

MAJOR PROGRAM POINTS

"WORKING SAFELY WITH SUSPENDED SCAFFOLDING"

**Training for the
OSHA SCAFFOLDING STANDARD**

**"Quality Safety and Health Products, for Today...and
Tomorrow"**

OUTLINE OF MAJOR PROGRAM POINTS

The following outline summarizes the major points of information presented in the course on "Suspended Scaffolding Safety". The outline can be used to survey the course before taking it on a computer, as well as to review the course when a computer is not available.

- **Some of the places where lots of people work... people who normally keep their feet on the ground... include:**
 - Offices.
 - Stores.
 - July 9, 2001 Warehouses.

- **But there is a special breed of workers who spend their days working in the air.**
 - These are the specialists who work with scaffolds.

- **When you do your job above the ground, safety is a crucial issue.**
 - In fact, an estimated 10,000 scaffold accidents occur each year.

- **That is why OSHA has developed CFR 29, Part 1926.451, regulations designed specifically for people who erect and work on scaffolds.**
 - While there are many kinds of scaffolds covered by OSHA's regulations, this course will focus on Suspended Scaffolds.

- **Suspended Scaffolds are made up of one or more platforms that are hung from an overhead structure by various kinds of "rope."**
 - These scaffolds allow workers to safely reach places that are normally difficult, or impossible, to get to.

- **In many ways, Suspended Scaffolds are like any other tool.**
 - There are certain procedures that must be followed in order to make sure that no one gets hurt when they are working with them.

- **That is why workers must be trained on the rules and safety regulations for Suspended Scaffolds before they use them.**
- **OSHA regulations state that this training must include:**
 - The proper ways to assemble and take down Suspended Scaffolds.
 - Their correct use and placement.
 - How to handle materials while working on Suspended Scaffolds.
 - Fall prevention and protection techniques.
- **Even though workers must undergo thorough training, OSHA also requires that a "Scaffold Expert" be on site where Suspended Scaffolds are being used. This person is responsible for:**
 - Designing each scaffold.
 - Supervising scaffold construction.
 - Enforcing safety regulations.
 - Resolving any problems that relate to the scaffolds and their use.
- **All these precautions are meant to keep employees safe while working on Suspended Scaffolds.**
- **But, before a Suspended Scaffold is even assembled, you must inspect the work site for possible safety hazards.**
 - These can include protruding items, such as pipes or construction equipment, that could block the scaffold's path or tip the scaffold platform over while it is being raised or lowered.
- **If you are part of the scaffold erection crew, you can start constructing the scaffold only after the work area has been inspected and approved by a Scaffold Expert.**
 - The Scaffold Expert will also assist you in choosing the right suspension device from which to hang the scaffold.
 - This is determined based on the kind of structure that the scaffold needs to be attached to.

- **There are a number of suspension devices to chose from, including:**
 - Cornice hooks.
 - Parapet clamps.
 - Roof irons.
 - I-Beam and Counterweight Systems.

- **All of these devices normally attach to the outer parts of the structure.**
 - These "anchor points" must be strong enough to support four times the Maximum Intended Load of the scaffold.

- **OSHA defines the Maximum Intended Load as "the total weight of a scaffold, including an estimate of all persons, equipment, tools and materials that can be applied to a scaffold or scaffold component at any time."**

- **In order to assure that they can hold the Maximum Intended Load, all suspension devices for scaffolds must be made out of one of the following materials:**
 - Wrought iron.
 - Steel.
 - A material equal in strength to these metals.

- **If possible, these devices are attached to the outside of the structure at locations such as:**
 - Parapets.
 - Cornices.

- **When external parts of a structure cannot support the weight of a Suspended Scaffold, "outrigger beams" are used.**
 - These beams are anchored to stronger bearing supports within the structure, and extend the scaffold out and away from the structure's surface.
 - For outrigger beams to safely bear the weight of a scaffold, they must be set at a ninety degree angle to their supports.
 - In some cases, where space does not permit this, a Scaffold Expert may determine that it is safe to attach them at a different angle.

- **Outrigger beams can be given added stability by using ropes known as "tie-backs".**
 - Like the scaffold itself, the tie-backs must also be strong enough to support the scaffold's Maximum Intended Load.
 - Tie-backs should be securely anchored to weight-bearing supports inside a structure, such as I-beams and girders.

- **Never attach tie-backs to parts of a structure that might give way, such as:**
 - Vents.
 - Pipes.
 - Electrical conduits.

- **To further stabilize the outrigger beams, "counterweights" should be attached.**
 - These keep the beam anchored firmly in place, while supporting the scaffold and its load.
 - It is important to make sure you are using materials that are designed specifically to act as counterweights.

- **Never use construction materials as counterweights, such as:**
 - Bricks.
 - Bags of sand.

- **Other workers might remove them for their normal use, and unknowingly unbalance the outrigger beam.**
- **Make sure the counterweights that you do use are securely attached to the beam, so that they can't become dislodged and fall off.**
- **Once all of a scaffold's suspension devices are in place, you need to install the "ropes" that suspend the platform.**
 - These ropes act as guides that the hoists will follow in order to move the scaffold up and down the side of the structure.
- **Ropes are usually made of metal or fiber, and you need to make sure that they are in top working condition at all times.**
 - They should be inspected for damage and wear before, during and after each use.
 - Replace a rope if you find any thing that could reduce its strength, such as tears, gouges or frayed strands.
- **Ropes must also be replaced if they have lost one-third of their original diameter. This can happen through:**
 - Exposure to the heat of welding torches.
 - Contact with electrical sources.
 - Abrasions.
 - Corrosion.
- **Ropes with kinks can be dangerous too, because they aren't able to travel smoothly through a hoist while the scaffold is being raised or lowered.**
 - Since kinks can't be removed, these ropes should be replaced as well.

- **Another reason to replace ropes is if they have been involved in a high-speed braking situation.**
 - This occurs when the platform starts to fall, pulling the ropes through the hoist extremely quickly.
 - Any abrupt change in speed will trigger the hoist's secondary safety brake, which automatically stops the scaffold's descent, quickly and smoothly.
 - But when the secondary break engages, an incredible strain is put on the rope.
 - So OSHA has decided that any rope that has been involved in a high-speed braking incident is no longer safe to use.
- **Once you have determined that your ropes are in good condition, they can be attached to the scaffold's hoist.**
- **Remember, if you are using a powered hoist to move your scaffold, it must have an electric or air-driven motor.**
 - Gas-powered motors are considered a fire hazard, which is why OSHA does not permit them to be used on Suspended Scaffolds.
 - Whatever type of hoists you are using, you should test them to make sure they are functioning properly.
- **After the hoists have been tested and proven to be in good working condition, they are ready to be connected to the suspension ropes.**
- **Always check with your Scaffold Expert to make sure that you have enough rope to safely reach your destination.**
 - You don't want to run out while you are lowering the scaffold.
- **As an additional safety precaution special "blockers" should be attached to the rope ends.**
 - These will prevent the entire rope from passing through the hoist while the scaffold is descending.

- **Remember, the ropes are the only thing holding up your scaffold.**
 - If you run out of rope, you run out of support... and that can be fatal.

- **All of this equipment... ropes, hoists and related hardware... must be strong enough to hold all the loads associated with a Suspended Scaffold.**
 - This means that suspended scaffold ropes must support up to six times the scaffold's Maximum Intended Load.
 - And since ropes attach to hoists, all hoists must support six times the Maximum Intended Load of the scaffold as well.

- **For further protection, a hoist must be able to support, decelerate and stop a load during a fall.**
 - The greatest amount of weight that a hoist can handle during such an incident is called the "stall load."

- **Another load you need to be aware of is the scaffold's "working load."**
 - This refers to the number of workers that the scaffold will safely hold at one time.

- **A suspended scaffold designed with a working load of 500 pounds can have no more than two workers on it's platform at the same time.**
 - If the scaffold's working load is designed to hold 750 pounds, no more than three workers can be on board at once.
 - If you have any questions about the different load capacities of a scaffold, its ropes or its hoists, be sure to talk to your scaffold expert before you begin work.

- **As important as they are, ropes and hoists are just part of the scaffold picture.**
 - You also need a strong platform to hold both you and your equipment while you work.

- **Scaffold platforms should be wide enough to allow workers room to safely store their tools, move around and pass by each other as they work.**
- **Platforms must also provide enough room for workers to move around safely.**
 - For example, if you are working on a two-point suspended scaffold (a scaffold suspended by two ropes) the platform must be between 20 and 36 inches in width.
 - This will provide enough area for both you and your coworkers to stand and do your jobs.
- **A one-point suspended scaffold, such as a "boatswain's chair", is suspended by one rope and does not require room for walking.**
- **Boatswain's chairs are designed to support only one worker, in a seated position.**
 - Boatswain's chairs are named after the naval officers in charge of maintaining the hulls of their ships (they used the first boatswain's chairs to inspect the sides of their vessels for damage).
 - The seat of a boatswain's chair can be a sling made from fiber, synthetic material or a wooden plank.
- **If a wooden plank is used, OSHA requires that the area of the seat be no smaller than 12 inches wide by 14 inches long.**
 - Also, to make sure a wooden seat is strong enough to support a worker's weight, it must be at least one inch thick.
- **When suspending a boatswain's chair, the rope should be secured so that it creates a sling.**
 - The rope should be secured by threading it through the four "corner holes" in the chair.
 - The rope must then cross beneath the seat, making the shape of an "X."
 - This forms a cradle, and provides additional support for the worker.

- **The type of rope you use with a boatswain's chair is also important.**
 - If you are using a fiber rope, it must be between 3/4 and 1/2 of an inch in diameter, depending on the type of fiber it is made of.
 - If you are using wire rope (which is stronger than fiber rope), it only needs to be 3/8 of an inch in diameter.
 - Because heat can burn through or weaken a fiber rope, only wire rope should be used in areas of high heat, especially where welding is taking place.
- **No matter what type of suspended scaffold you are using, making sure it is in good working condition is only half the battle.**
 - It is also important to spot problems and prevent hazardous situations from developing by using safe work practices.
- **First, fully inspect a scaffold before each use.**
 - Check to see that it has not been damaged or overloaded.
 - If you discover any problems, report them to your supervisor immediately.
 - Look for hazards around the scaffold too.
- **One of the most dangerous situations you can encounter when you are off the ground is the presence of electricity.**
 - You should always know the location of nearby power lines.
 - Check to see that workers and scaffold parts are a safe distance from sources of electricity like transformers, and that they can not accidentally come into contact with them.

- **The higher the voltage the further away you should be from the power source.**
 - OSHA mandates that if your scaffold is near a power line of less than 300 volts you need to be at least three feet away to be safe.
 - If the electrical source is between 300 volts and 50 kilovolts, you must be at least ten feet away.
 - And if the power line contains more than 50 kilovolts of electricity, you need to be at least ten feet away (with an additional 4/10 of an inch of separation for every kilovolt over 50).
 - If you have any questions about the distance that you need to maintain from an electrical source ask you supervisor.

- **Another important group of safe work practices deals with limiting the build-up of tools and other debris on a scaffold.**

- **Keep clutter to a minimum by:**
 - Promptly throwing away your trash.
 - Putting tools back where they belong when you are finished with them.
 - Not allowing excess materials to be "stored" on the platform.

- **All of these measures will limit the load on the scaffold, as well as reduce the potential for slips, trips and falls.**

- **"Think before you reach" describes another important practice that everyone who works on Suspended Scaffolds should adhere to.**
 - If you are trying to reach a work area that is above or below you, move the platform instead of leaning or stretching.
 - Leaning against a structure can push the scaffold platform out from under you, creating a gap between the platform and the structure that objects (or people) might fall through.

- **Standing on buckets, bricks and other debris to extend your reach is also unsafe.**
 - These items can easily tip, causing you to lose your balance.

- **Since falling is one of scaffolding safety's main concerns, you should always use a Personal Fall Arrest System (PFA System) whenever you work on a Suspended Scaffold. PFA Systems consist of:**
 - An anchoring device that is connected to a supporting structure.
 - A full-body harness.
 - A lifeline.
 - A deceleration device.

- **PFA Systems work by quickly slowing down, then gently stopping, a fall.**

- **Vertical lifelines should always be used to support PFA Systems on Suspended Scaffolds.**

- **These lines must not be attached to the platform or the suspension ropes.**
 - If for any reason the scaffold itself falls and your lifeline is connected to it, the scaffold could pull you down with it.
 - Another danger in attaching a lifeline to the scaffold platform is that the force of a falling worker could cause the scaffold to collapse, and pull everyone else down with it as well.

- **Instead, the lines should be attached to girders, I-beams or other supports that are part of the structure itself and that can withstand the weight of a falling worker.**

- **Remember, your lifelines should extend far enough to allow freedom of movement.**
 - Any lifeline that is too short to allow unrestricted movement must be immediately repositioned to another support that is closer to the platform.
 - A worker's lifeline must also be long enough to swing free of physical hazards like tools, debris or even other workers.
 - But extreme care must be taken to ensure that long lifelines do not snag on passing obstacles as the scaffold is being raised or lowered.
- **Your lifeline must always be attached to a fixed structure. This is especially true while the platform is in motion.**
 - So make sure to keep your connections safe as you move the scaffold to different positions.
 - And, most importantly, never disconnect yourself from your lifeline!
- **Because falling is such a dangerous hazard for scaffold workers, OSHA also requires that guardrails be installed on scaffold platforms before workers are allowed to use them.**
 - These guardrails must protect all of the open sides and ends of the platform.
 - OSHA mandates that guardrails must provide protection in an area between 39 and 45 inches above the walking surface of the scaffold, and that each guardrail have a top and middle rail.
 - Guardrails must also be sturdy enough to hold 200 pounds, what OSHA considers to be the average weight of any worker who might fall against them.
- **In addition to keeping themselves and their coworkers from falling, scaffold workers must also be concerned about objects that can fall from platforms, such as tools and other debris.**

- **Telling other workers on the job site to wear hard hats isn't nearly enough.**
 - After all, headgear is the last line of defense against being struck.
 - Devices that prevent objects from falling, such as toe-boards, screens and debris nets are much more effective weapons.

- **Toe-boards form a raised edge around the outside of a scaffold platform.**
 - They prevent objects from sliding off or being kicked over the edge of the scaffold.

- **Screens cover a larger area than toe-boards.**
 - They extend the barrier from the platform's surface up to the guardrail, while debris nets hang beneath the platform and catch objects that have fallen over the edge.

- **All of this protection is good for small-to-medium-sized objects, but if there is the potential for extremely large objects to fall from a scaffold, screens and netting will not be enough.**
 - In this case, the areas below the scaffold should be roped off, to prevent people from walking or working in the danger zone.

*** * * SUMMARY * * ***

- **Whenever you are working on a scaffold, remember that protecting yourself is your main responsibility!**

- **OSHA has made sure that you receive good safety and training information. But you have to do your part as well.**

- **Always set up your scaffold suspension devices correctly, and remember to use counterweights when needed.**

- **Make sure that you "know your ropes", and how to attach them to the structure you are working on.**
- **Keep your scaffold clean, and free of tools and debris.**
- **Use guardrails and PFA Systems to protect yourself from falling while on the job.**
- **Suspended Scaffolds are unique tools that allow us to work in high, hard to reach areas. The more knowledge and training you have about them, the safer you will be while on the job.**
- **If you play it safe while working on Suspended Scaffolds, you can "hang on" to your job for a long time!**