

Location: _____ Instructor: _____ Date/Time: _____

TOPIC C153: EXCAVATION & SHORING (PART 1)

Introduction: Trench cave-ins are the major cause of death in excavation operations. Several factors can contribute to trench cave-ins and all need to be understood and guarded against. Soil instability causes cave-ins and may be a natural property of the soil due to the drying of previously stable soil because it was exposed by excavation. Instability may also be caused by vibrations from traffic or machinery, pressure from heavy equipment or machinery, or nearby structures. Protecting against cave-ins is done by sloping or benching of trench walls, or by supporting the walls (shoring /shielding). One of these methods must be used on all trenches unless, the excavation is made entirely in stable rock, or the excavation is less than 5 feet deep and has been examined by a competent person to ensure there's no potential for cave-in. The soil type where the excavation is to occur must be determined by a trained competent person. Sloping of trench walls is the simplest way to protect workers in a trench. Sloping does increase the amount of material excavated. The sloping needed for trench walls depends on the type of soil being excavated, and must be determined by a trained competent person.

Benching systems: Benched trench walls must be built according to the following OSHA guidelines:

- No unsupported vertical trench 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. Benching for excavations over 20 feet deep must be designed by a registered professional engineer

Support Systems: A support system design is often taken from a manufacturer's data table, and must meet all of the requirements made by the manufacturer. Deviations are only allowed with the manufacturer written approval. The material and equipment used must be damage and defect free. The materials and equipment used must be maintained according to manufacturer. Any damaged material or equipment must be repaired, re-inspected and approved before re-use.

Installation and Removal of Support: Support systems components must be securely connected together to prevent sliding, falling, or kick outs.

- Support systems must be installed and removed in a way that protects workers from cave-ins, structural collapse, or from being struck by members of the system. Individual system parts must not be subjected to loads they weren't designed for. Before temporarily removing any part of a system, additional precautions, such as installing other parts, must be taken to ensure worker safety. Shoring panel removal must start with lowest panels and progress upward. Panels must be released slowly to see if there is any risk of the remaining panels failing or possible cave-in. Backfilling operations should be coordinated as closely as possible with removal of support systems. The top edge of support system shields must extend at least 18" above the lip of the trench. Don't excavate more than 2' below the bottom of the support system, and then only if it's designed for the full depth of the trench, and there's no sign of soil movement from behind or below the system. Shields must be installed so that they limit lateral or other hazardous movement. Never enter shoring or shields when they're being installed, removed, or moved vertically.
- Support systems must be examined before each shift and after any incident that could decrease its integrity

Employee Attendance:(Names or signatures of personnel who are attending this meeting)

These guidelines do not supersede local, state or federal regulations, and must not be construed as a substitute for, or legal interpretation of, any OSHA regulations.