Excavations don't have to be big to cause BIG problems

Presented by James McRay, Trench Safety Specialist
Efficiency Production – An Arcosa Shoring Products company

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Every day, companies and their safety personnel are faced with excavation challenges.

When the challenge is on a large scale and expected – planning and coordination is part of the job cost

Coordination to ensure all elements are in place to help maximize potential profit can be accomplished long before excavation begins.

This includes choosing the best option for protective systems such as shielding and shoring equipment based on expected obstacles.

When time allows and resources are available – planning prior to start is critical for project success.

But what about the little excavations being done every day?

Do we need to apply the same effort to excavations of less magnitude?

Let's look at a few considerations….


SAFETY

This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches. 1926.650(a)

SAFETY & OSHA Subpart P

Subpart P has no minimum size or depth regarding application of standards

An **excavation** is defined as:

"Any man-mad cut, cavity, trench or depression in an earth surface, formed by earth removal." §1926.650

SAFETY & OSHA Subpart P

The ***Competent Person*** is defined as:

"One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." §1926.650

SAFETY & OSHA Subpart P

Hazards Identified

- Surface Encumbrances
- Underground Installations
- Access and Egress
- Exposure to Vehicular Traffic
- Exposure to Falling Loads
- Hazardous Atmospheres
- Water Accumulation
- Stability of Adjacent Structures
- Protection From Loose Rocks or Soil
- Fall Protection

These hazards may be present in <u>any size</u> excavation

SAFETY & OSHA Subpart P

A **Cave-In** is defined as:

"Separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person."
§1926.650

This hazard is *ALWAYS* present in any size excavation

SAFETY & OSHA Subpart P

5 FT RULE….

SAFETY & OSHA Subpart P

Safety and Health Regulations for Construction

Subpart: P Excavations

1926.652 - Requirements for Protective Systems

(a) Protection of employees in excavations.

(1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

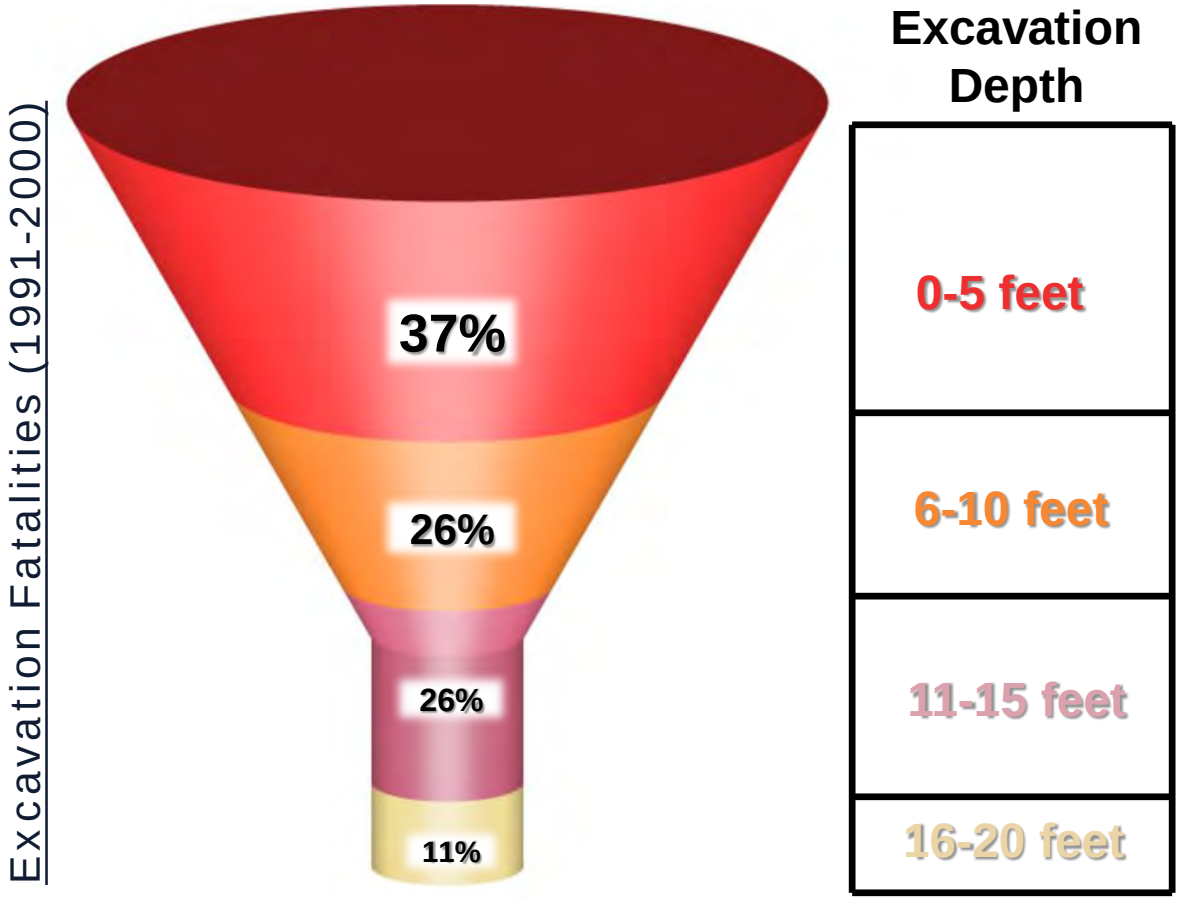
(2) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

5 FEET DEEP =
MUST HAVE

Less than 5 Feet =
If POTENTIAL for cave-in

SAFETY & OSHA Subpart P

- Hazard and depth may be opposite of what you assumed…

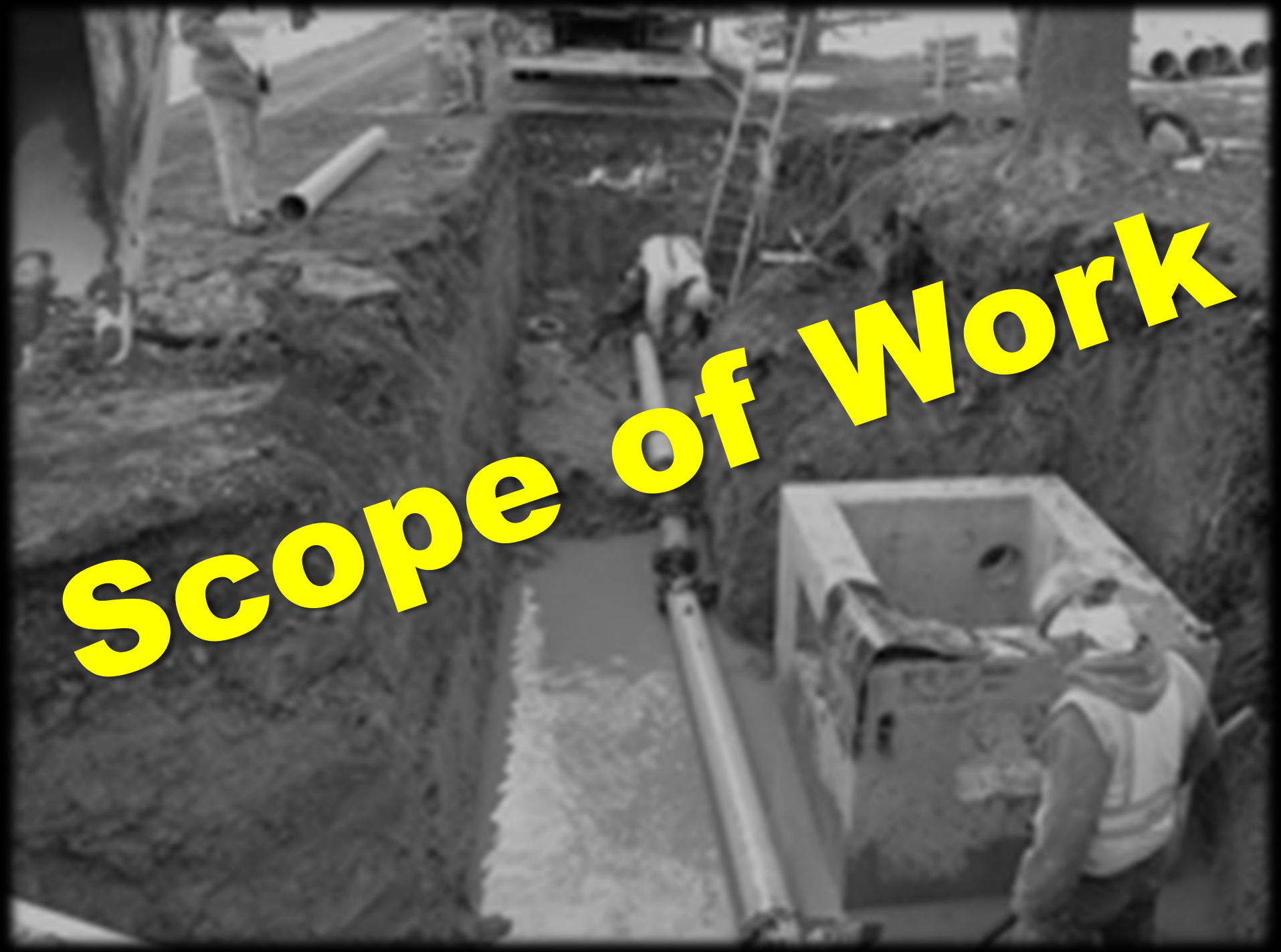


SAFETY & OSHA Subpart P

Which excavation seems more dangerous?

SAFETY & OSHA Subpart P

Depth & Size are not the only factors…


Scope of Work

Scope of Work

Does the work to be performed allow for prior planning?

Scheduled

Installation/Maintenance

Emergency

Repair

Scope of Work

Scheduled work

When work is a scheduled excavation – time is available to assess the expected obstacles and choose the best equipment needed.

Scope of Work

Scheduled work

An initial assessment can be made regarding which of the three *trench protective systems* will provide safest work conditions and best production.

Sloping

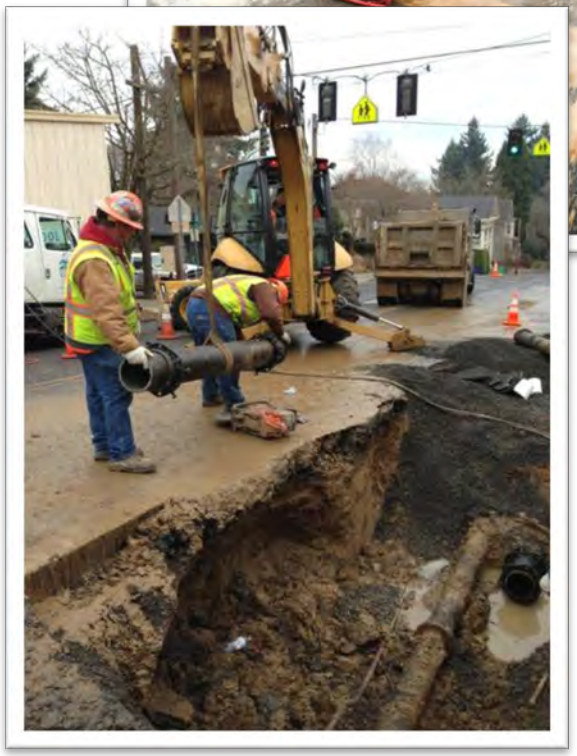
Shielding

Shoring

Scope of Work

Emergency Work

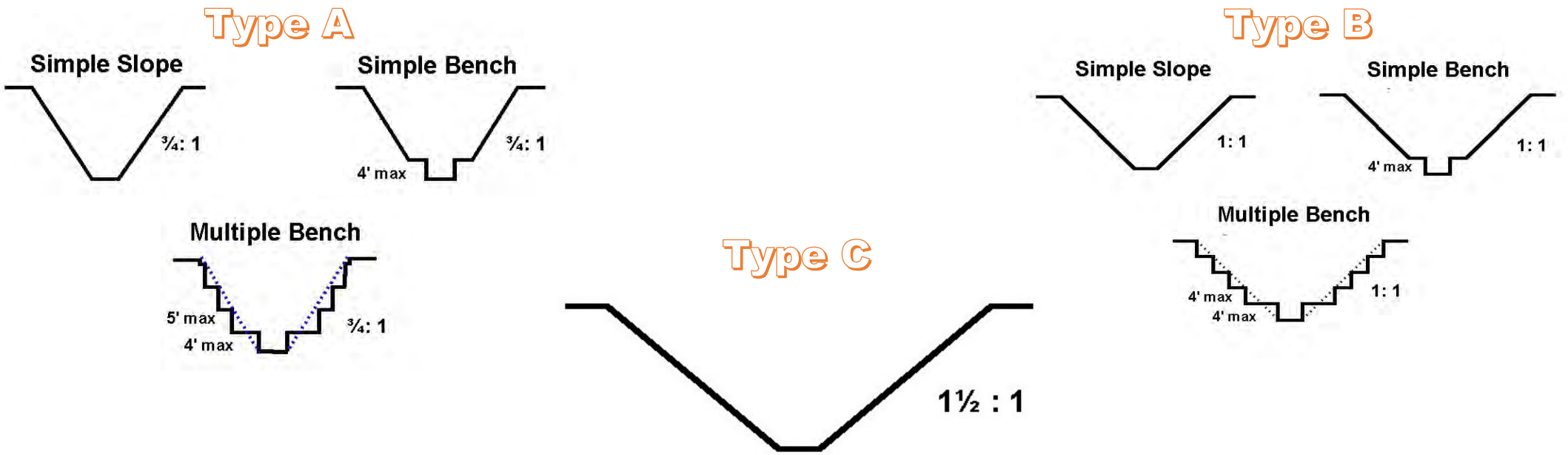
- Emergency or unscheduled repair work taxes the company and Competent Person due to the many unknown conditions and the limited planning time
- The use of sloping is common because of inherent flexibility and no requirement for equipment other than excavator



Scope of Work

Emergency Work

When using a slope as protection – always refer to *29 CFR 1926 Subpart P Appendix B – Sloping* to ensure slope is properly constructed.



Scope of Work

Emergency Work

Some employers choose to have an emergency repair trailer stocked and ready to go.


Available
Equipment
800-552-8800

Available Equipment

- A variety of equipment is available for projects completed with smaller excavators or in restricted work areas
- The demand for safe and productive excavation in these situations has led manufacturers to develop purpose built equipment to meet this demand
- Each manufacturer will build a unique design that fills a particular need in the industry
- The following slides show types of systems available and the problem they are designed to solve

Available Equipment

Trench Shield: A protective shield strong enough to protect employees from hazard of cave-in, but light enough to be handled by the backhoe or excavator

Steel Trench Shield

Aluminum Trench Shield

Available Equipment

Steel Shield Variations

Traditional 2-Sided with Spreaders

Available Equipment

Steel Shield Variations

Manhole Shield

Available Equipment

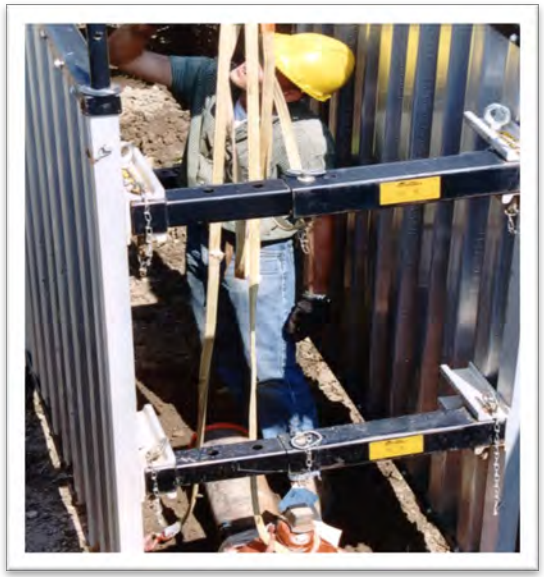
Steel Shield Variations

Inner Shield Liner – “Telescoped”

Available Equipment

Aluminum Shield Variations

Lightweight Corrugated Aluminum Shields



Available Equipment

Aluminum Shield Variations

Modular Aluminum Shields

Available Equipment

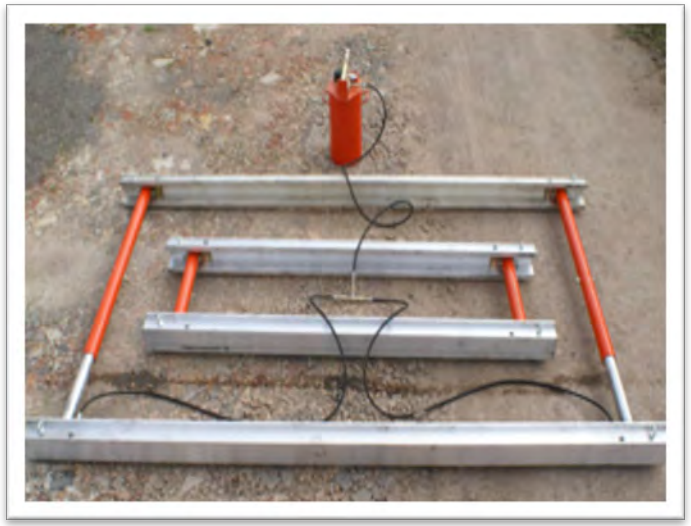
Vertical Hydraulic Shores

Uses hydraulic pressure arcs to prevent cave-in

Available Equipment

Hydraulic Walers

Greater inside clearance than vertical shores



Available Equipment

Hydraulic Manhole Braces

Available Equipment

Hydraulic Aluminum Shields

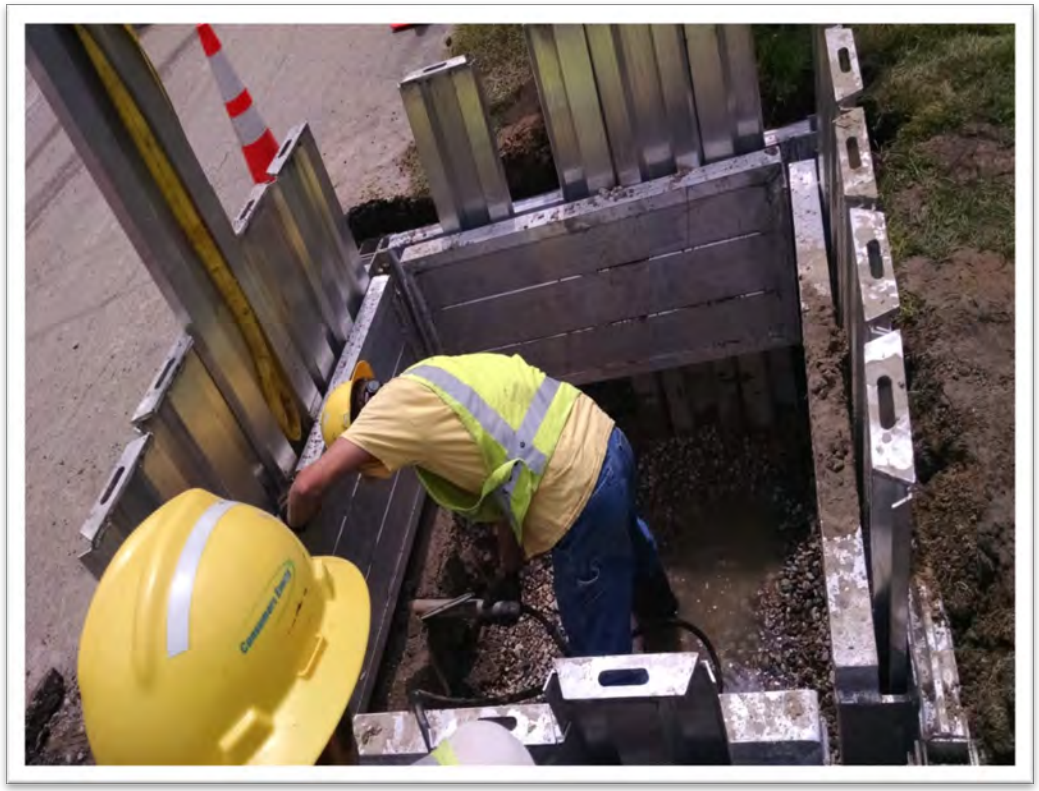
Hybrid Shoring and Shielding

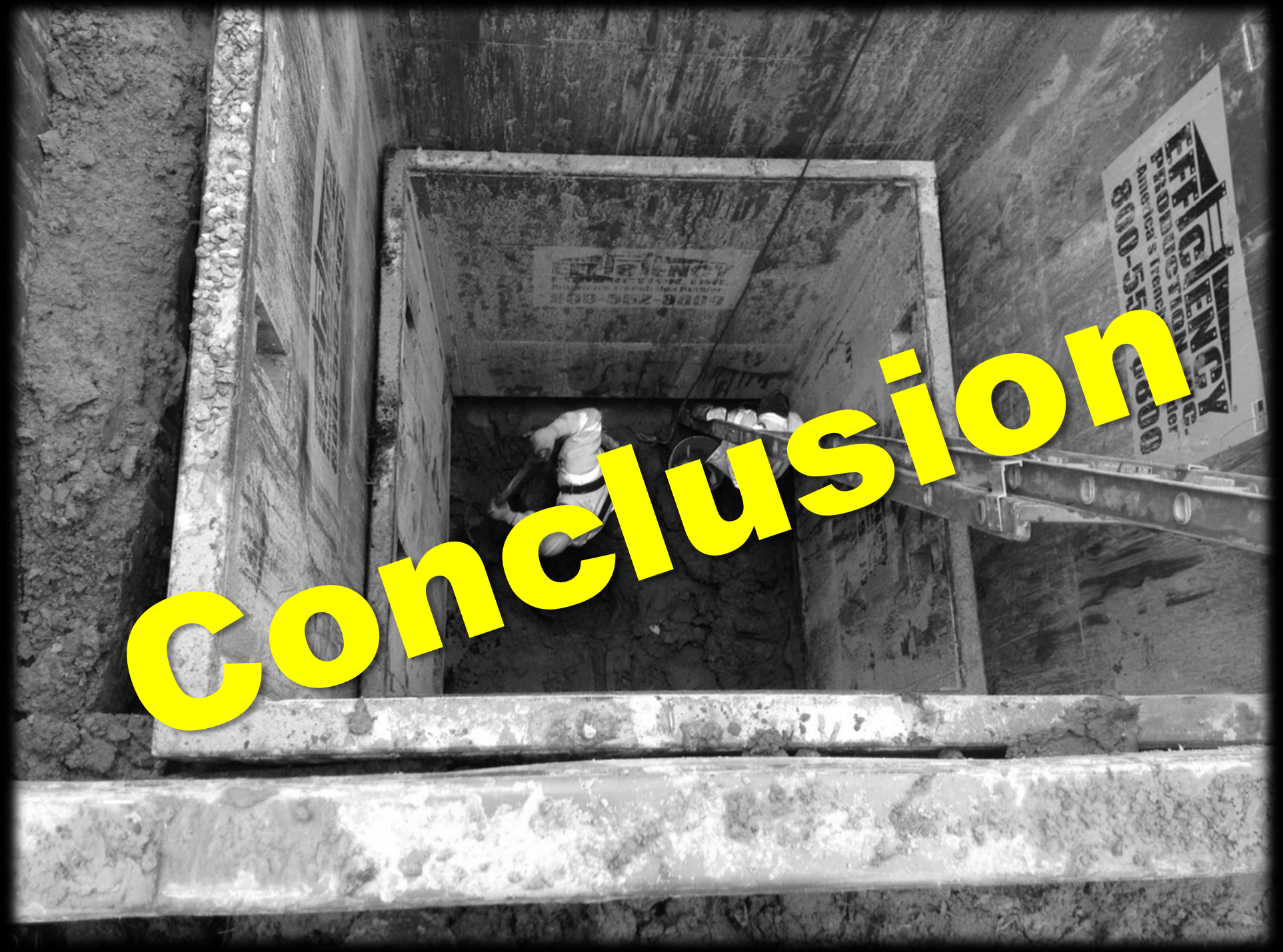
Available Equipment

Steel Sheeting Frames

Available Equipment

Aluminum Sheeting Frames




Conclusion

Conclusion

- A small excavation can create large problem.
- The safety and production concerns are always present
- If possible – prior planning can limit delays or hazards
- Don’t sacrifice safety during emergency operations
- Equipment may be readily available to solve safety and production issues
- Use same thought process for large and small excavations


QUESTIONS & COMMENTS
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