Change Requirements of Backfill Material for Electric Distribution Only Trenches

SUMMARY

This utility bulletin communicates slurry as the alternative material used for trench bedding, shading and backfill material requirements for electric distribution-only trenches. This alternate material is only allowed to mitigate the safety risks of trench erosions or washouts under certain field conditions with erosion hazards or local jurisdictions overrides.

Additionally, this bulletin communicates the change in the maximum native soil particle size allowed in the shading and bedding areas.

LEVEL OF USE: INFORMATIONAL USE

AFFECTED DOCUMENT

Numbered Document 038193 “Minimum Requirements For the Design and Installation of Electric Conduit, Insulated Cable, and Facilities”

TARGET AUDIENCE

Electric operations employees and contractors who design, work on, install, or inspect electric distribution-only trench installations.

WHAT YOU NEED TO KNOW

1 Background Information

1.1 Figures 1 and 2 of Numbered Document 038193 show the current PG&E electric distribution-only trench requirements.

1.2 Erosion and washout issues have been repeatedly reported after rain events at recent project areas, including Community Rebuild projects, where import sand was used for trench bedding/shading and backfill on slopes.

1.3 Compacted native soil remains to be the default backfill material.

2 Definitions

Backfill: material placed at the minimum of 12 inches over the top of the conduit(s) to the finished grade

Bedding: material placed at the bottom of the trench, the base layer for the conduit(s) rests on

Cement-sand slurry: a flowable mixture of cement, sand, water, and optional chemical additives which achieves a low compressive strength when cured

Controlled Low-Strength Material (CLSM): self-consolidating cementitious material used primarily as a backfill as an alternative to compacted fill.

Native Slurry Backfill: a flowable mixture of native on-site soil with cement and water

Change Requirements of Backfill Material for Electric Distribution Only Trenches

Native soil: soil excavated from the trench site

One sack: a mixture with cement content approximately 94 pounds per cubic yard

Popcorn slurry: a mixture of cement, pea gravel, sand, water, and optional chemical additives which achieves a low compressive strength when cured

Shading: material that provides support from lateral displacements, distribute overhead loads, and protect the conduit(s) during final backfilling and paving operations

Trench plug: Interceptor dike or raised barrier installed at the base of the trench section, for trapping the backfill material and preventing it from being washed out of the trench. Plugs are installed on certain spacing as related to the severity of the trench slope.

Two sack: a mixture with cement content approximately 188 pounds per cubic yard

Zero sack slurry: a mixture of sand and water with no cement content, also known as wet sand

3 Required Action

3.1 The alternate use of cement-sand slurry for trench bedding, shading, and backfill layers may only be considered for one or more following field condition(s) identified by contractor and PG&E personnel:

1. Native soil is not suitable to be reused as compacted backfill (ie: rocks, bay mud, etc)
2. Existing erosion issues or high water table is identified (ie: above the trench base).
3. Trench is located on 5% grade or steeper slopes.
4. Trench is located on major roadways or highways where local jurisdiction requires slurry material to be used.

3.2 On-site native soil is the default material for trench bedding, shading, and backfill. Import sand should only be used for the listed conditions of Numbered Document 038193 Trench Requirements Note 3B. The use of slurry should only be considered for field conditions listed in Section 3.1 of this bulletin.

3.3 Slurry for bedding and shading layers shall only be one-sack cement-sand slurry or contain specified compressive strength between 50psi and 150psi as hand excavatable material. The material is defined as Controlled Low-Strength Material (CLSM) as self-compacted, cementitious material used primarily as backfill in place of compacted fill and remains hand excavatable.

3.3.1 Zero-sack slurry (wet-sand) and Popcorn slurry are not acceptable.

3.3.2 Slurry compressive strength may be allowed up to 200psi maximum only if required by the governing jurisdictions.

Change Requirements of Backfill Material for Electric Distribution Only Trenches

A&A Concrete Supply, Inc.

8272 Berry Ave, Sacramento, Ca. 95828
Phone (916) 383-3756 - Fax (916) 383-8427 - www.aareadymix.com

CONTRACTOR: Cedar Creek Corp 123 Concrete Lane (800) 123-4567 DESIGN #: Z3201050 DATE: (800) 456-7890 May 7, 2024

PROJECT: PG&E Marysville Ring

MIX USE: Cal-Trans - Slurry Cement Backfill
*2 sack sand slurry *** CLSM*

PLACEMENT METHOD: Check with your pumping Contractor

BATCH PLANT: Yuba City # 31

MAX SIZE AGG:	Concrete Sand
DESIGN STRENGTH**	50 - 150 Psi
PROJECT STRENGTH*	N/S Psi
W/(C+P):	2.26
SLUMP:	5-10" 10" Max.
MATERIAL SOURCES:	
CEMENT:	ASTM C-150 Type II/V
FLY ASH:	ASTM C-618 ~ Class "F"
COARSE AGG:	Western Aggregates
FINE AGGREGATE:	Western Aggregates
ADMIXTURES:	Master Builders - BASF Admixtures

Figure 1. Example of Mix Design with Specified Compressive Strength

3.4 The backfill layer (above shading section) can be either one-sack, two-sack cement-sand slurry, and meeting local jurisdiction requirements when applicable.

3.4.1 Zero-sack slurry (wet-sand) is not acceptable.

3.5 Slurry mix design shall be submitted to PG&E inspector, construction manager, and/or standards engineer for review and acceptance prior to construction.

3.6 6-inch-wide warning tape installation is still required in between shading and backfill layers per Numbered Document 038193 Note 4.

3.7 Trench plug installation is not required for slurry backfill trench.

3.8 Native Slurry Backfill (NSB) is considered acceptable for trench bedding, shading, and backfill layers only if the CLSM compression strength requirements per Section 3.2 thru 3.5 are satisfied. Warning tape installation between shading and backfill layers per Section 3.6 is also required.

3.9 The native soil particle size allowed in the shading and bedding layers is ¾" maximum, per Figure 2 and 3 below.

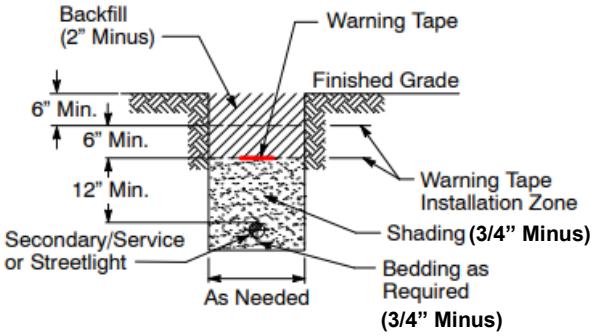

Figure 2
Secondary/Service or Streetlight Trench: Minimum Covered Depth from Top of Conduit is 24 inches

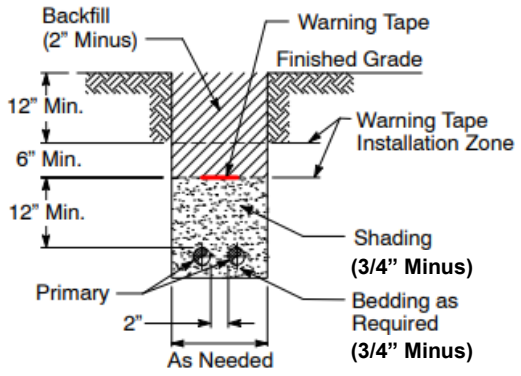

Figure 3
Primary Trench: Minimum Conduit Covered Depth from Top of Conduit is 30 Inches

Change Requirements of Backfill Material for Electric Distribution Only Trenches

4 Application Criteria

4.1 Table 1 below shows required field actions.

Table 1. Field Actions

Activity Type	Action
New Construction	FOLLOW the requirements listed in this utility bulletin and Numbered Document 038193 when constructing electric only trenches.
Re-Construction Work	
Maintenance	
Emergency	

DOCUMENT APPROVER

Matthew Perez, Manager, Electric Distribution Engineering Standards

DOCUMENT CONTACT

Calvin Yu, Senior Consulting Electric Standards Engineer (Civil)

Lisseth Villareal, Senior Consulting Electric Standards Engineer (Electrical)

Randy Royval, Principal Electric Distribution Standards Specialist

Robert Bendele, Principal Electric Distribution Standards Specialist

INCLUSION PLAN

The information contained in this bulletin will be included in the next revision of Numbered Document 038193 “Minimum Requirements For the Design and Installation of Electric Conduit, Insulated Cable, and Facilities”