

# OSHA<sup>®</sup> FactSheet

## Trenching and Excavation Safety

Excavation and trenching are among the most hazardous construction operations. OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet (4.5 meters).

### Dangers of Trenching and Excavation

Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in employee fatalities. Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment. Trench collapses cause dozens of fatalities and hundreds of injuries each year.

### Protect Yourself

Do not enter an unprotected trench! Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. Trenches 20 feet (6.1 meters) deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer.

### Protective Systems

There are different types of protective systems. **Sloping** involves cutting back the trench wall at an angle inclined away from the excavation. **Shoring** requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins. **Shielding** protects employees by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes due to weather or climate, excessive vertical loads (e.g., spoils piles, other materials to be used in the trench) and other operations in the vicinity.

### Competent Person

OSHA standards require that trenches be inspected daily and as conditions change by a competent person prior to employee entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees and who is authorized to take prompt corrective measures to eliminate or control these hazards and conditions.

### Access and Egress

OSHA requires safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet (1.22 meters) or deeper. These devices must be located within 25 feet (7.6 meters) of all employees.

### General Trenching and Excavation Rules

- Keep heavy equipment away from trench edges.
- Keep vertical loads at least 2 feet (0.6 meters) from trench edges.
- Know where underground utilities are located.
- Test for low oxygen, hazardous fumes and toxic gases.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm.
- Do not work under raised loads.

### Additional Information

Visit OSHA's Safety and Health Topics web page on trenching and excavation at <http://www.osha.gov/SLTC/trenchingexcavation/index.html>.