

# TRENCH EXCAVATION STANDARDS

## 1.0 INDEX

- 1.0 INDEX
- 2.0 SCOPE
- 3.0 GENERAL
- 4.0 TRENCHING GUIDELINES
- 5.0 SAFETY
- 6.0 BOX / VAULT / JUNCTION ENCLOSURE INSTALLATION
- 7.0 PAD INSTALLATION
- 8.0 STREET LIGHT INSTALLATION

## 2.0 SCOPE

The following Standards provide trench configurations and general requirements and guidelines for trenching and excavation for pipe, conduit, box, and vault installations within SPPCO service territory.

## 3.0 GENERAL

**All applicable City, County, State, and Federal Specifications must be met in addition to the requirements of this Standard. In the case of conflict, the more rigid Specification or Standard shall apply.**

## 4.0 TRENCHING GUIDELINES

### 4.1 Trenching Configurations

Trench configuration drawings attached as part of this standard are the typical configurations used by SPPCO. In cases where a typical configuration does not apply, a trench section drawing shall be provided to the contractor or customer showing necessary dimensions and details. The following general rules apply to all trenches:

**4.1.1** Backfill: The top 18 inches minimum of all trenches in streets, highways, or other paved areas shall be backfilled with crushed gravel compacted to 95% maximum density in accordance with SPPCO Specification SUB01X, Section 5.4.1.

**4.1.2** Bedding: Compacted sand bedding shall be placed a minimum of 12 inches above



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING  
TRENCH EXCAVATION  
STANDARDS

SHEET 19 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06

and 6 inches below all pipes and conduits.

- 4.1.3** Backfill Option: Either crushed gravel or sand bedding material may be used for backfill material in the trench area between 12 inches above the pipe or conduit, and 12 inches below finish grade. In either case, the material shall be compacted to 90% maximum density in accordance with SPPCO Specification SUB01X, Section 5.4.
- 4.1.4** Warning Tape: Warning tape shall be placed in all trenches at least 18" below finish grade and 12" above SPPCO pipe, conduit, or cable.
- 4.1.5** Conduit Installation: Primary conduit shall be installed with a minimum clearance of six inches (6") from the sides of the excavation. Secondary electrical conduit shall maintain a one and one-half inch (1-1/2") clearance from other electrical conduits and a minimum clearance of two inches (2") from the sides of the excavation. All electrical facilities shall be installed with a minimum twelve inches (12") of clearance from any other non-electric joint trench facility (i.e., gas, water, communications, etc.) See TE0003U Note #16 for other requirements.
- 4.1.6** Gas Installation: Gas installations require variables in sidewall clearances, sand bedding and separation depending on pipe sizes. Sidewall clearances are twelve inches (12") each side for sizes six inch (6") through sixteen inch (16"), and eighteen inches (18") for pipe sizes equal to or larger than eighteen inches (18"). Sand bedding is six inches (6") for size six inch (6") through twelve inch (12"), and twelve inches for sizes fourteen inch (14") through thirty-six inch (36"). Separation for pipes in joint trenches is nine inches (9") for sizes six inch (6") and eight inch (8") pipe, and twelve inches (12") for sizes ten inch (10") through fourteen inch (14") pipe, and sixteen inches (16") for fourteen inch (14") pipe, and sixteen inches (16") for pipe sizes larger than sixteen inch (16").

## 4.2 Trench Locations

Trench locations are typically shown relative to street centerlines, right-of-way lines, or property lines in new and existing developments. It is the responsibility of the contractor or the customer to verify that these reference lines are established and accurate. Where such references are unavailable, alignment shall be established by SPPCO.



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING

TRENCH EXCAVATION  
STANDARDS

SHEET 20 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06

### 4.3 Trench Depth

Depths shown in the standard trench configurations are minimums. For trenches which fall on a side slope, the depth shall be measured from the low side.

### 4.4 Dewatering

Where ground water is encountered during trench excavation, it shall be the responsibility of the contractor or customer to adequately dewater the trench to provide for safe and convenient installation of pipe or conduit. See SUB01X, Section 5.6, for details.

### 4.5 Other Utilities/Facilities

**4.5.1 Joint Trenches:** Joint trench construction shall be by mutual agreement of all parties involved. Coordination of separate utility/facility installations in a joint trench shall be by the contractor or the customer.

**4.5.2 Customer facilities** (except fuel/sewage/leach lines) may be installed in a joint trench if (1) approved by all the utilities involved, (2) all clearances are met, and (3) if on private property. No customer facilities will be allowed in joint trenches in franchised right-of-ways. Gas Service line shall not be installed in common trench with water lines on private property

**4.5.3 Existing Utilities:** Prior to commencement of excavation, the contractor or customer shall telephone the **Underground System Alert (USAN) at 1-800-227-2600**. After existing utilities have been located, extreme caution shall be exercised while excavating in their vicinity. Once exposed, pipes, conduits, and cable shall be shored or supported as necessary to prevent damage. **The full cost of repair or replacement of damaged utilities shall be borne by the contractor or customer.**

### 4.6 Installation Procedures

Pipes, conduits, and cables shall be installed in the trench, in accordance with the manufacturer's recommended procedures, SPPCO Specifications, and/or Standards and accepted practices.

### 4.7 Bedding and Backfill

Pipes, conduits, and cables shall be bedded, and trenches backfilled, in accordance with



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING  
TRENCH EXCAVATION  
STANDARDS

SHEET 21 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06

SPPCO Specification SUB01X. Conduits/trenches should be backfilled the same day as conduit is installed.

## **5.0 SAFETY**

### **5.1 Responsibility**

The contractor or customer shall be responsible for initiating, maintaining, and supervising all safety precautions in connection with the implementation of these standards, and shall comply with all applicable laws, rules and regulations of any public authority relative to the safety of persons or property, or their protection from damage, injury, or loss.

### **5.2 Shoring or Sloping**

When applicable, trenches shall be shored or their sides sloped, in accordance with SPPCO Standard GI0003U, and Federal Occupational Safety and Health Act (OSHA) requirements.

### **5.3 Excavated Material**

Soil and rock from the trench excavation shall be placed not closer than 24 inches to the edge of the trench.

### **5.4 Protective Gear**

All workmen shall have adequate protective gear including, but not limited to, hard hats, gloves, goggles, respirators, boots, etc.

### **5.5 Tools and Equipment**

All workmen shall be provided with safe, adequate, and well-maintained tools and equipment, including ladders for trench ingress and egress, in accordance with OSHA requirements.

## **6.0 BOX / VAULT / JUNCTION ENCLOSURE (JE's) INSTALLATION**

### **6.1 Application**

Selection of the correct type of box or vault involves judgement, taking into account the



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING

TRENCH EXCAVATION  
STANDARDS

SHEET 22 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06

present and future intended traffic use for the area where the box will be located.

- a. Incidental Traffic: For use in sidewalks, pedestrian traffic areas, parking lots where light vehicular traffic is expected, driveways in residential subdivisions and parkway strips. Incidental Traffic Boxes are not to be installed in traveled public thoroughfares, i.e. highways, streets, bridges.
- b. Full Vehicular Traffic: For use in streets, driveways, parking lots where heavy vehicular traffic is expected.
- c. Non-Traffic: For use in areas where there is no current or future exposure to any type of vehicular traffic.

## 6.2 Excavation

Excavation for boxes/vaults/JE's shall be performed by the contractor or customer concurrent with adjacent trench excavation, unless otherwise directed by the SPPCO Engineer, Planner, or Inspector. Size, depth, and alignment of the excavation shall be as shown on the attached Standard Drawings.

## 6.3 Dewatering

Where ground water is encountered during excavation, it shall be the responsibility of the contractor or customer to adequately dewater the excavation to provide for safe and convenient installation of the box/vault/JE's.

## 6.4 Installation

Boxes/vaults/JE's shall be installed using equipment with adequate load capacity to safely handle the components. No personnel shall be in the excavation during placement. All boxes and vaults shall be set level, squarely aligned with existing or proposed improvements and with the top 2.0 inches above finish grade in unpaved areas, 0.25 inch below finish grade in paved areas, and flush in sidewalks.

## 6.5 Bedding and Backfill

Boxes/vaults/JE's shall be bedded and the surrounding excavation backfilled, in accordance with SPPCO Specification SUB01X. Clean drain rock (3/4" minus) may be substituted for sand bedding and backfilling of vaults.



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING  
TRENCH EXCAVATION  
STANDARDS

SHEET 23 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06

## 7.0 PAD INSTALLATION

### 7.1 Excavation

Excavation for pads shall be performed by the contractor or customer concurrent with adjacent trench excavation, unless otherwise directed by the SPPCO Engineer or Inspector. Size, depth, and alignment of the excavation shall be as shown on Standard Drawings.

### 7.2 Dewatering

Where ground water is encountered during excavation, it shall be the responsibility of the contractor or customer to adequately dewater the excavation to provide for safe and convenient installation of the pads.

### 7.3 Installation

Transformer and switch pads shall be installed using equipment with adequate load capacity to safely handle the components. All pads and enclosures shall be set level, squarely aligned with the base at existing or proposed finish grade. The 10' area in front of all pads (equipment doors) shall be level.

### 7.4 Bedding and Backfill

Pads shall be bedded with 8" - 12" Type II subbase, depths as indicated on Standard Drawings, at 95% compaction and the surrounding excavation backfilled, in accordance with SPPCO Specification SUB01X.

## 8.0 STREETLIGHT INSTALLATION

### 8.1 Excavation

Excavation for streetlights shall be performed by the contractor or customer concurrent with adjacent trench excavation, unless otherwise directed by the SPPCO Engineer or Inspector. Size, depth, and alignment of the excavation shall be shown on standard drawings. See SLB02U and SLB12U, Standards Volume 5. For imbedded poles, see sonotube specification shown on the Work Order Drawing. Note: Sonotube may be substituted with PVC water or sewer pipe.

Sierra Pacific  
POWER COMPANY



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING

TRENCH EXCAVATION  
STANDARDS

SHEET 24 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06

## 8.2 Dewatering

Where ground water is encountered during excavation, it shall be the responsibility of the contractor or customer to adequately dewater the excavation to provide for safe and convenient installation of the streetlight substructure, sonotube, or precasted base.

## 8.3 Installation

Precast streetlight bases shall be installed using equipment with adequate load capacity to safely handle the components. All bases shall be set 3" - 6" above proposed finish grade with bolt pattern aligned for proper arm direction as shown on work order drawings, typically 90 degrees off curb line.

## 8.4 Bedding and Backfill

Streetlights, sonotubes and precasted bases shall be bedded with Type II subbase for the full depth of component at 90% compaction surrounding the component at a 2' radius in accordance with SPPCO Specification SUB01X.



ENGINEERING & CONSTRUCTION STANDARD

SECTION 3 STAKING AND TRENCHING  
TRENCH EXCAVATION  
STANDARDS

SHEET 25 OF 37

DRAWING NUMBER

**TE0001**

DRAWN	DESIGN	SUPR	DATE	REV
GD	JF	KT	5/98	7/06