



Occupational Safety Program

Ladder Safety Program Manual

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Purpose

The purpose of this program is to protect the health and safety of employees who use ladders in their daily activities.

Scope

The scope of the program applies to the use of any ladder on the University campus, except those used in emergency operations firefighting, rescue, and tactical law enforcement operations, or training for these operations; or designed into or is an integral part of machines or equipment. Applicable equipment within the scope includes portable ladders (step stools, step ladders, straight ladders, extension ladders, and extension trestle ladders); fixed ladders; job made ladders and rolling ladders. It applies to all Towson University employees. Allowing non-Towson University personnel to use ladders owned by the University is strongly discouraged unless proper training has been provided and a waiver signed. Documentation of these requirements is the responsibility of the lending personnel and must be available upon request.

Definitions

ANSI (American National Standards Institute): A nonprofit organization that approves national safety standards.

Alternating tread-type stair: A type of stairway consisting of a series of treads that usually are attached to a center support in an alternating manner such that an employee typically does not have both feet on the same level while using the stairway.

Anchorage: A secure point of attachment for equipment such as lifelines, lanyards, deceleration devices, and rope descent systems.

Authorized: an employee who the employer assigns to perform a specific type of duty or allows in a specific location or area.

Cage: means an enclosure mounted on the side rails of a fixed ladder or fastened to a structure behind the fixed ladder that is designed to surround the climbing space of the ladder. A cage also is called a “cage guard” or “basket guard.”

Carrier: The track of a ladder safety system that consists of a flexible cable or rigid rail attached to the fixed ladder or immediately adjacent to it.

Combination ladder: A portable ladder that can be used as a stepladder, extension ladder, trestle ladder, or stairway ladder. The components of a combination ladder also may be used separately as a single ladder.

Dangerous equipment: Equipment, such as vats, tanks, electrical equipment, machinery, equipment or machinery with protruding parts, or other similar units, that, because of their function or form, may harm an employee who falls into or onto the equipment.

Designated area: A distinct portion of a walking-working surface delineated by a warning line in which employees may perform work without additional fall protection.

Dockboard: a portable or fixed device that spans a gap or compensates for a difference in elevation between a loading platform and a transport vehicle. Dockboards include, but are not limited to, bridge plates, dock plates, and dock levelers.

Equivalent: Alternative designs, equipment, materials, or methods, that the employer can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials, or methods specified in the regulation.

Extension ladder: A non-self-supporting portable ladder that is adjustable in length.

Failure: A load refusal, breakage, or separation of component parts. A load refusal is the point at which the ultimate strength of a component or object is exceeded.

Fall hazard: Any condition on a walking-working surface that exposes an employee to a risk of harm from a fall on the same level or to a lower level.

Fall protection: Any equipment, device, or system that prevents an employee from falling from an elevation or mitigates the effect of such a fall.

Fixed ladder: A ladder with rails or individual rungs that is permanently attached to a structure, building, or equipment. Fixed ladders include individual-rung ladders, but not ship stairs, step bolts, or manhole steps.

Grab bar: An individual horizontal or vertical handhold installed to provide access above the height of the ladder.

Guardrail system: A barrier erected along an unprotected or exposed side, edge, or other area of a walking-working surface to prevent employees from falling to a lower level.

Handrail: A rail used to provide employees with a handhold for support.

Hoist area: Any elevated access opening to a walking-working surface through which equipment or materials are loaded or received.

Hole: A gap or open space in a floor, roof, horizontal walking-working surface, or similar surface that is at least 2 inches (5 cm) in its least dimension.

Individual-rung ladder: A ladder that has rungs individually attached to a building or structure. An individual-rung ladder does not include manhole steps.

Ladder: A device with rungs, steps, or cleats used to gain access to a different elevation.

Ladder safety system: A system designed to eliminate or reduce the possibility of falling from a ladder. A ladder safety system usually consists of a carrier, safety sleeve, lanyard, connectors, and body harness. Cages and wells are not ladder safety systems.

Low-slope roof: A roof that has a slope less than or equal to a ratio of 4 in 12 (vertical to horizontal).

Lower level: A surface or area to which an employee could fall. Such surfaces or areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, equipment, and similar surfaces and structures, or portions thereof.

Manhole steps: Steps that are individually attached to, or set into, the wall of a manhole structure.

Maximum intended load: The total load (weight and force) of all employees, equipment, vehicles, tools, materials, and other loads the employer reasonably anticipates to be applied to a walking-working surface at any one time.

Mobile: Manually propelled or movable.

Mobile ladder stand (ladder stand): A mobile, fixed-height, self-supporting ladder that usually consists of wheels or casters on a rigid base and steps leading to a top step. A mobile ladder stand also may have handrails and is designed for use by one employee at a time.

Mobile ladder stand platform: A mobile, fixed-height, self-supporting unit having one or more standing platforms that are provided with means of access or egress.

Open riser: The gap or space between treads of stairways that do not have upright or inclined members (risers).

Opening: A gap or open space in a wall, partition, vertical walking-working surface, or similar surface that is at least 30 inches (76 cm) high and at least 18 inches (46 cm) wide, through which an employee can fall to a lower level.

Personal fall arrest system: A system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

Personal fall protection system: A system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

Platform: A walking-working surface that is elevated above the surrounding area.

Portable ladder: A ladder that can readily be moved or carried, and usually consists of side rails joined at intervals by steps, rungs, or cleats.

Positioning system (work-positioning system): A system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or window sill, and work with both hands free. Positioning systems also are called "positioning system devices" and "work-positioning equipment."

Qualified: Describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

Ramp: An inclined walking-working surface used to access another level.

Riser: The upright (vertical) or inclined member of a stair that is located at the back of a stair tread or platform and connects close to the front edge of the next higher tread, platform, or landing.

Rope descent system: A suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent. A rope descent system usually consists of a roof anchorage, support rope, a descent device, carabiner(s) or shackle(s), and a chair (seatboard). A rope descent system also is called controlled descent equipment or apparatus. Rope descent systems do not include industrial rope access systems.

Rung, step, or cleat: The cross-piece of a ladder on which an employee steps to climb up and down.

Runway: An elevated walking-working surface, such as a catwalk, a foot walk along shafting, or an elevated walkway between buildings.

Scaffold: Any temporary elevated or suspended platform and its supporting structure, including anchorage points, used to support employees, equipment, materials, and other items. For purposes of this subpart, a scaffold does not include a crane-suspended or derrick-suspended personnel platform or a rope descent system.

Ship stair (ship ladder): A stairway that is equipped with treads, stair rails, and open risers, and has a slope that is between 50 and 70 degrees from the horizontal.

Side-step ladder: A type of fixed ladder that requires an employee to step sideways from it, in order to reach a walking-working surface, such as a landing.

Spiral stairs: A series of treads attached to a vertical pole in a winding fashion, usually within a cylindrical space.

Stair rail or stair rail system: A barrier erected along the exposed or open side of stairways to prevent employees from falling to a lower level.

Stairway (stairs): Risers and treads that connect one level with another and includes any landings and platforms in between those levels. Stairways include standard, spiral, alternating tread-type, and ship stairs.

Standard stairs: A fixed or permanently installed stairway. Ship, spiral, and alternating tread-type stairs are not considered standard stairs.

Step bolt (pole step): A bolt or rung attached at intervals along a structural member used for foot placement and as a handhold when climbing or standing.

Stepladder (or step ladder): A self-supporting, portable ladder that has a fixed height, flat steps, and a hinged back.

Stepstool (or step stool): A self-supporting, portable ladder that has flat steps and side rails. For purposes of the final rule, stepstool includes only those ladders that have a fixed height, do not have a pail shelf, and do not exceed 32 inches (81 cm) in overall height to the top cap, although side rails may extend above the top cap. A stepstool is designed so an employee can climb and stand on all of the steps and the top cap.

Through ladder: A type of fixed ladder that allows the employee to step through the side rails at the top of the ladder to reach a walking-working surface, such as a landing.

Tieback: An attachment between an anchorage (e.g., structural member) and a supporting device (e.g., parapet clamp or cornice hook).

Toeboard: A low protective barrier that is designed to prevent materials, tools, and equipment from falling to a lower level, and protect employees from falling.

Travel restraint system: A combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

Tread: A horizontal member of a stair or stairway, but does not include landings or platforms.

Unprotected sides and edges: Any side or edge of a walking-working surface (except at entrances and other points of access) where there is no wall, guardrail system, or stair rail system to protect an employee from falling to a lower level.

Walking-working surface: Any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location.

Warning line: A barrier erected to warn employees that they are approaching an unprotected side or edge, and which designates an area in which work may take place without the use of other means of fall protection.

Well: A permanent, complete enclosure around a fixed ladder.

Responsibilities

A. Environmental Health & Safety (EHS)

1. EHS will provide guidance in the proper use of ladders through the Program.
2. EHS will provide ladder safety training.
3. EHS will provide inspection of ladders as necessary.

B. Departments/Employees

1. Departments will be responsible for the purchase, storage, maintenance, and proper disposal of ladders.
2. Employees will be responsible for the inspection of ladders prior to use.
3. Employees will be responsible for the safe transport and use of ladders.

Introduction

Ladders are one of the most commonly used tools in the workplace. Ladders allow access to various levels or heights necessary to carry out work functions. They may be used for maintenance, such as cleaning, painting, or repairing infrastructure (electrical, plumbing, communications, etc.) Ladders are common in construction and may be used both indoors and outdoors, come in differing lengths and arrangements, and are composed of differing materials based to exploit strength and avoid incompatible uses.

Unfortunately, the use of ladders is a major source of injury and fatalities every year. The National Safety Council (NSC) has reported that falls from ladders accounts for 16% of all fatal injuries in construction and 24% of non-fatal injuries involving days away from work. In 2020, 22,710 workers were injured in nonfatal accidents and 161 were fatally injured. It is also one of the ten most frequently cited standards every year by OSHA.

The common causes of ladder injuries associated with ladders are the improper step-up of a ladder, leading to an unstable base or rail, sliding down forward or sideways); overloading or exceeding the capacity of the ladder; improperly carrying a ladder; employee losing their balance or making misstep; leaving the ladder unattended; and mounting or dismounting the ladder improperly. The very use of ladders presents many potential hazards in addition to falls.

Other hazards are pinches, cuts, sprains and strains, and collision hazards, and contact with or arcing of live conductors, resulting in electrical shock/electrocution. Users must be aware of the possible hazards and take precautions to reduce these risks. Proper use and work practices eliminate or mitigate these hazards providing a safe work environment.

Applicable Regulations

- 1910.23 – Ladders
- 1926.1050 – Stairways and Ladders
- 1926.1053 – Ladders

Procedure

A. Selection

1. Specifications

- a) Ladders must have an ANSI Duty Rating label affixed to the side rail.
 - b) Step ladders cannot exceed 20 feet in length.
 - c) Straight (single) ladders cannot exceed 30 feet in length.
 - d) Extension ladders cannot exceed 60 feet in length.
 - e) For step ladder or combination ladder used in a stepladder mode must be 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.
 - f) 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, except that:
 - i. *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;*
 - ii. *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);*
 - iii. *Rungs and steps on rolling ladders used in telecommunication centers must have a minimum clear width of 8 inches (20 cm); and*
 - iv. *Stepstools have a minimum clear width of 10.5 inches (26.7 cm).*
 - g) 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.
2. Use the ladder designed for your tasks. Know the limitations of the ladder, never assume that a ladder is safe for every task. Consider the following properties:
 - a) ANSI Ladder Duty Rating Required
 - i. *Duty Rating determines maximum weight a ladder may safely carry or hold.*
 - ii. *This rating should be listed on a label affixed to the side rail of the ladder. Always read the manufacturer's label. If you cannot read the label, do not use the ladder.*

- iii. *Do not exceed the Duty Rating for the classification of ladder being used (see Table 1).*
 - iv. *To calculate the total weight that the ladder will be supporting, add the following amounts together and compare the sum to the rating:*
 - 1) *User weight;*
 - 2) *The weight of user clothing and personal protective equipment;*
 - 3) *The weight of tools and supplies being carried; and*
 - 4) *The weight of any tools and supplies used directly on the ladder.*
- b) *Ladder Type Required (see Definitions for more information)*
- i. *Step ladder*
 - 1) *Properties include self-supporting, portable, and not adjustable in length.*
 - 2) *It is used where items need to be reached, but there is no structure to support the ladder.*
 - ii. *Straight ladder*
 - 1) *Properties include not being self-supporting nor adjustable in length, but portable.*
 - 2) *It is used where items need to be reached and has the structure to support the ladder.*
 - iii. *Extension ladder*
 - 1) *Properties include not being self-supporting, consisting of two or more sections traveling in guides for height adjustment (adjusted by pulley, rope, ladder locks), but portable.*
 - 2) *It is used like a straight ladder, but for greater heights.*
 - iv. *Fixed ladder*
 - 1) *Properties include being permanently fixed to a structure or equipment, possibly including cages, wells, landing platforms, or ladder safety devices.*
 - 2) *It is used like a straight ladder.*
 - v. *Step stool*
 - 1) *Properties include being self-supporting, portable, and not adjustable in length, 32 inches or less in length. A step stool is measured along the front side rail from the bottom of the feet to the top step. The side rails may continue above the top cap. Side rails may extend above or over the top step but any rails above the top step are not included in the overall height measurement of the step stool.*
 - 2) *It is used similarly to a step ladder where items need to be reached and there is no structure to support the ladder, but it is designed to be climbed on the ladder top cap as well as all steps.*
- c) *Height and Pitch Required to Do Work or Provide Access*
- d) *Appropriate Material of Construction*
- i. *Aluminum*
 - ii. *Fiberglass*

- iii. Wood
- iv. Other Fiber-Reinforced Plastic (FRP)
- v. Other Metal (e.g. Steel, Stainless Steel)
- vi. For metal ladders:
 - 1) 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.
 - 2) Must be made with corrosion-resistant material or protected against corrosion.

- e) Surface Conditions in Work Area
- f) Hazardous Obstructions in Work Area
 - i. Electrical

3. For step ladders (planned use):
 - a) The top of the ladder must be within three (3) feet of the highest point you must reach to perform the work.
 - b) Never stand on the top cap and top step of a step ladder, nor the top two rungs.
 - c) Never use a step ladder as a straight ladder (that is, never use it folded and placed against a structure).
4. For straight or extension ladders (planned use):
 - a) Never use the top three steps of a straight or extension ladder.
 - b) The amount of overlap between the fly and base section of an extension ladder is dependent upon the length of the ladder (see Guide 2 of Table 2 or Table 3).
5. For maximum working heights for a specific length ladder, see Guide 1 of Table 2.

Ladder Duty Rating			
<u>Rating</u>	<u>Description</u>	<u>Intended Use</u>	<u>Capacity (lb)</u>
Type IAA	Industrial	Heavy Duty	375
Type IA	Industrial	Heavy Duty	300
Type I	Industrial	Heavy Duty	250
Type II	Commercial	Medium Duty	225
Type II	Household	Light Duty	200

Table 1. Ladder Duty Rating Table. Per ANSI, there are five categories of ladder duty ratings. The ratings are listed by rating type, use setting description, intended use, and weight capacity in pounds.

STEP LADDER HEIGHT SELECTION GUIDE		EXTENSION LADDER LENGTH SELECTION GUIDE			
STEPLADDER SIZE	APPROX. HIGHEST STANDING LEVEL	LADDER SIZE	MAXIMUM EXTENDED LENGTH	*WORKING RANGE TO TOP SUPPORT	*MAXIMUM ACCESSIBLE ROOF HEIGHT RANGE
4'	1' 11"	16'	13'	7½'-12 ½'	4½'-9½'
5'	2' 10"	20'	17'	9½'-16 ½'	6½'-13½'
6'	3' 9"	24'	21'	11½'-20'	8½'-17'
7'	4' 9"	28'	25'	13½'-24'	10½'-21'
8'	5' 8"	32'	29'	15½'-28'	12½'-25'
10'	7' 7"	36'	32'	17'-31'	14'-28'
12'	9' 6"	40'	35'	19'-33½'	16'-30½'
14'	11' 5"	44'	39'	21'-37½'	18'-34½'
16'	13' 4"	48'	43'	23'-41½'	20'-38½'
18'	15' 3"	60 ⁽¹⁾	48'	23'-46½"	20'-43½'
20'	17' 2"				

*When set up at the proper 75½° angle ⁽¹⁾ Three-section extension

Table 2. Working Height Table. In the Step Ladder Height Selection Guide (Guide 1), the stepladder size in feet and approximate highest standing level in feet and inches are listed. In the Extension Ladder Length Selection Guide (Guide 2), the ladder size (in feet), maximum extended length (in feet), working range to top support (in feet), and maximum accessible roof height range (in feet) are listed.

Extension Ladder Use	
Ladder Length	Minimum Overlap Required
Under 36 ft (11 m)	3 ft (0.9 m)
Over 36 ft (11 m) to under 48 ft (14.6 m)	4 ft (1.2 m)
Over 48 ft (14.6 m) to under 60 ft (18.3 m)	5 ft (1.5 m)

Table 3. Extension Ladder Use Table. The table lists the minimum overlap required for each ladder length range listed.

B. Inspection

1. Ladders should be inspected for defects before and after each use.
 - a) Ladder rungs or steps are clean and secure.
 - b) Ladder hardware and parts, such as support braces, ropes, and pulleys, function properly and are in good condition.
2. Ladders should be inspected after any incident (e.g. tip over) that could have damaged the ladder or affected their safe use.
3. The person using the ladder should perform the inspection at the beginning of the workday. Ladders shall be inspected by a competent person for visible defects on a periodic basis.
4. Ladders with broken, unsecure, or missing rungs or steps, broken side rails, or other defects are not permitted for use. If a ladder is found to be defective, it should be removed from service immediately.
5. Reject and tag out of service any defective ladder with a sign "Do Not Use".

6. If the ladder cannot be repaired, remove all identification labels, discard, and remove from inventory. When discarded, the ladder should be marked "Destroy"/ "Can Not be Repaired" or render it completely inoperable. Notify EHS.
7. The Ladder Inspection Form must be completed annually, and the record of each ladder submitted to EHS. A copy of this form is found in Appendix A.

C. Use

1. General

- a) Do not use a ladder which does not have an ANSI Duty Rating label attached to the side.
- b) Get assistance when handling a heavy or long ladder (10 feet or more).
- c) No portable single rail ladders may be used.
- d) Never use a ladder for a purpose for which it is not intended such as horizontally for scaffolding or a bridge.
- e) Never attempt to strap or tie two ladders together.

2. Preparation & Setup

- a) Set up barricades and post warning signs when using a ladder in a doorway, high traffic area such as a passageway, near blind corners, intersections, or in driveways.
 - i. *Ladders must be secured to prevent accidental displacement.*
 - ii. *Ladders must be guarded by a temporary barricade, such as a row of traffic cones or caution tape, to keep the activities of traffic away from the ladder.*
- b) Secure the area by bracing or locking doors.
- c) Ladder rungs, steps, and cleats must be parallel, level, and uniformly spaced when the ladder is in position for use.
- d) Never use unsecured, unstable, or otherwise inappropriate items to level the feet or surface of the ladder, nor to obtain additional height.
- e) Ensure that all electrical equipment used during ladder work is in good working condition and properly grounded.
- f) Clear the area around the base and top of the ladder of debris, tools, and other objects. Practice good housekeeping.
- g) Ladder Use Based on Surface Conditions
 - i. *Use ladders on level, stable, clean, and slip-free surface.*
 - ii. *For uneven surfaces, use the appropriate attachments to level the feet of the ladder.*
 - iii. *If the surface is smooth or hard, use a ladder with nonskid feet or spurs to prevent the ladder feet from pushing outward. Take extra precautions to prevent the base from moving such as having another worker hold or heel the ladder.*
 - iv. *Do not place a ladder against flexible or movable surfaces or erect on unstable surfaces when possible. If the surface is slippery or otherwise unstable, the ladder must be secured and stabilized to prevent accidental displacement.*

- h) Ladder Use Based on Hazardous Obstructions
 - i. Check for infrastructure such as doors, protrusions, plumbing, antennae, and electrical equipment (e.g. wiring) to avoid collisions and damage.*
 - ii. If an electrical obstruction exists, use a ladder with nonconductive material (e.g. wood, fiberglass, or other reinforced plastic), and maintain at least 10 feet of clearance from the hazard at all times. Keep ladder away from electrical wires. Check for overhead electrical wires before setting up.*
 - i) When using straight ladders or extension ladders, set up the ladder using the 4 to 1 rule (approximately 75.5° angle from the horizontal).
 - i. This may also be estimated by setting up the ladder with appropriate length extending over top support, extending the ladder feet outward, so that the pitch is roughly 75 degrees. The worker must stand so that the bottom of the side rails touch with the toe of each shoe. Then, the worker must stand up straight and reach out their arms directly forward. The palms of the hands should be touching the top of the rung at shoulder height level if the pitch is correct for the ladder.*
 - ii. Tie off ladder at the top and secure bottom to prevent it from slipping, when possible.*
3. Accessing Ladder & Landing Platforms (All Ladder Use)
- a) Ensure proper footwear is in good condition.
 - b) Avoid climbing with wet, muddy, or slippery shoes.
 - c) Ensure only one person is on a single width ladder at any given time. Never allow two workers to use a ladder at the same time.
 - d) Face the ladder when ascending or descending and when working from the ladder.
 - e) Keep the center of your body within the side rails. Do not overreach using any ladder, meaning do not reach beyond your arm's normal extension. Maintain your center of gravity by keeping the center of your body positioned between the side rails at all times. This avoids a fall or accidentally moving the ladder.
 - f) Maintain "three points of contact", that is, two hands and one foot or two feet and one hand, with the ladder at all times. If three points of contact cannot be maintained, additional fall prevention or protection is required.
 - g) Grasp the rungs when climbing, not the side rails.
 - h) Do not carry objects in your hands while climbing
 - i) Avoid distractions when ascending or descending and when working from the ladder. No horseplay.
 - j) Ascend and descend the ladder slowly so as not to cause the ladder to bounce or sway. Never attempt to move up or down a ladder too quickly.
 - k) Never attempt to reposition (i.e. walking or shifting) a ladder while it is in use. Never move, shift, or extend a ladder while an employee is on it. Ladders may only be repositioned from the ground.

- l) Do not leave the ladder unattended.
 - m) Do not overload the ladder beyond the maximum intended load or duty rating.
 - n) If tools exceed the weight capacity of the ladder, they may be brought up to a landing platform by using a tow line or rope.
 - o) When accessing a roof or other working/walking surface, extend the ladder three (3) feet beyond the access surface. Make sure that the ladder is three feet above the top support with its top anchored, and its bottom tied or held by a fellow worker.
 - p) When climbing onto a structure or landing platform, never step over the top rung of a ladder, but step sideways when coming to the landing platform where the top of the ladder is positioned.
 - q) For using ladders of 25 feet or more, secure four points (two at the top support of ladder and two at the base of ladder); for shorter ladders, a fellow worker may heel the ladder for extra support.
 - r) If a ladder becomes defective during use, it should be tagged out as in Step B5 and removed from service immediately.
4. Step Ladder Use
- a) Keep step ladders close to your work; do not overreach.
 - b) Never climb the supportive cross bracing for a step ladder; some step ladders have steps on the front and reverse while others have steps only on the front.
 - c) The top of the ladder must be within three (3) feet of the highest point you must reach to perform the work.
 - d) Never stand on the top cap and top step of a step ladder, nor the top two rungs.
 - e) Never use a step ladder as a straight ladder (that is, never use it folded and placed against a structure).
5. Straight Ladder Use
- a) Never use the top three steps of a straight ladder.
6. Extension Ladder Use
- a) Make sure that the ladder is set up correctly as weight capacity will depend on this. Fly out means the extensible sections are placed away from the structure that is being ascended, while fly in means the section is placed towards the structure. Manufacturer instructions may guide worker in proper placement.
 - b) Always extend ladders while standing at the base to observe that locking devices are engaged.
 - c) Never use the top three steps of an extension ladder.
7. Fixed Ladder Use
- a) Fixed ladders that are taller than 24 feet must have fall protection. Cages are no longer considered adequate fall protection for fixed ladders that are taller than 24 feet. A personal fall arrest system or ladder safety system is the best fall protection to be used here. Always use a ladder safety system, if available.

D. Maintenance, Storage, & Transport

1. Maintenance

- a) Keep ladders (particularly its steps) clean of oil, grease, and other slipping hazards. Ladders should have hardware, however, cleaned and lubricated to maintain its function.
- b) Keep ladder surface clear of structural defects to prevent entanglement of clothing or puncture/laceration hazards.
- c) Never paint a wooden ladder. Wooden ladders may need to be refinished, but painting may obscure serious surface or structural defects.

2. Storage

- a) Proper storage of the ladder will maintain its integrity and extend longevity of its use.
- b) Ladders should be stored in designated areas that are kept clean, dry, and noncorrosive. Do not store ladders where they will come into contact with water or other chemicals.
- c) Store ladders to prevent damage from extreme heat and cold.
- d) Use racks or brackets that provide adequate weight support to prevent accidental drops, collisions, and damage. Ensure that weight is properly distributed when ladders are stored on racks to avoid warping or other stress damage. If ladders are stored vertically, ensure that they are supported by restraints or other restrictive equipment.
- e) Store ladders where they will not be struck by moving objects, otherwise damaged, or in areas where they do not impede egress or block emergency equipment.
- f) Store extension ladders horizontal and supported every six feet.

3. Transport

- a) When transporting ladders, make sure to secure both ends, particularly when carried on a vehicle.
- b) When transporting ladders, carry the ladder parallel to the surface, and balance the weight by holding the side rail at the middle of the ladder with palm facing inward.
- c) When transporting a heavy ladder or a ladder with a length of 10 feet or greater, always have two people carry the ladder.

E. Training

All employees that utilize ladders should participate in the Ladder Safety Program. Employees should receive training when first hired and when they are observed using a ladder incorrectly or using the wrong type of ladder for the intended use. Training is used to ensure each employee can recognize all hazards related to the selection, use,

handling, and environmental surroundings affecting the safe use of ladders; and to minimize these hazards through proper procedures and work practices.

Employees shall request training for Ladder Safety through EHS by emailing safety@towson.edu or by calling at 410-704-2949. It will be assigned virtually through Vector Solutions SafeColleges found at the following URL: <https://towsonehs-md.safecolleges.com/training/home>.

Resources

A. OSHA

1. [OSHA Construction E-Tool](#)
2. [OSHA Stairs and Ladder Booklet \(osha3124\).pdf](#)
3. [OSHA Stairways and Ladder Safety Outreach](#)

B. American Ladder Institute


1. Develops seven ANSI standards currently.
2. Published according to a 5-year renewal cycle.
3. ANSI standard number and content:
 - a) A14.1 - Wood Ladders
 - b) A14.2 - Portable Metal Ladders
 - c) A14.3 - Fixed Ladders
 - d) A14.4 - Job Made Wooden Ladders
 - e) A14.5 - Portable Reinforced Plastic Ladders
 - f) A14.7 - Mobile Ladder Stands and Mobile Ladder Stand Platforms
 - g) A14.9 - Disappearing Attic Stairways

C. [Werner Fiberglass Ladder Technical Manual](#)

D. Environmental Health and Safety

For additional information, please contact the EHS at 410-704-2949 or safety@towson.edu.

Appendix A: Ladder Inspection Form

	Occupational Safety Program	Ladder Inspection Form	Prepared by: FHB 7/22/2024																																																					
	Ladder Safety Program Form		Area																																																					
<p>Ladders shall be inspected for the following items frequently or if the ladder tips over. Any ladder found defective (except for missing ID label) shall be tagged out of service immediately (i.e. not used) until such time it is repaired. A ladder that cannot be repaired shall be discarded. Check YES (indicates a defect) or NO (indicates no defect) in the boxes provided.</p>																																																								
YES	NO	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: left;">General - Inspect ALL ladders for:</th> </tr> <tr><td style="width: 20px;"></td><td>Missing or loose steps or rungs (they are loose if they can be moved by hand.)</td></tr> <tr><td></td><td>Loose nails, screws, bolts, or other metal parts.</td></tr> <tr><td></td><td>Cracked, split, worn or broken rails, braces, steps, or rungs.</td></tr> <tr><td></td><td>Rough or splintered surfaces.</td></tr> <tr><td></td><td>Damaged or worn non-slip feet.</td></tr> <tr><td></td><td>Twisted or distorted rails.</td></tr> <tr><td></td><td>Missing identification label (assign an ID #).</td></tr> <tr><td></td><td>Corrosion, rust, oxidization, and excessive wear, especially on treads.</td></tr> <tr><td></td><td>Sharp edges on rails and rungs.</td></tr> </table> <p>In addition to the above, the following shall be inspected:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20px;">YES</th> <th style="width: 20px;">NO</th> <th style="text-align: left;">Step Ladders</th> </tr> <tr><td></td><td></td><td>Wobble.</td></tr> <tr><td></td><td></td><td>Loose or bent hinge spreaders.</td></tr> <tr><td></td><td></td><td>Broken stop on hinge spreader.</td></tr> <tr><td></td><td></td><td>Loose hinges.</td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20px;">YES</th> <th style="width: 20px;">NO</th> <th style="text-align: left;">Extension Ladders</th> </tr> <tr><td></td><td></td><td>Loose, broken, or missing extension locks.</td></tr> <tr><td></td><td></td><td>Defective locks that do not seat properly when ladder is extended.</td></tr> <tr><td></td><td></td><td>Insufficient lubrication of working parts.</td></tr> <tr><td></td><td></td><td>Defective cords, chains, and ropes.</td></tr> <tr><td></td><td></td><td>Missing or defective pads or sleeves.</td></tr> </table>	General - Inspect ALL ladders for:			Missing or loose steps or rungs (they are loose if they can be moved by hand.)		Loose nails, screws, bolts, or other metal parts.		Cracked, split, worn or broken rails, braces, steps, or rungs.		Rough or splintered surfaces.		Damaged or worn non-slip feet.		Twisted or distorted rails.		Missing identification label (assign an ID #).		Corrosion, rust, oxidization, and excessive wear, especially on treads.		Sharp edges on rails and rungs.	YES	NO	Step Ladders			Wobble.			Loose or bent hinge spreaders.			Broken stop on hinge spreader.			Loose hinges.	YES	NO	Extension Ladders			Loose, broken, or missing extension locks.			Defective locks that do not seat properly when ladder is extended.			Insufficient lubrication of working parts.			Defective cords, chains, and ropes.			Missing or defective pads or sleeves.	
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Ladder Type		Serial / Identification Number	Location (Building)																																																					
<p>Note: Record up to 10 inspections of <u>safe</u> ladders on the form. Each defective ladder must be recorded on a separate form.</p>																																																								
Signature			Date																																																					

Appendix B: Safety Tips for Ladder Setup and Use

StartSafe
Construction: Ladder Safety Series

Safety Tip 1: Ladder Set-up

Minimum 1 metre above roof surface.

Secure ladder to roof.

For every 4-up, place the ladder base 1-out from the wall.

Check ladder is in good condition and strong enough for the job.

Use ladder with non-slip feet or spike, depending on terrain.

Make sure there is enough room to safely step off ladder and keep the area clear of equipment and materials.

Make sure base of ladder is level and secure to prevent side-slip or kick-out from base.

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Safety Tip 2: Ladder Use

Don't lean to the side—keep your weight between the ladder supports.

Carry tools in a tool belt or raise and lower them with a hand line.

Check that boots and rungs are free from grease and mud.

Keep 3-points of contact with the ladder at all times.

If you must place your ladder in front of a door, be sure it is locked or blocked off.

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Safety Tip 3: Stepladder Use

If possible, brace yourself with your free hand.

The top two steps and bucket shelf are not safe to stand on.

Climbing or standing on the rear part of the ladder can cause it to collapse or tip over.

Fully open stepladder and lock spreaders in place.

Stepadders should NEVER be used folded up and leaning against a surface.

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Safety Tip 4: Extension Ladder Use

Metal ladders conduct electricity. KEEP away from power lines and electricity.

Be sure the two sections of the ladder overlap according to the manufacturer's instructions.

Ladders should only be placed against stable surfaces.

Tie off the securing rope.

Check all locks on the ladder are properly engaged.

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Appendix C: General Work Practices for Ladder Safety

- A. **CHOOSE** a ladder tall and strong enough for the job.
- B. **CHECK** that ladders have all parts in good condition, including the following:
- Slip-resistant steps or rungs
 - Braces, bolts, screws, and spreaders
 - Rope
 - Safety feet
- C. **TAG AND TURN IN** any damaged or defective ladder.
- D. **POSITION** the ladder for steadiness with the following:
- Ground surface level.
 - Feet parallel to the wall at a distance that is equal to one-fourth the ladder length.
 - At least three feet above top support with top anchored, and bottom tied or held.
- E. **WORK** cautiously on a ladder to prevent falls.
- F. **REMEMBER the following:**
- Allow one person only on a ladder, wearing shoes with clean, nonskid soles.
 - Face the ladder and hold both rails while climbing.
 - Carry tools on a belt, rope, or hoist.
 - Stay below the top two stepladder steps or four top ladder rungs.
 - Work with body centered, one hand on rail and tools in hanger or holder.
- G. **WARNING:** Don't use a metal ladder around electricity!

Appendix D: OSHA Quick Card for Portable Ladder Safety Tips



Portable Ladder Safety Tips



Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries.

- Read and follow all labels/markings on the ladder.
- Avoid electrical hazards! – Look for overhead power lines before handling a ladder. Avoid using a metal ladder near power lines or exposed energized electrical equipment.
- Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.



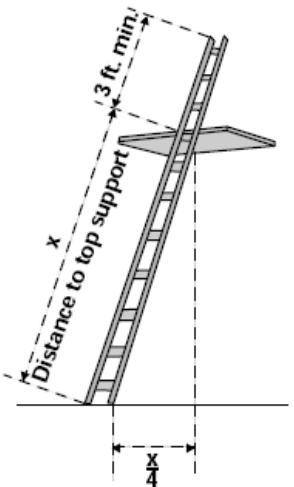
3-Point Contact

- Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).
- Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
- Ladders must be free of any slippery material on the rungs, steps or feet.

- Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
- Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.

(continued on reverse)

- Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.
- Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- Do not move or shift a ladder while a person or equipment is on the ladder.
- An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).



- A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.
- Be sure that all locks on an extension ladder are properly engaged.
- Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.

For more complete information:

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

OSHA 3246-11/05