



Tailgate Safety Training for Landscaping and Horticultural Services

Agricultural Safety Program, 590 Woody Hayes Drive, Columbus, OH 43210

Trenching and Excavation Safety

Objective: Demonstrate safe trenching and excavation.

How to Use This Module

Trenching and excavation can be dangerous activities, leading to serious injuries and even death. For this module:

- Read the information on trenching and excavation. Also, review hazards and safety guidelines.
- Ask your supervisor and other workers to share examples of trenching and excavation accidents.
- Review the important points.
- Take the True/False quiz to check your learning.

Note: State laws on trenching and excavation vary. Even if operations are exempt, however, an operator may still be held liable for accidents. This module is not a strict legal interpretation of any particular state's trenching and excavation laws. For more information on state trenching and excavation laws, consult your own state's extension service.

Background

Taking safety precautions during trenching jobs may seem to waste time and money. However, if safety precautions are not taken, costly and even fatal accidents can occur. In addition to the loss of human life, possible costs of a trenching accident include:

- Work delays to save the victim.
- Extra time and labor to re-excavate the collapsed trench.
- Worker compensation costs and increased insurance fees.
- Extra paperwork due to the investigation of the accident.
- Fines may also be imposed.

Soil is a very heavy material. It may weigh more than 100 pounds per cubic foot. A cubic yard of soil (3 ft x 3 ft x 3 ft) contains 27 cubic feet of material. Thus, it may weigh more than 2,700 pounds. That is nearly one

and a half tons in a space less than the size of the average office desk. One and a half tons is the same weight as a car. Wet soil, rocky soil, or rock is usually heavier. A worker can easily be crushed under the weight of these materials in a trenching accident.

General Requirements

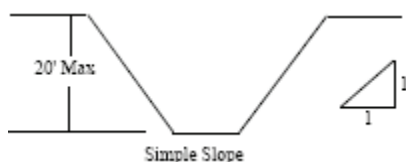
- To identify the location of any underground cables or utility installations in the area of the proposed excavation, call your local utilities and local utilities protection service.
- State law may require workers to call your local utilities or local utilities protection service a specified period before breaking ground — for example, two days.
- Locate and mark these areas. Then avoid them.
- A backfilled trench might be located near a railroad, a road, a source of vibration, or other unstable condition. If so, take extra precautions to properly shore the trench. Also, brace the excavation to help prevent cave-ins.
- Do not undercut exposed vertical faces of trenches. It is prohibited unless supported by a specific method written into your state law or administrative code.
- All excavated or fill materials should be placed at least two feet away from the top edge of the trench.
- Materials may need to be placed closer than two feet from the edge of the trench. If so, install an effective barrier to prevent them from falling into the trench.

Key Guidelines

- The type of soil at the work site should be identified to reveal the level of danger. This is necessary to provide a safe work site.
- You should use the proper sloping, shoring, and bracing structures for each trenching or excavation site. They should be planned for the particular site and soil type.
- Proper design, construction, and placement of support structures will create a safe work environment.
- Trench failures often occur in multiples. Usually, soil near the bottom of the trench wall will move first. After the base fails, the entire wall will quickly erode. The wall will then collapse.

Three Safety Techniques Used to Control Earth Movement

Shoring. Wood or metal sheets should be braced tightly against the vertical walls of the trench. This will protect the workers in the trench. The sheets will also prevent the collapse of nearby structures. There are ways to reduce soil movement outside of the sheeting. Use struts, cross braces, or hydraulic trench jacks to support the sheets.



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

Sloping. Move soil 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 These Important Points

- Soil is an extremely heavy material.
- It is necessary to know the characteristics of the soil at the particular job site.
- You should contact your local utilities and local utilities protection service before breaking ground.
- Precautions need to be taken to prevent cave-ins.

About These Modules

The author team for the training modules in the landscape and horticultural tailgate training series includes Dee Jepsen, Program Director, Agricultural Safety and Health, Ohio State University Extension; Michael Wonacott, Research Specialist, Vocational Education; Peter Ling, Greenhouse Specialist; and Thomas Bean, Agricultural Safety Specialist. Modules were developed with funding from the Occupational Safety and Health Administration, U.S. Department of Labor, Grant Number 46E3-HT09.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture or the U.S. Department of Labor.

Answer Key: 1 = T, 2 = F, 3 = F, 4 = T, 5 = T.

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Name _____

True or False?

- | | | |
|----------------------------------------------------------------------------------------------------------------------------|---|---|
| 1. Soil may weigh more than 100 pounds per cubic foot. | T | F |
| 2. It is not necessary to contact your local utilities. Only the local utilities 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 |