

STAIRWAYS AND LADDERS

Document History

<i>Version</i>	<i>Date</i>	<i>Comments</i>
0.1	March 25, 2015	Initial Draft
0.2	October 5, 2015	Internal Review
1.0	May 2, 2016	Final
2.0	April 5, 2017	Yearly FMOHS Review

This document will be reviewed routinely and updated with changes as needed. Departments listed as having roles and responsibilities are provided with updated version of this document upon revision.

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PURPOSE

The purpose of this guide is to explain the proper selection, use, and maintenance of ladders for use in the workplace at University of Virginia Facilities Management. The most common hazard associated with ladders is falling caused by improper use or poorly maintained and/or broken ladders. This guide is based upon Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1926, and 29 CFR 1910.

SCOPE

This guide applies to all University of Virginia Facilities Management employees who use ladders or temporary stairways during the course of their normal job duties and describes the minimum requirements for construction and use of ladders and stairways. The information contained in this guide is not inclusive of all OSHA regulations. Please contact UVA Facilities Management Occupational Health and Safety or visit www.OSHA.gov for more information regarding workplace hazards, safety precautions, and regulations.

GOVERNMENTAL STANDARDS

The bulk of UVA Facilities Management activities are considered “industrial” in nature and the federal OSHA standards for General Industry safety apply. However, federal OSHA standards for construction safety apply when facility work involves construction, alteration, renovation and/or repair activities, including painting and decorating.

Applicable OSHA Standards:

- 29CFR1910 Occupational Safety and Health Standards (General Industry) – Subpart D
- 29CFR1926 Safety and Health Regulations for Construction – Subpart X

GENERAL REQUIREMENTS

- A stairway or ladder shall be provided at all points of access where there is a break in elevation of 19 inches or more, and no ramp, runway, sloped embankment, or personnel hoist is provided.
- When a building or structure has only one point of access between levels, that point of access shall be kept clear to permit free passage of employees.

Stairways

- Temporary stairs shall have landings at least 30 inches long, and at least 22 inches wide every 12 feet or less of vertical rise.
- Stairs shall be installed between 30 deg. and 50 deg. from horizontal.
- Variations in riser height or tread depth shall not be over 1/4-inch in any stairway system.
- All parts of stairways shall be free of hazardous projections, such as protruding nails
- Foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material at a later date, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan.
- Stairways having four or more risers or rising more than 30 inches, whichever is less, shall be equipped with at least one handrail; and one stairrail system along each unprotected side or edge.
- Stairrails shall be not less than 36 inches from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

- Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, shall be provided between the top rail of the stairrail system and the stairway steps.
- Screens or mesh, when used, shall extend from the top rail to the stairway step, and along the entire opening between top rail supports.
- When intermediate vertical members, such as balusters, are used between posts, they shall be not more than 19 inches apart.
- The height of handrails shall be between 30 and 37 inches from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches between the handrail and walls, stairrail systems, and other objects

Ladders

General

The following requirements apply to all ladders as indicated:

- Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.
- Rungs, cleats, and steps of portable ladders and fixed ladders shall be spaced between 10 inches and 14 inches apart, as measured between center lines of the rungs, cleats and steps.
- The rungs and steps of both fixed and portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.
- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

Fixed Ladders

- The minimum clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches, except in the case of an elevator pit ladder for which a minimum perpendicular clearance of 4 1/2 inches is required.
- The minimum perpendicular clearance between a fixed ladder and any obstruction on the climbing side of the ladder shall be 30 inches.
- The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches.
- Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches on each side of the centerline of the ladder.
- Where the total length of a climb equals or exceeds 20 feet, fixed ladders shall be equipped with one of the following:
 - Ladder safety devices; or
 - Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet; or
 - A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet.
- The side rails of through or side-step fixed ladders shall extend 42 inches above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

- Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.
- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:
 - Immediately tagged with "Do Not Use" or similar language;
 - Marked in a manner that readily identifies it as defective;
 - Or blocked (such as with a plywood attachment that spans several rungs).
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

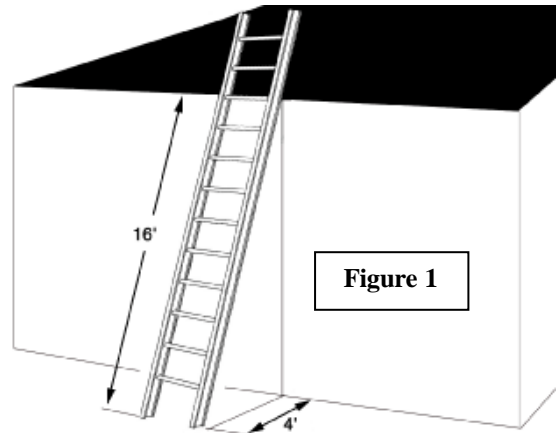
Portable Ladders

- University of Virginia Facilities Management employees shall only use portable ladders that are owned and inspected by the University.
- Ladders shall be inspected by a competent person for visible defects on a periodic basis (Appendix A) and after any occurrence that could affect their safe use.
- Portable ladder side rails shall extend at least 3 feet above the upper landing surface to which the ladder is used to gain access.
- The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches.
- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity:

Duty Rating (pounds)	Ladder Type	Max Working Load
Extra Extra Heavy Duty	IAA	375 lbs
Extra Heavy Duty	IA	300 lbs
Heavy Duty	I	250 lbs
Medium Duty	II	225 lbs
Light Duty	III	200 lbs

- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the length of the ladder. (Figure 1.)

- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
- A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.
- A stepladder shall not be used in any other than its fully open and locked position.
- The top or top step of a stepladder shall not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- If a ladder is involved in any of the following, immediate inspection is necessary:
 - If a ladder falls or is involved in an accident, inspect the ladder to ensure that it is in good condition and does not have any bent or damaged components.
 - If a ladder is exposed to oil and grease, it should be cleaned to ensure adequate traction and a non-slippery surface on the rungs or rails
 - Ladders with defects must be taken out of service until repaired.



Step Stool

A step stool is self-supporting, portable ladder, nonadjustable in length, 32 inches or less in overall size.

- The top step is designed to be used as a step.
- The side rails may continue above the top cap to provide additional support.
- Step stools may not be placed on top of one another, furniture, vehicles, sloping surfaces, unstable surfaces, or support more than one person at a time.
- Rungs, cleats, and steps of step stools shall be not less than 8 inches apart, nor more than 12 inches apart, as measured between center lines of the rungs, cleats, and steps.

Ladder Storage and Maintenance

- Portable ladders shall be secured and locked in an upright position, if possible, when not in use.
- Ladders must have all of the appropriate markings; manufacturer's labels, use instructions, Type, and warnings.
- The joint between the rung and side rails shall be tight and all hardware and fittings securely attached.
- Metal bearings of locks, wheels, pulleys, etc., shall be frequently lubricated.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either

be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service.

TRAINING

Each employee using ladders and stairways shall be provided training, as necessary. The training shall enable each employee to recognize hazards related to ladders and stairways, and shall train each employee in the procedures to be followed to minimize these hazards. This training shall include:

- The nature of fall hazards in the work area;
- The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
- The proper construction, use, placement, and care in handling of all stairways and ladders;
- The maximum intended load-carrying capacities of ladders and
- The standards stipulating proper ladder use and maintenance.
- Retraining shall be provided for each employee as necessary so that the employee maintains the understanding and knowledge required to conduct work with ladders and stairways safely.



Facilities Management
Occupational Health and Safety

Appendix A – Ladder Inspection

Ladder Inspection

Date:		Name of Inspector:	
Shop #:		Type of Ladder:	<input type="checkbox"/> Extension <input type="checkbox"/> Step

Ladder #:				
General Inspection Items	Y/N	Y/N	Y/N	Y/N
Loose Steps or Rungs				
Loose screws, bolts, or other metal parts				
No splinters/slivers on uprights, rungs, or steps				
Damaged or worn non-slip bases				
Wobbly (from side strain)				
Loose or bent hinge spreaders				
Step or hinge spreaders broken				
Loose hinges				
Broken, split, or worn steps				
Loose, broken , or missing extension locks				
Worn or knotted rope				
All stickers clear and legible				

Use	Y/N
Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached, and moveable parts operating freely without binding or undue play	
Are non-slip safety feet provided on each metal or rung ladder, and are ladder rungs and steps free of grease and oil	
Are employees prohibited from placing a ladder in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded	
Are employees prohibited from placing ladders on boxes, barrels, or other unstable bases to obtain additional height	
Are All ladders secured and locked when not in use	

