ENVIRONMENTAL HEALTH & SAFETY
THE UNIVERSITY OF TEXAS AT TYLER

PROGRAM FOR LADDERS

2023

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Introduction:

The University of Texas at Tyler Environmental Health and Safety department has developed this Ladder Safety Program to ensure a safe work environment and to protect the health and safety of University Staff and any contractors or vendors working on University property. This program was written with guidance from OSHA guidelines, the University of Texas System Construction Safety Program, and on-site Job Hazards Analyses.

Purpose:

This program establishes written procedures to be followed when using or working on ladders of any type on UT Tyler property to prevent falls and overhead hazard injuries.

Application:

This program applies to work performed by any UT Tyler employee, student, or contractor performing work in existing buildings, new construction in existing buildings, or new construction attached to existing buildings. It is enforced by the Department of Environmental Health and Safety (EH&S).

Notice:

Employees and outside contractors shall not use ladders until they have completed the ladder safety training and passed with an 80% or higher on the test.

Definitions:

Angle of inclination
the preferred pitch for portable non-self-supporting ladders.

Articulated joint
A hinge which is able to be locked in one or more positions.

Articulated ladder
A portable ladder with one or more pairs of locking articulated joints which allow the ladder to be set up in several modes such as a straight or extension ladder, with or without a stand-off, as a regular or double front stepladder, scaffold or worktable.

Back leg (rear rail)
the support members of a self-supporting portable ladder-back section. The back legs are joined by rungs, bars, rear braces or other bracing to form the back section.

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. Its components may be used as single ladders.

Composite
A homogeneous material created by the synthetic assembly of two or more materials (a selected filler or reinforcing elements and a compatible matrix binder) to obtain specific characteristics and properties.

Duty rating
the combination of factors, including, but not limited to, ladder type and design features, which imply service capability.

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.

Extension trestle ladder
a self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together.

Fiberglass
In this standard, fiberglass refers to glass-reinforced plastic, where the most common plastic encountered would be polyester. The composite would possess directional properties, as well as specific mechanical, electrical, corrosive, and weathering characteristics.

Highest standing level
the vertical distance, expressed in feet and inches, from the uppermost rung or step the climber is advised to use to the horizontal plane of the ladder base support, with the ladder in the preferred climbing position.

Inside clear width
The distance between the inside flanges of the side rails of a ladder.

Ladder
A device incorporating or employing steps, rungs, or cleats on which a person may step to ascend or descend.

Ladder foot, shoe, or slip-resistant bearing surface
that component of ladder support that is in contact with the lower supporting surface.

Ladder Type
The designation that identifies the working load.

Marking
Any sign, label, stencil, or plate of a primary hazard or informational character, or both, affixed, painted, burned, stamped or embossed on a ladder surface.

Maximum extended length or maximum working length
the total length of the extension ladder when the middle or intermediate and top or fly sections are fully extended (maintaining the required overlay).

Permanent deformation (set)
that deformation remaining in any part of a ladder after all loads have been removed.

Pitch
the included (acute) angle between the horizontal and the ladder, which is measured on the side of the ladder opposite the climbing side. It is usually expressed as the ratio H/L, which is the horizontal distance H from the base of the ladder to the supporting surface divided by the working length L of the ladder.

Plastic top cap
molded thermoset or thermoplastic uppermost horizontal member of a portable stepladder.

Platform
A landing surface that is used as a working or standing location.

Platform ladder
a self-supporting portable ladder of fixed size with a platform provided at the intended highest standing level.

Polyesters
Thermosetting resins produced by dissolving unsaturated, generally linear, alkyd resins in a vinyl-type active monomer such as styrene, methyl styrene, or diallyl phthalate. Cure is effected through vinyl polymerization using either peroxide catalyst and promoters or heat to accelerate the reaction.

Portable ladder
a ladder that can readily be moved or carried, usually consisting of side rails joined at intervals by steps, rungs, cleats, or rear braces.

Pultrusion
The reversed "extrusion" of resin-impregnated reinforcement in the manufacture of rods, tubes, and structural shapes of a permanent cross section. The reinforcement, after being properly wet-out by the resin application system, is drawn through a die to form a desired cross section. This is one method of manufacturing reinforced plastic shapes.

Rail
The side members joined at intervals by either rungs, steps, cleats, or rear braces.

Rear braces
Crosspieces or diagonals (in the back section of a self-supporting ladder) not intended for climbing, which may be spaced at any interval.

Reinforced plastic
a plastic with strength properties greatly superior to those of the base resin as a result of high-strength fillers embedded in the composition. The reinforcing fillers are usually fibers, fabrics, or mats made of fibers.

Reinforced plastic ladder
a device whose side rails are constructed of reinforced plastics. The crosspieces, called steps, rungs, or cleats, may be constructed of metal, reinforced plastics, or other suitable materials. This term does not denote the absence of all metallic elements, because even in ladders with side rails and crosspieces manufactured of reinforced plastics, the hardware and fasteners may be metallic.

Reinforcement
a strong inert material bonded into a plastic to improve its strength, stiffness, and impact resistance.
Reinforcements are usually fibers of glass, asbestos, sisal, cotton, and the like, in woven or non-woven form. To be effective, the reinforcement material must form a strong adhesive bond with the resin.

Rungs, steps, or cleats
Ladder crosspieces that are intended for use by a person in ascending or descending.

Scaffold
A temporary elevated platform and its supporting structure used for supporting worker(s) or materials or both.

Sections:

- Bottom or base section - The lowest section of a non-self-supporting portable ladder.
- Top or fly section - The uppermost section of a non-self-supporting portable ladder.
- Middle or intermediate section - The section between the top (fly) and bottom (base) sections of a non-self-supporting portable ladder.

Sectional ladder
A non-self-supporting portable ladder, nonadjustable in length, consisting of two or more - sections, and so constructed that the sections may be combined to function as a single ladder.

Single ladder
a non-self-supporting portable ladder, nonadjustable in length, consisting of one section.

Size
the quantitative description of the length of the ladder. Methods of defining size are presented in the individual standards.

Special-purpose ladder
A portable ladder that is either an experimentally designed ladder or a modification or assemblage of A14 approved requirements for design, testing or construction features of one of the general-purpose ladders defined elsewhere in this section, in order to adapt the ladder for special or specific climbing uses.

Standoff
A means by which a ladder may be erected at some horizontal distance away from its upper support point.

Stepladder
A self-supporting portable ladder, nonadjustable in length, with flat steps and hinged base.

Step stool (ladder type)
A self-supporting, foldable, portable ladder, nonadjustable in length, 32 inches or less in size, with flat steps and without a pail shelf, designed so that the ladder top cap as well as all steps can be climbed on. The side rails may continue above the top cap.

Step surfaces
the clear portion of steps, rungs, or cleats on which a person may step while ascending or descending ladder.

Straight ladder
an articulated ladder where all of the sections are in line.

Test failure
Damage or visible weakening of the ladder structure or a component, except where otherwise defined by the test protocol.

Test load
the applied load used to demonstrate compliance with performance test requirements.

Top cap
the uppermost horizontal member of a portable stepladder or step stool.

Top step
the first step below the top cap of a portable stepladder or step stool. Where a ladder is constructed without a top cap, the top step is the first step below the top of the rails.

Trestle (double front) ladder
A self-supporting portable ladder, non-adjustable in length, consisting of two sections, designed to be able to be climbed on by two (2) individuals simultaneously, one (1) per side and hinged at the top to form angles with the base.

Ultimate failure
the collapse of the ladder structure or, where applicable, a component thereof.

Uncoated vinyl flooring
In this standard, it shall be the Classic Corlon vinyl flooring from Armstrong.

Visual damage
Damage evident by visual inspection.

Visual inspection
Inspection by the eye without recourse to any optical device except prescription eyeglasses.

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.

Working load
the maximum applied load, including the weight of the user, materials, and tools, which the ladder is to support for the intended use.

Types of Ladders:

1. A-Frame Step Ladders: These are self-supporting portable ladders. They are non-adjustable in length, have flat steps and a hinged back. They are measured along the front edge of the side rails. They are available in “twin front” or “double front” designs so they can be climbed from both sides. 3’ to 20’ in height.
2. Extension Ladders: This is a non-self-supporting portable ladder that is adjustable in length. It consists of two (2) or more sections that travel in guides or brackets, which are arranged to permit length adjustment. An extension ladder’s size is designated by the sum of the lengths of the sections measured along the side rails. It cannot exceed 44 feet.
3. Extension Trestle Ladders: A stepladder that is a self-supporting portable ladder with an extension. They are available in “twin front” or “double front” design so they can be climbed from both sides
4. Fixed Ladders: A fixed ladder is a ladder permanently attached to a structure, building or equipment.
5. Combination Ladders: These ladders are non-self-supporting or self-supporting portable ladders, adjustable or non-adjustable in length. It consists of two or more sections of

ladder that may be combined to function as a single ladder. The overall length of the assembled sections designates its size.

6. Wooden ladders are not to be used. If your department has wooden ladders currently in use, please contact EH&S to arrange replacements.

Capacity Requirements:

1. There are five different capacity ratings for ladders:
    a. IAA-Special Duty 375lb max capacity
    b. IA-Extra Heavy Duty 300lb max capacity
    c. I-Heavy Duty 250lb max capacity
    d. II-Medium Duty 225lb max capacity
    e. III-Light Duty 200lb max capacity
2. The total load put on a ladder is the user's weight, plus the weight of their clothes, PPE, tool belt and tools, any materials placed on the paint shelf, and any tools tied off to the ladder.
3. At no point should the maximum capacity of a ladder be exceeded.

Color Codes and Capacity Labels:

Some ladder brands (Werner, for example) color codes their ladders for capacity, ANSI ladder class and additional safety information. **STEPLADDERS:** On fiberglass stepladders the fiberglass frame is colored, and on aluminum stepladders the base caps/pads and top caps are colored coded. **EXTENSION LADDERS:** On fiberglass extension ladders the fiberglass frame is colored, and on aluminum extension ladders the base and top caps/pads are color coded as well as the ropes.

Color codes for Fiberglass Stepladders and Extension Ladders
RED, 200 lbs., ANSI Code Type III
GREEN, 225 lbs., ANSI Code Type II
BLUE, 250 lbs., ANSI Code Type I
ORANGE, 300 lbs., ANSI Code Type IA
YELLOW, 375 lbs., ANSI Code Type IAA

Color codes for Aluminum Stepladders and Extension Ladders
RED, 200 lbs., ANSI Code Type III
GREEN, 225 lbs., ANSI Code Type II
BLUE, 250 lbs., ANSI Code Type I
BLACK or ORANGE, 300 lbs., ANSI Code Type IA
(Most aluminum 300 lbs. capacity ladders normally have black caps, but some newer ones have orange caps)
YELLOW, 375 lbs., ANSI Code Type IAA

Stability Requirements:

1. Ladders must be used only on stable, level ground. Avoid slippery, wet, or soft surfaces.
2. Ladders are never to be used on elevated surfaces (i.e. scaffolding, lift buckets or platforms, rooftops) If greater height is needed on rooftops, certified scaffolding with fall protection should be used.
3. Do not place ladders where they can accidentally be struck or displaced.
4. Extension ladders shall be tied off whenever possible.
5. Ensure that the ladder is properly set up and that the spreaders are locked in place and straight prior to using the ladder
6. Never use a step ladder as a lean-to ladder
7. Never place a ladder in front of doors or around blind corners without proper barricades to prevent collisions with the ladder.
8. Never lean a straight or extension ladder against a windowpane or other unstable surface
9. Fall protection must be used when working above 6ft if appropriate anchors are available, otherwise a lift or scaffold must be used. If this is not feasible, then work on ladders must be conducted in teams with one person on the ladder and at least one other person on the ground to aid in maintaining stability.

Use Requirements:

1. Always inspect ladders prior to use. This inspection should include:
    a. For step ladders, checking the spreader bars of the ladder to ensure there are no warps or twists
    b. Check the ladder for any missing hardware or damage
    c. Ensure all rungs are free of debris, clean the ladder of any oily or sticky residue
    d. Check for any signs of rust/corrosion
    e. Any damaged or defective ladders must be removed from use
2. Always inspect the job area prior to setting up a ladder. These inspections should include:
    a. Ensure the work area is level and stable to prevent the ladder from tipping
    b. Determine if barricades will be needed to prevent collisions with the ladder (are there blind corners, doorways, etc. that will need to be cordoned of
        i. If any access routes need to be blocked for ladder use, notify EH&S to ensure that life safety code requirements are still met.
    c. Clear the work area of all debris prior to setting up the ladder
    d. Check the surroundings for any low hanging electrical lines or other overhead hazards
    e. Never use ladders in severe weather or icy conditions
3. When climbing or descending a ladder always maintain three points of contact (one foot and two hands or two feet and one hand.)

4. Avoid overreaching. Keep your belt line between the side rails of the ladder at all times.
5. Do not stand on the top two rungs of the ladder.
6. Do not stand on the top cap of the ladder.
7. Always face the ladder while ascending of descending and grip the ladder rungs, not the side rails.

Additional Safety Requirements

1. Any damaged ladders must be immediately removed from service and, if not immediately destroyed, must be tagged “Do Not Use”.
2. No makeshift ladders are allowed on campus.
3. Ladders must not be moved while workers are on them.
4. No items such as, but not limited to, boxes, buckets, barrels, other ladders, bricks, etc. are allowed to be used to increase the height of a worker on a ladder.
5. Modifications to ladders are not allowed.
6. When working on in drop ceilings, check the area for loose or bare wires, sharp edges, or any other hazards prior to beginning work.
7. Always use a tool belt and other hands-free carrying devices (belt clips, D-rings, etc.) when ascending or descending a ladder.
8. Secure tools and supplies so they cannot fall from the ladder.
9. Never work alone at heights above six feet. Work in teams of two to ensure ladder stability and assist in tool and supply hand-offs.
10. Never use a metal ladder while working on electrical lines or equipment, or within 10 feet of overhead electrical lines.
11. When working on electrical equipment from a ladder, ensure that the equipment is locked and tagged out, no matter the strength of the electrical current.
12. In many cases, it is better to use an aerial lift or scaffolding. If you must work above six feet, evaluate the work to determine if a lift or scaffolding is needed instead of a ladder.
13. Always wear clean, dry, slip resistant shoes when on a ladder.
14. Do not wear baggy clothing or loose jewelry while working on a ladder as these things may get caught on the ladder or other surfaces creating a fall risk.
15. A straight or extension ladder should be placed 1 foot away from the surface it's resting on for every 4 feet of the ladder's height.
16. Never jump off a ladder.

Vertical Drop Zone:

1. Only employees essential to the operation are permitted in the vertical drop zone (VDZ).
2. Vertical drop zones must be tapped off or barricaded to control entry. Vertical drop zone should be set by using a 45-degree angle from the load, lifts, or working overhead. Ex. A load 15 feet in the air, must have an area of 15 feet in all directions tapped off.
3. No employee must be directly under the load, NO EXCEPTIONS!

4. An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone:
    - Physically guide the load;
    - closely monitor and give instructions regarding the load's movement;
    - Either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).
5. HARD HATS MUST BE WORN AT ALL TIME WHEN INSIDE THE VERTICAL DROP ZONE!

Training:

No student, staff, or faculty shall work at heights without the proper training. Employees shall be trained on the following topics prior to portable ladder setup or use:

Ladder types, compositions, and parts;

Ladder selection and inspection; and

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 by Environmental Health and Safety. Records shall contain the employee name, date of training, and the subject of the training.

Inspections:

A competent person must complete a visual inspection of the equipment before it will be used. The inspection must consist of observation for apparent deficiencies. Ladders must be inspected in accordance with this program.

1. Check rungs, steps, rails, hinges, rivets, locks, shoes, and platform for any damage, lose or bent items, rust, corrosion, or worn/missing pieces.
2. Ensure labels are in place and legible.
3. Check general overall stability of the ladder.

If any damage is found or labels are missing, tag the ladder as damaged and remove from service.

A quarterly ladder inspection will be completed, signed, and dated by a designated member of the Environmental Health and Safety department. EH&S shall maintain the original inspection on file for a minimum of three years. A copy of the ladder inspection will be forwarded to any department which required it. A Quarterly Inspection Color Code will be used to indicate when the inspection occurred (colored zip ties, and/or tape may be used). Ladders will also have an asset number (bar code or tag) attached. Do not remove inspection identifiers from ladders.

Quarterly Inspections	
Color Code	
January - March	
April - June	
July - September	
October - November	

Annual Compliance Review:

The Safety Organization will review the program annually to determine how the program can be improved. EH&S will strive to keep all programs up to date, with accurate information that employees, and outside contractors can rely on.

Revisions

Date	Author/Reviewer	Description/Reason for Change
5/3/2021	T Bay/ P Tate	Reviewed for latest revision/updated year/added revision section
5/28/2021	T Bay/P Tate	Added inspection information and color code details for ladders
6/22/2022	T Bay/P Tate	Reviewed for updates.
7/7/2023	T Bay/K Stapp	Reviewed, updated logo, date, & formatting