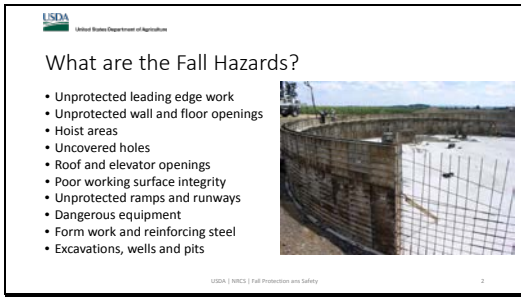
Slide 1

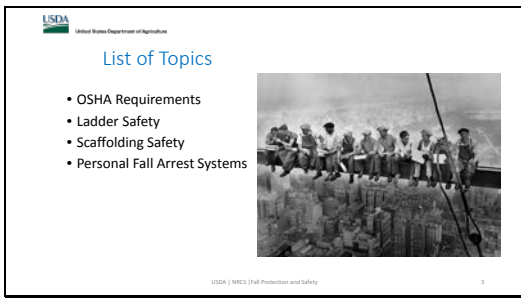

FALLS ARE THE LEADING CAUSE OF PRIVATE SECTOR WORKER DEATHS IN CONSTRUCTION (excluding highway collisions). In 2015, there were 350 fatal falls to a lower level out of 937 construction fatalities. The statistics are almost the same every year with the exception of the fact that they are increasing. Contractors can prevent these deaths by planning on how to accomplish their above ground work safely, providing the right fall protection equipment and training all workers to use the equipment safely.

Slide 2



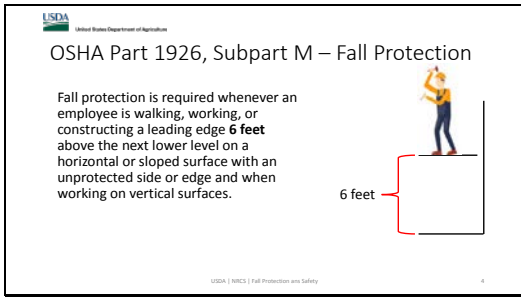

This list includes some common fall hazards. Fall safety begins with being able to recognize fall hazards that come with working above ground or on an elevated surface. Workers should be trained to recognize fall hazards and understand how to properly implement fall protection safety measures. NRCS policy says that whenever NRCS participates in any activity, reasonable standards of safety and health are to be made clear to all participants including the owner, the contractor, and NRCS personnel and that these standards are to prevail. (GM-110-402.1) Being able to recognize fall hazards and knowing how to guard against them, NRCS employees can verify that standards for reasonable conditions of fall safety prevail.

Slide 3



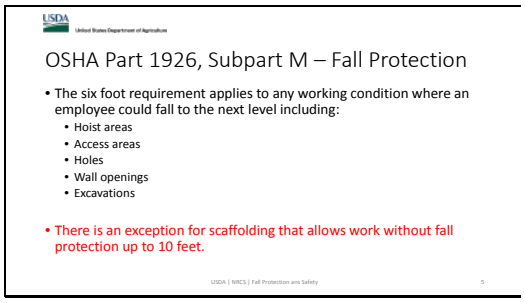

As with any safety hazard, OSHA requires the contractor to implement reasonable standards of safety. We'll review what OSHA says about when fall protection measures are required. Then we'll learn about the reasonable standards of fall safety that apply to ladders, scaffolding, and personal fall arrest systems.

Slide 4



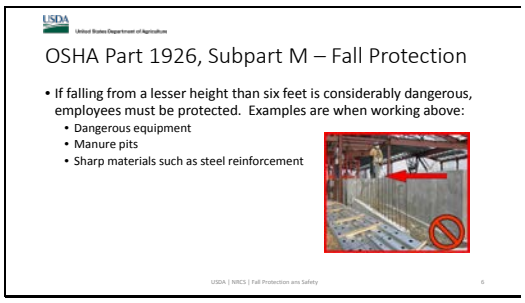

OSHA requires fall protection anytime an employee is working on any surface and is in danger of falling 6 feet or more. Horizontal surfaces include but are not limited to roofs, ramps, runways, and walkways. Examples of these would be roofs of barns, tops of inlet towers, and the edge of excavations. Vertical surfaces include, but are not limited to, walls, concrete forms, reinforcing steel, concrete surfaces, precast concrete erection, and related work.

Slide 5



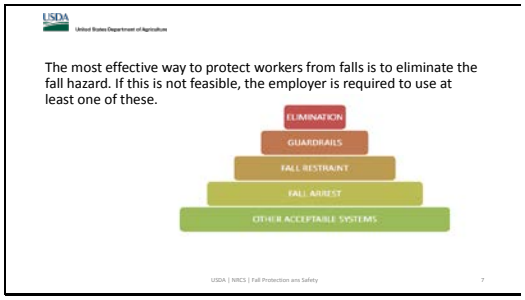

Fall protection is required at hoist areas, access areas, and holes (including skylights). Employees must be protected from tripping or stepping into or through holes. Employees must be protected when working near openings in walls. Fall protection is required where excavations are not readily seen because of plant growth or other visual barrier. It is also required at the edge of a well, pit, shaft, and similar excavation that is 6 feet or more in depth.

Slide 6




OSHA doesn't mention manure pits, but you get the idea. It does mention dangerous equipment. OSHA says "Employees must be protected when working above dangerous equipment regardless of the height at which they are working above the equipment." And exposed rebar is an obvious hazard. Protective caps are needed but even with protective caps, steel reinforcement can cause injury.

Slide 7




When fall hazards can't be eliminated guardrails may be used to limit fall potential. Fall restraint keeps workers from reaching a fall hazard. Fall arrest occurs after the fall has occurred to keep the person from hitting the ground.

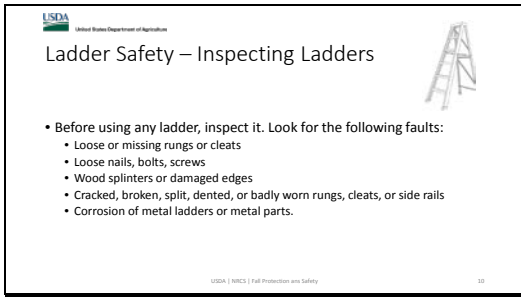
Slide 8


The need for fall safety occurs whenever a person begins to access an elevated surface or to work above ground. The most common tool for gaining elevation is a ladder. So we will spend a little time discussing ladder safety before we go on to discuss scaffolding, fall restraint, and fall arrests.

Slide 9

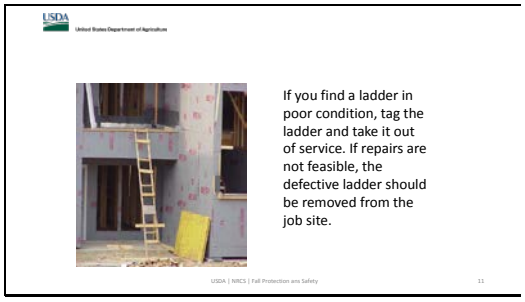

The first order of ladder safety is to choose the correct type and size of ladder for the job. The types and sizes of the ladders in the two photos on the left leave a lot to be desired. Remember that size refers to the load rating as well as the height of the ladder. In the photo on the right, gas was free, pay phones were still in use, and Moe must have left the dangerous work up to Harry and Larry. Maybe this photo was taken prior to OSHA's existence, be we don't need OSHA standards to know that this is unsafe.

Slide 10



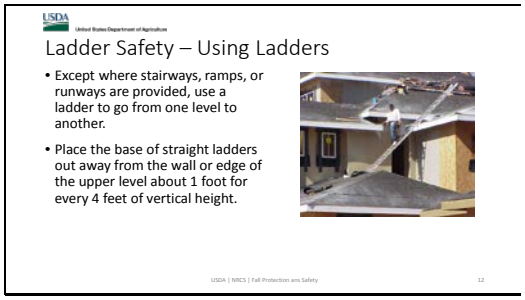

Once we've chosen the right type and size of ladder for the job, we need to inspect the ladder to verify that it is good safe working condition.

Slide 11



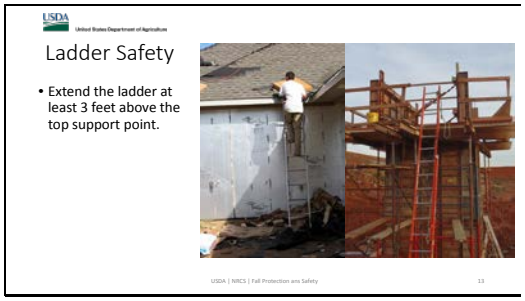

The contractor is responsible for the ladder, but we may have to bring safety issues to the contractor's attention. I suspect that if we have to bring to the contractor's attention the poor ladder condition shown in this photo, there will be several other issues that will need to be addressed.

Slide 12



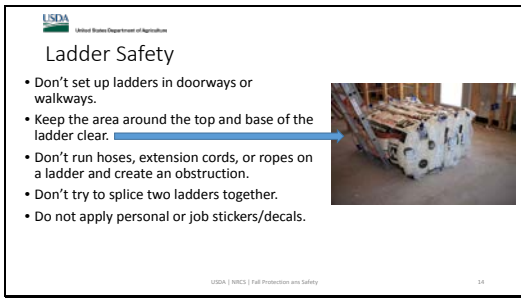

In this photo, they are using a ladder to go from one level to another as recommended, but the ladder is poorly placed; it is leaning at about a 1 to 1 angle rather than the recommended 1 to 4 angle.

Slide 13




The ladder in the right photo looks to extend about 3 feet above the top support, as recommended, so that you can hold on to the side rails as you step off of the ladder onto the deck. The ladder on the left does not meet the 3 feet above the top support point criteria.

Slide 14




Some ladder safety rules or recommendations seem like common sense. But workers get in a hurry or don't realize a hazard such as the one in the photo unless they are the ones actually using the ladder. Stickers and decals aren't going to hurt the ladder or impair its function, but they cover up warning labels that are intended to warn users of potential hazards related to the use of the ladder.

Slide 15


These ladders are not sitting on a stable base. It looks like the ladder in the left photo is a step ladder that is missing a leg. So, not only is it not properly supported, it is the wrong ladder for the job.

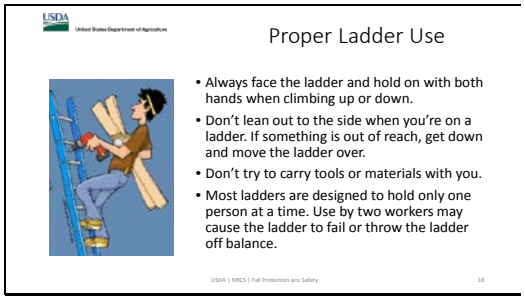
Slide 16


The bottom support is especially important if the feet of the ladder are resting on a slick surface. As previously mentioned, the ladder should be angled on about a 1 horizontal to 4 vertical angle, but it should be plumb or vertical from side to side so that there is equal weight on each foot. It is best to secure it at the top to keep it that way.

Slide 17

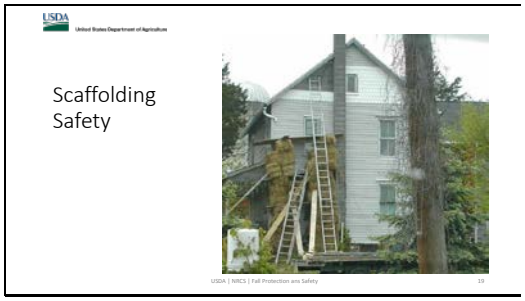

The ladder shown in the photo looks fairly stable, but ladders are not designed to be used as a platform, runway, or scaffold.

Slide 18




After we've chosen the correct type and size of ladder, inspected it to make sure its in good and safe condition, and set it up and secured it, we must know how to safely use it. This list may not be comprehensive but it is a good start. We are now ready to move on to scaffolding. Joe is going to take it from here.

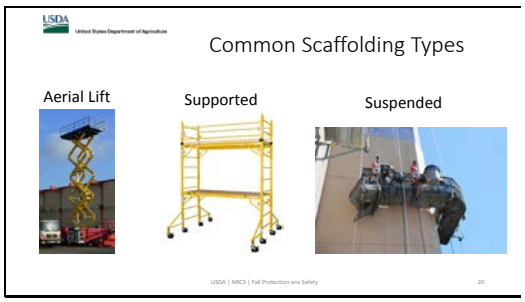
Slide 19




We do see quite a bit of scaffolding on our worksites. A simple definition of scaffolding is a fully planked or decked work platform that is at least 18 inches wide. Anything less than this would not meet the OSHA definition of scaffolding. Note that that doesn't say anything about guardrails.

Scaffolding below a certain height does not require guardrails. And even above that height, other fall protection measures could be used.

Slide 20




As far as OSHA, these are all different types of scaffolding. Each with their own requirements.

We're not going to say much about aerial lifts or suspended scaffolding except to say that they are rated by weight or occupancy. A scissor lift may say that it has an occupancy of 2 persons….so 4 shouldn't be on it at once.

We have seen suspended scaffolding on projects before.

Slide 21

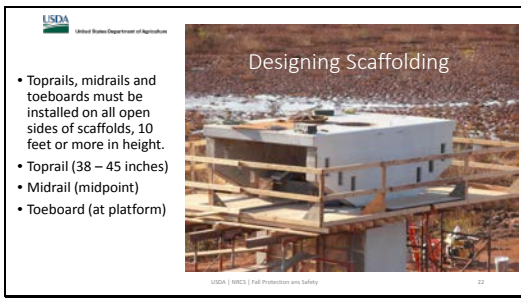

Not recommending bamboo scaffolding at all. Imagine what the OSHA requirements would be for scaffolding made of natural materials but it is interesting to know that this is still used to day in China, India and other countries.

Poles are imported from the Chinese mainland. The joints were tied with soaked bamboo strips until the 1970's when they went to nylon strips.

They are light weight, flexible, strong and adaptable. They are 1/10$^{th}$ the cost of steel scaffolding.

This is how they built the Great Wall of China.

Slide 22




We're going to look at design of scaffolding first.

To avoid the use of makeshift platforms, each job should be carefully planned to assure that scaffolding is used when required and that scaffolding conforms to the applicable regulations. We are usually not in charge of this but it's something to discuss at any prework conference. This is a tall tower. How are you going to work on it? What kind of scaffolding are you going to use?

- Toprails, midrails and toeboards must be installed on all open sides of scaffolds, 10 feet or more in height. Currently OSHA requirements say that scaffolding below 10 feet is not required to have toprails, midrails or toeboards.

Here let's point out that OSHA only allows you to work on scaffolding over 6 feet without guardrails, midrails and toeboards. That makes the definition of scaffolding that we discussed earlier important. A work platform that does not meet the definition of scaffolding is still at the 6 ft limit.

Earlier we said that fall protection was required at 6 feet. Why is it 10 ft. for scaffolding and 6 ft. for everything else? It seems that 1 bay of scaffolding is often over 6 ft. tall and it was felt that the 6 ft. limit would place an undue hardship on masons and other occupations that commonly use scaffolding.

That's not the case for us. We don't feel like it would be an undue hardship

for our contractors so there is a push to add a requirement in our NRCS Supplement to OSHA requiring the 6 ft. limit for our work. Falling from a height of 6 feet to 10 feet can cause serious injury. If you have an opinion on this we would appreciate hearing from you.

- The slide also shows the location of the toprail (38-45 inches), midrail and toeboard.

What is the purpose of the toeboard? It's mainly to protect those working below you, to keep something being knocked off the scaffold. It is also mentioned in some of the literature that it may keep someone from stepping through or sliding through it.

Slide 23

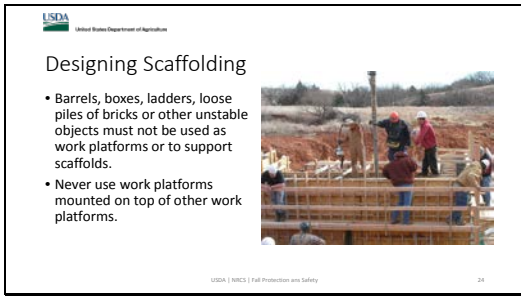

Here are other requirements for scaffolding:

* Scaffolds must be fully planked and constructed to support the load they are designed to carry. (own weight + 4 times maximum anticipated weight)

* Ties, guys, and braces must be installed according to the manufacturer's recommendations. If the specifications are unknown then the standards at 29 CFR 1926.451(c)(1) must be followed.

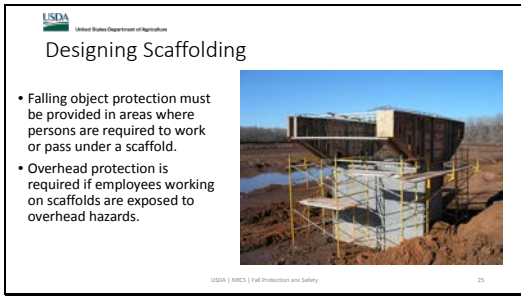
This slide shows a scaffolding system that does not meet the OSHA requirements, especially if it were over 10 ft high. It also shows why we may want to reduce that limit to 6 feet.

Slide 24



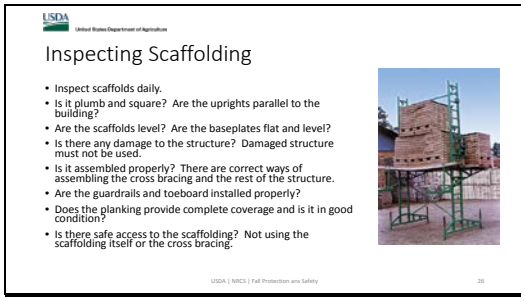

- Barrels, boxes, kegs, horses, ladders, loose tile blocks, loose piles of bricks, A-frames or other unstable objects are not to be used as work platforms or to support scaffolds.
- Never use work platforms mounted on top of other work platforms.

Slide 25




- Falling object protection must be provided in areas where persons are required to work or pass under a scaffold.
- Overhead protection is required if employees working on scaffolds are exposed to overhead hazards.

Slide 26

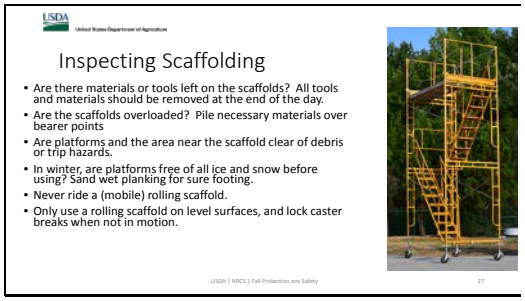



The contractor should inspect scaffolds daily before they trust your life to them. Here are some things to look for:

- Inspect scaffolds daily.
- Is it plumb and square? Are the uprights parallel to the building?
- Are the scaffolds level? Are the baseplates flat and level?

- Is there any damage to the structure? Damaged structure must not be used.
- Is it assembled properly? There are correct ways of assembling the cross bracing and the rest of the structure.
- Are the guardrails and toeboard installed properly and at the correct height?
- Does the planking provide complete coverage and is it in good condition?
- Is there safe access to the scaffolding where they are not using the scaffolding itself or the cross bracing?

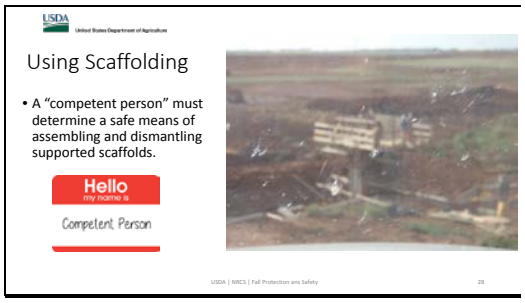
Slide 27




- Are there materials or tools left on the scaffolds? All tools and materials should be removed at the end of the day.
- Are the scaffolds overloaded? Pile necessary materials over bearer points
- Are platforms and the area near the scaffold clear of debris or trip hazards.

- In winter, are platforms free of all ice and snow before using? Sand wet planking for sure footing.
- Never ride a (mobile) rolling scaffold.
- Only use a rolling scaffold on level surfaces, and lock caster breaks when not in motion.

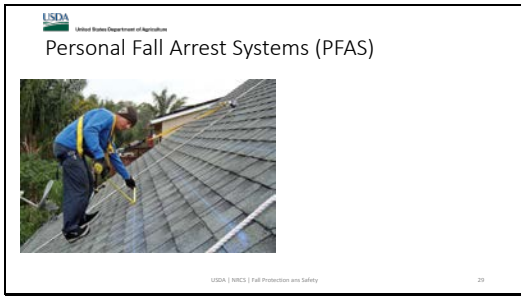
Slide 28




I've had questions from contractors before about how can they install scaffolding in an elevated area without scaffolding. This is OSHA's answer to this.

- OSHA uses the term "competent person" quite a bit in safety standards. It usually means someone who has the training and/or experience necessary to make observations and decisions about the work to be done. There are companies that give "competent person" training to individuals.
- This Competent Person must determine a safe means of assembling and dismantling supported scaffolds.

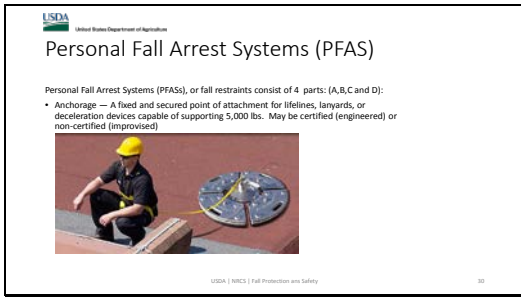
Slide 29




We don't see a lot of PFAS in NRCS work but you might find it with steep roof work and other unusual projects.

4.12:1 or steeper

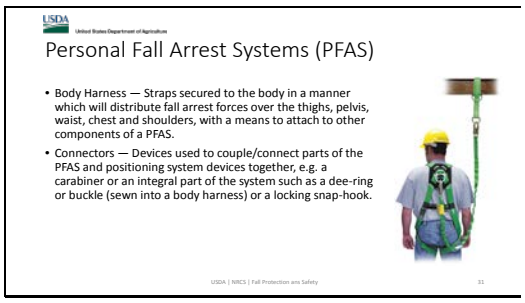
Slide 30




- Personal Fall Arrest Systems (PFASs), or fall restraints consist of 4 parts. People use the A, B, C and D as a reminder but some have two different D's:

- (1) Anchorage — A fixed and secured point of attachment for lifelines, lanyards, or deceleration devices capable of supporting 5,000 lbs. May be certified (engineered) or non-certified (improvised). Improvised anchorages include: structural members, but not standpipes, vents, other piping systems and electrical conduit.

Slide 31

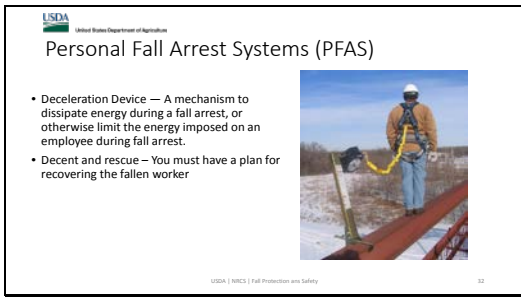



- (2) Body Harness — Straps secured to the body in a manner which will distribute fall arrest forces over the thighs, pelvis, waist, chest and shoulders, with a means to attach to other components of a PFAS.

This is not just a strap around your waist. These are highly specialized harnesses meant to save lives. They must be adjusted to fit properly.

- (3) Connectors — Devices used to couple/connect parts of the PFAS and positioning system devices together, e.g. a carabiner or an integral part of the system such as a dee-ring or buckle (sewn into a body harness) or a locking snap-hook.

Slide 32



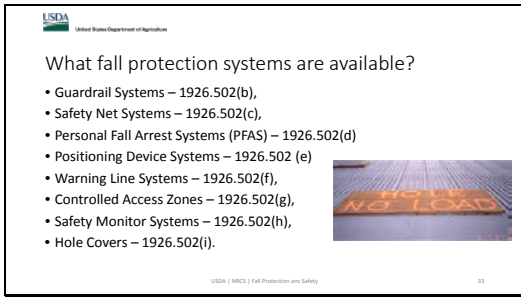

- (4) Deceleration Device — A mechanism to dissipate energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

These are designed to limit the force the body receives when coming to a stop. Without these, who knows which is worse, being stopped suddenly at the end of the rope or landing on the ground? Using a personal fall arrest system can't be done half way, it may do more harm than good.

- D could also be decent and rescue – if you plan on using a PFAS, you need to do it right and you need to

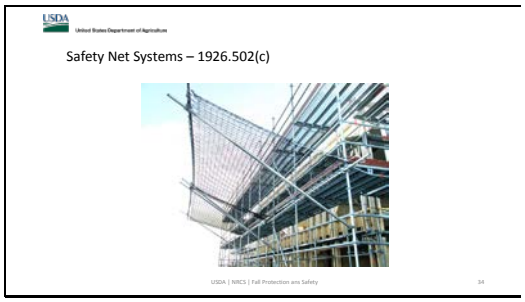
have a plan for rescuing the fallen worker. You don't need to be using PFAS if you don't also have a rescue plan.

Slide 33




These are the fall protection systems listed in OSHA. We've covered some and we'll now look at a couple more.

Slide 34



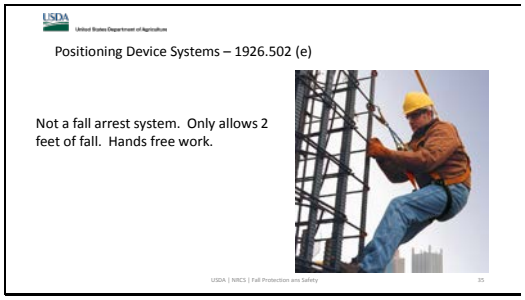

If safety nets are used, they must meet all OSHA requirements. Some of them are the following:
Installed as close as practicable under the highest surface on which employees are working, but in no case more than 30 feet below.

The potential fall area must be unobstructed.

Must be tested using a 400 bag of sand dropped from the highest surface.

They must be inspected weekly.

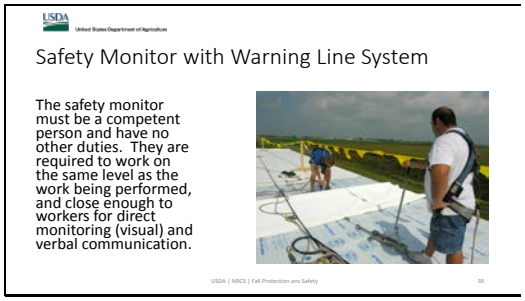
Slide 35




The positioning device system allows workers to hook their body belt or harness to a structure (the rebar in the picture is a good example), then lean back. It keeps them in place so they can do their work while using both hands.

This is not a true fall arrest system but has some of the same requirements.

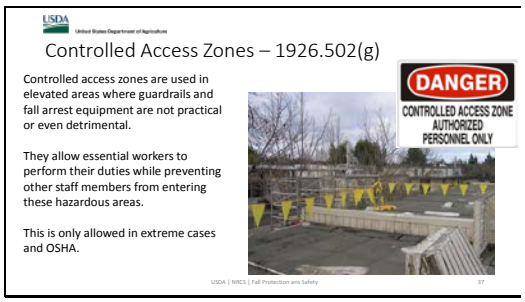
Slide 36




This is not the best photo because both of these workers are secured with a PFAS but it does show a warning line and someone monitoring the work of another. Customarily it would only be the safety monitor with the PFAS.

Workers can use a safety monitor system in conjunction with a warning line system with a low slope roof (4:12 vertical to horizontal, or less), under 50 feet or less in width. The safety monitor must be a competent person and have no other duties that could interfere with their responsibility. They are required to work on the same level as the work being performed, and close enough to workers for direct monitoring (visual) and for verbal communication.

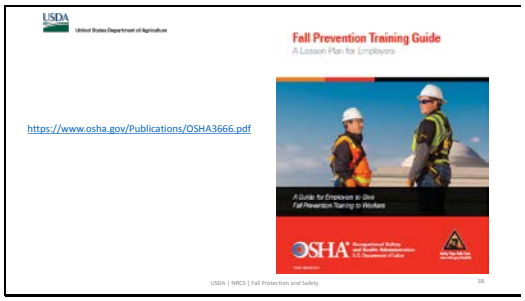
Slide 37




I bring this up just so that I can say we shouldn't be seeing this. Controlled access zones are an exception to all of the OSHA fall safety policy. It recognizes that there are some areas where conventional fall protection measures are not possible so it allows essential workers access but limits the access of others. Its use is extremely limited by OSHA. We are not likely to see a project where this is suitable.

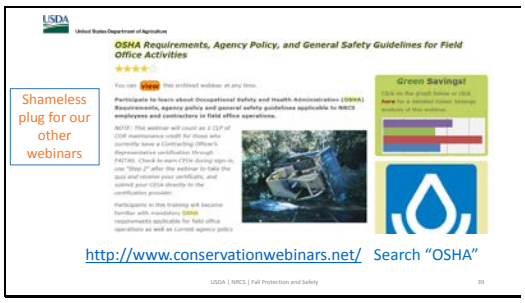
I reviewed an inspection report from OSHA saying that the use of controlled access zones by the contractor was improper. They had not demonstrated that conventional fall safety measures were not practical or detrimental so they were fined.

Slide 38




A great publication on fall safety from OSHA. It is one of the related files that's available here. It contains good ideas for weekly safety meetings.

Slide 39




We have three other webinars archived at conservationwebinars.net. You can find them by going there and searching for "OSHA". You'll find one on equipment operation safety, excavation safety and how OSHA requirements apply to general field office operations.

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