PART 1926  SUBPART L  SCAFFOLDS
1926.450 SCOPE, APPLICATION AND DEFINITIONS APPLICABLE TO THIS SUBPART.

(a) Scope and application. This subpart applies to all scaffolds used in workplaces covered by this Part. It does not apply to crane or derrick supported personnel platforms, which are covered by Sec. 1926.550(g). The criteria for aerial lifts are set out exclusively in Sec. 1926.453.

(b) Definitions

Adjustable hoist suspension scaffold means a suspension scaffold equipped with a hoist(s) that can be operated by an employee(s) on the scaffold.

Bearing (putlog) means a horizontal transverse scaffold member (which may be supported by ledgers or runners) upon which the scaffold platform rests and which joins scaffold uprights, posts, poles, and similar members.

Boatstairs (boathouse) means a single-point adjustable suspension scaffold consisting of a seat or sling designed to support one employee in a sitting position.

Body belt (safety belt) means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Booster (support) means a rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

Bricklayers' square scaffold means a supported scaffold consisting of a platform supported by ledgers and a double row of uprights independent of support (except ties, guys, braces) from any structure.

Body belt (safety belt) means a manual or power-operated mechanical device to raise or lower a suspended scaffold.

Horse scaffold means a supported scaffold consisting of a platform supported by construction horses (saw horses). Horse scaffolds constructed of metal are sometimes known as trestle scaffolds.

Independent pole scaffold (see "Double pole scaffold").

Interior hung scaffold means a suspension scaffold consisting of a platform suspended from the ceiling or roof structure by fixed length supports.

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

Ladder stand means a multi-point adjustable suspension scaffold equipped with a hoist(s) that can be operated by an employee(s) on the scaffold.

Lean-to scaffold means a supported scaffold which is erected erect by tilting it toward and resting it against a building or structure.

Lifeline means 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 a means for connecting other components of a personal fall arrest system to the anchorage.

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

Mason's adjustable supported scaffold (see "Self-contained adjustable scaffold").

Mason's multi-point adjustable suspension scaffold means a continuous run suspension scaffold designed and used for masonry operations.

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.

Mobile scaffold means a platform supported or unpowered, portable, caster or wheel-mounted supported scaffold.

Multi-level suspended scaffold means a two-point or multi-point adjustable suspension scaffold with a series of platforms at various levels resting on common struts.

Multi-point adjustable suspension scaffold means a suspension scaffold consisting of a platform(s) which is suspended by more than two ropes from overhead supports and equipped with means to raise and lower the platform to desired work levels. Such scaffolds include chimney hoists.

Needle beam scaffold means a platform suspended from needle beams.

Open sides and ends means the edges of a platform that are more than 14 inches (36cm) 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 (46cm).

Outrigger means the structural member of a supported scaffold used to increase the base width of a scaffold in order to provide support for and increased stability of the scaffold.

Outrigger beam (Thrustout) means the structural member of a suspension scaffold or outrigger scaffold which provides support for the scaffold by extending the scaffold point of attachment to a point out and away from the structure or building.

Overhead braceline means the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall during the overhand braceline process.
Personal fall arrest system means a system used to arrest an employee's fall. It consists of an anchorage, connectors, a body harness or body belt and may include a lanyard deceleration device, life line, 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.

Pole scaffold (see definitions for “Single-pole scaffold” and “Double (independent) pole scaffold”).

Power operated hoist means a hoist which is powered by other than human energy.

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

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.

Rated load means the manufacturer's specified maximum load to be applied or transmitted to a scaffold.

Repair bracket scaffold means a supported scaffold consisting of a platform supported by brackets which are secured in place around the circumference or perimeter of a chimney, stack, tank, or other supporting structure by one or more wire ropes placed around the supporting structure.

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

Runner (ledger or ribbon) means the lengthwise horizontal spacing or bracing member which may support the bearers.

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.

Self-contained adjustable scaffold means a combination supported and suspended scaffold consisting of an adjustable platform mounted on an independent supporting frame(s) not a part of the object being worked on and which is equipped with a means to permit the raising and lowering of the platform(s). Such systems include rolling roof rigs, rolling outrigger systems, and some monases' adjustable supported scaffolds.

Shore scaffold means a supported scaffold which is placed against a building or structure and held in place with props.

Single point adjustable suspension scaffold means a suspension scaffold consisting of a platform suspended by one rope from an overhead support and equipped with means to permit the movement of the platform to desired locations. Such systems include rolling suspended scaffolds.

Single-pole scaffold means a supported scaffold consisting of a platform(s) resting on bearers, the outside ends of which are supported on runnels secured to a single row of posts or uprights, and the inner ends of which are supported on or in a structure or building wall.

Stair tower (scaffold and stairway/tower) means a tower comprised of scaffold components and which contains internal stairway units and rest platforms. These towers are used to provide access to scaffold platforms and other elevated points such as roofs and floors.

Stall load means the load at which the prime-mover of a power operated hoist (except in the case of dollies or trolleys), or the power system, is automatically disconnected.

Step, platform, and trestle ladder scaffold means a platform resting directly on the rungs of step ladders or trestle ladders.

Stilts means a pair of poles or similar supports with raised footrests used to permit walking above the ground or working surface.

Stonesetters' multi-point adjustable suspension scaffold means a continuous run suspension scaffold designed and used for stonesetters operations.

Supported scaffold means one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

Suspension scaffold means one or more platforms supported by ropes or other non-rigid means from an overhead structure(s).

System Scaffold means a scaffold consisting of posts with fixed connection points that do not accept runnels, bearers, and diagonals that can be interconnected at predetermined levels.

Tank builders' scaffold means a supported scaffold consisting of a platform resting on brackets that are either directly attached to a cylindrical tank or attached to devices that are attached to such a tank.

Top plate scaffold means a supported scaffold supported by brackets that hook over or are attached to the top of a wall. This type of scaffold is similar to carpenters' bracket scaffolds and form scaffolds and is used in residential construction for setting brusses.

Tube and coupler scaffold means a supported or suspended scaffold consisting of a platform supported by tubing erected with coupling devices connecting uprights, braces, bearers, and runners.

Tubular welded frame scaffold (see "Fabricated frame scaffold").

Two-point suspension scaffold (swing stage) means a suspension scaffold consisting of a platform supported by hangers (stirrups) suspended by two ropes from overhead supports and equipped with the means to permit the raising and lowering of the platform to desired work levels.

Unstable objects means 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.

Vertical pick up means a rope used to support the horizontal rope in catenary scaffolds.

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

Window jack scaffold means a platform resting on a bracket or jack which projects through a window opening.

1926.451 GENERAL REQUIREMENTS

This section does not apply to aerial lifts, the criteria for which are set out exclusively in Sec. 1926.453.

(a) Capacity

(1) Except as provided in paragraphs (a) (2), (a) (3), (a) (4), (a) (5), and (g) of this section, each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.

(2) No suspension scaffolding between roofs and floors, and counterweights used to balance adjustable suspension scaffolds, shall be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at either the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.

(3) Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.

(4) Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.

(5) (i) Each end of a platform 10 feet or less in length shall not exceed over 18 inches (46 cm). Unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without fall arrest systems, the remaining open space between the platform and the uprights shall be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswain's chairs.

(6) Where the employer makes the demonstration provided for in paragraph (b) (2) (ii), each platform and walkway shall be full plated or decked as fully as possible and the remaining open space between the platform and the uprights shall not exceed 9-1/2 inches (24.1 cm).

Exception to paragraph (b) (1): The requirement in paragraph (b) (1) to provide full planking or decking does not apply to platforms used solely as walkways primarily by employees performing scaffolding erection or dismantling. In these situations, only the planking that the employer establishes is necessary to provide safe working conditions is required.

(2) Except as provided in paragraphs (b) (2) (ii) and (b) (3) of this section, each scaffold platform and walkway shall be at least 18 inches (46 cm) wide.

(i) Deer tail jack scaffold platform shall be full plated or decked as fully as possible and the remaining open space between the platform and the uprights shall be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswain's chairs.

(ii) Where scaffolds must be used in areas that the employer can demonstrate are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, each platform and walkway shall be built as wide as possible, and employees on those platforms and walkways shall be protected from fall hazards by the use of guardrails and/or personal fall arrest systems.

(3) Except as provided in paragraphs (b) (3) (i) and (ii) of this section, the front edge of each platform shall not be more than 14 inches (36 cm) from the face of the work unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used in accordance with paragraph (g) of this section to protect employees from falling.

(i) The maximum distance from the face for outrigger scaffolds shall be 3 inches (7.6 cm).

(ii) The maximum distance from the face for plastering and lathing operations shall be 18 inches (46 cm).

(4) Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least 6 inches (15 cm).

(5) (i) Each end of a platform 10 feet or less in length shall not exceed over its support more than 12 inches (30 cm) unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping, or has guardrails which block employee access to the cantilevered end.

(ii) Each platform greater than 10 feet in length shall not extend over its support more than 18 inches (46 cm), unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end.
On scaffolds where scaffold planks are abutted to create a long platform, each abutted end shall rest on a separate support surface. This provision does not preclude the use of common support members, such as T sections, to support abutting planks, or hook on platforms designed to rest on common supports.

On scaffolds where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches (30 cm) unless the platforms are nailed together or otherwise restrained to prevent movement.

At all 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, and platforms which rest at right angles over the same bearer shall be laid second, on top of the first platform.

Wood platforms shall not be covered with opaque finishes, except that platform edges may be covered or marked for identification. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.

Scaffold components manufactured by different manufacturers shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained by the user. Scaffold components manufactured by different manufacturers shall not be modified in order to intermix them unless a competent person has determined that galvanic action will not reduce the strength of any component to a level below that required by paragraphs (a), (b) of this section.

Criterions supported scaffolds

(1) Supported scaffolds with a height to base width (including outrigger folds) more than 35 feet (10.7m) high, they shall have rest platforms at 35-foot (10.7m) maximum vertical intervals.
(2) Portable, hook-on, and attachable ladders shall be positioned such that their bottom step is not more than 24 inches (61cm) above the scaffold supporting level.
(3) Stairway-type ladders shall:
   (i) Be positioned such that their bottom step is not more than 24 inches (61cm) above the scaffold supporting level.
   (ii) Be provided with rest platforms at 12 foot (3.7m) maximum vertical intervals.
(4) Stairtowers (scaffold stairway/towers) shall be positioned such that their bottom step is not more than 24 inches (61cm) above the scaffold supporting level.
   (i) A stairrail consisting of a toprail and a midrail shall be provided on each side of each scaffold stairway.
(5) Stairrails systems and handrails shall be surfaced to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.
(6) Rapid access to or from another surface shall be used only when the provision of safe access is feasible.
(7) On portable, hook-on, and attachable ladders, a minimum rung length of 10 inches (25cm) shall be provided at each level.

Maximum intended nominal thickness (in.)

<table>
<thead>
<tr>
<th>Maximum permitted span using full thickness undressed lumber (ft)</th>
<th>Maximum permitted span using nominal thickness lumber (ft)</th>
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</thead>
<tbody>
<tr>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>8</td>
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<tr>
<td>75</td>
<td>6</td>
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(iii) When erecting or dismantling tubular welded frame scaffolds, (end)
frames, with horizontal members that are parallel, level and are not more than
22 inches apart vertically may be used as climbing devices for access, provided
they are erected in a manner that creates a usable ladder and provides good
hand hold and footing for use.
(iv) Cross braces on tubular welded frame scaffolds shall not be used as a
means of access or egress.
(f) \textbf{Use.}

(1) Scaffolds and scaffold components shall not be loaded in excess of their
maximum intended rated capacities, whichever is less.
(2) The use of shore or lean-to scaffolds is prohibited.
(3) Scaffolds and scaffold components shall 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.
(4) Any part of a scaffold damaged or weakened such that its strength is
less than that required by paragraph (a) of this section shall be immediately
repaired or replaced, braced to meet those provisions, or removed from service
until repaired.
(5) Scaffolds shall not be moved horizontally while employees are on them,
unless they have been designed by a registered professional engineer specific-
ally for such movement or, for mobile scaffolds, where the provisions of Sec.
1926.452 (w) are followed.
(6) The clearance between scaffolds and power lines shall be as follows:
Scaffolds shall not be erected, used, dismantled, altered, or moved such that
they or any conductor of material handled on them come closer to
exposed and energized power lines than as follows:

<table>
<thead>
<tr>
<th>Insulated lines voltage</th>
<th>Minimum Distance</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 300 Volts</td>
<td>3 Feet (0.9 M)</td>
<td></td>
</tr>
<tr>
<td>300 Volts to 50 kv</td>
<td>10 Feet (3.1 M)</td>
<td></td>
</tr>
<tr>
<td>More than 50 kv</td>
<td>10 Feet (3.1 M)</td>
<td></td>
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</tbody>
</table>

(3) In addition to meeting the requirements of Sec. 1926.502(d),
employees installing suspension scaffold support systems on floors,
roofs, and other elevated surfaces are set for the in Subpart M
of this part.

(i) Each employee on a scaffold more than 10 feet (3.1m) above
a lower level shall be protected from falling to that lower level,
Paragraphs (g)(1)(i) through (vii) of this section establish the types of
fall protection to be provided to the employees on each type of
scaffold. Paragraph (g)(2) of this section addresses fall protection
for scaffold erectors and dismantlers.

Exception to paragraph (f)(6): Scaffolds and materials may be closer to
power lines than specified above where such clearance is necessary for
performance of work 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 the lines, relocated the lines,
or installed protective coverings to prevent accidental contact with the lines.

(7) Scaffolds shall be erected, moved, dismantled, or altered only under the
supervision of a competent person, qualified in scaffold erection, moving,
dismantling or alterations. Such activities shall be performed only by
experienced and trained employees selected for such work by the competent
person.

(8) Employees shall be prohibited from working on scaffolds covered with
snow, ice, or other slippery material except as necessary for removal of such
materials.

(9) 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.

(10) Suspension ropes supporting adjustable suspension scaffolds shall be
of a diameter large enough to provide sufficient surface area for the functioning
of brake and hoist mechanisms.

(11) Suspension ropes shall be shielded from heat producing processes.
When acids or other corrosive substances are used on a scaffold, the ropes
shall be shielded, treated to protect against the corrosive substances, or shall be
of material that will not be damaged by the substance being used.

(12) Work on or from scaffolds is prohibited during storms or high winds
unless they have been designed by a registered professional engineer specific-
ally for such movement or, for mobile scaffolds, where the provisions of Sec.
1926.452 (w) are followed.

(13) Debris shall not be allowed to accumulate on platforms.

(14) Makeshift devices, such as but not limited to boxes and barrels, shall
not be used on top of scaffold platforms to increase the working level height
of employees.

(15) Ladders shall not be used on scaffolds to increase the working level
height of employees, except on large area scaffolds where employers have
satisfied the following criteria:

(i) When the ladder is placed against a structure which is not a part of the
scaffold, the scaffold shall be secured against the sideways thrust exerted by
the ladder;

(ii) The platform units shall be secured to the scaffold to prevent their move-
ment;

(iii) The ladder legs shall be on the same platform or other means shall be
provided to stabilize the ladder against unequal platform deflection, and

(iv) The ladder legs shall be secured to prevent them from slipping or being
pushed off the platform.

(16) Platforms shall not deflect more than 1/60 of the span when
loaded.

(17) To reduce the possibility of welding current arcing through the
suspension wire rope when performing welding from suspended
scaffolds, the following precautions shall be taken, as applicable:

(i) An insulated thimble shall be used to attach each suspension
wire rope to its hanging support (such as corner hook or outrigger).
Excess suspension wire rope and any additional independent lines
from grounding shall be insulated.

(ii) The suspension wire rope shall be covered with insulating
material extending at least 4 feet (1.2m) above the hoist. If there
is a fall line below the hoist, it shall be insulated to prevent contact
with the platform. The portion of the fall line that hangs free below
the scaffold shall be guided or retained, or both, so that it does not
become grounded.

(iii) Each hoist shall be covered with insulated protective cov-
ers.

(iv) In addition to a work lead attachment required by the welding
process, a grounding conductor shall be connected from the scaf-
fold to the structure. The size of this conductor shall be at least
the size of the welding process work lead, and this conductor shall
not be in series with the work lead.

(v) If the scaffolding grounding lead is disconnected at any time, the
welding machine shall be shut off; and

(vi) An active welding rod or uninsulated welding lead shall not
be allowed to contact the scaffold or its suspension system.

(g) \textbf{Fall protection.}

(1) Each employee on a scaffold more than 10 feet (3.1m) above
a lower level shall be protected from falling to that lower level,
Paragraphs (g)(1)(i) through (vii) of this section establish the types of
fall protection to be provided to the employees on each type of
scaffold. Paragraph (g)(2) of this section addresses fall protection
for scaffold erectors and dismantlers.

Note to paragraph (g)(1): The fall protection requirements for
employees installing suspension scaffold support systems on floors,
roofs, and other elevated surfaces are set for the in Subpart M
of this part.

(i) Each employee on a boatswain’s chair, catenary scaffold,
float scaffold, needle beam scaffold, or ladder jack scaffold shall
be protected by a personal fall arrest system.

(ii) Each employee on a single-point or two-point adjustable
suspension scaffold shall be protected by both a personal fall arrest
system and guardrail system;

(iii) Each employee on a crawling board (chick ladder) shall be
protected by a personal fall arrest system, a guardrail system
with minimum 200 pound toprail capacity, or by a three-fourth
inch (1.9cm) diameter grabline or equivalent handhold securely
fastened beside each crawling board;

(iv) Each employee on a self-contained adjustable scaffold shall
be protected by a guardrail system (with minimum 200 pound toprail
capacity) when the platform is supported by the frame structure
and by both a personal fall arrest system and a guardrail system
with minimum 200 pound toprail capacity when the platform is
supported by ropes.

(v) Each employee on a walkway located within a scaffold shall
be protected by a guardrail system (with minimum 200 pound toprail
capacity) installed within 9-1/2 inches 924.1cm) of and along at
least one side of the walkway.

(vi) Each employee performing overhead bricklaying operations
from a supported scaffold shall be protected from falling from all
open sides and ends of the scaffold (except at the side next to
the wall being laid) by the use of a personal fall arrest system or
guardrail system (with minimum 200 pound toprail capacity).

(ii) For all scaffolds not otherwise specified in paragraphs (g)(1)(ii)
through (g)(1)(vi) of this section, each employee shall be protected
by the use of personal fall arrest systems or guardrails systems
meeting the requirements of paragraph (g)(4) of this section.

(2) Effective September 2, 1997, the employer shall have a
competent person determine the feasibility and safety of providing
fall protection for employees erecting or dismantling supported
scaffolds. Employers are required to provide fall protection for
employees erecting or dismantling supported scaffolds where
the installation and use of such protection is feasible and does not
create a greater hazard.

(3) In addition to meeting the requirements of Sec. 1926.502(d),
personal fall arrest systems used on scaffolds shall be attached
by lanyard to vertical lifeline, horizontal lifeline, or scaffold struc-
tural member. Vertical lifelines shall not be used when overhead
components, such as overhead protection or additional platform
levels, are part of a single-point or two-point adjustable suspen-
sion scaffold.

(i) When vertical lifelines are used, they shall be fastened to a
fixed safe point of anchorage, shall be independent of the
scaffold, and shall be protected from sharp edges and abrasion. Safe points of anchorage include structural members of buildings, but do not include standpipes, vents, or other piping systems, electrical conduit, outrigger beams, or counterweights.

(ii) When horizontal lifelines are used, they shall be secured to two or more structural members of the scaffold, or they may be looped around both suspension and independent suspension lines (on scaffolds so equipped) above the hoist and brace attached to the end of the scaffold. Horizontal lifelines shall not be attached only to the suspension ropes.

(vi) Vertical lifelines, independent support lines, and suspension ropes shall not be attached to each other, nor shall they be attached to or used on scaffolds, and at least 300 (1.2m) shall be attached to the same point on the scaffold or personal fall arrest system.

Guardrail systems installed to meet the requirements of this section shall comply with the following provisions (guardrail systems built in accordance with Appendix A to this subpart will be deemed to meet the requirements of paragraphs (g)(4)(vi), and (ix) of this section):

(i) Guardrail systems shall be installed along all open sides and ends of platforms. Guardrail systems shall be installed before the scaffold is released for use by employees other than erection/dismantling crews.

(ii) The top edge height of top rails or equivalent member on supported scaffolds manufactured or placed in service after January 1, 2000 shall be installed between 38 inches (0.97m) and 45 inches (1.2m) above the platform surface. The top edge height on supported scaffolds manufactured and placed in service before January 1, 2000, and on all suspended scaffolds where both a guardrail and a personal fall arrest system are required shall be between 36 inches (0.9m) and 45 inches (1.2m). When conditions warrant, the height of the top edge may exceed the above height; provided the guardrail system meets all other criteria of paragraph (g)(4).

(iii) When midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members are used, they shall be installed between the top edge of the guardrail system and the scaffold platform.

(iv) When midrails are used, they shall be installed at a height approximately midway between the top edge of the guardrail system and the platform surface.

(v) When screens and mesh are used, they shall extend from the top edge of the guardrail system to the scaffold platform, and along the entire opening between the supports.

(vi) When intermediate members (such as balusters or additional rails) are used, they shall not be more than 19 inches (49cm) apart.

(vii) Each top rail or equivalent member of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along its top edge of at least 100 pounds (445n) for guardrail systems installed on single-point adjustable suspension scaffolds or two-point adjustable suspension scaffolds, and at least 200 pounds (890n) for guardrail systems installed on all other scaffolds.

(viii) When the loads specified in paragraph (g)(4)(vii) of this section are applied in a downward direction, the top edge shall not drop below the height above the platform surface that is prescribed in paragraph (g)(4)(i) of this section.

(ix) Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along with the midrail or other member of at least 75 pounds (333n) for guardrail systems with a minimum 100 pound toprail capacity, and at least 150 pounds (660n) for guardrail systems with a minimum 200 pound toprail capacity.

(x) Suspension scaffold hoists and non-walk-through stirrup may be secured as encased in service brackets, if the space between the hoist or stirrup and the side guardrail or structure does not allow passage of an employee to the end of the scaffold.

(xi) Guardrails shall be surfaced to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

(xii) The ends of rails shall not overhang the terminal posts except when such overhang does not constitute a projection hazard to employees.

(xiii) Steel or plastic banding shall not be used as a top rail or midrail.

(xiv) Manila or plastic (or other synthetic) rope being used for top rails or midrails shall be inspected by a competent person as frequently as necessary to ensure that it continues to meet the strength requirements of paragraph (g) of this section.

(xv) Crossbracing is acceptable in place of a midrail when the crossing point of two braces is between 20 inches (0.5m) and 30 inches (0.8m) above the work platform or as a toprail when the crossing point of two braces is between 38 inches (0.97m) and 48 inches (1.3m) above the work platform. The end points at each upright shall be no more than 48 inches (1.3m) apart.

(h) Falling object protection system.

(1) In addition to wearing hard-hats, each employee on a scaffold shall be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toebears, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures. When the objects are too large, heavy or massive to be contained or deflected by any of the above-listed measures, the employer shall place such potential falling objects away from the edge of the surface from which they could fall and shall secure those materials as necessary to prevent their falling.

(2) Where there is a danger of any equipment falling from a scaffold and striking employees below, the following provisions apply.

(i) 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

(ii) A toebear shall be erected along the edge of platforms more than 10 feet (3.1m) above lower levels for a distance sufficient to protect employees below, except on float (ship) scaffolds where an edging of 3/4 x 1-1/2 inch (2 x 4cm) wood or equivalent may be used in lieu of toebears;

(iii) Where tools, materials, or equipment are piled to a height higher than the top edge of the toebear, paneling or screening extending from the toebear or guardrail to the top of the midrail shall be erected for a distance sufficient to protect employees below; or

(iv) A guardrail system shall be installed with openings small enough to prevent passage of potential falling objects; or

(v) A canopy structure, debris net, or catch platform strong enough to withstand the impact forces of the potential falling objects shall be erected over the employees below.

(iii) When canopies are used for falling object protection, they shall comply with the following criteria:

(i) Canopies shall be installed between the falling object hazard and the employees;

(ii) Canopies shall be capable of withstanding, without failure, a force of at least 50 pounds (220n) in any downward direction at any point along the toebear (toebears built in accordance with Appendix A to this subpart will be deemed to meet this requirement); and

(ii) When canopies are used on suspension scaffolds for falling object protection, the scaffold shall be equipped with additional independent support lines equal in number to the number of points supported, and equivalent in strength to the strength of the suspension ropes.

(iii) Independent support lines and suspension ropes shall not be attached to the same point of anchorage.

(4) Where used, toebears shall be:

(i) Capable of withstanding, without failure, a force of at least 50 pounds (220n) in any downward direction at any point along the toebear (toebears built in accordance with Appendix A to this subpart will be deemed to meet this requirement); and

(ii) At least three and one-half inches (9 cm) high from the top edge of the toebear to the level of the walking/working surface. Toebears shall be securely fastened in place at the out most edge of the platform and have not more than 1/4 inch (0.7cm) clearance above the walking/working surface. Toebears shall be solid or with openings not over one inch (2.5cm) in the greatest dimension.

1926.452 ADDITIONAL REQUIREMENTS APPLICABLE TO SPECIFIC TYPES OF SCAFFOLDS.

In addition to the applicable requirements of Sec. 1926.451, the following requirements may apply to the specific types of scaffolds indicated. Scaffolds not specifically addressed by Sec. 1926.452, such as but not limited to systems scaffolds, must meet the requirements of Sec. 1926.451.

(b) Tube and coupler scaffolds.

(1) When platforms are being moved to the next level, the existing platform shall be left undisturbed until the new bearers have been set in place and braced prior to receiving any additional load.

(2) Traverse bracing forming an X across the width of the scaffold shall be installed at the scaffold ends and at least every third set of posts horizontally (measured from only one end) and every fourth runner vertically. Bracing shall extend diagonally from the inner or outer posts or runners upward to the next outer or inner posts or rungs. Building ties shall be installed at the bearer levels between the traverse bracing and shall conform to the requirements of Sec. 1926.451(1).

(3) On straight run scaffolds, longitudinal bracing across the inner and outer rows of posts shall be installed diagonally in both directions, and shall be installed diagonally in both directions, and shall extend from the base of the end posts upward to the top of the scaffold at approximately a 45 degree angle. On scaffolds whose length is greater than their height, such bracing shall be repeated beginning at least at every fifth post. On scaffolds whose length is less than their height, such bracing shall be installed from the base of the end posts upward to the opposite end posts and then in alternating directions until reaching the top of the scaffold. Bracing shall be installed

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as close as possible to the intersection of the bearer and post or runner and post.

(4) Where conditions preclude the attachment of bracing to posts, bracing shall be attached to the runners as close to the post as possible.

(5) Bearers shall be installed transversely between posts, and when coupled to the posts, shall have the inboard coupler bear directly on the runner coupler. When the bearers are coupled to the runners, the couplers shall be as close to the posts as possible.

(6) Bearers shall extend beyond the posts and runners, and shall provide full contact with the coupler.

(7) Runners shall be installed along the length of the scaffold, located on both the inside and the outside posts at three levels (when tube and coupler guardrails and midrails are used on outside posts, they may be used in lieu of outside runners).

(8) Runners shall be interlocked on straight runs to form continuous lengths, and shall be secured to each post. The bottom runners and bearers shall be located as close to the base as possible.

(9) Bearers shall be of a structural metal, such as drop-forged steel, malleable iron, or structural grade aluminum. The use of gray cast iron is prohibited.

(10) Tube and coupler scaffolds over 125 feet in height shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design. Non-mandatory Appendix A to this subpart contains examples of criteria that will enable an employer to comply with design and loading requirements for tube and coupler scaffolds under 125 feet in height.

(c) Fabricated frame scaffolds (tubular welded frame scaffolds)

(1) Mobile moving platforms to the next level, the existing platform shall be left undisturbed until the new end frames have been set in place and braced prior to receiving the new platforms.

(2) Frames and panels shall be braced by cross, horizontal, or diagonal braces, or combination thereof, which secure vertical members together laterally. The cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, level, and square. All brace connections shall be secured.

(3) Frames and panels shall be joined together vertically by coupling or stacking means.

(4) Where uplift can occur which would displace scaffold end frames or panels, the frames or panels shall be locked together vertically by pins or equivalent means.

(5) Brackets used to support cantilevered loads shall:

(i) Be seated with side-brackets parallel to the frames and end brackets at 90 degrees to the frames;

(ii) Not be bent or twisted from these positions; and

(iii) Be used only to support personnel, unless the scaffold has been designed for other loads by a qualified engineer and built to withstand the tipping forces caused by those other loads being placed on the bracket-supported section of the scaffold.

(6) Scaffolds over 125 feet (38.0) in height above their base plates shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design.

(w) Mobile platforms

(1) Scaffolds shall be braced by cross, horizontal, or diagonal braces, or combination thereof, to prevent racking or collapse of the scaffold and to secure vertical members together laterally so as to automatically square and align the vertical members. Scaffolds shall be plumb, level, and squared. All brace connections shall be secured.

(i) Scaffolds constructed of tube and coupler components shall also comply with the requirements of paragraph (b)(6) of this section;

(ii) Scaffolds constructed of fabricated frame components shall also comply with the requirements of paragraph (c)(6) of this section.

(2) Scaffolds shall be locked with positive wheel and/or swivel locks, or equivalent means, to prevent movement of the scaffold while the scaffold is used in a stationary manner.

(3) Manual force used to move the scaffold shall be applied as close to the base as practicable, but not more than 5 feet (1.5m) above the supporting surface.

(4) Platform jacks shall be installed approximately 4 feet (1.2 m) above the brace to be passed, and shall be left in place until the pump jack has been moved and the original brace reinstalled.

(5) When guard rails are used for fall protection, a workbench may be used as the top rail only if it meets all the requirements in paragraphs (g)(4)(ii), (vii), (viii), and (xiii) of Sec. 1926.451

(6) Work benches shall not be used as scaffold platforms.

(7) When two or more are spliced to make a pole, mending plates shall be installed at all splices to develop the full strength of the member.

(k) Ladder jack scaffolds

(1) Platforms shall not exceed a height of 20 feet (6.1m).

(2) All ladders used to support ladder jack scaffolds shall meet the requirements of Subpart X of this part - Stairways and Ladder, except that job-made ladders shall not be used as jack scaffolds.

(3) The ladder jack shall be so designed and constructed that it will bear on the side rails and ladder rungs or on the ladder rungs alone. If bearing on rungs only, the bearing area shall include a length of at least 10 inches (25.4cm) on each rung.

(4) Ladders used to support ladder jacks shall be placed fastened, or equipped with devices to prevent slipping.

(5) Scaffolds platforms shall not be bridged one to another.

1926.454 TRAINING REQUIREMENTS

This section supplements and clarifies the requirements of Sec. 1926.21 (b)2 as these relate to the hazards of work on scaffolds.

(a) The employer shall have each employee who performs work while on a scaffold 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. The training shall include the following areas, as applicable:

(1) The nature of any electrical hazards, fall hazards and falling object hazards in the work area.

(2) The correct procedures for dealing with electrical hazards for erecting, maintaining, and dismantling the fall protection systems and falling object protection systems being used;

(3) The proper use of the scaffold and the proper handling of materials on the scaffold;

(4) The maximum intended load and the load-carrying capacities of the scaffolds used; and

(5) Any other pertinent requirements of this subpart.

(b) The employer shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold trained by a competent person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:

(1) The nature of scaffold hazards;

(2) The correct procedures for erecting, disassembling, moving, operating, repairing, and maintaining the type of scaffold in question;

(3) The design criteria, maximum intended load-carrying capacity and intended use of the scaffold;

(4) Any other pertinent requirements of this subpart.

(c) When the employer has reason to believe that an employee lacks the skills to carry out safe work involving the erection, use or dismantling of scaffolds, the employer shall retrain each such employee so that the requisite proficiency is regained. Retraining is required in at least the following situations:

(1) Where changes at the worksite present a hazard about which an employee has not been previously trained;

(2) Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or

(3) Where inadequacies in an affected employee’s work involving scaffolds indicate that the employee has not retained the requisite proficiency.

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