29CFR 1910.1926.454- Construction Scaffolds

Scaffold Safety

Preparation

1. Read Applicable Background information and related Company Policy Chapter.

- 2. Make _____ Copies of this Lesson Plan for Personnel
- 3. Make Transparency, procure transparency pens, etc.
- 4. Coffee, tea, snacks

Material

- 1. Scaffold Equipment the Employee is expected to use
- 2. Personal Protective Equipment

Objective

By the end of this session, personnel shall be able to describe:

- 1. Supervisor and Employee Responsibilities
- 2. General Scaffold Requirements
- 3. Scaffold Design and Rope Shielding
- 4. Inspection Checklists
- 5. Use of Fall Protection

Background

Scaffolding is a temporary, field erected structure used for working aloft. Because it is temporary and field erected, it is subject to wear and abuse, improper assembly, and unauthorized changes. Construction standards require that a "competent person" inspect scaffolds for defects before every work shift. Yet, in all industries, every employee who works on or around scaffolding should be aware of safety requirements.

The most common accident involving scaffolds is a fall to a lower level. That's quite obvious, since the purpose of erecting scaffolds is to provide a safe place to work when you must work at a height above ground level. This short training program is designed to review some of the basics of scaffolds and how to properly use this equipment. Keep in mind that each state has different rules, regulations and standards and it's up to you to

determine the exact scaffold requirements in the state where you're located and working. This short program does not list all hazards or safety measures of scaffolds, it's simply an overview of some basics, to help make you more aware of safety around scaffolds. Notes

Lesson Supervisor and Employee Responsibilities	Notes
Supervisors of all employees that are required to work from scaffolds will ensure the following procedures are taken:	
1. Comply with the current and proposed OSHA regulations for working with scaffolds.	
2. Assure that design and construction of scaffolds conform with OSHA requirements.	
3. Shield scaffold suspension ropes and body belt or harness system droplines (lifelines) from hot or corrosive processes, and protect them from sharp edges or abrasion.	
4. Inspect all scaffolds, scaffold components, and personal fall protection equipment before each use.	
5. Provide personal fall protection equipment and make sure that it is used by all workers on suspension scaffolds.	
6. Use structurally sound portions of buildings or other structures to anchor droplines for body belt or harness systems and tiebacks for suspension scaffold support devices. Droplines and tiebacks should be secured to separate anchor points on structural members.	
7. Provide proper training for all workers who use any type of suspension scaffold or fall protection equipment.	
8. Follow scaffold manufacturers' guidance regarding the assembly, rigging, and use of scaffolds.	
Employees shall;	
1. Inspect all scaffolds, scaffold components, and personal fall protection equipment before each use. Defective components must be removed from service and replaced.	
2. Shield scaffold suspension ropes and body belt or harness system droplines (lifelines) from hot or corrosive processes, and protect them from sharp edges or abrasion.	

3. Wear a body belt or body harness which may include a deceleration device, lifeline, or suitable combinations. The body belt or body harness shall be rigged so that an employee can neither free fall more than 3 feet nor contact any lower level and bring an employee to a complete stop and limit the maximum deceleration distance an employee travels to 2 feet

The use of body belts for fall arrest is prohibited

Scaffold Requirements

Although many codes only require such scaffolding with guard railing over ten feet high, the Company requires guard railing on scaffolding 4 feet high and taller.

Guard railing- The **top rail** should be at least 2 x 4 lumber or the equivalent. It must be at least 3 and a half feet high. **Intermediate rails** should be made from 1 x 6 lumber or its equivalent and installed approximately half way between the top rail and the platform surface. The **toeboard** should be at least four inches high and if necessary, a screen or paneling should extend along the entire opening between the toeboard and the intermediate or top rail to prevent materials stacked higher than the toeboard, such as bricks, from being knocked off the scaffold and striking people below. To make sure the scaffold is rigid, space **support posts** for guard railing should not be more than 8 feet apart.

If workers are exposed to falling objects, **overhead protection** must be provided.

Power lines near scaffolds are dangerous...so make sure the power company has shut off the electricity before a scaffold is erected where a worker might come in contact with the lines.

Even safely constructed scaffolds are hazardous if they are not used correctly.

-When hoisting materials onto a scaffold, attach a tag line to safely control the load and keep it from swinging and striking someone or damaging the scaffold.

-Keep the work platform clear of tools, materials, and debris which could cause tripping hazards.

-Do not work on scaffolds which are covered with ice and snow....the slipping hazard is too great.

-Proper scaffold maintenance is important also. Check metal on scaffolds for rust, which, if left untreated, can weaken the structure. Do not use damaged parts. If a scaffold is damaged in any

way...don't use it until it's repaired or replaced

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Types of Scaffolds-The most common types of scaffolds are built up scaffolds, rolling scaffolds and suspended scaffolds. **Built up scaffolds** are made of wood or metal supports and are built up higher as the work progresses. In all built up scaffolds, the vertical members must be straight up and down and the horizontal members completely level. If the scaffold tilts noticeably it might collapse if it is unevenly loaded. Cross bracing or diagonal bracing or both will keep the scaffold erect, level and rigid. Again, make sure the footing and anchorage for built up scaffolds are sound, rigid and strong enough to support four times the maximum intended load.

Never allow unstable objects such as barrels, boxes, loose bricks or concrete blocks to be used as support for scaffolds or planks. As a means for additional safety, built up scaffolds should be secured to the building or structure at least every 30 feet horizontally and every twenty six feet vertically, by heavy wire, brackets or the equivalent. A ladder must be provided to give you safe access to the scaffold platform.

Rolling scaffolds are similar to built up scaffolds except they are wheel mounted. They have the same safety requirements, plus a few additional ones. To prevent tipping, the maximum work height of a rolling scaffold must not be more than 4 times the smallest dimension of its base. When this requirement cannot be met, either use suitable outrigger frames to enlarge the base, or brace the scaffold. Rolling scaffold wheels must have a lock to prevent unexpected movement. Never move the scaffold with anyone on the scaffold.

Suspended scaffolds, such as those used in office building construction, carry a working platform on ropes secured to outrigger beams thrust out from the building. There are light duty, medium duty and heavy duty scaffolds, each designed for a specific requirement and use. Always follow your company's policies and procedures when erecting, using, handling or working on scaffolds. There have been many fatalities, serious injuries related to poorly constructed scaffolds, overloading, improper use of scaffolds and in general, not following proper procedures. There's no reason to take short cuts....it's simply asking for an accident. When your using scaffolds, take the time to work and act safely because your life really does depend upon how well you follow the rules.



Supervisors and employees will insure that the following operating procedures are observed:

- Scaffolds must be substantially constructed to carry the loads imposed upon them and to provide a safe work platform.
- All scaffolds more than 4 ' high must have approved guardrails on all ends exposed ends and sides.
- Guardrails, mid-rails, and toe boards must be installed on all open sides of scaffolds 4' high or more in height.
- Only approved scaffolds will be used. Barrels, boxes, rebar. Or other make-shift substitutes for scaffolds will not be used.
- Scaffold planks must be cleated together, and must extend over the end supports at least 6 inches, but not more than 12 inches.
- All scaffold planks must be visually inspected before each use. Damaged scaffold planks must be destroyed immediately.
- All scaffold planks must be at least two planks wide: No employee may work from a single plank.
- Adequate mud sills or other rigid footing, capable of withstanding the maximum intended load, must be provided.
- Scaffolds must be tied to the building or structure at intervals which do not exceed 30 feet horizontally and 26 feet vertically.
- Do not overload scaffolds. Materials should be brought up as needed. Scaffolds must not be loaded in excess of one-fourth of their rated capability.
- Where persons are required to work or pass under scaffolds, a screen of 18 guage, ¹/₂ inch wire mesh is required between the toe and guard rail.

Overhead protection is required if employees working on scaffolds are exposed to overhead hazards. Such protection must be a 2" thick plank or equivalent.

- Diagonal bracing must be used on all support components.
- Midrails 1" X 6" or equivalent must be present on all sides.
- Ladders will be used as a means of entry onto and exit off of the scaffold.

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Rolling Scaffolds- General Requirements:

- The height of the rolling scaffold must not exceed four times the minimum base dimension.
- The work platform must be planked tight for the full width of the scaffold. Cleat the underside of the planks to prevent their movement.
- Caster breaks must be locked when the scaffold is not in motion.
- Get help when moving rolling scaffolds. Make certain that the route is clear. Watch for holes and overhead obstructions.
- No one shall be permitted to ride on rolling scaffolds.

Two Point Suspended Scaffolds (Swinging Stages) General Requirements:

- Each employee working from a two point suspended scaffold must be tied off to an independent safety line.
- Suspended scaffolds must be not less than 20 inches nor more than 36 inches wide.
- Wire ropes used to suspend such scaffolds must be able to withstand a load that is six times the load it is intended to support.
- Non-conductive insulating material must be placed over suspension cables of each scaffold for protection when the chance of contact with an electric arc exists.

Shielding of Ropes

The design and construction of scaffolds must conform with OSHA requirements concerning type of equipment, rated capacities, construction methods, and use. Each scaffold and scaffold component must be capable of supporting its own weight plus at least four times the maximum intended load without failure. Each suspension rope must be capable of supporting at least six times the maximum intended load.

Suspension ropes and droplines for body belt or harness systems should be shielded from:

- heat-producing processes such as welding,
- acids or other corrosive substances, and
- sharp edges or abrasions.

Such ropes should be made from material that is not adversely affected by heat or by acids or other corrosives.

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Inspection Checklists

Supervisors and Employees will inspect all scaffolds and scaffold components for visible defects before use on each work shift. Scaffolds will be erected, moved, dismantled, or altered only under the supervision of a competent person.

All components of personal fall protection equipment (including body belts or harnesses, lanyards, droplines, trolley lines, and points of anchorage) should be inspected by Supervisors and Employees before use. Any visibly damaged or worn equipment should be removed from service immediately.

The following list includes things to watch for:

- Scaffolding must be erected on *firm footing* capable of carrying the maximum intended load. Boxes, barrels, loose concrete blocks or brick must not be used to support the structure.
- Consideration must be given to the weight the scaffold is to carry. It must be capable of supporting, *without failure*, four times the maximum intended load. The load includes not only the weight of the people on the scaffold but also any supplies and equipment being used.
- Scaffolding is naturally unstable because it is usually a tall structure with a narrow base. To counteract this, the scaffold must be braced or tied off to a stable structure such as a ship's hull or building wall.
- The planking used must be "scaffold grade." The wood must be clear, free of loose knots, splits, or other defects. To create a proper work surface, generally 2 planks need to be laid side by side to create a 20" wide work platform. At the ends, the planking must overlap at least 6" but no more than 18" (limited to 12" for shipyards and construction) unless the planks are fastened to the supporting members.
- Toe boards at least 4" high (3 ¹/₂" for construction) should be installed along the outer scaffold edge, to prevent tools or materials from falling onto workers below.
- Guard rail requirements for supported scaffolds vary for different industries. The Company Standard is 4 feet or higher. Federal OSHA standard for construction and general industry requires guardrails when a platform is 10 feet or higher. In shipyards, they must be installed if the work platform is 5 feet or more above a solid surface, or at any distance above water. Some State codes may set the height at 6 feet. You must know the rule for your state or jurisdiction.

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- Guard rails are usually made of 2x4 lumber or steel pipe. The top rail should be about 42" above the scaffold walking surface, with a "mid-rail" at about 21 inches. Fiber or wire rope can be used if it is attached to rigid supports and kept taut. However, a variance may be needed to do so in some jurisdictions. It should be noted that the railings must be of adequate strength to restrain someone who has started to fall.
- Railings can be omitted if a structure, such as a ship's hull prevents their use. However, in these circumstances, you must wear a safety harness and life line if you working more than 5 feet above a solid surface. If over water, you must wear an approved buoyant work vest.

Finally, never make any changes to scaffolding yourself. Only designated "Competent Persons" should make modifications.

Use of Fall Protection

The Company will provide appropriate fall protection systems and ensure their use by all workers on suspension scaffolds. Generally, these workers will be protected by a full body harness.

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Closure

The Company will provide workers with proper training, including the manufacturers' recommendations for installing and operating suspended scaffold systems and for using personal fall protection equipment. Untrained personnel should never be permitted to work from any type of suspension scaffold.

What questions do you have?

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