

MIOSHA Fact Sheet



Trenching and Excavation Protective Systems

Cave-ins are perhaps the most feared trenching hazard. However, other potentially fatal hazards exist in trenching and excavation operations, including asphyxiation due to lack of oxygen, inhalation of toxic fumes, drowning, etc. Electrocution or explosions can occur when workers contact underground utilities. MIOSHA has investigated five fatal excavation accidents in the period of 2018 through 2022.

MIOSHA requires that workers in trenches and excavations be protected, and that safety and health programs address the variety of hazards they face. Construction Standard [Part 1, General Rules](#), Rule 114 requires an Accident Prevention Program at every construction work site.

How to Avoid Hazards

Pre-job planning is vital to accident-free trenching; safety cannot be improvised as work progresses. The following concerns must be addressed by a competent and/or qualified person:

- Preplan: contact utilities (e.g., gas, electric) to locate underground lines, plan for traffic control when necessary, and determine proximity to structures that could affect choice of protective systems.
- Evaluate soil conditions and select or construct appropriate protective systems in accordance with Construction Standard [Part 9, Excavation, Trenching, and Shoring](#). Appropriate protective systems to prevent a cave-in may include trench boxes, shields, benching, and/or appropriate sloping of trench sides.
- Test for low oxygen and hazardous gases and vapors, especially when gasoline engine equipment is running nearby, or the soil has been contaminated by leaking lines or storage tanks. Fossil fuel powered equipment produces carbon monoxide in exhaust and must not be used without adequate ventilation.
- Provide appropriate respiratory protection when necessary.
- Provide safe access into and out of the excavation.
- Provide appropriate protections if water accumulation is a problem.
- Perform ongoing inspections of excavations and trenches including, daily at the start of each shift, following a rainstorm, and after any other hazard-increasing event.
- Keep excavations open the minimum amount of time needed to complete operations.

For additional assistance, please contact the Construction Safety and Health Division at 517-284-7680 or the Consultation Education and Training Division at 517-284-7720. Construction Safety Standards can be viewed on the MIOSHA website at www.michigan.gov/mioshastandards.



LEO is an equal opportunity employer/program.

Construction Safety and Health Division
530 W. Allegan Street • P.O. BOX 30645 • Lansing, Michigan 48909-8145
www.michigan.gov/miosha • (517) 284-7680
(CSDH Fact Sheet #24 • Revised 8/14/2023)

