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**Trench safety
saves in
many ways**

by David Dow,
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Trench safety SAVES in many ways

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Your organization can realize real savings by using proper trench support equipment and practices. The key word is “proper.”

Unfortunately, contractors sometimes use trench-support methods that are not designed – or rated – for the project at hand. Tragic reports of death and injury in trench cave-ins are repeated all too frequently in newspapers and on television across the country.

Following are eight ways you can decrease costs and reduce these senseless tragedies:

1. Plan the job.

Planning is a matter of safety and economics. Having the proper equipment at your jobsite – and available to your workers – allows them to work safely. It speeds production and it lowers job costs.

Pre-engineered systems eliminate

guesswork and the cost of custom engineering. Modular shoring and shielding systems make installations fast and easy without cutting, welding, nailing or other expensive and time-consuming steps.

2. Avoid repairs.

The cost of repairing existing utility lines that are damaged by improper trench support can be substantial.

3. Reduce soil removal and replacement costs.

In Type C soil, a 10' deep, 4' wide trench would have to be sloped 15' on each side. Likewise, a 10' deep, 10' square pit in Type C soil would have to be more than seven times larger if it was sloped. Sloping means significant additional costs for soil removal, replacement and compaction.

4. Reduce workers' compensation claims.

Never use trenchbox or shoring system components as a way to get in and out of a trench. It's recommended that a ladder, stairway or ramp be used to enter or exit any trench deeper than 4'.

Workers' compensation insurance premiums are based on a company's three-year claims experience. Injuries and fatalities can easily add more than 100 percent to these insurance costs. That could translate into losing bids to competitors because your costs are higher.

5. Avoid damage to adjacent property.

Loss of adjacent streets, curbs and sidewalks are common costs that can result from using improper trench support methods and equipment. Undermining adjacent structural foundations to slope the trench properly can lead to property-damage claims. Paying

such claims means higher liability insurance premiums and increased out-of-pocket expenses.

6. Reduce disposal liabilities.

Disposal of soil and debris is an expensive part of any excavation project. Eliminating unnecessary excavation can mean that those “disposal” dollars wind up in your pocket.

7. Reduce unsafe conditions and increase productivity.

Crews working in unsafe excavations are not as productive as those working in safe conditions. Unprotected workers must always keep a wary eye on the unstable excavation walls which can result in drastically reduced production and costly inefficiency.

8. Avoid fines, legal expenses and even a jail term.

OSHA fines can be as high as \$7,000 per serious violation and may reach \$70,000 for willful or repeat violations. Legal defense costs surrounding these fines can be just as damaging. In extreme cases, OSHA can even order jail time for repeat offenders.

Contractor requirements

No matter what your role on the jobsite, there is some responsibility for safety in trenches for every contractor. Here is how OSHA defines contractors’ responsibilities:

General or prime contractor has overall responsibility. The prime contractor, according to OSHA, “assumes all obligations” and “in no case ... shall be relieved of overall responsibility for compliance with the requirements of the part for all work to be performed under the contract.” This includes work being done by all subcontractors on the jobsite.

Subcontractors have joint responsibility. The law states, “with respect to subcontracted work, the prime contractor and any subcontractor ... shall be deemed to have

joint responsibility.” The subcontractor “of any tier” is still responsible for the safety of workers involved in his or her part of the job.

Fines can be levied. The general contractor, the subcontractor, and even the owner of the project are subject to enforcement and fines when it can be shown they “could

have had [such] knowledge with the exercise of reasonable diligence.” The OSHA standard says: “Where joint responsibility exists, both the general (prime) contractor and his subcontractor or subcontractors, regardless of tier, shall be considered subject to the enforcement provisions of the Act.”

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Trench boxes are an important part of safe trenching jobs. Follow directions outlined by the trench box operator manual and the competent person in charge of the trenching project. In this instance, it could be argued the workers should be wearing fall protection because they are working in an area where they could fall at least 6'.

Tips to assure safety in trenches

The General Requirements Section of OSHA's Subpart P (OSHA CFR 1926.651) provides a number of commonsense steps to help insure worker safety while they work in trenches. As with any OSHA Standard or other safety procedure, remember that these are the minimum requirements to assure safe jobsites.

Surface encumbrances: Rocks, trees, telephone and utility poles and fire hydrants are just some of the obstacles in the way of trenching work. They need to be removed or supported during excavation to assure their stability.

Underground utilities and installations: Utilities such as electrical, water or sewer lines must be located and marked before beginning work. Property owners and/or utility companies should be notified at least 24 hours prior to digging, unless a longer time is required by local law. For example, Tennessee requires 72 hours; many states require 48 hours. Most states have one-call services that can locate all buried utilities.

As the trenching work progresses, the underground installation must be protected, supported or removed while the trench is open.

Access and egress: These are fancy words for the method workers use to enter and exit a trench.

OSHA requires that any trench 4' or deeper must have a means of access and egress. Spacing between ladders, stairs, or ramps should not be more than 50' so workers do not have to travel more than 25' laterally to get out of a trench.

Ladders must be secured and extend 36" above the landing. Wood or fiberglass ladders should be used where there is any possibility of contact with electrical lines.

The competent person, as defined by OSHA, must design all structural ramps used by workers. This person must be qualified in structural design and usually is a registered professional engineer.

The components used in structural ramps must be connected, be of uniform thickness and built so cleats and other connectors don't create tripping hazards. If ramps are used, they must have cleats or other surface treatments to prevent slips.

Worker exposure to vehicular traffic: Employees must be protected from motor vehicles. Also, employees must be provided with — and must wear — warning vests or other highly visible garments when exposed to traffic. Generally, employees are "exposed" when they are within the right-of-way of a road. Signs, signals, barricades, and/or flagmen may be required.

Exposure to falling loads: Employees must be protected from falling objects. Forbid them from working under raised loads. Require employees to stand away from equipment during loading or unloading. Equipment operators

may stay in equipment with an adequate cab shield or canopy.

Warning system for mobile equipment: Prevent vehicles from falling or backing into a trench by using barricades or stop logs and grading away from the excavation. Use hand or mechanical signals to help operators position the load without endangering the trench.

Equipment with an obstructed view must have working back-up alarms or rely on assigned observers during reverse operation.

Hazardous atmospheres: The competent person is responsible for protecting employees from hazardous atmospheres. Several conditions that can make confined spaces hazardous to workers:

- Oxygen-deficient atmospheres — Normal air is 20.9 percent oxygen; an oxygen-deficient atmosphere has less than 19.5 percent oxygen.
- Oxygen-enriched atmosphere — A confined space with 23.5 percent or more oxygen.
- Carbon monoxide causes oxygen starvation and can be fatal to workers even if they are exposed to a carbon monoxide concentration of just one percent for one minute.
- Hydrogen sulfide is a toxic gas and methane is a flammable gas. Both can be found in trenchwork, particularly around sewers.

If any possibility that a hazardous atmosphere exists, the air should be tested before employees enter a trench or manhole. Workers must be provided with respirators or ventilation when needed. During work, test the confined space often to assure the trench remains safe. ❑

David Dow is president of TrenchSafety and Supply, Inc. in Memphis, Tennessee. His company offers trench safety training as well as trench box equipment for construction work. Go to www.trenchsafety.com for helpful trench safety information as well as dates of future training seminars.