Deep Trench Excavation Safety Talk

Deep-trench excavation work poses significant risks, and, according to incident data, many of the most serious outcomes occur during entry and exit, not the digging itself. A ladder too far away, a trench wall that shifts, or an exit route that doesn't exist when it's needed… those are the moments that turn a routine task into a tragedy.

When a Protective System and Exits are Required

- Protective system: Trenches 5 feet (1.5 m) or deeper must use a protective system (sloping, shoring, or shielding) unless cut entirely in stable rock; 20 feet (6.1 m) or deeper requires a design by a registered professional engineer.
- Access/egress: Trenches 4 feet (1.22 m) or deeper must have a stairway, ladder, ramp, or other safe means of egress within 25 feet (7.62 m) of lateral travel for every worker. This exit must always be available.

Ladder Placement

- Inside the protective system. The ladder (or stair/ramp) must be placed within the shielded/shored area, not outside the box or beyond the shoring line.
- Extension above the edge. Ladder side rails must extend at least 3 feet (0.9 m) above the trench lip. If that extension isn't possible, secure the ladder and provide a grasping device (e.g., grabrail).
- Angle & footing. Use the 4:1 rule (1 foot out for every 4 feet up). Set the ladder on a stable, level surface; secure it if displacement is possible; keep the top and bottom clear of obstructions.
- Distance to workers. No worker should travel more than 25 lateral feet to an exit ladder or stair. For long runs, add more ladders.

Entry/Exit Protocol

1. Competent person clears the trench for entry. Confirm protective system, water control, spoils set-back (≥2 feet from the edge), and traffic/overhead loads controlled. Re-evaluate after weather changes or vibrations.
2. Inspect the ladder. Check rungs, rails, feet, locks; remove any defective ladder from service. Clean oil/grease; verify duty rating meets the load.
3. Set the ladder correctly. Place inside the box/shoring, at 4:1 angle, extending 3 feet above the edge, secured against displacement. Keep landing areas clear.
4. Control the climb. Face the ladder, three points of contact, one hand on a rung at all times. Do not carry loads that could throw off balance—use tag lines or lower/raise tools instead.
5. Manage flow. One climber at a time; maintain communication with the top watcher; stop work if soil conditions change or water accumulates.

Special Considerations for Deep Trenches (>5 ft)

- Exits as conditions change. As trench length grows, install additional ladders so the 25-ft rule remains true for every worker location. Move ladders as work advances.
- Do not climb on trench boxes. Ladders must provide access into and out of the protected zone; never scale shields or stand on stacked boxes to enter/exit.
- After rain or utility strikes. Re-inspect walls and bedding; pause entry until the competent person re-approves and ladders are re-verified. Many fatal collapses occur during re-entry after conditions change.
- Keep edges light and clear. Maintain the 2-ft spoil setback; keep equipment and stored materials away from the edge to reduce surcharge loads near the ladder landing.

Common Ladder Errors to Eliminate

- Ladder too short (no 3-ft extension) or not tied off when it can't extend—fix by securing and adding a grabrail.
- Ladder outside protection (forcing workers to step under/around the shield to climb). Always place access inside the system.
- Overreaching or carrying tools on the climb. Keep hands free, stage tools in the trench via hoist, handline, or lowering devices.

Quick Checklist Before Anyone Climbs

- Protective system was installed and inspected daily.
- Ladder every ≤25 ft of lateral travel, within the protective system.
- 4:1 ladder angle; 3-ft extension; secured; landings clear.
- Spoils ≥2 ft from edge; water controlled; surface loads minimized.
- Climbers face the ladder, three points of contact, no carried loads.

Summary

Trenching isn't just about how deep you dig, it's about how safe you climb in and out. Engineered protection, correctly placed ladders, clear access, and ongoing hazard awareness form the backbone of safe trench operations.

Discussion Points

1. *Discuss all the special considerations for deep trenches.*