



Scaffolds

Work activities associated with scaffolds are subject to many hazards, however, falls are by far the number-one cause of injury or death among construction workers. The following requirements regulate the design, erection, use, and dismantling of scaffolds:

A. General requirements

1. Scaffolds must be provided for work that cannot be done safely by employees standing on ladders or on solid construction that is at least 20 in. wide.

Exception: A 12-in. wide plank on members that are on 24 in. (or closer) centers is permitted. 1637(a)

2. The design and construction of scaffolds must conform to applicable standards and requirements **1637**, ANSI A10.8-1988, ANSI/ASSE A10.8-2001. Standards are based on stress grade lumber. Metal or aluminum may be substituted if the structural integrity of the scaffold is maintained. **1637(b)**
3. Manufactured scaffolds shall be used in accordance with the manufacturer's recommendations. **1637(b)(4)**

*Exception: Where specific requirements that address riding on a rolling scaffold in Section **1646(i)** and **(j)** may conflict with the manufacturer's recommendations, the provisions in Section **1646(i)** and **(j)** take precedence.*

4. Each scaffold must be designed to support its own weight and 4 times the maximum load. Maximum working loads are as follows: **1637(b)**
 - a. Light-duty scaffolds: 25 psf of work platform.
 - b. Medium-duty scaffolds: 50 psf of work platform.
 - c. Heavy-duty scaffolds: 75 psf of work platform.
 - d. Special-duty scaffolds: exceeding 75 psf as determined by a qualified person or a California registered Civil Engineer with scaffold design experience.



- e. Engineered scaffolds: as determined by a California registered Civil Engineer with scaffold design experience.
5. The erecting and dismantling of scaffolds are regulated as follows:
 - a. Scaffold erection and dismantlement must be supervised by a qualified person. **1637(k)(1)**
 - b. Scaffolds must be erected and dismantled according to design standards, engineered specifications, or manufacturer's instructions. **3328, 1637(k)**
 - c. A DOSH permit is required for erecting and dismantling scaffolds that exceed three stories or 36 ft. in height. **341(d)(5)(B)**
6. Scaffold access: Ladders, horizontal members, and stairways must provide safe and unobstructed access to all platforms. The equipment must be located so that its use will not disturb the stability of the scaffold: **1637(n)**
 - a. Ladders may be used if the following applies:
 01. Portable ladders shall comply with T8 CCR **3276.1675(b)**
 02. Fixed ladders shall comply with T8 CCR **3277.1675(c)**
 03. Ladders must be securely attached to scaffolds. **1637(n)**
 04. Ladders must extend 3 ft. above the platform, or handholds must be provided. **3276(e)(11)**
 - b. Manufactured hook-on and attachable ladders shall be securely attached to the scaffold and: **1637(n)**
 01. Shall be specifically designed for the type of scaffold used;
 02. Shall have a minimum rung length of 11 1/2 in. (29 cm); and
 03. Shall have uniform spaced rungs with a maximum spacing between rungs of 16 3/4 in.
 - c. Horizontal members built into the end frame of a scaffold may be used to access platforms if: **1637(n)**
 01. The horizontal members are parallel and level.
 02. The horizontal members make a continuous



ladder, bottom to top, with the ladder sides of the frames in a vertical line.

03. The horizontal members provide sufficient clearance for a good handhold and foot space. **1637(n), 1644(a)**
- d. Stairways must conform to the following: **1637(n)(2)**
 01. Permanent stairways for scaffolds must comply with GISO requirements (i.e. **3214, 3622**).
 02. Prefabricated scaffold steps or stairs must comply with:
 - ANSI 10.8-1988 or ANSI/ASSE 10.8-2001 if manufactured on or before May 28, 2005
 - ANSI/ASSE 10.8-2001 if manufactured after May 28, 2005
7. Scaffolds must be secured as follows:
 - a. Scaffolds must be tied off with a double-looped No. 12 iron wire or a single-looped No. 10 iron wire or the equivalent. A compression member should prevent scaffold movement toward the structure. **1640, 1641, 1644**
 - b. Light duty wooden pole scaffolds must be tied off every 20-ft. horizontally and vertically. **1640(b)**
 - c. Heavy-trade wooden pole scaffolds must be tied off every 15-ft. horizontally and vertically. **1641(f)**
 - d. Metal scaffolds must be tied off as specified in **1644(a)(5)**.
8. Scaffold platforms must conform to the following:
 - a. Platforms must be capable of supporting the intended load. **1644(a)(1), 1637(m)**
 - b. Platforms must be planked solid (without gaps) and cover the entire space between scaffold uprights. **1640(b), 1641(g), 1644(a), 1646(e)**

Exception: In solid planking the following gaps are permissible:

 01. The opening under the back railing
 - Wood scaffolds: 8 in. (max) horizontal. **1640(b)(5)**
 - Metal scaffolds: 10 in. (max) horizontal. **1644(a)(7)**
 02. Space between the building (structure) and the platform



- Wood scaffolds: 14 in.(max). **1640(b)(5)**
 - Metal scaffolds: 16 in. (max). **1644(a)(7)**
 - Bricklayers scaffolds: 7 in. (max) to finished face of building. **1641(g)(2)**
- c. Platform minimum widths are as follows:
- 01. Light duty: 20 in. **1640(b)(5)**
 - 02. Heavy trades: 4 ft. **1641(c)**
- d. Platform slope must not exceed 2 ft. vertically to 10 ft. horizontally. **1637(o)**
- e. Overhead protection is required when people are working overhead. **1637(q)**
- f. Slippery platform conditions are prohibited. **1637(p)**
- g. All scaffold platforms shall meet the planking requirements of Section 1637, **3622(f)(5)**
9. Planking must conform as follows:
- a. All solid sawn planking, unless specified in other orders, must be made of scaffold grade (structural plank 2200 Psi) lumber (see **1504**) with a nominal dimension of at least 2" x 10". **1637(f)(1)**

Prior to being placed into service, all solid sawn wood scaffold planks shall be certified by, or bear the grade stamp of, a grading agency approved by the American Lumber Standards Committee. **1637(f)(5)**
 - b. All Douglas Fir and Southern Pine planking sized 2 x 10-inch (nominal) or 2 x 9-inch (rough) shall not exceed a maximum span as follows: **1637(f)(2)**
 - 01. Light trades @ 25 psf = 10 ft.
 - 02. Medium trades @ 50 psf = 8 ft.
 - 03. Heavy trades @ 75 psf = 7 ft.
 - c. The maximum permissible spans allowed for other wood species of scaffold planking shall not exceed 10 ft. and shall be determined by a licensed professional engineer. **1637(f)(3)**
 - 01. All manufactured scaffold planking including engineered wood products, laminated veneer lumber, metal, composite, and plastic planks shall be capable of supporting, without failure, its own weight and 4 times the maximum intended working load.



02. Prior to being placed in service, all laminated veneer lumber scaffold planks manufactured after December 2, 2010 shall be labeled with the seal of an independent, nationally recognized, inspection agency approved by the International Accreditation Services (IAS) certifying compliance with ASTM D 5456-09a and ANSI/ASSE A10.8-2001, Section 5.2.10.
03. Planks with spans in excess of 10 ft. shall be labeled to indicate the maximum intended working load.
04. Planks shall be used in accordance with the manufacturer's specifications.
- d. All scaffold planks shall be visually inspected for defects before use each day. **1637(f)(6)**
- e. Defective or damaged scaffold planks shall not be used and shall be removed from service. **1637(f)(7)**
- f. Planking shall overhang the ledger or support as follows:
 01. A minimum of 6 in. **1640(b), 1645(b)**
 02. A maximum of 18 in. **1637(g), 1645(b)**
- g. A single plank (up to 4 ft. high) is only permitted on light-trade wooden pole and horse scaffolds. **1640(b)(5)(A), 1647(e)(2)**
- h. All platform planks shall not deflect more than 1/60 of the span when loaded to the manufacturer's recommended maximum load. **1637(w)**
10. Guardrails must be installed on open sides and ends of platforms that are 7 1/2 ft. or higher. **1621(a)**

*Exception: **1644(a)(6)(A),(B)***

 - *X braces that substitute for a mid-rail must intersect 20 in. to 30 in. above the platform*
 - *X-braces that substitute for a top rail must intersect 42 in. to 48 in. above the platform, and a mid-rail must be placed at 19 in. to 25 in. above the platform*
11. Toeboards are required on all railed sides of work surfaces where employees work or pass below. **1621(b)**



12. Height limits for scaffolding are as follows:

- a. Wood (frame/post) = 60 ft. 1643
- b. Tube and coupler = 125 ft. **1644(b)(4)**
- c. Tubular (welded) = 125 ft. **1644(c)(7)**

Exception: The above limits do not apply when the scaffolding is designed by a civil engineer registered in California.

- d. Horse (single) = 10 ft. **1647(b)(2)**
- e. Horse (tiered) = 10 ft. **1647(b)(2)**

13. Prohibited scaffolds and supports: **1637(j)**

- a. Shore scaffolds
- b. Jack scaffolds (with brackets attached to single studs)
- c. Lean-to scaffolds
- d. Stilts
- e. Nailed brackets
- f. Brick or blocks
- g. Loose tile
- h. Unstable objects

14. Maximum scaffold working load must be posted or provided to and available from the jobsite supervisor. **1637(b)(6)**

15. Prohibited work practices:

- a. Work on or from scaffolds during storms or high winds unless: **1637(u)**
 - 01. A qualified person has determined that it is safe and
 - 02. Employees are protected by a personal fall arrest system or wind screens.

*Note: Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces. **1637(u)***

- b. Wood platforms shall not be painted with opaque finishes but can be coated with certain clear finishes. **1637(v)**

B. Scaffold-specific requirements

After reviewing the general requirements for scaffolds, refer to the regulations listed below (and any other applicable SOs) for the specific type(s) of scaffold in use to determine whether these requirements replace or augment the general requirements.

The requirements listed below are unique to each specific type of scaffold listed:

1. Tubular welded scaffold systems **1644**

These scaffold systems are commercially fabricated and must meet the following requirements:

- Frames must nest with coupling or stacking pins to provide proper vertical alignment. **1644(c)(5)**
- Frame panels must be vertically pinned if uplift may occur. **1644(c)(6)**

2. Tower and rolling scaffolds **1646**

The specifications for tower and rolling scaffolds are as follows:

- The “height-to-base” must not exceed 3:1 unless the scaffold is secured. **1646(a)**
- A screw jack must extend 1/3 of its length into the leg tube and the exposed thread must not exceed 12 in. **1646(b)(2)**
- Two wheels or casters must swivel; all four must lock. **1646(c)**
- A fully planked platform is required. **1646(e)**
- All frame and center joints shall be locked together by lock pins, bolts, or equivalent fastenings. **1646(d)**
- The scaffold must have horizontal diagonal bracing (see Illustration 9). **1646(b)**
- Railings are required if the platform is 7 1/2 ft. or more above grade. **1646(b)**
- Ladders or other unstable objects shall not be placed on top of rolling scaffolds to gain greater height. **1646(f)**
- When scaffolds are built on motor trucks or vehicles, they must be rigidly attached to the truck or vehicle. **1646(g)**



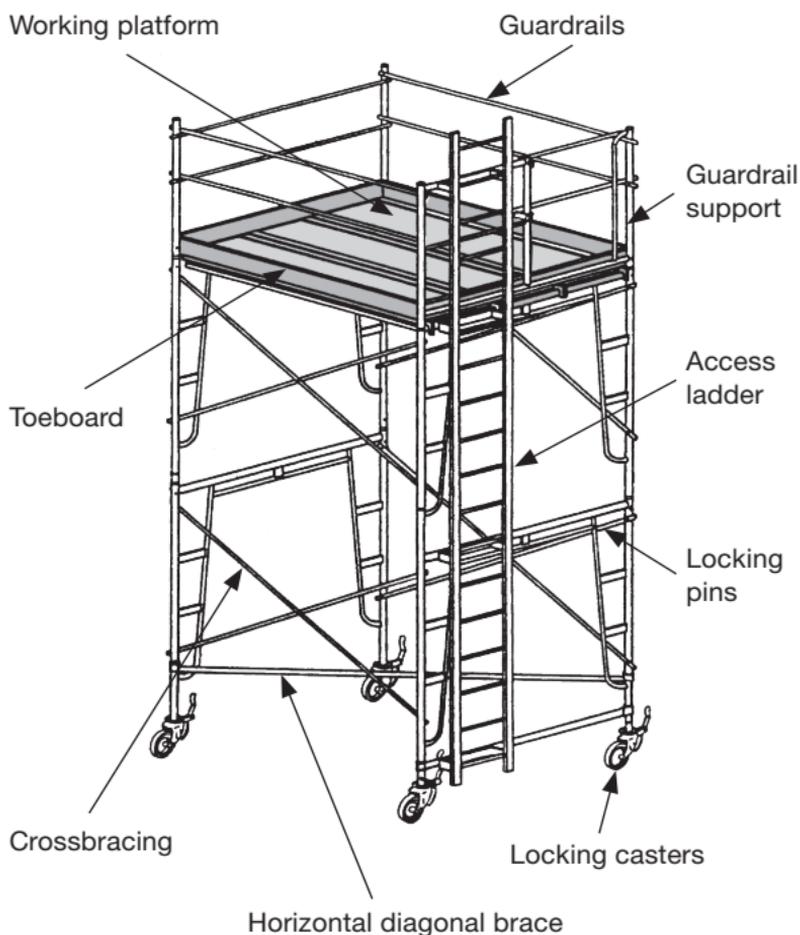
- j. Trucks or vehicles that have scaffolds attached to them shall have a device in use whenever employees are on the scaffold that prevents swaying or listing of the platforms. **1646(h)**
- k. Employees may ride on rolling scaffold moved by others below if the following conditions exist: **1646(i)**
 - 01. The floor or surface is within 3 degrees of level, and free from pits, holes, or obstructions.
 - 02. The minimum dimension of the scaffold base, when ready for rolling, is at least 1/2 of the height. Outriggers, if used, shall be installed on both sides of staging.
 - 03. The wheels are equipped with rubber or similar resilient tires. For towers 50 ft. or over, metal wheels may be used.
 - 04. The manual force used to move the scaffold shall be applied as close to the base as practicable, but not more than 5 ft. (1.5 meters) above the supporting surface of the scaffold.
 - 05. Before a scaffold is moved, each employee on the scaffold shall be made aware of the move.
 - 06. No employee shall be on any part of the scaffold which extends outward beyond the wheels, casters, or other supports.
- l. Employees may ride and move on a Self-Propelled rolling scaffold while on the platform without assistance from others below provided the following conditions are met: **1646(j)**
 - 01. All of the provisions in **1646(i)** shall be met, except that the scaffold need not be moved by others below.
 - 02. The scaffold platform shall not be more than 4 ft. above the floor level.
 - 03. The working platform shall be no less than 20 in. in width with a maximum 1 in. space between platform planks.
 - 04. Wheels or casters of rolling scaffolds shall be provided with an effective locking device that is used in accordance with **1646(c)** or rolling scaffolds shall be provided with an effective device that is used to prevent movement of the

scaffold when workers are climbing or working on the scaffold.

05. The use of power systems such as motor vehicles, add-on motors, or battery powered equipment to propel a rolling scaffold is prohibited.

- m. Employees who ride on rolling scaffolds and employees that assist in moving employees riding on a rolling scaffold shall be trained on the hazards associated with riding on a rolling scaffold as per **1646** and **1509**.

Illustration 9 | Tower and Rolling Scaffold





3. Suspended Scaffolds **1658**

a. General requirements for suspended scaffolds (swing staging). **1658**

Most suspended scaffolding has a two-point suspension supported by hangers or stirrups. The following applies:

01. Each wire is suspended from a separate outrigger beam or thrustout. **1658(k)**
02. Multi-stage units or units with overhead protection must be equipped with additional suspension lines to support the scaffolding in case the primary suspension system fails. **1658(u)**
03. The scaffold must be inspected daily by a qualified person and tested frequently. **1658(g)**
04. When a suspended scaffold is left unattended in an elevated position, it shall be securely lashed to the building and be cleared of all tools, buckets, or other moveable materials. **1658(p)**
05. All hoisting mechanisms and metal platforms must meet nationally recognized standards. **1658(a)**
06. Outrigger beams must be secured in a saddle and anchored at one end to solid structure. The inboard end must be tied back. **1658(j)**
07. The beam must be capable of supporting four times the intended load. **1658(j)(1)**
08. Use of a ladder as a platform is prohibited even if a horizontal work surface is added over the rungs. **1658(d)**
09. The load limit is one person per suspension rope. **1660(a)**
10. An insulated wire suspension rope is required when workers are welding, burning, sandblasting, or using any chemical substance which may damage the rope. **1658(f)**
11. A separate safety harness and lifeline are required for each worker. **1658(i)**, **1660(g)**
12. Platform dimensions must be as follows:
 - Width = 14 in. to 36 in. **1660(d)** = 24 in. to 36 in. if the platform is used by cement masons. **1661(b)**



- Span = 10 ft. (2" x 10" planks). **1660(e)**; = 12 ft. (2" x 12" planks). **1660(e)**
- Bolster (ledger) = 2" x 4" cross section. **1660(c)**

b. Specific requirements for suspended scaffolds:

01. Powered suspended scaffolds **1667**

The general rules for swing scaffolds apply except as listed below:

- The minimum platform width must be 20 in. **1667(d)**
- Railings are required on open sides and ends and on all sides if the scaffold is suspended by one rope. **1667(a)**
- The load limit is 425 lbs. for a ladder-type platform. **1667(b)**
- Controls must be of the dead-man type.
- Load release units for fast descent are prohibited. **1667(f)(1)**

02. Interior hung suspended scaffolds **1665**

These scaffolds are of a wood or steel-tube-and-coupler type, and they are suspended from a ceiling or roof structure. The general and suspended scaffold rules apply.

Exception:

- *Suspension ropes must be wrapped twice around supporting members and ledgers. **1665(b)***
- *Ends of wire rope must be secured with at least three clips.*

03. Float suspended scaffolds. **1663**

These scaffolds are intended for such work as welding, riveting, and bolting. **1663(a)**

- Platform size: 3 ft. x 6 ft. x 3/4 in. plywood. **1663(a)(1)**
- Rope: 1 in. diameter manila (min.). **1663(a)(4)**
- Load limit: Three people **1663(a)**



- Personal fall protection and a separate lifeline: Required for each person. **1663(a)(5)**

04. Boatswain's chair. **1662**

The use of a boatswain's chair requires training or experience. **1662(a)**

- Platform size: 10 in. x 24 in. x 2 in. **1662(i)**
- Rope: 5/8 in. diameter manila (min.) and 3/8 in. diameter protected wire for welding. **1662(j),(k)**
- Personal fall protection and a separate lifeline: Required **1662(c)**
- Area below: Barricaded. **1662(b)**

05. Needle-beam scaffolds. **1664**

The specifications for needle-beam scaffolds are as follows:

- Beam size: 4 in. x 6 in. x 10 ft. **1664(a)(1)**
- Rope: 1 1/4 in. diameter manila. **1664(a)(4)**
- Personal fall protection: Required in accordance with Article 24 in the CSOs. **1664(a)(12)**

Note: See the hitches for holding needle beams in Illustration 10.

06. Outrigger scaffolds. **1645**

Outrigger scaffolds are regulated as follows:

- Brackets or beams must be anchored or braced against turning, twisting, or tipping. **1645(a)(1)**
- Platform: at least two 2 in. x 10 in. planks. **1645(a)(2), 1645(b)(5)**
- Beam size: 3 in. x 12 in. (min.) **1645(a)(2)**
- Beam length: Outboard of fulcrum must not exceed 6 ft; inboard must be 1 1/2 times the outboard section. **1645(a)(1)**

*Note: For multi-level structures the units must be designed by a California registered Civil Engineer. **1645(a)(3)***



Illustration 10 | Hitches for Holding Needle Beams



Square knot



Bowline



Rolling or
taut-line hitch



Scaffold hitch



Clove hitch



Round turn and
two half-hitches



Eye splice



Running bowline



Scaffold hitch

07. Bracket scaffolds (light trades). 1645

Brackets must be bolted through walls, welded to tanks, properly secured to metal studs, or hooked over a supporting member. 1645(d)



- Platform: 20 in. x 10 ft. (min.)
- Load limit: Carpenter's type = two workers and 75 lbs. of equipment. **1645(e)(4)**

08. Horse scaffolds. **1647**

The specifications for horse scaffolds are as follows:

- Platform width:
 - i. Light trades = 20 in. (min.); 10 in. if the platform is less than 4 ft. high.
 - ii. Heavy trades = 4 ft. (min.). **1647(e)(2)**
 - iii. Width of base legs = $1/2 \times$ height (min.). **1647(a)(3)**
- Height:
 - i. Collapsible horse = 6 ft. (max.) **1647(d)(2)**
 - ii. Single horse = 10 ft. (max.). **1647(e)(1)**
 - iii. Two tiers (max.) = 10 ft. (max.). **1647(e)(1)**

09. Ladder jack scaffolds. **1648**

The specifications for ladder jack scaffold platforms are as follows:

- Span = 16 ft. (max.) **1648(b)**
- Height = 16 ft. (max.) **1648(a)**
- Width = 14 in. (min.) **1648(b)**
- Load = two workers (max.) **1648(a)**

Notes:

- » *Ladders must be Type I, IA, or IAA duty rated ladders in accordance with **3276(c)**. Job-built ladders shall not be used for this purpose. **1648(d)***
- » *A safety line is required for each worker. **1648(c)***

10. Window jack scaffolds. **1654**

The specifications for window jack scaffolds are as follows:

- Only one window per scaffold is permitted. **1654(d)**