

# Trench and Excavation Safety

Trench collapses, or cave-ins, are the **leading hazard** in excavation work. Safe trenching helps **prevent** falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment.

## Trench Safety Measures

**Trenches 5 feet or deeper** require a protective system unless dug in stable rock. For **trenches less than 5 feet**, a competent person must decide if protection is needed.

**Trenches 20 feet or deeper** must have a protective system designed or approved by a registered professional engineer, as required by OSHA 1926.652(b) and (c).

## Competent Person

Before workers enter a trench, a competent person **must inspect it daily** and after any condition changes to ensure safety. This person is **trained** to identify hazards, determine soil types, select protective systems, and has the authority to correct issues immediately.

## Access and Egress

- Keep heavy equipment and spoils at least 2 feet from trench edges
- Locate underground utilities before digging
- Test for atmospheric hazards in trenches over 4 feet deep
- Inspect trenches daily, at the start of each shift, after storms, and after conditions change
- Never work under suspended loads
- Wear high visibility clothing when near traffic



## Protective Systems

- **Benching**: a method of protecting workers from cave-ins by cutting the sides of an excavation into horizontal steps. Benching is not allowed in Type C soil.
- **Sloping**: involves cutting back the trench wall at an angle inclined away from excavation.
- **Shoring**: requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.
- **Shielding**: protects workers by using trench boxes or supports to prevent cave-ins. Designing these systems can be complex, as factors like soil type, trench depth, moisture, weather, nearby loads, and site activity must all be considered.

OSHA standards require that employers provide workplaces free of recognized hazards. The employer must comply with the trenching and excavation requirements of **29 CFR 1926.651 and 1926.652**.



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# Toolbox Talks



## Preventing Excavation/Trench Cave-ins

Ask the following questions and give time for answers.

### What are the hazards?

Bodily or equipment entrapment in soil.

### What are the results?

Broken or crushed limbs and bones, entrapment, suffocation, head injury, internal damage, and death.

### What should we look for?

Stable rock and soil type (A, B, C), depth of excavation, cave-ins, water in trench, weather conditions (rain, frost), water table, protective systems, competent person, operation of heavy equipment near excavation, barricades, and falling loads.



## How do we prevent these results?

- A competent person must evaluate excavations daily. Excavations should be re-evaluated after events such as rain.
- Use shoring equipment, shielding, and/or sloping or benching systems for excavations greater than 5 feet in depth or less when deemed necessary by the competent person.
- Examine protective systems in accordance with manufacturers recommendations and remove damaged systems from service.
- Excavated material/other objects must be kept at least 2 feet from edge.

## Understanding Soil Types

- Type "A" - most stable (clay, hardpan)
- Type "B" - next most stable (silt, loam, unstable dry rock)
- Type "C" - least stable (gravel, loamy sand)

## Let's talk about this site now

### How can you prevent cave-ins?

Shoring, shielding, sloping, and/or benching.

### At what depth is cave-in protection required?

5 feet or less depending on the assessment by a competent person.

### Name some conditions that can increase cave-ins.

Rain, heavy equipment, vibration, spoil piles, etc.

**The unfortunate reality** - From 2011 to 2021 there were at least **220 trenching fatalities** across the United States. These fatality incidents were preventable with the use of a protective system, proper employee training, and implementation of a safety and health management system.

## AN UNPROTECTED TRENCH IS AN EARLY GRAVE



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