



TRENCHING AND EXCAVATION

PLANNING AND PROTECTION
WILL HELP WORKERS STAY SAFE

By Alan Ferguson, associate editor

Photos: Ron Childs, National Trench Safety and North American Excavation Shoring Association



On April 29, 2022, two brothers died when the 10-foot-deep trench they were working in collapsed. The cave-in was discovered only after the homeowner arrived to check the progress of a barn construction project near Grand Rapids, MI.

Emergency responders needed several hours to recover the bodies of the two men, both of whom worked for their family's company.

The two deaths were among the 39 caused by full/partial trench or excavation cave-ins in 2022, according to OSHA, and they marked a sobering increase from the 15 recorded in 2021.

The spike spurred the agency to launch enhanced enforcement initiatives.

"Every one of these tragedies could have been prevented had employers complied with OSHA standards," agency administrator Doug Parker announced in a July 14 press release. "There simply is no excuse for ignoring safety requirements to prevent trench collapses and cave-ins, and leaving families, friends and co-workers to grieve when the solutions are so well-understood."

The hazards

The hazards of trenching and excavation are well-established. One is the sheer weight of soil. A cubic yard can weigh about 3,000 pounds. That's as much as a car.

"The weight of soil is so heavy that it will crush you," says a hazard alert from CPWR – The Center for Construction Research and Training. "You could die in minutes from a trench collapse, even if your head and arms are above the dirt."

Another danger? The volatile nature of a trench or excavation. For example, water accumulation – from weather or from underground – can weaken the soil and lead to a cave-in.

"A change can happen at a moment's notice," said Mike Kassman, director of OSHA and disaster response training at CPWR. "It's going to happen faster than you can react."

"A lot of folks, maybe young workers, think they can get out faster than they actually can."

Hazards can also stem from:

- Construction equipment and machinery
- Buried electrical or gas lines
- Gases and fumes

Among the trenching and excavation deaths in OSHA's Accident Search for 2022 were an electrocution, a worker who died of severe heat stroke, another who was struck by a falling concrete pipe and one who fell into a trench.

Protections

OSHA's excavation standards are covered in 1926 Subpart P, which includes 1926.650-652 and Appendixes A-F.

Casey Perkins, assistant regional administrator of enforcement programs for OSHA Region 6, and Ralph DiNapoli, director of safety for construction company Columbia in North Reading, MA, both emphasized that OSHA standards are *minimum* compliance. Employers should aim to go beyond the minimum requirements – especially when it comes to trenching and excavation.

OSHA requires protective systems for excavations 5 feet or deeper, unless the excavation is composed entirely of stable rock. For excavations shallower than 5 feet, a protective system is required if a "competent person" finds any indication of a potential cave-in.

The main protective systems are:

Sloping: Cutting back the trench wall at an angle that's inclined away from the excavation.

Benching: Forming one or a series of horizontal levels or steps into the sides of an excavation, usually with vertical or near-vertical surfaces between levels.



Shoring: Installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.

Shielding: Using trench boxes or other supports to prevent cave-ins.

CPWR cautions that workers should never enter a trench unless it has been properly inspected. Once they're in it, they should stay inside the protected areas only.

"Some types of soil are stable and some are not," OSHA says. "When digging a trench, it's important to know the type of soil you're working with so you know how to properly slope, bench or shore the trench."

Appendix A in 1926 Subpart P outlines the types of soils: stable rock and types A, B and C. The competent person has the responsibility of classifying the soil type.

The competent person

The task of inspecting a trench and its protective systems also belongs to the competent person. OSHA requires that inspection to take place daily and "as conditions change."

Who qualifies as a competent person? Someone who is "capable of identifying existing and predictable

hazards" and has the authority to correct or eliminate them. This person should also have the authority to stop work and remove employees from the trench or excavation if needed.

Additionally, the competent person is tasked with designing structural ramps, monitoring any water removal equipment and knowing when to check for hazardous gases.

Perkins cautioned that the selection of a competent person could lead to a conflict of interest: The person responsible for safety also might be in charge of making sure a job gets done on time and on budget.

Time and financial pressures can lead to unsafe practices during trenching and excavation jobs. This is especially true in construction, where, for example, a subcontractor may have other jobs lined up at other sites later in the week. "We often hear, 'I'm just going to be in there for a few minutes' – but soil collapses do not follow a timeline," Perkins said.

One possible way to eliminate that conflict of interest, he said, is getting "another set of eyes on the site" to ensure supervisors/lead persons aren't giving into those pressures. "Even the smallest of employers can have unannounced jobsite visits by the owners, their purchasing department, their quality-control department, a third party (such as safety consultants)," Perkins said. "To ensure safety expectations are implemented, some companies are also requiring foremen and supervisors to send photos of proper safety systems as part of a daily job safety analysis."

Kassman added that many contractors have safety officers or safety directors who act as that additional set of eyes for their subcontractors.

It's important to give the competent person for a trench or excavation just one role: ensuring safety.

"It's having that designated person there to solely do that job," said Nick Fragola, safety manager with Colantonio Inc., a Holliston, MA-based construction company.

Is it a trench or an excavation?

OSHA defines an **excavation** as "any man-made cut, cavity, trench or depression in an earth surface that is formed by earth removal." A **trench**, meanwhile, is "a narrow excavation (in relation to its length) made below the surface of the ground."

Typically, a trench is deeper than it is wide, but that width when measured from the bottom is no greater than 15 feet.

"Every trench is an excavation, but not every excavation is a trench," said Kenneth Koroll, a safety and occupational health specialist in OSHA's Office of Construction Services.

“A lot of the times people complain about, ‘Well, you’re paying another person to do this,’ but [being a competent person is] a job.”

Planning

Planning is another crucial step for trenching and excavation safety – one that may get overlooked by some employers.

Part of that planning is making sure utility companies, or services such as 811 or DigSafe, are contacted to mark the location of utility lines before digging starts. Scheduled training may also be necessary, especially for inexperienced workers or those whose primary language isn’t English.

In addition, plans may be needed to ensure equipment such as pipes – and even excavated soil, sometimes known as spoil piles – are kept at least 2 feet away from the opening of an excavation. It’s an OSHA requirement.

“I’ve been in trenches when people wanted to see what I was doing and they walk a little close” to the edge, Kassman said. “As they step a little closer, they could maybe knock stones down into the trench or even fall into the trench. Everybody wants to take a peek to see how deep it is and see what workers are doing. But if you get too close, you could add a potential problem – not only to yourself, but to the workers below.”

To keep unauthorized people away from a trench or excavation, barricades or signage may be needed. Employers also must make sure all the necessary tools and equipment are onsite. In one recent fatal incident, Perkins noted, the employer had a trench box and hydraulic shoring a half mile away from the worksite.



Photo: Laborers' Health & Safety Fund of North America

Trench Safety Stand Down

This year’s Trench Safety Stand Down is set to take place June 19-23, in conjunction with Trench Safety Month.

“A safety stand-down presents the opportunity for employers to talk directly to employees and others about safety,” the National Utility Contractors Association says. “These stand-downs will focus on trench and excavation hazards and reinforce the importance of using trench protective systems and protecting workers from trenching hazards.”

Go to nuca.com/tssd for more information.

Another important part of planning is making sure employees have a safe way of entering and exiting a trench or excavation. OSHA requires this for excavations that are 4 feet or deeper. Employers need to ensure the safe way of entry and exit, such as a ladder, is no more than 25 feet away from workers.

“It’s just having a checklist, doing your pre-job meeting right in the morning or the day before, making sure, ‘OK, we need all of this equipment here before we start the task tomorrow, before everybody signs their morning huddle worksheet. We need to have all equipment checked off, inspected and ready to go,’” Fragola said.

Vetting process

Columbia uses a “premobilization” meeting as part of its trenching and excavation planning, said DiNapoli and Mike Harrington, the company’s senior safety manager.

“You bring the subcontractor in and talk about what we’re going to do,” DiNapoli said. “We go over all the different scenarios: Have the operators been trained? Do they have a license for hoisting? What equipment are they using? Weather conditions. I mean, I can go on and on.”

The company takes another step to research subcontractors via a pre-qualifications process. That includes looking for any OSHA violations and information about previous work with Columbia.

“Let’s check this company for how many negatives they have, and if they have any infractions on our projects,” DiNapoli said.

He added that Columbia will reach out to other superintendents to get a second opinion on a foreman’s performance history, or they might have meetings with the subcontractors’ management, including any safety managers or directors, and Columbia’s management.

“It’s not to give a slap on the wrist.” Harrington said, “It’s that we want to ensure all craft workers go home safely. It’s critical we have safe subcontractors working for us.” **S+H**