SPECIAL Report

NATIONAL ROOFING CONTRACTORS ASSOCIATION

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This special report provides an overview of the new OSHA scaffold standard; it includes comparisons to the previous rule. The new rule was issued by the Occupational Safety and Health Administration (OSHA) on August 30, 1996 and became effective on November 29, 1996.

BACKGROUND

On November 25, 1986, OSHA published a Notice of Proposed Rulemaking (NRPM) to revise and update the existing scaffold standard for the construction industry found at 29 CFR 1926.450-.454, Subpart L. Submission of written comments was requested by OSHA until May 9, 1988.

On March 29, 1993, however, OSHA reopened the rulemaking record seeking additional information and comments regarding fall protection and safe means of access for employees erecting and dismantling scaffolds, the use of crossbraces in scaffold systems, and the use of repair bracket scaffolds. The comment period ended on June 29, 1993.

OSHA reopened the rulemaking record again on February 1, 1994, seeking information on scaffold stairways, repair bracket scaffolds, tank builder scaffolds, a NIOSH study of workplace fatalities, and scaffold-related materials incorporated from 29 CFR Part 1910. This final comment period ended March 18, 1994.

OSHA issued its final rule on August 30, 1996. Some of the more significant changes in the new standard include eliminating outdated, redundant, and unnecessary provisions, such as guardrail requirements that were listed 19 times in the old standard.

OVERVIEW

The new standard is divided into five sections: definitions, general requirements, specific requirements for particular scaffolds, aerial lifts, and training. In addition, there are five nonmandatory appendices. The standard begins at 1926.450 with an alphabetical listing of more than eighty applicable definitions, including the following roofing-specific terms: competent person, crawling board, fabricated frame scaffold, ladder jack scaffold, pump jack scaffold, qualified person, and roof bracket scaffold. Each is described below.

The standard provides general requirements applicable to all scaffold systems. This section provides the requirements for scaffold capacity, platform construction, supported scaffolds,

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suspension scaffolds, access, use, and fall protection, including falling object protection.

Section 1926.452 describes additional, detailed information applicable to specific types of scaffolds. It is here where the requirements for scaffolds typically used on roofing jobsites are addressed, e.g., fabricated frame scaffolds (formerly tubular welded frame scaffolds), roof bracket scaffolds, pump jack scaffolds, ladder jack scaffolds, crawling boards and mobile scaffolds. The requirements for each of these scaffold systems are described below.

The requirements for aerial lifts are provided in detail in section 1926.453. The information contained in this section stands alone; it does not apply to any part of 1926.451 or 1926.452.

Finally, in section 1926.454, training requirements are provided for those employees working with or on scaffold systems. The training requirements coincide with the type of work performed.

Five nonmandatory appendices follow the standard. Appendix A gives detailed technical information pertinent to a variety of scaffold systems. This appendix, although provided as nonmandatory, makes it very clear that when its specifications are not followed, a registered professional engineer must be employed to design and approve the scaffold system.

On September 2, 1997, Nonmandatory Appendix B is scheduled to be completed. This appendix will provide nonmandatory criteria for determining the feasibility of providing safe access and fall protection for scaffold erectors and dismantlers. NRCA will provide an update to this report when Appendix B is published.

Nonmandatory Appendix C applies only to aerial lifts and Nonmandatory Appendix D provides a list of training topics for scaffold erectors and dismantlers. Finally, Nonmandatory Appendix E provides illustrations with details pertaining to scaffold systems.

DEFINITIONS

Competent person — one who is capable of identifying existing and predictable hazards in the workplace that are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

Crawling board (chicken ladder) — a supported scaffold for use on sloped surfaces, such as roofs, consisting of a plank with cleats spaced and secured to provide footing.

Fabricated frame scaffold (tubular welded frame scaffold) — a scaffold consisting of a platform(s) supported on fabricated end frames. The end frames consist of vertical, horizontal load bearing, and posts.

Ladder jack scaffold — a supported scaffold consisting of a platform resting on brackets attached to ladders.

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. An example of transmitted or other reasonably anticipated load is the wind load imposed on a scaffold system when a wind screen is attached to it.

Mobile scaffold — a powered or unpowered, portable, caster or wheel-mounted supported scaffold.

Pump jack scaffold — a supported scaffold consisting of a platform supported by vertical poles and movable support brackets.

Qualified person — one who, by possession of a recognized degree, certificate, professional standing, or extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject.

Roof bracket scaffold — a rooftop supported scaffold consisting of a platform resting on angular-shaped supports.

Supported Scaffold — one or more platforms supported by brackets, poles, legs, uprights, posts, frames or similar rigid support.

Suspended Scaffold — one or more platforms suspended by ropes or other nonrigid means from an overhead structure(s).

Walkway — is a portion of a scaffold platform used only for access and not as a work level.

GENERAL SCAFFOLD REQUIREMENTS

The following general requirements, found in 1926.451, are applicable to all scaffold systems. Requirements for aerial lifts are listed exclusively in 1926.453 and are discussed separately.

Capacity 1926.451 (a)

There have been no substantive changes to this section from the old one other than to remove ambiguous or inconsistent statements. However, OSHA now requires a qualified person to design the scaffold and for it to be loaded within the limits of the design. In Appendix A, OSHA has provided requirements for various scaffolds.

The standard requires each scaffold and scaffold component to be capable of supporting four times its maximum intended load. The new standard uses the term "maximum intended load," which was previously referred to as "working load."

Scaffold Platform Construction 1926.451 (b)

In this section, OSHA requires all work platforms to be fully planked or decked. The spacing between planks or decking cannot exceed 1 inch (25.4 mm) except where hardware, such as couplers or side brackets, prevents this. Regardless, no spacing can exceed 9 1/2 inches (241 mm).

Scaffold platforms and walkways must be at least 18 inches (457 mm) wide. Typically, a scaffold plank is about 10 inches (254 mm) wide and, therefore, at least two are needed to comply with the width requirement. However, ladder jack, top plate bracket, roof bracket and pump jack scaffold platforms must be at least 12 inches (305 mm) wide.

If the platforms and walkways are not at least 18 inches (457 mm) wide, personal fall arrest systems must be used and/or guardrails provided. When the scaffold system is more than 14 inches (356 mm) away from the structure it faces, personal fall arrest systems or guardrails must be used.

Platforms must extend at least 6 inches (152.4 mm) beyond the edge of the scaffold system unless they are cleated or equipped with hooks to prevent movement. However, platforms less than 10 feet (3.05 m) long must not extend more than 12 inches (305 mm) beyond the scaffold support. When platforms do exceed 10 feet (3.05 m), they cannot extend more than 18 inches (457 mm) beyond the support.

When scaffold planks are abutted in order to create a longer platform, each abutted end must rest on separate supports. Or if the scaffold platforms are overlapped to create a longer platform, the overlap must be a minimum of 12 inches (305 mm) and can rest on one support.

Platforms cannot be covered with opaque finishes like paint that obscure the ability to inspect the board. However, edges may be covered or marked for identification purposes. Non-opaque products like wood preservative, fire-retardant, slip-resistant finishes are allowed.

OSHA does allow the use of scaffold components from different manufacturers to be intermixed, provided they are compatible and the structural integrity of the scaffold is not compromised.

If intermixed parts are modified to fit a system, a competent person must determine that the structural integrity has not been compromised. For example, the competent person must determine that galvanic action, caused by using dissimilar metals, will not reduce the strength of any component.

Criteria for Supported Scaffolds 1926.451 (c)

OSHA made changes in this section from what previously existed. If a scaffold system exceeds a 4-to-1 height-to-base ratio, it must be secured to the structure it faces at the 4-to-1 vertical point. If the 4-to-1 height-to-base ratio is not exceeded, anchors are not required. OSHA requires securement to the structure be made on the horizontal post at all times, unless the scaffold system prohibits it, such as, fabricated frame end scaffolds where only vertical supports and crossbracing are used.

Additional vertical anchors must be installed at intervals not to exceed 20 feet (6.1 m), if the scaffold system is 3 feet (0.91 m) wide or less. Or, if the scaffold system is greater than 3 feet (0.91 m) wide, guying, tying, or bracing must be installed at intervals not to exceed 26 feet (7.9 m).

If the scaffold system exceeds the 4-to-1 height-to-base ratio, horizontal securement is also required. Anchors are required at each end of the scaffold regardless of length, but only after the 4-to-1 height-to-base ratio is exceeded. If the scaffold length exceeds 30 feet (9.1 m) horizontally, additional anchors must be installed at intervals not to exceed 30 feet (9.1 m).

For example, if a scaffold is 5 feet (1.52 m) wide, 50 feet (15.2 m) long, and 18 feet (5.5 m) high, an anchoring system would not be required because the 4-to-1 height-to-base ratio has not been exceeded. If, however, the scaffold is 5 feet (1.52 m) wide, 25 feet (7.6 m) long, and 50 feet (15.2 m) high, and anchoring would be required by guying, tying, or bracing because the 4-to-1 ratio has been exceeded.

In the second example, OSHA requires vertical anchoring nearest the 4-to-1 height-to-base ratio. And, because the scaffold is 5 feet (1.52 m) wide, OSHA requires additional anchors at intervals not to exceed 26 feet (6.1 m). Because the scaffold is less than 30 feet (9.1 m) long, additional horizontal anchors would not be needed. In this example, four anchors would be used: one at the 20- and 46-foot (6.1- and 14 m) vertical points on each end of the scaffold.

If the scaffold dimensions measured 5 feet (1.52 m) wide, 70 (21.3 m) feet long, and 50 (15.2 m) feet high, anchors would be required at the 20- and 46-foot (6.1- and 14 m) levels vertically. And, because the scaffold length is greater than 30 feet (9.1 m), additional horizontal anchors are required at the 0-, 30-, 60- and 70-foot (0-, 9.1-, 18.3-, and 21.3 m) distances. A total of eight anchors is required on this system.

The scaffold is only as sturdy as its foundation. Where possible, select a firm foundation, such as compacted soil or concrete, which will properly support the load. Avoid sand, loose rocks, and sides of excavations or other unstable ground.

Often on new construction projects, it is difficult to find a solid foundation and, therefore,

cribbing may be necessary. Be aware that changing weather conditions can compromise the ground's stability, for example, when frozen grounds begin to thaw or heavy rains erode soil.

Scaffold manufacturers supply base plates with screw jacks to level the scaffold. On unstable ground, mudsills with screw jacks can provide a more stable foundation for the scaffold. An example of a typical mud sill is an old 10 by 10-inch (254 by 254-mm) piece of scaffold-grade lumber placed under the base plates. Some ground conditions, however, may warrant the use of a mudsill made of a continuous scaffold plank that runs the entire length of the scaffold system.

If mudsills are used, it is important to secure the base plate to the mudsill to prevent the scaffold system from "walking", or moving, as loads on the scaffold shift.

OSHA requires the scaffold system to be braced, plumb, and square to prevent it from swaying or moving. In order to do this, make sure all scaffold components are used. If wind screens are used, make sure that wind forces imposed on the scaffold system are taken into consideration.

Suspension Scaffolds

Suspension scaffolds are rarely, if ever, used in the roofing industry. Please refer to 1926.451 (d) for specific requirements or call NRCA with any questions.

Access — 1926.451 (d)

Safe access must be provided to all scaffold systems using portable ladders, hook-on ladders, or ladders that attach to the structure whenever there is a gap of more than two feet (0.6 m). Hook-on or attachable ladders cannot be used in anyway that could tip the scaffold structure. The bottom rung of the ladder must be less than 24 inches (61 mm) above the supporting level of the scaffold. Also, for very tall scaffolds, rest platforms must be provided at levels not to exceed 35 feet (10.7 m).

Stair towers, stairway-type ladders, ramps, and walkways are also addressed in this paragraph. For details, please refer to paragraph 1926.451 (d).

Scaffold manufacturers will fabricate ladders into the end frames of various systems and, therefore, discourage the intermixing of scaffold components. When prefabricated ladders are used, OSHA requires uniformity throughout the structure. For example, the distance between the rungs cannot exceed 16 3/4 inches (34 mm) and the end frames must match for the entire height of the scaffold.

The requirements for safe access for workers designated as scaffold erectors or dismantlers is scheduled to be completed by September 2, 1997. In the meantime, a competent person

must determine whether or not it is feasible to provide safe access using one of the above methods. Crossbracing, however, can never be used as access to scaffolds by anyone.

Use

Scaffolds can only be used within the limitations of their maximum intended loads or rated capacities, whichever is less. All scaffolds and scaffold components must be inspected by a competent person before each workshift or after any occurrence that could affect its structural integrity. If there are any damaged or weakened scaffold parts, they must be removed.

Unless designed by a registered professional engineer, a scaffold cannot be moved horizontally while employees are on the system. However, mobile scaffolds are excepted from this requirement because of their design as long as safe work practices are employed. An example of a safe work practice is informing all employees on the scaffold before it is moved.

When working around power lines, OSHA requires a minimum distance of 10 feet (3.1 m) plus an additional 4 inches (101.6 mm) for every kilovolt above 50 kilovolts. Keep in mind that consideration must be given to the employees' activities while on the scaffold platform. Even though the scaffold is 10 feet away from the line, if an employee's duties breach that safety zone when lifting materials up on the side of the scaffold, for example, it may be necessary to relocate the scaffold. In some cases, it may be necessary to contact the local utility company to de-energize the power line.

Whenever a scaffold must be moved, altered, erected, or dismantled, it must be performed only under the direct supervision of a competent person. The competent person must be on the project when these activities occur and qualified in scaffold erection, moving, dismantling or alteration. Trained and experienced employees must be selected by the competent person to perform these activities.

Employees are not allowed to work on scaffolds when the scaffold is covered with ice, snow, or other slippery materials unless they are attempting to remove these conditions. In addition, tag lines must be used when swinging loads near the scaffold.

During high winds, it is prohibited to work on a scaffold unless a competent person determines that it is safe. In this case, the employees must be protected by fall-arrest systems or wind screens. Remember, that the use of wind screens will impose greater forces on the scaffold system and, therefore, must be appropriately designed and anchored.

Ladders may not be used on scaffolds to increase working level heights unless the following criteria is met:

1. The ladder can not be a part of the structure; it must be secured against

movement.

2. The platform units must be secured from movement.

3. Both ladder legs must rest on the same platform.

4. The ladder legs must be secured preventing them from movement or slippage.

Fall Protection 1926.451 (g)

OSHA requires fall protection for each employee working on a scaffold at least 10 feet (3.05 m) above a lower level. Guardrails and personal fall arrest systems can be used as required in Subpart M — Fall Protection. Fall protection methods for various roofing-related scaffolds will be described below.

Effective September 2, 1997, a competent person must determine if fall protection is feasible for employees erecting or dismantling scaffold systems. Fall protection is not required when a competent person determines that it is infeasible or creates a greater hazard.

Some scaffold systems provide crossbracing to ensure the system's rigidity. Crossbracing can serve as a guardrail component under the following conditions:

1. If the crossbracing crosses at a height of 20 inches (0.5 m) to 30 inches (0.8 m) above the work platform, it can be used as a midrail.

2. If the crossbracing crosses at a height of 38 inches (0.97 m) to 48 inches (1.3 m) above the work platform, it can be used as a toprail.

When guardrails are used, they must be built in accordance with Appendix A or the provisions in 1926.451(g)(4), and erected around the entire work platform.

In Appendix A, OSHA provides information to help satisfy the 200 pound (890 n), 1926.451(g)(4) requirement for toprail resistance. Appendix A recommends using a toprail with the strength of at least a 2 by 4-inch (50.8 by 101.6-mm) piece of lumber. Alternatives listed are 1 1/4 by 1/8-inch (31.75 by 3.175-mm) structural angle iron; 1 by 0.070-inch (25.4 by 1.8-mm) wall steel tubing; or 1.990 by 0.058-inch (50.55 by 1.47-mm) wall aluminum tubing. Using these materials with posts no greater than 8 feet (2.4 m) apart will meet the 200-lb (890 n) strength requirement.

OSHA requires the toprail of a scaffold system to be placed between 36 and 45 inches (0.9-1.2 m) above the work platform. After January 1, 2000, toprails must be installed between 38 and 45 inches (0.97 and 1.2 m) above the platform surface.

Falling Object Protection 1926.451 (h)

All employees working on scaffolds are required to wear hardhats to protect themselves from falling objects. In addition to hardhats, employees must be protected from falling objects by the use of toeboards, screens, or guardrail systems; or erecting debris nets, catch platforms, or canopy structures designed to catch or deflect debris; or barricades on the ground to keep the public and employees out of a potentially dangerous area.

COMPETENT PERSON

OSHA places the responsibility on the contractor of determining who in their organization is a competent person. Attending a scaffold safety course does not necessarily qualify an employee as a competent person; it is the contractor who makes the determination based on the employee's training, experience, and qualifications.

The scaffold standard requires a competent person to determine the structural integrity of a system, conduct damage assessments, and identify and correct deficiencies. The most important responsibility a competent must be given is the authority to take prompt, corrective measures.

This following identifies specific duties of a competent person regarding supported scaffold systems.

1926.451(b)(10)	When intermixing components from various manufacturers, a competent person must determine if the scaffold is structurally sound.
1926.451(b)(11)	When intermixing component parts from different manufacturers, the competent person must determine if galvanic action, i.e., corrosion, will decrease their strength. OSHA expects the competent person to be capable of identifying the causes and significance of any deterioration present in each component.
1926.451(e)(9)(i)	The competent person must determine the appropriate means of access for employees erecting or dismantling scaffolds (based on site-specific conditions).
1926.451(f)(3)	The competent person must inspect each scaffold component before each workshift for visible defects and after any occurrence that could affect its structural integrity.
1926.451(g)(4)(xiv)	If manila or synthetic ropes are used for either the mid- or toprail, they must be inspected frequently to ensure they meet the standard's strength requirements.
1926.451(f)(7)	A competent person must be on site whenever scaffold erection, moving, dismantling, or alterations take place and be qualified to direct these activities.
1926.451(g)(2)	A competent persons must determine the feasibility of providing fall

protection for scaffold erectors and dismantlers.

1926.451(f)(12) During high-wind conditions, the competent person must determine if it is safe for employees to work on scaffolds by taking into consideration wind loads and scaffold anchoring conditions.

SPECIFIC SCAFFOLD REQUIREMENTS

In 1926.452, OSHA provides additional information and requirements that go beyond the general requirements provided in section 1926.451. The following roofing-related scaffold system requirements, including the recommendations from Appendix A will be described.

1. Fabricated frame scaffolds, 1926.452 (c)
2. Roof jack scaffolds, 1926.452 (h)
3. Pump jack scaffolds, 1926.452 (j)
4. Ladder jack scaffold, 1926.452 (k)
5. Crawling boards, 1926.452 (m)
6. Mobile scaffolds, 1926.452 (w)

For other scaffold systems not listed, please refer to the standard.

Fabricated Frame Scaffolds

Known as the tubular welded frame scaffold in the old standard, the requirements have remained virtually unchanged. In addition to the general requirements for supported scaffolds described earlier, the following also apply:

1. All scaffolds are to be plumb, rigid, and square.

2. Scaffold parts from different manufacturers should not be intermixed on fabricated frame scaffold systems because the methods used to plumb and square them depends on the use of all of the components for that system.

3. Crossbracing, when properly installed, will automatically square and align the vertical members.

4. Platforms cannot be moved until all of the braces have been set and secured, and the system is square.

5. End frames and side panels must be secured together by using coupling or stacking pins.

Scaffold systems in excess of 125 feet (38.1 m) in height must be designed by a registered professional engineer and loaded according to that design.

Nonmandatory Appendix A provides no additional information for fabricated frame scaffold.

Roof bracket scaffolds

Roof bracket scaffolds must be built to fit the slope of the roof. The brackets must be secured to the roof by nails, unless it is impractical to use them. First-grade manila rope with a minimum diameter of 3/4-inch (19.1 mm) or equivalent can be used as an alternative.

Personal fall arrest systems or guardrails can be used as fall protection options for roofs with slopes greater than 4-in-12.

No additional information is provided in Nonmandatory Appendix A for roof bracket scaffolds.

Pump jack scaffolds

Angle iron and metal plates must be used to fabricate brackets, braces, and accessories. Triangular braces or an equivalent must be used to secure the poles to the structure, at least at the top and bottom of each pole. Whenever necessary, additional brackets must be used to ensure the scaffold's stability.

A workbench may be used in lieu of a guardrail provided it meets the strength requirements of a toprail. The workbench must be between 36 inches (0.9 m) and 45 inches (1.2 m) above the work platform and meet the guardrail performance of withstanding 200 pounds (890 n) force in any direction.

If wooden poles are used, they must be free of defects, such as, severe splintering or large loose knots, that may impair the strength of the system and cannot exceed 30 feet (9.1 m) in height. Poles constructed of two continuous lengths, must be joined together at the seam parallel to the bracket. If 2 by 4-inch (50.8 by 101.6-mm) pieces of lumber are joined to make 4 by 4-inch (101.6 by 101.6-mm) poles, mending plates must be used for added strength.

Nonmandatory Appendix A requires that two-by-fours to be nailed together using 10 penny common nails. The nails must be set 12 inches (0.3 m) on-center, staggered uniformly from the opposite outside edges.

Additionally, the maximum intended load cannot exceed 500 pounds (2,450 n), applied at the center of the span between poles. And no more than two employees are allowed on the scaffold between the poles at a time.

Ladder jack scaffolds

Ladder jack scaffold platform height is limited to 20 feet (6.1 m). The ladders must meet

the requirements of Subpart X — Stairways and Ladders, and job-made ladders cannot be used to support ladder jack scaffolds.

When constructing the ladder jack scaffold, the brackets may rest on the ladder's side rails and rungs, or on the rungs alone. If the brackets rest on the rungs alone, the area bearing the load must include at least 10 inches (254 mm) of each ladder rung.

Ladder jacks scaffolds cannot be constructed where two platforms rest on one ladder. For example, if three ladders were placed next to each other and one platform placed between each, the middle ladder would bear more weight than the outside two ladders and is prohibited.

Nonmandatory Appendix A limits the maximum span between ladders to 8 feet (2.4 m). Also, the maximum intended load is limited to 25 lbs/ft^2 (1.2 kg/m^2) and two employees at any time.

A personal-fall arrest system must be worn for fall protection.

Crawling boards

The standard requires crawling boards to extend from the roof peak to the eaves. The crawling board must be attached to the roof with nails and ridge hooks. Clinching the nails on the underside of the roof is no longer required.

Nonmandatory Appendix A requires the boards to be no less than 10 inches (254 mm) wide and 1 inch (25.4 mm) thick. The cleats must be as wide as the board and at least 1 inch (0.25.4 m) in width by 1 1/2 inches (38.1 m) in height. They must also be equally spaced no more than two feet (0.61 m) apart.

Mobile scaffolds

Mobile scaffolds must be erected so that the system is square, plumb, and level. If the mobile scaffold is constructed using fabricated frame components, the requirements listed above must be also be followed.

When the scaffold system is stationary, its casters and wheels must remain locked to prevent movement. When moving the scaffold, push or pull it at a point no higher than five feet (1.52 m) above the ground.

Employees are allowed to ride on the system during movement, if the following conditions are met:

1. The ground is within 3 degrees of level and free of pits, holes, or obstructions;
2. The height-to-base ratio is 2-to-1 or less, or the scaffold design is built

according to ANSI/SIA A92.5 and A92.6;

3. If scaffold outriggers are used, they must be installed on both sides of the scaffold system;
4. If power systems are used to propel the scaffold, the speed cannot exceed 1 foot per second (0.3 meters per second); and
5. No employee is on any part of the scaffold which extends beyond the wheels, casters, or other supports.

Platforms must not extend beyond the wheels or casters of the scaffold system unless outriggers are used to increase the stability of the system. When preparing to move the scaffold, warn all employees.

AERIAL LIFTS

Previously, the requirements for aerial lifts were found in two separate locations: 1926.451(f) and 1926.556. The requirements were identical and referenced ANSI A92.2-1969, Vehicle Mounted Elevating and Rotating Work Platforms. In an effort to alleviate the confusion, OSHA deleted 1926.451(f) and moved 1926.556 to 1926.453.

The requirements for "extensible and articulating boom platforms" have not significantly changed except that body belts must be used in accordance with Subpart M Fall Protection. Body belts can only be used as a tethering or restraint system and not as a fall-arrest device.

In Appendix C, OSHA identified seven national consensus standards that can be referenced in addition to the A92.2-1969 ANSI Standard for various aerial lift use.

TRAINING REQUIREMENTS

OSHA requires employees who erect, dismantle, or work on scaffolds to be trained. The standard specifies three training levels.

1. Employees working on a scaffold systems must be trained by a qualified person in the following areas:

    A. Fall, electrical, or falling object hazards;
    B. Hazards associated with erecting, maintaining, and disassembling the scaffold;
    C. How to properly handle materials on and use the scaffold;
    D. The maximum intended load and load-carrying capabilities of the scaffold system; and
    E. Any other pertinent information.

2. Employees erecting, dismantling, inspecting, moving, operating, maintaining, or repairing scaffolds must be trained by a competent person on the following topics, as

applicable:

A. The nature of scaffold hazards;
B. Correct erecting, dismantling, inspecting, moving, operating, maintaining, or repairing scaffolds;
C. The design criteria, maximum intended load, carrying capacity and intended use of the scaffold; and
D. Any other pertinent information.

3. Additional training is needed:

A. When new hazards arise;
B. When changes in the scaffold system, fall protection system or falling object protection occur; and
C. When an employee's work practices indicate there is a need for additional training.

Nonmandatory Appendix D lists additional topics for employees erecting or dismantling supported scaffold systems. They are:

General Overview of Scaffolds
Tubular Welded Frame Scaffolds (Fabricated Frame Scaffolds)
Tube and Clamp Scaffolds
System Scaffolds

Nonmandatory Appendix E provides illustrations of particular types of scaffolds and scaffold components and graphic illustrations of bracing patterns and tie spacing patterns. This appendix is intended to provide visual guidance to assist the user in complying with the requirements of Subpart L.

CONCLUSION

The new scaffold standard became effective November 29, 1996. One of the more significant changes to the standard is the training requirements. Also important is the new competent person requirements.

The standard is broken into five sections, beginning with definitions, general requirements, specific requirements, aerial lifts, and training.

The definitions identify over eighty scaffold-related terms, including competent person and qualified person, both of which play a significant role in the scaffold standard. Roofing-related terms are also referenced and have been described above.

The standard describes general requirements for all scaffold systems. These requirements

are broken into two major sections: suspended and supported scaffolds. The roofing industry typically uses supported scaffolds. Suspended scaffolds are not addressed in this report though other industries, such as window washing, use them.

Specific requirements follow in section 1926.452, providing detailed information on scaffolds. In this section, specific requirements for all scaffolds are referenced, including all roofing-related scaffolds.

Aerial lifts have specific scaffold requirements that do not apply to any other scaffold, except for training. Training requirements are defined for three different groups of employees: those erecting or dismantling, working on the scaffold, and those needing additional training in certain instances.

Five nonmandatory appendices follow the regulations. Appendix A provides technical information that supplements the general and specific requirements; while it is referred to as "nonmandatory", the requirements are mandatory unless a professional engineer determines otherwise. All scaffolds are referenced, including roofing-related scaffold systems.

Appendix B will provide information for safe access and egress for employees erecting and dismantling scaffold systems. This information will be available September 2, 1997. Appendix C provides a list of consensus standards for aerial lifts. Appendix D provides a suggested list of topics to train employees who erect and dismantle scaffold systems. Appendix E provides illustrations for some scaffold systems and various details pertaining to those scaffolds. Again, it is also nonmandatory.

OSHA's Subpart L — Scaffolds is a fairly complex standard. If you would like a copy of the standard, or if there are any additional questions, please contact NRCA's Risk Management Department.