

Safety Educational Series – Excavation & Trenching



Why We Are Here!?!?

- Routine work can dull alertness and create a relaxed attitude.
- In many jobs the same tasks are repeated with little thought.
- We may not recognize the importance for safety because we have been doing the same task for years.

Overview

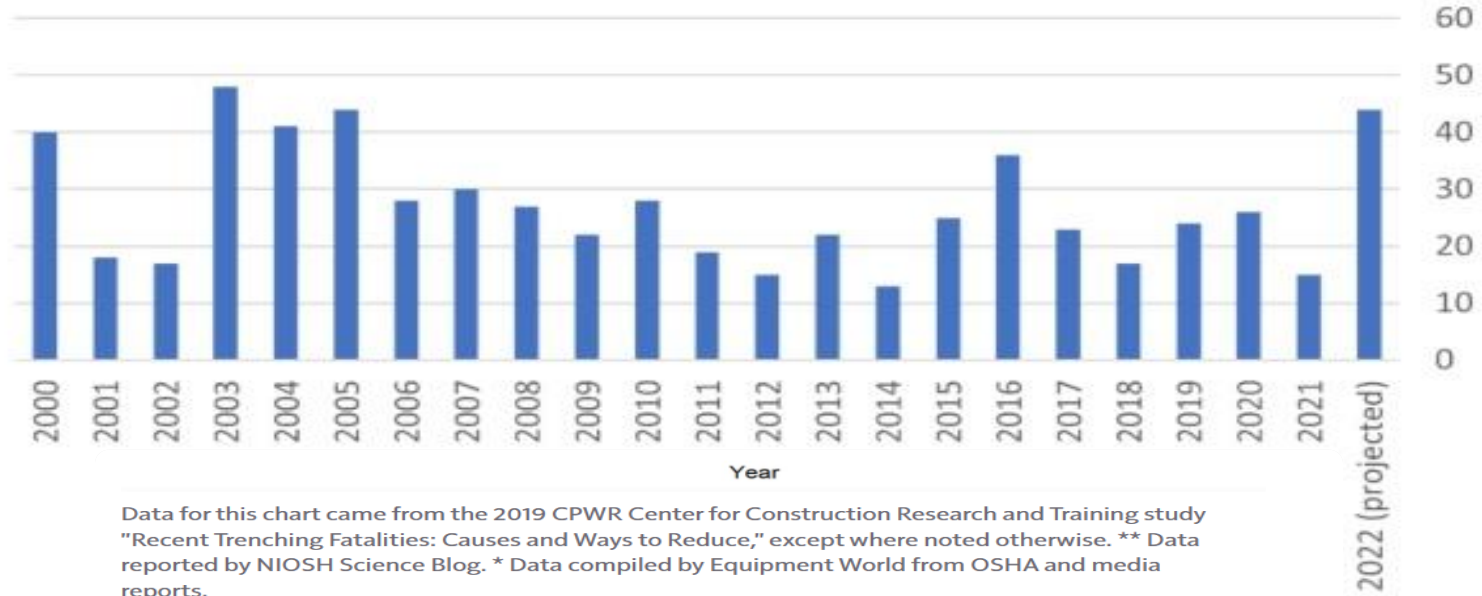
- Without some periodic reawakening to the ever-present hazards around us, lethargy deepens and the odds of an accident occurring increases.



Trench-Collapse Deaths 2000-2022

Trenching and Excavation Fatalities by Year, 2000-2022

Source: Bureau of Labor Statistics Census of Fatal Occupational Injuries





York, PA – December 2010

One worker buried alive for more than 5 hours under 10-15 feet is pulled free and taken to a hospital. The second worker was not so lucky and was killed as a result of the cave in.



Lancaster PA – JUNE 2011

A York County resident, was laying residential water lines in the 10-foot-deep trench when it caved in, according to the Fire Chief. **Co-workers tried to free the worker but were unsuccessful.** They were barred from the area when emergency crews arrived because of the instability of the trench, "It was too dangerous. There was no shoring on either side that would permit rescue personnel to enter the trench," he said.

Excavation vs. Trench

- Any man-made cut in an earth surface, formed by earth removal.
- Trench is a type of excavation, generally deeper than it is wide.



General Requirement For Protection

- Five feet deep or deeper shall be protected from cave-ins by an adequate protective system



General Requirement For Protection

- Under 5 feet, the requirement for a protective system is a judgment call for the “Competent Person.”





Competent Person

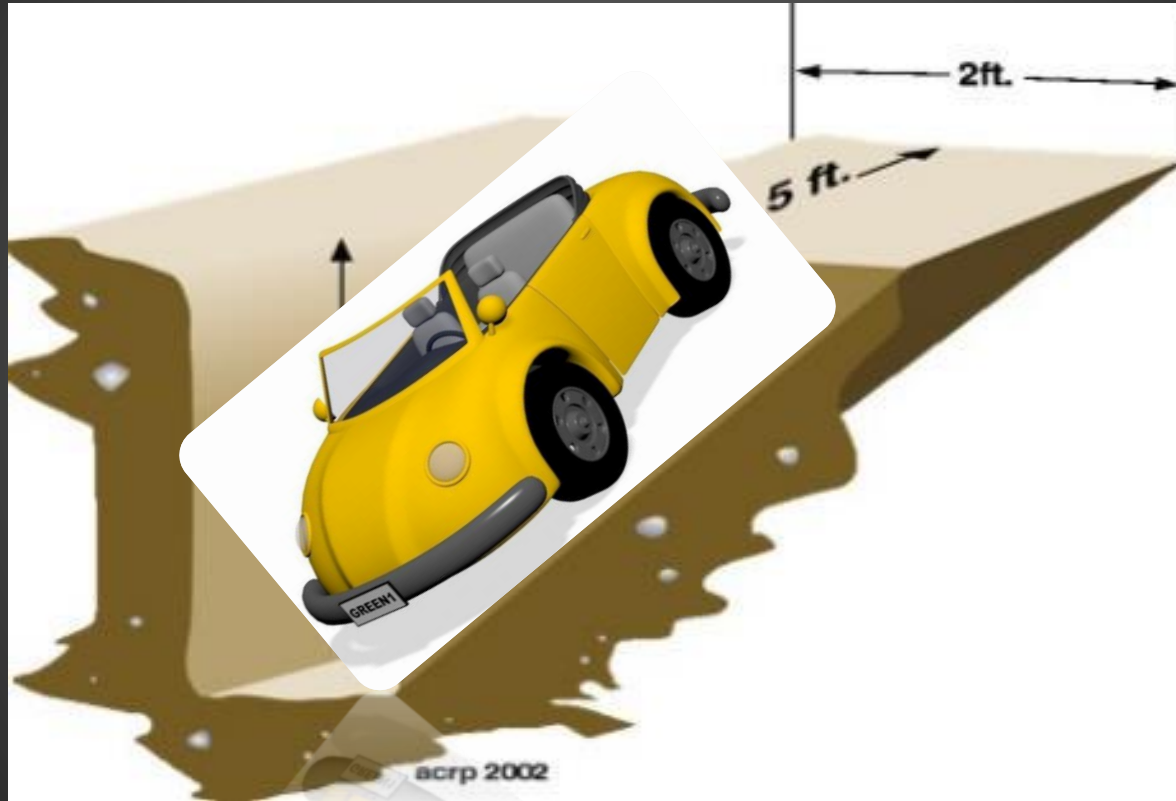
- Know The Standard;
- Identify Hazard(s); and
- Designated/Authority To Take Action.



**Competent person
must make daily
inspection of:**

- **Excavations;**
- **Areas around
excavation; and**
- **Protective
Systems**

Collapse Forces





Chances of trench collapse increase with . . .

- **Previously disturbed soil...**
- **Dug up before...**
- **NO Matter how long ago**



**What is
undisturbed
soil?**

- Water in an excavation
 - lubricates soil grains
 - Reduces
 - weight bearing capacity
 - cohesiveness.





RULES of 2-3-4-5-6

2' = ?

3' = ?

4' = ?


5' = ?

6' = ?



RULE of 2

- Soil's gotta go **somewhere.**
- Piled on the edge of the excavation, it puts weight on the side walls.
- Spoil must be kept back **AT LEAST 2 feet,** but more may be better.



Ladder is not extended 3 feet above excavation

RULE of 3

Ladders need to be extend at least **36 inches** above landing



RULE of 4

- **4 feet or deeper:**
 - Ladder secured
 - Extend at least **36 inches** above landing
 - Means of egress cannot be more than **25 feet** from the workers.



RULE of 5

- **Protective Systems**
- Soil classification
- Depth of cut
- Water content of soil
- Changes due to weather
- Other operations in the vicinity



Soil Classification

- Must be classified by a competent person
- Classifications must be made based on at least 1 visual & 1 manual test

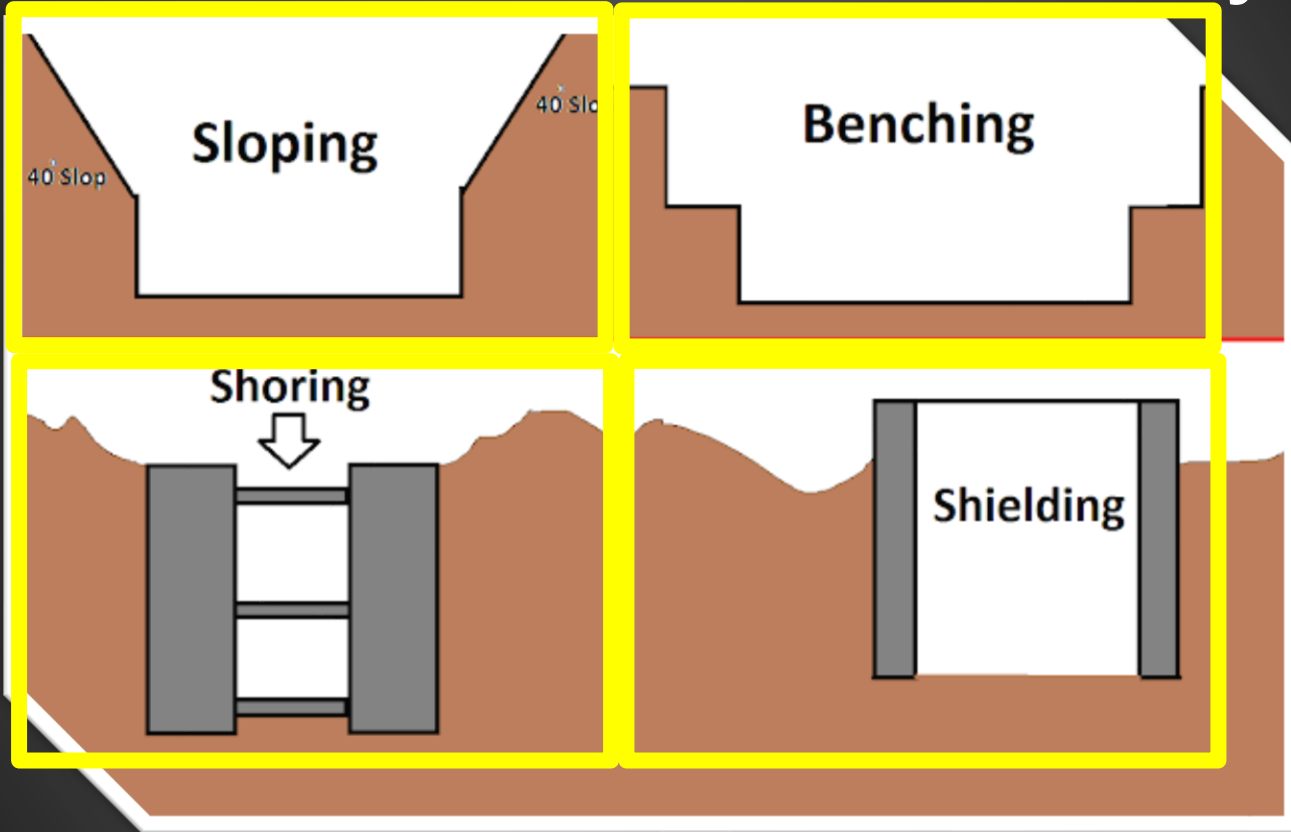
Visual Testing



Manual Testing



Protective Systems





Shielding (Trench Boxes)

- Installation & removal instructions
- Backfill
- Excavate no greater than 2' below bottom of box
- No one allowed in boxes/shields when being moved
- 18" stick up above box when material is present
- Head protection (PPE) – Must protect from falling, rolling, and / or sliding material



Protective Systems Require Proper Use!



RULE of 6

- Fall Hazards 6 feet and over...
- **Workers must be protected**
- Guardrails
- Barriers
- Controlled access zones
- Fall arrest systems

Important Things To Remember

Before You Dig . . .



White - Proposed Excavation



Pink - Temporary Survey Markings



Red - Electric Power Lines, Cables, Conduit and Lighting Cables



Yellow - Gas, Oil, Steam, Petroleum or Gaseous Materials



Orange - Communication, Alarm, or Signal Lines, Cables or Conduit and Traffic Loops



Blue - Potable Water



Purple - Reclaimed Water, Irrigation and Slurry Lines



Green - Sewer and Drain Lines



Vehicles & Equipment

- Prevent equipment from running into the excavation (barricades, stop logs).
- Barricade excavation site perimeter
- This is becoming one of the GREATEST dangers in excavating!



- Employees signaling and exposed to traffic need to wear high visibility warning apparel.



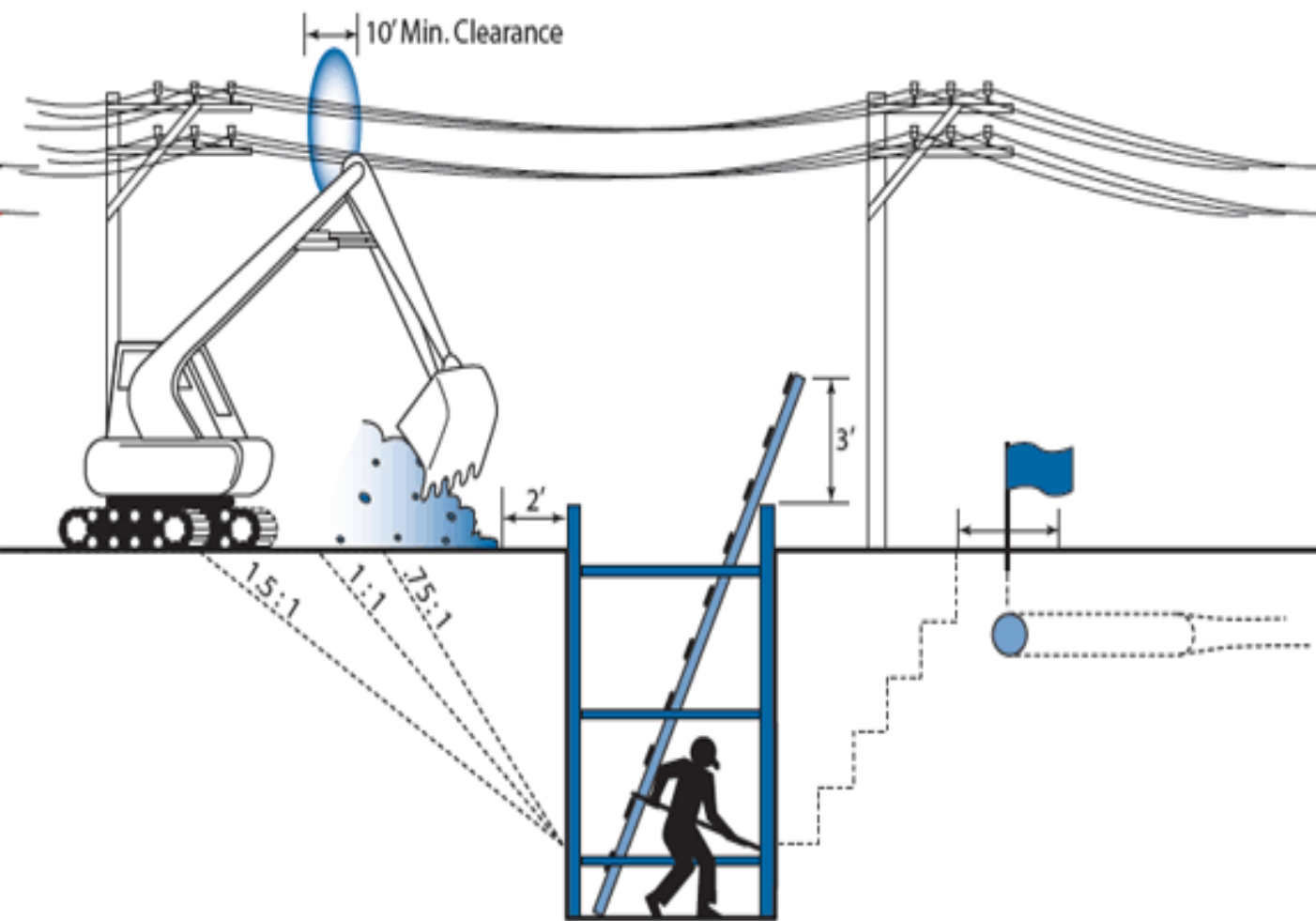
Hazardous Atmospheres

- Oxygen
- Combustible Gas
- Hazardous Substances



Surface Encumbrances

- Sidewalks
- Trees
- Roadways
- Anything on the surface



**Look Up ...
Know What Is
Above You?**



In An Emergency

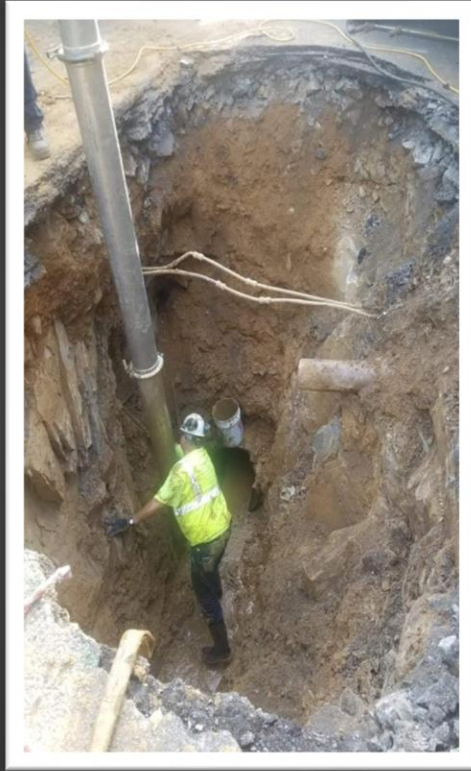
- Know your emergency plan - and GET HELP!
- See that the area is made safe BEFORE entering - and that entry is limited to trained rescue and service personnel.
- Attempting to rescue your friend with a backhoe is likely to cut him in two - HAND DIG!

Summary

- Excavations are inherently dangerous.
- **Identify, Abate, and Avoid**
- RESPECT THE UNEXPECTED...THINK THROUGH YOUR RISKS.



Past Performance Doesn't Predict Future Results!





PLANET
UNDERGROUND.TV

Excavating
Eric Giguere - Buried Alive!



“I’m a guy who got comfortable doing things the wrong way,” Eric Giguere told NSC attendees. “I’m your average, hardworking guy. Essentially, I am any of you people in this room.”

Questions, Comments or Concerns?

