



Excavations

OSHA 10-Hour Construction Industry Course

Required Online Topic Time: 30m



Learning Objectives



Duration

30 minutes

Terminal Learning Objective

Given current OSHA and general industry information regarding worksite illnesses, injuries, and/or fatalities, the student will be able to recognize responsibilities related to excavations.

Enabling Learning Objectives

- Identify the greatest risk present at an excavation site.
- Recognize the three methods of protecting employees from cave-ins.
- Name hazards associated with excavation areas and ways to eliminate them.
- Describe the functions of a competent worker at an excavation site.
- Identify employer requirements to protect workers from excavation hazards.



Excavation Risks



According to OSHA, an **excavation** is a man-made cut, cavity, trench, or depression formed by earth removal.

Excavating is one of the most hazardous construction operations for construction workers. Nearly all excavation accidents take place in trenches 5 to 15 feet deep, and there is usually **no warning** before they occur.

A trench is actually a **narrow excavation**. The depth is greater than the width, but not wider than 15 feet.

You should never enter an unprotected trench that is 5 feet or more in depth, because cave-ins can happen without warning. Even excavations less than five feet deep need to be deemed safe by a **competent worker**.



Excavation Risks continued...



Of the many risks associated with excavations, **cave-ins** are the greatest.

Employees exposed to a cave-in must be protected by sloping or benching the sides of the excavation, by supporting the sides of the excavation, or by placing a shield between the side of the excavation and the work area.

Other excavation risks include:

- *Asphyxiation due to lack of oxygen*
- *Inhalation of toxic materials*
- *Fire*
- *Collapse of an excavation due to moving machinery near the edge*
- *Accidental severing of underground utility lines*



Excavation Risks continued...



Knowledge Key

Excavating is one of the most hazardous construction operations for construction workers. Nearly all excavation accidents take place in trenches 5 to 15 feet deep, and there is usually no warning before they occur. Of the many risks associated with excavations, cave-ins are the greatest. Other excavation risks include: asphyxiation due to lack of oxygen, inhalation of toxic materials, fire, collapse of an excavation due to moving machinery near the edge and accidental severing of underground utility lines.

Protecting Workers from Cave Ins and Utility Hazards



The three main protection methods against cave-ins are **shields**, **shoring**, and **sloping or benching**.

- **Shield:** a structure that is able to withstand the forces imposed on it by a cave-in thereby protecting employees within the structure
- **Shoring:** a structure that supports the sides of an excavation which is designed to prevent cave-ins
- **Sloping and Benching:** Sloping forms the sides of an excavation that are inclined away from the excavation. Benching refers to excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels



Protecting Workers from Cave Ins and Utility Hazards continued...



To **protect** employees from exposure to potential cave-ins:

- Slope or bench the sides of the excavation
- Place a shield between the side of the excavation and the work area

Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when:

- Excavations are made entirely out of stable rock
- Excavations are less than five feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in

Protecting Workers from Cave Ins and Utility Hazards continued...



Knowledge Key

Your employer has the ability to protect you from cave-ins and other hazards by using adequately-designed protection systems in excavations, but these are not required when an excavation is made entirely in stable rock or is less than 5 feet deep if a competent person has found no indication of a potential cave-in. The three main protection methods against cave-ins are shields, shoring, and sloping or benching. All of these systems must have the capacity to resist, without failure, all intended or expected loads.

Protecting Workers from Cave Ins and Utility Hazards continued...



An underground utility line is damaged once every nine minutes.

Hitting underground utility lines when digging can result in **severe injury** or **death**, or potentially **disrupt critical services**, so knowing what's below and having lines marked before you start work is critical.

Contacting 811 **before** you start any projects that involve digging is important for multiple reasons. These include:

- Helps keep you, your co-workers, and the local community **safe**.
- **Prevents utility service disruptions** including heat, water, natural gas, electricity, cable, and telecoms.
- Helps **protect the environment**: land, water, and wildlife.

Regardless of whether you are simply taking care of a small home improvement project or are participating in a digging project at work, in almost every case you must **contact 811 before you dig**, even if you previously made contact for a similar project at the exact same location.



Know what's below.
Call before you dig.



Protecting Workers from Cave Ins and Utility Hazards continued...



Knowledge Key

An underground utility line is damaged once every nine minutes. Hitting underground utility lines when digging can result in severe injury or death, or potentially disrupt critical services. Calling 811 before you dig reduces the risk of damaging utility lines, which protects you, your co-workers, the local community, and the environment. Your employer must also protect you against other excavation-associated hazards, including adjacent structures, spoils, and falls.

Roles of Workers and Employers



A competent person is someone who can recognize and manage hazards in a work area and who also has training in **soils classification, usage of protective systems, and OSHA excavation standard requirements.**

Their responsibilities include inspecting excavation areas before work begins, after rainstorm and high winds, or after other occurrences which may increase hazards.

Your employer is responsible for preplanning, protecting you and your coworkers from cave-ins and other hazards, inspecting an excavation at least daily, taking corrective action when a hazard is identified, ensuring that appropriate ladders are available, and taking other measures to keep trenches safe.

You also have the responsibility to keep yourself and others safe around excavation sites including working defensively, following your company's excavation and trenching safety rules, correcting the hazards you are able to correct, and reporting to your supervisor the hazards you are unable to correct.

Roles of Workers and Employers

continued...



Knowledge Key

A competent person is someone who can recognize and manage hazards in a work area and who also has training in soils classification, usage of protective systems, and OSHA excavation standard requirements. Their responsibilities include inspecting excavation areas before work begins, after rainstorm and high winds, or after other occurrences which may increase hazards. While OSHA requires employers to do certain things to protect you, the worker, from hazards present on excavation sites, you also have the responsibility to keep yourself and others safe around excavation sites including working defensively, following your company's excavation and trenching safety rules, correcting the hazards you are able to correct, and reporting to your supervisor the hazards you are unable to correct.

Practice Questions



1. What two requirements must be met so that a trench does not need to have a protective system installed? **Select all that apply.**

- a. The trench will be less than 5 feet deep or made entirely out of stable rock.
- b. A competent person has examined the ground and finds no indication of a potential cave-in.
- c. The trench will be greater than 10 feet deep.

2. There are ways to protect yourself when excavating. Which of the following is a way to protect yourself when working around excavations?

- a. Slope or bench the sides of the excavation and support the sides of the excavation.
- b. Have a competent person identify that the work site is hazardous; no employees can declare an excavation unsafe.
- c. Support systems, shield systems, or other protective systems should be used only when the excavation is 10 feet in depth or deeper.
- d. Place a shield outside the work area.

Practice Questions continued...



3. An excavation is at risk for a cave-in because the walls of the excavation are unstable. What type of excavation protection will address this situation?

- a. Fall prevention
- b. Oxygen deficiency and toxic fumes
- c. Shoring

4. What is the minimum distance that excavation materials, tools, and other supplies be kept back from the excavation's edge?

- a. 1 foot
- b. 2 feet
- c. 7.5 feet
- d. 25 feet

5. Whose responsibility is it to keep excavated dirt, rocks, and other materials back a sufficient distance from the excavation's edge?

- a. Employer
- b. Employee

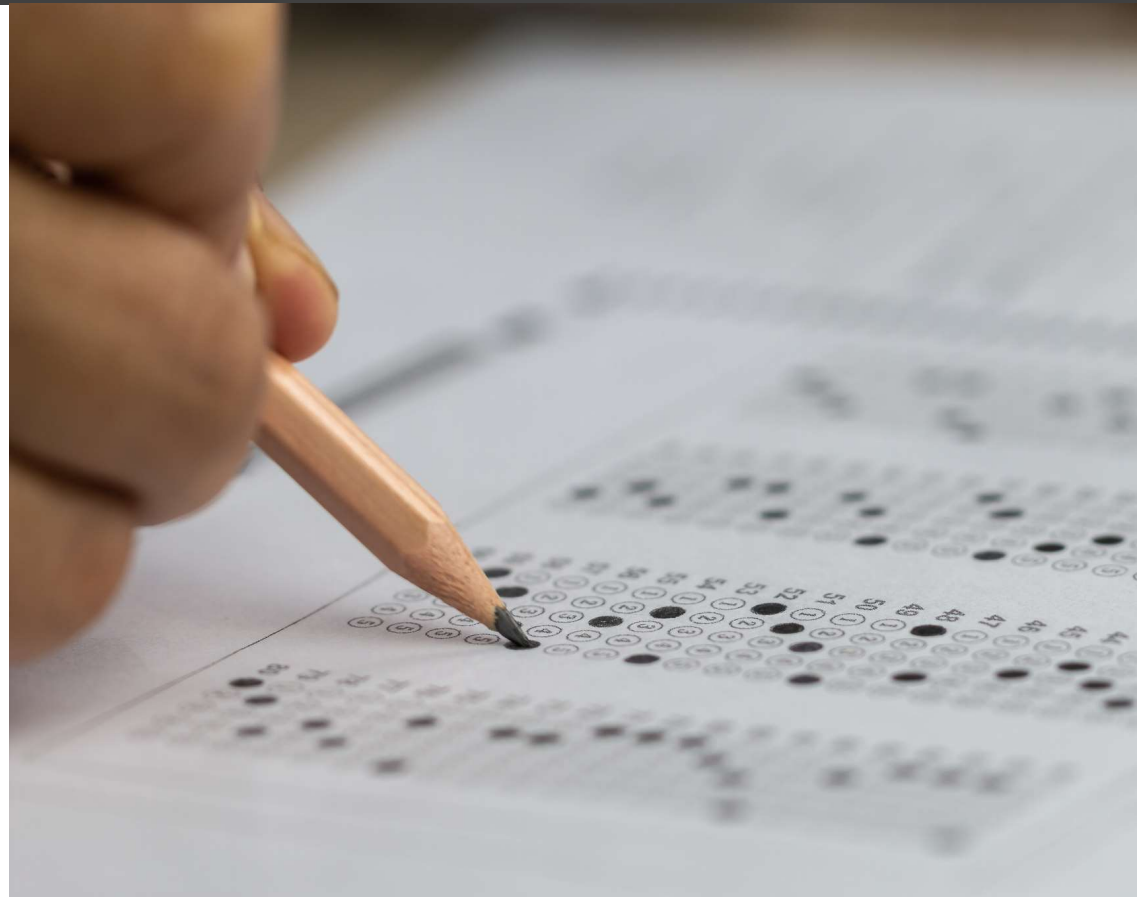
6. Whose responsibility is it to correct hazards which can be corrected?

- a. Employer
- b. Employee

Practice Questions Answer Key



1. A, B
2. A
3. C
4. B
5. A
6. B



Conclusion



Great job!

You have completed the Excavations topic.

