Excavation Safety Tips

WHAT’S AT STAKE?

One of the most dangerous forms of construction work is excavation labour involved with trenching and shoring.

Excavation is defined as ground breaking or making trench in ground.

Cave-in is defined as the separation of mass of soil or rock material from the side of excavation, or the loss of soil from under a trench shield.

WHAT’S THE DANGER?

Excavation Labour

Thousands of employees are injured each year performing this type of work, and hundreds are killed. In fact, the fatality rate for trenching is twice that of deaths incurred from other forms of construction.

Cave-Ins

The reason for this high mortality rate is the danger involved with cave-ins while on the job. Cave-ins can result from many shifts in the earth that occur during the trenching and shoring process.

- The addition or removal of water
- Vibrations from the excavation
- Added or reduced weight of soil or adjacent structures
- Reduction in frictional forces
- Any amount of freezing or thawing

Once these cave-ins occur, death can result instantly or workers can become trapped and be severely injured or suffer from asphyxiation.

Excavation Safety Hazards

1. **Cave-ins**

Trench collapses kill an average of two workers every month, making this a serious threat to worker safety. To prevent cave-ins, OSHA requires a professional engineer or a qualified professional to analyze soil composition, and then design and implement a system that:

- Slopes
- Shields
- Supports

Hiring a professional engineer or a qualified professional to design a system that prevents cave-ins is critical for preventing injury and jobsite fatalities.

2. **Falls and falling loads**

Workers and work equipment can fall into an excavated area. When possible, install a barrier and safety signage around the perimeter of the excavation to clearly mark the fall hazard. Falling loads, such as jobsite equipment or excavated dirt, can also fall into a trenched area and crush anybody who is working below. This is why OSHA requires jobsite materials to be stored at least two feet away from the edge of an excavation. Additionally, OSHA recommends that employers do not allow work to be conducted beneath suspended or raised loads.

3. **Hazardous atmospheres**

Trenched areas sometimes have depleted oxygen levels, which is safety hazard that must be taken into consideration on excavation sites. The atmosphere in trenched areas can also be contaminated by toxic gases and chemicals. For these reasons, OSHA requires atmospheric testing to be performed by a qualified professional in excavations that exceed four feet. If atmospheric hazards are present, then workers must wear the appropriate respiratory protection equipment depending on the hazard in the excavated area.

4. **Mobile equipment**

Mobile equipment operators might have an obstructed view and therefore not be able to detect when they are approaching the perimeter of the trench. OSHA suggests that a spotter or a flagger be designated to direct the mobile equipment operator and prevent the vehicle from falling in the trench. When material is being loaded or unloaded from the construction vehicle, workers should be required to stand back in order to prevent being hit by flying debris.

Make sure to wear a reflective vest to make yourself more visible to mobile equipment operators, and wear a hard hat to protect your head from construction debris.

5. **Hitting utility lines**

In addition to causing expensive damage to municipal infrastructure, hitting utility lines when digging can also cause electrocution and natural gas leaks, which can lead to worker fatalities. Fortunately, you can easily avoid hitting utility lines by contacting your local utility companies before you dig.

HOW TO PROTECT YOURSELF

Before You Begin

To start with, the work site must be evaluated for potential hazards, known hazards must be reduced or removed, and utility locations must be properly marked. Furthermore, the leads on the project should set times for periodic inspection intervals and establish emergency procedures.

PRECAUTIONS

OSHA EXCAVATION SAFETY MEASURES

- Inspect trenches daily before work begins. Don’t go near an unprotected trench.
- Check weather conditions before work, be mindful of rain and storms.

- Keep heavy equipment away from trench edges.
- Be mindful of the location of utilities underground.
- Always wear proper protective equipment.
- Don’t work beneath raised loads.
- Conduct atmosphere tests. If low oxygen and toxic gases were detected, workers must not enter the trench.
- Protective systems like benching, sloping, shoring and shielding must be created.
- Planning and implementation of safety measures must be done by a competent person.
- Use a checklist to perform regular self-inspections – download free excavation safety checklists here.

NIOSH TOP EXCAVATION SAFETY TIPS

- Train a specific individual to oversee each excavation job and properly enforce specific safety regulations.
- Have an expert examine soil stability before the dig.
- Trenches over 20 feet in depth need a site-specific, professionally engineered protective system.
- Develop and have employees practice a trench collapse emergency plan.
- Before work begins and throughout each workday, the job foreman or the safety enforcement employee should recheck the excavation site for soil and safety apparatus stability, especially after a storm.
- Trench exit ladders should never be over 25 feet away from the workers inside.
- Notify subcontractors of the trench location and make sure they keep vehicles and other heavy equipment at a safe distance from the trench.
- Closely monitor the trench for hazards other than cave-ins such as noxious gases, unstable edges, or rigging hazards.
- Teach employees about trench collapse warning signs, but also that these signs may not present themselves before an incident.

FINAL WORD

No worker’s life should end in a trench, Cave-ins during excavations are some of the most common and grisliest causes of worker fatalities in construction, yet they are entirely preventable. With proper training, procedures, and supplies, employers can help to prevent these accidents.