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## SAFETY WATCH

by Marcia Gruver

# Heavy loads

## Soil exerts tremendous pressures during trench cave-ins.

### The accident:

Working in the December cold, a utility construction worker was helping install a sewer line in a 25- to 30-foot-deep trench. A steel trench box was in the excavation but was not large enough to reach the bottom of the trench. The surrounding soil, which had a crust of frozen, snow-covered ground, was a heavy mix of water-soaked sand and clay. The trench walls collapsed, and the man became trapped in mud up to his neck. Although initial rescue efforts freed the worker's chest, the unstable ground continued to flow into the area and rescuers were unable to prevent his death.

**The bottom line:** According to OSHA, the fatality rate for excavation work is 112 percent higher than the rate for general construction. A cubic yard of soil weighs 2,700 pounds, says Auburn University in its [trenchsafety.org](http://www.trenchsafety.org) website, or about as much as a mid-size automobile. A trench



Illustration by Don Lomax

wall collapse might contain 3 to 5 cubic yards of soil, weighing from 8,000 to 14,000 pounds.

A cave-in is lightning fast. Unstable soil flows like a fluid quickly into the trench opening, exerting extremely high pressures on anything in its path. According to [trenchsafety.org](http://www.trenchsafety.org), the initial momentum of collapsing soil can knock a person down and break bones. High soil pressures can impair circulation to buried legs and arms, and can kill someone buried only to his waist. The heavy soil loads are likely to inflict serious injury even if a worker is rescued.

OSHA requires trenches 5 feet deep or greater to have a protec-

tive system. These can include:

- Sloping, which protects workers by cutting back the trench wall at an angle inclined away from the excavation
- Stepped bench grades
- Shoring, or aluminum hydraulic or other types of supports to prevent soil movement
- Shielding, usually

trench boxes, to prevent soil cave-ins.

Before you work in a trench, OSHA requires a designated competent person (someone who's been trained in OSHA excavation standards) to OK it. Be especially wary of water in an excavation. See that there is a quick way to get out of the trench – usually a ladder – within 25 feet of you. Any spoil piles or heavy equipment should be placed more than 2 feet away from the edge of the trench.

And as hard as it may seem, in the event of a cave-in, never go into the trench to try to rescue a co-worker. You'll be more effective – and safer – if you work to rescue them from outside the trench. **EW**

Information for this Safety Watch was gathered from news reports, OSHA ([www.osha.gov](http://www.osha.gov)) and [www.trenchsafety.org](http://www.trenchsafety.org). It

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