Being in the construction field, we use scaffolding quite a bit. There are estimates, with number all over the board about how many projects use scaffolding but it's in the millions. So, at some time in your life on a construction site, the chances are pretty good that you'll be working around scaffolding.

So, what is scaffolding? Scaffolding is a temporary structure used to support a work crew and materials to assist in the construction, maintenance and repair of buildings, bridges and other man-made structures.

Scaffolds are typically used on construction sites by workers to get access to high areas that would be otherwise be pretty hard to get to. Scaffolding is also used in modified forms for formwork and shoring.

In this course we'll cover the General Requirements for Scaffolding 1926.451. We'll first cover some important definitions. Then we'll understand the capacity of scaffolding and the construction of it. We'll discuss both supported and suspended scaffolds, access requirements, fall protection, and falling object protection. We'll cover aerial lift requirements, and then wrap the course up with training safety requirements for scaffolding so you can stay safe and help other stay safe on the job. So, let's get started!

Work Platforms and Scaffolding General Provisions

In this section, we'll establish safety requirements for the construction, operation, maintenance and use of work platforms and scaffolding used in construction, alteration, demolition, operations and maintenance of buildings and other structures.

Scaffolding and work platforms shall be erected, used, inspected, tested, maintained and repaired in accordance with for non-mechanized equipment, A10.8-2019: Scaffolding Safety Requirements or the scaffolding shoring and forming institute's code of safe practices and the manufacturer's operating manual for mechanized equipment, a copy of the manufacturer's operating manual, which shall be available at the work site. First, let's go over some common terms regarding the use of scaffolding.

What is a scaffold?

A scaffold is an elevated, temporary work platform. There are three basic types supported scaffold platforms supported by rigid load bearing members, such as poles, legs, frames, and outriggers.

Suspended scaffolds platforms are suspended by ropes or other non-rigid overhead supports, and aerial lifts, such as cherry pickers or boom trucks.

What is a Competent Person

The term Competent Person is used in many OSHA standards and documents. A competent person is an individual capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to

employees, and who has authorization to take prompt corrective measures to eliminate them. By way of training and experience, a competent person is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to scaffolds or other worksite, equipment, or procedures, and has the authority to take prompt, corrective measures to eliminate them.

What is a Qualified Person

A qualified person is someone who possesses a recognized degree, certificate of professional standing, or has extensive knowledge, training, and experience and therefore can resolve problems related to the work or the project. For instance, a Qualified Person must design the scaffolding. We'll get into the Qualified person's other duties in a little while.

Personal Fall Arrest System

A personal fall arrest system is a system used to arrest an employee's fall. It consists of an anchorage connectors, a body harness, lanyard, deceleration device, lifeline, or combinations of these.

Duties and Roles: Competent Person

A competent person has specific duties when it comes to scaffolds on a job site and are required to be present on all sites where scaffolding is used. The competent person must select and direct the workers who erect, dismantle, move, or alter scaffolds.

A competent person is to determine if it is safe for employees to work on or from a scaffold during storms or high winds. Other competent person duties include ensuring that a personal fall arrest system or windscreens protect employees and to determine the feasibility and safety of providing fall protection and access for erectors and dismantlers. The competent person must also make sure that a scaffold will be structurally sound if intermixing components from different manufacturers.
One of their most important functions is inspecting the scaffolds. Scaffolds must be inspected, including scaffold components for visible defects before each work shift and after any occurrence which could affect the scaffold.

OSHA requires all workers be trained by a competent person. Erector dismantler training includes the nature of scaffold hazards and the proper procedures for erecting, disassembling, and repairing the type of scaffold to be utilized. Training should also include design criteria, maximum intended load capacity, and intended use of the scaffold, along with any other pertinent requirements.

Duties and Roles: Qualified Person

A qualified person must determine the type of scaffold needed for the job and be able to design and load scaffolds in accordance with that design. As part of the design procedure, the qualified person will determine the maximum load of the scaffold, assure a good foundation, and avoid any electrical hazards. The Qualified Person is also responsible for training the employees prior to scaffolding work.

General Requirements 1926.451

Capacity

Scaffolding, including its components must support its own weight without failure.

But we know the scaffolding will have people, tools, and maybe equipment on it while it's being used. The requirement continues (p) The scaffolding must support the maximum intended load applied or transmitted to it, by FOUR TIMES.

So, the maximum intended load of a scaffold is the total of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to the scaffold or scaffold component at any one time.

A qualified person must determine the type of scaffold needed for the job and be able to design and load scaffolds in accordance with that design. As part of the design procedure, the qualified person will determine the maximum load of the scaffold, assure a good foundation, and avoid any electrical hazards.

Scaffolds and scaffold components must never be loaded in excess of their maximum intended loads or rated capacities, whichever is less.

Scaffold Platform Construction

Each platform must be planked and decked as fully as possible with the space between the platform and uprights not more than 1 inch wide. The space must not exceed 9 inches when side brackets or odd-shaped structures result in a wider opening between the platform and the uprights.

Scaffold Planking Requirements

Scaffold planking must be able to support, without failure, its own weight and at least four times the intended load.

Work Area

Each scaffold platform and walkway must be at least 18 inches wide. When the work area is less than 18 inches wide, guardrails and-or personal fall arrest systems must be used.

Guardrails

The standard requires employers to protect each employee on a scaffold more than 10 feet above a lower level from falling to that lower level. To ensure adequate protection, guardrails must be installed along all open sides and ends before releasing the scaffold for use by employees, other than the erection and dismantling crews.

Criteria for Supported Scaffolds

Supported Scaffolds

Supported scaffolds are platforms supported by legs, outrigger beams, brackets, poles, uprights, posts, frames, or similar rigid support. The structural members, including poles, legs, posts, frames, and uprights, must be plumb and braced to prevent swaying and displacement.

Training

All employees must be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and how to control or minimize those hazards. The training must include fall hazards, falling object hazards, electrical hazards, proper use of the scaffold, and handling of materials.

Tipping

Supported scaffolds with a height to base width ratio of more than 4 to1 must be restrained by guying, tying, bracing, or an equivalent means. To prevent tipping, either the manufacturers' recommendation or the following placements must be used for guys, ties, and braces:

- Install guys, ties, or braces at the closest horizontal member to the 4:1 height and repeat vertically with the top restraint no further than the 4:1 height from the top.
- Vertically, every 20 feet or less for scaffolds less than three feet wide; every 26 feet or less for scaffolds more than three feet wide.
- Horizontally—at each end; and at intervals not to exceed 30 feet from one end.

Footing and foundation requirements for supported scaffolds

Supported scaffolds' poles, legs, posts, frames, and uprights must bear on base plates and mud sills, or other adequate firm foundation.

Forklifts, front-end loaders, and similar equipment support platforms

Forklifts can support platforms only when the entire platform is attached to the fork and the forklift does not move horizontally when workers are on the platform.

Front-end loaders and similar equipment can support scaffold platforms only when they have been specifically designed by the manufacturer for such use.

Increasing the working level height for employees on supported scaffolds

Stilts may be used on a large area scaffold. When a guardrail system is used, the guardrail height must be increased in height equal to the height of the stilts. If this is the case, The manufacturer must approve any alterations to the stilts before they're used.

Criteria for Suspended Scaffolds

What are suspension scaffolds?

A suspension scaffold contains one or more platforms suspended by ropes or other non-rigid means from an overhead structure, such as the following scaffolds:

- Single point
- Multi-point
- Multi-level
- Two-point
- Adjustable
- Boatswains' chair
- Catenary
- Chimney hoist
- Continuous run
- Elevator false car
- Go-devils
- Interior hung
- Masons
- and Stone setters

Requirements for suspension scaffolds

Employers must ensure that all employees are trained to recognize the hazards associated with the type of scaffold being used.

All support devices must rest on surfaces capable of supporting at least four times the load imposed on them by the scaffold when operating at the rated load of the hoist, or at least one-and-a-half times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater.

A competent person must evaluate all direct connections prior to use to confirm that the supporting surfaces are able to support the imposed load

All suspension scaffolds must be tied or otherwise secured to prevent them from swaying, as determined by a competent person.

Guardrails, a personal fall arrest system, or both must protect each employee more than 10 feet above a lower level from falling.

A competent person must inspect ropes for defects prior to each work shift and after every occurrence that could affect a rope's integrity.

When scaffold platforms are more than 24 inches above or below a point of access, ladders, ramps, walkways, or similar surfaces must be used.

When using direct access, the surface must not be more than 24 inches above or 14 inches horizontally from the surface.

When lanyards are connected to horizontal lifelines or structural members on single-point or two-point adjustable scaffolds, the scaffold must have additional independent support lines equal in number and strength to the suspension lines and have automatic locking devices.

Emergency escape and rescue devices must not be used as working platforms, unless designed to function as suspension scaffolds and emergency systems.

Are there specific requirements for counterweights?

Counterweights used to balance adjustable suspension scaffolds must be able to resist at least four times the tipping moment imposed by the scaffold operating at either the rated load of the hoist, or one-and-a-half (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.

Only those items specifically designed as counterweights must be used.
Counterweights used for suspended scaffolds must be made of materials that cannot be easily dislocated. Flowable material, such as sand or water, cannot be used.
Counterweights must be secured by mechanical means to the outrigger beams.
Vertical lifelines must not be fastened to counterweights.
Materials such as sand, masonry units, or rolls of roofing felt cannot be used for counterweights.

Outrigger Beams

Outrigger beams are the structural members of a suspension or outrigger scaffold that provide support. They must be placed perpendicular to their bearing support.

Tiebacks for outrigger beams must be secured to a structurally sound anchorage on the building or structure. Sound anchorages don't mean standpipes, vents, other piping systems, or electrical conduit.

Tiebacks

A single tieback must be installed perpendicular to the face of the building or structure. Two tiebacks installed at opposing angles are required when a perpendicular tieback cannot be installed.

Suspension ropes

The suspension ropes must be long enough to allow the scaffold to be lowered to the level below without the rope passing through the hoist, or the end of the rope configured to prevent the end from passing through the hoist. The standard prohibits using repaired wire.
Drum hoists must contain no less than four wraps of the rope at the lowest point. Employers must replace wire rope when the following conditions exist:

- Kinks
- six randomly broken wires in one rope lay, or
- three broken wires in one strand in one lay.
- one third of the original diameter of the outside wires is lost.
- heat damage.
- evidence that the secondary brake has engaged the rope.
- and any other physical damage that impairs the function and strength of the rope.

Suspension ropes supporting adjustable suspension scaffolds must be a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.
Suspension ropes must be shielded from heat-producing processes.

What are some of the requirements for power-operated suspension scaffold hoists?

- Power-operated hoists used to raise or lower a suspended scaffold must be tested and listed by a qualified testing laboratory.
- The stall load of any scaffold hoist must not exceed three times its rated load.
- The stall load is the load at which the prime-mover (motor or engine) of a power-operated hoist stalls or the power to the prime-mover is automatically disconnected.
- Gasoline power-operated hoists or equipment are not permitted.
- Drum hoists must contain no less than four wraps of suspension rope at the lowest point of scaffold travel.
- Gears and brakes must be enclosed.
- And, an automatic braking and locking device, in addition to the operating brake, must engage when a hoist makes instantaneous change in momentum or an accelerated overspeed.

What are some requirements for manually operated suspension scaffold hoists?

Manually operated hoists used to raise or lower a suspended scaffold must be tested and listed by a qualified testing laboratory. These hoists require a positive crank force to descend.

Can welding be done from a suspension scaffold?

Welding can be done from suspended scaffolds when:

- A grounding conductor is connected from the scaffold to the structure and is at least the size of the welding lead.

- The grounding conductor is not attached in series with the welding process or the work piece.
- An insulating material covers the suspension wire rope and extends at least 4 feet above the hoist.
- insulated protective covers cover the hoist.
- The tail line is guided, retained, or both, so that it does not become grounded.
- And when each suspension rope and any other independent lines are insulated from grounding.

Access to Scaffolds

Employers must provide access when the scaffold platforms are more than 2 feet above or below a point of access. Direct access is acceptable when the scaffold is not more than 14 inches horizontally and not more than 24 inches vertically from the other surfaces.
The use of crossbraces as a means of access is always prohibited.

Types of Access Permitted

- Ladders, such as portable, hook-on, attachable, and stairway
- Stair towers
- Ramps and walkways
- Integral prefabricated frames

Access Requirements when Employees Erect and Dismantle Supported Scaffolds

Employees erecting and dismantling supported scaffolding must have a safe means of access provided when a competent person has determined the feasibility and analyzed the site conditions.

Prohibited Scaffolds

- Shore and lean-to scaffolds are strictly prohibited.
- Also, employees are prohibited from working on scaffolds covered with snow, ice, or other slippery materials - except to remove these substances.

Fall Protection

- Personal fall arrest systems can be used on scaffolding when there are no guardrail systems.
- Use fall-arrest systems when working from the following types of scaffolding: boatswain's chair, catenary, float, needle beam, ladder, and pump jack.
- Use fall-arrest systems also when working from the boom/basket of an aerial lift. The following chart describes the type of fall protection required for specific scaffolds

Type of Scaffold	Fall Protection Required
Aerial lifts	Personal fall-arrest system
Boatswains' chair	Personal fall-arrest system
Catenary scaffold	Personal fall-arrest system
Crawling board (chicken ladder)	Personal fall-arrest system, or a guardrail system, or a ¾ inch (1.9 cm) diameter grabline or equivalent handhold securely fastened beside each crawling board
Float scaffold	Personal fall-arrest system
Ladder jack scaffold	Personal fall-arrest system
Needle beam scaffold	Personal fall-arrest system
Self-contained scaffold	Both a personal fall-arrest system and a guardrail system
Single-point and two-point suspension scaffolds	Both a personal fall-arrest system and a guardrail system
Supported scaffold	Personal fall-arrest system or guardrail system
All other scaffolds not specified above	Personal fall-arrest system or guardrail systems that meet the required criteria

Both Fall-arrest and guardrail systems must be used when working on single- and two-point adjustable suspension scaffolds and self-contained adjustable scaffolds that are supported by ropes.

Falling Objects

To protect employees from falling hand tools, debris, and other small objects, install toeboards, screens, guardrail systems, debris nets, catch platforms, canopy structures, or barricades. In addition, employees must wear hard hats.

Scissor Lifts

Scissor lifts are mobile supported scaffold work platforms used to safely move workers vertically and to different locations in a variety of industries including construction, retail, entertainment and manufacturing. Scissor lifts are different from aerial lifts because the lifting mechanism moves the work platform straight up and down using crossed beams functioning in a scissor-like fashion. Although scissor lifts present hazards similar to scaffolding when extended and stationary, using scissor lifts safely depends on considering equipment capabilities, limitations and safe practices.

Employers need to assess the worksite to identify all possible hazards in order to select the appropriate equipment for the task. Employers who use scissor lifts need to evaluate and implement effective

controls that address fall protection, stabilization and positioning. Only trained workers are allowed to use scissor lifts, and employers must make sure that those workers show that they can use a scissor lift properly. Safe scissor lift use includes properly maintaining the equipment, following the manufacturer's instructions, providing workers training and needed personal protective equipment (PPE), and implementing safe work practices.

Scissor lifts must have guardrails installed to prevent workers from falling.

Employers should train workers to:

Check to see that a guardrail system is in place before working on the scissor lift.
Only stand on the work platform; never stand on the guardrails.
Keep work within easy reach to avoid leaning away from the scissor lift.
Employers should ensure that scissor lifts are stable and will not tip over or collapse. Some safe work practices to ensure safe, stable conditions for scissor lift use include:

- Follow the manufacturer's instructions for safe movement—this usually rules out moving the lift in an elevated position.
- Isolate the scissor lift or implement traffic control measures to ensure that other equipment cannot contact the scissor lift.
- Select work locations with firm, level surfaces away from hazards that can cause instability (e.g., drop-offs, holes, slopes, bumps, ground obstructions, or debris).
- Use the scissor lift outside only when weather conditions are good.
- Scissor lifts rated for outdoor use are generally limited to wind speeds below 28 miles per hour.
- Although rare, the collapse of scissor lifts can be prevented if employers:
- Ensure that safety systems designed to stop a collapse are maintained and not bypassed.
- Never allow the weight on the work platform to exceed the manufacturer's load rating.
- Never allow equipment other than the scissor mechanism to be used to raise the work platform (e.g., using a forklift to lift the work platform).
- Keep the lift from being struck by other moving equipment on the worksite.
- Caution: Wind Can Make Extended Scissor Lifts Unstable

Scissor lifts present crushing hazards similar to vehicles and other mobile equipment at worksites. Employers should train workers to be watchful when:

- A moving scissor lift is near a fixed object.
- A moving vehicle and the scissor lift are operating closely.
- The scissor lift passes under a fixed object, such as a door frame or a support beam.
- Positioning the scissor lift to avoid electrocution, arc flash, and thermal burns is important for safely using scissor lifts near energized power lines. Since electricity can arc or jump from the power line to the scissor lift or worker, electrocution can occur even if neither the scissor lift nor the worker touches the power line.

The following work practices ensure that scissor lifts are safely positioned:

Implement traffic control measures around the scissor lift to prevent other workers or vehicles from getting too close.

Use ground guides when operating or moving the scissor lift around the workplace.
Select work locations that do not approach electrical power sources (e.g., power lines, transformers) by at least 10 feet and that do not pose other overhead hazards such as other utilities, branches, and overhangs.

If the job task requires work near an electrical source, the employer must ensure that the worker is qualified and has received the required electrical training.

Employers should regularly maintain scissor lifts to ensure that they are safe to use (e.g., prevent the lifting mechanism from collapsing). Manufacturer's maintenance and inspection instructions will generally include how to:

- Test and inspect controls and components before each use.
- Ensure that guardrail systems are in good working condition.
- Verify that brakes once set will hold the scissor lift in position.
- Employers must provide workers training on hazards, including how to work safely with or near scissor lifts.

Training must, at a minimum, include:

- The correct procedures for operating the scissor lift vertically and while in transit.
- How to handle materials on the scissor lift, including weight limits.
- Other worksite hazards workers may encounter when working on a scissor lift.
- Employers should also train workers in reporting any equipment defects or maintenance needs.

Aerial Lifts

- An aerial lift is any vehicle-mounted device used to elevate personnel. Types include:
- Extendable boom platforms,
- Aerial ladders,
- Articulating (jointed) boom platforms,
- Vertical towers, and
- Any combination of the above.

Aerial lifts have replaced ladders and scaffolding on many job sites due to their mobility and flexibility. They may be made of metal, fiberglass reinforced plastic, or other materials. They may be powered or manually operated and are considered to be aerial lifts whether or not they can rotate around a primarily vertical axis.

Many workers are injured or killed on aerial lifts each year. OSHA provides the following information to help employers and workers recognize and avoid safety hazards they may encounter when they use aerial lifts.

Employers need to assess the worksite to identify all possible hazards in order to select the appropriate equipment for the task. Employers who use aerial lifts need to evaluate and implement effective controls that address fall protection, stabilization and positioning. Only trained workers in general industry and authorized workers in construction may be allowed to use aerial lifts, and employers must make sure that those workers show that they can use an aerial lift properly. Safe aerial lift use includes

properly maintaining the equipment, following the manufacturer's instructions, providing workers training and needed PPE, and implementing safe work practices.

The following hazards, among others, can lead to personal injury or death:

1. Fall from elevated level,
2. Objects falling from lifts,
3. Tip-overs,
4. Ejections from the lift platform,
5. Structural failures (collapses),
6. Electric shock (electrocutions),
7. Entanglement hazards,
8. Contact with objects, and
9. Contact with ceilings and other overhead objects.

Training

Only trained and authorized persons are allowed to operate an aerial lift. Training should include:

- Explanations of electrical, fall, struck-by and falling object hazards;
- Procedures for dealing with hazards;
- Recognizing and avoiding unsafe conditions in the work setting;
- Instructions for correct operation of the lift (including maximum intended load and load capacity);
- Demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job;
- When and how to perform inspections; and
- Manufacturer's requirements.

Retraining

Workers should be retrained if any of the following conditions occur:

- An incident occurs during aerial lift use,
- Workplace hazards involving an aerial lift are discovered, or
- A different type of aerial lift is used.

Employers should also retrain workers who they observe operating an aerial lift improperly.

Pre-start Inspection

Prior to each work shift, conduct a pre-start inspection to verify that the equipment and all its components are in safe operating condition. Follow the manufacturer's recommendations and include a check of:

Vehicle components

- Proper fluid levels (oil, hydraulic, fuel and coolant)
- Leaks of fluids

- Wheels and tires
- Battery and charger
- Lower-level controls
- Horn, gauges, lights and backup alarms
- Steering and brakes
- Lift components

Operating and emergency controls

- Personal protective devices
- Hydraulic, air, pneumatic, fuel and electrical systems
- Fiberglass and other insulating components
- Missing or unreadable placards, warnings, or operational, instructional and control markings
- Mechanical fasteners and locking pins
- Cable and wiring harnesses
- Outriggers, stabilizers and other structures
- Loose or missing parts
- Guardrail systems

Do not operate any aerial lift if any of these components are defective until it is repaired by a qualified person. Remove defective aerial lifts from service (tag out) until repairs are made.

Work Area Inspections

Employers must assure that work areas are inspected for hazards and take corrective actions to eliminate such hazards before and during operation of an aerial lift. Items to look for include:

- Drop-offs, holes, or unstable surfaces such as loose dirt
- Inadequate ceiling heights
- Slopes, ditches, or bumps
- Debris and floor obstructions
- Overhead electric power lines and communication cables
- Other overhead obstructions
- Other hazardous locations and atmospheres
- High wind and other severe weather conditions, such as ice; and
- The presence of others in close proximity to the work.

Operating an aerial lift

Fall Protection

- Ensure that access gates or openings are closed.
- Stand firmly on the floor of the bucket or lift platform.
- Do not climb on or lean over guardrails or handrails.
- Do not use planks, ladders, or other devices as a working position.
- Use a body harness or a restraining belt with a lanyard attached to the boom or bucket.
- Do not belt-off to adjacent structures or poles while in the bucket.

- Operation/Traveling/Loading

Do Not Do The Following

- Do not exceed the load-capacity limits. Take the combined weight of the worker(s), tools and materials into account when calculating the load.
- Do not use the aerial lift as a crane or to hoist materials.
- Do not carry objects larger than the platform.
- Do not drive with the lift platform raised (unless the manufacturer's instructions allow this).
- Do not operate lower-level controls unless permission is obtained from the worker(s) in the lift (except in emergencies).
- Do not exceed vertical or horizontal reach limits.
- Do not operate an aerial lift in high winds above those recommended by the manufacturer.
- Do not override hydraulic, mechanical, or electrical safety devices.

Overhead Protection

- Be aware of overhead clearance and overhead objects, including ceilings.
- Do not position aerial lifts between overhead hazards if possible.
- Treat all overhead power lines and communication cables as energized, and stay at least 10 feet away.
- Ensure that the power utility de-energizes power lines in the vicinity of the work.

Insulated aerial lifts offer protection from electric shock and electrocution by isolating you from electrical ground. However, an insulated aerial lift does not protect you if there is another path to ground (for instance, if you touch another wire).To maintain the effectiveness of the insulating device, do not drill holes in the bucket.

Stability in the work zone

- Set outriggers on pads or on a level, solid surface if available.
- Set brakes when outriggers are used.
- Use wheel chocks on sloped surfaces when it is safe to do so.
- Set up work area warnings, such as cones and signs, when necessary to warn others.

Ladders

Ladders are another piece of equipment where workers often get hurt from falls. We'll go over both Extension Ladders and Step ladders in this section. First up is Extension Ladders.

Workers who use extension ladders risk permanent injury or death from falls and electrocutions. These hazards can be eliminated or substantially reduced by following good safety practices. Let's examine some of the hazards workers may encounter while working on extension ladders and discuss what employers and workers can do to reduce injuries. OSHA's requirements for extension ladders are in Subpart X.

Extension Ladders

Extension ladders, also called portable ladders, ladders usually have two sections that operate

in brackets or guides allowing for adjustable lengths. Because extension ladders are not self-supporting they require a stable structure that can withstand the intended load.

OSHA has specific safety requirements for ladders to ensure workers stay out of harms way. These requirements are:
Use a ladder that can sustain at least four times the maximum intended load, except that each extra-heavy duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load.

Follow the manufacturer's instructions and labels on the ladder. To determine the correct ladder, consider your weight plus the weight of your load.

Do not exceed the load rating and always include the weight of all tools, materials and equipment.

A competent person must visually inspect all extension ladders before use for any defects such as: missing rungs, bolts, cleats, screws, and loose components.

Where a ladder has these or other defects, it must be immediately marked as defective or tagged with "Do Not Use" or similar language.

Allow sufficient room to step off the ladder safely.

Keep the area around the bottom and the top of the ladder clear of equipment, materials and tools. If access is obstructed, secure the top of the ladder to a rigid support that will not deflect, and add a grasping device to allow workers safe access.

Set the ladder at the proper angle. When a ladder is leaned against a wall, the bottom of the ladder should be one-quarter of the ladder's working length away from the wall.

For access to an elevated work surface, extend the top of the ladder three feet above that surface or secure the ladder at its top.

Before starting work, survey the area for potential hazards, such as energized overhead power lines. Ladders shall have nonconductive side rails if they are used where the worker or the ladder could contact exposed energized electrical equipment. Keep all ladders and other tools at least 10 feet away from any power lines.
Set the base of the ladder so that the bottom sits securely and so both side rails are evenly supported. The ladder rails should be square to the structure against which it is leaning with both footpads placed securely on a stable and level surface.

Secure the ladder's dogs or pawls before climbing.

When using a ladder in a high-activity area, secure it to prevent movement and use a barrier to redirect workers and equipment. If the ladder is placed in front of a door, always block off the door

Provide the Right Extension Ladder

Select a ladder based on the expected load capacity (duty rating), the type of work to be done and the correct height. There are five categories of ladder duty ratings.

Type	Duty Rating	Use	Load
IAA*	Special Duty	Rugged	375 lbs.
IA	Extra Duty	Industrial	300 lbs.
I	Heavy Duty	Industrial	250 lbs.
II	Medium Duty	Commercial	225 lbs.
III	Light Duty	Household	200 lbs.

Source for Types IA, I, II, III: Subpart X—Stairways and Ladders, Appendix A (American National Standards Institute (ANSI)) 14.1, 14.2, 14.5 (1982)) of OSHA's Construction standards. Source for Type IAA: ANSI 14.1, 14.2, 14.5 (2009), which are non-mandatory guidelines.

Training

Train Workers to Use Extension Ladders Safely
Employers must train each worker to recognize and minimize ladder-related hazards.

The DO'S of Safe Extension Ladder Use

- Maintain a 3-point contact (two hands and a foot, or two feet and a hand) when climbing/
- descending a ladder.
- Face the ladder when climbing up or descending.
- Keep the body inside the side rails.
- Use extra care when getting on or off the ladder at the top or bottom. Avoid tipping the
- ladder over sideways or causing the ladder base to slide out.
- Carry tools in a tool belt or raise tools up using a hand line. Never carry tools in your hands while climbing up/down a ladder.
- Extend the top of the ladder three feet above the landing.
- Keep ladders free of any slippery materials.

The DO NOTS of Safe Extension Ladder Use

- Place a ladder on boxes, barrels, or unstable bases.
- Use a ladder on soft ground or unstable footing.
- Exceed the ladder's maximum load rating.
- Tie two ladders together to make them longer.
- Ignore nearby overhead power lines.
- Move or shift a ladder with a person or equipment on the ladder.
- Lean out beyond the ladder's side rails.
- Use an extension ladder horizontally like a platform.

Stepladder Safety

A stepladder is a portable, self-supporting, A-frame ladder. It has two front side rails and two rear side rails. Generally, there are steps mounted between the front side rails and bracing between the rear side rails.

Inspection

A competent person must inspect stepladders for visible defects on a periodic basis and after any occurrence that could affect their safe use.

Defects include, but are not limited to:

- Structural damage, split/bent side rails, broken or missing rungs/steps/cleats and missing or damaged safety devices.
- Grease, dirt or other contaminants that could cause slips or falls.
- Paint or stickers (except warning or safety labels) that could hide possible defects

Always Use The Proper Stepladder for the Job

Use a ladder that can sustain at least four times the maximum intended load, except that each extra-heavy duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. Also acceptable are ladders that meet the requirements set forth in Appendix A of Subpart X. Follow the manufacturer's instructions and labels on the ladder. To determine the correct ladder, consider your weight plus the weight of your load. Do not exceed the load rating and always include the weight of all tools, materials and equipment.

Type	Duty Rating	Use	Load
1AA	Special Duty	Rugged	375 lbs.
1A	Extra Heavy Duty	Industrial	300 lbs.
1	Heavy Duty	Industrial	250 lbs.
II	Medium Duty	Commercial	225 lbs.
III	Light Duty	Household	200 lbs.

Source for Types IA, I, II, III: Subpart X—Stairways and Ladders, Appendix A (American National Standards Institute (ANSI) 14.1, 14.2, 14.5 (1982)) of OSHA's Construction standards. Source for Type IAA: ANSI 14.1, 14.2, 14.5 (2009), which are non-mandatory guidelines.

Train Workers to use Stepladders Safely

Employers must train each worker to recognize and minimize ladder-related hazards.

Common Stepladder Hazards

- Damaged stepladder
- Ladders on slippery or unstable surface
- Unlocked ladder spreaders
- Standing on the top step or top cap
- Loading ladder beyond rated load
- Ladders in high-traffic location
- Reaching outside ladder side rails
- Ladders in close proximity to electrical wiring/equipment

The DO'S of Safe Stepladder Use

- Read and follow all the manufacturer's instructions and labels on the ladder.
- Look for overhead power lines before handling or climbing a ladder.
- Maintain a 3-point contact (two hands and a foot, or two feet and a hand) when climbing/
- descending a ladder.
- Stay near the middle of the ladder and face the ladder while climbing up/down.
- Use a barricade to keep traffic away from the ladder
- Keep ladders free of any slippery materials.
- Only put ladders on a stable and level surface that is not slippery.

The DO NOTS of Safe Extension Ladder Use

Use ladders for a purpose other than that for which they were designed. For example, do not use a folded stepladder as a single ladder.
Use a stepladder with spreaders unlocked.
Use the top step or cap as a step.
Place a ladder on boxes, barrels or other unstable bases.
Move or shift a ladder with a person or equipment on the ladder.
Use cross bracing on the rear of stepladders for climbing.
Paint a ladder with opaque coatings.
Use a damaged ladder.
Leave tools/materials/equipment on stepladder.
Use a stepladder horizontally like a platform.
Use a metal stepladder near power lines or electrical equipment.