

OSHA Safety Training Excavations



While cave-ins are the most feared excavation hazard, other potentially fatal dangers also exist. These include asphyxiation due to lack of oxygen in a confined space (for instance, if you are running gas-powered machinery that causes a buildup of carbon monoxide and depletes oxygen), inhalation of toxic fumes, drowning, and more. Electrocutation or explosions are possible if workers unknowingly come in contact with underground utilities. OSHA requires that workers be protected and that safety and health programs address the variety of hazards they face.

Benching is a useful protective system when one can excavate the sides of a hole out to form one or more horizontal levels (with vertical platforms in between) so that the shallowness of the finished product can make a cave-in less likely.

Shoring or shielding is used when the location or the depth of the cut makes sloping back to the maximum allowable slope impractical. There are two basic types of shoring: timber and aluminum hydraulic.

Trench boxes differ from shoring in that instead of supporting the trench face, they serve mostly to protect workers from cave-ins. The area between the trench box and the face of the actual trench should be as small as possible, and it may be backfilled to prevent lateral movement of the box. The shields should never exceed the load for which they are rated. It should also be noted that trench boxes may be used in conjunction with sloping and benching.

OSHA does not require a protective system if the excavation is made entirely in stable rock, or is less than 5 feet deep, as long as a competent person has examined the ground and found no indication of a potential cave-in.

Maintenance of Protective Systems

- Materials and equipment should be free from damage or defects.
- Manufactured materials and equipment should always be used and maintained in a manner consistent with the manufacturer's recommendations.
- A competent person must examine any damaged materials or equipment. Always remove unsafe materials and equipment from service until a registered professional engineer can evaluate and approve them for use.



OSHA requires that workers in trenches and excavations be protected, and that safety and health programs address the variety of hazards they face. The following hazards cause the most trenching and excavation injuries:

1. No Protective System

If you are not using protective systems or equipment while working in trenches or excavations at your site, you are in danger of suffocating, inhaling toxic materials, fire, drowning, or being crushed by a cave-in.

2. Failure to Inspect Trench and Protective Systems

If trenches and excavations at your site are not inspected daily for evidence of possible cave-ins, hazardous atmospheres, failure of protective systems, or other unsafe conditions, you are in danger.

3. Unsafe Spoil-Pile Placement

Excavated material (spoils) at your site are hazardous if they are set too close to the edge of a trench/excavation. The weight of the spoils can cause a cave-in, or spoils and equipment can roll back on top of workers, causing serious injuries or death.

- Set spoils and equipment at least 2 feet back from the excavation.
- Use retaining devices, such as a trench box, that will extend above the top of the trench to prevent equipment and spoils from falling back into the excavation.

Where the site does not permit a 2-foot set back, spoils may need to be temporarily hauled to another location.

4. Unsafe Access/Egress

To avoid fall injuries during normal entry and exit of a trench or excavation at your job site, ladders, stairways, or ramps are required. In some circumstances, when conditions in a trench or excavation become hazardous, survival may even depend on how quickly you can climb out.

- Provide stairways, ladders, ramps, or other safe means of egress in all trenches that are 4 feet deep or more.
- Position means of egress within 25 lateral feet of workers.