Trenching Safety Meeting Kit



WHAT’S AT STAKE

A trench is a narrow channel (up to 15 feet wide), generally deeper than it is wide, made below the surface of the ground. An excavation is any man-made hole or trench that is made by removing earth. Trenching is recognized as one of the most hazardous construction activities. The greatest risk is a cave-in and even a small job can present serious safety hazards. The key to preventing this type of accident is good planning.

WHAT’S THE DANGER

HAZARDS OF TRENCH AND EXCAVATION JOBS

Collapses or Cave-ins. During a cave-in, the walls collapse inward, and the trench fails. Collapses are also excavation hazards that pose the greatest threat to workers’ lives.

Unstable soil. If the soil in the trench can move around, it might cause the walls to become unstable and fall in. Sometimes, the soil is dry and doesn’t hold together correctly.

Nearby vibrations. Depending on where builders construct the trench, heavy traffic or nearby construction might cause excess vibrations. These could shake the trench, causing the soil to fall and the tunnel to collapse.

Adverse weather. Weather is one of the biggest threats to trench stability. Flooding or heavy rainfall might cause water accumulation at the bottom of the trench and weaken the walls’ strength. According to Occupational Safety and Health Administration (OSHA) standards, trench workers should not work in trenches with water buildup until they can properly remove it. Rain can also flood the trench and cause a collapse.

Too much pressure. If workers remove large amounts of soil or place heavy equipment near the edge of the trench, the pressure might cause the walls to cave in.

Hazardous Air. Oxygen deficiencies and toxic air conditions are common below ground.

Not enough oxygen. If workers don't receive enough oxygen, they might reach an oxygen deficiency and struggle to breathe. Or, other gases and substances in the trench might replace oxygen. To maintain healthy oxygen levels, inspectors must remove any harmful toxins and require all workers to wear protective gear, like atmosphere-supplying respirators, which supply workers air from an independent source.

Hazardous substances nearby. Some excavation sites are located near landfills or chemical plants. Contaminated air could travel from the site and accrue in the trench. This may include hydrogen sulfide gas from sewer lines or carbon monoxide from running equipment. It's important to have emergency procedures in case the air becomes too toxic.

Utility Lines Dangers

Water. If workers strike a water line, they could cause the pipe to leak. In turn, leaks might reduce or contaminate the residents' water supply. Workers might also encounter contaminated or toxic water. Any resulting flooding could also cause a cave-in.

Electrical. Striking an electrical line is highly dangerous for workers due to electrocution possibilities.

Natural Gas. Natural gas utility lines are especially hazardous because of the high amounts of pressure used to run the gas through pipelines. Even a small encounter could cause an explosion.

Falling Materials. Construction equipment like dump trucks or ramps could fall into the excavation.

Suffocation. If a large piece of equipment falls into the trench, it could cut off healthy oxygen flow for workers. Or heavy loads of dirt or rocks might fill the trench and make breathing difficult. These materials might also damage, or block exits of the trench, trapping workers below.

Head trauma or injury. If falling materials strike someone's head, this could cause brain damage or head trauma. Depending on the size of the equipment and speed of the fall, workers could sustain serious and potentially fatal injuries.

HOW TO PROTECT YOURSELF

PLANNING PREVENTS TRENCH COLLAPSE/CAVE – INS

- Assign and train a competent person.
- Call 811 to identify and mark underground utility lines.
- Dig a minimum 5 feet away from utility lines.
- Evaluate the soil to determine its stability.
- Plan the job layout to identify safe locations for spoil piles and heavy equipment routes.
- Before the job starts, if the trench will be 5 feet or deeper, set up a protective system.
- If the trench will be 20 feet or deeper, provide additional engineering protections.
- Have a traffic control plan and lane closure permits.
- Develop a trench emergency action plan.

Trench Inspections. A competent person must inspect trenches before work begins and as conditions change before any worker enters a trench. The competent person inspects the trench for excavation hazards and must eliminate them if they are identified. Trenches should also be inspected following a rainstorm or other water intrusion or after any other occurrence that could have changed the trench conditions.

REQUIREMENTS FOR PROTECTIVE SYSTEMS. Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on data approved by a registered professional engineer.

Sloping and Benching. Sloping refers to cutting back the trench wall at an angle to create a slope. Benching is the act of creating steps (like long benches) to travel up and down the earthen wall.

Shoring. Shoring means that a support system made of timber, mechanical parts or hydraulic systems that help prevent a cave-in are installed. They help keep the Earth in place and provide an extra layer of protection.

Trench Shield. Unlike shoring, trench shields, also known trench boxes, aren’t meant to prevent a cave-in or collapse, but rather protect the worker should one occur.

FINAL WORD

Protective systems are methods of protecting workers from cave-ins of material that can fall or roll into an excavation/trench or from the collapse of nearby soil structures. Protective systems include shoring, sheeting, shielding, sloping, and benching.