

Ladder Safety Best Practices



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Introduction

Ladders are part of our everyday work environment. Used correctly, ladders are an important part of the work we do. Often we do not give the use of ladders a second thought until there is an accident. Ladders can pose many hazards that include primarily a fall from height which can result in serious injury and even death. When employees know how to properly maintain ladders, how to use them safely, and what to look for prior to use, the workplace is much safer for all employees. The key is to have a system in place that advises everyone about precautions needed to avoid accidents. Clear and well-planned communication is essential and required by OSHA regulations. OSHA regulations for ladders are found under “CFR 1910. Subpart D, Walking and Working Surfaces, 1910.23” for General Industry and “CFR 1926 Subpart X, Stairways and Ladders, 1926.1053” for Construction. Both standards apply to self-supporting portable, non-self-supporting portable, and fixed ladders, except for those ladders used for emergency operations such as firefighting, rescue, and tactical law enforcement operations, or training for these operations; or designed into or ones that are an integral part of machines or equipment.

Scope

This information was prepared to assist you in developing your ladder safety program. To be effective this must relate to **your operations and your employee exposures**. You should consider the hazards associated with ladder use such as environmental factors, type of ladder (step stools, step ladders, extension ladders and fixed ladders), overall condition, ladder design materials, ladder load rating, and potential falls with the need for fall protection during use.

Ladder Use by Department

Several different types of ladders are found in many municipal departments, schools, and utilities. Because ladders are so common or so infrequently use in the workplace, some departments may think they have no exposure and do not fall within the requirements of the OSHA standard. Listed below are some examples by municipal department of ladder use.

- **Administrative** – Facility maintenance, such as custodial cleaning / maintenance, painting, changing light fixtures, records / publication storage / retrieval, Library activities.
- **Public Works** – Material storage, facility maintenance, vehicle access for repair, tree/branch removal, trench access / egress, equipment maintenance.
- **Law Enforcement** – Non-emergency use, records storage, facility maintenance.
- **Fire / Rescue Departments** – Non-emergency use, records storage, facility maintenance, fleet maintenance.

- **Educational Facilities** – Custodial / maintenance activities, light fixture maintenance, painting, repair, records storage.
- **Water and Pollution Control Facilities** – Facilities / equipment maintenance, egress to pump stations.
- **Parks & Recreation** – Grounds keeping, facilities / grounds maintenance, playground equipment installation and repair.

Ladder Safety Program Overview

OSHA Standard 29 CFR 1910.23, which has been adopted by Maine Department of Labor and is applicable to municipalities and quasi-municipal entities, requires that the employer must ensure the following:

General Ladder use guidelines:

- Ladder rungs, steps, and cleats are parallel, level, and uniformly spaced when the ladder is in position for use.
- Ladder rungs, steps, and cleats are spaced not less than 10 inches (25 cm) and not more than 14 inches (36 cm) apart, as measured between the centerlines of the rungs, cleats, and steps.
- Ladder rungs and steps in elevator shafts must be spaced not less than 6 inches (15 cm) apart and not more than 16.5 inches (42 cm) apart, as measured along the ladder side rails.
- Fixed ladder rungs and steps on towers must be spaced not more than 18 inches (46 cm) apart, measured between the centerlines of the rungs or steps.
- Steps on stepstools are spaced not less than 8 inches (20 cm) apart and not more than 12 inches (30 cm) apart, as measured between the centerlines of the steps.
- Ladder rungs, steps, and cleats have a minimum clear width of 11.5 inches (29 cm) on portable ladders and 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders. The minimum clear width does not apply to ladders with narrow rungs that are not designed to be stepped on, such as those located on the tapered end of orchard ladders and similar ladders.
- Rungs and steps of manhole entry ladders that are supported by the manhole opening must have a minimum clear width of 9 inches (23 cm).
- Rungs and steps on rolling ladders used in telecommunication centers must have a minimum clear width of 8 inches (20 cm).
- Stepstools have a minimum clear width of 10.5 inches (26.7 cm).
- Wooden ladders are not coated with any material that may obscure structural defects.
- Metal ladders are made with corrosion-resistant material or protected against corrosion.
- Ladder surfaces are free of puncture and laceration hazards.
- Ladders are used only for the purposes for which they were designed.

- **Ladders are inspected before initial use in each work shift, and more frequently as necessary, to identify any visible defects that could cause employee injury.**
- Any ladder with structural or other defects is immediately tagged "Dangerous: Do Not Use" or with similar language in accordance with § 1910.145 and removed from service until repaired in accordance with § 1910.22(d), or replaced.
- Each employee faces the ladder when climbing up or down it.
- Each employee maintains three points of contact with least one hand to grasp the ladder when climbing up and down it.
- **No employee carries any object or load that could cause the employee to lose balance and fall while climbing up or down the ladder.**

Portable Ladder use guidelines

- Rungs and steps of portable metal ladders are corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.
- Each stepladder or combination ladder used in a stepladder mode is equipped with a metal spreader or locking device that securely holds the front and back sections in an open position while the ladder is in use.
- Ladders are not loaded beyond the maximum intended load. The maximum intended load, as defined in § 1910.21(b), includes the total load (weight and force) of the employee and all tools, equipment, and materials being carried.
- Ladders are used only on stable and level surfaces unless they are secured or stabilized to prevent accidental displacement.
- No portable single rail ladders are used.
- No ladder is moved, shifted, or extended while an employee is on it.
- Ladders placed in locations such as passageways, doorways, or driveways where they can be displaced by other activities or traffic need to be protected.
- Ladder is secured to prevent accidental displacement or are guarded by a temporary barricade, such as a row of traffic cones or caution tape, to keep the activities or traffic away from the ladder;
- The cap (if equipped) and top step of a stepladder are not used as steps.
- Portable ladders used on slippery surfaces are secured and stabilized.
- The top of a non-self-supporting ladder is placed so that both side rails are supported, unless the ladder is equipped with a single support attachment.
- Portable ladders used to gain access to an upper landing surface have side rails that extend at least 3 feet (0.9 m) above the upper landing surface (see Figure D-1).
- Ladders and ladder sections are not tied or fastened together to provide added length unless they are specifically designed for such use.
- Ladders are not placed on boxes, barrels, or other unstable bases to obtain additional height.

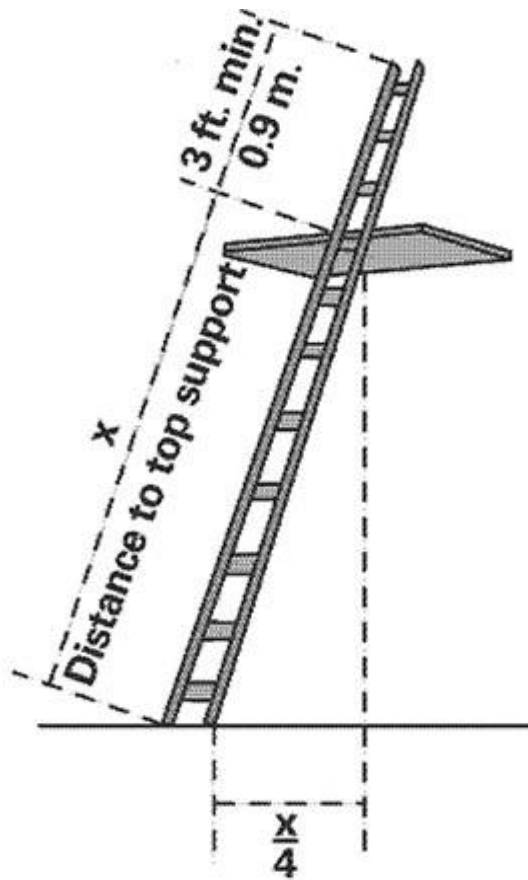


Figure D-1 -- Portable Ladder Set-up

Fixed ladder use guidelines

- Fixed ladders are capable of supporting their maximum intended load.
- The minimum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in back of the ladder is 7 inches (18 cm), except for elevator pit ladders, which have a minimum perpendicular distance of 4.5 inches (11 cm).
- Grab bars do not protrude on the climbing side beyond the rungs of the ladder that they serve.
- The side rails of through or sidestep ladders extend at least 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For parapet ladders, the access level is the roof, if the parapet is cut to permit passage through the parapet or the top of the parapet, if the parapet is continuous.
- For through ladders, the steps or rungs are omitted from the extensions, and the side rails are flared to provide not less than 24 inches (61 cm) and not more than 30 inches (76 cm) of clearance. When a ladder safety system is provided, the maximum clearance between side rails of the extension must not exceed 36 inches (91 cm).

- For side-step ladders, the side rails, rungs, and steps must be continuous in the extension (see Figure D-2).
- Grab bars extend 42 inches (1.1 m) above the access level or landing platforms served by the ladder.
- The minimum size (cross-section) of grab bars is the same size as the rungs of the ladder.
- When a fixed ladder terminates at a hatch (see Figure D-3) the hatch cover opens with sufficient clearance to provide easy access to or from the ladder and opens at least 70 degrees from horizontal if the hatch is counterbalanced.
- Individual-rung ladders are constructed to prevent the employee's feet from sliding off the ends of the rungs (see Figure D-4).
- Fixed ladders having a pitch greater than 90 degrees from the horizontal are not used.
- The step-across distance from the centerline of the rungs or steps is for through ladders, not less than 7 inches (18 cm) and not more than 12 inches (30 cm) to the nearest edge of the structure, building, or equipment accessed from the ladders.
- For side-step ladders, not less than 15 inches (38 cm) and not more than 20 inches (51 cm) to the access points of the platform edge.

Fixed ladders that do not have cages or wells use guidelines

- A clear width of at least 15 inches (38 cm) on each side of the ladder centerline to the nearest permanent object.
- A minimum perpendicular distance of 30 inches (76 cm) from the centerline of the steps or rungs to the nearest object on the climbing side. When unavoidable obstructions are encountered, the minimum clearance at the obstruction may be reduced to 24 inches (61 cm), provided deflector plates are installed (see Figure D-5).
- **Note:** CFR 1910.28 establishes the employer's duty to provide fall protection for employees on fixed ladders, and CFR 1910.29 specifies the criteria for fall protection systems for fixed ladders.

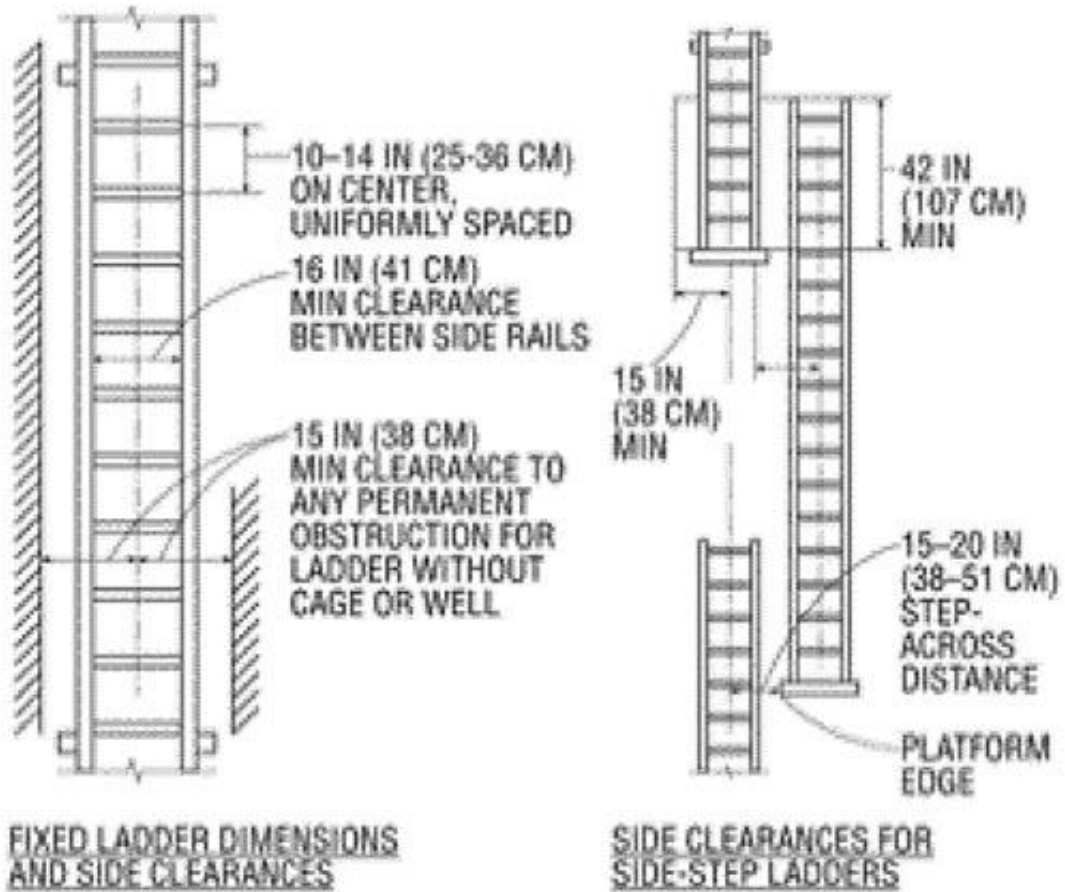


Figure D-2 -- Slide-Step Fixed Ladder Sections.

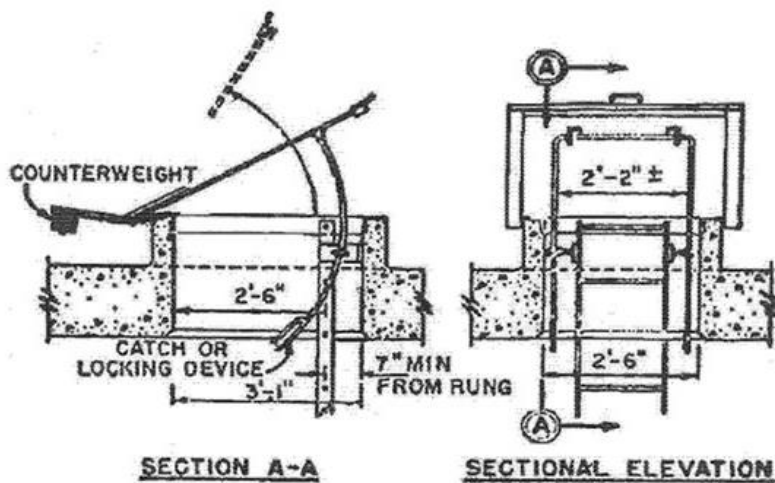


Figure D-3 -- Example of Counterbalanced Hatch Cover at Roof.

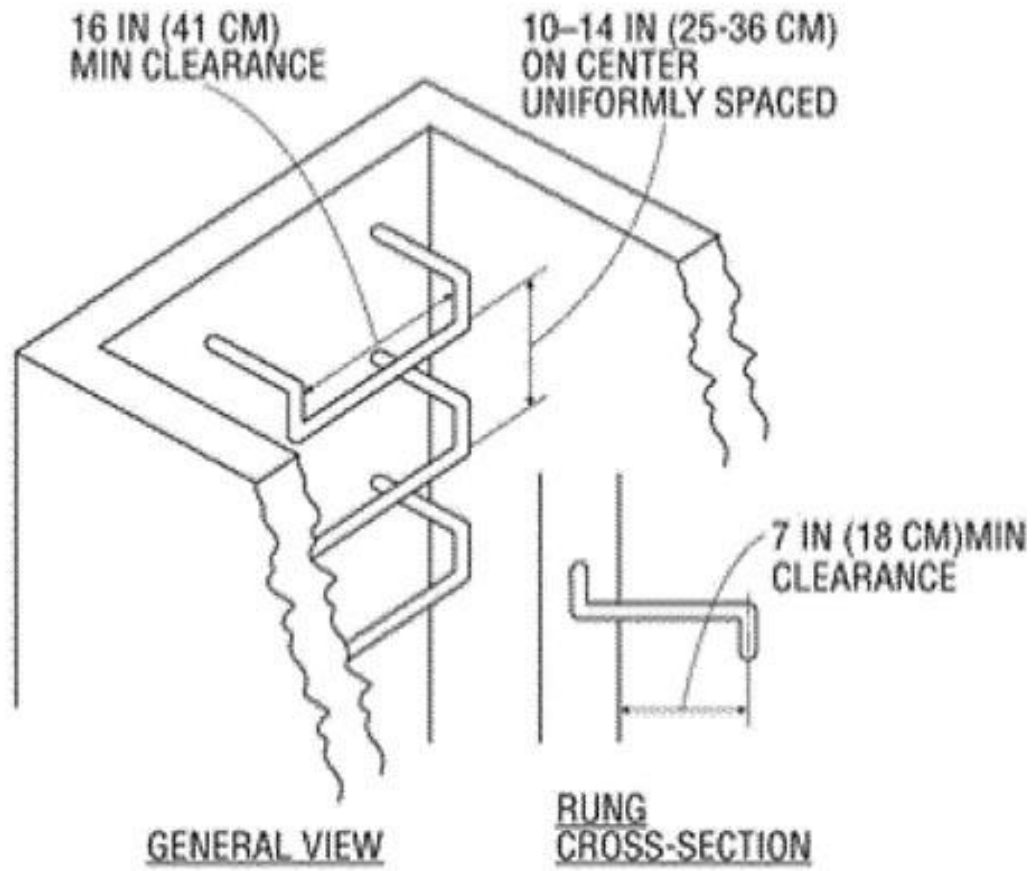


Figure D-4 -- Individual Rung Ladder.

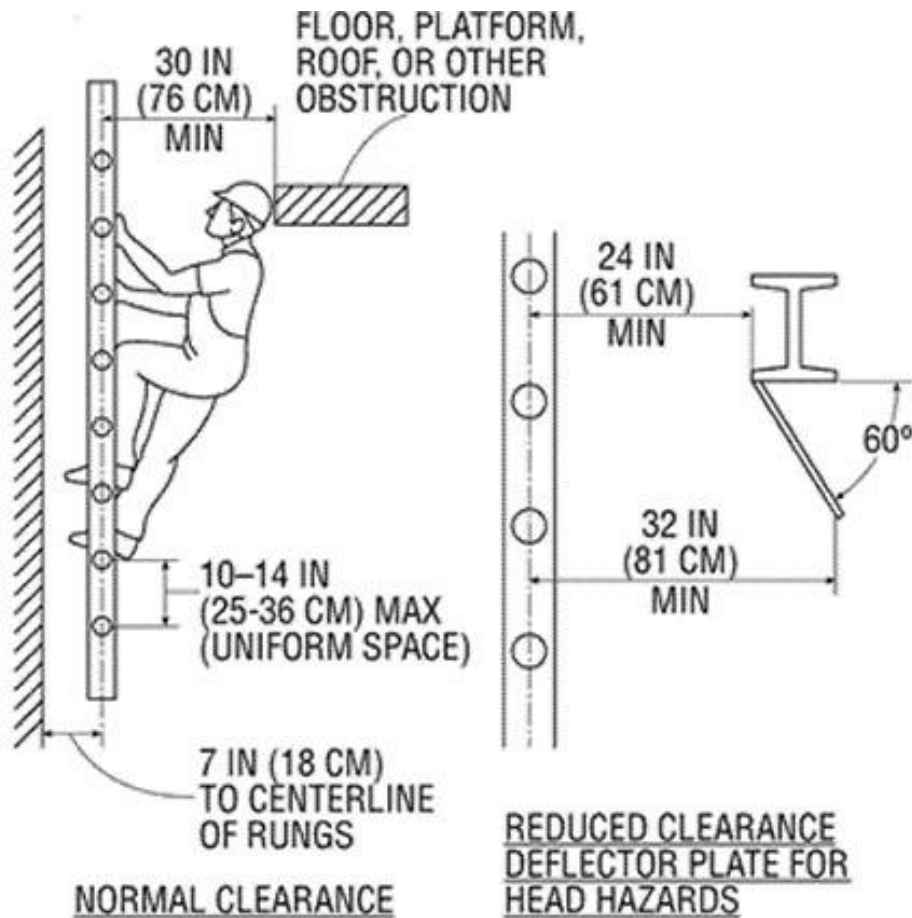


Figure D-5 -- Fixed Ladder Clearances.

Mobile ladder stands and mobile ladder stand platforms use guidelines

- Mobile ladder stands and platforms have a step width of at least 16 inches (41 cm);
- The steps and platforms of mobile ladder stands and platforms are slip resistant. Slip-resistant surfaces must be either an integral part of the design and construction of the mobile ladder stand and platform, or provided as a secondary process or operation, such as dimpling, knurling, shot-blasting, coating, spraying, or applying durable slip-resistant tapes.
- Mobile ladder stands and platforms are capable of supporting at least four times their maximum intended load.
- Wheels or casters under load are capable of supporting their proportional share of four times the maximum intended load, plus their proportional share of the unit's weight.
- Mobile ladder stands and platforms with a top step height of 4 feet (1.2 m) or above have handrails with a vertical height of 29.5 inches (75 cm) to 37 inches (94 cm), measured from the front edge of a step. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special use applications.

- The maximum work-surface height of mobile ladder stands and platforms does not exceed four times the shortest base dimension, without additional support. For greater heights, outriggers, counterweights, or comparable means that stabilize the mobile ladder stands and platforms and prevent overturning must be used.
- Mobile ladder stands and platforms that have wheels or casters are equipped with a system to impede horizontal movement when an employee is on the stand or platform.
- No mobile ladder stand or platform moves when an employee is on it.

Design requirements for mobile ladder stands.

- Steps are uniformly spaced and arranged, with a rise of not more than 10 inches (25 cm) and a depth of not less than 7 inches (18 cm). The slope of the step stringer to which the steps are attached must not be more than 60 degrees, measured from the horizontal.
- Mobile ladder stands with a top step height above 10 feet (3 m) have the top step protected on three sides by a handrail with a vertical height of at least 36 inches (91 cm); and top steps that are 20 inches (51 cm) or more, front to back, have a midrail and toeboard. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special-use applications and the standing area of mobile ladder stands is within the base frame.

Design requirements for mobile ladder stand platforms.

- Steps of mobile ladder stand platforms meet the requirements of paragraph (e)(2)(i) of this section. When the employer demonstrates that the requirement is not feasible, steeper slopes or vertical rung ladders may be used, provided the units are stabilized to prevent overturning.
- Mobile ladder stand platforms with a platform height of 4 to 10 feet (1.2 m to 3 m) have, in the platform area, handrails with a vertical height of at least 36 inches (91 cm) and midrails and all ladder stand platforms with a platform height above 10 feet (3 m) have guardrails and toeboards on the exposed sides and ends of the platform.
- Removable gates or non-rigid members, such as chains, may be used on mobile ladder stand platforms instead of handrails and guardrails in special-use applications.

Whew, that's a ton of requirements!

Develop a Ladder Safety Program

Given the volume of ladder use requirements, you maybe scratching your head as to where to start with your ladder safety program. MMA RMS Loss Control suggests completing the following steps when developing your ladder safety program.

First off, Employee Training day 1 of hiring followed by annual refresher ladder use training. All employees that will be using or working around ladders should have training on safe ladder use. General Ladder Safety Training can be found through our Online University at memun.org

Additional Ladder Safety Training can be found on our Safety Shorts listings at <https://www.memun.org/Insurance-Services/Risk-Management-Services/Loss-Control/Safety-Shorts>

Through the Maine Department of Labor Safety Works (4 hour course) check their calendar for class dates.

https://www.maine.gov/tools/whatsnew/index.php?topic=Safetyworks_Classes&v=ListAll

Werner Ladder- https://www.wernerco.com/docs/default-source/literature/ladder-safety-inspection-form.pdf?sfvrsn=ff6cdffd_0

American ladder Institute- <https://www.americanladderinstitute.org/page/Ladders101>

American National Standards Institute (ANSI) has developed “standards” for the manufacture, materials, design, and load ratings for ladders:

- [A14.1 - Portable Wood Ladders - 2018](#)
- [A14.2 - Portable Metal Ladders - 2017](#)
- [A14.3 - Fixed Ladders - 2008](#)
- [A14.4 - Job Made Ladders - 2018](#)
- [A14.5 - Reinforced Plastic Ladders - 2017](#)
- [A14.7 - Rolling Ladders - 2011](#)
- [A14.8 - Requirements for Ladder Accessories - 2013](#)
- [A14.9 - Disappearing Attic Stairways - 2019](#)
- [A14.11 - Stepstools - 2018](#)

Employee training should consist of the minimum topics:

- Choosing the appropriate ladder.
- Proper ladder set ups.
- Appropriate use of ladders.
- Hazards of use.
- Ladder load ratings.
- Proper Ladder Storage.
- Ladder pre use and periodic inspections (hands on). Ladder inspection documents can be found in the Attachment section of this document.



Appendix A - Sample Ladder Policy

Organization Name has developed this safety policy for ladder use to ensure that our employees have a reduced exposure to hazards associated with ladder use and to minimize potential injuries due to ladder use. Employees observed not following the Ladder Safety Policy will be disciplined. Supervisors not enforcing the Ladder Safety Policy will be disciplined.

Ladder Types

There are 4 primary types of ladders. They include step-ladders, straight ladders, extension ladders, and extension trestle ladders. A step-ladder is a self-supporting ladder, non-adjustable in length, having flat steps and a hinged back. A single straight ladder is nonadjustable in length, consisting of only one section, while an extension ladder is a portable ladder adjustable in length, consisting of multiple sections.

Ladder Composition

The rails on a ladder are generally composed of wood, metal, or fiberglass. The following information outlines important details regarding the different properties of these materials as they apply to ladders.

- **Wood Ladders:** Wood ladders are electrically non-conductive and are the best natural insulator against heat. However, they can be electrically conductive if wet. Wood ladders are heavier than metal and susceptible to rotting and splitting in the absence of a protective finish.
- **Metal Ladders:** Metal ladders are relatively strong and lightweight, but they are prone to dent, bend, and conduct heat. They must not be used when working on or near electrical wires or when working around energy sources. Metal ladders must be labeled with a “DANGER” sticker indicating an electrocution hazard.
- **Fiberglass Ladders:** Fiberglass ladders are strong and electrically non-conductive, but they are generally heavier than metal ladders. Fiberglass may chip or crack upon impact, and when overloaded, fiberglass may crack to the point of failure.

Ladder Selection

When selecting a ladder, ensure that the ladder has an adequate proper duty rating to support the combined weight of the user, materials, and tools. Materials include the weight of clothing, protective equipment, and supplies being carried or stored on the ladder. The ladder duty ratings are as follows:

- **Type IAA (Extra Heavy Special Duty Industrial):** for heavy duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 375 pounds.

- **Type 1A** (Extra Heavy Duty Industrial): for heavy duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 300 pounds.
- **Type I** (Industrial): for heavy duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 250 pounds
- **Type II** (Commercial): for medium duty, such as painters, offices, and light industrial use. Load capacity not to exceed 225 pounds.
- **Type III** (Household): for light duty, such as light household use. Load capacity not to exceed 200 pounds.

Ladder inspection & repairs

Each user shall inspect the ladder prior to use. The user performing the inspection shall visually inspect and confirm that applicable criteria are met within the appropriate “Ladder Inspection Checklist”. A user shall re-inspect the ladder immediately after events that could impact the integrity of the ladder (e.g. dropping the ladder or transporting the ladder). Ladders that do not meet the requirements of the “Ladder Inspection Checklist” shall be tagged as “Dangerous, Do Not Use” and removed from service immediately. Improvised repairs shall not be made to ladders. Only repairs that restore the ladder to the manufacturer’s design specifications are permitted under this program. In addition, wood ladders shall not be painted with an opaque finish or coated with any material that may hide defects.

Ladder storage & transport

Ladders should be stored in a location out of direct sunlight and away from chemicals or materials that may cause decay or damage. Materials shall never be stored on a ladder or hung from a ladder in storage. All ladders shall be secured during transport to prevent damage.

Ladder setup & securement

Employees shall ensure that the following “proper use” criteria are met prior to setup:

- Ladders shall be set-up on a flat, level surface;
- Ladders shall not be placed in front of a door opening unless the door is blocked open, locked, or guarded;
- Ladders shall not be used horizontally as a platform, a runway, or scaffold;
- Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height;
- The area around a ladder must remain clear from debris, equipment, etc;
- Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer’s rated capacity;
- Ladders shall not be setup or used outdoors during wind speeds exceeding 20 miles per hour;
- Ladders shall not be setup or used on slippery surfaces such as snow, ice, wet, or oily deposits;
- Ladders shall not be used by more than one employee at a time;

- The maximum length of a step-ladder shall not exceed 20 feet, a single straight ladder shall not exceed 30 feet, and an extension ladder shall not exceed 36 feet. Aerial lifts or other means should be used for heights exceeding 36 feet;
- Shorter ladders shall not be spliced together to create longer sections; and
- Standing ladders shall not be left unattended.

Employees shall setup the ladder according to the following chronological steps depending on the type of ladder:

Step-Ladders

- Lay the step-ladder on the ground, and extend and lock the metal spreaders in place.
- Lift the ladder from the top and walk it up until the ladder is sitting on all four feet.
- If the ladder is large or the task is too difficult alone, ask for help to setup the ladder. Using two people, raise the ladder like one would a straight ladder. Have one person on the front side rails and the other person on the back side rails. Separate the front from the back by walking in opposite directions. Ensure the spreader is engaged and the hinge is locked.
- Once the ladder is in the upright position, the metal spreader shall be checked again to ensure that the spreader is locked prior to use. A step-ladder shall not be used in a folded position.

Straight and Extension Ladders

- Lay the ladder on the ground with the base resting against the bottom of a wall and the top pointing away from the wall.
- Starting at the top, lift the ladder over your head and walk under the ladder to the wall. Move hands from rung to rung as you go.
- When the ladder is vertical and the top is against the wall, pull the base out so that the distance from the wall is one-fourth the height to the point of support.
- If using an extension ladder, extend the ladder up as necessary from the ground only.
- The minimum overlap for any two-sections on an extension ladder shall be at least three feet.
- No ladder shall be used to gain access to another location unless the top of the ladder extends at least 3 feet above the point of support, at floor, working surface, eave, gutter, or roofline.
- When possible, each ladder shall be secured at the top and bottom to prevent movement. At a minimum, the bottom shall be securely blocked against a fixed object such as a cleat, tied to the base of the wall, or footed against another person.

Ladder climbing and standing

When climbing or standing on a ladder, the following safety precautions shall be followed:



- The top two steps of a stepladder and the top two rungs of a straight or extension ladder shall not be used for standing.
- Shoes and rungs shall be free of mud, soil, paint, ice, or other slippery materials
- When ascending or descending, the user must face the ladder.
- At least one hand must be free to grasp the ladder at all times. Maintain at least three points of contact with the ladder (two feet and one hand or two hands and one foot) when climbing the ladder.
- The top rest for portable rung and cleat ladders shall be rigid and have strength to support the load.
- Do not stand on the pail shelf of a step-ladder.
- Do not stand on the back bracing of a step-ladder.
- Do not straddle the front and back of a step-ladder.
- Supplies or equipment shall not be hand carried by the worker on the ladder; instead, a rope, block, tool belt, or pulley system shall be used to carry tools or equipment.
- When working to the side of a ladder, the centerline of the body must be maintained between the side rails. Do not overreach or lean too far to one side.
- Do not move, shift, or extend ladders while in use.
- Never climb onto the back side of a ladder, slide down the rails of a ladder, or sit on ladder rails.
- If one feels sick or dizzy while climbing or standing on a ladder, do not try to climb down in a hurry. Drape your arms around the rungs and rest your head against the ladder until you feel better. Then climb down slowly.
- If conditions such as wind change while working, work shall be abandoned on the ladder until work conditions improve.

Work near energized circuits or equipment

Safe work practices shall be maintained to prevent electrical shock or other injuries caused by contact with energized electrical equipment or circuits. These work practices shall be consistent with Lockout/Tagout, Arc Flash Protection (NFPA 70E) programs and policies. Under no circumstances shall metal ladders be used where contact could occur with energized electrical equipment or circuits.

Training and Recordkeeping

Employees shall be trained on the following topics prior to portable ladder setup or use:

- Ladder types, compositions, and parts.
- Ladder selection and inspection.
- Ladder storage, setup, and use.

Employees shall be retrained after an incident or as necessary to maintain their understanding and knowledge regarding the safe use of ladders. Training records shall be retained. Records shall contain the employee name, date of training, and the subject of the training.