

Trenching and excavation safety

In Minnesota, trenching and excavation work remains highly hazardous. From 2021 through 2025, two Minnesota workers died in a trench, excavation or ground collapse. Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in worker fatalities.

Minnesota law requires employers to provide a workplace free of recognized hazards that may cause serious injury or death. This includes the trenching and excavation requirements of 29 CFR 1926.651 and 1926.652.

An excavation is any man-made cut, cavity, trench or depression in an earth surface, formed by earth removal. A trench or a trench excavation is a narrow excavation (in relation to its length) made below the surface of the ground; in general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet.

Dangers of trenching and excavation

In addition to cave-ins, other potential hazards include falls, falling loads, hazardous atmospheres and incidents involving mobile equipment. Two cubic yards of soil can weigh about 6,000 pounds or as much as a small car. An unprotected trench is an early grave. Do not enter an unprotected trench.

Trench safety measures

Trenches five feet deep or greater require a protective system unless the excavation is made entirely in stable rock. If the trench is fewer than five feet deep, a competent person may determine a protective system is not required. Trenches 20 feet 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 in accordance with 1926.652(b) and (c).

Competent person

OSHA standards require employers to ensure trenches or excavations are safe before employees enter them and that they are inspected by a competent person daily and as conditions change to ensure the elimination of hazards. **A “competent person” is someone who:**

- Can identify existing and predictable hazards, including unsafe soil conditions, inadequate protective systems, water accumulation, nearby structures, spoil pile issues and other dangers.
- Understands soil classification and knows which protective system (sloping, shoring, shielding, engineered systems) is required for each soil type and depth.
- Has authority to stop work and to implement immediate corrective actions to eliminate hazards.

OSHA requires:

- **Every trench or excavation** must be inspected *before worker entry* each day.
- Additional inspections must happen **as conditions change** (weather, vibrations, water intrusion, soil sloughing, equipment movement, etc.).
- Inspections must be done by a **competent person**.

Access and egress

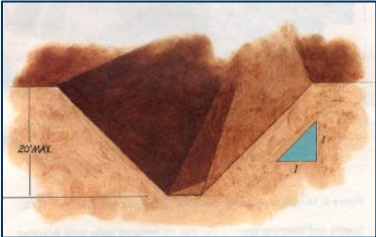
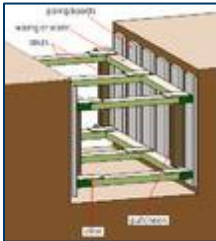
OSHA standards require safe access and egress (ladders, steps and ramps) in trenches four feet or deeper, located within 25 feet of workers to ensure quick exit. Structural ramps must be designed by a competent person and ladders must extend at least three feet above the landing.


General trenching and excavation rules

- Keep heavy equipment away from all trench edges.
- Identify other sources that might affect trench stability.
- Keep excavated soil (spoils) and other materials at least two feet or more from trench edges.
- Know where underground utilities and overhead powerlines are located before digging.
- Test for atmospheric hazards, such as low oxygen, hazardous fumes and toxic gases, when greater than four feet deep.
- Inspect trenches at the start of each shift and following a rainstorm or other water intrusion.
- Do not work underneath suspended or raised loads and materials.
- Inspect trenches after any occurrence that could have changed conditions in the trench.
- Ensure personnel protective equipment is used or worn, such as hard hats, high-visibility items or other suitable clothing, when exposed to vehicular traffic or mobile earth-moving equipment.

Protective systems

There are different types of protective systems – sloping, shoring and shielding. Trenches five feet or deeper require a protective system.

Type of protective system	Illustration of system
<p>Sloping involves cutting back the trench wall at an angle inclined away from the excavation.</p>	
<p>Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.</p>	

Type of protective system	Illustration of system
<p>Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because many factors must be considered: soil classification; depth of cut; water content of soil; changes caused by weather or climate; surcharge loads (spoil, other materials to be used in the trench); and other operations in the vicinity.</p>	

More information

To learn more about excavation safety, view the standards on the [federal OSHA website](#).

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