

Excavation and Trenching Safety

Good morning, everyone. Today we're talking about one of the most dangerous jobs on a construction site: excavations and trenching. A trench is any narrow excavation where the depth is greater than the width, but the width is no more than 15 feet. Cave-ins kill or seriously injure workers every year, often with no warning. One cubic yard of soil can weigh over 3,000 pounds, about the same as a small car. The good news? These incidents are 100% preventable if we follow the rules and stay vigilant.

Here are the main dangers we face in excavations:

- Cave-ins: The number one killer. Soil can collapse suddenly, burying workers.
- Falls: Into the trench or from equipment.
- Falling loads: Tools, materials, or spoil piles sliding in from the edge.
- Hazardous atmospheres: Low oxygen, toxic gases (like hydrogen sulfide or carbon monoxide), or explosive vapors from nearby utilities or soil.
- Struck-by incidents: From excavators, vehicles, or swinging buckets.
- Underground utilities: Hitting gas, electric, water, or sewer lines.
- Water accumulation: Weakens walls and creates drowning or electrocution risks.
- Mobile equipment near edges: Can cause collapse from vibration or weight.

OSHA's Excavation Standard (29 CFR 1926 Subpart P) is clear on how to keep us safe

Before Digging

Call 811 (or your local one-call system) at least 3 business days ahead to locate and mark underground utilities. Never assume maps are accurate.

Have a Competent Person on site. This person must be trained to identify hazards, classify soil, and select protective systems.

Daily Inspections

The Competent Person inspects the excavation, adjacent areas, and protective systems every day before work starts, after rain, or any condition change.

Look for cracks, water, bulging soil, or slumping. If anything looks wrong, get everyone out until it's fixed.

Access and Egress

For trenches 4 feet or deeper, provide safe entry/exit (ladders, ramps, or steps) no more than 25 feet apart.

Ladders must extend 3 feet above the edge.

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Protective Systems (The 5-Foot Rule)

Any trench 5 feet deep or more requires protection unless it's entirely in stable rock.

Options:

Sloping: Angle walls back based on soil type (e.g., Type C soil: 1.5 horizontal to 1 vertical, or 34 degrees).

- Benching: Step the sides (only allowed in cohesive soils, not granular).
- Shoring: Hydraulic jacks, timber, or aluminum systems to brace walls.
- Trench shields/boxes: Steel or aluminum boxes lowered into the trench.
- For trenches over 20 feet deep, a registered professional engineer must design the system.

Never work outside the protection, even for a quick task

- Spoil Piles and Surcharge Loads
- Keep excavated soil and materials at least 2 feet back from the edge.
- No vehicles or heavy equipment closer unless supported.

Atmospheric Hazards

- Test the air in trenches deeper than 4 feet if oxygen deficiency or toxic gases are possible.
- Ventilate or provide respiratory protection if needed.

Water and Weather

- Remove standing water and use pumps if necessary.
- After rain or freezing/thawing, re-inspect before entry.

Emergency Response

Have rescue equipment ready (harnesses, tripods, winches).

Never rush in to help someone buried. Call 911 first and use mechanical means to dig them out.

Best Practices

Never enter an unprotected trench, no matter how short the job.

Wear your hard hat, high-vis, and sturdy boots.

Barricade the excavation to keep unauthorized people out.

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Stand clear of swinging loads and excavator buckets.

Train everyone. Know your soil type and the right protection.

Excavation work doesn't have to be deadly. Follow the plan, use the protective systems, inspect daily, and speak up if something looks wrong. Your life and your coworkers' lives depend on it.

