



Legal Relations and Responsibility to the Public – Laws – Labor Code – Occupational Safety and Health Standards – Excavation Safety

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	03-30-2023	Original Issue	Richard Foley

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Background

This process establishes Structure Construction (SC) roles, responsibilities, and procedures for review and authorization of the contractor’s submittals for a protective system for providing worker protection from caving ground during excavation. A protective system as required by [Labor Code Section 6705](#) and defined by Cal/OSHA *Construction Safety Orders (CSO)*, [§ 1540, Excavations](#), is:

“A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.”

This process addresses review and authorization of shop drawings submitted by contractors that (1) utilize protective systems described in the Cal/OSHA CSO; or (2) utilize engineered designs for protective systems.

Additional information for related excavation responsibilities and procedures during construction will be found under [BCM 19-3.03B\(1-4\)](#), *Earthwork – Structure Excavation and Backfill – Construction – Structure Excavation*.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#), Section 7-1.02K(6)(b), *Legal Relations and Responsibility to the Public – Laws – Labor Codes – Occupational Safety and Health Standards – Excavation Safety*, that this BCM is based on as identified in the title block above. The information in the *Contract Specifications* typically will not be repeated in the text of this BCM.

Process Inputs

1. Contractor submittal for the excavation safety protective system

Procedure

1. All work associated with this process is charged as [Project Direct – Construction](#).
2. Inspection of field work for this process is: Not applicable, for submittal review.
3. Before construction begins:
 - a. For all submittals:
 - i. When submittals are received, create and maintain a record of chronological review of the submittals. Refer to [Falsework Manual](#), Chapter 2, Section 2-9, *Review of Shop Drawings – Chronological Record of Shop Drawing Review*, and document in daily reports.
 - ii. Review the shop drawings for completeness using the contents listed in the specifications and return incomplete submittals promptly. Consider also the following:
 1. Shop drawings for the excavation safety protective system must be site-specific and operation-specific.
 2. Shop drawings should address pertinent conditions found in the Cal/OSHA CSO, [§1541](#), *General Requirements*.
 - a. Note that the safety orders are found in the *California Code of Regulations*, Title 8, Chapter 4, Subchapter 4 and are discussed in [Attachment 2](#), *List of Relevant Construction Safety Order Sections*.
 - iii. Review supplemental project information (Geotechnical Report/Foundation Report and Log of Test Borings) to verify the soil parameters used for the protective system.
 - iv. Review project documents (contour grading plan, contours on the foundation plan, and/or the site in the field) for verification of the depth of excavation or protective system.

- v. Verify shop drawing includes a note for the Contractor to contact the Underground Service Alert, for the utility owners to mark the location of their utilities before excavation begins.
 - vi. Verify shop drawing shows known utilities adjacent to the excavation, including any Caltrans' facilities.
 - vii. Verify that shop drawings for excavations 5 feet or more in depth include a note that an excavation permit has been/will be obtained from Cal/OSHA as required by Cal/OSHA CSO, §341, *Permit Requirements*, Section (d)(5)(A). See [Attachment 2](#), *List of Relevant Construction Safety Order Sections*, for additional reference. This may be an annual permit or a site-specific permit.
 - viii. For projects utilizing the Torvane shear strength to determine parameters used to obtain a value for cohesion, refer to the *Trenching and Shoring Manual*, Chapter 3, Section 3-6, *Soils – Field and Laboratory Tests*, for additional conditions and submittal requirements. Consult with the [SC Falsework Engineer](#) for further assistance.
 - ix. For shoring adjacent to or under railroads, refer to [Attachment 3](#), *Shoring Systems Adjacent to Railroads*.
 - x. Authorize or reject the submittal, notifying the Contractor in writing. For a sample authorization letter see [Attachment 1](#), *Sample Authorization Letter*.
 - xi. For shoring that is not adjacent to or under a railroad, it is mandatory that one copy of the shoring plans, one copy of the Structure Representative's calculations, and a copy of the authorization letter be submitted to the [SC Headquarters Office Associates](#), immediately after they have been reviewed and authorized by the Structure Representative. Retain a minimum of one set of the authorized shoring plans and calculations in the job files.
- b. For submittals that conform to Cal/OSHA CSO, [§ 1541.1](#), *Requirements for Protective Systems*, as outlined in § 1541.1(b) Option (1), Option (2), or Option (3):
- i. Review shop drawings to ensure that they comply with the requirements of Cal/OSHA CSO, [§ 1541](#), *General Requirements*.
 - ii. Review shop drawings to ensure that they comply with the requirements of Cal/OSHA CSO, § 1541.1, *Requirements for Protective Systems*.
- c. For submittals that conform to Cal/OSHA CSO, [§ 1541.1](#), *Requirements for Protective Systems*, as outlined in § 1541.1(b) Option(4):

- i. Verify that the shop drawings and calculations have been sealed and signed by an engineer who is registered as a civil engineer in the State of California.
 - ii. Perform an independent engineering analysis of the shop drawings utilizing the requirements found in the Cal/OSHA CSO and the guidelines in the *SC Trenching and Shoring Manual*. The Contractor is allowed to use any published method of analysis.
 - iii. Sloped excavations greater than 20 feet, require a design by a professional engineer and will require a slope stability analysis to be included in the submittal. Consult Geotechnical Services as needed for assistance with checking the slope stability analysis during the review.
 - iv. Verify if special conditions as defined by the Cal/OSHA CSO exist. These conditions are typically:
 1. For shafts, Cal/OSHA CSO, [§ 1542](#), *Shafts*
 2. For cofferdams, Cal/OSHA CSO, [§ 1543](#), *Cofferdams*
 3. For confined spaces, Cal/OSHA CSO, [Article 37](#), *Confined Spaces in Construction*
 - a. Refer to the following references for additional information:
 - i. Division of Construction, [Code of Safe Practices](#)
 - ii. [BCM A-1](#), *Communicating Staff Responsibilities for Processes Owned by Others*
 - v. For complex protective system or shoring submittals, consult with the SC Falsework Engineer for assistance as needed (see [SC Headquarters Contacts](#)).
4. During construction:
- a. Check that the Contractor is working from an authorized set of plans. See [Volume II BCMS](#) related to *Contract Specifications*, Section 19-3, *Earthwork – Structure Excavation and Backfill* within [Section 19](#), *Earthwork*, for related field responsibilities and procedures during construction.
5. File all project documentation (chronological record of shop drawing review, correspondence, authorization or rejections of shop drawings, daily reports, etc.) in the appropriate category in the project records as specified in the *Construction Manual*, Chapter 5, [Section 5-102](#), *Contract Administration – Organization of Project Documents*.

Process Outputs

1. Authorized shop drawings for the protective system
2. Chronological record of shop drawing review for the protective system

Attachments

1. [Attachment 1](#), *Sample Authorization Letter*
2. [Attachment 2](#), *List of Relevant Construction Safety Order Sections*
3. [Attachment 3](#), *Shoring Systems Adjacent to Railroads*