Trenching Safety Guide

In accordance with OSHA 29 CFR 1926 Subpart P, safety and health programs must be in place to address the variety of hazards workers face while in excavation sites. The following guide is designed to provide best practices to prevent trenching injuries and fatalities for trenches less than 20 feet deep.

**Pre-Planning (to be conducted by a competent person of authority)**

- Contact utilities to locate all underground lines prior to digging
- Evaluate soil conditions (see chart)
- Based on soil type, determine maximum allowable slope for excavations less than 20 feet based on angle to the horizontal (see chart)
- Select appropriate protective systems
- Determine proximity to the structures that could affect the choice of protective system
- Test for low oxygen, hazardous fumes and toxic gases, especially when gasoline engine driven equipment is running, or the dirt has been contaminated by leaking lines or storage tanks
- Insure adequate ventilation or respiratory protection, if necessary
- Provide a warning system for mobile equipment, if necessary
- Plan for vehicle traffic control, if necessary
- Train all workers to recognize existing or potential hazards and how to protect themselves from cave-ins.


<table>
<thead>
<tr>
<th>Soil type</th>
<th>Height/Depth ratio</th>
<th>Slope angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Rock (granite or sandstone)</td>
<td>Vertical</td>
<td>90°</td>
</tr>
<tr>
<td>Type A (clay)</td>
<td>3/4:1</td>
<td>53°</td>
</tr>
<tr>
<td>Type B (gravel, silt)</td>
<td>1:1</td>
<td>45°</td>
</tr>
<tr>
<td>Type C (sand)</td>
<td>1 1/2:1</td>
<td>34°</td>
</tr>
<tr>
<td>Type A (short-term); for a max. excavation depth of 12 feet</td>
<td>1/2:1</td>
<td>63°</td>
</tr>
</tbody>
</table>

**Protective Systems**

- Always use a protective system, such as sloping, shoring or shielding, for trenches 5 feet deep or greater.
  - Slope to protect workers by cutting back the trench wall at an angle inclined away from the excavation that is not steeper than a height/depth ratio of 1 1/2:1, according to the sloping requirements for the type of soil.
  - Shore to protect workers by installing supports to prevent soil movement for trenches that do not exceed 20 feet in depth.
  - Shield to protect workers by using trench boxes or other types of supports to prevent soil cave-ins.
- Instruct employees to never enter an unprotected trench

**Access & Egress**

- If trench is four feet deep or more, provide stairways, ladders, ramps or other safe means of egress

*For reference use only. Not intended to identify all hazards, or reflect all requirements of federal, state, or local law.*
Insure structural ramps used solely for access or egress are designed by a competent person.

Provide ladders or steps within 25 lateral feet of workers.

When two or more components form a ramp or runway, they must be connected to prevent displacement, and be of uniform thickness.

Cleats or other means of connecting runway components must be attached in a way that would not cause tripping.

Structural ramps used in place of steps must have a non-slip surface.

Use earthen ramps as a means of egress only if a worker can walk them in an upright position, and only if they have been evaluated by a competent person.

Keep excavations open the minimum amount of time needed to complete operations.

**Inspection Procedures**

Inspections should be conducted by a competent person who has training in soil analysis, use of protective systems, is knowledgeable about the OSHA requirements and has authority to immediately eliminate hazards.

Inspect trenches daily for evidence of possible cave-ins, hazardous atmospheres, failure of protective systems, or other unsafe conditions. Inspect the trench:

- Before construction begins
- Daily before each shift
- As needed throughout the shift
- After any hazard-increasing event such as a rainstorm, vibrations or excessive surcharge loads

**Considerations for Excavated Materials**

Excavated materials are hazardous if they are set too close to the edge of a trench. The weight of the spoils can cause a cave-in, or spoils and equipment can roll back on top of workers, causing serious injuries or death. Provide protection by one or more of the following:

- Set spoils and equipment at least 2 feet back from the excavation
- Use retaining devices, such as a trench box that will extend above the top of the trench, to prevent equipment and spoils from falling back into the excavation
- Where the site does not permit a two-foot setback, temporarily haul spoils to another location

Provided by: Murray Risk Management and Insurance  Tel: 800-533-5271

*Source: OSHA*