April 2015

BIE SAFETY ADVISOR

March 20, 2015 marked the spring equinox. Though it seems that winter will never leave, it is undeniable that spring will eventually appear. With a frost line reported to have exceeded 4 feet in some areas, repairs to the damage this winter caused to some of our underground infrastructure will continue over the next few months.

As temperatures warm, combining with the rain that spring typically brings, ground conditions will be extremely poor at times posing continual threats to the safety of employees engaged in trenching activities.

Trenching and excavation work creates hazards to workers that are extremely dangerous. Compliance with OSHA construction standards applicable to such operations is frequently bypassed because of economic pressures, a belief that compliance is unnecessary or an expectation that these short-term operations will go undetected.

On September 19, 1985 OSHA established a National Emphasis Program (NEP) for the programmed safety inspection of trenching and excavation operations that is still in effect today. Although it would be expected that, after more than 30 years of enforcement activity, most employers would be adhering to shoring and sloping requirements, experience has shown that is not the case. OSHA believes that the rate of deaths and serious injuries resulting from trench/excavation accidents (mostly cave-ins) can be significantly affected only by a concentration of compliance resources within the area of trenching and excavation operations. Failure to provide protective systems for trenches remains one of the most frequently cited serious violations each year.

Why do we need protective systems?
Soil is heavy. A cubic foot can weigh as much as 114 pounds, and a cubic yard can weigh over 3,000 lbs. - a little more than a small car. Most workers don't realize the force that will hit them when a cave-in occurs. A person buried under only a few feet of soil can experience enough pressure in the chest area to prevent the lungs from expanding. Suffocation can take place in as little as three minutes while heavier soils can crush the body in a matter of seconds.

Protective systems are methods to protect workers from cave-ins, materials that can fall or roll into an excavation, or from the collapse of nearby structures. If an excavation is less than 5 feet deep, OSHA does not require a protective system if the competent person determines there are no signs of a potential cave-in. (It is important to remember that a wall collapse in a trench four and 1/2 feet deep can still have serious results).

For trenches between 5 feet and 20 feet deep, shoring and sheeting, shielding, sloping and benching are all acceptable protective measures. It is up to the planners of the construction project and the competent person on site to determine which systems will work best. If an excavation is greater than 20 feet deep, a registered professional engineer must design the protective system.

Pre-job planning: Pre-job planning is vital to accident-free trenching. Safety cannot be improvised as work progresses. The cost of protective systems, based on the anticipated trenching hazards to be encountered, should be analyzed when bidding work.

Appoint a competent person: Regardless of the depth of the excavation, OSHA requires a competent person to inspect conditions at the site on a daily basis. Inspections must be made as frequently as necessary during the progress of the work, to ensure that the hazards associated with excavations are eliminated before workers enter the trench.

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Monthly Toolbox Talk

Trenching & Excavation

Excavation and trenching are among the most hazardous construction operations. OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet when measured at the bottom.

Dangers of Trenching and Excavation
Cave-ins pose the greatest risk and are much more likely than other excavation related accidents to result in worker fatalities. Trench collapses cause dozens of fatalities and hundreds of injuries each year. Other potential trenching hazards include:

- Falls,
- Falling loads,
- Hazardous atmospheres, and
- Incidents involving mobile equipment.

Protect Yourself:
Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely in stable rock. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/ or approved by a registered professional engineer.

Protective Systems
Do not enter an unprotected trench! There are different types of protective systems:

- Sloping involves cutting back the trench wall at an angle inclined away from the excavation.
- Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.
- Shielding protects workers by using trench boxes or other types of supports to shield workers from cave-ins.

Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes due to weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

Access and Egress
OSHA requires safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet or deeper. These devices must be located within 25 feet of all workers.

General Trenching and Excavation Rules

- Keep heavy equipment away from trench edges.
- Keep surcharge loads at least 2 feet from trench edges.
- Know where underground utilities are located and have them marked.
- Test for low oxygen, hazardous fumes and toxic gases.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm.
- Do not work under raised loads.

Competent Person
OSHA standards require that trenches be inspected daily and as conditions change by a competent person prior to worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees and who is authorized to take prompt corrective measures to eliminate or control these hazards and conditions.