OSHA
DEPARTMENT OF LABOR AND INDUSTRY

Fact sheet

Trenching and excavation safety

From 2014 through 2019, four 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 ensure trenches – before worker entry – are inspected by a competent person daily and as conditions change, 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 workers; who understands soil types and the protective systems required; and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

Access and egress

OSHA standards require safe access and egress to all excavations, including ladders, steps, ramps or other safe means of exit for employees working in trench excavations four feet or deeper. These devices must be located within 25 feet of all workers.

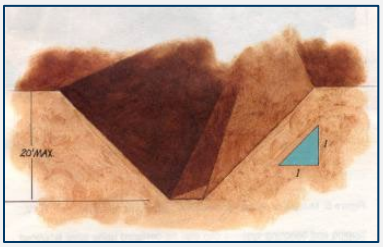
General trenching and excavation rules

- Keep heavy equipment away from trench edges.
- Identify other sources that might affect trench stability.
- Keep excavated soil (spoils) and other materials at least two feet from trench edges.
- Know where underground utilities 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 wear high-visibility 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.

Type of protective system	Illustration of system
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 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.	

More information

To learn more about excavation safety, view the standards at osha.gov.

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