



Trenching and Excavations Fact Sheet

About 400 workers die in the U.S. every year from trenching and excavation related accidents, and about 6,500 are seriously injured. If you are in a trench when a wall collapses you may get buried in soil very quickly. One cubic yard of dirt can weigh approximately 2,800 pounds – about the same as a small pickup truck! In addition to the obvious danger of getting buried by soil, there are other potential dangers when working in trenches, such as hazardous gas inhalation, falling objects, drowning, dangerous equipment, and power sources like electricity. The Occupational Safety and Health Administration (OSHA) requires trench protection in all excavations and trenches deeper than 5 feet. However, even in excavation and trenches less than 5 feet deep, trench protection may be required depending on the soil type and presence of water.

Classification of Soil

OSHA classifies soil types into 3 categories: "A" (most stable), "B" (intermediate), and "C" (least stable). The "Competent Person" in charge of a job is the person who has proper training to identify soil types and other excavation and trenching hazards, and has the authority to take prompt action, including stopping the job. The Competent Person must identify the soil type and select the correct protective system for the trench or excavation.

Protective Systems

Sloping, benching, shoring, and shielding are the main protective systems used. The type of soil determines the sloping angle. Shoring is designed to prevent walls from collapsing. Shoring can be made out of timber or hydraulically or mechanically-operated metal jacks. Shielding or trench boxers are used to protect workers from collapsing walls. The tabulated data on the shoring and shielding provided by the manufacturer or the design professional engineer must be followed regardless of the soil classifications.

General Safety in Excavations and Trenching

1. Trenches over 4 feet deep must have exits within 25 feet of every worker by way of ladder or ramp.
2. Underground utilities should be marked by JULIE before the beginning of the excavation.
3. Any excavation under a base, foundation, or wall requires a support system designed by a registered professional engineer.
4. Excavation spoils must be placed at least 2 feet away from the trench opening.
5. Hard hats are required in every trenching and excavation work zone, and traffic vests are required when working in street areas.
6. Before beginning of an excavation, look out for overhead power lines and make sure there is enough clearance to work under the power lines.
7. No one should be allowed under the loads handled by the digging or loading equipment.
8. Barricade tape, barricades, and fences should be used to prevent unauthorized persons from getting inside the work area.
9. Heavy vehicles which create vibrations should not be allowed close to excavations.
10. The Competent Person must examine the excavation site every morning and after rain or changing conditions, such as water in the excavation, for signs of earth movement and movement of shoring.

Hazardous Atmosphere in Trenches or Excavations

A hazardous atmosphere can be present or develop in a trench or an excavation, especially when digging close to a landfill, toxic site, or sewer. It can also develop if chemicals are used inside or close to the trench or excavation. Oxygen deficiency and presence of toxic or highly flammable gases (such as carbon monoxide, hydrogen sulfide, methane, or solvent vapors) are the main contributors to hazardous atmospheres. Testing for such hazardous atmospheres should be done, and if problems exist they should be addressed by providing fresh air ventilation or using personal protective equipment.

For questions contact the Division of Safety and Compliance, (217) 265-9828, or safetyandcompliance@illinois.edu.