Ladder Safety

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This course was adapted from the U.S. Department of Labor, Publication OSHA Fact Sheet, "Reducing Falls in Construction", which is in the public domain.

OSHA® FactSheet

Reducing Falls in Construction: Safe Use of Stepladders

Workers who use ladders in construction risk permanent injury or death from falls and electrocutions. These hazards can be eliminated or substantially reduced by following good safety practices. This fact sheet examines some of the hazards workers may encounter while working on stepladders and explains what employers and workers can do to reduce injuries. OSHA's requirements for stepladders are in Subpart X—Stairways and Ladders of OSHA's Construction standards.

What is a Stepladder?

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. (See Figure 1, below.)

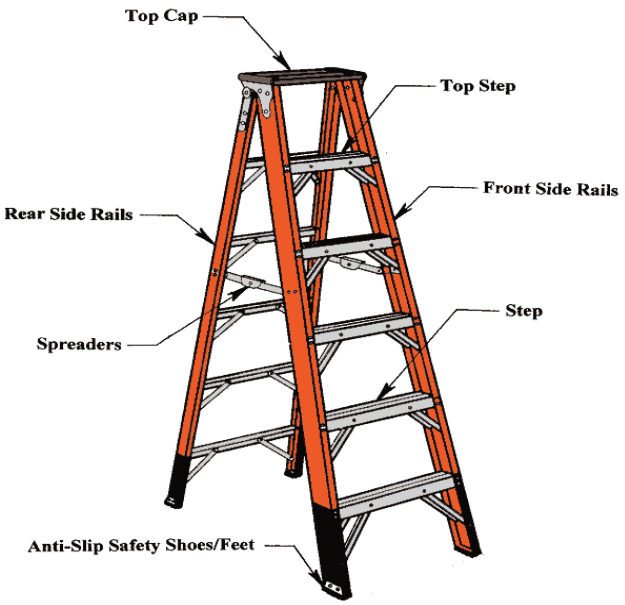

Figure 1: Stepladder

PLAN Ahead to Get the Job Done Safely.

A competent person must visually 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.

PROVIDE the Right Stepladder for the Job with the Proper Load Capacity.

- 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.

PLAN. PROVIDE. TRAIN.
Three simple steps to prevent falls.

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

Safe Stepladder Use—DO:

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.

Safe Stepladder Use—DO NOT:

- 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.

OSHA standard: 29 CFR 1926 Subpart X—Stairways and Ladders

American National Standards Institute standard: ANSI A14.1, A14.2, A14.5—Ladder Safety Requirements
(Not an OSHA standard, included to be used as guidance to meet OSHA's requirements)

Employers using stepladders must follow the ladder requirements set forth in 29 CFR 1926 Subpart X. Per Appendix A to Subpart X of Part 1926—Ladders, ladders designed in accordance with the following ANSI standards will be considered in accordance with 29 CFR 1926.1053(a)(1): ANSI A14.1-1982—American National Standard for Ladders-Portable Wood-Safety Requirements, ANSI A14.2-1982—American National Standard for Ladders—Portable Metal—Safety Requirements, and ANSI A14.5-1982—American National Standard for Ladders—Portable Reinforced Plastic—Safety Requirements.

State plan guidance: States with OSHA-approved state plans may have additional requirements for avoiding falls from ladders. For more information on these requirements, please visit: www.osha.gov/dcsp/osp/statesstandards.html.

Most OSHA offices have compliance assistance specialists to help employers and workers comply with OSHA standards. For details call 1-800-321-OSHA (6742) or visit: www.osha.gov/htm/RAmap.html.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

OSHA® Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

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OSHA® FactSheet

Reducing Falls in Construction: Safe Use of Job-made Wooden Ladders

Workers who use job-made wooden ladders risk permanent injury or death from falls and electrocutions. These hazards can be eliminated or substantially reduced by following good safety practices. This fact sheet lists some of the hazards workers may encounter while working on job-made wooden ladders and explains what employers and workers can do to reduce injuries. OSHA's requirements for job-made ladders are in Subpart X—Stairways and Ladders of OSHA's Construction standards.

What is a Job-made Wooden Ladder?

A job-made wooden ladder is a ladder constructed at the construction site. It is not commercially-manufactured. A job-made wooden ladder provides access to and from a work area. It is not intended to serve as a work platform. These ladders are temporary, and are used only until a particular phase of work is completed or until permanent stairways or fixed ladders are installed. A 24-ft. job-made ladder built to the American National Standards Institute (ANSI) A14.4-2009 non-mandatory guidelines is shown below.

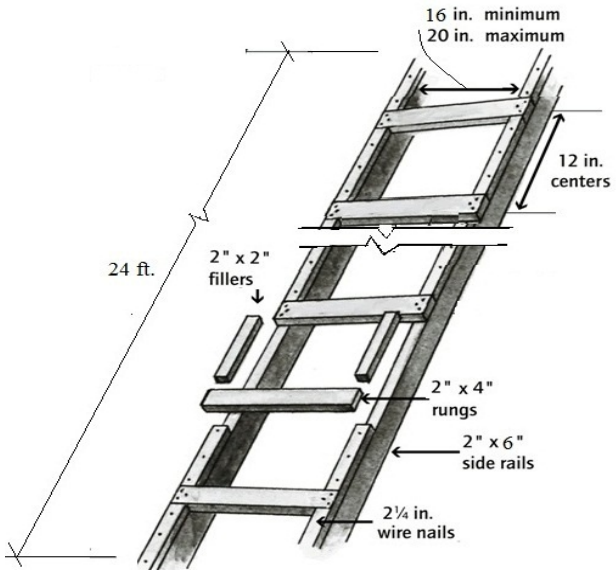

Figure 1: Single-Cleat Ladder

Training Requirements

Employers must provide a training program for employees using ladders and stairways. The training must enable each worker to recognize ladder-related hazards and to use ladders properly to minimize hazards.

Constructing a Safe Job-made Wooden Ladder

Side rails:

- Use construction-grade lumber for all components.
- Side rails of single-cleat ladders up to 24 ft. (7.3 m) long should be made with at least 2 in. (3.8 cm) x 6 in. (14 cm) nominal stock lumber.
- Side rails should be continuous, unless splices are the same strength as a continuous rail of equal length.
- The width of single-rung ladders should be at least 16 in. (41 cm), but not more than 20 in. (51 cm) between rails measured inside to inside.
- Rails should extend above the top landing between 36 in. (91.5 cm) and 42 in. (1.1 m) to provide a handhold for mounting and dismounting, and cleats must be eliminated above the landing level.
- Side rails of ladders which could contact energized electrical equipment should be made using nonconductive material. Keep ladders free of any slippery materials.
- Only put ladders on a stable and level surface that is not slippery.

Cleats:

- Cleats should be equally spaced 12 inches on center from the top of one cleat to the top of the next cleat.
- Cleats should be fastened to each rail with three 12d common wire nails which are nailed directly onto the smaller surfaces of the side rails.
- Making cuts in the side rails to receive the cleats is not advisable.
- Cleats should be at least 1 in. (2.5 cm) x 4 in. (8.9 cm) for ladders 16 ft. (41 cm) to 24 ft. (7.3 m) in length.

Filler Blocks:

- Filler should be 2 in. (3.8 cm) x 2 in. (3.8 cm) wood strips.
- Insert filler between cleats.
- Nail filler at the bottom of each side rail first. Nail the ends of a cleat to each side rail with three 12d common nails. One nail is placed 1-1/2 inch in from each end of the filler block.
- Nail the next two fillers and cleat, and then repeat. The ladder is complete when filler is nailed at the top of each rail.
- Make all side rails, rungs and fillers before the ladder is assembled.

Inspecting Ladders

- A competent person must visually inspect job-made ladders for defects on a periodic basis and after any occurrence that could affect their safe use.
- Defects to look for include: structural damage, broken/split side rails (front and back), missing cleats/steps, and parts/labels painted over.
- Ladders should be free of oil, grease and other slipping hazards.

PLAN. PROVIDE. TRAIN.

Three simple steps to prevent falls.

Safe Ladder Use—DO:

To prevent workers from being injured from falls from ladders, employers are encouraged to adopt the following practices:

- Secure the ladder's base so that it does not move.
- Smooth the wood surface of the ladder to reduce injuries to workers from punctures or lacerations and to prevent snagging of clothing.
- Use job-made wooden ladders with spliced side rails at an angle so that the horizontal distance from the top support to the foot of the ladder is one-eighth the working length of the ladder.
- Ensure that job-made wooden ladders can support at least four times the maximum intended load.
- Only use ladders for the purpose for which they were designed.
- Only put ladders on stable and level surfaces unless secured to prevent accidental movement.
- Ensure that the worker faces the ladder when climbing up and down.
- Maintain a 3-point contact (two hands and a foot, or two feet and a hand) when climbing a ladder.
- Keep ladders free of any slippery materials.
- Maintain good housekeeping in the areas around the top and bottom of ladders.

Safe Ladder Use—DO NOT:

- Paint a ladder with nontransparent coatings.
- Carry any object or load that could cause the worker to lose balance and fall.
- Subject a job-made wooden ladder to excessive loads or impact tests.

OSHA standard: 29 CFR 1926 Subpart X—Stairways and Ladders

American National Standards Institute standard: ANSI A14.4-1979, ANSI A14.4-2009

Employers constructing job-made ladders must follow the ladder requirements set forth in 29 C.F.R. 1926 Subpart X. They are encouraged to consult the non-mandatory guidelines set forth in ANSI A.14.4-1979—Safety Requirements for Job-Made Ladders (referenced in Appendix A to Subpart X of Part 1926—Ladders) and ANSI A.14.4-2009—Safety Requirements for Job-Made Wooden Ladders.

State plan guidance: States with OSHA-approved state plans may have additional requirements for avoiding falls from ladders. For more information on these requirements, please visit: www.osha.gov/dcsp/osp/statesstandards.html.

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OSHA® FactSheet

Reducing Falls in Construction: Safe Use of 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. This fact sheet examines some of the hazards workers may encounter while working on extension ladders and explains what employers and workers can do to reduce injuries. OSHA's requirements for extension ladders are in Subpart X—Stairways and Ladders of OSHA's Construction standards.

What is an Extension Ladder?

Also known as "portable ladders," extension ladders usually have two sections that operate in brackets or guides allowing for adjustable lengths. (See Figure 1, below.) Because extension ladders are not self-supporting they require a stable structure that can withstand the intended load.

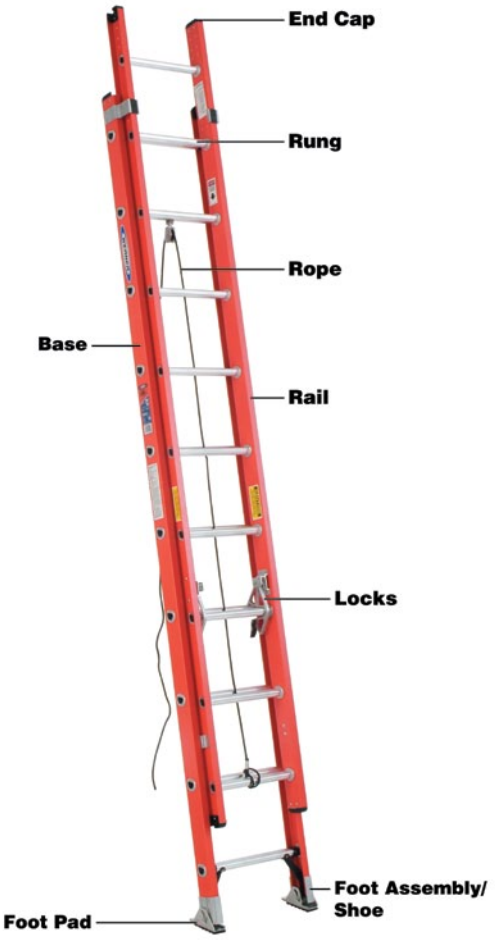

Figure 1: Extension Ladder

PLAN Ahead to Get the Job Done Safely.

- 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.
- 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.

Figure 2: Ladder extending three feet above the landing area.

PROVIDE the Right Extension Ladder for the Job with the Proper Load Capacity.

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.

TRAIN Workers to Use Extension Ladders Safely.

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

PLAN. PROVIDE. TRAIN.

Three simple steps to prevent falls.

Safe Ladder Use—DO:

- 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. (See Figure 2.)
- Keep ladders free of any slippery materials.

Safe Ladder Use—DO NOT:

- 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.

OSHA standard: **29 CFR 1926 Subpart X**—Stairways and Ladders

American National Standards Institute standard: **ANSI A14.1, A14.2, A14.5—Ladder Safety Requirements**
(Not an OSHA standard, included to be used as guidance to meet OSHA's requirements)

Employers using extension ladders must follow the ladder requirements set forth in 29 CFR 1926 Subpart X. Per Appendix A to Subpart X of Part 1926—Ladders, ladders designed in accordance with the following ANSI standards will be considered in accordance with 29 CFR 1926.1053(a)(1): ANSI A14.1-1982—American National Standard for Ladders—Portable Wood—Safety Requirements, ANSI A14.2-1982—American National Standard for Ladders—Portable Metal—Safety Requirements, and ANSI A14.5-1982—American National Standard for Ladders—Portable Reinforced Plastic—Safety Requirements.

State plan guidance: States with OSHA-approved state plans may have additional requirements for avoiding falls from ladders. For more information on these requirements, please visit: www.osha.gov/dcsp/osp/statesstandards.html.

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U.S. Department of Labor
Occupational Safety and Health Administration
Directorate of Technical Support & Emergency Management
Office of Science and Technology Assessment

Working Safely with Mobile Ladder Stands

Safety and Health Information Bulletin SHIB 09-27-2019

Introduction

Mobile ladder stands and platforms (i.e., mobile ladders) are used in businesses with warehouses, material storage facilities, merchandise distribution centers, and in home improvement stores. Manufacturing and production facilities are more likely to customize mobile ladder design for specific work activities. Each year, preventable injuries and fatalities occur while using mobile ladders, usually when not operated in accordance with the manufacturers' instructions and industry safety standards. Safe mobile ladder design, training, and inspections, as part of an overall workplace safety and health program, will prevent mobile ladder incidents.

Figure 1: A mobile ladder stand platform used at a NASA facility. Source: www.wildeck.com/

Mobile Ladder Design

Mobile ladders are designed to provide a safe, elevated work surface that can also move horizontally across a floor on casters or wheels (see figure 1). Manual or automatic position locking mechanisms are a design element that ensures the mobile ladder does not move when a worker is standing on the elevated work surface. While their appearance and design can vary depending on specific workplace requirements, mobile ladders are generally classified into two main categories: mobile ladder stands and mobile ladder stand platforms.

- **Mobile ladder stands** are at a fixed height, self-supporting, and have stairs accessing a top step (i.e., a mobile staircase). These ladders are usually designed for one worker to use at a time while standing. For example, a worker might use a mobile ladder stand to access a small item stored on a shelf or to change a light bulb.
- **Mobile ladder stand platforms** provide larger elevated work surfaces (i.e., platforms) that allow multiply workers to use the ladder at the same time and space to stage materials and tools. These mobile ladders are generally used for manufacturing, assembly, and maintenance activities.

Preventing injuries and fatalities when using mobile ladders starts with choosing the right mobile ladder for the activity. The following are considerations to make when choosing an appropriate mobile ladder for the work task:

- Preventing overreach of the rail during the work activity.
- Align the platform size, height, and mobility of the ladder with the task duration, complexity, and/or mobility needs.
- Calculate and compare the maximum intended load (e.g., worker, tools, and materials to the mobile ladders' designed capabilities.

A mobile ladder's main structural components and use must meet specific requirements in 29 CFR 1910.23(e): Mobile ladder stands and mobile ladder stand platforms and the applicable general requirements for ladders in 29 CFR 1910.23(b).

For additional information on mobile ladders, employers should reference appropriate industry standards such as ANSI A14.7.

Training

Before using a mobile ladder, employers must train each employee in the proper care, inspection, storage, and use of mobile ladders, which may include:

- Position locking mechanisms (i.e., weight activated vs manual).
- Stair step, platform, handrail, and guardrail use.
- Structural component and design requirements.

Employers must retrain workers when they have reason to believe workers do not have the understanding and/or skill required to safely continue to use mobile ladders. Some situations requiring employers to retrain workers include, but are not limited to, when the worker:

- Performs the job or uses equipment in an unsafe manner;
- Receives an evaluation or information that the worker is not performing the job safely or the employer receives such information; or
- Is involved in an incident or near-miss.

These training requirements can be found in 29 CFR 1910.30: Training requirements.

An on-line safety training video offered by the American Ladder Institute for Mobile Ladder Safety is available at: www.americanladderinstitute.org/page/LSTVideos.

Using Mobile Ladders

Mobile ladder use includes two different functions; moving the mobile ladder from position to position, and as an immobilized elevated work surface. **Never** move the mobile ladder stand or platform while an employee is on it. (29 CFR 1910.23(e)(1)(viii))

When **moving** mobile ladders:

- Ensure the mobile ladder is unoccupied.
- Disengage locking mechanisms and verify the casters or wheels can move freely.
- Maintain awareness to avoid hitting objects, other elevated structures, and workers in the

area.

When **working** on mobile ladders:

- Position the mobile ladder on a smooth, flat surface.
- Engage the locking mechanisms to prevent the mobile ladder from moving before stepping onto the ladder.
- Ensure that steps and platforms of mobile ladder stands and platforms are slip resistant. (29 CFR 1910.23(e)(ii))
- Keep steps and platforms clean, dry, and free of spills and debris. (29 CFR 1910.22(a)(3))
- Ensure the mobile ladder is only used for the purposes for which they were designed (29 CFR 1910.23(b)(8):
    - Do not use additional ladders or other objects to increase the working height.
    - Do not overreach from the top step or platform.
    - Do not stand on handrails, mid-rails, or toeboard, if so equipped, to gain additional height.
    - Keep both feet firmly on a step or platform.

When using mobile ladders around electrical lines, additional precautions should be taken to prevent electrical shock. For information on hazardous energy sources, see https://www.osha.gov/SLTC/electrical.

Inspecting Mobile Ladders

Mobile ladder inspections, conducted by a competent person following the manufacturer's instructions, will identify structural defects before use. These inspections should be documented and each mobile ladder should display a sticker, placard, tag, or log with inspection dates. In addition to following the manufacturer's recommended schedule, inspections must be conducted before it is used each work shift. (29 CFR 1910.23(b)(9))

Per 29 CFR 1910.23(b)(10), if structural defects are found:

- Immediately tag "Dangerous: Do Not Use".
- Remove the mobile ladder from service until it is repaired or replaced.

Mobile Ladders in the Workplace Safety and Health Program

Workplace safety and health programs should incorporate mobile ladders, when applicable, to clearly communicate policies for safe use. Specifically, safety and health programs should include:

- Where there mobile ladders are located in the workplace.
- How to access the manufacturers' instructions.
- Clarify roles and responsibilities mobile ladder use, inspection, training, and maintenance.
- Procedures for using each mobile ladder in specific worksite areas.
- Inspection expectations.
- Training program expectations.

Resources

29 CFR 1910.23: Ladders

ANSI A14.7: American National Standard for Mobile Ladder Stands and Mobile Ladder Stand Platforms

29 CFR 1910.30: Training Requirements

29 CFR 1910.145: Specifications for accident prevention signs and tags

29 CFR 1910 Subpart I, Personal protective equipment

OSHA Recommended Practices for Safety and Health Programs

Additional Information

OSHA provides compliance assistance through a variety of programs. OSHA On-Site Consultation Program offers no-cost and confidential occupational safety and health services to small and medium-sized businesses in all 50 states, the District of Columbia and several U.S. territories, with priority given to high-hazard worksites. Consultants from local agencies or universities work with employers to identify workplace hazards and how to fix them, provide advice for compliance with OSHA standards, train and educate, and assist in establishing and improving safety and health programs. On-Site Consultation services are separate from OSHA enforcement efforts and do not result in penalties or citations. However, employers must agree to correct any serious and imminent danger hazards identified in a timely manner. To locate the OSHA On-Site Consultation Program nearest you, call 1-800-321-OSHA (6742) or visit www.osha.gov/consultation.

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.
- Exercise their rights under the Consumer Product Safety Improvement Act (CPSIA) without retaliation, including reporting a potentially unsafe or defective product to their employer, the federal government (i.e., the Consumer Product Safety Commission (CPSC)), or a state attorney general. A worker must file a CPSIA whistleblower complaint with OSHA no later than 180 days after an alleged violation occurs.

For additional information, see OSHA's Workers' page.