Excavating and Shoring Guidelines Safety Talk



WHAT'S AT STAKE?

Excavation work generally means work involving the removal of soil or rock from a site to form an open face, hole or cavity, using tools, machinery or explosives.

It is mandatory that any trench or excavation more than 1.2 m (4 feet) is properly sloped or shored to comply with the occupational health and safety regulations. No employee shall enter any trench or excavation that is not properly sloped or shored.

WHAT'S THE DANGER?

EXCAVATION HAZARDS

The main hazards associated with excavation work include:

- Surface encumbrances.
- Excavation collapse.
- Loose rock or soil.
- Contact with underground services and/or overhead power lines.
- Falling loads – Materials falling onto people working in the excavation.
- Mobile equipment – People and vehicles falling into the excavation.
- Vehicular traffic – People being struck by plant machines.
- Undermining of nearby structures.
- Access/egress to/from excavation.
- Hazardous atmospheres.
- Ground water.
- Accidents to members of the public.

TRENCHING / SHORING

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

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 can result from many shifts in the earth that occur during the trenching and shoring process. For example:

- 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.

HOW TO PROTECT YOURSELF

PROCEDURE BEFORE EXCAVATION WORK

- Investigate if a dangerous atmosphere is present or liable to be present?
- See if the space is adequately ventilated to maintain adequate oxygen content and prevent the accumulation of harmful substances?
- Find out what the use and history of the location of work is when carrying out risk assessment. Buried underground pipe work or a leakage in sewage system may present a hidden hazard.
- Investigate if a dangerous atmosphere is potentially present; the excavation must be treated as a confined space.
- A safe system of work must be developed and put in place, including the making of appropriate emergency arrangements. The safe system of work may involve the provision of adequate ventilation, testing of atmosphere, or other precautions, as devised by a competent person.

Shoring Types

Shoring is the provision of a support system for trench faces used to prevent movement of soil, underground utilities, roadways, and foundations. Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. Shoring systems consist of posts, wales, struts, and sheeting.

Hydraulic Shoring

The trend today is toward the use of hydraulic shoring, a prefabricated strut and/or wale system manufactured of aluminum or steel. Hydraulic shoring provides a critical safety advantage over timber shoring because workers do not have to enter the trench to install or remove hydraulic shoring.

Pneumatic Shoring

Works in a manner similar to hydraulic shoring. The primary difference is that pneumatic shoring uses air pressure in place of hydraulic pressure. A disadvantage to the use of pneumatic shoring is that an air compressor must be on site.

Screw Jacks

Screw jack systems differ from hydraulic and pneumatic systems in that the struts of a screw jack system must be adjusted manually. This creates a hazard because the worker is required to be in the trench in order to adjust the strut. In addition, uniform “preloading” cannot be achieved with screw jacks, and their weight creates handling difficulties.

EXCAVATION PRECAUTIONS

According to the Construction Regulations, precautions must be taken that are adequate to:

- Guard against danger to persons at work from a fall or dislodgement of earth, rock or other material by suitable shoring or otherwise

- Guard against dangers arising from the fall of materials or objects or the inrush of water into the excavation, shaft, earthworks, underground works or tunnel
- Secure adequate ventilation at all workplaces so as to maintain an atmosphere fit for respiration and to limit any fumes, gases, vapours, dust or other impurities to levels which are not dangerous or injurious to health
- Enable persons at work to reach safety in the event of fire or an inrush of water or materials
- Avoid risk to persons at work arising from possible underground dangers such as underground cables or other distribution systems, the circulation of fluids or the presence of pockets of gas, by undertaking appropriate investigations to locate them before excavation begins
- Ensure that a safe means of access to and egress from each excavation

CAVE – INS

Employers can help reduce injuries and fatalities caused by cave-ins. 10 safety tips that will allow crews to work safer.

1. Never enter an unprotected trench.
2. Park heavy equipment as far from trench edges as possible. Keep soil or other materials at least two feet away from the sides of the trench. If the job site does not allow for two feet of distance, soil removed from the trench may need to be moved to another location until work is completed.
3. Find out where utilities are located underground before crews start digging.
4. Inspect trenches daily before work begins and after storms or other events that may cause changes to the trench. OSHA requires that these inspections are completed by a 'competent person,' someone with the knowledge to identify hazards in and around the excavation and who has the authority to promptly correct those hazards.
5. When exposed to traffic, workers can prevent accidents by wearing highly visible clothing such as **traffic safety vests**.
6. Educate workers on the dangers involved in excavation and on proper safety precautions. An affordable way to ensure workers receive thorough information is to use **training videos and DVDs**.
7. Never work beneath suspended loads of materials.
8. When the trench is more than four feet deep, test atmospheric conditions before work begins. If tests reveal low oxygen, toxic gases, or hazardous fumes, no one should enter the trench.
9. Create systems to protect workers and prevent collapses. Some of the most common and effective protective systems include:

    - Benching – Building steps into the sides of an excavation
    - Sloping – Angling the trench wall away from the excavation
    - Shoring – Installing supports such as aluminum hydraulics to prevent soil movement
    - Shielding – Protecting workers with trench boxes or other protective equipment

10. Provide safe entrances and exits to the trench. OSHA requires that ladders, steps, or ramps be used whenever a trench or excavation is more than four feet deep and that all employees work within 25 feet of these provisions at all times. When using ladders, they must extend a minimum of 3 feet above the surface of the trench.

FINAL WORD

Employers can help prevent injuries and deaths by frequently reminding workers of these guidelines and posting signs that stress the dangers of excavation. These warnings could be the difference between good and bad decision-making on the job site.