

Supported scaffolds

*Requirements and best practices
for the construction industry*



Department of Consumer
and Business Services

Supported scaffolds

*Requirements and best practices for the
construction industry*

About this guide

Supported scaffolds: Requirements and best practices for the construction industry is an Oregon OSHA Standards and Technical Resources publication.

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Introduction

You can set up a scaffold to work on just about anything – silos, tanks, chimneys, bridges, stairways, roofs, ramps, and ceilings, are just a few examples. In its most basic form, a supported scaffold is just a platform and a couple of uprights. Anyone can set one up. And that's the main reason why too many workers are injured or killed when they're using a scaffold – components fail, planks break, handrails give way, or the entire structure collapses in a heap.

Most scaffold accidents happen because scaffold users are untrained or improperly trained.

Because supported scaffolds used for construction work are complex structures, you need to know how to erect, dismantle, and work from them safely. This guide and our Subdivision L scaffold rules will help get you started so that your next scaffolding project won't let you down.



Oregon OSHA photo – Troy Menard

It takes more than ingenuity to set up a safe scaffold. Read this guide if you think nothing is wrong with this picture!

Competent and qualified persons - how are they different?

Federal OSHA created the terms “competent person” and “qualified person” to designate those who can evaluate hazardous conditions and mechanical systems, inspect equipment, and train others to work safely. You’ll find these terms used throughout our Subdivision L, Scaffolding rules.

The competent person

A competent person, designated by the employer, is someone who “can identify hazardous working conditions and has authorization to take prompt corrective measures to eliminate them.” The competent person is responsible for supervising and directing all scaffolding erection, dismantling, and altering work and must:

- Know the Subdivision L requirements applicable to the types of scaffolds used
- Be able to identify and correct hazards encountered in scaffold work
- Be trained in the structural integrity of the types of scaffolds used
- Have authority to promptly abate hazardous worksite conditions

A competent person’s duties can be shared as long as each person is qualified to perform the duty and has authority to correct hazards promptly.

Subdivision L requires that competent persons do the following:

- Determine feasible safe access for persons erecting and dismantling scaffolds
- Inspect scaffolds and components for hazards before each work shift and after any event that could affect the scaffolds’ structural integrity
- Supervise and direct all scaffold erection, dismantling, and altering work
- Train erectors and dismantlers to recognize hazards associated with their work
- Determine the feasibility of providing fall protection for each scaffold erection and dismantling operation
- Determine whether it is safe to work on scaffolds during storms or high winds
- Determine whether scaffold components made from different metals can be used together
- Determine whether scaffold components made by different manufacturers can be used together
- Identify the cause and significance of deteriorated scaffold components and repair or replace them

The qualified person

A qualified person is someone who has a recognized degree or certification, or has extensive knowledge, training, and experience, and has the ability to solve problems related to the project. The qualified person does not have to be a registered professional engineer; many contractors use the scaffold manufacturer as the "qualified person" as long as their competent person is erecting, using, and dismantling per the manufacturer's specifications. Scaffolds must be designed by a qualified person and must be constructed and loaded according to that design.



Some scaffolding jobs require much design - and planning!



A good place to start here would be determining who the qualified person is and evaluating the design, construction, and capacity. Of course, other concerns here can be fall protection, access, electrical, and the use of the portable ladder.

The scaffold platform

Scaffold platforms (except walkways and platforms used by erectors and dismantlers) must be fully decked or planked between the front uprights and the guardrail supports.

Platform gaps

Place platforms so that the spaces between them do not exceed one inch unless more space is necessary (for fitting around uprights with side brackets to extend platform width, for example).

The remaining space between the last plank and guardrail can't exceed 9½ inches (the space required to install an additional plank).

Platform and walkway widths

Platforms and walkways must be at least 18 inches wide. If work areas are too narrow for 18-inch platforms or walkways, you can use narrower platforms, but workers must be protected from falling with guardrails or personal fall-arrest systems.

- ➔ **Oregon OSHA allows 12-inch widths for ladder jack, top-plate (carpenter's) bracket, roof bracket, and pump-jack scaffolds.**

Front edge of platforms

The front edge of the scaffold platform can't be more than 14 inches from the face of a structure unless guardrails or personal fall-arrest systems are used to keep workers from falling between the structure and the platform.

- ➔ **There's one exception to this requirement: Scaffolds used for plastering and lathing can't be more than 18 inches from the face of a structure.**

Platform lengths

Platforms up to 10 feet long must extend at least six inches – but no more than 12 inches – beyond their supports unless the extra length is guarded or can support workers and material without tipping.

Platforms longer than 10 feet must extend no more than 18 inches beyond a support unless the extra length is guarded or can support workers and material without tipping.

- ➔ **Many contractors use pre-fabricated decks in lieu of individual planks. This way they don't have to worry about overlapping.**



NIOSH/John Rekus

With few exceptions, platforms must be fully planked and at least 18 inches wide.



Oregon OSHA photo

Platform gaps are too wide. The spaces between platforms can't exceed one inch.

Abutted planks

When you place planks end to end to make a long platform, each abutted end must rest on a separate support. Abutted planks must touch end to end on separate supports; they can't rest on one another.

Overlapped planks

When you overlap planks to make a long platform, they must overlap at least 12 inches over the supports *unless* they are nailed together or restrained so they won't move.

Platforms that change direction

When a platform changes direction (turns a corner, for example) any platform that rests on a bearer at an angle other than a right angle must be laid first. Platforms that rest at right angles over the same bearer must be laid second, on top of the first platform.

➔ **Make sure that all platform planks are fully bearing so that they're stable.**

Opaque finishes

Don't paint wood platforms with opaque finishes – opaque finishes can hide defects. Preservatives or slip-resistant and fire-retardant finishes are acceptable if the finish doesn't cover structural defects or make them hard to see.

➔ **Fire retardants can reduce a wood platform's load capacity. Before fire retardants are used, an engineer should ensure that the planks could support the required load.**

Scaffold components made by different manufacturers

Scaffold components made by different manufacturers can't be mixed unless they fit together easily and do not affect the scaffold's integrity. Components made by different manufacturers can't be modified to fit together *unless a competent person approves*.

Scaffold components made from different metals

Scaffold components made from different metals can't be used together unless a competent person approves.



Each individual plank must extend at least six inches over its support. The maximum overlap depends on platform length.

Platform deflection

A platform can't deflect more than 1/60th of its span when loaded.

➔ **For example, a platform 10 feet long can't deflect more than two inches.**

$$1/60 = .017 \cdot 10 \text{ ft. span} = 120 \text{ in.} \cdot .017 \times 120 \text{ in.} = 2.04 \text{ in.}$$

Forklifts and front-end loaders

Forklifts. You can use a forklift to support a platform only if the entire platform is attached to the forks and the vehicle is not moved when someone is on the platform.

Front-end loaders. Don't use a front-end loader to support a scaffold platform unless the vehicle has been designed by the manufacturer for that purpose.

Increasing the working height

Don't use items such as ladders, buckets, or boxes to increase the working height on scaffold platforms. Use ladders only on large-area scaffolds.

- ➔ **Ladders can be used on large-area scaffolds.**
- ➔ **Large-area scaffolds include tube-and-coupler scaffolds, systems scaffolds, and fabricated-frame scaffolds erected over an entire work area.**



OSHA Training Institute

The sagging top platform in this photo is dangerously overloaded. But that's just one of the problems. Cross bracing and guardrails are missing and there's no walkway for workers.



Safway Training Series

Using makeshift devices and ladders to increase height on scaffolds can be dangerous.

Access

Workers must have safe access to scaffolds and scaffold platforms. They can use ladders or stairways to reach platforms that are more than two feet above or below the access point.

➔ **You can't use cross braces for access.**

Other examples of safe access include integral prefabricated scaffold access frames, direct access from another scaffold, personnel hoists, ramps, or walkways.

Ramps and walkways six feet or more above lower levels must have guardrails that comply with subdivision M, Fall Protection. Cleats – not more than 14 inches apart – must be installed if the slope is steeper than seven degrees above horizontal (one vertical to eight horizontal). Ramps or walkways cannot be used for access if more than 20 degrees above horizontal (one vertical to three horizontal).

Portable, hook-on, attachable, and stairway-type ladders

Bottom step. The bottom step or rung of hook-on ladders, attachable ladders, and stairway-type ladders must be no more than 24 inches above or below the scaffold supporting level.

Rest platforms. Hook-on and attachable ladders on supported scaffolds more than 35 feet high must have rest platforms at 35-foot intervals. Stairway-type ladders must have rest platforms every 12 feet.

➔ **Stairways and portable ladders must meet the requirements of Subdivision X, Stairways and ladders.**



NIOSH/John Rekus

Ladders or stairways are acceptable ways to reach scaffold platforms that are more than two feet above the access point.



Hook-on and attachable ladders must be specifically designed for use with the type of scaffold used.

Integral prefabricated scaffold access frames

Integral prefabricated scaffold access frames must:

- Be designed and constructed for use as ladder rungs.
- Have rungs that are at least eight inches long.
- Not be used as work platforms when rungs are less than 11½ inches long unless workers use a fall protection or a positioning device system that meets the requirements in Subdivision M, Fall protection, 1926.502.
- Have rest platforms every 35 feet on supported scaffolds more than 35 feet high
- Be uniformly spaced within each frame section.
- Have a maximum spacing between rungs of 16¾ inches. Non-uniform rung spacing is allowed if the spacing does not exceed 16¾ inches.

➔ **Standard masonry scaffold spacing is approximately 19 inches between rungs.**

Access for erectors and dismantlers

- A competent person must determine if safe access is feasible at each stage of the erecting and dismantling process.
- Hook-on or attachable ladders must be installed as soon as the scaffold has progressed to a point that permits safe installation and use.
- End frames of fabricated frame scaffolds that have parallel, level, or horizontal members that aren't more than 22 inches apart may be used for access.
- Cross bracing is not an acceptable means of access.



Integral prefabricated scaffold access frame



Safway Training Series

A safe means of access for employees erecting or dismantling a scaffold must be provided where the provision of safe access is feasible and does not create a greater hazard. This determination must be based on site conditions and the type of scaffold being erected or dismantled.

Stability and loads

Base plates and mud sills

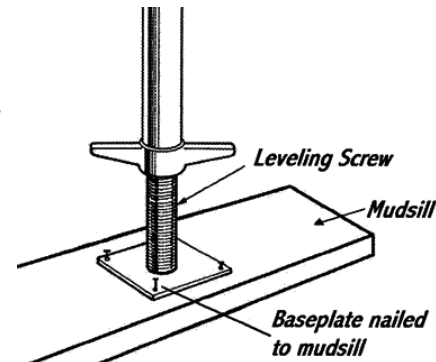
Poles, legs, posts, frames, and uprights must bear on base plates and mud sills or another firm foundation. Footings must offer full support without settling (e.g. dirt, sand, gravel, and warm asphalt are foundations that can allow settling or displacement).

- ➔ **A concrete slab is considered a firm foundation. However, it's still a good practice to use mud sills. Nailing base plates to mud sills will prevent a scaffold from "walking."**
- ➔ **The scaffold must be plumb and braced so that it does not sway.**

Height to base-width ratio

Supported scaffolds with a height-to-base-width ratio greater than 4-to-1 (including outrigger supports) must be prevented from tipping. Use ties, guys, braces, or another means that provides at least the same degree of safety.

- ➔ **Scaffold frames are typically three to five feet wide.**



Base plates and mud sills (or other firm foundation) are required on supported scaffolds. [elcosh image]



Exercise caution with wrapped scaffolding due to wind conditions.

Guys, ties, and braces

Install guys, ties, or braces where the horizontal members support both the inner and outer legs. They must be installed according to the manufacturer's instructions (or at the closest horizontal member to the 4-to-1 height) and be repeated vertically at least every 20 feet if the scaffold is up to three feet wide, every 26 feet if the scaffold is more than three feet wide.



Never use bricks or blocks to level a scaffold.

- ➔ **Be careful when using wire. Wire is often used to tie scaffolding to buildings when there is no other means of attachment.**
- ➔ **However, there are many variables to wiring safely, including the condition of the wire (fatigue from overuse) and the skill of the person doing the wiring.**
- ➔ **Make sure a competent person is involved in determining the proper use of wire for tie ins.**

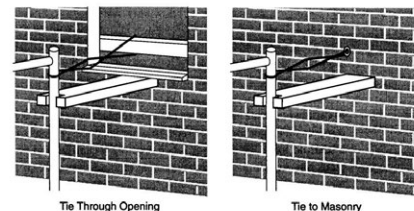


Figure 5-12
Through tie made with no. 9 wire

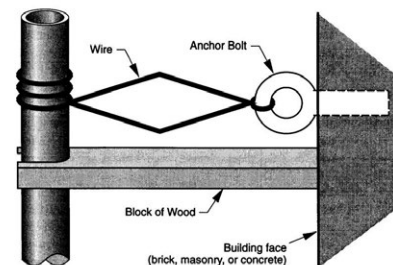


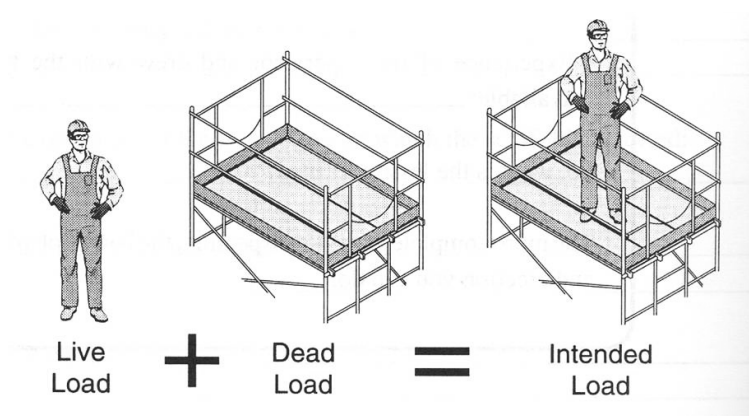
Figure 5-13
Anchor bolt or ring bolt tie made with no. 9 wire.

Load capacities

Is the load capacity for your scaffold rated for light, medium, or heavy duty? Is it rated for one person? Two? Three?

Scaffolds and components must be able to support their own weight and at least four times the maximum intended load applied to them. The maximum intended load includes workers, equipment, and supplies.

- ➔ **Follow all manufacturer specifications. Remember – scaffolds must be designed by a qualified person (i.e., manufacturer) and must be constructed and loaded in accordance with that design.**
- ➔ **Appendix A to Subdivision L includes maximum intended loads for certain types of scaffolds.**



Illustrations: Apprenticeship & Training Fund of North America

Fall protection

If you work on a scaffold more than 10 feet above a lower level, you must use fall protection. Personal fall arrest systems or guardrails are the most common methods.

➔ **Workers must be protected from falling onto dangerous equipment (e.g., impalement hazards) at any height.**

Personal fall-arrest systems

Personal fall-arrest systems must be attached by a lanyard to a vertical lifeline, horizontal lifeline, or structural member that will hold at least 5,000 pounds. A competent person should decide the most appropriate connection. All personal fall-arrest systems must meet the requirements in Subdivision M, Fall protection, 1926.502(d).

Personal fall-arrest systems for erectors and dismantlers

Erectors and dismantlers must use fall protection when feasible. A competent person, designated by the employer, must make the decision at each stage of the erecting and dismantling process. Questions in the decision-making may be: Is the structure close enough to use as an appropriate anchorage point? Is the scaffolding designed to be used as a fall-arrest anchorage?



Personal fall-arrest systems are required to protect workers on ladder-jack scaffolds. However, this one appears to be out of adjustment. The lanyard's attachment to the lifeline's rope grab is too low, allowing this worker to free fall more than six feet and possibly contact the ground.



Safway Training Series

A scaffold erector using personal fall arrest.

Guardrails

Guardrails must be installed along all open sides and ends of platforms before workers (except erectors and dismantlers) can use the scaffold.

➔ **Guardrails include top-rails, mid-rails, and posts.**

The top edge of top-rails on supported scaffolds must be between 38 inches and 45 inches above the platform surface. When conditions warrant, the height of the top edge may exceed 45 inches.

Mid-rails must be approximately midway between the top edge of the guardrail and the scaffold platform.



Cross bracing

Cross braces can be used as a mid-rail when the crossing point of the braces is between 20 inches and 30 inches above the work platform.

Cross braces can be used as a top-rail when the crossing point is between 38 inches and 48 inches above the work platform. The ends at each upright must be no more than 48 inches apart.

Don't forget guarding the platform ends!

Using gates that swing inward at access points is a best practice among many contractors.



No guardrails! This scaffold has no guardrails and is not fully planked. If you work on a supported scaffold more than 10 feet above a lower level, you must be protected from falling.

Falling objects

If you're exposed to falling objects (such as tools, materials, or equipment), you must wear a hard hat and ensure that you're protected from above by toe boards, screens, guardrail systems, debris nets, catch platforms, or canopies. Your hard hat can't be the only means of protecting you from falling objects.

If people below you are exposed to falling objects, you must barricade the area below your scaffold or place a toe board along the edge of the scaffold platform. Use panels or screens to protect people below when tools, materials, or equipment are piled higher than the top edge of the toe board.



NIOSH/John Rekus

A toeboard can provide falling object protection in addition to the use of hardhats.

Training

Training for scaffold users

Before you work on a scaffold, you must be trained by a person qualified in the subject matter of the scaffold you will use.

You must be able to recognize the hazards associated with the scaffold and you must know how to control or minimize the hazards.

Your training must cover:

- Electrical hazards, such as overhead power-transmission lines
- Fall hazards and methods to control them
- Ways to protect people below from falling objects
- How to use the scaffold's walkways, platform components, and access areas
- The scaffold's load capacity and the types of loads appropriate for the scaffold
- The requirements in Subdivision L that apply to the scaffold

Training for erectors and dismantlers

In addition to the training required for scaffold users (above), your scaffold training must include:

- Hazards associated with the scaffold you're erecting or dismantling
- Correct procedures for erecting, disassembling, moving, and maintaining the scaffold
- Design criteria, maximum intended loads, and intended use of the scaffold

Document the training

- Include enough information on the records to help contractors evaluate their program and policies
- Refer to documentation to determine the need for retraining
- Documentation can help a new safety director know what was and was not covered



Safway Training Series

Training for users must include the safe use of platforms.

Retraining

You must be retrained if your employer thinks that you lack the skill or knowledge to safely use, erect, or dismantle a scaffold. Other reasons for retraining include worksite changes that create new hazards and changes in the types of scaffolds, fall protection, or falling-object protection used.

Environment

Power lines

Stay clear of power lines when you're working on a scaffold. Minimum distances are shown in the table below:

Insulated lines

Some overhead power lines are installed with a covering that insulates the voltages in the line. The insulation usually deteriorates over time.

Voltage	Minimum distance	Alternatives
Less than 300 volts	3 feet	-
300 volts to 50 kv	10 feet	-
More than 50 kv	10 feet plus 0.4 inches for each 1 kv over 50 kv	Two times the length of the line insulator, but never less than 10 feet

Uninsulated lines

Voltage	Minimum distance	Alternatives
Less than 50 kv	10 feet	-
More than 50 kv	10 feet plus 0.4 inches for each 1 kv over 50 kv	Two times the length of the line insulator, but never less than 10 feet



United States Department of Labor – OSHA

Stay clear of power lines! This scaffold is too close.

You can work closer to power lines than the minimum distances on the previous page if you notify the utility company 48 hours before you begin work and you are certain the company has de-energized the lines, relocated the lines, or installed non-conductive barriers that prevent contact with the lines or equipment.

➔ ***It's a good practice to stay at least 10 feet away from all power lines, regardless of the voltage.***

Slippery scaffolds

Do not work on a scaffold coated with snow, ice, or other slippery material unless you must remove it. A competent person should make the decision.

Storms and strong winds

Do not work on a scaffold during storms or strong winds unless a competent person has determined that it is safe and all workers are protected by personal fall-arrest systems or wind screens.

➔ ***Wind screens can't be used unless the scaffold is secured against the anticipated force of the wind.***

Debris

Do not allow debris to accumulate on scaffold platforms.



Wind screens can't be used unless the scaffold is secured against the anticipated force of the wind.

Erecting and dismantling

Scaffolds must be erected, moved, dismantled, and altered under the supervision of a competent person. The competent person must be on the worksite to direct and supervise the work. The work must be performed by people selected by the competent person.

- ➔ **Scaffold access.** See page 11, *Access for erectors and dismantlers*
- ➔ **Training.** See page 17, *Training for erectors and dismantlers*
- ➔ **Shore and lean-to scaffolds.** Never use a shore or lean-to scaffold. They can't be set up safely and are a safety hazard for anyone who works on them.



It's a best practice to use a tag like this one at all scaffold access points to let employees know **the scaffold is being erected or dismantled**.

Inspections

Scaffolds and components must be inspected by a competent person before each workday and after any incident that could weaken them.

- ➔ **Use the competent person's checklist on Pages 31 and 32 as a guide to ensure that you're not missing anything when you inspect a supported scaffold.**

Damaged scaffolds and components

Any part of a damaged scaffold or a scaffold component must be removed from service until it is repaired or replaced.



Effective inspections can detect a variety of hazards. Here, a nail is used to hold a railing in place.



Tags stating the current status of the scaffold is a best practice among many companies.

Common supported scaffolds

- Fabricated (welded) frame scaffolds
- Ladder jack scaffold
- Mast climbing scaffold
- Mobile scaffold (“rolling tower”)
- Pump jack scaffold
- Stilts
- Systems scaffold
- Top plate (carpenter’s bracket) scaffold
- Tube and coupler scaffold



BBC

Bamboo scaffolding: Although not common here, it's pretty fascinating.

Fabricated (welded) frame scaffolds

These scaffolds are versatile, economical, and easy to use. They're often used by residential contractors, but they can also be stacked several stories high for commercial construction jobs.

- When you move platforms to the next level, leave the existing platform undisturbed until the new end frames have been set in place and braced.
- Frames and panels must be braced by cross, horizontal, or diagonal braces that laterally secure vertical members together.
- Vertically join frames and panels together with coupling or stacking pins.
- Frames or panels must be locked together vertically if they could be displaced.
- Scaffolds higher than 125 feet above their base plates must be designed by a registered professional engineer.



Fabricated frame scaffolds have platforms supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members.

Ladder jack scaffold

A ladder jack scaffold is a platform with brackets attached to two or more ladders. They're often used in light-duty applications because of their portability and cost effectiveness.

- Platforms must not exceed 20 feet in height.
- All ladders used to support ladder jack scaffolds must meet the requirements of Subdivision X, Stairways and Ladders.
- Job-made ladders can't be used to support ladder jack scaffolds.
- The ladder jack must be designed and constructed to bear on the side rails and ladder rungs or on the ladder rungs alone.
- Ladders that support ladder jacks must be placed, fastened, or equipped with devices to keep them from slipping.
- Scaffold platforms must not be bridged to one another.
- **Employees must be protected from falling 10 feet or more (e.g., personal fall-arrest system).**



Qual-Craft Industries, Inc.

This worker is wearing a personal fall-arrest system. A railing has also been placed on brackets.

Not only is there a lack of fall protection, this ladder jack scaffold does not appear to be very plumb.

Mast climbing scaffold

Mast climbers have become popular, particularly in masonry construction. They can be used as a single tower or as multiple towers braced together. The platform climbs the mast with a gas- or electric-powered engine. Mast climbers are useful for medium to high-rise projects, and projects such as for brick and masonry work, painting, and window installation.

- A competent person must do daily inspections.
- Before erecting the platform, make sure there are no holes, drop-offs, debris, ditches, or soft fill in the area.
- Make sure that the platform is away from trees and balconies, and at least 10 feet from electrical power lines at all times.
- Extend and lock all outriggers (if equipped) before raising the platform.
- Before raising the platform, make sure the mast is plumb, all guardrails are properly attached, and the “end of mast stop” system is working.
- Allow only designated trained operators to use the platform.
- Secure the scaffold to the structure following the manufacturer’s instructions.
- Do not exceed the manufacturer’s specified load capacity.
- Place loads as close as possible to the mast.
- Never erect, use, or dismantle the platform during strong winds, electrical storms, freezing rain, or snow.
- Never use the platform as an elevator or equipment jack.
- Additional reference: Mast Climbing Work Platforms ANSI/SIA A92.9



Mast climbing scaffold

Mobile scaffold (“rolling tower”)

Mobile scaffolds, designed to be moved on wheels or casters, are useful when workers must frequently change position.

- Don't move a scaffold when a worker is on it unless it has been designed for that purpose.
- Don't use forklifts, trucks, motor vehicles, or add-on motors to move the scaffold unless it has been designed for that purpose.
- Use cross, horizontal, or diagonal braces to secure vertical members and to prevent the scaffold from racking or collapsing.
- Make sure that the scaffold is plumb, level, and square.
- Secure all brace connections.
- Lock casters and wheels to prevent the scaffold from moving.
- Stabilize the scaffold so it does not tip when it's moved.
- Platforms can't extend outward beyond the scaffold base supports without outriggers.
- Secure caster stems and wheel stems in scaffold legs.



When you move a scaffold, push as close to the base as possible, but no more than five feet above the supporting surface. The supporting surface must be within three degrees of level and the scaffold must have a 2:1 height-to-base ratio or less.



Mobile scaffold

Pump jack scaffold

A pump jack scaffold is a platform supported by moveable brackets on vertical poles. Pump jacks are relatively inexpensive and useful when it's necessary to work at various heights. Pump jacks are also practical for work where two buildings are so close together that a ladder jack scaffold cannot be installed at the proper angle.

Types of pump jack scaffolds include steel, aluminum, and wood. Steel pump jacks are made of pressed metal and are designed for use on double-thick two-inch by four-inch wood poles. Aluminum pump jacks are made of aluminum extrusions and are designed for special four-inch by four-inch aluminum poles. Steel pump jack components and aluminum pump jack components can't be interchanged.

- Pump jack brackets, braces, and accessories must be made from metal plates and angles. Each pump jack bracket must have two positive gripping mechanisms.
- Secure poles to the structure with rigid triangular bracing.
- Workbenches can't be used as scaffold platforms, but can act as a top rail.
- Wood poles must be straight-grained and free of shakes and other defects.
- Wood poles constructed in two continuous lengths must be joined together with the seam parallel to the bracket.
- Wood poles should not exceed 30 feet in length.
- If two-by-fours are spliced to make a pole, mending plates must be installed at all splices to maintain the full strength of the member.



A pumpjack scaffold's triangular bracing.



Pump jack scaffolds will normally have a work bench that can act as a top rail if it is 38 inches to 45 inches. Don't forget a midrail and guarding the ends.

Stilts

- Stilts can't be used on scaffolds – except – for large-area scaffolds.
- When a worker uses stilts on a large-area scaffold and is protected by guardrails, the height of the guardrails must be increased by an amount equal to the height of the stilts.
- Stilts can be used only on surfaces that are flat and free of pits, holes, and other obstructions.
- Keep stilts properly maintained. Any alteration of the original equipment must be approved by the manufacturer.

Systems scaffold

Systems scaffolds combine the versatility of tube and coupler scaffolding with the set-up ease of a fabricated frame scaffold. Systems scaffolds have many applications, especially in industrial settings. System scaffold components resemble tube and coupler components, but with special connectors that are used for joining different components together.



This ring rosette on a systems scaffold offers easy connections.



Stilts

OSHA Training Institute

Top plate (carpenter's bracket) scaffold

Top plate or carpenter's bracket scaffolds are useful for rolling out, setting, and bracing trusses and can be attached to interior or exterior walls. Two two-inch by six-inch planks, adequately supported, or a 12-inch fabricated scaffold plank can be used for the platform.

Top plate scaffold brackets are available commercially. They have a vertical member, which rests against the stud; a horizontal member for the platform; and an upright to prevent the platform from slipping.

- Job-made and manufactured scaffold brackets must be designed by a qualified person and be able to support four times the anticipated load.
- The scaffold platform can't sag more than 1/60th the distance between the brackets or supporting members when supporting the weight of employees, tools, and materials; for example, when scaffold brackets are four feet apart, the scaffold planks must sag less than one inch.
- If you attach a carpenter's bracket scaffold or a top plate bracket scaffold to a wall, make sure the wall is adequately supported and braced to withstand four times the scaffold's load.



Job made (left) and manufactured carpenter's bracket scaffolding.

Oregon OSHA photos

Tube and coupler scaffold

Tube and coupler scaffolds have platforms supported by tubing and erected with coupling (clamp) devices connecting uprights, braces, bearers, and runners. These scaffolds are among the most labor intensive of all scaffolding.

Because of their versatility and strength, tube and coupler scaffolds are often erected where very heavy loads need to be supported and where the scaffold must adapt to unique or difficult-to-reach structures.

➔ ***Beware! These scaffolds are so adaptable, they can be hard to build correctly. Please refer to Subdivision L, 1926.452(b) for specific requirements.***



Couplers, or “clamps,” on a tube and coupler scaffold contribute to the scaffold’s versatility.

Safe practices checklist

	Yes	No	N/A
1. Scaffold and components are inspected by a competent person before each work shift and after any incident that could weaken them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Scaffold is plumb, level, and square.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Scaffold legs are braced and braces are properly attached.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Workers have safe access to the scaffold and scaffold platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Base plates securely contact mud sills and frame.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Mud sills are properly placed and adequately sized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Components and platforms are in good condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Brackets, tube and clamps, and accessories are properly placed and secure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Casters are locked before work begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Damaged scaffold components are removed from service until they are repaired or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Guardrails are in place on all open sides and ends of the platform where a worker can fall 10 feet or more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The top edge of top-rails is between 38 inches and 45 inches above the platform surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
13. Toe boards are properly installed when necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Overhead protection is installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Barrels, ladders, and similar items are not used to increase the working height on scaffold platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Platform is free of debris and slippery surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Platform is fully planked at all working levels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Planking is placed so that the spaces between planks do not exceed one inch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. The front edge of the platform isn't more than 14 inches from the face of the structure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Platforms and components can support at least four times the maximum intended load applied to them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Platforms and walkways are at least 18 inches wide.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Platforms can't deflect more than 1/60th of the span with maximum intended load (or two inches in 10 feet).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Platforms longer than 10 feet extend no more than 18 inches beyond their supports.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Platforms up to 10 feet long extend at least six inches – but no more than 12 inches – beyond their supports.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Workers stay at least 10 feet away from power lines when they're working on a scaffold.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Checklist for erectors and dismantlers

	Yes	No	N/A
1. The scaffold is designed by a qualified person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Erectors and dismantlers have been trained by a competent person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The scaffold is erected, moved, dismantled, or altered under the supervision of a competent person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. A competent person determines the means of access to the scaffold.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. A competent person determines if safe access is feasible at each stage of the erecting and dismantling process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Hook-on or attachable ladders are installed as soon as possible after scaffold erection begins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The bottom step of access ladders is no more than 24 inches above or below the scaffold supporting level.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Cross bracing is not used for access to the platform.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Erectors and dismantlers use fall protection when feasible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Scaffold is built from the bottom up and dismantled from the top down.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Poles, legs, posts, frames, and uprights bear on base plates.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The scaffold is secured to the structure during erection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
13. The scaffold is secured to the structure during dismantling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Ties to the structure are installed as soon as the scaffold is completed to each tie-in area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Ties are removed only as the work progresses downward, unless other methods are used to prevent the scaffold from falling over.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Supported scaffolds that have a height-to-smallest-base-width ratio greater than 4-to-1 (including outrigger supports) are prevented from tipping.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Scaffold components made by different manufacturers aren't mixed unless they fit together easily and do not affect the scaffold's integrity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Damaged scaffold components are removed from service until they are repaired or replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Guys, ties, and braces are installed where horizontal members support the inner and outer legs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. The end of each abutted plank on a long platform rests on a separate support.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Planks overlapped to make a long platform overlap at least 12 inches over the supports unless they are nailed together.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Structural members aren't removed below the level being dismantled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Platforms are secured so they can't slip from supports.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Checklist for scaffold users

	Yes	No	N/A
1. Scaffold users are trained to recognize hazards associated with their work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Scaffold users have safe access to the scaffold and scaffold platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Cross bracing is not used for access to the platform.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Scaffold users wear hard hats when they're exposed to falling objects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Adequate fall protection is provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Buckets, ladders, and similar items are not used to increase the working height on scaffold platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Workers and tools are at least 10 feet away from high voltage power lines when they're on a scaffold.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Scaffold users know the competent person's name.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Scaffold users know when the scaffold was last inspected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Oregon OSHA Services

Oregon OSHA offers a wide variety of safety and health services to employers and employees:

Appeals

- ▶ **503-947-7426; 800-922-2689; admin.web@dcbs.oregon.gov**
 - Provides the opportunity for employers to hold informal meetings with Oregon OSHA on concerns about workplace safety and health.
 - Discusses Oregon OSHA's requirements and clarifies workplace safety or health violations.
 - Discusses abatement dates and negotiates settlement agreements to resolve disputed citations.

Conferences

- ▶ **503-378-3272; 888-292-5247, Option 1; oregon.conferences@dcbs.oregon.gov**
 - Co-hosts conferences throughout Oregon that enable employees and employers to learn and share ideas with local and nationally recognized safety and health professionals.

Consultative Services

- ▶ **503-378-3272; 800-922-2689; consult.web@dcbs.oregon.gov**
 - Offers no-cost, on-site safety and health assistance to help Oregon employers recognize and correct workplace safety and health problems.
 - Provides consultations in the areas of safety, industrial hygiene, ergonomics, occupational safety and health programs, assistance to new businesses, the Safety and Health Achievement Recognition Program (SHARP), and the Voluntary Protection Program (VPP).

Enforcement

- ▶ **503-378-3272; 800-922-2689; enforce.web@dcbs.oregon.gov**
 - Offers pre-job conferences for mobile employers in industries such as logging and construction.
 - Inspects places of employment for occupational safety and health hazards and investigates workplace complaints and accidents.
 - Provides abatement assistance to employers who have received citations and provides compliance and technical assistance by phone.

Public Education

- ▶ **503-947-7443; 888-292-5247, Option 2; ed.web@dcbs.oregon.gov**
 - Provides workshops and materials covering management of basic safety and health programs, safety committees, accident investigation, technical topics, and job safety analysis.

Standards and Technical Resources

► **503-378-3272; 800-922-2689; tech.web@dcbsoregon.gov**

- Develops, interprets, and gives technical advice on Oregon OSHA's safety and health rules.
- Publishes safe-practices guides, pamphlets, and other materials for employers and employees.
- Manages the Oregon OSHA Resource Center, which offers safety videos, books, periodicals, and research assistance for employers and employees.

Need more information? Call your nearest Oregon OSHA office.

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Salem, OR 97301-3882

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Bend

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Bend, OR 97701-4374
541-388-6066
Consultation: 541-388-6068

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Medford, OR 97504-8293
541-776-6030
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Pendleton, OR 97801-3072
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503-378-3274
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