



SSU 2007-07

## SCAFFOLD STANDARDS FOR CONSTRUCTION

*By SeaBright Insurance Loss Control*

**T**he Occupational Safety and Health Administration (OSHA) rule, Subpart L of 29 CFR 1926, regulates the design, construction, and use of scaffolds in the construction industry. The revised standard became effective on November 29, 1996. The standard applies to all scaffolds used in construction except for crane or derrick suspended personnel platforms that are covered under a separate existing standard. Exclusive criteria for aerial lifts are also included in the standard.

### The Goal: Fewer Scaffold Accidents and Injuries

Scaffolds are used in construction for both interior and exterior work, and injuries associated with this equipment are common. Scaffold accidents in the construction industry account for about 88 fatalities annually. While falls are the most serious hazard of concern, additional hazards include falling objects, structural instability, overloading, and electrocution.

### What's New in the Standard?

Safety issues that were not previously addressed, include:

- The need to provide safe methods of access to scaffolds.
- Employers now have options to use fall arrest systems as well as guard rails to protect employees working on scaffolds.
- Fall protection methods are required for employees who erect and dismantle scaffolds as well as for those who work on them.
- The new rules specify different training requirements for these two functions, as well as the need for either “qualified” or “certified” trainers in each case.

Another specification defines the allowable distance, or the “gap,” between a scaffold and a work surface.

The standard is complex, with many exceptions, but this *Supervisor's Safety Update* will review the highlights of the standard, to help supervisors better understand what is required and how they can best safeguard the workers they supervise.

### OSHA's Top Five Scaffolding Violations

- **Fall protection.**
- **Access and Egress from the working platform.**
- **Scaffold planking.**
- **Firm foundations.**
- **Scaffold training.**

## **DEFINITIONS**

Key definitions contained in the standards:

**Competent person** means 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.

**Guardrail system** means 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 a walkway to lower levels.

**Maximum intended load** means 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** means the edges of a platform that are more than 14 inches (36 cm) 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 (46 cm).

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

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

**Qualified** means 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.

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

## **PLATFORM WEIGHT CAPACITY**

In general, all scaffolds and scaffold components must be capable of supporting the weight of the structure *and* at least 4 times the maximum intended load applied. Additional capacity requirements apply to suspension type scaffolds and their associated hardware. The stall load of any scaffold hoist must not exceed 3 times the rated load.

If you design and construct your own scaffold, it must be designed by a qualified person and must be constructed and loaded in accordance with the design. Additional specific criteria for scaffold capacity specifications are contained in a non-mandatory appendix to the new standards.

## **PLATFORM CONSTRUCTION**

All working level platforms of scaffolds must be fully planked or decked between the front uprights and the guardrail supports. If the platform is composed of several individual platform units, such as scaffold grade planks, then the maximum space allowed between units or between a unit and an upright is one inch.

However, if you can demonstrate that a wider space is absolutely necessary, then an open space of up to nine inches is allowed. An example of this situation would be when a space of more than one inch is necessary to fit around the uprights when side brackets are used to extend the width of the entire platform.

**The use of shore or lean-to scaffolds is not allowed.**

## **PLATFORM WIDTH**

In most cases, a scaffold platform must be at least 18 inches wide. However, the standard has a minimum width requirement of 12 inches for ladder jack scaffolds, top plate bracket scaffolds, roof bracket scaffolds, and pump jack scaffolds.

OSHA has temporarily delayed the roof bracket scaffold width requirement based upon manufacturers' claims that most existing roof bracket scaffolds are either 8 or 10 inches wide and are functioning adequately.

## **THE GAP ON THE OPEN-SIDED EDGE**

The maximum allowable space between the working edge of a platform and the face of the work surface is 14 inches, unless a guardrail system or personal fall arrest system is utilized for fall protection on this edge. Exceptions are:

- a maximum space of only 3 inches applies to outrigger scaffolds;
- a maximum space of up to 18 inches from the face of the work surface is allowed for plastering and lathing operations.

Each platform end must extend over its support by at least 6 inches unless it is cleated or otherwise restrained from movement by hooks or equivalent means.

The end of each platform that is 10 feet or less in length must not extend over its support by more than 12 inches. The end of each platform that is more than 10 feet in length must not extend over its support by more than 18 inches. However, in both cases, the maximum extension distance over the support may be increased if the platform is designed and installed so that the cantilevered portion is able to support employees and materials without tipping, or if a guardrail system is installed to block employees from accessing the cantilevered end.

### **ACCESS TO SCAFFOLDS**

Whenever a scaffold platform is more than 2 feet above or below the point of access, a suitable ladder, stair tower, ramp, walkway, personnel hoist, or other suitable structure is required for access. Cross braces must not be used as a means of access.

Rules applicable for access when employees are erecting or dismantling scaffolds as follows:

- Safe means of access must be provided if feasible and if it does not create a greater hazard for employees. A competent person will make this determination, based upon site conditions and the type of scaffold being erected or dismantled;
- Hook-on or attachable ladders must be installed as soon as scaffold erection has progressed to a point that permits safe installation and usage;
- When erecting or dismantling tubular welded frame scaffolds, end frames with horizontal members that are parallel and not more than 22 inches apart vertically may be used as climbing devices for access if they are erected in a manner that creates a usable ladder and provides good hand hold and foot space; and
- Cross braces on tubular welded frame scaffolds shall not be used as a means of access.

### **SAFETY INSPECTIONS**

Scaffolds and their components must be inspected for visual defects by a competent person before every work shift and after any incident that may have affected the structural integrity. Any part of a scaffold that is damaged or weakened below the applicable strength provisions is to be immediately repaired, replaced, or removed from service.

- Working on a scaffold is prohibited whenever covered by snow, ice, or other slippery material except as necessary to remove such materials.
- Accumulation of debris on platforms is not allowed.
- Makeshift devices or items, such as boxes or barrels, must not be used on scaffold platforms to increase the working height of an employee.
- Ladders must not be used on scaffolds. Ladders are allowed on large area scaffolds if special criteria for securing and stabilizing them are met.

### **FALL PROTECTION**

Some type of fall protection, such as a guardrail system, is required for each employee who works on a scaffold more than 10 feet above a lower level.

- Each employee on a boatswains' chair, catenary scaffold, float scaffold, needle beam scaffold, or ladder jack scaffold must be protected from falling with a personal fall arrest system.
- Each employee on a single-point or two-point adjustable suspension scaffold must be protected by *both* a personal fall arrest system and guardrail system.
- Each employee on a crawling board (chicken ladder) must be protected by a fall arrest system, guardrail system, *or* by a ¾ inch diameter grab line or equivalent handhold securely fastened beside the crawling board.

Rules are applicable for providing fall protection to employees who erect or dismantle supported scaffolds. A “competent person” must determine the feasibility and safety of providing fall protection.

All personal fall arrest systems used on scaffolds must meet the requirements contained in the OSHA Construction Fall Protection Standard (29 CFR Part 1926 - Subpart M).

## **ANCHORAGE POINTS & LANYARDS**

A lanyard may be attached to a scaffold structural member in a personal fall arrest system. However, the scaffold structural member must be capable of supporting at least 5000 pounds per employee attached and this particular requirement makes it very difficult for most structural members to meet the necessary requirements for an anchorage point.

- Vertical lifelines must be fastened to a fixed safe anchorage point that is independent from the scaffold.
- Horizontal lifelines must be secured to two or more scaffold structural members, or they may be looped around both suspension and independent suspension lines above the hoist and brake attached to the end of the scaffold.
- Horizontal lifelines must not be attached only to the suspension ropes.

## **GUARDRAILS**

If a guardrail system is utilized for fall protection, it must be installed on all open sides and ends of platforms *before* employees other than erection and dismantling crews release the scaffold for use.

- The top edge height of top rails on *supported* scaffolds manufactured or placed in service after January 1, 2000 must be between 38 and 45 inches above the platform surface.
- The top edge height of top rails on *suspension* scaffolds and on scaffolds manufactured or placed in service before January 1, 2000 must be between 36 and 45 inches above the platform surface.
- Top rails must be strong enough to withstand a force of at least 200 pounds applied in any downward or horizontal dimension. When midrails are used, they must be installed at approximately half the height between the top edge of the top rail and the platform surface.
- When screens and mesh are used, they must extend along the entire opening between the supports and from the top rail to the scaffold platform.
- Midrails, screens, and mesh must be strong enough to withstand a force of at least 150 pounds applied in any downward or horizontal dimension.
- All guardrails are required to be surfaced in order to prevent punctures, lacerations, and snagging of clothing.
- Cross bracing is acceptable as a top rail when the crossing point is between 38 and 45 inches above the work platform, or is acceptable as a midrail when the crossing point is between 20 and 30 inches above the work platform. The end points at each upright must be no more than 48 inches apart.

Cross braces may be used as a substitute for either a top rail or a midrail, but not for both at the same location.

## **PROTECTION FROM FALLING OBJECTS**

In addition to wearing a hard-hat, each employee on a scaffold must be provided with additional protection from falling hand tools, debris, and other small objects by the utilization of toe-boards, screens, guardrail systems, debris nets, catch platforms, or canopy structures that contain or deflect falling objects.

- Large potential falling objects must be placed away from the surface edge and secured to prevent falling.
- Toe-boards must: be at least 3 ½ inches above the working surface; be securely fastened in place at the outer most edge of the platform; have not more than ¼ inch clearance above the working surface; and be capable of withstanding a force of at least 50 pounds applied in any downward or horizontal direction at any point.

Toe-boards must be solid or with openings of no more than 1 inch wide in the greatest dimension.

## **AERIAL LIFTS**

Aerial lifts are vehicle-mounted aerial devices, which elevate employees above the ground. Aerial lifts include extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers, and a combination of any such devices. They may be powered or manually operated and may be capable of rotating about a substantially vertical axis.

If modified for use other than those intended by the manufacturer, the modification must be at least as safe as the equipment was before modification. Also, the modification must be certified in writing by the manufacturer or by any other equivalent entity to be in conformity with all applicable provisions of the American National Standards Institute (ANSI).

- All extensible and articulating boom platforms must have the lift controls tested each day prior to use and must be operated by authorized employees.
- Upper controls that are within easy reach of the operator in the platform and lower controls that provide for overriding of the upper controls are both required.
- Employees must stand firmly on the floor of the basket and wear a harness and lanyard that is attached to the boom or basket.
- Tying off to an adjacent pole, structure, or equipment is not permitted.
- The aerial lift must be placed on a firm level surface.

## **TRAINING REQUIREMENTS**

Each employee who *performs work* while on a scaffold must be trained by a person “qualified” in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.

Training must include:

- the nature of any electrical hazards, fall hazards, and falling object hazards in the work area;
- the correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being utilized;
- the proper use of the scaffold and proper handling of materials on the scaffold;
- the maximum intended load and load-carrying capacities of the scaffold used;
- any pertinent requirements of Subpart L.

Each employee who is involved in *erecting, disassembling, moving, operating, repairing, maintaining, or inspecting* a scaffold must be trained by a “competent person” to recognize any hazards associated with the work. Training must include:

- the nature of scaffold hazards; correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold;
- the design criteria, maximum intended load-carrying capacity, and intended use of the scaffold;
- Any pertinent requirements of Subpart L;

Retraining of an employee is required whenever there is reason to believe that the employee lacks the skill or understanding needed for safe use, erection, or dismantling of scaffolds. Retraining is required if changes in the work site, type of scaffold, fall protection, falling object protection, or other equipment present a hazard that the employee has not been previously trained to recognize and control. Retraining is also required where inadequacies in an affected employee’s work indicate a lack of the requisite proficiency.

## **CONCLUSION**

A few additional specific requirements are applicable to each of the 25 specific types of scaffold listed in the standards. Due to the extensive length of these standards, we have not covered all of the specific requirements in this document. We have reviewed the general highlights, however and emphasize that all OSHA standards contain the minimum compliance requirements.

## **STATE PLANS MAY BE STRICTER**

State plans are allowed to have *more* stringent requirements, so check your local standards carefully. For example, the old OSHA standards required scaffold platforms with a minimum horizontal dimension in either direction of less than 45 inches, when the platform was 4 to 10 feet above a lower level, to have standard guardrails on all open sides and ends. While this specific requirement has been removed from the revised OSHA standards, individual states may have retained it.

For additional information or assistance, please contact your SeaBright Loss Control Consultant.