Section 16C. Excavation, Trenching and Shoring

Due to the hazardous nature of trenching and excavating work, the following safety procedures have been formulated to protect workers while performing these tasks.

- An excavation is defined as a man-made cut, cavity, trench or depression in the earth’s surface, formed by earth removal.
- A trench is defined as a narrow excavation, in relation to its length, made below the surface of the ground.

**Follow safety rules to avoid excavation hazards:**

- Cave-ins (crushing or smothering)
- Asphyxiation from lack of oxygen
- Illness or death from inhaling toxic substances
- Fire
- Drowning
- Injury or death from falling materials or vehicle/machinery contact
- Electrocution or other injury from utility line contact

**Before entering an excavation, be sure that:**

- A safety and health program identifies hazards and protection and you are trained.
- An emergency contingency plan is available and you are familiar with it.
- Utilities have been contacted and located both underground and overhead.
- All necessary lockout-tagout procedures are in place.
- Surface water sources and runoff are held back by dikes, ditches or equipment.
- Sources of groundwater are identified and standing water is not in trench.
- If water is controlled or prevented from accumulating by use of pumps, a competent person shall monitor the equipment and overall operation.
- Adjacent structures are stable or supported.
- The atmosphere in excavation is evaluated and tested if necessary for hazardous substances (toxic, corrosive, explosive or flammable vapors) and adequacy of oxygen (GT 19.5%).
- When mechanical ventilation or other controls are used to reduce atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.
☐ Loose rock or soil is scaled, barricaded or otherwise held back (at least 2 feet [2’] from edge).

☐ Special steps or other sturdy entry/exit means are within 25 feet (25’) of the work area.

☐ Walkways are in place for crossing over an excavation.

☐ Empty wells, pits, etc. are covered or barricaded.

☐ Barricades or stops are in place at edge to prevent equipment entry.

☐ Although state law allows sloping and benching of soil to prevent cave-ins, (if performed by a competent person) at the Tree Fruit Research and Extension Center all trenches four foot (4’) deep or more shall be shielded. If sloping should become necessary, soil shall be considered type C soil and shall be sloped accordingly.

☐ If excavation is four feet deep or more, it is deeper than wide and less than 15 feet wide overall. Sides must be shielded.

☐ If excavation is not a trench as defined above, sides are adequately sloped or benched.

☐ Traffic is routed away from excavation to reduce vibration.

☐ A competent person’s inspection approved the safety conditions (re-evaluate upon re-entering).

☐ Assigned personal protective equipment is undamaged.
EXCAVATION SAFETY CHECKLIST

☐ All necessary equipment such as pumps, rescue equipment is operable and available on site.

**Take safety precautions to work in and around excavation:**

☐ Wear assigned personal protective equipment such as hard hats, shoes, safety glasses, gloves, respirators, etc.

☐ If there is a hazardous atmosphere or lack of oxygen, follow confined space procedures and wear harness and lifeline.

☐ Wear a reflective vest or other highly visible garment to work in areas with traffic.

☐ Operate equipment only if you are trained and authorized.

☐ Don’t stand or work under loaded lifting or digging equipment.

☐ Leave any excavation where water is present or coming in.

☐ Do not work on edges or slopes of excavation or above employees below.

☐ Keep all materials at least two feet away from edge.

☐ Leave the hole immediately to report cracks, bulges, chemical smells or any other potential dangers.

**Site security:**

☐ Excavation is barricaded and/or covered with proper caution signs or tape to prevent unwanted or accidental entry by pedestrians or vehicles.

☐ Excavation is backfilled as soon as work is completed or shield or shoring is moved or removed.

**Trench emergency plan:**

☐ All untrapped personnel exit trench immediately. Do not attempt a rescue.

☐ Leave trapped personnel tools where they are.

☐ Report cave-in to competent person immediately.

☐ Call 911.

☐ Stop all traffic.

☐ Shut off all heavy equipment immediately.

☐ Record time of cave-in.

☐ Clear everyone to at least 50 feet from excavation. Stay away from excavation edge.

☐ Inform trapped person(s) help is on the way.

☐ Start pumps if water is present in the trench.

☐ Inform competent person of what conditions exist in the excavation, how deep the excavation is, how deep the soil is that caved in, how many people are trapped, where and how much soil is covering them. Also record utilities around the trench, whether they are damaged, and soil classification.
Have information ready for rescue personnel when they arrive.
Post an employee with knowledge of the incident at arrival location of rescue personnel to lead them to the site of the accident.

Responsibilities
A. Competent Person:
   - Identification of predictable or existing hazards in surroundings.
   - Authorization or authority, by the nature of their position, to take prompt corrective measures.
   - Knowledge of the requirements for trenching and shoring safety and regulations.
1. Identification of hazards.
2. Selection of proper protective system for conditions and work being done. Post data.
3. Training of employees of site hazards and work practices.
4. Overseeing site work practices.
5. Emergency coordination and contingencies.
6. Inspection of protective system materials and installation. Inspection of site after rainfall or other potentially hazardous activity like weight bearing forces or vibration.
7. Prove proper egress from excavation. No more than 25’ lateral travel.
8. Traffic control and protection from falling into excavation.
9. Utility locate performed. Utilities protected, supported or removed to protect employees.
10. Lockout-tagout requirements.

B. Workers in and around excavations:
1. Wearing proper PPE.
2. Following proper work practices.
4. Keeping away from opening of excavation.
5. Prevention of falling objects into excavations.
6. Keeping materials at least two feet (2’) from excavation edge.
7. Do not work under loaded lifting or digging equipment.
8. Stay alert at all times. Watch for conditions that can cause cave-ins. Alert to ventilation problems and chemical smells.
9. Stay out of excavation if it has water in it or is coming in unless there is a special shield installed or a lifeline is attached.
10. Competent person inspection of conditions before entering trench. Competent person determination of proper protective system and installation before entering trench.