



NGFA Safety Tips: Trenching & Excavation Safety

...Committed to promoting safety and health in the workplace.

Trenching and Excavation Work pose significant hazards

Trenching and excavation are among the most hazardous of operations within the construction industry. Although the grain, feed, processing and milling industry does not fall under the scope of OSHA's [29 CFR 1926 Subpart P - Excavations](#), much can still be applied when a project dictates that ground breaking is necessary. 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 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).

Dangers of Trenching and Excavation

The most common serious hazard is a **cave-in**. Workers can be killed or seriously injured if a trench or other excavation collapses.

- **Cave -ins** are most often caused by:
 - Vibration from construction equipment or traffic in the area which makes the soil come apart.
 - Weight of equipment or weight of the earth that has been removed (**spoil bank**) to close to the edge.
 - Soil morphology, profile and cohesion are natural properties that can lend to cave-ins.
 - Previously disturbed soils, where maintenance or installation of utility lines has taken place before.
 - Water weakens the side walls of a trench, whereas soil that is to dry will crumble.
- **Other Potential Hazards;**
 - Falling loads, hazardous atmospheres, hazards from mobile equipment, and contact with utility lines.

***NOTE:** The likelihood of a cave in increases when more than one of these conditions is present!

Designating a Competent Person

OSHA's standard require that a competent person inspect trenches daily, before worker entry, to ensure elimination of excavation hazards. A competent person is an individual who can identify existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

Disclaimer: The National Grain and Feed Association make no warranties, expressed or implied, concerning the accuracy, application or use of the information contained in this publication. Further, nothing contained herein is intended as legal notice. Competent legal counsel should be consulted on legal issues. Grain handling facilities should contact experienced safety and health legal counsel or a third-party expert if they have questions about the proper way to implement the items addressed in the document.

- The NGFA is committed to promoting safety and health in the workplace, and shares the Occupational Safety and Health Administration's (OSHA's) commitment to protecting employees.
- The NGFA's extensive efforts to enhance safety include unprecedented research and education efforts launched in the early 1980s that helped lead to a dramatic reduction in the number of fire and explosion incidents in commercial grain-handling facilities.
- Each year, NGFA jointly sponsors regional safety seminars with affiliated state and regional grain and feed associations. The one-day conferences focus on keeping grain handling employees physically safe.

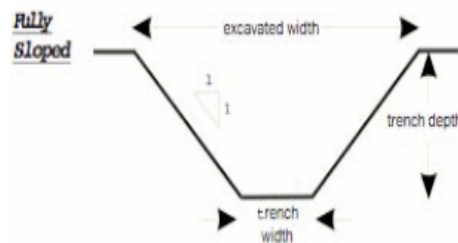
General Trenching and Excavation Rules

- Inspect trenches at the start of each shift.
- Inspect trenches after any occurrence that could have affected the integrity of the trench, i.e. precipitation, heavy traffic causing ground vibration, utility line contact, or other atmospheric or operational changes.
- Do not work under suspended loads or raised materials.
- Know where underground utilities are before digging.
- Control traffic in an around trench.
- Keep excavated spoils away from trench edge by 2 feet or more.
- Test for atmospheric hazards within the trench.

Protecting Workers from Cave-Ins

Sloping - Means The sides of the hole open out from the excavation. The type of soil determines the required angle. Sloping is less practical for deeper digs.

Benching - Similar to sloping only with steps or benches cut into the sides of the trench.



NOTE: A registered engineer **MUST** approve sloping and benching systems in excavations greater than 20 feet in depth!

Shoring - Supports the walls of the excavation. Shoring is made up of wales, crossbraces, and uprights. The material can be metal or wood. The equipment can be hydraulic or pneumatic. Shoring must be installed from the top down and removed from the bottom up.



Shielding - Also called trench boxes or trench shields. These are structures that are placed in the excavation to prevent the sides of a trench from caving-in. The worker is only protected while in the "box." Some trench boxes can be moved as the work progresses. Heavy equipment must always be used to place the box or shield in the trench. The shield must extend at least 18 inches from the top of the slope of the trench.

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



More safety information at www.ngfa.org

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