

1.0 Purpose and Applicability

- 1.1 It is the policy of the University of Pennsylvania in coordination with the Office of Environmental Health and Radiation Safety to provide the University community with a safe and healthful environment. This program defines practices and procedures to be implemented in order to use ladders safely.
- 1.2 This program applies to all University of Pennsylvania employees and students.

2.0 Scope

- 2.1 The Ladder Safety Program educates Penn employees and students to recognize and avoid hazards related to the use of fixed and portable ladders.
- 2.2 This program does not cover scaffolds or elevated work platforms which are covered under separate programs.

3.0 Responsibilities

- 3.1 **Environmental Health and Radiation Safety (EHRS) shall be responsible for:**
 - 3.1.1 Development and updating of Penn's Ladder Safety Program.
 - 3.1.2 Providing ladder safety training as requested,
 - 3.1.3 performing or coordinating competent person inspections and maintaining inspection records of ladder safety systems.
 - 3.1.4 Maintaining training records.
- 3.2 **Supervisors, Faculty & Student Advisors shall be responsible for:**
 - 3.2.1 Ensuring employees or students have been properly trained before using ladders and that they adhere to the provisions of this program.
 - 3.2.2 Coordinating maintenance, repairs, or replacement of ladders.
- 3.3 **Employees & Students shall be responsible for:**
 - 3.3.1 Selecting the appropriate ladder for the task, inspecting the ladder prior to the task and using the safe work practices defined in this program.

4.0 Definitions

- 4.1 **Combination ladder** - A portable ladder capable of being used either as a stepladder or as a single or extension ladder. It may also be capable of being used as a trestle ladder or a stairwell ladder.
- 4.2 **Competent Person** - One who is 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.
- 4.3 **Extension ladder** - A non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets or the equivalent and so arranged as to permit length adjustment.

- 4.4 **Fixed ladder** - A ladder that is permanently attached to a structure.
- 4.5 **Ladder** - A device incorporating or employing steps, rungs, or cleats on which a person may step to ascend or descend.
- 4.6 **Ladder Safety System** - An assembly of components whose function is to arrest the fall of a user, including the carrier and its associated attachment elements (brackets, fasteners, etc.), safety sleeve, body support and connectors, wherein the carrier is permanently attached to the climbing face of the ladder or immediately adjacent to the structure.
- 4.7 **Platform** - A landing surface that is used as a working or standing location.
- 4.8 **Rail** - The side members joined at intervals by either rungs or steps.
- 4.9 **Stepladder** - A self-supporting portable ladder, non-adjustable in length, with flat steps and a hinged base.
- 4.10 **Step stool (ladder type)** - A self-supporting, foldable, portable ladder, non-adjustable in length, 32-inches or less in overall size, with flat steps and without a pail shelf, designed to be climbed on the ladder top cap so that the ladder top cap as well as all steps can be climbed. The side rails may continue above the top cap.
- 4.11 **Top cap** - The uppermost horizontal member of a portable stepladder.
- 4.12 **Top step** - The first step below the top cap of a portable stepladder. Where a ladder is constructed without a top cap, the top step is the first step below the top of the rails.
- 4.13 **Working length** - The length of a non-self-supporting portable ladder measured along the rails from the base support point of the ladder to the point of bearing at the top.
- 4.14 **Working load** - Maximum applied load, including the weight of the user, materials, and tools, that the ladder is to support for the intended use.

5.0 Ladder Construction Requirements

- 5.1 Fixed and portable ladders and step stools shall at minimum meet the appropriate Occupational Safety and Health Administration (OSHA) and American National Standards Institute (ANSI) A14.1 materials and construction specifications.
- 5.2 Newly installed fixed ladders that are 24-feet or longer shall be outfitted with a ladder safety system. Existing fixed ladders that are 24-feet or longer must be retrofit with a ladder safety system prior to 11/18/2036.
- 5.3 Portable ladders shall display the appropriate legible ANSI standard compliance marking and other ladder safety markings. Labels/markings must be replaced when they are no longer legible.

6.0 Rules for Ladder Use

- 6.1 **Training** - Supervisors, faculty or student advisors shall ensure that employees or students who use ladders receive training on how to use them safely. EHRS provides training on the safe use of ladders and ladder safety systems.
- 6.2 **Intended Use** - Ladder use shall be restricted to the purpose for which the ladder was designed.
- 6.2.1 The duty rating of the ladder must be clearly indicated on the ladder. The working load to be placed on the ladder, including the person and tools, must be less than the duty rating.
- 6.2.2 Ladders shall not be climbed by more than one person at a time unless designed to support more than one person.
- 6.2.3 Stepladders shall not be used as single ladders or in the closed or partially closed position.
- 6.2.4 The user shall not step or stand higher than the step or rung indicated on the label marking the highest standing level on a ladder.
- 6.2.5 The user shall not step or stand on the ladder top cap and the top step of a stepladder or a combination ladder configured as a self-supporting ladder.
- 6.2.6 The rear braces of a stepladder may not be used for climbing.
- 6.3 **Angle of Inclination** - Portable non-self-supporting ladders should be erected at a pitch of approximately 75 degrees from horizontal for optimum resistance to sliding, strength of the ladder, and balance of the climber. A simple rule for setting up a ladder at the proper angle is to place the base a distance from the wall or upper support equal to one-quarter the effective working length of the ladder. Effective working length is the distance along the side rails from the bottom of the support point of the upper portion of the ladder.
- 6.4 **Footing Support** - The ladder base shall be placed with a secure footing on a firm, level support surface. Ladder levelers may be used to achieve equal rail support on uneven surfaces. Devices such as shoes, spurs, spikes, combinations thereof, or similar device of substantial design should be installed where required for slip resistance and bearing areas. Where ladders with no safety shoes, spurs, spikes or similar devices are used, a foot ladder board or similar device may be employed. Ladders shall not be used on ice, snow, or slippery surfaces unless suitable means to prevent slipping are employed. Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.
- 6.5 **Top Support** - The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load. It should be used when the ladder top support is a pole, light standard, or building corner, or in tree-type operations.
- 6.6 **Side Loading** - Portable ladders are not designed for excessive side loading, and such abuse of the ladder shall be avoided. The ladder shall be kept close to the work. The user shall not overreach, but shall descend and relocate the ladder instead. When using a ladder, the user shall never push or pull unless the ladder is properly secured.

- 6.7 **Climbing Ladders** - When ascending or descending the ladder, the user shall face it and maintain a firm hold. It is preferable to grasp the rungs with an overhand grip as opposed to grabbing the side rails. Grip strength is improved while grasping the rungs. Three points of contact with the ladder should be maintained at all times. Recommended climbing pattern is hand, hand – foot, foot. Belt buckle area of the body should remain centered on the ladder and never extend beyond the side rails.
- 6.8 **Electrical Hazards** - Users are cautioned to take proper safety measures when ladders are used in areas containing electrical circuits. These precautions should prevent any contact or possible contact with an energized, uninsulated circuit or conductor in order to avoid electrical shock or short circuit. Metal ladders and wood ladders with side-rail metal reinforcement wires shall not be used where they would come in contact with exposed energized electric wires. All ladders should be kept away from electric power lines. It is imperative to also take precautions to avoid contact with electrical circuits with tools that are in use while on the ladder.
- 6.9 **Access to Roof or Platform** - When a single section or extension ladders are used to gain access to a roof or platform, the top of the ladder shall extend at least 3-feet above the point of support at the eaves, gutter, platform, or roofline. The user shall take care when ascending from the ladder to the roof or/platform or descending from the roof/platform to the ladder to avoid tipping the ladder over sideways or causing the ladder base to slide.
- 6.10 **Doorways** - Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.
- 6.11 **Set-Up and Adjustment of Ladders:**
- 6.11.1 **Extension Ladders** - Adjustment of extension ladders shall only be made by the user when standing at the base of the ladder so the user may observe when the locks are properly engaged. The user shall check that the rope is tracking correctly in the pulley. Adjustment of extension ladders from the top of the ladder (or any level over the locking devices) is a dangerous practice and shall not be attempted. Adjustments shall not be made while anyone is standing on the ladder. The user shall ensure that both upper and lower ladder support points are contacting firm support surfaces. Combination ladders used in a non-self-supporting configuration require that the same procedures be observed.
- 6.11.2 **Stepladders** - The user shall ensure that the stepladder is fully opened, with spreaders locked and all feet in contact with a firm and level support surface.
- 6.12 **Wood Ladder Use Restriction** - Wood ladders are prohibited for use by Facilities and Real Estate Services (FRES) employees. Fiberglass ladders or aluminum ladders may be used depending on the specific application.

7.0 Ladder Care & Maintenance

- 7.1 **Inspection** - A thorough ladder inspection shall be made when the ladder is originally purchased, received, and put into service. The ladder shall be inspected before each use. Working parts and rung/step-to-side-connections shall be checked. A portable ladder inspection checklist is attached to this program to assist with the inspection (Attachment A). In addition, a link is provided in the resources section of this program for the National Institute of Occupational Safety and Health Ladder Safety App. The app has inspection checklists for various types of ladders. Where structural damage or other

hazardous defect is found, the ladder shall be taken out of service and either discarded or repaired by a competent mechanic. Ladder safety systems shall be inspected by the user prior to each use, by a competent person at least annually and according to the manufacturer's recommendations.

- 7.2 **Damaged Ladders** - Broken or bent ladders shall be marked and taken out of service until they are repaired by a competent mechanic or destroyed in such a manner as to render them useless. The user shall not attempt to repair a defective side rail.
- 7.3 **Maintenance** - Proper ladder maintenance ensures the safe condition of the ladder. Hardware, fittings, and accessories should be checked frequently and kept in proper working condition. All pivoting connections and the rung-lock cam surfaces should be lubricated frequently. All bolts and rivets shall be in place and secure before using a ladder, and no ladders shall be used if any bolts or rivets are missing or if the joints between the steps (or rungs) and the side rails are not tight. Ladders with safety shoes or padded feet which are excessively worn shall be taken out of service until repaired.

8.0 Contractors/Vendors

- 8.1 Contractors and vendors shall be responsible for supplying and using their own portable ladders on University of Pennsylvania campuses.
- 8.2 Refer to Penn's [Fall Protection Program](#) for additional information regarding protecting employees and contractors from fall hazards.

9.0 Recordkeeping

- 9.1 Supervisors maintain ladder safety inspection forms.
- 9.2 EHRS maintains Ladder Safety Program training records and inspection records for ladder safety systems.

10.0 References/Resources

- 10.1 [OSHA Subpart D – Walking-Working Surfaces](#)
- 10.2 [ANSI ASC A14 Ladder Standards](#)
- 10.3 [Penn EHRS Ladder Safety Fact Sheet](#)
- 10.4 [National Institute of Occupational Safety & Health \(NIOSH\) Ladder Safety App](#)

**ATTACHMENT A – PORTABLE LADDER INSPECTION CHECKLIST
PORTABLE LADDER INSPECTION CHECKLIST**

Ladder ID/Description _____ Department _____

Inspected By _____ Inspection Date _____

Storage Location _____

LADDER DESCRIPTION				
Style	<input type="checkbox"/> Single	<input type="checkbox"/> Extension	<input type="checkbox"/> Step	<input type="checkbox"/> Combination
Material	<input type="checkbox"/> Wood	<input type="checkbox"/> Aluminum	<input type="checkbox"/> Fiberglass	<input type="checkbox"/>

GENERAL LADDER INSPECTION		
Side Rails	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect:
Rungs or Steps	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect:
Safety & Rating Labels	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect:
Cleanliness (Oils & Grease)	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect:
Comments		

LADDER HARDWARE INSPECTION			
End Caps	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Rung Locks	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Non-Slip Feet	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Pail Shelf	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Spreader Braces	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Support Braces	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Ropes & Pulleys	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Rivets/Fasteners	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail*-Note Defect	<input type="checkbox"/> Not Applicable
Comments			

Overall Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Fair	<input type="checkbox"/> Dangerous – Do Not Use*
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Comments _____

Signature

Date

* Ladders in need of repair must be clearly marked “Dangerous-Do Not Use” and be repaired prior to use or destroyed and disposed of.