



## MONTHLY SAFETY BRIEF: EXCAVATION SAFETY

Working in, or around excavations/trenches creates a level of exposure that workers need to be familiar with. These hazards may meet all the qualifications for the [OSHA's Focus Four Hazards](#): Falls, Struck By, Electrocution, and Caught Between. Excavations may be prone to cave in's, and are often accompanied by heavy construction equipment such as excavators or skid steers.

Hygieneering's policy is that workers are not allowed to excavations, without proper authorization from the Project Manager and appropriate training. It is imperative that the worker is personally granted permission from the contractor(s) that own/ work on the excavation before entering. A worker may need to enter a trench or excavation in order to set or collect a sample for a client.

### DEFINITIONS

**Egress Requirements for Trenching:** Any trench/ excavation that is 4 feet or greater requires a form of egress that can provide workers with a safe escape from collapse, such as ladders, steps, or ramps. All methods of egress must be located within 25 feet of workers.

**Excavation:** OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the Earth's surface formed by earth removal.

**Focus Four Hazard:** Four specific hazards recognized by OSHA to represent the leading cause of construction related fatalities. The four hazards involve: Falls, Struck By, Electrocution, and Caught Between. It is important to remember that the term "electrocution" is always defined as a fatal exposure to electricity.

**Protected Trench:** Any trench/ excavation that is 5 feet or greater requires protection from cave-ins or collapse by protective means or structures unless working on stable rock.

**Stable Rock:** Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

**Trench:** A trench is defined as a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

**Trench Shield (Trench Boxes):** A steel or aluminum structure designed to protect workers from the force of cave-ins or similar incidents. Should not be confused with Trench Shoring Devices.

**Trench Shoring:** A process that braces the walls of a trench/ excavation and ultimately prevents against instance of collapse or cave ins. Should not be confused with Trench Shield Devices.

**Type A Soil:** Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples include: clay, silty clay, sandy clay, and clay loam. Certain conditions preclude soil from being classified as Type A. Soil that is subject to vibration, soil that is fissured, or soil that has previously been disturbed cannot be classified as Type A.

**Type B Soil:** Includes cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa) and granular cohesionless soils (such as angular gravel, similar to crushed rock, silt, silt loam, sandy loam, and, in some cases, silty clay loam and sandy clay loam).



**Type C Soil:** Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less, granular soils (including gravel, sand, and loamy sand), submerged soil or soil from which water is freely seeping, submerged rock that is not stable, or material in a sloped, layered system where the layers dip into the excavation or with a slope of four horizontal to one vertical (4H:1V) or steeper.

## REDUCING EXPOSURE TO HAZARDS

### **Falls**

- Using ladders in trenches may create exposure to falls. Use safe practices when ascending or descending ladders, if applicable.
- Not paying attention to surroundings may lead to workers falling into trench opening. Be aware of surroundings, especially when working in proximity to trenches or excavations.
- Trying to lean over the edge of a trench to set a sample may lead to the worker accidentally falling in. Do not attempt to “cheat” by leaning into a trench to place a sample.

### **Struck By's**

- Tools around the surface of trenches may fall into trench, striking employee. Ensure that tools (personal or contractor's) are away from the edge of the trench before working.
- Excavation equipment may swing freely and strike an employee. Identify machines/ equipment in proximity to surroundings and ensure that you are visible to equipment operators.
- Working under a suspended load may present the opportunity of getting struck by equipment. Never work or pass underneath a suspended load.

### **Electrocution**

- Working in trenches may create exposure to underground cables, wires, etc. Avoid contact with cables, and assume all equipment is live.
- Metal ladders may come in contact with live equipment and could become energized. Use caution while using metal ladders near electrical equipment.
- Working in a trench with standing water may increase exposure to electrical shock. Avoid contact with trenches that have visible standing water.

### **Caught Between (Crushed)**

- Improperly protected trenches may collapse suddenly with little to no warning. Do not enter trenches that are 5 feet or greater that lack protective structures.
- Heavy machinery working near the site of excavation may cause soil to shift or collapse. Use caution when heavy machinery is working in close proximity to trenches.
- If a trench collapses, workers must exit immediately. Use good judgement and ensure a form of egress is within realistic distance (25 feet or less) in case of emergency.



## Excavations Quiz

- 1) At which height requires the use of protective structures in trenches?
  - a. 4 Feet
  - b. 5 Feet
  - c. 6 Feet
  - d. 25 Feet
  
- 2) At which height requires means of egress in a trench?
  - a. 4 Feet
  - b. 5 Feet
  - c. 6 Feet
  - d. 25 Feet
  
- 3) Trench Shields (Trench Boxes) best prevent against the instance of collapse or cave-ins.  
 True  
 False
  
- 4) Have you ever been electrocuted in your life?  
 True  
 False

**SCORE: PASS / FAIL**

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Supervisor Signature

\_\_\_\_\_  
Date