Tragedy in the Trenches Webinar – Q and A

This Q and A is designed to briefly answer questions brought up in the Webinar. Please understand, I strongly recommend a good course covering the OSHA regulations as a bare minimum. The OSHA 3015 Excavation Course is a very good 3-day course for regulation coverage.

OSHA regulations are the bare minimum standards…Strive for practices that go above and beyond the regulations – Best Practices!

Q and A

- **Soil Classifications and What is stable rock?**
  - **I recommend a detailed trenching/excavating course to properly classify soils! This forum is not designed to be train you on proper soil classification.**
  - Reference 29 CFR 1926 Subpart A – Soil Classification.
  - Under the OSHA regulations, soil classification must be made by the competent person by at least one visual and one manual test.
  - Soils are classified as stable rock, A, B or C.
    - Stable rock = natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
    - Type A = cohesive soils with an unconfined compressive strength of 1.5 tons per square foot or greater, However, no soil is Type A if: it is fissured; or subject to vibration; or is previously disturbed; or part of a sloped or layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or it is subject to other factors that would require it to be classified as a less stable material.
    - Type B: cohesive soil with an unconfined compressive strength greater than 0.5 tons per square foot (tsf) but less than 1.5 tsf.
    - Type C: cohesive soil with an unconfined compressive strength of 0.5 tsf or less…granular soils, submerged soil or soil where water is freely seeping.
    - Proper soil classifications must be made to determine proper protective systems.
      - For example, when you look at the Timber Shoring Charts in Appendix C, they reference a formula for the calculation of lateral stress of soils according to the soil types.
      - This is also referenced in the Tabulated Data for protective systems.
      - A question was in the chat regarding C 60 versus C 80 soils. OSHA references C 80 soil but does not reference C 60 soil. C 60 soil is commonly referenced

on the Tabulated Data by the protective system manufacturer. C 60 soil will normally hold a vertical cut until the protective system can be installed.
- This is not the forum for detailed soil classification – please attend a good course or reach out to a "competent person" for further explanation.

- **Questions regarding jurisdictional requirements**
  - As discussed in the webinar…and on the slides, be advised there are the OSHA requirements enforced by Federal OSHA and many State plans. However, many States, Cities, and Towns have their own regulations and laws to be followed. The Authority Having Jurisdiction (AHJ) must be contacted for any special regulations, laws, standards, permitting, etc.
- **Is there a significant increase or decrease in the amount of trench work in the U.S.?**
  - This is a little hard to quantify…according to the Bureau of Labor Statistics, construction has remained consistently approximately 4% of the workforce in the U.S. for decades. You can search the BLS website for many different aspects of construction work. Another resource would be "The Chart Book" from the Center to Protect Workers' Rights.
- **Do company owned trench boxes need to be certified by an outside source and how often?**
  - The trench boxes/shields/shores/protective systems must have approvals and tabulated data designed by a Registered Professional Engineer. This tabulated data needs to be onsite as the equipment is being installed, used, and removed. The competent person is responsible for the inspection of this equipment. If the competent person is unsure if the defects/damage of the equipment requires it to be removed, the competent person must not use it and reach out to the manufacturer for verification of its continued use.
- **What is surcharge load?**
  - Surcharge load is a weight or load placed on a surface which exerts pressure on the underlying soil and structures (e.g. barricades, vehicles, heavy equipment, cranes, concrete trucks, etc.)
  - I recommend an RPE/soils engineer/qualified person properly calculate surcharge loading and lateral stress
  - Soil mechanics must be understood to address vertical stress and lateral stress
- **Trenches that are 10' in depth. Should heavy equipment be stored at a 1:1 ratio or 1 ½ :1 ratio? How far has the excavator digging the trench have to be from edge of trench**
  - Surcharge loading, as discussed in the question above, must be addressed. The distance for equipment to be placed can depend upon the weight of the equipment, condition of the soil, water content, depth of the excavation and more. Contractors will typically use 1 ½ :1 as a minimum best practice.
- **What responsibilities does Miss. Utility have for incorrectly marked lines?**
  - One-call centers and utilities will provide mark-outs under Federal law – even outside of OSHA requirements. Even digging in your yard requires mark-outs. The contractor/individual is still responsible to "determine the exact location of the utility line." You will need to "bare the line" by hand-digging. There are tolerance zones for various utilities, so the person digging must be aware of the "811" system in your area. https://call811.com/
- **A commenter had a classmate in 5th grade who lost their life to a sand fort collapse. How do we educate the general public on excavation safety if we are still having problems in construction?**

    - Many beach areas/towns/cities are beginning to educate lifeguard personnel on the dangers of sand hole collapse…and the proper response…but we have a long way to go with this.
- **"Shovel touches the ground" equals an excavation.**
    - 29 CFR Subpart P - **Scope and application**. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.
    - Excavation is defined as: any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
    - So as soon as you put the shovel in the ground and removal soil you are excavating and Subpart P applies. Even if you are "gardening" be careful of underground utilities…you may need a protective system at a depth less than 5 feet. All conditions, hazards must be identified…and controlled when you are digging.
- **Letters of interpretation by OSHA**
    - Letters of interpretation are most easily found on the OSHA website. If you look in any of the OSHA regulations, you may see t he regulation number that is in a blue font with an underline (e.g. 1926.651(b)) If you click on that, Letters of Interpretation or other accessory information will be listed.
- **Fall protection and excavations. What slope determines fall protection required when standing outside the excavation? Vertical obviously, but what about a 45 degree, 60, etc.?**
    - This is a problem in the way the OSHA standards are written.
    - Subpart P Excavations – only discusses a crossover walkway to have guardrails if the walkway is 6 feet or more above the lower level.
    - Subpart M Fall Protection – requires guardrails, fences, or barricades for excavations 6 feet or more in depth when the excavations are not readily seen because of plant growth or other visual barrier.
    - If the excavation is a well, pit, shaft, and similar excavation 6 feet or more in depth – Subpart M Fall Protection also requires guardrails, fences, barricades, or covers.
    - If you are using sloping or benching as a protective system…the sloping angle would be adequate protection for the workers if it meets the sloping angle for that type of soil. For example: Type B soil requires at 45° angle… Type C soil requires a 34° angle.
    - With all this being said…fall protection would be advisable in many situations. Best practice systems could include clamp-on guardrail systems for trench boxes/shields; portable weighted-base guardrail systems are good options for workers at the top of a deep trench.
- **Is a trench a confined space? Permit-required confined space?**
    - Purely on the regulatory front, trenches are not considered confined spaces. The confined space standard 29 CFR Subpart AA "excludes" excavations.
    - Subpart P Excavations addresses hazardous atmospheres in 29 CFR 1926.651(g)
    - An excavation may have a confined space within it – when manholes, vaults, or other structures are installed.
    - Consider best practice – do what you need to do to protect your people!
- **Question regarding a CSHO (Compliance Safety and Health Officer) practice during an inspection. The CSHO asked about an open excavation which had already been backfilled. The CSHO took pictures of the area – even though it was backfilled.**
    - There could be some reasons for this…possibly, something was brought up previously by an employee, or a drive-by on a previous date, something on a media outlet.

    - It is okay to ask questions during an inspection…hopefully, the CSHO will give you an answer.
- **Is OSHA 30hr considered a competent person?**
    - All by itself it would not provide enough training for a competent person level. The 30-hour course typically provides 2 hours per topic in the course.
- **Is the competent person required to be on site for the entire excavation/trenching process?**
    - The regulations do not specifically state that…but, I STRONGLY suggest it.
- **What defines a competent person? Competent Person certification? How do you evaluate a person for competent person? I have had many people try to say they know what a competent person is, but what I have found it is not true. PLEASE GIVE YOUR FEELING WHAT A TRUE COMPETENT PERSON IS, PLEASE!!!!!!**
    - Definition – 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.
    - This can be achieved through knowledge, training, experience, etc. It does not have to be a formalized "competent person" course. That individual should know "everything" about "everything" with that excavation, protective system, weather problems, traffic issues, surrounding hazards, etc. **AND**
    - The competent person **MUST** have the authority from their employer to promptly correct the hazards and/or remove employees from the situation if unable to correct the hazards.
    - FYI, there are many references in the OSHA construction regulations for a competent person: excavations, scaffolds, confined spaces, cranes, steel erection, ladders, rigging, inspections, **and** more. It is not a one size fits everything – you may have different people serving as a competent person for different subjects. It is not an easy undertaking.
    - If you like to read legal stuff, there are a lot of cases involving "competent person" on the Occupational Safety and Health Review Commission's website. https://www.oshrc.gov/search/?keyword=competent%20person
- **Employer has no competent persons. What are options/resources to acquire this certification?**
    - The employer needs to develop a baseline safety and health program which includes an employee training program: the program should outline the means and methods of training for the following personnel: management, supervisors, qualified persons, competent persons, and employees.
    - Your insurance company may be able to help, safety and health consultants, OSHA consultation programs, and training courses on developing a safety and health program.
- **Do the checks by a competent person need to be in writing?**
    - The regulations do not state they have to be written, however, most people will say if you didn't document it, it didn't happen. You want to be able to show you are implementing good, safe practices as well as corrective actions. These can be daily logs, checklists, etc.
- **What's a good way to keep up with legislation after a few years being a competent person?**
    - OSHA website, trade journals, professional societies, ongoing training, webinars, etc.
- **For standard language that is left up for interpretation, have you seen companies utilize the Chevron Case being overthrown in their favor?**

    - Very recently, July 2024, the Supreme Court overturned the Chevron doctrine. Over the years, people argued that *Chevron* allowed regulators to expand their own authority by adopting broad interpretations of ambiguous regulatory scope. A good statement I came across reads: "the Supreme Court entirely overrules the Chevron doctrine holding that judges, not federal agencies are responsible for resolving statutory ambiguities."
      I have not, personally, seen any cases overturned at this point.
- **As the controlling entity at an industrial construction site, is the onus for providing a qualified person on the contractor performing the work, or is it the owner/controller that is responsible for ensuring the inspection has been performed?**
    - Each employer onsite is responsible for the safety of their workers – when I worked for an electrical contractor, everyone of my electrical supervisors and most workers were trained as a competent person for excavations. They had the right at any time to stop work if they noticed unsafe conditions.
    - When I worked for a construction manager or general contractor, every worker was trained and designated as a competent person so they can also ensure all trades are doing what they are supposed to be doing.
    - A "controlling employer" onsite is ultimately responsible for safety onsite – by practice – or even contractually…under OSHA's multi-employer worksite policy…Also liability is a huge consideration for all contractors/employers/owners.
    - The regulations require a competent person to inspect the excavation each day and before entry…and as hazards may change throughout the day. It should be discussed in a pre-job conference – all the responsibilities and accountability.
- **Do you find that states that have higher penalties and a stronger involvement in the excavation process (issuing permits) also have a lower utility strike rate?**
    - That would be difficult to quantify…some States have a different penalty structure than Federal OSHA (e.g. California). They must at least meet the minimum penalty structure of Federal OSHA, but can exceed it.
- **What is the main hazard of surface encumbrances?**
    - The main hazards are the dangers of these objects collapsing, dislodging and falling into the excavation. Light posts, sidewalks, fire hydrants, etc. must be removed or supported.
- **In reference to underground utilities, would 1926.651 also deal with supporting the utilities while the trench is opened?**
    - Yes
- **Is standing water from rain an issue?**
    - Yes, standing water must be removed from the excavation prior to workers entering the excavation. Water removal equipment must be monitored by the competent person.
- **How frequently do you address inquiries related to EM 385-1-1 standards for excavation on military projects?**
    - To quote applicability of EM385-1-1 : "It applies to Headquarters, US Army Corps of Engineers (HQUSACE) elements, major subordinate commands, districts, centers, laboratories, and field operating activities (FOA), as well as USACE contracts and those administered on behalf of USACE. Applicability extends to occupational exposure for missions under the command of the Chief of Engineers, whether accomplished by military, civilian, or contractor personnel."

- I would recommend you look at bid specifications – especially on military installations.

- **Does anyone use "China" made shackles?**
  - You must look for approval markings to be compliant with OSHA/ASME standards. Rigging components must also be compatible within the entire rigging setup.
  - The markings must be forged, cast, or die-stamped on the body and pin of the shackle. The markings include: manufacturer's identification; working load limit (WLL); quality or grade; size; and identification marking.
- **How would you move trench boxes if chains are subject in breaking? High performance straps and hooks?**
  - Rigging – all rigging equipment must be inspected by a competent person each day before use. The competent person must be knowledgeable of all rigging equipment utilized. Slings may be ally steel chain, wire rope, metal mesh, or rope….and approved.
  - Trench boxes/shields are designed with rigging points where attachments are made.
  - This will minimize damage done to the protective system.
- **What if the tabulated data does not have a Stamp? could you use it or not?**
  - You must have the approving RPE identification on the tabulated data.
- **If spoil piles are set back 2' do spoils still increase depth of trench?**
  - Possibly…depending on the depth of the trench and the height of the spoil pile. The depth of the trench is measured from the "toe" of the trench to "infinity and beyond." So, if the spoil pile is high, it can increase the depth and infringe upon the sloping angle.
- **Power lines. If work is being performed at a distance of 5 or more feet from a power line is that automatically considered compliant?**
  - No.
  - First, you must identify the voltage of the power lines. Clearance distances are based on the voltage of the power lines.
    - **Cranes**: **Up to 50 kV**: 10 feet minimum clearance…**Over 50kV up to 200 kV**: 15 feet minimum clearance…**Over 200kV to 350 kV**; 20 feet minimum clearance…**Over 350 kV to 500 kV:** 25 feet minimum clearance.
    - **Heavy equipment**: **50 kV or below**…10 feet minimum clearance…**Over 50 kV**…10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet.
- **There is a letter of interpretation where the use of protective systems deeper than 5' is infeasible where swimming pool excavation walls are used as the form for gunite or shotcrete pool walls. Given this letter of interpretation, how can employers keep workers safe in this scenario and also avoid a citation from OSHA during the excavation and shotcrete of swimming pool walls?**
  - This is a difficult situation for swimming pools, as you stated, where the walls of the excavation are used for the gunite or shotcrete to form the pool walls. I would recommend what OSHA states in that Letter of Interpretation: maintain an effective safety program; applicable safety training and knowledge of the plan and procedures; spoil piles, vehicles, equipment and materials are placed a safe distance away from the excavation (equal to or greater than the depth of the excavation); competent person must remain onsite at all times while workers are in the excavation; and any portions of the excavation which appear to slough or show signs of a cave-in must be removed or stabilized.

- **Trenches along roadways and exclusion zones for cars/people. What do those zones entail? Do you need a hard barrier to prevent vehicles from accidentally entering the space?**
    - Traffic control zones and devices are referenced in29 CFR Subpart G – 1926.200(g)(2) This regulation incorporates the MUTCD (Manual for Uniform Traffic Control Devices)
    - Hi-visibility garments are also referenced in MUTCD – and ANSI.
    - Note: you should also consult local jurisdictions (Cities, Towns, etc.) for additional rules.
- **Do accidents increase when groups are union or non-union?**
    - Statistics can be tricky as to the scope of specific activities, age groups, etc. However, the Bureau of Labor Statistics show that union employers typically have less injuries and fatalities.
- **What is the recommended safe way to install a timber system?**
    - This can vary with respect to the specific system. However, protective systems are installed top down and removed bottom out. I have a contractor that uses timber shoring and they will dig…install the top level of timber shores from grade level – then they can enter the trench and progress down. There are some good videos on YouTube showing this process.
    - I would also research using hydraulic shores as a possible alternative to timber. Timber is expensive to use the proper stress of lumber – and difficult to handle proper sizes of lumber.
- **As stated you can't cut vertical walls in type C soils. Is there an exception or letter of interpretation for placing pipe bedding, i.e. 18" trench in the middle of the excavation for stone or sand?**
    - I am not fully understanding your question…are your referencing an 18” deep trench? If so, if soil conditions are good you can cut that vertically. The competent person should identify any potential problems – if present.
- **Regarding access egress, we are looking at needing 20 ft catwalks to walk out to the ladder at the top of the trench shield. Any ideas of a lightweight solution on the market?**
    - Many trench box/shield manufacturers also design walkways, bridges, and access ramps. I am not sure how “lightweight” a 20-foot ramp will be. You can also search portable walkways, catwalks, bridges.
- **Seems like your RPE design with soil nails would require employee exposure to unshored soil to install. Can you explain?**
    - You excavate in stages and repeat the process from top down. Excavate, drill, insert steel bars, grout, install bearing plates, and repeat.
    - It is a little more challenging with an open face existing walls for stabilization.
- **I have a hypothetical question and want to make sure I am not confused: If I have an excavation that is 2-3 feet deep, not a trench excavation, just an excavation. Do the access and egress for excavation apply under 1926.1051(a): "A stairway or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches (48 cm) or more, and no ramp, runway, sloped embankment, or personnel hoist is provided"...Because 1926.651(c)(2) states: "Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees."**
    - 1926.1051(a) would NOT apply. That is Subpart X and specifically applies to stairs and ladders used in a different application.

    - The access requirement as you stated in 1926.651(c)(2) applies only to trenches and are 4' or more in depth.
- **How many fatalities are complacency, what do we do with that?**
    - Typically, complacency is not defined as a cause of an incident. I would be addressing the possible issues of proper training, proper supervision, lack of a disciplinary policy or procedure. Is there a means of ensuring your employees are following the policies, procedures, programs, and training protocols in place. The employer is responsible for that.
- **Is there any specific regulation about how often should the Multi-gas detectors be recalibrated?**
    - There is no specific OSHA regulations, however, you must follow the manufacturer's guidelines for the care and maintenance of the equipment. Some manufacturers require monthly calibration and some require calibration before each use.
- **Many of these charts are Deaths or Injuries per year. But I didn't notice any that coincided with the amount of construction of those years. Do you have a chart for percent of deaths or Injuries per total labor hours.**
    - You can go into the Bureau of Labor Statistics website and do all kinds of searches for statistics – fatal, non-fatal, by trade, by age of worker, etc.

Thank you for your time, attention, and great questions.
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