



Safety Topic: Trenching and Excavation Cave-in Protection

Whether it's digging a hole to set a utility pole or trenching for a duct bank, utility workers frequently perform excavation work. Cave-ins are the most severe hazard we encounter during trenching and excavation, commonly occurring between five and 15 feet deep. One cubic yard of soil can weigh up to 2,200 pounds, depending on moisture content.

Potential hazards associated with trenching and excavation work include:

- Falling loads.
- Hazardous atmospheres.
- Collapse.
- Hazards related to mobile equipment work in or around trenches.

Competent person

OSHA defines a competent person as an individual, designated by the employer, who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous or dangerous to workers. In addition to identifying excavation hazards, the competent person must also have the authority to take prompt corrective measures to eliminate them.

Protective systems

Excavations identified by the competent person or that are five feet deep or greater require a protective system unless the excavation is made entirely in stable rock. State, local or site conditions may require protective systems when less than five feet deep.

Employers can aid in preventing cave-ins by using one of three systems:

- Sloping and benching the sides of the excavation.
- Supporting the sides of the excavation.
- Placing a shield between the side of the excavation and the work area.

Excavations greater than 20 feet in depth require that a protective system be designed or be approved based on pre-existing data by a registered professional engineer.

Standards require that excavations and protective systems be inspected daily and as conditions change by a competent person prior to performing work.

Standards require that spoil piles be at least two feet from the edge of the excavation.

Never begin an excavation prior to calling a utility locating authority for that area.

Water in excavations

Water in an excavation can undermine the bottom and sides of the excavation, which can create a collapse and also make it more difficult for the worker to get out of the excavation. OSHA only allows work to be performed inside an excavation where water has accumulated if adequate precautions are taken to protect the worker.

These precautions include:

- Special support or shield system.
- Water removal pumping system. The water removal system must be monitored by the competent person.

Soil types

OSHA defines four different classes of soils: Solid rock, Type A, Type B and Type C. Solid rock is the most stable.

Key take-aways

- Never enter an excavation unless:
 - A competent person has verified that the excavation is safe to enter.
 - Cave-in protection measures are in place.
 - Means of entry and egress have been established.
 - Machinery and equipment are not close to the edge.
 - There is no standing water inside the excavation.
 - Air has been tested and verified that atmospheric hazards are not present.

For more information on trenching and excavation safety, visit <https://www.osha.gov/SLTC/trenchingexcavation/index.html>.