**Trenching by the Numbers – Toolbox Training**



Toolbox -

Trenching by the Numbers

**This model form/template must be customized to meet your Agency’s needs.**

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Instructor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Considering that **20 percent** of excavation, trenching, and shoring fatalities are estimated to occur in the employee’s **first 90 days** of employment, and that **40 percent** are estimated to occur within the first year of employment, there appears to be a direct correlation between experience and safety. Though not all-inclusive, the following list includes some very useful numbers to consider in Trench and Excavation Safety.

**Zero** employees are allowed under loads.

**One** competent person must be assigned by the employer and conduct an ongoing inspection of an excavation or trench.

**One** Visual and Manual test must be performed and documented by the competent person to classify soil. Soil that is not tested will be **Class C** soil.

The top cylinder of a shore shall be placed **one to two** **feet** from the top of the trench.

Excavated material/soil must be kept back not less than **two feet** back from excavation’s edge.

Contact 811 **two full working days** (not including the day of notification) before excavating. If the facilities are marked with **two** **feet** of the planned excavation, use only hand digging to locate utilities. An on-site must be held between the excavator and facility owner if excavation is being done within **ten** **feet** of a marked high priority line.

Ramps, runways, bridges, etc. to be used by employees to cross a trench or ditch shall be capable of supporting not less than **two** **times** the imposed load.

Ladders must extend not less than **three** **feet** above the top of the excavation.

An excavation more than **four** **feet** in depth and occupied by employees shall have either a ladder or a ramp.

The bottom cylinder of a shore shall be placed not more than **four** **feet** from the bottom of the trench.

As a best practice, excavations greater than **four feet**, the atmosphere should be tested if oxygen deficiency, welding/chemicals are to be used, or a hazardous atmosphere does or is reasonably expected to exist.

There are **four** methods a competent person can use to create a protective system:

1. **Sloping**
2. **Benching**
3. **Shoring/Jacks**
4. **Shields/Boxes**

Trenches **five** **feet** in depth and greater must have a protective system in place.

Trenches from **three to five** **feet** in depthmay need a protective system based on soil condition and other site hazards.

When benching a side of a trench, the maximum height of a bench shall not be more than the **four feet** in Type B soil.

Guardrails are required on walkways that are over excavations **six feet** or more above lower levels.

A minimum of **20 feet** in clearance shall be maintained from energized overhead electrical lines (including excavators, dump trucks, materials, personnel, and ladders).

In sloped systems with vertically sided lower portions, the trench boxes must extend **18 inches** above the top of the vertical sides.

A minimum of **19.5** percent oxygen must be present before employees enter a confined space (other confined space regulations may also need to be followed).

Sloping, benching, shoring, or shields for excavations greater than **20 feet** must be designed by a registered professional engineer.

Sheeting and trench boxes must not be more than **24 inches** from the trench bottom.

Ladders must be placed in trenches so that no employee is more than **25 feet** from a ladder at any time.

Guardrails must be **42 inches** plus or minus **3 inches** at the top.

The degree of angle for a slope in Type B soil access shall not be more than **45 degrees**.

**Hundreds** are ***killed*** each year in excavations.

**Thousands** are ***injured*** each year in excavations.

**Tens of thousands** ***of dollars can be saved if employers and employees are aware of safety regulations and practice safety at their worksites.***

**Attendee’s Name Signature Date\_**

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