



Excavation & Trenching
Module 11
1 hour of instruction

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VERSION: 2018



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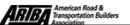
Learning Objectives

- Identify the basic hazards associated with trenching & excavation
- Explain how benching, shoring and shielding systems work to protect workers
- Describe other safety considerations in trenching & excavation work



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VIDEO:

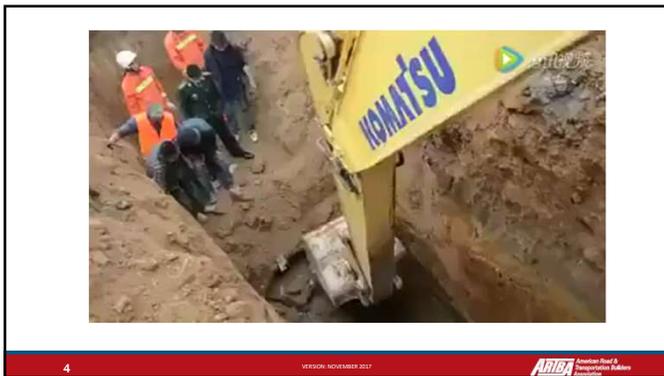
STUDY CASE: HAZARD IDENTIFICATION

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Discussion: Trench or Excavation?

Activity instructions: Ask the group “What is a trench?” and “What is an excavation?”

29 CFR 1926.650 (b) 

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Excavation



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Trench



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Why are Trenches & Excavations Dangerous?



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Why are Trenches & Excavations Dangerous?



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Employer's Responsibility

- Competent Person
[29 CFR 1926.652\(a\)\(1\)\(ii\)](#)
- Daily inspection
 - Access and Egress
 - Water removal
 - Drainage

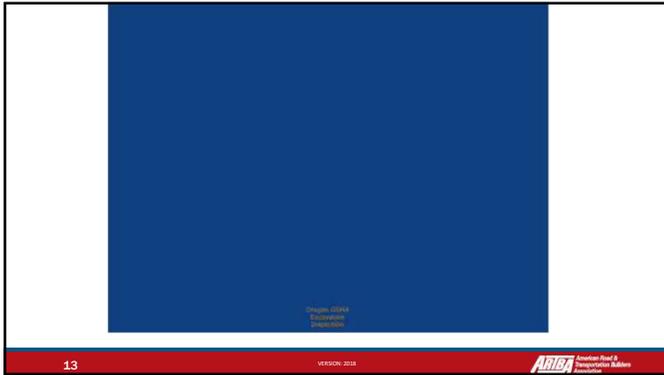


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VIDEO: Oregon OSHA

STUDY CASE: EXCAVATION MULTIPLE HAZARDS

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What Causes a Cave-in?

- Layered Soil Failure
- Soft Zone Failure
- Sloughing
- Soft Pockets
- Wedge Failure
- Rotational Failure
- Boiling

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Soil Types

- Stable rock
- Type A clay
- Type B angular gravel, slit
- Type C gravel, sand, submerged soil

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VIDEO: OSHA

CAVE-IN PROTECTION AND SOIL CLASSIFICATION

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Protective Systems - Shoring



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Protective Systems - Shielding



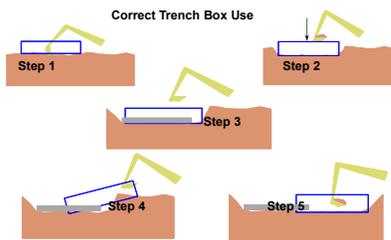
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Trench Box Installation



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Protective Systems - Sloping & Benching

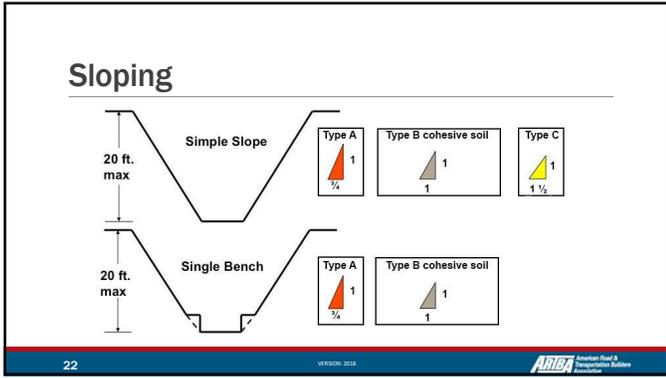


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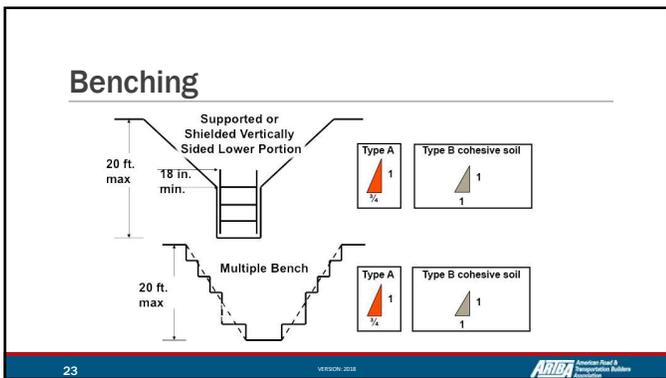
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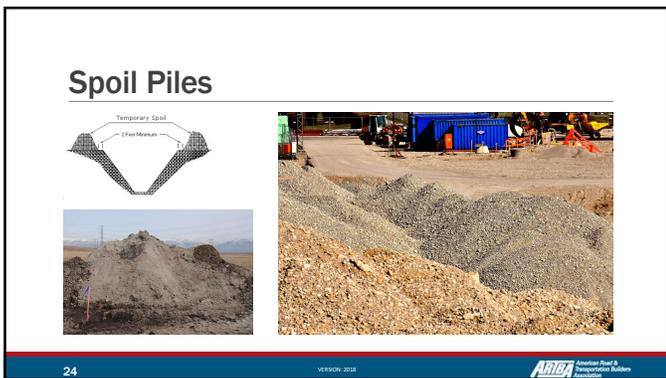
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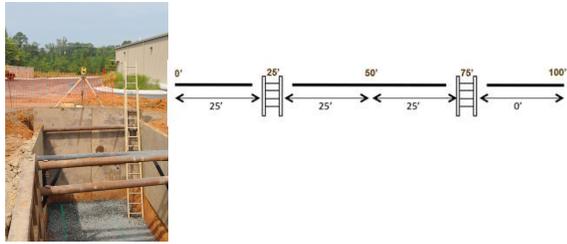


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Entering & Exiting



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Worker Egress

A stairway, ladder or ramp must be present in excavations that are 4 or more feet deep, and within 25 feet of the employees.

These two ladders which are lashed together are not an adequate means of egress.



The ladder should extend 3 feet above the excavation.

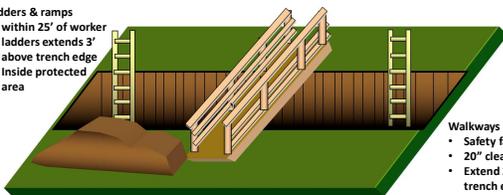
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Trench Diagram

- Ladders & ramps
- within 25' of worker
 - ladders extends 3' above trench edge
 - Inside protected area



Spoil pile 24" from trench edge

- Walkways
- Safety factor of 4
 - 20" clear width
 - Extend 24" past trench edge
 - Fitted guardrails

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Crossing Over Trenches



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Vehicles & Equipment



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Other Hazards- Buried Utility Lines

- Sewer
- Water
- Electric
- Gas
- Data/phone



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VIDEO:

CAVE-IN AND BURIED UTILITIES

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Support Buried Lines While Digging



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Other Hazards – Overhead Loads



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Other Hazards – Confined Spaces



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Summary

- Identify the basic hazards associated with trenching & excavation.
- Explain how benching, shoring and shielding systems work to protect workers.
- Describe other safety considerations in trenching & excavation work.



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Break

Questions?

Poll

We Will continue in ... minutes



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