



Helping Protect
People
at Work, at Home, for Life



Trenching and Excavation

According to the Bureau of Labor Statistics, in the United States between 2000 and 2009, 350 workers died in excavation or trench collapses. Trenching operations usually include water, sewer, pipeline, communications or power line construction. One study indicated 64% of fatalities occurred in excavations of less than 10 feet (3 meters). In addition to collapses, trenching operation hazards include: falls; falling objects from above and hazardous atmospheres.

Prior to any trenching or excavation, local utility companies should be contacted to locate and identify any underground cables, pipes, tunnels or tanks that may be in the excavation area. "Pot-hole" to determine their exact location prior to digging.

Trench Depths

- **Less than 5 feet (1.5 meters)** - A competent person should review the excavation soil and plans and determine if a protective system as described below is required.
- **5 feet (1.5 meters) to less than 20 feet (6.1 meters)** - a protective system must be in place unless a competent person has determined that the excavation is entirely in solid, stable rock with no potential for cave-in.
- **20 feet or greater** – a protective system designed and approved by a registered professional engineer must be installed.

Competent Person

A person trained in trenching and excavation safety should inspect the excavation daily. The inspection should be repeated if conditions change (e.g. after rain fall, freeze/thaw weather changes). The competent person should be authorized to order immediate corrective action, including restricting entry into the excavation, until any hazards or potential hazards have been eliminated.

Protective Systems to prevent cave-ins

- Benching – excavating the sides of an excavation to form one or more horizontal levels or steps (1)
- Sloping – Cutting back the trench wall at an angle away from the excavation. (2)
- Shoring – Installing a support system of using materials such as posts, beams, planking and hydraulic jacks to support or "shore up" the sides of the excavation. (3)
- Shielding - Using trench boxes or similar enclosures to prevent cave-ins. (4)
- Refer to ANSI A12.10-1998 for specific design requirements.

Other safety requirements

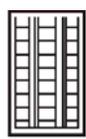
- Keep heavy equipment away from the sides of the excavation
- Keep spoils piles at least 2 feet (1 meter) away from the trench edge. (5)
- For excavations deeper than 4 feet – conduct air monitoring similar to confined space entry – oxygen, combustibles, and toxic gases/vapors.
- Ladders, steps, or ramps must be provided for safe exiting from the trench. An exit point must always be within 25 feet of all workers at all times. These may need to be continuously relocated as the job progresses. (6)
- Ensure workers are trained on work hazards and proper work practices.
- Develop a trench emergency action plan and train workers and supervisors on the proper actions to take in an emergency.



(1)



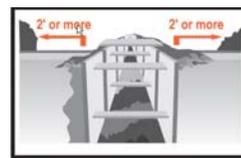
(2)



(3)



(4)



(5)



(6)