

# Great Western Painting

## Scaffolds

29 CFR 1926.450 *Scope, Application and Definitions Applicable to this Subpart*

29 CFR 1926.451 *General Requirements*

29 CFR 1926.452 *Additional Requirements Applicable to Specific Types of Scaffolds*

29 CFR 1926.454 *Training Requirements (For Scaffold Safety)*

1926 Subpart L App A: *Scaffold Specifications*

1926 Subpart L App D: *List of Training Topics for Scaffold Erectors and Dismantlers*

1926 Subpart L App E: *Drawings and Illustrations*

## SCAFFOLDS

### OVERVIEW

Scaffolds are everyday items on many construction sites and their use presents specific hazards -- the most common being electrical shock, falls and falling objects. This program addresses these hazards and provides safety rules for the use of this type of equipment.

Affected individuals must be aware of the specific hazards applicable to their work situation and the proper safety procedures for avoiding these hazards.

All scaffold applications require a knowledge of: equipment inspection (a competent person will ensure that scaffolds are inspected and safe prior to, and periodically during use) , load capacities, ground conditions, effects of weather, fall protection, potential electrical hazards, and protection from falling objects. It is expected that all personnel understand how to perform work in a safe manner while on a scaffold, recognize unsafe work situations, and effectively deal with them. If you are aware of a scaffold hazard (or any safety hazard), immediately bring it to the attention of your immediate supervisor or the competent person on the job site.

### SCAFFOLD SAFETY

A scaffold, by definition, is any temporary elevated platform and its supporting structure used for supporting employees or materials or both. Because of the numerous types of scaffolds, the infinite possible combinations of uses, the various surface features on which the scaffold may rest, and the varying conditions in which scaffolds may be used, it would be impossible to detail what to do in every situation. The goal of any safety program - including scaffold safety - is to eliminate the possibility of harm to employees while they are performing their duties.

Only safety harnesses, not belts, will be used in fall protection.

Leading causes for scaffold accidents and injuries are plank slippage, being struck by falling objects, and the actual collapse of the support structure or planking.

## DEFINITIONS

There are a number of terms and phrases which must be understood by all employees when dealing with scaffolds. Below are listed important definitions to aid in the understanding of this Program, however they are not all-inclusive. A complete list of definitions, including the many types of scaffolds and their individual components is found in 29 CFR 1926.450.

**BODY HARNESS:** a design of straps which may be secured about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with means for attaching it to other components of a personal fall arrest system.

**COMPETENT PERSON:** one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

**EXPOSED POWER LINES:** electrical power lines which are accessible to employees and which are not shielded from contact. Such lines do not include extension cords or power tool cords.

**FAILURE:** load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

**GUARDRAIL SYSTEM:** a vertical barrier consisting of, but not limited to, top rails, midrails, and posts erected to prevent employees from falling off a scaffold platform or walkway to lower levels.

**LANDING:** a platform at the end of a flight of stairs.

**LIFELINE:** a component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**LOWER LEVELS:** areas below the level where the employee is located and to which an employee can fall. Such areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

**MAXIMUM INTENDED LOAD:** the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

**OPEN SIDES AND ENDS:** the edges of a platform that are more than 14 inches away horizontally from a sturdy, continuous, vertical surface (such as a building wall) or a sturdy, continuous, horizontal surface (such as a floor), or a point of access. Exception: For plastering and lathing operations, the horizontal threshold distance is 18 inches.

**PERSONAL FALL ARREST SYSTEM:** a system used to arrest an employee's fall. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or combinations of these.

**PLATFORM:** a work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

**QUALIFIED PERSON:** one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

**RATED LOAD:** the manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold equipment.

**SCAFFOLD:** any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage) used for supporting employees or materials or both.

**UNSTABLE OBJECTS:** items whose strength, configuration, or lack of stability may allow them to become dislocated and shift and therefore may not properly support the loads imposed on them. Unstable objects do not constitute a safe base support for scaffolds, platforms, or employees. Examples include, but are not limited to, barrels, boxes, loose brick, and concrete blocks.

## **GUIDELINES FOR SCAFFOLD USE**

### **ALL SCAFFOLDS:**

Employees who work on any type of scaffold must follow the below listed guidelines:

- a. scaffolds and scaffold components shall not be loaded in excess of their maximum intended loads or rated capacities, whichever is less.
- b. scaffolds and scaffold components will be inspected for visible defects by a competent person before each work shift and after any occurrence which could affect a scaffold's structural integrity. **Any defective scaffold or component will be tagged by the competent person with a red accident prevention tag indicating that item is defective and it will be removed from service per 29 CFR 1926.451(f)(4). Employees will be instructed in this policy.**
- c. damaged or weakened parts will be immediately replaced.
- d. scaffolds shall be erected, moved, dismantled or modified only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or modification. Such

activities shall be performed only by experienced and trained employees selected for such work by the competent person.

**Note** Because modifications to scaffolds by non-qualified employees may create unacceptable hazards, any non-qualified employee modifying a scaffold system will be subject to disciplinary action.

- e. work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and these employees are protected by a personal fall arrest system or wind screens.
- f. personnel may not work on scaffolds covered with snow, ice or other slippery material except to remove the material with extreme care.
- g. where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads shall be used.
- h. debris shall not be allowed to accumulate on platforms.
- i. make-shift devices on top of scaffold platforms shall not be used to increase the working level height of employees.
- j. guardrails should have smooth surfaces to prevent puncture, laceration, or snagging injuries.
- k. make-shift parts will not be used. A nail is not a substitute for a pin.

### **SUPPORTED SCAFFOLDS:**

Employees who work on supported scaffolds must follow the below listed rules and guidelines. These guidelines cover most, but not all situations. The competent person will address unusual situations.

- a. Each platform unit on all working levels of a scaffold shall be fully planked or decked between the front uprights and the guardrail supports and each platform unit shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch wide (where feasible.)
- b. Supported scaffolds must have a height to base (including outrigger supports, if used) width ratio of no more than 4:1 unless restrained from tipping by guying, tying, bracing, or equivalent means. The competent person will direct the procedures for prevention of tipping.
- c. Supported scaffold poles, legs, posts, frames and uprights must rest on **base plates AND** mud sills or other adequate firm foundation.

**Note:** Base plates must always be used on supported scaffolds

- 1. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
- 2. Unstable objects can not be used to support scaffolds or platform units.

3. Unstable objects shall not be used as working platforms.
  4. Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use.
  5. Fork-lifts shall not be used to support scaffold platforms unless the entire platform is attached to the fork and the fork-lift is not moved horizontally while the platform is occupied.
- d. Supported scaffold poles, legs, posts, frames and uprights shall be plumb and braced to prevent swaying and displacement.
  - e. Scaffolds shall not be moved horizontally while employees are on them unless they have been designed by a registered professional engineer specifically for such movement or, in the case of mobile scaffolds:
    1. the surface on which the scaffold is being moved is within 3 degrees of level and free of pits, holes, and obstructions.
    2. the height to base width ratio of the scaffold during movement is two to one or less.
    3. outrigger frames, when used, are installed on both sides of the scaffold.
    4. when power systems are used, the propelling force is applied directly to the wheels and does not produce a speed in excess of 1 foot per second.
    5. no employee is on any part of the scaffold which extends outward beyond the wheels, casters, or other supports.
    6. before the scaffold is moved, each employee on the scaffold must be made aware of the move.

### **SUSPENDED SCAFFOLDS:**

Employees who work on suspended scaffolds must follow the below listed rules and guidelines. These guidelines cover most, but not all situations. The competent person will address unusual situations.

- a. All suspension scaffold devices shall rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).

- b. Direct connections on suspension scaffolds must be evaluated before use by a competent person who shall confirm that the supporting surfaces are capable of supporting the loads to be imposed.
- c. Counterweights shall be made of non-flowable material. Sand, gravel and similar materials that can be easily dislocated may not be used as counterweights.
  - 1. Only items specifically designed as counterweights shall be used as counterweights. Construction material shall not be used as counterweights.
  - 2. Counterweights shall not be removed from an outrigger beam until the scaffold is disassembled.
- d. The use of repaired wire rope as suspension rope is prohibited.
- e. Wire ropes shall not be joined together except through the use of eye splice thimbles and secured by eye splicing or equivalent means.
- f. Wire ropes shall be inspected for defects by a competent person prior to each work shift and after every occurrence which could affect a wire rope's integrity. Wire ropes will be **replaced** if any of the following conditions exist:
  - 1. any physical damage which impairs the function and strength of the rope.
  - 2. kinks that might impair the tracking or wrapping of rope around the drum(s) or sheave(s).
  - 3. six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay.
  - 4. abrasion, corrosion, scrubbing, flattening or peeling causing loss of more than one third of the original diameter of the outside wires.
  - 5. heat damage caused by a torch or any damage caused by contact with electrical wire.
  - 6. evidence that the secondary brake has been activated during an overspeed condition and has engaged the suspension rope.
- g. Gasoline-powered equipment and hoists shall not be used on suspension scaffolds.
- h. Gears and brakes of power-operated hoists used on suspension scaffolds shall be enclosed.
- i. Manually operated hoists shall require a positive crank force to descend.

## GUIDELINES FOR THE CONTROL OF ELECTRICAL HAZARDS

To prevent the possibility of electrical shock, neither the scaffold nor any conductive material handled on the scaffold shall come closer to exposed and energized power lines as noted below:

### INSULATED POWER LINES

<u>Voltage</u>	<u>Minimum Distance</u>	<u>Alternatives</u>
Less than 300 volts	3 feet	
300 volts to 50 kv	10 feet	
More than 50 kv	10 feet plus 0.4" for each 1 kv over 50 kv	2 X's the length of the line insulator, but never less than 10 feet

### UNINSULATED POWER LINES

<u>Voltage</u>	<u>Minimum Distance</u>	<u>Alternatives</u>
Less than 50 kv	10 feet	
More than 50 kv	10 feet plus 0.4" for each 1 kv over 50 kv	2 X's the length of the line insulator, but never less than 10 feet

Scaffolds may be closer to power lines if it is necessary to accomplish the work, but only after the utility company or electrical system operator has been notified of the need to work closer, and the utility company or electrical system operator has deenergized or relocated the lines or installed protective coverings to prevent accidental contact with the lines.

When using 110 volt electrical power tools or lights, ground fault circuit breakers must be used. Electrical extension cords must be inspected for cuts or cracks in the insulation before use.

## GUIDELINES FOR THE CONTROL OF FALL HAZARDS

Each employee working on a scaffold more than 10 feet above a lower level must be protected from falling to that lower level as noted below:

<u>SCAFFOLD TYPE</u>	<u>FALL PROTECTION REQUIREMENTS</u>
Boatswains' Chair Catenary Scaffold Float Scaffold Needle Beam Scaffold Ladder Jack Scaffold	Personal Fall Arrest System

<u>SCAFFOLD TYPE</u>	<u>FALL PROTECTION REQUIREMENTS</u>
Single-Point Adjustable Suspension Scaffold Two-Point Adjustable Suspension Scaffold	Personal Fall Arrest System and a Guardrail System
Crawling Board (Chicken Ladder)	Personal Fall Arrest System; *Guardrail System or a ¾" diameter grabline or equivalent handhold securely fastened beside each crawling board.
Self-Contained Adjustable Scaffold	*Guardrail System when the platform is supported by the frame structure; by both a Personal Fall Arrest System and a *Guardrail System when the platform is supported by ropes.
Walkway Located within a Scaffold	*Guardrail System installed within 9½" of and along at least one side of the Walkway.
Supported Scaffolds used while performing Overhand Bricklaying	Personal Fall Arrest System or a *Guardrail System (except at the side next to the wall being laid.)
All Other Scaffolds not specified above	Personal Fall Arrest System or a *Guardrail System

\*Guardrail Systems must have a minimum 200 pound toprail capacity.

## **SPECIAL PRECAUTIONS FOR THE PREVENTION OF FALLING**

### **PLANKING REQUIREMENTS:**

Plank slippage causes falls and falls cause injuries. Below are requirements for platforms and/or planks used on scaffolds and walkways:

- a. each platform unit (e.g., scaffold plank, fabricated plank, fabricated deck, or fabricated platform) shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch wide.

1. Exceptions to the above:

when a wider space is necessary (for example, to fit around uprights when side brackets are used to extend the width of the platform). In this instance, the platform must be planked or decked as fully as possible and the remaining open space between the platform and the uprights shall not exceed 9½", or

when planking or decking is used solely for walkways or solely for use by personnel erecting or dismantling the scaffold. In these instances, only the planking the competent person establishes as necessary to provide safe working conditions is required.

b. Each scaffold platform and walkway shall be at least 18 inches wide.

1. Exceptions to the above:

each ladder jack scaffold, top plate bracket scaffold, roof bracket scaffold, and pump jack scaffold shall be at least 12 inches wide.

there is no minimum width for boatswain's chairs.

where working areas are so narrow that platforms and walkways cannot be at least 18 inches wide, the platforms and walkways shall be as wide as feasible. In these instances, personnel shall be protected from fall hazards by the use of guardrails and/or personal fall arrest systems regardless of the height.

c. The front edge of all platforms shall not be more than 14 inches from the face of the work unless guardrail systems are erected along the front edge and/or fall arrest systems are used.

1. Exceptions to the above:

for outrigger scaffolds, the maximum distance from the face of the work shall be 3 inches.

for plastering and latching operations, the maximum distance from the face of the work shall be 18 inches.

d. Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support by at least 6 inches and not more than:

1. twelve (12) inches for a platform 10 feet or less in length unless the platform is designed and installed so that the cantilevered\* portion of the platform is able to support personnel and/or material without tipping, or has guardrails which block access to the cantilevered end.

2. eighteen (18) inches for a platform greater than 10 feet in length unless it is designed and installed so that the cantilevered\* portion of the platform is able to support personnel without tipping or has guardrails which block access to the cantilevered end.

\*NOTE: Cantilevered portion of the platform is the portion of the platform which extends beyond the support by 12 or 18 inches.

- e. On scaffolds where scaffold planks are abutted to create a long platform, each abutted end shall rest on a separate support surface. The use of common support members such as “T” sections to support abutting planks or hook on platforms designed to rest on common support is acceptable.
- f. Where platforms are overlapped to create a long platform, the overlap shall occur only over supports and shall not be less than 12 inches unless the platforms are nailed together or otherwise restrained to prevent movement.
- g. At points of a scaffold where the platform changes direction, such as turning a corner, any platform that rests on a bearer at an angle other than a right angle shall be laid first; platforms which rest at right angles over the same bearer shall be laid second on top of the first platform.
- h. With the exception that the edges may be marked for identification, wood platforms shall not be covered with opaque finishes. Platforms may be coated with wood preservatives, fire-retardant finishes, and slip-resistant finishes as long as the coatings allow the actual wood to be seen. This is so the wood platforms may be inspected for damage and/or deterioration.
- i. Scaffold components manufactured by different manufacturers can not be intermixed unless the components fit together without force and the scaffold’s structural integrity, as determined by a competent person, is maintained.
- j. Scaffold components made of dissimilar metals shall not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component below acceptable levels.

### **FALL PROTECTION DURING ERECTION & DISMANTLING OF SUPPORTED SCAFFOLDS**

**Supported Scaffolds:** The competent person must determine the feasibility and safety of providing fall protection for employees erecting and dismantling supported scaffolds.

**Suspended Scaffolds:** Fall protection for those erecting and dismantling suspended scaffolds is possible because the anchorage points used for supporting the scaffold would certainly support a fall protection system. Therefore, fall protection will be utilized for personnel erecting or dismantling supported scaffolds.

## GUIDELINES FOR THE CONTROL OF FALLING OBJECTS

All personnel working on a scaffold must wear hard hats. Further protection from falling objects will be provided, if needed, by toeboards\*, screens, or guardrail systems; or through the erection of debris nets, catch platforms, or canopy\*\* structures that contain or deflect the falling objects.

Objects that are too heavy or massive to be prevented from falling by the above measures will be kept away from the edge of the scaffold and secured as necessary to prevent their falling.

Where there is a possibility of falling objects (tools, materials, or equipment), the below safeguards must be implemented:

- a. the area below the scaffold to which objects can fall shall be barricaded and employees shall not be permitted to enter the hazard area, **or**
- b. a toeboard will be erected along the edge of platforms more than 10 feet above lower levels for a distance sufficient to protect employees below.

When tools, material, or equipment are piled to a height higher than the top edge of the toeboard, the below listed safeguards must be implemented:

- a. paneling or screening extending from the toeboard or platform to the top of the guardrail shall be erected for a distance sufficient to protect employees below, **or**
- b. a guardrail system shall be installed with openings small enough to prevent passage of potential falling objects, **or**
- c. a canopy structure, debris net or catch platform strong enough to prevent passage of potential falling objects shall be erected over the employees below.

\*NOTE: Toeboards must be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or horizontal direction and be at least 3½" high from the top edge of the walking/working surface. Further, toeboards must be secured to the outermost edge of the platform and not have more than ¼" clearance above the walking/working surface. Toeboards must either be solid or have openings not over 1" in the greatest dimension.

\*\*NOTE: Canopies used for falling object protection must be installed between the falling object hazard and the employees below.

## ACCESS

Two feet -- 24 inches -- is the height at which some sort of access is required to reach a scaffold platform. When a scaffold platform is two (2) feet above or below the point of access (often the ground level), portable ladders, hook-on ladders, ramps, walkways, ladder stands, etc. must be used. Never use a crossbrace as a means of getting on or off a scaffold.

Hook-on and attachable ladders must:

- a. be positioned so they do not tip the scaffold.
- b. have the bottom rung within 24 inches of the supporting level.
- c. have rest platforms at least at 35-foot vertical intervals when used on supported scaffolds.
- d. be designed for use with the scaffold being used.
- e. have a minimum spacing between rungs of 16  $\frac{3}{4}$  inches and a minimum rung length of 11  $\frac{1}{2}$  inches.

Stairway type ladders have essentially the same requirements except that:

- a. the rest platforms must be at the 12 foot (maximum) vertical level.
- b. the minimum step width is 16 inches (mobile scaffold stairway-type ladders: 11  $\frac{1}{2}$  inches).
- c. slip-resistant treads are required on all steps and landings.

Stairtowers, if used, must have the bottom step within 24 inches of the supporting level and have

- a. a top rail and midrail (stairrail) on each side.
- b. a landing platform at least 18 inches by 18 inches at each level.
- c. a width of 18 inches between stairrails.
- d. resistant surfaces on treads and landings.

Employees must be able to safely get on and off a scaffold platform and, at 24 inches, you will need a specific method of access.

### **GENERAL VERSUS SPECIFIC SCAFFOLD SAFETY GUIDELINES**

General safety guidelines apply to all situations. In all situations, employees must be aware of:

- a. potential electrical hazards, fall hazards, and falling object hazards and how to eliminate them.
- b. the proper use of scaffolds and the proper handling methods of materials on the scaffold being used.
- c. the maximum intended load and the load-carrying capacities of the scaffold being used and never exceeding these limits.

Within the broad categories of suspended and supported scaffolds, there are many specific types of scaffolds -- each with its own limitations and special characteristics. Each job site has its own unique ground composition on which a supported scaffold is erected, or unique

attachment points for suspended scaffolds. The competent person on the job site will instruct affected employees on any unusual or unique items that must be known about a specific circumstance.

## **TRAINING**

Interactive training will be given to all employees who will be performing work on scaffolds by a competent (qualified) person. Training will focus on the hazards associated with the type(s) of scaffolding used on our job site, as well as the methods to minimize or eliminate those hazards.

Training will address proper use, fall protection, and load capacity as well as the below hazards associated with scaffold use.

1. fall hazards
2. electrical hazards
3. falling object hazards

**All of the above training topics are addressed within this program.**

For those employees who will be erecting, disassembling, moving, operating, repairing, inspecting, or maintaining our scaffolds, the competent person will provide additional training applicable to their job requirements.

### **Retraining**

Retraining will be provided should new types of scaffolding be introduced, conditions change, standards change, or on-the-job performance indicate that a particular employee has not retained the required proficiency in scaffold safety.

Additionally, retraining will be conducted when changes at the worksite present a hazard about which an employee has not been previously trained; when changes in fall protection, falling objects protection, or equipment present a hazard which an employee has not been previously trained.