All States Materials Group®

SAFE EXCAVATING & SHORING

Toolbox Talk

Trench cave-ins are the leading cause of death in trenching work. Workers can suffocate, and the force of a collapse can even embed a body into the opposite trench wall. Many factors contribute to cave-ins and must be addressed before any trenching begins. Soil instability may be natural—such as loose or sandy soil—or caused by drying after excavation. External factors like traffic vibrations, nearby equipment, or adjacent structures can also weaken trench walls.

Safeguarding against cave-ins is accomplished by proper sloping or benching of trench walls or proper support of walls by shoring or shielding. These precautions are legally required unless the excavation is made entirely in stable rock or is less than 5 feet deep and has been examined by a competent person to ensure there is no potential for cave-in. A trained competent person must also classify soil type to determine the correct protective system or slope.

Sloping of trench walls is the simplest protection method but requires excavating and stockpiling more material. Sloping for trench walls 20 feet or less in depth varies as follows **(Ratios are Horizontal : Vertical)**:

- **Soil Type A: ¾:1**
- **Soil Type B: 1:1**
- **Soil Type C: 1 ½: 1**

Benching systems: Benched (or stepped) trench walls should be built following OSHA guidelines:

- **No unsupported vertical** side should be over 3 ½ feet
- **Trenches less than 8 feet deep** have a maximum allowable slope of ¾ horizontal to 1 vertical
- **Trenches 8 to 20 feet deep** have a maximum allowable slope of 1 horizontal to 1 vertical
- **Sloping and benching** for excavation over 20 feet deep must be designed by a registered professional engineer

Support Systems: Design of support systems that are drawn from manufacturer's tabulated data must be in accordance with all specifications, recommendations and limitations made by the manufacturer. Any deviations from those specifications are only allowed after the manufacturer issues specific written approval.

- Material and Equipment used for protective systems must be free from damage or defects that might impair their proper function.
- Manufactured materials and equipment used must be used and maintained according to manufacturers' recommendations.
- Damaged material or equipment must be inspected and approved before re-use.

Installation and Removal of Support: Members of support systems must be securely connected to prevent sliding, falling or kick out.

- Support systems must be installed and removed in a manner that protects employees from cave-ins.
- Do not subject individual members to loads they were not designed for.
- Before temporary removal of individual members begin additional precautions, such as installing other members, must be taken to ensure employee safety.
- Removal of shoring panels shall begin with lowest members and progress upward.
- Members must be released slowly to note any indication of remaining members failing or possible cave-in.

- Backfilling operations should be coordinated as closely as possible with removal of support systems.
- Top edge of support system shields should protrude at least 18 inches above the lip of the trench.
- Excavate no lower than 2 feet below the bottom of the support system and then only if the system is designed for the full depth of the trench and there is no indication of loss of soil from behind or below the system.
- Shields must be installed in a manner to restrict lateral or other hazardous movement.
- Employees must not be allowed inside shoring or shields when they are being installed, removed or moved vertically.
- Employees shall be protected from cave-ins when entering or exiting the area protected by shields.
- Support systems must be examined at the beginning of each shift and after any incident, such as heavy rains, which may compromise integrity.

Proper sloping, benching and shoring or support systems for trenches when applied according to regulation will prevent injuries and fatalities by cave-ins. Carefully follow these guidelines for safe trenching operation.

Trenching by the Numbers

1 Foot	Trench box away from the side of the excavation
18 Inches	Must set up off sloped surface or grade
2 Feet	Distance away soils piles and equipment must be
3 Feet	A ladder must extend above the top of the trench box/excavation
4 Feet	You need egress
5 Feet	You need a protective system
6 Feet	You must provide fall protection
10 Feet	Start to be considered a confined space
15 Feet	If it is wider than this – it is not considered a trench
20 Feet	If it is deeper than this – the protective system must be designed by an engineer
25 Feet	Maximum distance to travel to a ladder
50 Feet	Distance between ladders is

Toolbox Talk Attendance Form

Supervisor / Project Manager: _____

Date: _____

PRINT NAME	SIGNATURE