

Module Title: Trenching and Excavation Safety

Objectives: To understand and practice safe trenching and excavation.

Trainer's Note: Although farmers are generally exempt from the state trenching and excavation statutes, they may still be held liable for accidents and loss of life resulting from trenching and excavation activities conducted under their direction. The purpose of this module is to increase your awareness of excavation and trench safety, and is not intended as a strict legal interpretation of Ohio's trenching and excavation laws. For additional information consult the *Trenching and Excavation: Safety Principles* Fact Sheet provided through the Ohio State Extension Service.

Background

Taking safety precautions during farm trenching jobs may seem to waste valuable time and money, but accidents that occur because safety precautions were not taken can be costly. In addition to the loss of human life, the possible financial costs of a trenching accident include: Work delays to rescue the victim; additional time and labor to re-excavate the collapsed trench; workers compensation costs and increased insurance premiums; and additional paperwork resulting from the investigation of the accident. Sometimes, fines may also be imposed.

Soil is an extremely heavy material, and may weigh more than 100 pounds per cubic foot. A cubic yard of soil (3ft x 3 ft x 3 ft), which contains 27 cubic feet of material, may weigh more than 2,700 pounds. That is nearly one and a half tons (the equivalent weight of a car) in a space less than the size of the average office desk. Wet soil, rocky soil or rock is usually heavier. A person can easily be crushed under this weight.

General Requirements:

- Contact the Ohio Utility Protection Service (OUPS) at 1-800-362-2764 and the Oil and Gas Producers Protection Service at (614) 587-0486 to identify the location of any underground cables, pipes or utility installations in the area of the proposed excavation.
- Ohio law requires excavators to call OUPS two working days before breaking ground.
- Once these areas are located and marked, avoid them.
- When working in areas where there is a backfilled trench, railroad, highway, source of vibration or other unstable condition, take additional precautions to properly shore and brace the excavation to help prevent cave-ins.
- Undercutting of exposed vertical faces is prohibited unless supported by one or more of the methods prescribed in the Ohio Administrative Code, Chapter 4121:1-3, for exposed faces of trenches.
- All excavated or fill materials should be placed at a minimum of two feet away from the top edge of the trench.
- If materials need to be placed closer than two feet from the edge of the trench, install an effective barrier to prevent them from falling into the excavation.
- For further details consult the Ohio Administrative Code, Chapter 4121:1-3.

Key points to remember:

- The soil characteristics at the work site should be identified to help provide a safe work place.
- For each trenching or excavation situation, you should employ the proper sloping, shoring and bracing structures and measures designed specifically for the particular situation.
- Proper design, construction and placement of support structures will allow employees to work in a safe environment.
- Trench failures often occur in multiples, starting with a movement of soil material near the bottom of the trench wall. After the failure of the base, the support of the wall will quickly erode and the wall will collapse.

Mechanics of a trench failure:

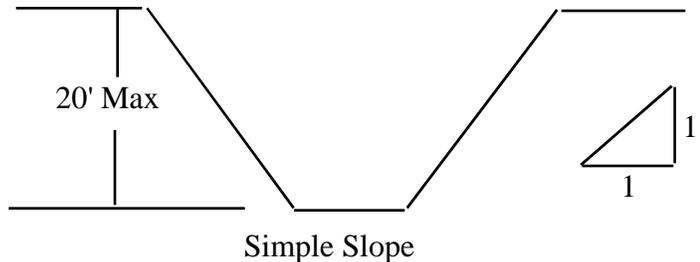


Three safety techniques used to control earth movement:

Shoring: Wood or metal sheets braced tightly against the vertical walls of the trench will protect the workers in the ditch, and prevent the collapse of adjacent structures. To reduce movement outside of the sheeting, push sheets against the soil with struts, cross braces, or hydraulic trench jacks.

Shielding: Trench shields or portable trench boxes surround the workers with a strong wall of steel or concrete. There is no support for adjacent structures using this method.

Sloping: Moving the earth away from the sides of the trench until the walls are at a safe angle from the floor of the trench. The soil will remain at rest at angles ranging from 90 degrees to 26 degrees.



Review The Following Points

- Soil is an extremely heavy material.
- It is necessary to know the characteristics of the soil at the particular job site.
- The OUPS and the Oil and Gas Producer Protection Service should be contacted before breaking ground.
- Precautions need to be taken to prevent cave-ins.

True or False Answer Key

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

Trenching and Excavation Safety Quiz

True or False

Name _____

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|--|---|---|
| 1. Soil may weigh more than 100 pounds per cubic foot. | T | F |
| 2. It not necessary to contact the Ohio Utility Protection Service, only the Oil and Gas Producers Protection Service needs to be contacted. | T | F |
| 3. Identification of the soil characteristics at the work site is not important. | T | F |
| 4. Trench failures often occur in multiples. | T | F |
| 5. Proper design, construction and placement of support structures will allow employees to work in a safe environment. | T | F |