Excavation/Trenching/Shoring

SafetyNet #: 136

Excavation, trenching, and shoring operations rules, regulations, requirements, and guidelines are set forth in Title 8, California Code of Regulations, Section 1539 to 1543[1]. Excavations and trenches over 5 feet in depth are required to be shored, properly sloped or benched. If there is the possibility of soil movement, even shallower excavation and trenches are required to be shored. A stairway, ladder, ramp, or other safe means of egress must be located in excavations/trenches that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

Exceptions: Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when:

- Excavations are made entirely in stable rock; or
- Excavations are less than 5 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in

Definitions: An excavation is any man-made cut, cavity, trench, or depression in the Earth’s surface formed by earth removal. A trench is defined as a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet. Generally, shoring is required for any excavation or trench greater than 5 feet in depth.

Excavation/Trenching Trigger Numbers

2 FEET: Required distance for spoils piles from edge of excavation/trench

3 FEET: Length ladder must extend above excavation/trench

4 FEET: Depth at which a ladder or ramp is required for access and egress

5 FEET: Depth at which mandatory shoring, benching, and/or a protection system is required
6 FEET: Depth at which fall protection is required for bridges/walkways across excavations/trenches

20 FEET: Shoring designed by a registered engineer is required

25 FEET: Maximum travel distance to an exit ladder

“IF IN DOUBT, GET OUT”

**Design:** Slope configuration, bench, supports, shielding and other protection system design must conform to manufacturer’s requirements, approved tables or otherwise designed by a Professional Engineer. Design must consider many factors: soil classification, depth of cut, water content of soil, changes due to weather and climate, or other operations in the vicinity.

**Hazards:** Cave-ins pose the greatest risk and are more likely than some other excavation-related incidents to result in worker fatalities. One cubic yard of soil can weigh as much as a car. An unprotected trench can be an early grave. Employers must ensure that workers enter trenches only after adequate protections are in place to address cave-in hazards. Other potential hazards associated with trenching work include falling loads, hazardous atmospheres, and hazards from mobile equipment. Before excavation, a check must also be made for any underground utilities or pipelines in the area.

**Inspections:** A qualified "competent person" is required to supervise and inspect any excavation, trenching, and shoring operation. A “Competent Person” must make daily inspections of the excavation/trench and protective systems prior to work commencing and as the work progresses. “Competent Person” is defined by Cal/OSHA as one who must demonstrate:

- Knowledge of the regulations pertaining to excavations, trenches and earthwork as found in Title 8, California Code of Regulations, Section1539-1543
- Knowledge of soil analysis pertaining to excavations, trenches and earthwork as found in Title 8, California Code of Regulations, Section 1539-1543
- Knowledge of the use of protective systems
- Authority to take prompt corrective action on the job as conditions warrant
- Ability to recognize and test for hazardous atmospheres

**Department Responsibilities**
Departments are responsible for the following:

1. Implementing a written departmental excavation, trenching, and shoring operations program

2. Ensuring employees receive initial instructor led training and annual (online) refresher training [2] for:
1. Potential hazards associated with excavation, trenching, and shoring operations
2. Standard Operating Procedures developed within each department
3. Safety procedures and the use of personal protective equipment
4. Providing training for the competent person
5. Ensuring excavation, trenching, and shoring procedures and requirements are followed
6. Providing and ensuring appropriate excavation, trenching, and shoring equipment is used

**Contracting Recommendations**
The following recommendations are for departments contracting excavation and trenching activities:

- Trenching/shoring must be in compliance with Title 8, California Code of Regulations, Section 1539-1543
- Require contractor to demonstrate knowledge of Title 8 regulations
- Require contractor to identify and provide qualification documentation for the “Competent Person” to be used on the project
- Verify current training records for personnel identified on the project

**References**

1. [Title 8, California Code of Regulations, Section 1539-1543](http://www.dir.ca.gov/Title8/sb4a6.html)
2. [UC Davis Policy & Procedure Manual, Section 290-86 – Hazardous Operations](https://safetyservices.ucdavis.edu/safetynet/excavationtrenchingshoring)

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**More information**
[https://safetyservices.ucdavis.edu/health-safety-staff-listing](https://safetyservices.ucdavis.edu/health-safety-staff-listing)

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