

Ladder, Scaffolding, and Fall Protection Safety Program



Environmental Health, Safety, and Risk Management Department

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I. PURPOSE AND SCOPE

The purpose of this program is to communicate safety through planning, procedures, training, and inspections for Stephen F. Austin State University (SFA) employees while working on ladders, scaffolding, and stationary elevated work surfaces. This program does not address motorized man lifts such as aerial lifts and scissor lifts. For safety information on this equipment, see the SFA Aerial Lift Safety Program located on the Safety Department's website at: www.sfasu.edu/safety.

This safety program applies to all University employees who work on any elevated work surface where there is a fall hazard of 4 feet or more. Following the guidance and safety precautions described in this program can greatly reduce your risk and potential for injury while using ladders and elevated work surfaces. This program has been developed in compliance with the Occupational Safety and Health Administration (OSHA) regulations 29 CFR 1910.26 (Walking & Working Surfaces) and 29 CFR 1910.29 (Fall Protection).

II. RESPONSIBILITIES

A. Environmental Health, Safety, & Risk Management (EHSRM)

1. Maintain the written Ladder, Scaffolding, and Fall Protection Safety Program;
2. Assist department supervisors with training of new employees and retraining of existing employees who utilize ladders, elevated work surfaces, and fall protection;
3. Periodically inspect work operations and job sites where ladders, scaffolding, elevated work surfaces, and fall protection systems are used to ensure compliance with this program; and
4. Temporarily stop work or close a job site, if an immediate danger is observed, until proper safety equipment and corrective action has been achieved.

B. Department/Shop Supervisors

1. Be familiar with the safety procedures described in this manual;
2. Ensure employees are trained on the proper use and safety of ladders, scaffolding, elevated work surfaces, and required fall protection prior to performing the work;
3. Provide proper personal protective equipment (PPE) such as safety harnesses, lanyards, and hardhats to employees as needed;
4. Ensure damaged equipment is taken out of service immediately and replaced or repaired by a qualified person;
5. Periodically inspect work sites for safe work practices; and
6. Ensure employees conducting the work comply with OSHA 29 CFR 1910.26 and 1910.29 as described in this program.

C. Employees

1. Complete the required Ladder, Scaffolding, and Fall Protection Safety Training and comply with all procedures in this written program;
2. Use all PPE and equipment in the correct manner as described in this program;
3. Notify your supervisor if PPE or safety equipment is needed or damaged; and
4. Notify your supervisor or EHSRM immediately if a safety hazard is observed.

III. SAFETY PROCEDURES

The safety procedures described in this program have been adapted from the OSHA standards on Walking and Working Surfaces and Fall Protection. Read these procedures carefully and be sure you fully understand prior to conducting any work on ladders, scaffolding, or other elevated work surfaces of 4 feet or more requiring fall protection. Talk to your supervisor or contact EHSRM at 468-6034 or safety@sfasu.edu if you have any questions about these procedures or you have safety concerns about the equipment or work environment.

A. Ladders

Almost everyone uses a ladder at some point ranging from small step ladders to extension and fixed ladders reaching as high as 40 feet or more. According to the National Safety Council, falls and accidents involving ladders are responsible for more than 164,000 emergency room treated injuries and 300 deaths a year in the U.S. Using ladders properly and safely while understanding their limitations is key in reducing the risk of falls.

The following guidance will help minimize your risk of falls and injuries while using ladders:

General Ladder Safety

1. Select the right ladder for the job based on the work environment, length of ladder needed, the weight capacity of the ladder, and the tools and materials you need to complete the job. For some jobs, it's better to use scaffolding or an aerial lift.
2. Before a new ladder is placed in service, it should be equipped with rubber shoes and wall grips.
3. Ladders must be placed firmly on the ground, floor, or other solid fixed surface. Never use other objects such as boxes, barrels, or scaffolds to obtain additional height.
4. Always wear clean, dry, slip-resistant shoes when using a ladder.
5. Be aware of using ladders near doors which could bump the ladder causing a fall. If you need to use a ladder near a door, lock the door or post a sign to warn people of the ladder use.
6. Never use a ladder outdoors in bad weather or in high wind (20 mph or more).
7. Do not lean sideways or overreach while working from a ladder. This may cause the ladder to slip or you may lose your balance. Always reposition the ladder to access things that are out of reach.
8. When working with A-type ladders, always open or spread fully and make sure the spreader supports are locked in place before you attempt to work from the ladder.
9. Tools left on top of stepladders can easily fall and injure someone. Keep tools in a bucket lashed to the ladder or in tool pouches.

Climbing and Standing Techniques

1. Do not step or stand on the top two rungs.
2. Do not step or stand on the top cap or bucket shelf.
3. When ascending or descending the ladder, always face the ladder and maintain a firm hand hold.
4. Always grip ladder rungs, not side rails.

5. Do not attempt to carry other objects in your hand(s) while climbing/descending. Use tool belts or get help.
6. Use 3 points of contact on the ladder at all times, 2 feet and 1 hand or 2 hands and 1 foot.
7. Never jump off a ladder.

Extension Ladder Setup and Placement

1. Make sure the ground is level and solid.
2. Make sure the top of the ladder has firm support and tie off the ladder when possible.
3. Never lean a ladder against a window or unstable surface.
4. The angle of the ladder should be at least 1 foot away from the surface it rests against for every 4 feet of ladder height.
5. A ladder should extend at least 3 feet over the top of the structure if it is being used for roof access.
6. Use only fiberglass ladders when there are power lines and electrical hazards.

Fixed Ladders

1. Fixed ladders should have a pitch or slope in the range of 75-90 degrees and should be free from sharp edges or burs. They should also be painted, treated, or made from a rust resistant material, especially when used outdoors.
2. Landing Platforms and Access to Fixed Ladders:
 - When ladders are used to ascend to heights exceeding 20 feet, landing platforms shall be provided for each 30 feet of height.
 - Landing platforms shall be equipped with standard railings and toe boards to give safe access to the ladder. Platforms shall not be less than 24 inches in width and 30 inches in length.
 - The step-across distance from the nearest edge of the ladder to the nearest edge of equipment or structure shall not be more than 12 inches, or less than 2 1/5 inches.
3. The distance from the center line of rungs, cleats, or steps to the nearest permanent object in back of the ladder shall not be less than 7 inches, except when unavoidable obstructions are present.
4. A guard, cage, basket, or ladder well shall be provided on ladders of more than 20 feet to a maximum unbroken length of 30 feet.
5. Ladder safety devices such as those that incorporate life belts, friction brakes, and sliding attachments may be used on tower, water tanks, and chimney ladders over 20 feet in unbroken length in place of cage protection and must meet the design requirements of the ladders that they serve. No landing platform shall be required in these cases.
6. Fall protection must be provided whenever the length of a fixed ladder is 24 feet or higher. See the section on Fall Protection on page 6 of this program for more information.

While ladders are easy to transport and setup for many small jobs, they have limitations in weight capacity, working surface, and extent of reach. For those jobs where a larger elevated work surface is needed, scaffolding or an aerial lift may be the better choice. See the SFA Aerial Lift Safety Program on the EHSRM website at: www.sfasu.edu/safety for information on extendable aerial and scissor lifts. The following section describes scaffolding safety guidelines.

B. SCAFFOLDING

Scaffolding shall be furnished and erected in accordance with OSHA standard 29CFR, 1910.28, and ANSI-A92.1 for persons engaged in work that cannot be done safely from the ground, solid construction, or ladders.

Following the guidance and procedures below while using scaffolding will greatly reduce your risk of a fall or injury.

1. The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as boxes, bricks, boards or concrete blocks should never be used to support scaffolding or used in an attempt to level scaffolding. Any minor adjustments needed to maintain scaffolding in a plumb position should be attained by adjustable screw jacks provided in the base section.
2. All scaffolding shall be capable of supporting at least four times the intended working load.
3. All exposed surfaces shall be free from sharp edges, burrs, or other safety hazards.
4. The minimum platform width of any work level shall not be less than twenty inches.
5. The maximum work level height shall not exceed four times the smallest base dimension of the scaffolding. Higher work levels require the use of outriggers to maintain this 4:1 ratio.
6. All scaffolding work levels ten feet or higher above ground or floor level, shall have a four-inch toe board and handrails that are 42 inches, plus or minus 3 inches, high with a mid-rail.
7. A climbing ladder or stairway shall be provided for proper access and egress, and shall be affixed or built into the scaffolding and located where its use will not tip the scaffolding.
8. All scaffolding casters shall be provided with a positive wheel or swivel lock or both to prevent movement.
9. Where uplift may occur, panels or sections shall be locked together vertically by pins or other equivalent means.
10. Scaffolding shall be erected and used only by capable personnel who have been trained in their use. Units shall be inspected thoroughly before and after each use.
11. Overhead protection shall be provided for the work platform when an overhead hazard exists for personnel on the work platform. If a physical overhead protection barrier is not available, the use of hardhats will be required.
12. Where moving vehicles or pedestrian traffic is present in the immediate area, signs, barricades, or ropes will be used to secure the area.
13. Tools and work materials will be hoisted or lowered to and from work platforms by use of hand lines or suitable containers such as buckets.
14. No scaffolding shall be erected to exceed fifty feet. An aerial lift or bucket truck may be required to reach additional heights.
15. All people, tools, materials, and loose objects must be removed from the scaffolding prior to moving it.
16. Ladders and other objects must not be used on the work platform to gain additional height.
17. Personnel shall not work from scaffolding during high winds (20 mph or more) or inclement weather.

C. Fall Protection

Fall protection requirements apply to all University staff and students working on elevated work surfaces of 4 feet or greater above the lower level. These fall protection requirements do not apply to the use of extension or A-frame ladders.

Engineering controls such as guardrails and walls with a height of 42 inches, plus or minus 3 inches, is always the preferred method of fall protection when possible. However, when engineering controls cannot be implemented, the use of active fall protection systems (such as a harness and lanyard) must be used.

Passive Fall Protection

Passive fall protection systems include guardrail systems and parapet walls meeting the height criteria for guardrails. These do not require operational involvement from the user in order to be protected while performing work at heights.

1. Whenever possible guardrails, aerial lifts, and platforms should be installed/used in place of active fall protection systems.
2. Personal fall arrest or restraint systems shall not be attached to guardrail systems, unless they have been permitted by a qualified person.
3. The top edge height of the top rails shall be 42 inches plus or minus 3 inches above the walking/working level. The height of the top edge may exceed the 45 inches as long as the guardrail system meets all other criteria.
4. Mid-rails, screens, mesh, or intermediate vertical members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall of at least 21 inches high. Midrails shall be installed at a height midway between the top edge of the guardrail system and the walking/working level. (Example: If the top edge of the guardrail is 42 inches, then the mid-rail must be 21 inches.)

Active Fall Protection

Active fall protection systems require that employees and students understand when they are exposed to fall hazards and have a working knowledge of the fall protection system available for their protection. Active systems begin with a certified anchor point and have components connected to the worker (body harness, lanyard, self-retracting lifeline, rope grab, etc). Proper training in their use is essential for an effective fall protection system.

The following guidance describes the requirements for active fall protection and should be used in combination with hands-on training provided by your supervisor (or designee). Contact EHSRM at 468-6034 or safety@sfasu.edu for assistance with fall protection training.

1. Before using personal fall protection systems, the employee/supervisor must assess the potential fall area and select a system that will prevent the user from contacting the ground or other objects, such as the side of a building.
2. Personal fall protection systems are comprised of an anchorage point, lanyard, and full body harness.
3. SFA employees shall use only commercially manufactured equipment specifically designed for fall protection.

4. Personal fall arrest systems shall have sufficient strength to withstand twice the potential impact energy of a user free falling distance of 4 feet.
5. All anchor points must be capable of withstanding two times the foreseeable force for fall arrest, restraint, and work positioning.
6. Certified anchor points must be capable of withstanding five times the applied load for rescue and must be certified by a qualified person such as a structural engineer.
7. All non-certified anchor points such as beams, girders, columns, or other building steel must be approved by the shop supervisor or designee.
8. Anchor points should, generally be directly above the user's head.
9. Fall arrest lanyards (or lifeline) shall not exceed six feet in length, provided that the user will not contact objects or a lower level.
10. Only lanyards made from synthetic fibers are permitted.
11. Personal fall arrest systems shall not be attached to guardrail systems, unless they have been permitted by a qualified person.
12. Never tie off to fire sprinkler piping, conduit, ductwork piping, or other structures that are not intended nor designed for fall protection and haven't been approved by a qualified person. *These are not designed to withstand the load required for anchorage systems.*
13. Tying off around rough or sharp edges should be avoided.
14. A full body harness must be used to complete the personal fall protection system. The straps of the harness should be positioned in a manner that will distribute the fall arrest forces over the thighs, shoulders, chest, and pelvis.
15. All users must be properly fitted with an appropriately sized harness to fit their body.
16. All harnesses, lanyards, and other required safety equipment will be provided by the user's department.
17. Fall protection equipment such as harnesses and lanyards should be stored in a clean dry place away from sunlight, heat, chemicals, and paint.

D. Inspection

Active fall protection equipment including anchor points, lifelines, lanyards, full body harnesses, snap hooks, and connectors shall be inspected before each use or at least annually by the user. Defective equipment shall be taken out of service and discarded or repaired by a qualified person. The following items should be included in the inspection prior to each use:

1. Examine webbing for cuts, tears, holes, mildew, enlarged eyeholes, and any other signs of wear that may affect the integrity of the equipment.
2. Examine the stitching for damage or signs of weakening.
3. Examine all metal hardware for cracks, fractures, deformation, loosening of anchorage, or other signs of wear or deterioration which may affect the equipment or its ability to fasten/close.
4. Examine lifelines and lanyards for fraying, broken strands, cuts, abrasions, chemical damage, discoloration, or deterioration that may affect the effectiveness of the equipment.
5. Examine anchor points to ensure it has not become unseated, that there are no cracks, deformities, or other damage.
6. All components of the fall protection system must be inspected by a qualified person if an incident where a fall from an elevated work surface occurs.

Guardrails shall be inspected at least annually by maintenance personnel. If any damage or deterioration of the guardrail system is observed, it must be immediately labeled with a warning or danger sign and reported for repair. Look for the following issues when inspecting guardrails:

1. Loose connections, components, deformation, cracks, or damage.
2. Corrosion.
3. Gates at ladders and similar unprotected edges should operate smoothly with one hand. Spring closures should be able to fully close and secure the gates.
4. Regular guardrails and removable railings should not show excessive play at the connections. Pins and removable components should be in place. Removable components like pins should be tethered to the railing or socket to prevent them from being lost.

E. Fall Rescue

Employees engaging in work that requires personal fall protection should always work in pairs. There should be a coworker who remains in contact with the person using the fall protection by visual contact, radio, or cell phone. Visual contact is always preferred when possible. The coworker must be able to immediately contact rescue personnel in the event of a fall. In some cases, the employee who has fallen can be reached safely using an aerial lift. Once immediate hazards are eliminated, the rescue can be performed by placing the lift under the fallen individual. The suspended individual must not be detached from their lanyard until they are completely inside the lift. If the employee cannot be reached safely or in a timely manner with a lift, or if a serious injury has occurred. Call 911 immediately.

IV. TRAINING

SFA employees shall not be permitted to work on ladders higher than 6 feet, scaffolding, or other elevated work surfaces greater than 4 feet without the proper training. All employees must complete both the classroom training and hands-on site-specific training initially and every two years thereafter. The classroom training will be given by EHSRM or designated shop supervisor and the hands-on site-specific training will be given by the shop supervisor or their designee.

Retraining will occur at least every two years or when:

- An incident in the workplace has occurred that is associated with a fall from a ladder or other elevated work surface.
- Changes in the workplace present new hazards or equipment.
- Observations by a supervisor or EHSRM Safety Officer show a lack of user's knowledge or use of fall protection systems understanding or skill.