



# Trenching Work

## You Need to Know

### Definition

Excavating is defined as “any man-made cut, cavity, trench, or depression in an earth surface, formed by the removal of earth.” A trench is a type of narrow excavation in which the depth is typically deeper than the width; and the width is not larger than fifteen feet. According to this definition, all trenches are excavations, but not all excavations are trenches. The specific safety requirements for trenches depend on the depth of the trench.

Trenching cave-ins are often deadly. OSHA requires that each worker in a trench be protected from a cave-in by adequate protective systems, including:

- Sloping—cutting back the trench wall at an angle inclined away from the excavation;
- Benching—creating stepped benched grades (for Type A or B soil only);
- Shoring—installing aluminum, hydraulic, or other types of supports to prevent soil movement and cave-ins; or
- Shielding—using trench boxes or other types of supports to prevent soil cave-ins.

Whichever protective system is chosen, workers must understand that they need to stay within that system to keep themselves safe.

### Cave-In

When cave-ins occur, a cubic yard of soil can weigh up to 3,000 lbs. and suffocation can occur in as few as three minutes. With that understanding, it is important to follow the rules and provide appropriate supports. Provide trench wall support so collapse is avoided.

Other hazards, and there are many, include: falls, workers being struck by natural elements or equipment, and electrocution, oxygen deficiency, or toxic gases. Workers involved in this type of work should familiarize themselves with each hazard and work to mitigate them before excavation work begins.



*Soils fall into one of four categories:*

- *stable rock*
- *type A (e.g., clay)*
- *type B (e.g., angular gravel, silt)*
- *type C (e.g., sand).*

*By having a competent person conduct an inspection and test to identify the kind of soil(s) involved and the properties of those soils, contractors can then use that information to determine the best solution for protecting worker safety.*

### Hazard Training

Trench hazard training can prevent a tragic outcome. Make sure your employees and foremen know these safety basics:

1. Do not enter an unprotected trench.
2. Keep surcharge loads at least two feet from trench edges.
3. Know where underground utilities are located.
4. Test for low oxygen, hazardous fumes, and toxic gases.
5. A competent person must inspect trenches daily and when conditions change (rainstorm, snow, etc.)
6. Inspect trenches at the start of each shift.
7. Do not work under raised loads.
8. Provide a protective system for trenches five feet deep or greater.
9. Trenches 20 feet deep or greater require a protective system designed by a registered professional engineer or based on data supplied by a registered professional engineer.
10. Place excavated or other materials and equipment at least two feet back from the edge of a trench.
11. Provide a safe way to exit within 25 feet of workers in a trench.

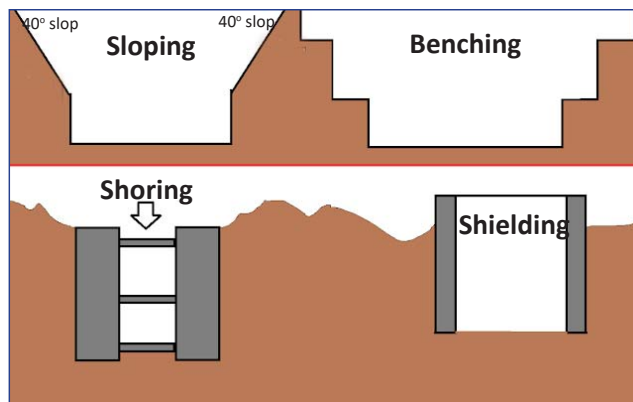
Remember, too, that collapses aren't the only hazards of trenches. Other dangers include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment.



## Sloping and Benching System

Sloping is the technique through which the edges of the excavated area are cut-down to 40 degrees so that they minimize the pull of gravity by lowering the height of evacuation depth. This technique is used where the ground material's nature is not sandy and the material stability remains intact against wind and jerks of power tools or machines.

Benching is also called stepping technique this method of the protection system is adopted where the ground is not sufficient around the excavated area and it cuts down the edges into multiple steps. It is recommended that each step must be at 1/3 of the excavation depth. The benching system is very effective where the excavated ground is composed of hard soil.



Once the soil type is determined, the next step is to determine the best method for securing the trench, considering its depth and width. Depending on these and other factors, there are several ways to secure the trench: sloping, benching, shoring, or shielding.

## Shoring System

Shoring is implemented where sloping and benching systems are impractical due to several reasons such as if the excavated area is located near the road site where vibration due to running vehicles can erode soil from edges of the excavated area. Or if the excavation is done in a muddy or high-water seepage area due to which soil stability cannot retain for long.

Wood or aluminum plates can be used for shoring and fixed in place with horizontal jacks or brackets installed at appropriate distances.

## Trench Shielding System

Trench shielding is the best protective system among all system because it not only provides safety against cave-in hazard but also provides a safe space to work for the workers inside the shielding system.

For shielding system's, ready-made customized shielding structures are installed inside the excavated area with the help of a crane or hoist. These protective systems are mainly recommended in projects where underground machines or system installation is required.

## QUIZ

True or False

1. Experience as a worker qualifies you to do inspections. T or F
2. One cubic yard of soil can weigh 3,000 pounds. T or F
3. There must be an exit from the trench within 15 feet of the work area. T or F
4. If the soil is hard rock it doesn't need additional shoring. T or F
5. Benching/Stepping can be used in sandy areas to prevent cave-ins. T or F
6. Workers must stay within the protective system to keep themselves safe. T or F

1.F, 2.T, 3.F, 4.T, 5.F, 6.T

## SAFETY TRAINING SIGN-IN SHEET

Company Name: \_\_\_\_\_ Date: \_\_\_\_\_

Subject: Trenching Work

The following employees participated in this training.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
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