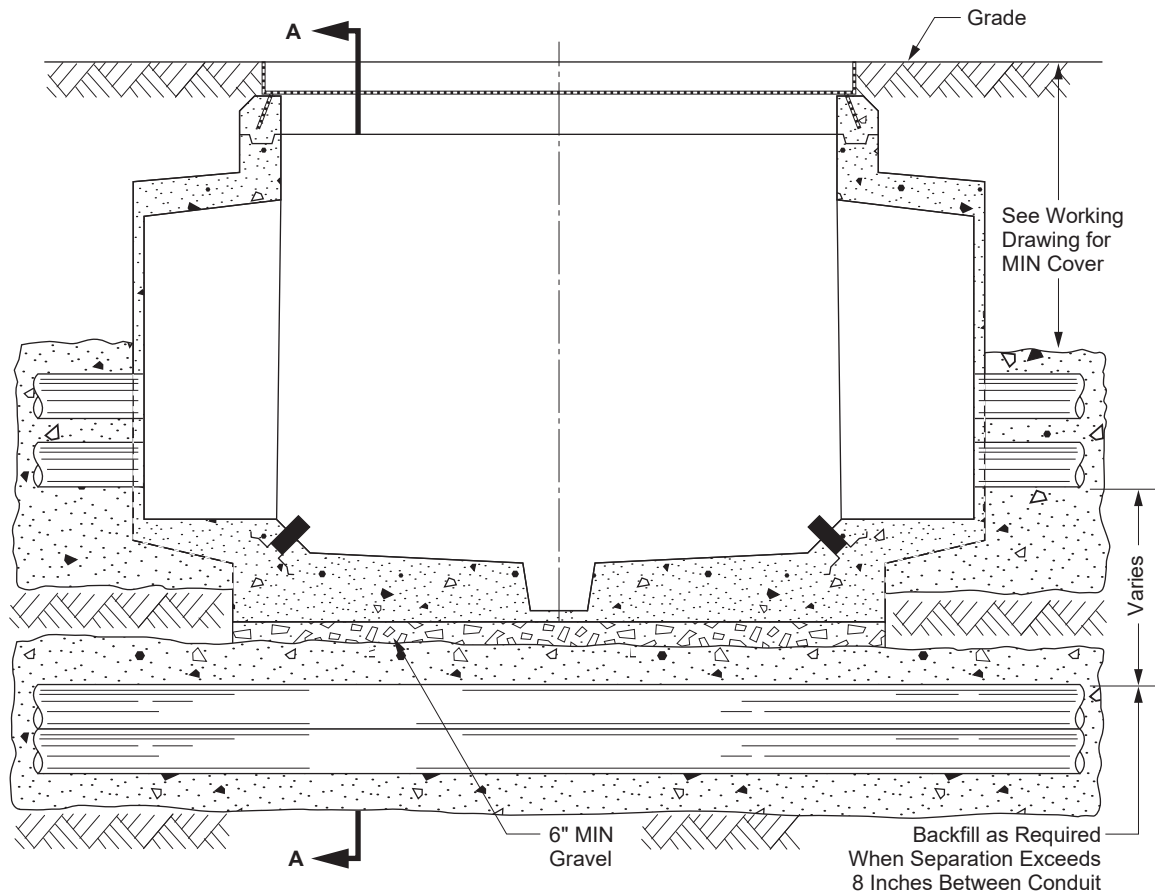



Figure CD 135-1.1: Side Elevation

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

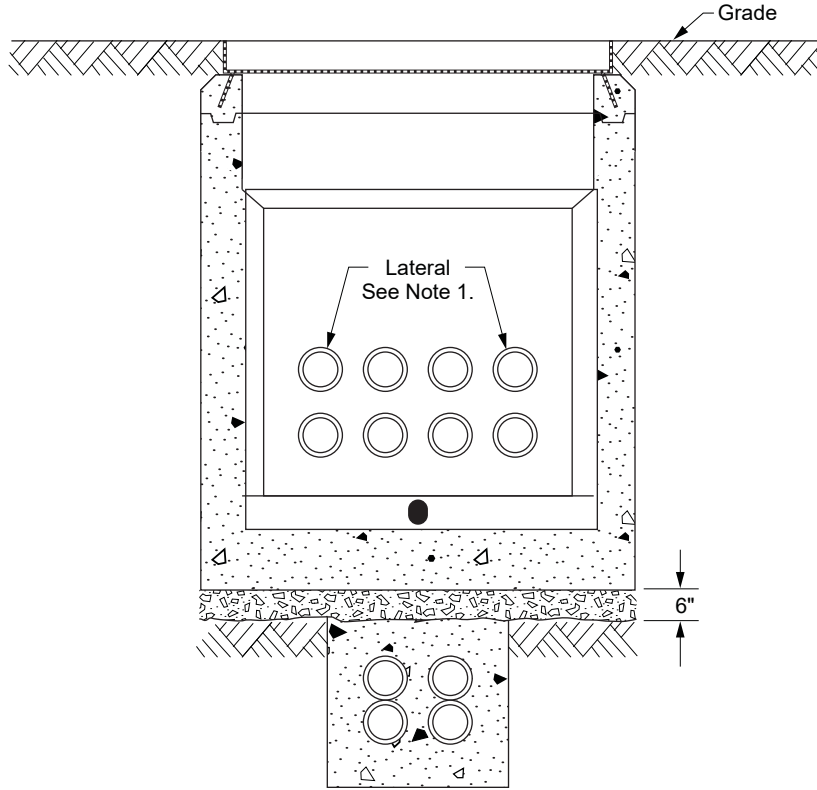


Figure CD 135-1.2: Section A-A

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

► SCE Public ◀

Typical Installation of Precast Pull Box in Main Line Conduit

What's Changed?

Approved by:

PHH

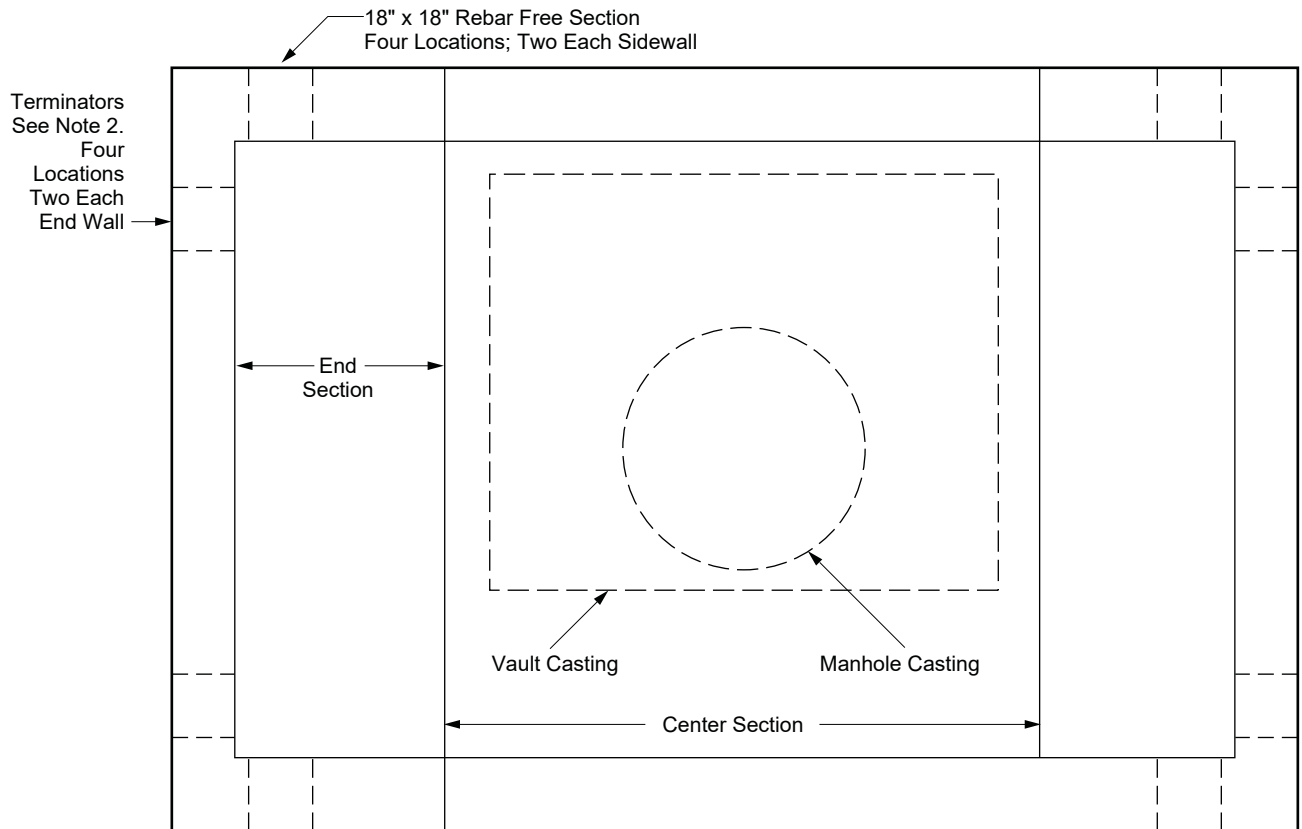
Effective Date:

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):

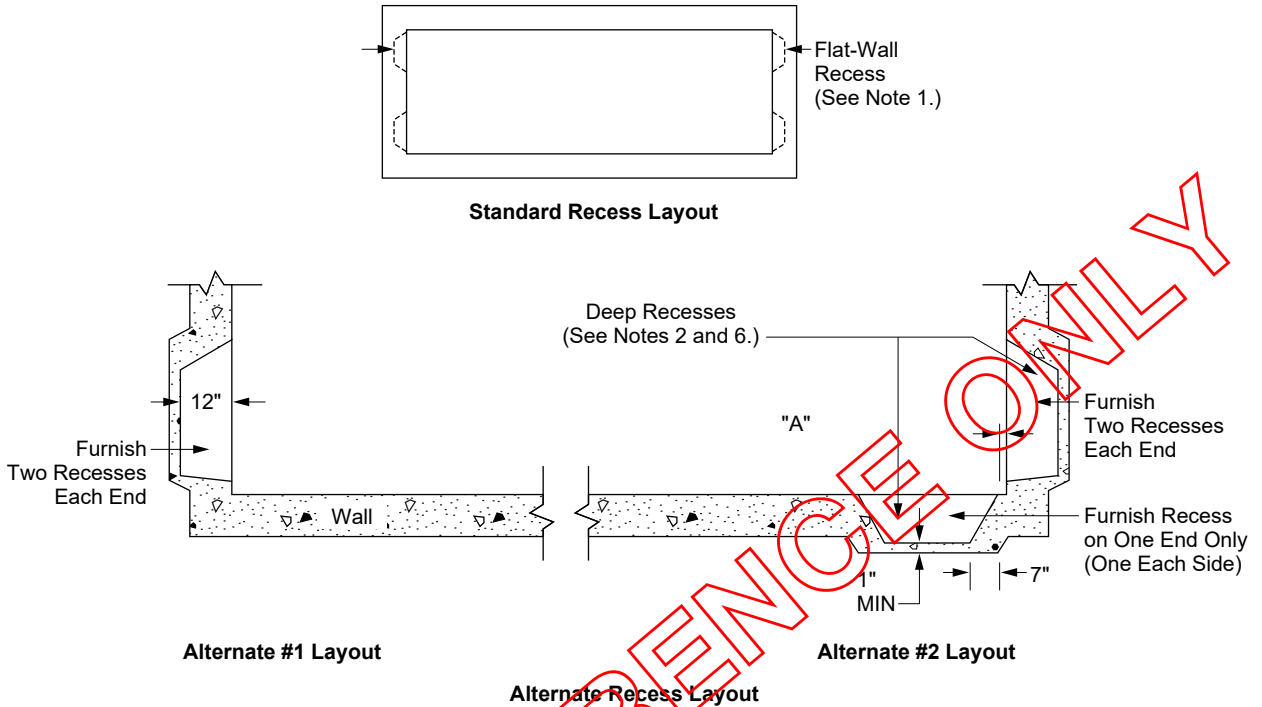
1. With SCE Company approval, small variations in design may be allowed precasters in order to accommodate individual methods of manufacturing.
2. See [CD 142](#).

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

This page intentionally left blank.

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:

PHH

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

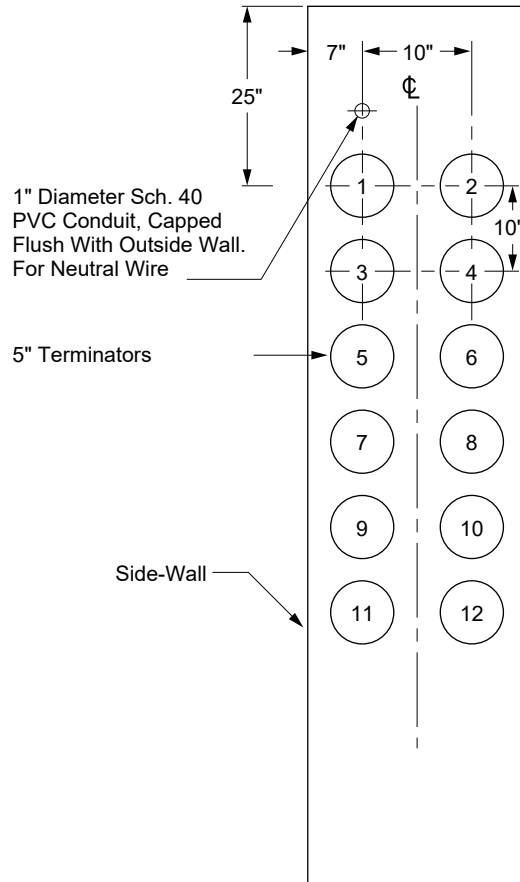
UGS

This page intentionally left blank.

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.

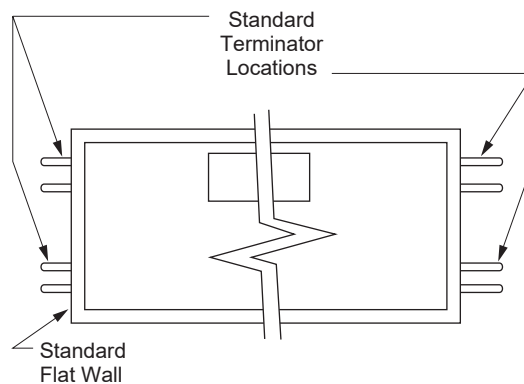


Figure CD 142-1.1: Vault Top View

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

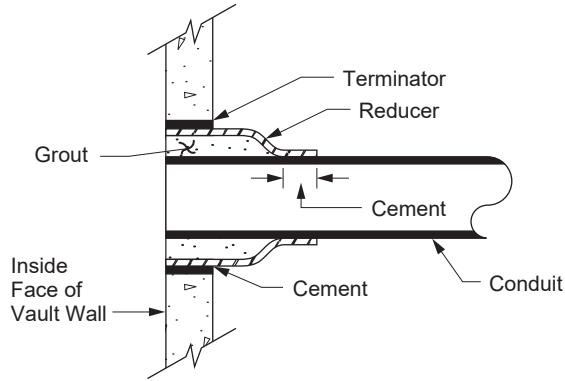


Figure CD 142-1.2: Side View

1.0 Requirements:

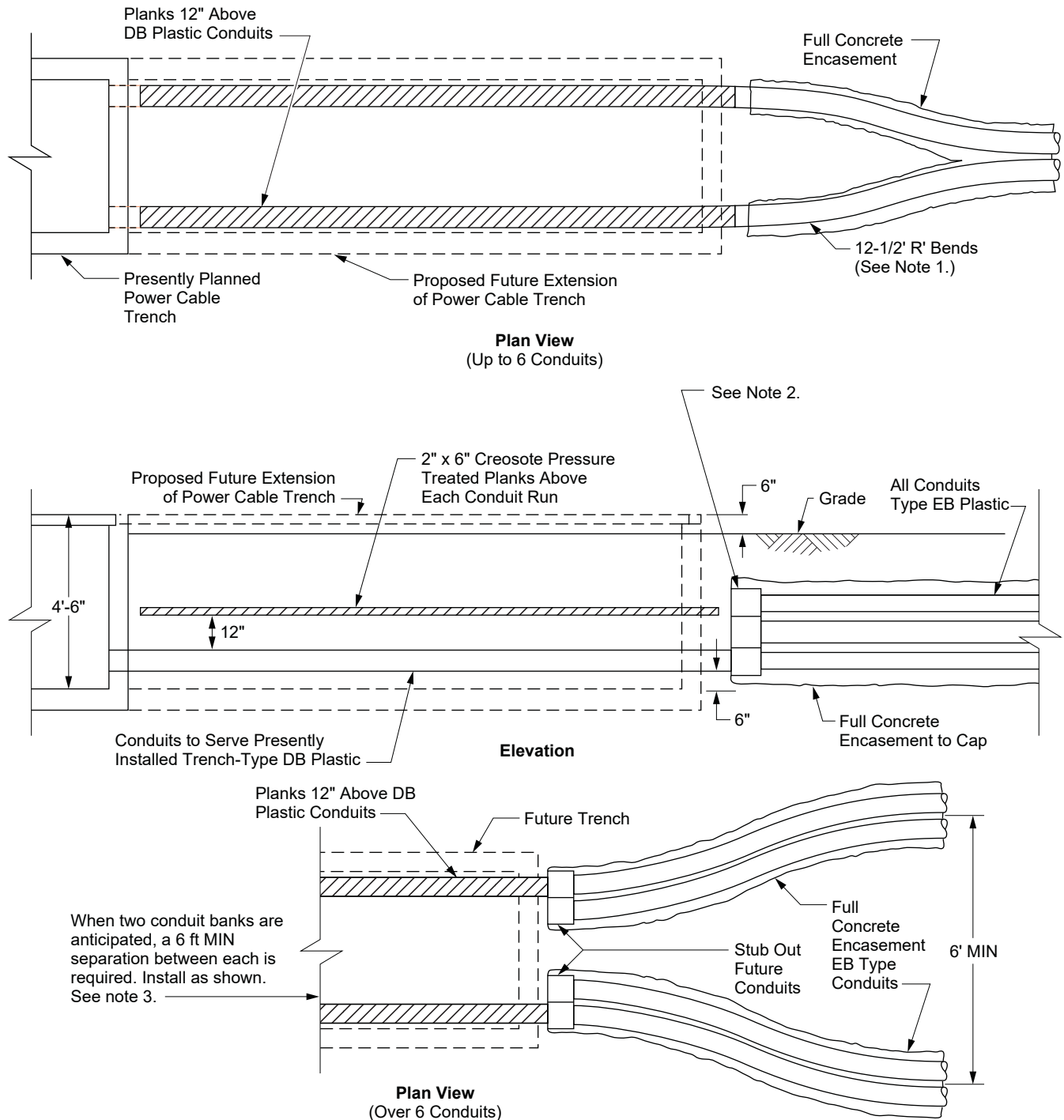
1. Two sets of 12 five-inch or six-inch terminators, as specified, will be furnished in each end wall unless otherwise specified on working drawing.
2. Terminators must provide a watertight seal with or without conduits installed.
3. Reducers will be furnished (number per working drawing) when small 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 142	Conduit Terminators for Precast Tunnel Vaults	Approved by: <i>a/j</i>
Sheet 2 of 2	What's Changed?	Effective Date: 07-27-2018
UGS		

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:



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

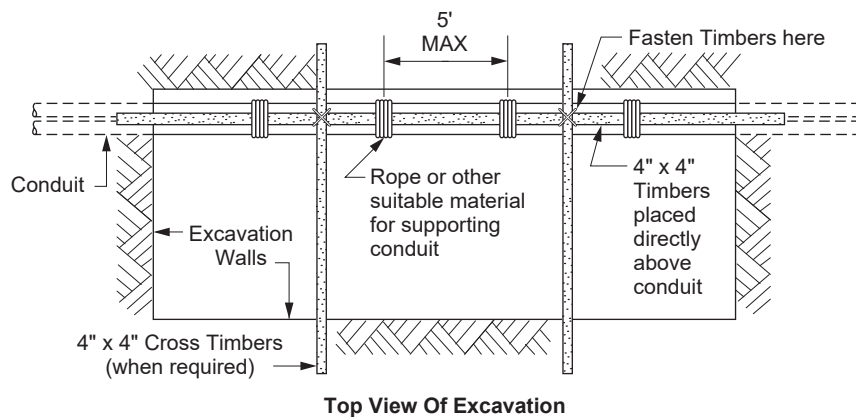
When intercepting existing conduit, adequate support must be provided in order to prevent damage to the cables. If the conduit run to be intercepted is concrete encased, carefully remove all existing concrete. Generally, the encasement can be removed without damage to plastic, HDG, or similar conduit 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):

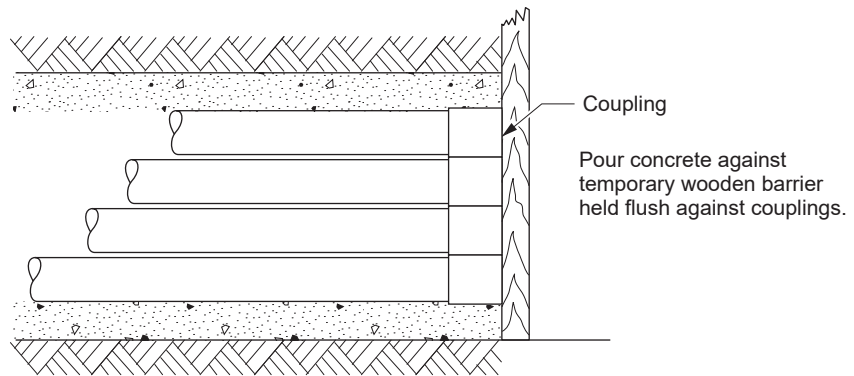
1. Where excavation is extensive in length or a large number of conduit are being supported, cross timbers may be required to adequately support the conduit bank.
2. Size and number of timbers to be increased as required for size of excavation and weight of conduit.

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

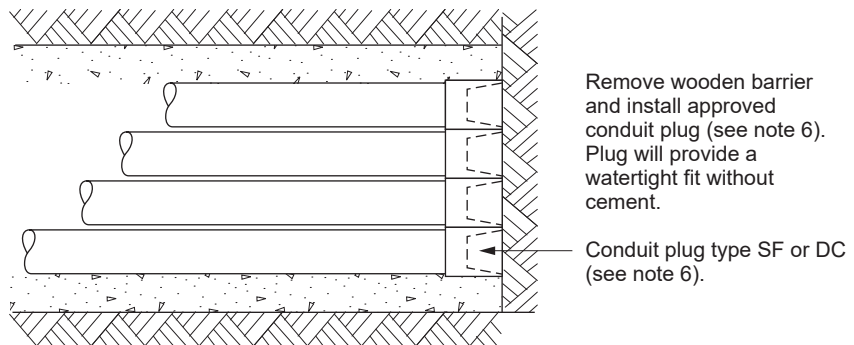
This page intentionally left blank.

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](#).

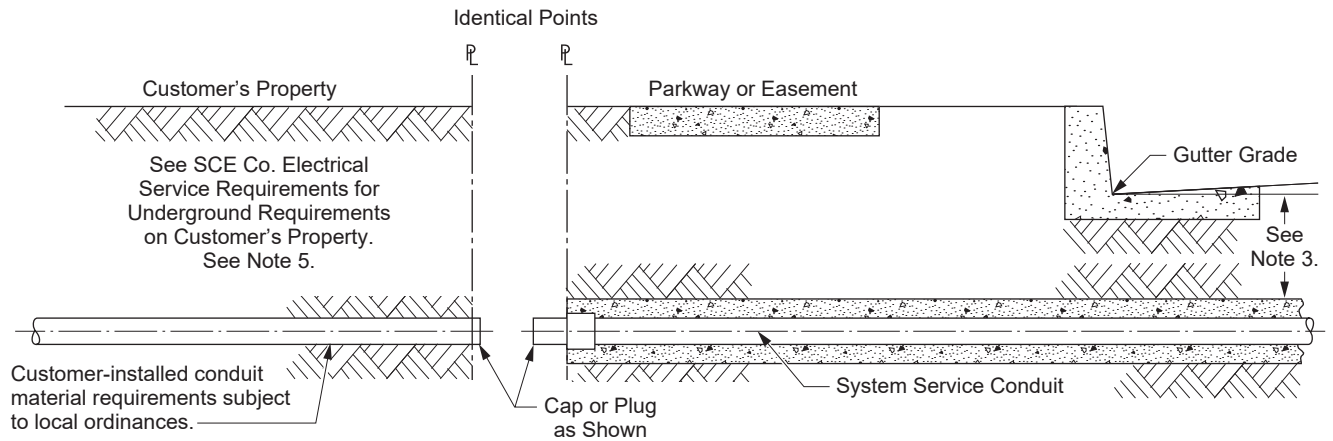
Approved by: 	Capping Main Line Conduit	CD 148
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1 UGS

This page intentionally left blank.

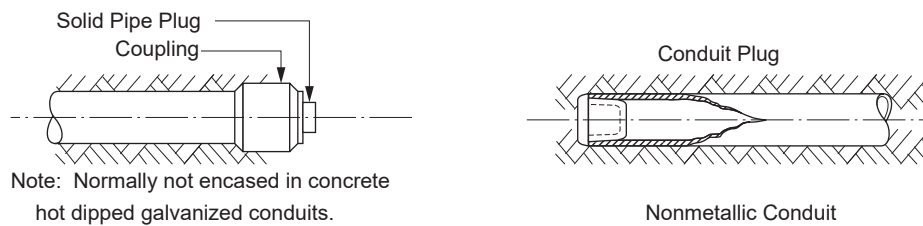
CD 150 Service Lateral Terminations

Scope CD 150.1 Service Lateral Terminations

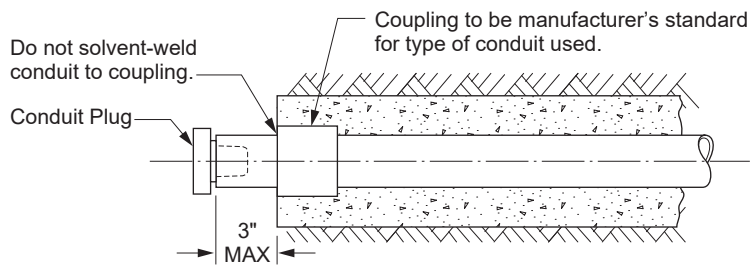
Figure CD 150-1: Service Lateral Terminations



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.

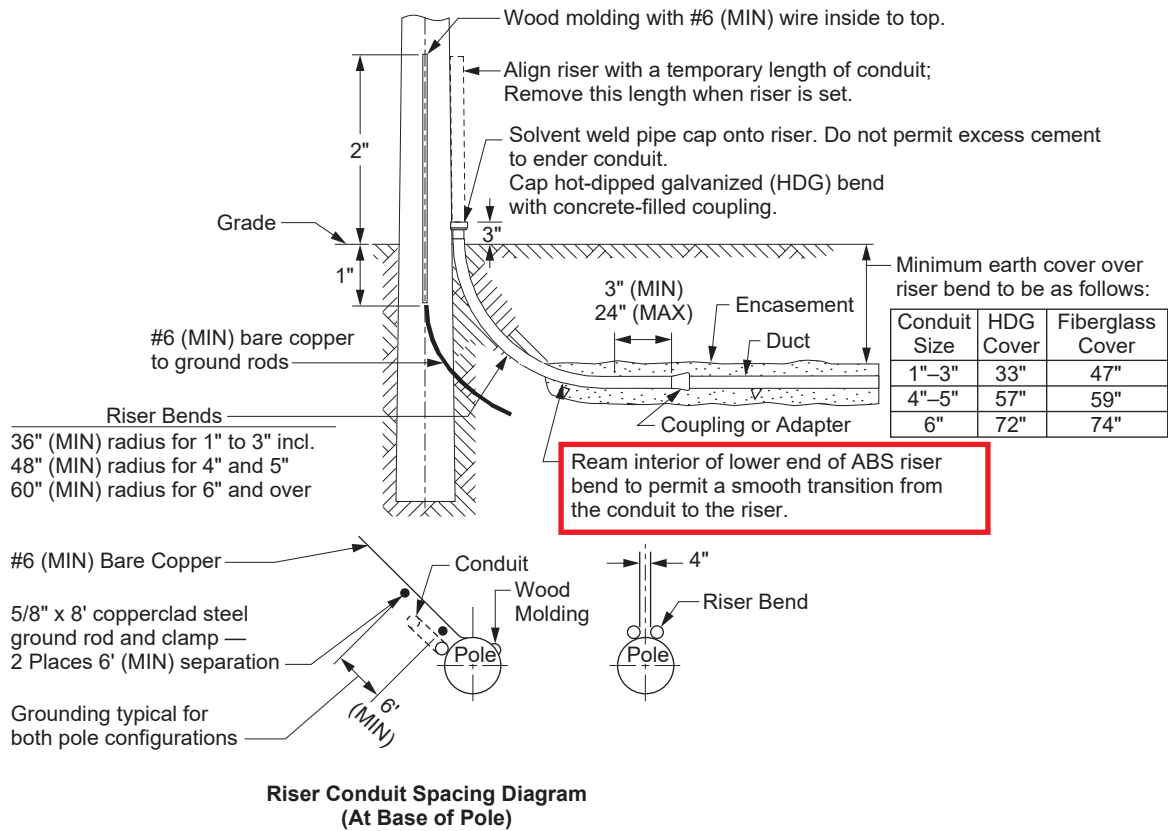
Approved by: <i>PhH</i>	Service Lateral Terminations	CD 150
Effective Date: 01-26-2007	What's Changed?	Sheet 1 of 1
		UGS

This page intentionally left blank.

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):

1. 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

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. 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: 
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

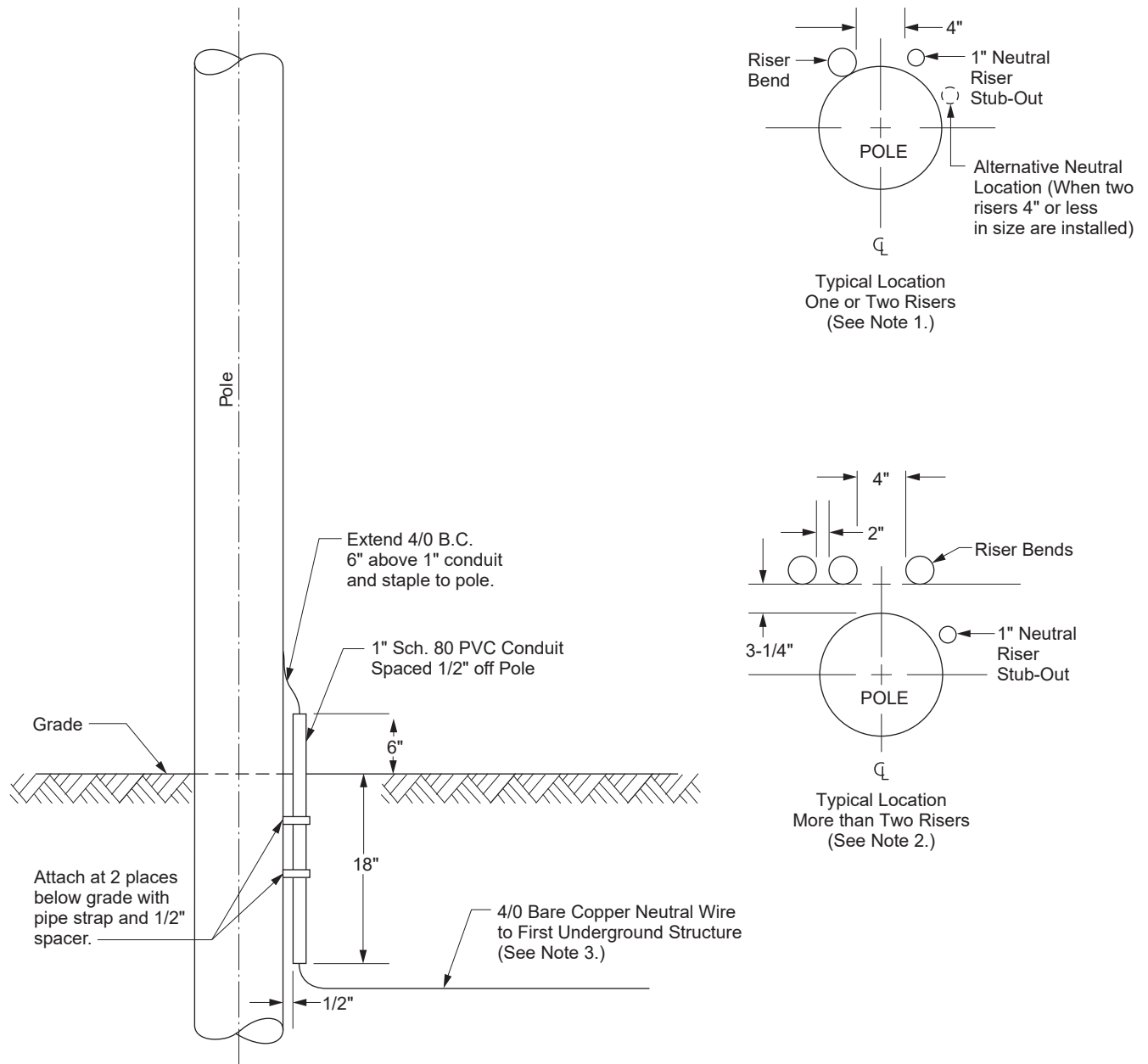
2. The top and bottom of three-, four-, five-, or six-inch fiberglass bends are furnished with permanently attached PVC couplings. Also included is a six-inch long, three-, four-, five-, or six-inch Schedule 80 PVC stub-out, solvent welded into the top coupling. See [CD 166](#) for fiberglass riser bend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

Sheet 1 of 1

Effective Date:
07-27-2007

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

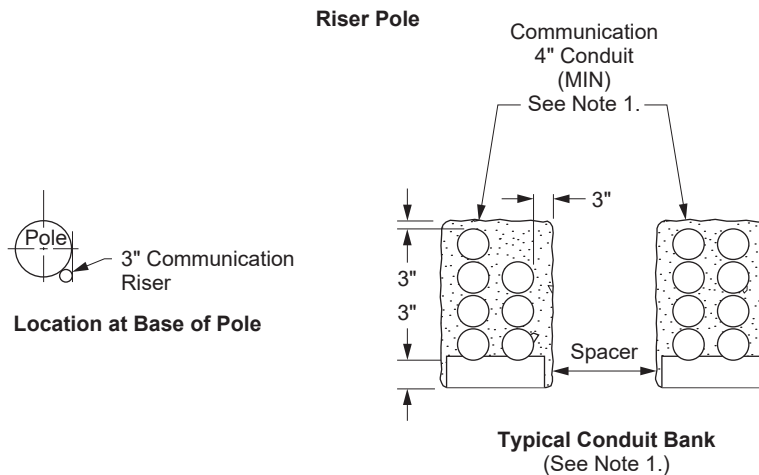
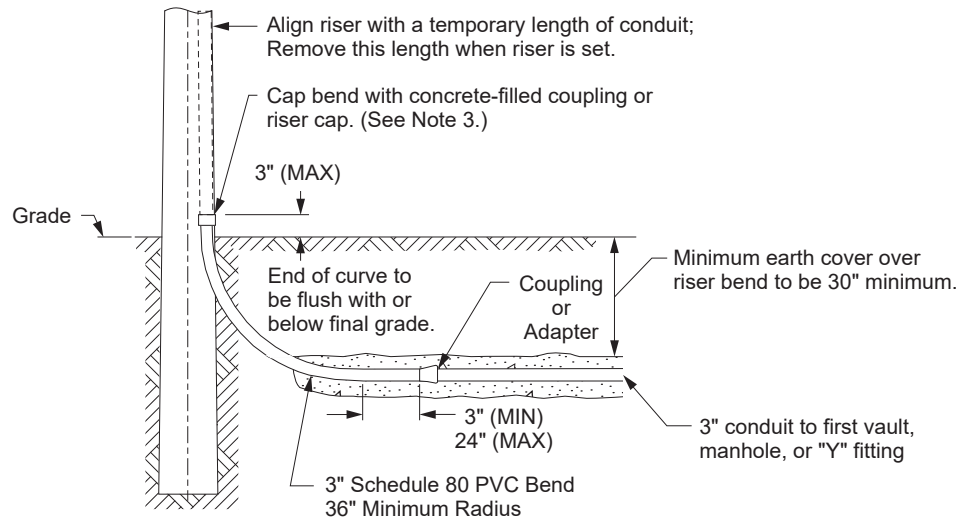
UGS

This page intentionally left blank.

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

This page intentionally left blank.

CD 164 Specification for Abandoning Conduit and Risers

Scope CD 164.1 Specification for Abandoning Conduit and Risers

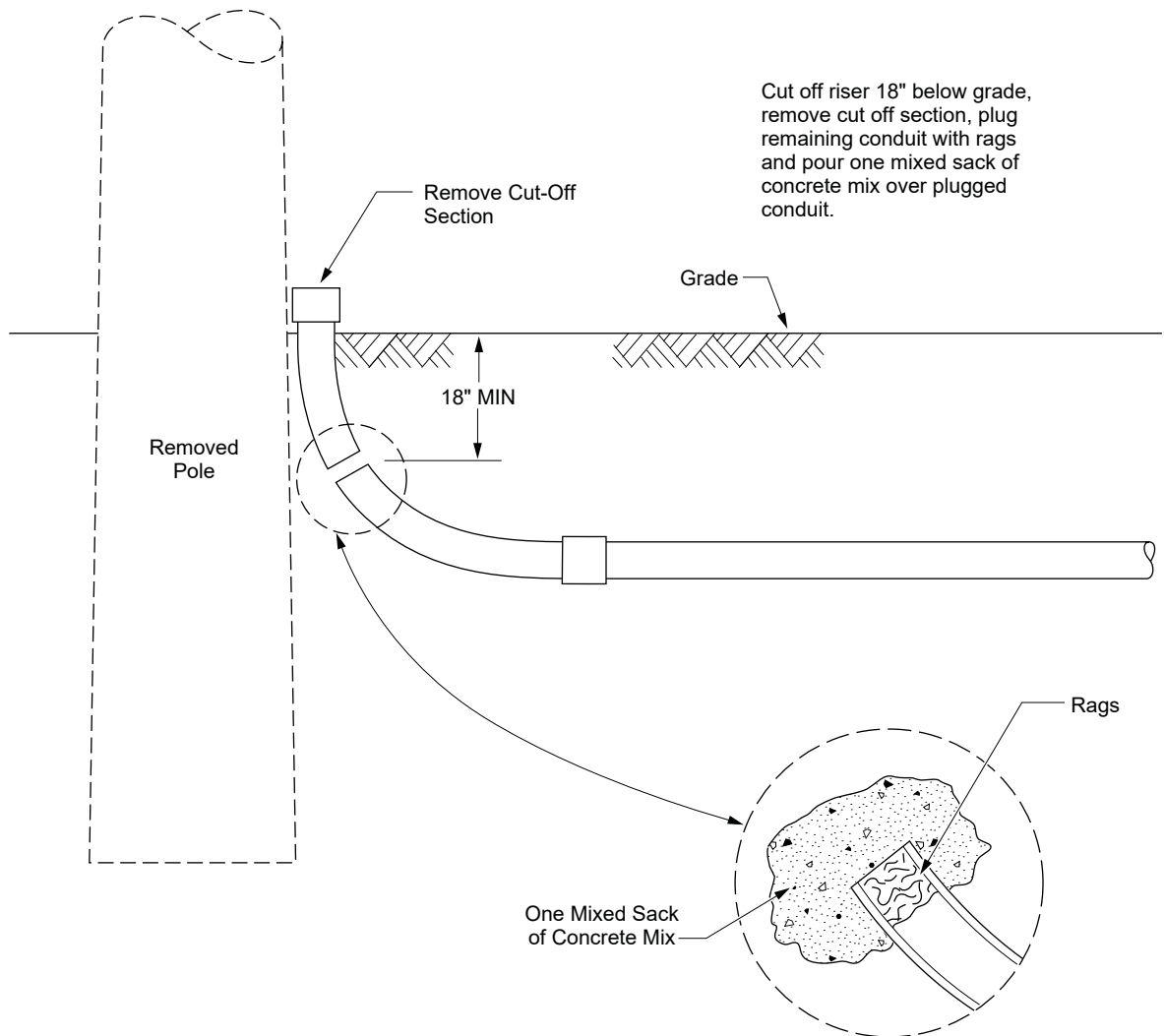
1.0 Conduit

- 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:

PhH

Specification for Abandoning Conduit and Risers

CD 164

Sheet 1 of 1

Effective Date:
01-26-2007

What's Changed?

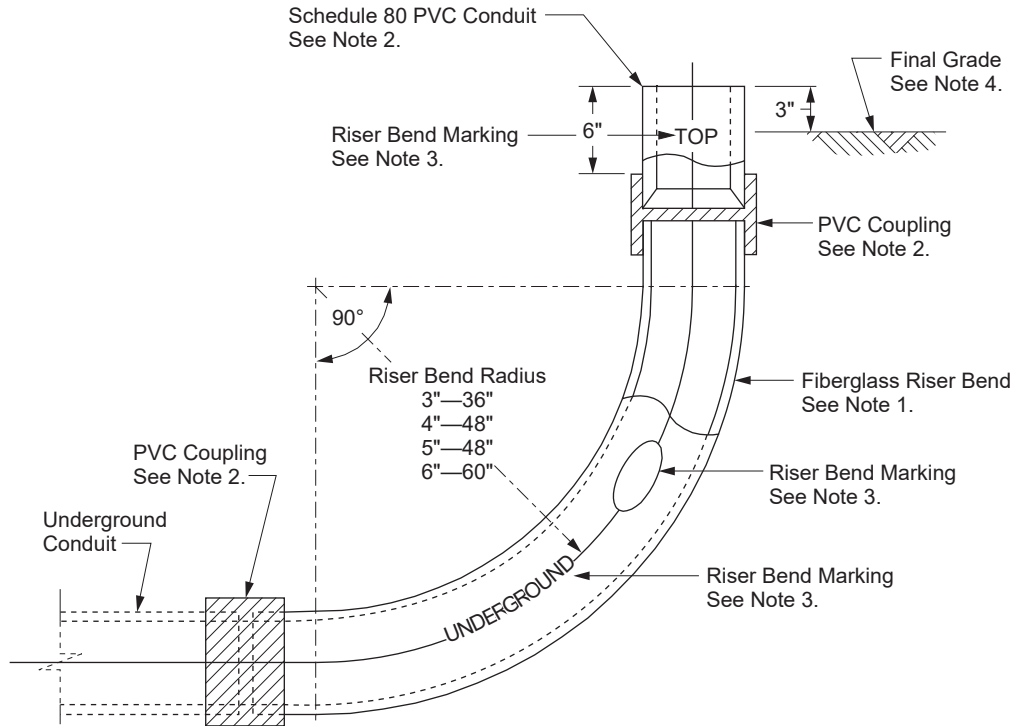
UGS

This page intentionally left blank.

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

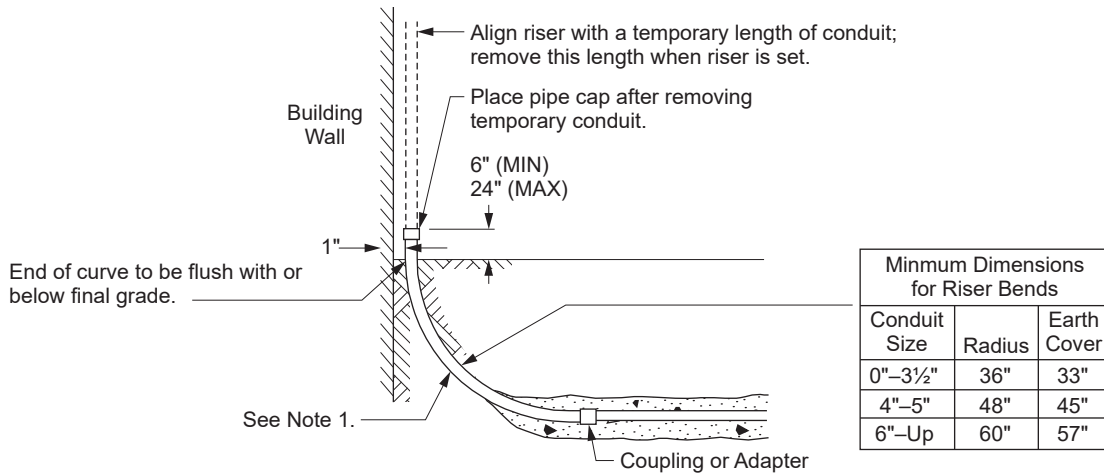
Approved by: 	Three-, Four-, Five-, or Six-Inch Fiberglass Riser Bends	CD 166
Effective Date: 04-26-2019	What's Changed? The approved manufacturer information has been updated.	Sheet 1 of 1 UGS

This page intentionally left blank.

CD 170 Riser Bend Installation at Wall or Pad

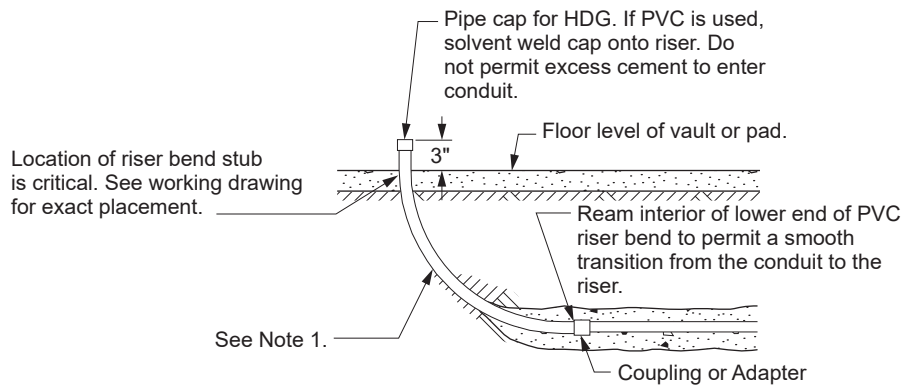
Scope CD 170.1 Riser Bend Installation at Wall or Pad

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

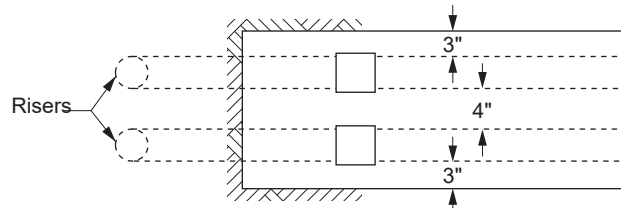


Minimum Dimensions for Riser Bends		
Conduit Size	Radius	Earth Cover
0"-3½"	36"	33"
4"-5"	48"	45"
6"-Up	60"	57"

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?

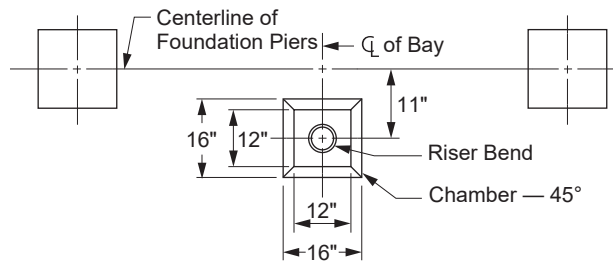
UGS

This page intentionally left blank.

CD 172 Underground Risers in Substation

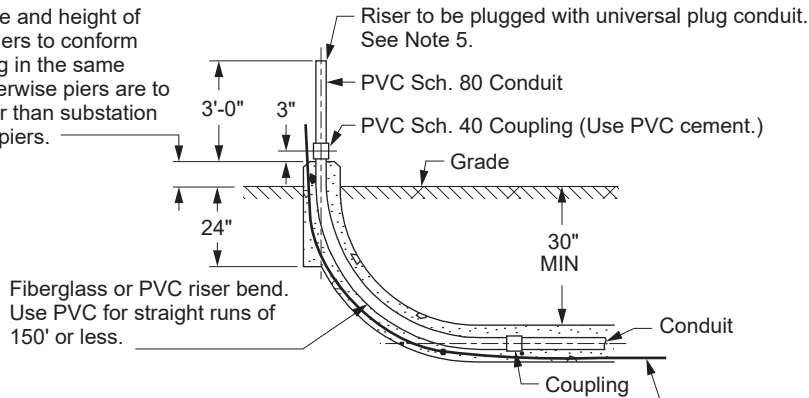
Scope CD 172.1 Underground Risers in Substation

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



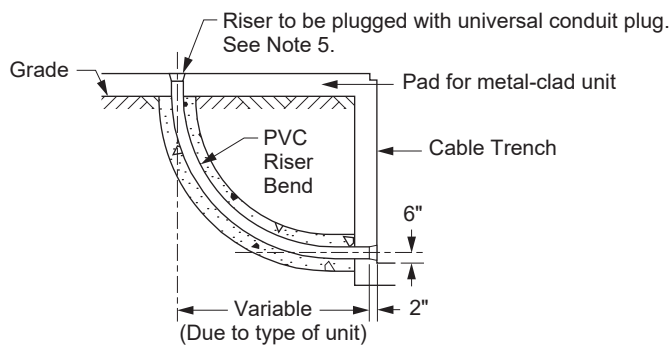
Plan
Location for Riser (See Detail “A.”)

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

4/0 BCN from top of riser pier to first underground structure. A 3-foot tail should extend beyond each termination point.



Detail “B”
Riser for Metal-Clad Unit

Approved by:
PhH

Underground Risers in Substation

CD 172

Effective Date: **What's Changed?**
10-26-2012

Sheet 1 of 3

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

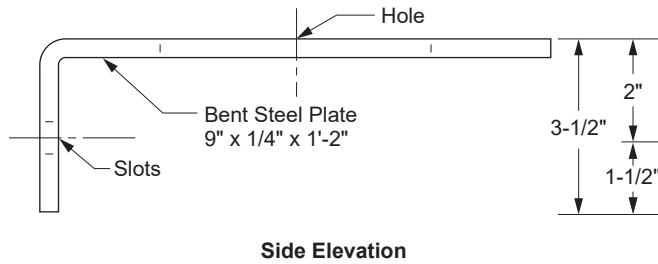
What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.

Effective Date:

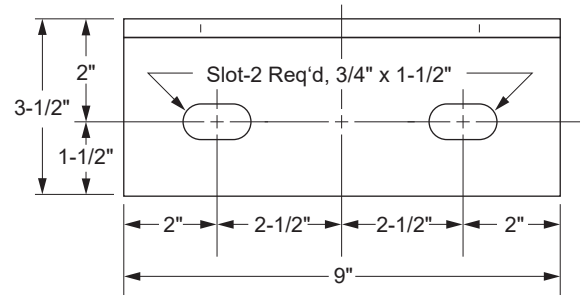
10-26-2012

UGS

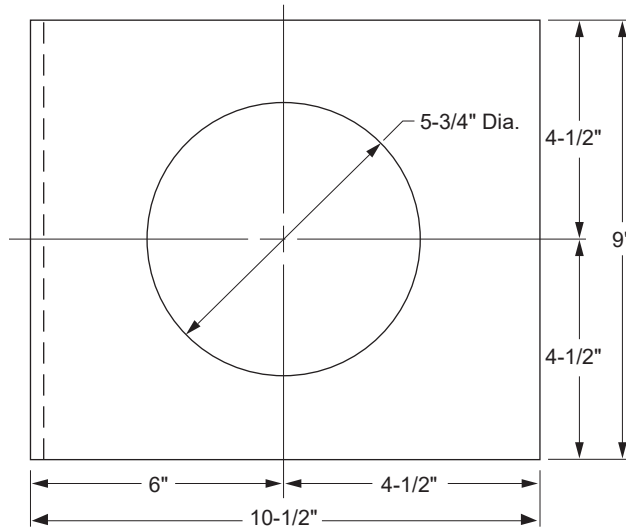
Figure CD 172-2: Underground Risers in Substation — Details of Riser Anchor Plate and Detail 3



Side Elevation

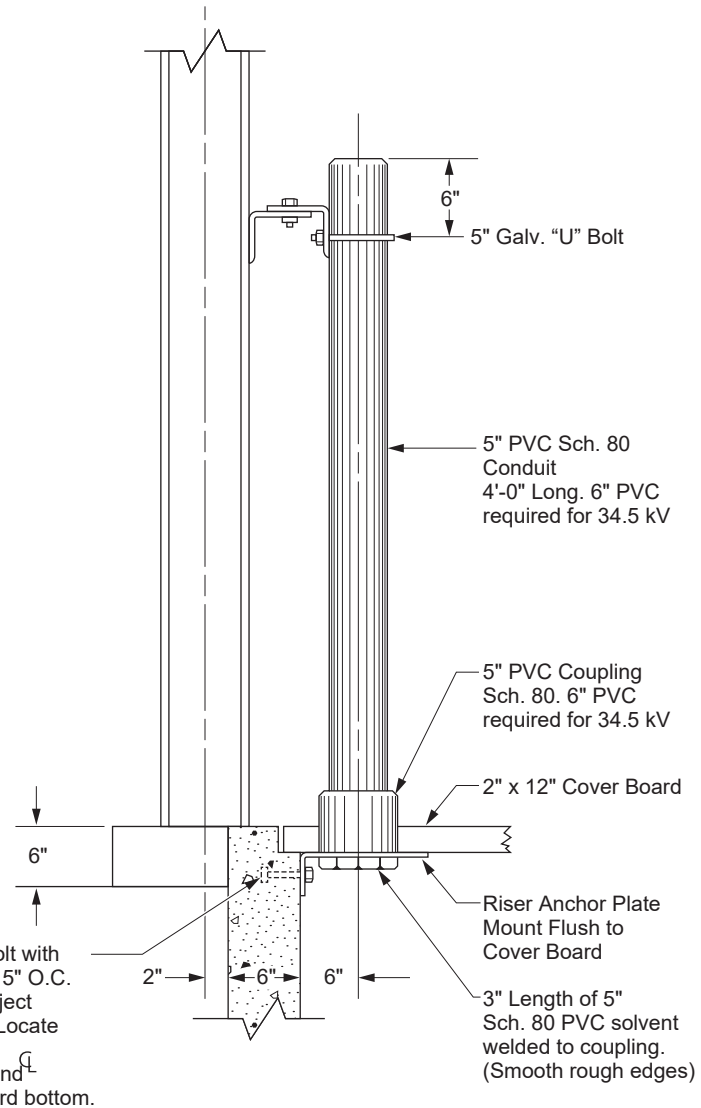


Front Elevation



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

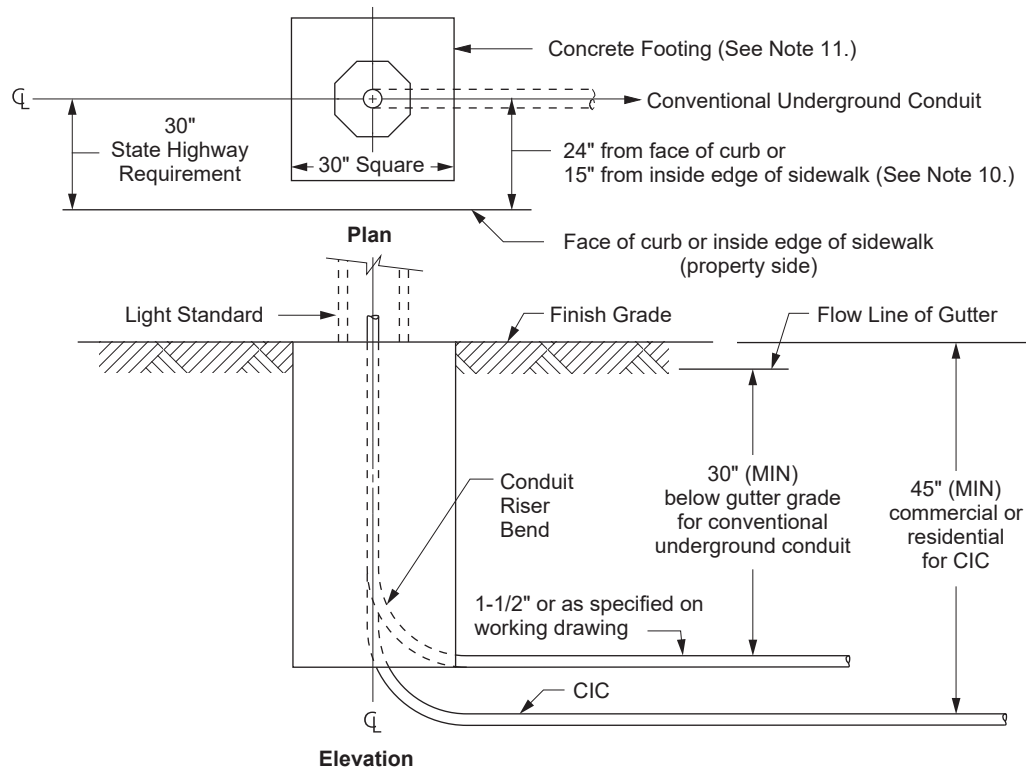
What's Changed?

UGS

This page intentionally left blank.


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



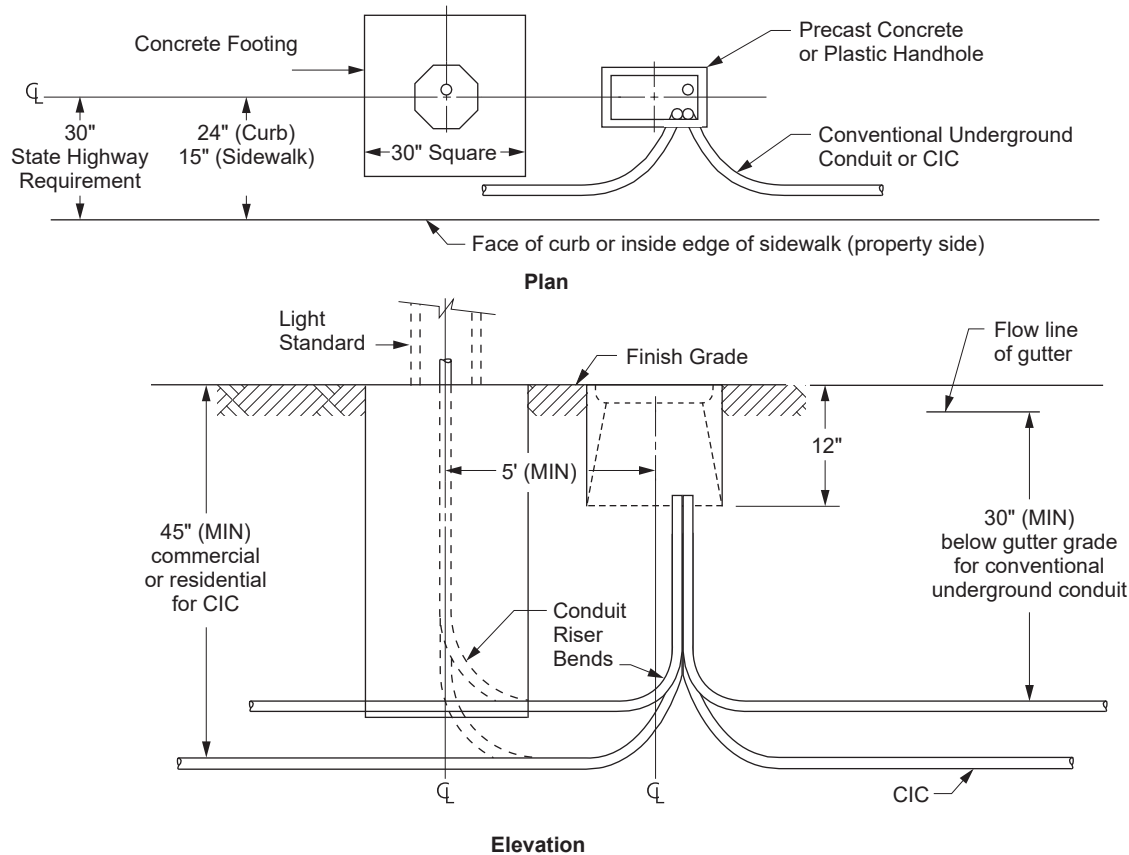
Note(s):

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:

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.

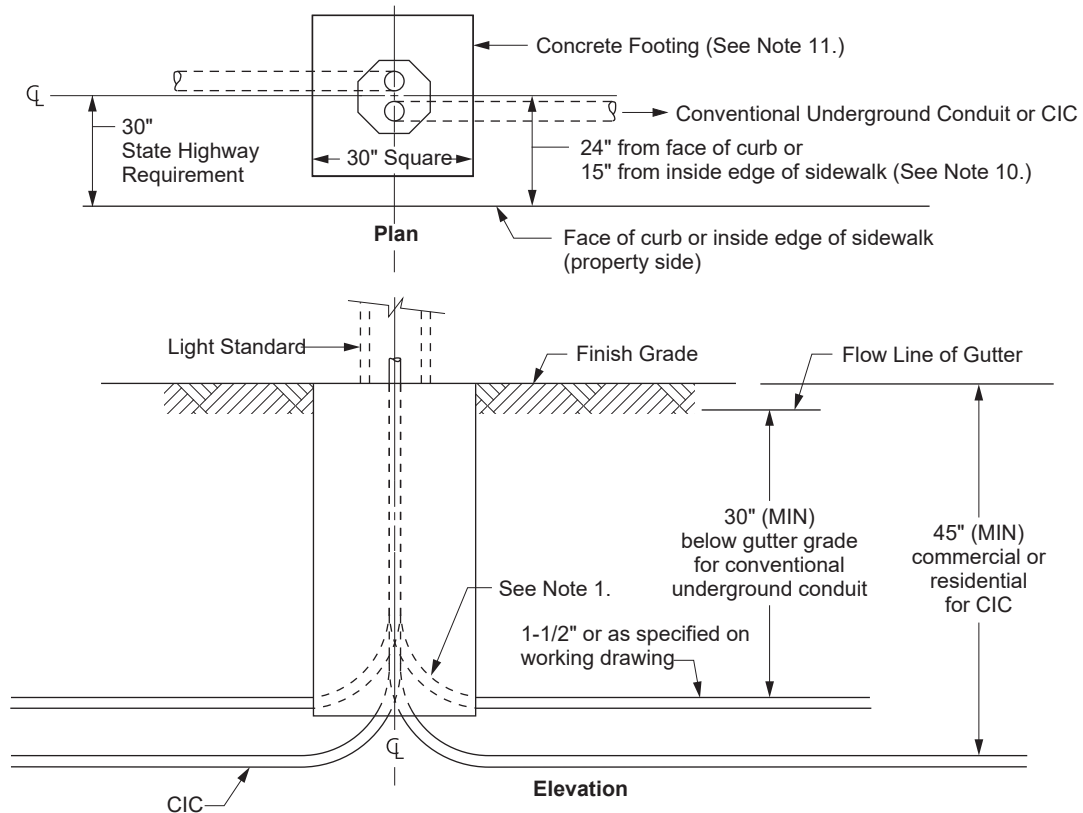
Effective Date:

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.

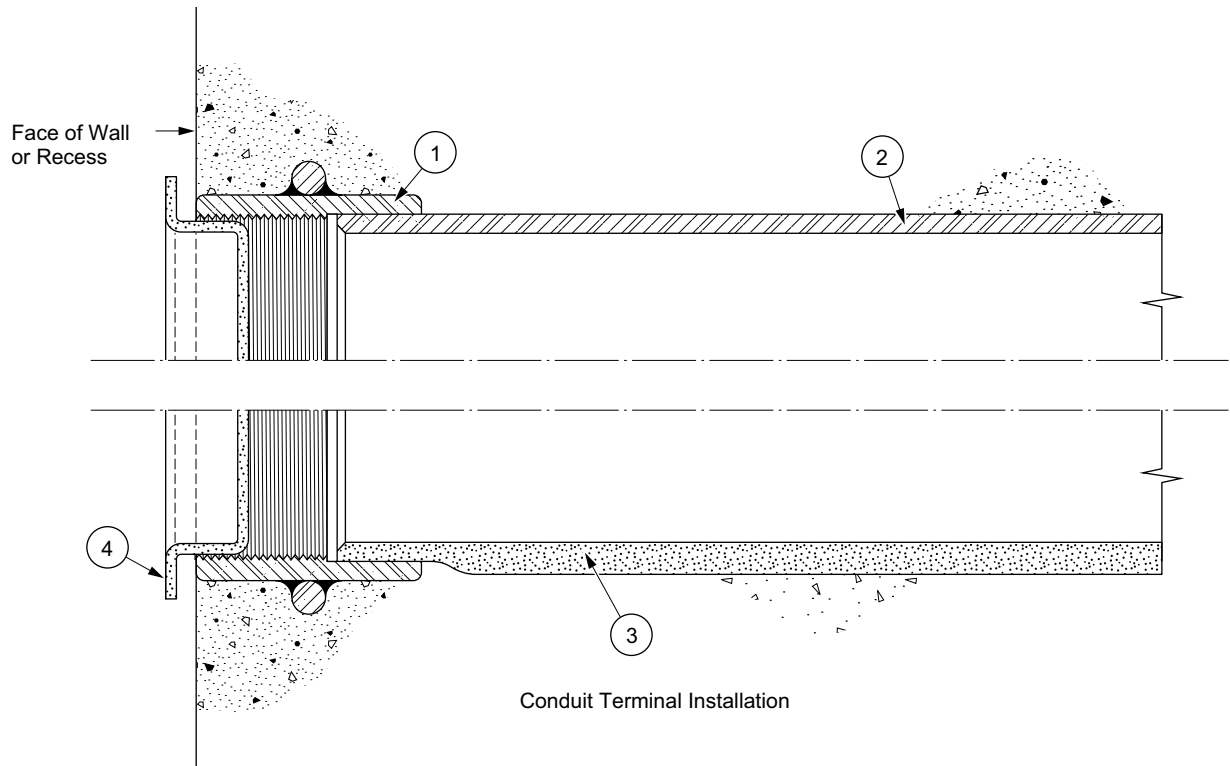
Approved by: 	Streetlight Conduit and Riser Bend Installation for Service to One Streetlight Standard	CD 175
Effective Date: 10-26-2012	What's Changed? The acronym for the Miscellaneous Chapter of the UGS Manual has been changed from 'MS' to 'MC' for clarity.	Sheet 3 of 3
		UGS

This page intentionally left blank.

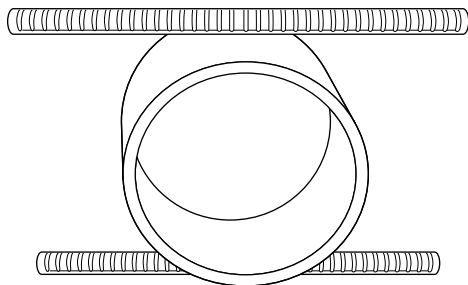
CD 177 Riser Conduit Lower Terminal (Anchor for Cable Support)

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

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

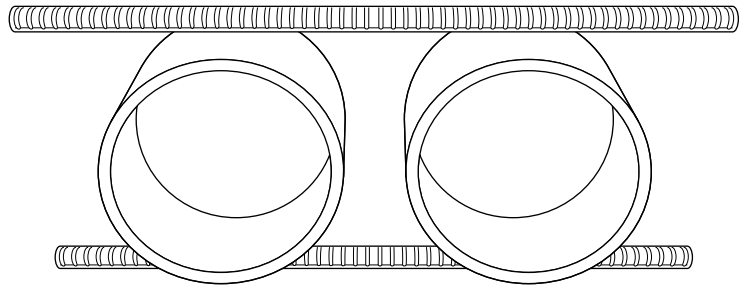


Hot Dip Galvanize After Fabrication



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

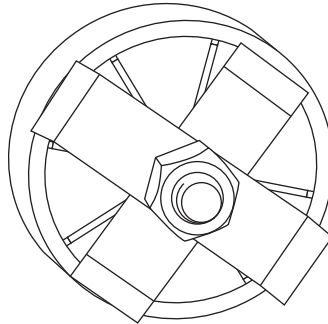


Figure CD 180-1.1: Type 1 Blank Conduit Plug

Note(s):

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

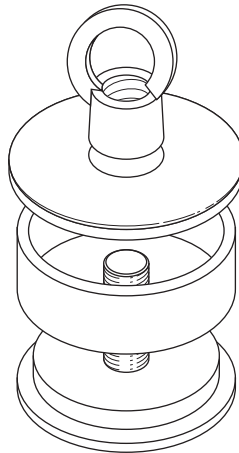



Figure CD 180-1.2: Type 3 and DC Blank Conduit Plugs

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

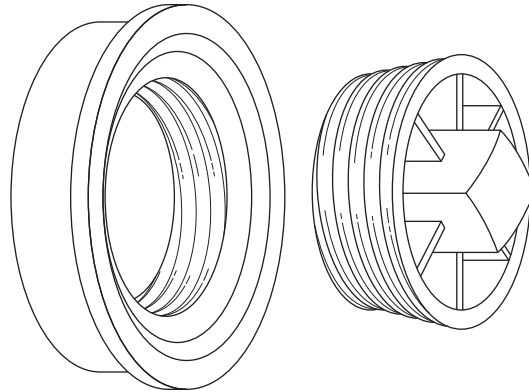


Figure CD 180-1.3: Type 2 and SF Blank Conduit Plugs

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.

CD 180

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

Approved by:

ajf

Sheet 2 of 4

What's Changed?

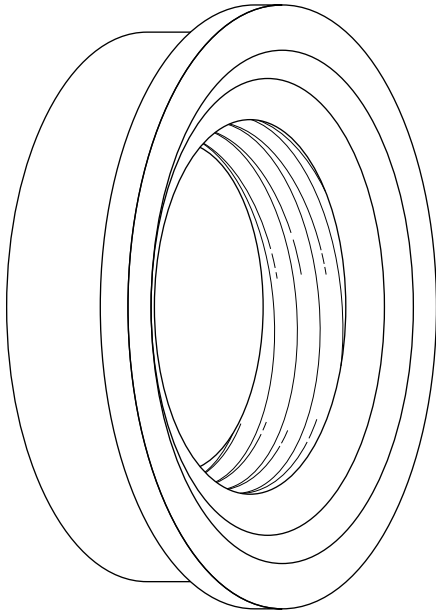
Effective Date:

UGS

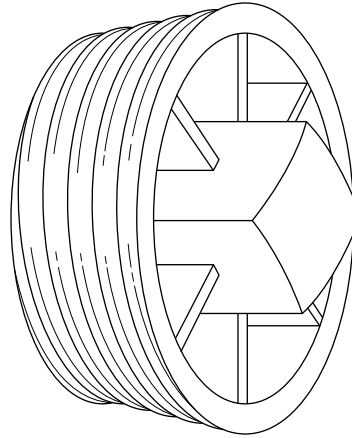
04-26-2019

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.


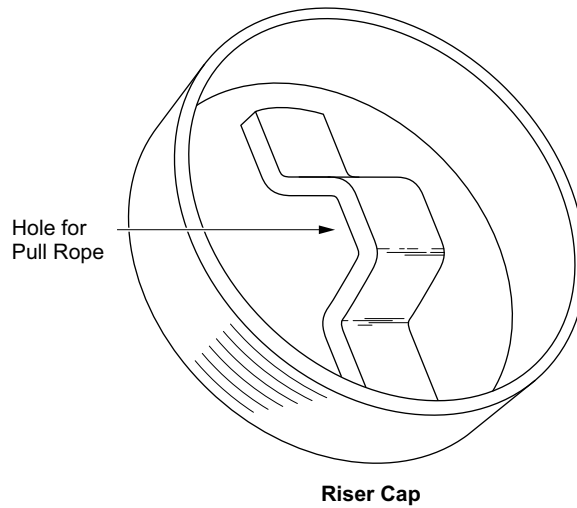

Approved by: 	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures	CD 180
Effective Date: 04-26-2019	What's Changed?	Sheet 3 of 4 UGS

Figure CD 180-3: Riser Cap



Note(s):

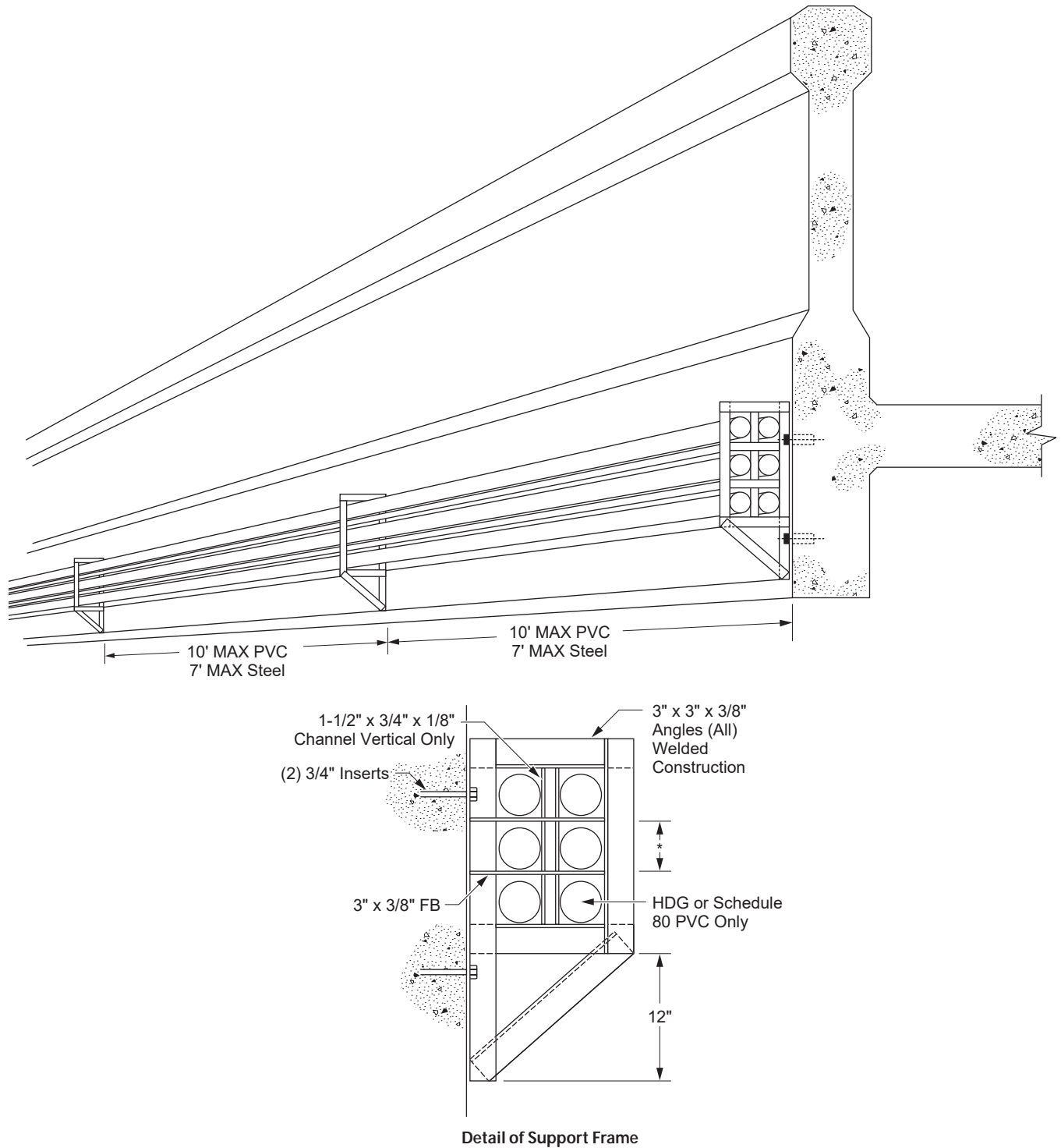
1. This ABS riser cap is available in four- through six-inch sizes. A plastic strap is welded to the inside of the cap. The pull rope or pull tape should be tied securely to the cap through this strap.
2. This plug should be cemented to the Sch. 80. ABS riser bend stubbed at a pole. It will provide a 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 Sheet 4 of 4 UGS	Blank Conduit Plugs for Vaults, Manholes, and PME and PMH Structures	Approved by: 
	What's Changed?	Effective Date: 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

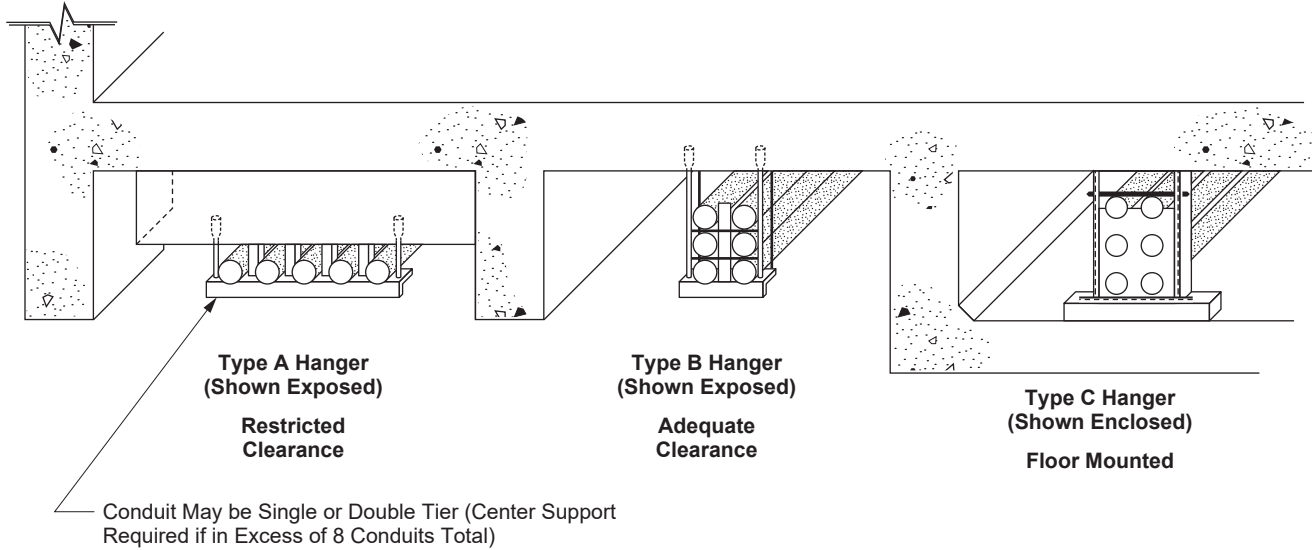


Figure CD 190-2.1

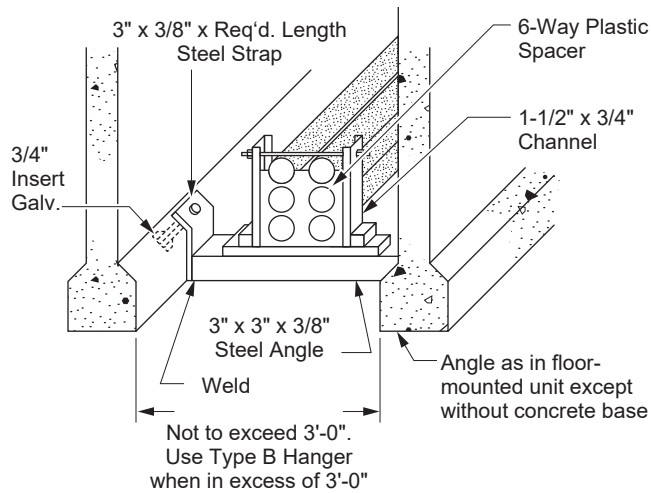


Figure CD 190-2.2: Type D Alternate to Hanger Support (Shown Exposed)

CD 190

Supports for Conduits on Bridges

Approved by:

RR

Sheet 2 of 5

What's Changed?

Effective Date:

04-24-2020

UGS

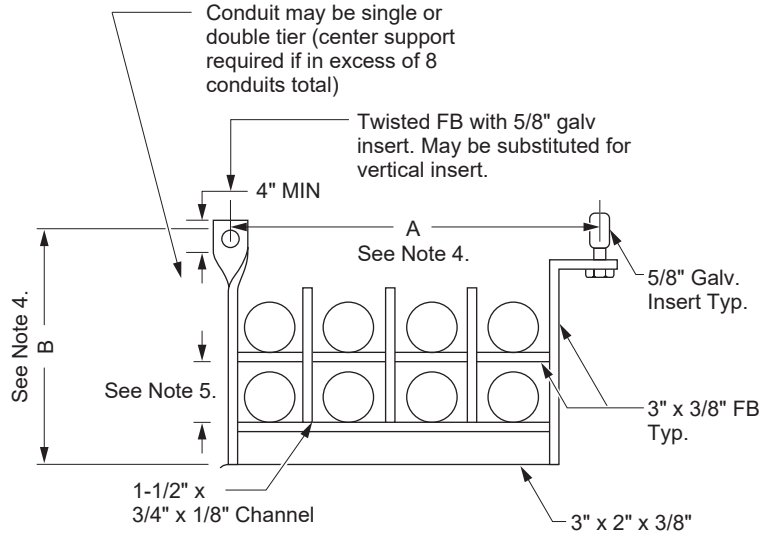


Figure CD 190-2.3: Type A Details

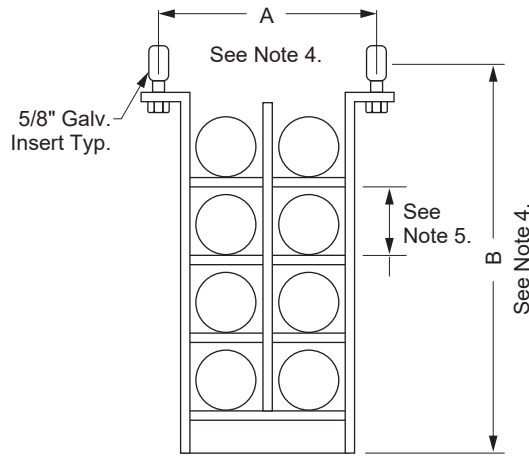


Figure CD 190-2.4: Type B Details

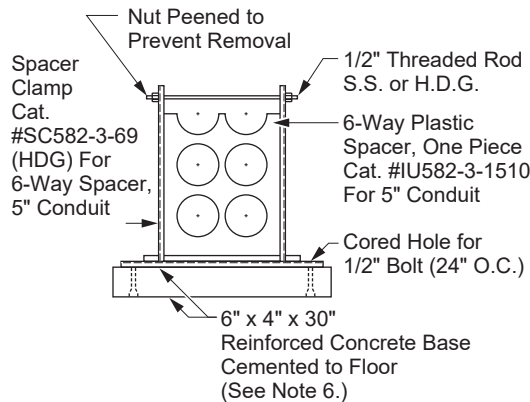


Figure CD 190-2.5: Type C Details

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):

1. 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

2. 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#

3. Bolts:

1/2" Dia. = 0.7 lb/ft
 5/8" Dia. = 1.1 lb/ft
 3/4" Dia. = 1.5 lb/ft

4. See Section 3.4 (Sheet 5).
 5. See Section 3.6 (Sheet 5).
 6. See Section 3.8 (Sheet 5).


1.0 Conduit

- 1.1 For exposed installations — Schedule 80 PVC or standard HDG steel.
- 1.2 For enclosed installations — (Isolated from public and maintenance crews) Type DB, ABS, or PVC, or HDG steel.
- 1.3 Conduit configuration to be shown on working drawing. Typical illustrations are for depicting material required.
- 1.4 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).
- 1.5 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:


- 2.1 HDG steel — At each bridge expansion joint CD 192 (Sheet 1).
- 2.2 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

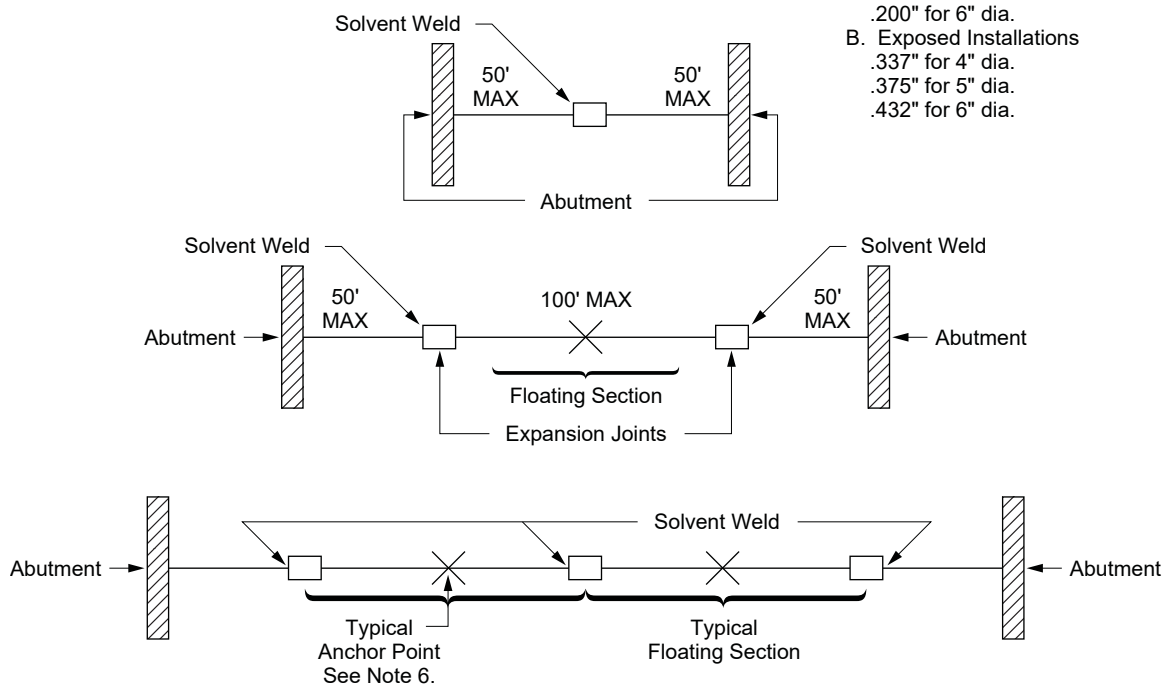
- 3.1 Supports to be a seven feet maximum spacing for steel conduit, five feet maximum spacing for DB plastic conduit, and ten feet maximum spacing for Schedule 80 plastic conduit.
- 3.2 Supports to be hot dipped galvanized after fabrication. All bolts, studs, nuts, and so forth, to be stainless steel. 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

This page intentionally left blank.

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:

ajf

Expansion Joint for Plastic Conduit

CD 191

Sheet 1 of 1

Effective Date:
07-27-2018

What's Changed? Revised distance from abutment to solvent weld and expansion joints to 50'.
Added Note 7.

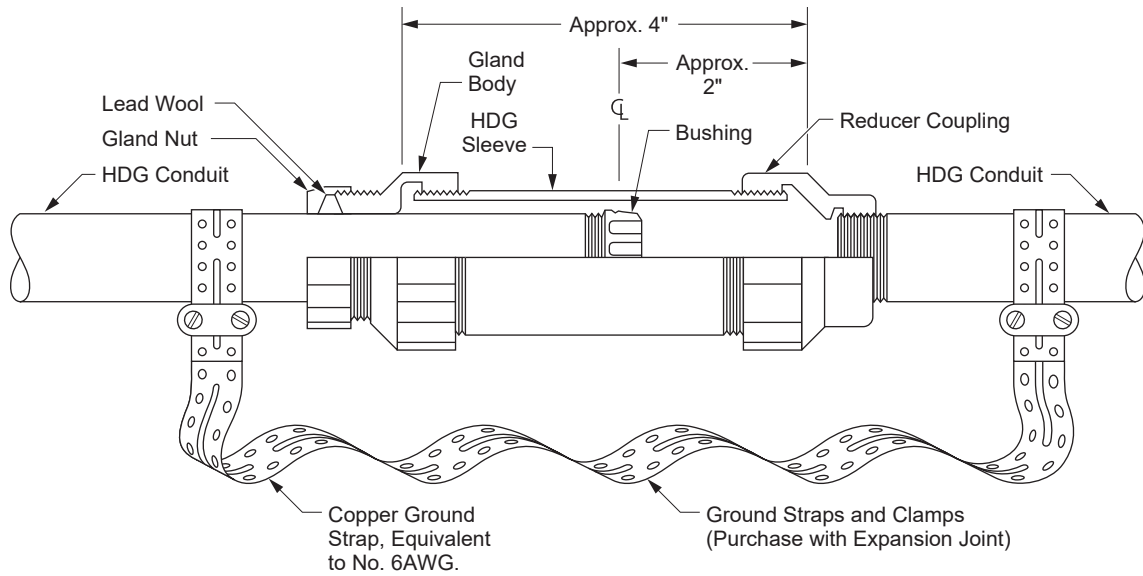
UGS

This page intentionally left blank.

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: 01-26-2007	What's Changed?	Sheet 1 of 1 UGS

This page intentionally left blank.

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

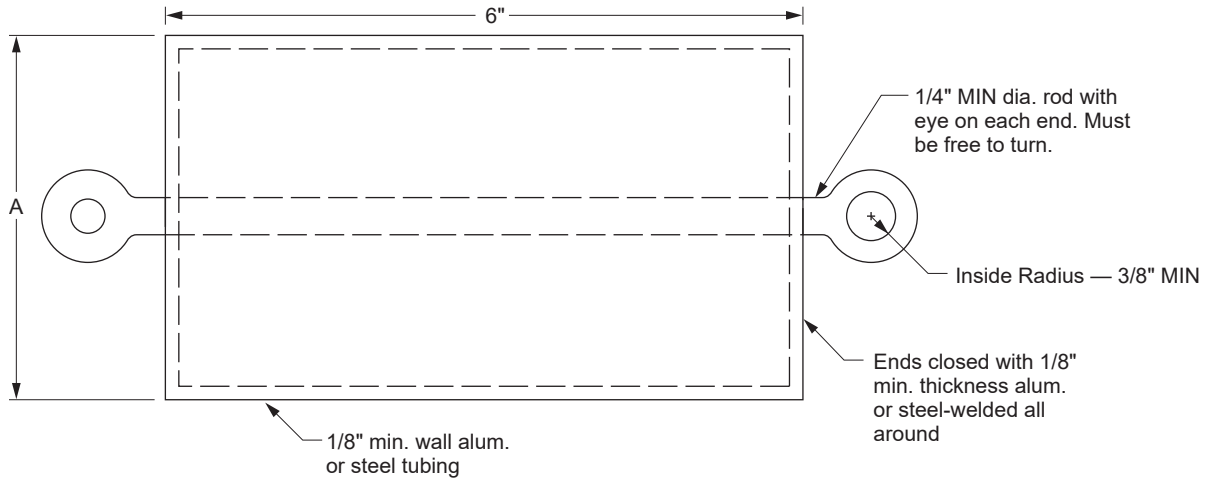


Table CD 197-1: Conduit Mandrels Data

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

This page intentionally left blank.