LIBERTY UNIVERSITY | ENVIRONMENTAL HEALTH & SAFETY

Liberty University Fall Protection Program (Policy & Procedures)

I. INTRODUCTION

Each year over 100,000 injuries and deaths are attributable to work-related falls. The Bureau of Labor Statistics show falls as one of the leading causes of occupational death. An OSHA study involving 99 fall-related fatalities suggests that all deaths could have been prevented by the use of fall protection. OSHA recognizes that accidents involving falls are generally complex events which involve a variety of factors. Consequently, the standard for fall protection deals with both the human and equipment related issues in protecting workers from fall hazards.

An employee must be protected from falling when working on a surface that has an unprotected side or edge which is 4 feet (6 feet for construction contractors) or more above an adjacent lower level or when working from aerial lifts or other elevated work platforms and lifts.

In each of these cases, the fall hazards must be evaluated to determine the preferable method to protect the employee. When considering what type of fall protection to use, the following hierarchy of remedies, in order of preference, should be considered:

- Elimination of the fall hazard by bringing the work down to safe ground level.
- Use of passive fall protection systems such as guard rails.
- Fall restraint which prevents a person from reaching a fall hazard.
- Fall arrest which utilizes equipment to stop a fall after it occurs.
- Administrative controls which use work practices or procedures to signal or warn a worker to avoid approaching a fall hazard.

II. PURPOSE & SCOPE

It is the policy of Liberty University (LU) to take precautions to eliminate fall hazards from elevated work locations. This Fall Protection Program prescribes the duty to provide fall protection; sets the criteria and practices for fall protection; and outlines required training and recordkeeping.

The purpose of this program is to outline the fall protection requirements to minimize/eliminate fall related injuries. This program is developed in accordance with the following Occupational Safety and Health Administration (OSHA) regulations:

- 29 CFR 1910 Subpart D, “Walking-Working Surfaces”
- 29 CFR 1910 Subpart F, “Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms”
- 29 CFR 1910.132 “Personal Protective Equipment”
- 29 CFR 1926 Subpart M, “Fall Protection”
- ANSI/ASSE Z359 Fall Protection

Scope: This Fall Protection Program establishes and outlines the requirements for departments, supervisors, Competent Person(s), and Authorized Person responsibilities; identification of fall hazards and control measures; and training, inspection and recordkeeping related to fall protection on/in LU buildings. The program applies to all LU employees whose work duties require them to work at unprotected heights greater than four (4) feet.

There will be ZERO TOLERANCE for not abiding by the requirements set forth herein for management, supervisors, employees, LU controlled contractors, and LU controlled subcontractors on job sites and at all LU facilities/properties.

LU Mandates a 100% TIE-OFF policy, **dual lanyards are required when moving between varying work surface platforms.** (This includes working from height in a scissor lift.)

Where protection is required per (OSHA 29 CFR 1926.501 – "Duty to Have Fall Protection"), select fall protection systems appropriate for given situations.

- Use proper construction and installation of safety systems;
- Supervise employees properly;
- Use safe work procedures;
- Train workers in the proper selection, use, and maintenance of fall protection systems

The use of ladders, scaffolds, and mobile elevated work platforms (aerial lifts) are not covered in detail within this program. Refer to the LU EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Policies Programs & SOP's for more information when working with or on these devices.

III. POLICY

Liberty University is committed to providing a safe and healthful work environment for our LU community. All employees, students, volunteers, and contractors working under direct LU supervision shall comply with all elements of the LU Fall Protection Program and with all Federal, State, and Local Regulations. Additionally, any contractors working independently or through a general contractor on LU properties must comply with the LU Contractor Safety Program found on the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under LU Contractor Safety.

IV. PROGRAM RESPONSIBILITIES

A. Program Administrator

Environmental Health and Safety Division (EHS) provides:

- Program oversight and consultation to LU departments with fall protection components.
- Provides training (Introduction to Fall Protection & Advanced Fall Protection) and maintenance of applicable records.
- Performs program reviews and updates, as necessary.
- Provides recommendations for fall protection during the building design process.
- Provide continual safety evaluations of work operations and enforcement of this policy. ********EHS staff are authorized to halt any unsafe work practice that is not in accordance* with this or any other LU EHS policy or procedure where there is the potential of injury or death.**

B. Departmental Management

Departmental management is responsible for providing a safe workplace and working conditions for their faculty, staff, and students. Departments must review work locations and activities to identify if there are any exiting or potential fall hazards. Departments must also identify personnel that are exposes to fall hazards. Common LU work activities to be evaluated include but are not limited to:

- Roof maintenance and repairs (e.g. roof patching, repairing slates, repairing roof deck, cleaning gutters, painting metal roofs).
- Roof renovations (e.g., replacing roof materials, roof deck and gutters).
- Building maintenance (e.g., window cleaning, painting).
- Building heating, ventilation, and air conditioning systems (e.g., access for installation, repairs, preventative maintenance and changing filters).
- Lighting (e.g., auditoriums, stairwells, pools, stadium lights).
- Scoreboards
- Construction and renovations
- Material storage, high lift reach trucks
- Production lighting and personnel for rigging (e.g., theaters)
- Tree climbing
- Utilities

- Departmental management must ensure all personnel that will be working at elevated heights have attended LU EHS Intro to fall protection class and if working in a supervisory capacity serving as the competent person have attended the LU EHS Advanced Fall Protection Class. Additionally, departmental management must procure the proper fall protection system necessary for working safely at elevated heights. Fall protection equipment can be obtained through EHS.

- Departmental management must train faculty, staff, or student members to recognize fall hazards specific to their work location or assigned activities. Personnel must follow this Fall Protection Policy & Procedures as well as any Safety Procedures established by the department to protect them from the risks of falls at elevated heights. Personnel who are assigned Fall Arrest Equipment must follow the equipment manufacturer's instructions in the proper use, care, and inspection of their equipment. Personnel must also understand the equipment's limitations and when to remove the equipment from service.

C. Supervisors

Supervisors must identify and provide the necessary personal fall protection equipment required for working in fall hazard situations. The supervisor shall be a Competent Person, as defined by OSHA, or assign someone to be the Competent Person for the work group. OSHA defines a Competent Person as:

- A person who is capable of identifying existing and predictable hazards in the surroundings or identifying working conditions which are hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

Competent Person

Employees delegated the Competent Person shall be responsible for the oversight, implementation, and management of the fall protection program. The Competent Person shall:

- Receive Advanced Fall Protection Training (5 hours) from EHS.
- Be knowledgeable through training and experience of applicable fall protection standards and regulations applicable to their operation(s).
- Conduct fall hazard surveys (job hazard analyses) to identify fall hazards before authorized persons are exposed to fall hazards.
- Have the authority to stop work immediately if it is determined unsafe to proceed.
- Prepare, update, and review written fall protection procedures and ensure a written rescue plan is developed for situations where fall hazards exist.
- Specify in writing the fall protection procedures, the systems in place to include anchorage points, connecting means, and other fall protection equipment that authorized persons are required to use when exposed to a fall hazard.
- Supervise the selection, installation, use and inspection of noncertified anchor points.
- Verify the fall protection systems are installed and inspected in compliance with this plan and applicable standards.
- Verify and ensure all authorized persons working at heights are trained and authorized to do so.
- Ensure a prompt rescue of authorized persons can be accomplished through adequate rescue operations.
- Participate in investigations of all incidents related to falls from elevated work surfaces.
- Immediately remove from service any fall protection equipment found defective or subjected to forces as a result of a fall from elevated work.
- Inspect fall protection equipment as recommended by the manufacturer and specified in this plan and ensure inspections by qualified persons are conducted as required.

D. Authorized Person/Employee

Authorized Person/Employees working where fall hazards exist must comply with the provisions of this program including the use of Personal Protective Equipment (PPE), fall protection equipment and rescue systems/operations; completion of equipment inspections; training; and reporting of any concerns related to fall protection to their supervisor. Requires Fall Protection Fundamentals Training (2 ½ hours) from EHS.

V. Definitions

- **Anchorage/Anchor point:** secure point of attachment for lifelines, lanyards, or deceleration devices.

- **Authorized person:** a person assigned by employer to perform duties at a location where the person will be exposed to a fall hazard.

- **Body belt (safety belt):** a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

- **Body harness:** straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with means for attaching it to other components of a personal fall arrest system.

- **Buckle:** is any device for holding the body belt or body harness close around the employee's body.

- **Competent Person/Individual:** one who is capable of identifying existing and predictable hazards in the work environment and has the ability to take corrective actions to eliminate hazards; knowledge of the rules regarding the erection, use, inspection, and maintenance of fall protection equipment and systems. One who has the responsibility to inspect fall protection systems for certification purposes,including the manufacturer's recommendations and instructions for proper use, inspection, and maintenance; Persons/individuals are deemed competent through a combination of training and hands-on experience to possess knowledge about all aspects of the fall protection program and fall protection equipment and the ability to identify existing and potential fall hazards.

- **Connector:** is a device which is used to couple or connect parts of the personal fall arrest system and positioning device systems together.

- **Dangerous equipment:** equipment (such as cooling towers, fuel storage tanks, silos, etc.) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

- **Deceleration device:** any mechanism, such as a rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

- **Deceleration distance:** the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the

deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

- **Failure:** is load refusal, breakage, or separation of component parts.

- **Free fall:** the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

- **Free Fall Distance:** is measured from the onset of the fall until deceleration or the fall arrest system applies force.

- **Guardrail system:** a barrier erected to prevent employees from falling to lower levels.

- **Hole:** a gap or void of 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.

- **Lanyard:** a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

- **Leading edge:** the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

- **Lifeline:** a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

- **Low-slope roof:** a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

- **Lower levels:** those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

- **Mechanical equipment:** all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mop carts.

- **Opening:** a gap or void 30 inches (76 cm) or higher and 18 inches (48 cm) or wider, in a wall or partition, through which employees can fall to a lower level.

- **OSHA:** Occupational Safety and Health Administration.

- **Parapet:** a low protective wall constructed at least 39 inches in height along the edge of a roof, bridge, or balcony meant to impede free walking past the point of construction. The parapet may not prevent reaching or stumbling over the edge.

- **Personal fall arrest system:** a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt, or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited. Fall arrest systems are engineered to be compatible between the permanent system and the personal protective equipment. Interchanging of the components is not permitted.

- **Personal fall restraint system:** fall protection system, which prevents an employee from approaching a fall hazard through the use of a lanyard and body harness.

- **Positioning device system:** a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

- **PPE:** Personal Protective Equipment.

- **Qualified person:** a person with a recognized degree or professional certificate AND with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating, and specifying fall protection and rescue systems.

- **Rope Grab:** is a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee.

- **Roof:** the exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface of a building.

- **Roofing work:** the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

- **Safety-monitoring system:** a safety system in which a Competent Person is responsible for recognizing and warning employees of fall hazards.

- **Self-retracting lifeline/lanyard:** a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

- **Shock-absorbing lanyard:** a lanyard with energy absorbing capacity

- **Snap hook:** a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are generally one of two types:

    - The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or

- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.

- **Standard Railing:** railing or safety railing system which meets the requirements for top rail (42 inches 107 cm +/- 3 inches (8 cm)), mid-rail (at least 21 inches (53cm) or halfway between top rail and walking surface)), and toe board (at least 3.5 inches (8.9 cm) in height)) specifications.

- **Steep Roof:** is a roof having a slope greater than 4 in 12 (vertical to horizontal).

- **Toe board:** a low protective barrier that will prevent the falling of materials and equipment to lower levels and provide protection from falls for personnel by demarcating a lower surface edge.

- **Unprotected sides and edges:** any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall, parapet, or guardrail system at least 39 inches (1.0 m) high.

- **Walking/working surface:** any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork, and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

- **Warning line system:** a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, or body belt systems to protect employees in the area.

- **Work Area:** is the portion of a walking/working surface where job duties are being performed.

VI. PROCEDURES (APPLICATION & IMPLEMENTATION)

A. General

All employees will be protected from falling when working on a surface that has an unprotected side, edge, etc., elevated work platforms four feet or more above an adjacent lower level, and when working above dangerous equipment while working in general industry. While preforming construction type activities, all employees will be protected from falling from a surface six feet or more above a lower level. Scaffolds used during construction type activity require fall protection to be used at 10 feet or more above a lower level. In construction activities involving steel erection, qualified steel erection employees who are on a walking working surface with an unprotected edge more than 15 feet above a lower level must be protected by conventional fall protection. When working from aerial lifts, review the LU Aerial Work Platform Program by going to the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Policies Programs & SOP's.

Fall hazards will be evaluated by the Competent Person to determine the best method to protect the employee. If the Competent Person is uncertain how to protect the worker(s) they can contact the Environmental Health and Safety office for assistance. When selecting what type of fall protection to use, the hierarchy of hazard control, which organizes risk control techniques from

most-to least-effective (examples are shown below in order of decreasing effectiveness and preference).

- Elimination of the fall hazard by bringing the work down to safe ground level.
- Passive fall protection systems, such as guard rails, that do not require active participation by the worker.
- Fall restraint that prevents a person from reaching a fall hazard.
- Fall arrest that utilizes equipment to stop a fall after it occurs.
- Administrative controls such as work practices or procedures to signal or warn a worker to avoid approaching a potential fall hazard.

B. Fall Hazard Identification & Control Measures

It is the intent of this program to ensure that all fall hazards are appropriately addressed to protect workers from injury. The Competent Person will assess the assigned job task and area for potential fall hazards. This evaluation will document the required steps for protecting employees from the identified hazards.

C. General Industry Fall Hazards

- Loading Docks

  Loading docks will be protected by a guardrail system. The guardrail will have removable sections to provide access for loading vehicles, but rails must remain in place when loading is not in progress.

- Wall Openings

  All wall openings 4 feet or more above an adjacent surface will be guarded by one of the following: a rail, picket fence, half door or equivalent barrier will be placed across the wall opening. If the wall opening extends to the floor, a toe board at least four inches high shall be installed to prevent materials accidental falling from the edge. Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, shall be guarded by standard slats, standard grill work, or standard railing.

- Dangerous Equipment and Materials

  When working at any height above dangerous equipment or materials, each worker will be protected from falling into or onto the dangerous equipment or materials by a guardrail system, equipment guards, safety net system or personal fall arrest system.

- Skylights

  Skylights are considered an opening when present on a roof. Skylight screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied perpendicularly at any one area on the screen. They shall also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork with openings not more than 4 inches long or of slat-work with openings not more than 2 inches wide with length unrestricted.

- Floor Openings

  An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials, but not persons, may fall such as a belt hole, pipe opening or slot opening. All floor holes will be guarded by one of the following: a) A standard railing with toe board on all exposed sides. b) A covering of sufficient strength and construction to handle the heaviest load that could be placed on it (Note: While the cover is not in place, the floor hole must be constantly attended by someone or protected by a standard railing).

D. Construction Industry Fall Hazards

- Leading Edges

  Each worker working on or near a leading edge six feet or more above a lower level will be protected by guardrail systems, safety net systems or personal fall arrest systems. **Remember, if no 39-inch guardrail or parapet, and if no rated fall protection tie-off points, then no closer than 15 feet.**

  OSHA has determined that there is no safe distance from an unprotected side or edge that would render fall protection unnecessary. However, OSHA "Letters of Interpretation" set an allowable distance of 15 feet from the unprotected side or edge, as long as this distance is clearly demarcated and enforced.

- Low-Slope Roofs

  Workers on a low-slope (less than or equal to 4/12 pitch) roof that has one or more unprotected side or edge shall be protected from falling by one of the following:

  a) Guardrail System
  b) Safety Net System
  c) Personal Fall Arrest System
  d) A combination of conventional fall protection system and warning lines
  e) A warning line system and a safety monitoring system (Note: When engaged in roofing work on low-slope roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted)

  OSHA considers these types of systems to be "conventional fall protection systems." Whatever system you use, OSHA expects you to implement it early in the construction process and to maintain that system in place until the permanent elements of the structure, which will eliminate the exposure to falling hazards, are in place or until the work is completed.

- Steep Roofs

Workers on a steep roof (greater than 4/12 pitch) that has one or more unprotected side or edge shall be protected from fall by one of the following:

- Guardrail systems with toe boards
- Safety net systems
- Personal fall arrest systems

- Wall Openings
  All workers working on, at, above, or near wall openings(including those with chutes attached), where the bottom edge of the wall opening is less than 39 inches above the walking/working surface, must be protected from:

  - Falling into or through wall openings which are four (4) or more feet above lower levels by covers over the openings, erecting a guardrail system around the openings, or using a personal fall arrest or safety net system

- Openings

  Means a gap or void 30 inches (76 cm) or higher and 18 inches (48 cm) wide or wider, in a wall or partition, through which employees can fall to a lower level.

- Unprotected Sides and Edges

  Employees on a work surface with an unprotected side or edge which is 4 feet or more above a lower level shall be protected from falling by the use of a guardrail system or personal fall restraint or arrest system. If one of these systems is not available or is infeasible during leading edge work, a specialized fall protection plan must be developed and implemented to protect workers from fall hazards.

  Hoist areas shall be protected by guardrail or personal fall arrest systems. If guardrail systems or portions of guardrail systems are removed to facilitate the hoisting process creating a potential fall hazard for the employee, that employee must be protected by a personal fall arrest system.

  Unprotected sides and edges 4 feet above the lower level shall be protected by a guardrail system. Loading docks more than 4 feet above a lower level are not required to have a guardrail system on the working side of the dock where it can be demonstrated that the presence of guardrails would prevent the performance of work. All non-working sides of a loading dock must be protected by a guardrail system. Dock doors shall remain closed when not in use to minimize the fall hazard and all personnel working around loading docks shall be trained to recognize and avoid the applicable fall hazards.

  Hoist Areas

  Each employee in a hoist area must be protected from falling six (6) feet or more in construction areas and four (4) feet or more in industrial areas. Your choices for this protection are:

  - Guardrail systems

- Personal fall arrest/restraint systems

If guardrail systems (or chain) or portions thereof must be removed to facilitate hoisting operations, as during the landing of materials, and a worker must lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee must protected by a personal fall arrest system

- Excavations

Employees working at the edge of an excavation 4 feet or more in depth shall be protected from falling by guardrail systems, fences, barricades, or a personal fall arrest system. This includes trenches, wells, pits, shafts, or other similar excavations. Excavations where the public may be exposed shall be so addressed as to not create potential fall hazards. Refer to LU Trenching and Excavating found on the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Policies Programs & SOP's. Any LU employee performing trenching and excavation operations must be trained and comply with the LU Trenching and Excavating Safety Program.

- Dangerous Equipment or Materials

Employees less than 4 feet above dangerous equipment shall be protected from falling into or onto the equipment by guardrail systems or equipment guards. Employees more than 4 feet above dangerous equipment shall be protected from fall hazards by guardrail, personal fall arrest, safety net system, or warning line systems.

Protection from Falling Objects

When employees are exposed to falling objects, hard hats must be worn and one of the following measures must be implemented.

• Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels.

• Erect a canopy structure and keep potential falling objects far enough from the edge of the higher level so that these objects will not go over the edge if they are accidentally moved.

• Barricade the area to which objects could fall by prohibiting workers from entering the barricaded area and keep objects that may fall far enough away from the edge of a higher level so that these objects will not go over the edge if they are accidentally moved.

- Holes

Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes. Each employee on a walking/working surface shall be protected from tripping in or

stepping into or through holes (including skylights) by covers. Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.

OSHA does not intend that a guardrail be erected around holes while employees are working at the hole, passing materials, etc. Therefore, if the cover is removed while work is in progress, guardrails are not required because they would interfere with the performance of work. When the work has been completed, the employer will be required to either replace the cover or erect guardrails around the hole.

Ramps, runways, and other walkways must be equipped with guardrails when employees are subject to falling six (6) feet or more to lower levels, four (4) feet in general industry settings.

- Covers

  Covers for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements: Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover. All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees. All covers shall be color coded, or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

- Mobile Elevated Work Platforms

  Body harnesses must be worn with a lanyard, not to exceed 3 feet in length, or a self-retracting lifeline when working from all elevated mobile work platforms. The point of attachment must be the anchor point installed and designated by the equipment manufacturer. Personnel will not attach lanyards to adjacent poles, structures, or equipment while they are working from the aerial lift. Personnel will not move an aerial lift while the boom is in an elevated working position and the operator is inside the lift platform. Scissor lifts and telescoping lifts that can only move vertically do not require the use of a harness and lanyard as long as the work platform is protected by a proper guardrail system and occupants do not stand on above guardrail system. See Liberty University Aerial Work Platform Safety Program and Standard Operating Procedures for more safety information on the proper use of aerial work platforms. This information is located on the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Policies Programs & SOP's.

- Scaffolds

  Fall hazards on scaffolds shall be addressed by the installation of a guardrail system. All scaffolds must be managed and inspected by a trained, Competent Person and

scaffold inspection tags must be completed each day and affixed to the scaffold. Such tags shall be legible and protected from harsh environments.
Fall arrest systems may also be warranted based on the type of work being conducted or if guardrails have to be removed to reach a particular position or for loading of materials onto scaffolding. Employees utilizing aerial work platforms shall be protected from fall hazards according to the manufacturer's recommendations including guardrail systems, fall restraint systems, and fall arrest system. For safe use of ladders see Liberty University Ladder Safety and Standard Operating Procedures for Safe Use of Ladders located on the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Policies Programs & SOP's.

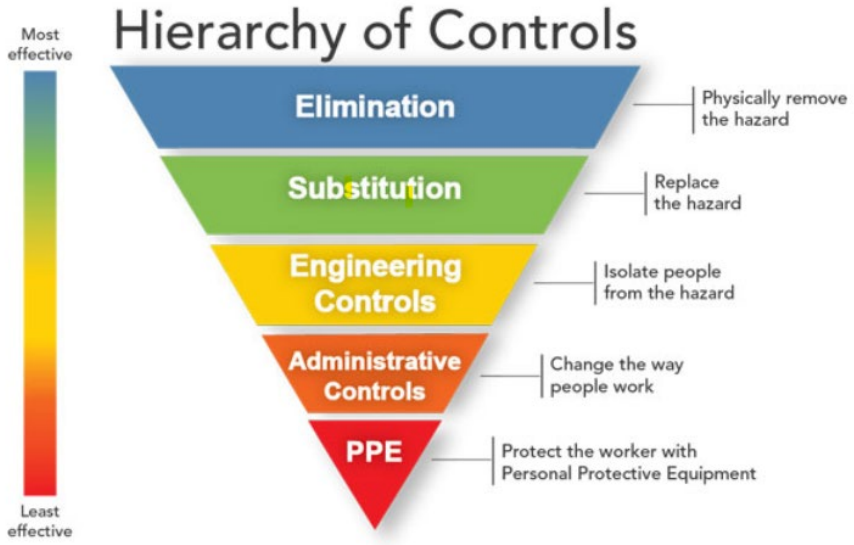
- Building Rooftops

  All new construction or renovation/repair to existing roof systems shall incorporate engineered fall protection into the project design. This includes guardrail systems (including parapets) and/or personal fall arrest or fall restraint systems. Fall protection design shall be approved by a Professional Engineer. On buildings where fall restraint or fall protection is installed, only authorized personnel may perform work. Equipment designed and engineered for use as a fall protection system on a rooftop may not be interchanged with other fall protection systems, including fall restraint systems and personal protective equipment. On buildings where no rooftop fall protection is provided by a permanent guardrail system (including parapets) or fall arrest/restraint system, the supervisor must create a fall protection plan, based on the work being done prior to employees accessing a rooftop. This may include the use of a mobile anchor point; temporary guardrail and/or a safety monitoring system. In addition, some roof tops on LU buildings have designated walking paths. Employees utilizing the walking paths are not required to be in fall protection equipment. Any time employees must access rooftop areas between the roof edge and the walk path, fall protection equipment is required.

VII. Fall Protection System Type & Use

Fall protection systems incorporated into a building or facility design shall meet all applicable standards including, but not limited to: ANSI A10.32-2004 Fall protection systems for construction and demolition operations; ANSI Z359 Fall Protection Code; OSHA 29 CFR Part 1910 Subpart D-Walking and working surfaces; OSHA 29 CFR 1910 Subpart I-Personal protective equipment; OSHA 29 CFR 1926 Subpart M-Fall protection.

Choosing fall protection systems: The hierarchy of controls, or preferred order of controls, shall be used to choose methods to eliminate or control fall hazards.



Conventional fall protection systems

Conventional fall protection systems provide the greatest protection against fall hazards and should be considered a priority when addressing employee protection. These are:

- Standard guardrail system
- Fall restraint system
- Personal fall arrest system

Specialized fall protection systems: If conventional fall protection systems are not practical or feasible the use of a specialized fall protection system including a warning line system or safety monitoring system must be utilized to protect employees from fall hazards. These systems include:

- Warning lines
- Safety Nets
- Safety monitoring
- Mobile, temporary anchor point

A. Guardrail Systems

After eliminating the elevated work, guardrails are the preferred method for the protection of fall hazards. Typical locations that require guardrails include floor openings, wall openings, open-sided floors, platforms, and runways.

Installed and temporary guardrail systems shall comply with OSHA 29 CFR 1910.23-Guarding floor and wall openings and holes. Guardrail systems installed during construction projects and activities shall comply with OSHA 29 CFR 1926.502-Fall protection systems criteria and practices. Guardrail systems provide a barrier to prevent employees from falling to lower levels, and can also designate an area in which work may take place without the use of additional fall protection PPE.

Where guardrail systems are in place as a fall protection measure, the railing shall have a vertical height of 42 inches (+/-3 inches) measured from the upper surface of the top rail to the working surface and consist of a top rail, intermediate rail, and posts. Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is not wall or parapet wall

at least 21 inches high. Guardrails shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

- The intermediate rail shall be approximately halfway between the top rail and the working surface.
- Guardrail systems must be capable of withstanding, without failure, a force of at least 200 pounds in any direction. Refer to Table 1 for material specifications for guardrail systems.
- When 200 pounds of force is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the working surface.
- The ends of all top rails and midrails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.
- Top rails and midrails shall be at least ¼ inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is utilized for top rails, it shall be flagged at not more than 6-foot intervals with high visibility material.

Stair railings shall not be more than 34 inches or less than 30 inches from the upper surface of the top rail to the forward edge of the tread surface.

A standard toe board shall be provided on all guardrail systems where persons can pass under the work surface; there is moving machinery; and/or equipment utilized on the elevated surface with which falling equipment creates a hazard. toe boards shall be 3.5 inches nominal in vertical height and securely fastened in place with not more than ¼ inch clearance above the working surface. Where material is stored near the guardrail system, at heights exceeding the toe board, paneling from the work surface to the intermediate rail shall be provided.

Toe boards shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toe board.

Engineered guardrail systems may be utilized provided they meet these requirements and are installed as per the manufacturer's specifications.

Table 1: Guardrail system specifications

Material of Construction	Post Requirements	Top Rail Requirements	Intermediate Rail Requirements	Additional Requirements
Wood	2-inch by 4-inch stock, spaced 6 feet apart	2-inch by 4-inch stock	2-inch by 4-inch stock	If top rail is two right angle pieces of 1'x4', posts may be spaced 8 feet on center. Wood components shall be minimum 1500 lb-ft/in^2 fiber (stress grade)
Pipe	1 ½ inches nominal diameter spaced not more than 8 feet on center	1 ½ inches nominal	1 ½ inches nominal	
Structural Steel	2'x2'x 3/8" angles spaced not more than 8 feet on center	2'x2'x3/8" angles	2'x2'x3/8" angles	

Other	Provide strength to top rail to support 200 pounds applied in any direction	Smooth surface at a height 42” above the work surface, capable of withstanding 200 pounds top rail pressure	Protection between top rail and floor equivalent to that afforded by standard intermediate rails	

Portable guardrail systems may be utilized as a fall protection measure provided they meet the OSHA and ANSI guardrail specification requirements.

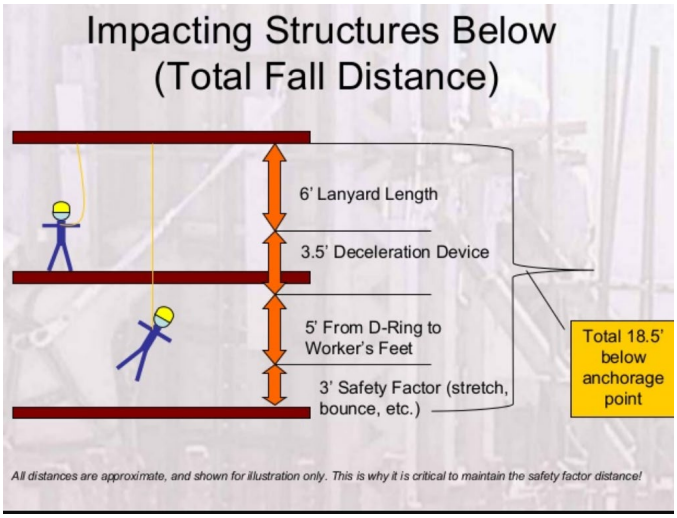
B. Fall restraint systems

These systems are typically installed on aerial lifts and boom lifts. Refer to the appropriate regulations and LU programs for additional information on fall restraint systems and aerial lifts. Fall restraint systems may also be utilized on elevated work surfaces as a preventative measure against fall hazards or as a positioning device system. These systems prevent an employee from approaching a fall hazard through the use of a lanyard and body harness.

- The restraint lanyard must be short enough to prevent a fall from occurring; be protected against cutting and abrasion; and attach the body harness directly to the anchor point independently of any other lines.
- When used as a positioning device system, the lanyard length shall be rigged such that an employee cannot free fall more than 2 feet.
- Full body harness or belt use is required when utilizing fall restraint systems.
- Anchor points must be capable of supporting at least twice the potential impact load of an employee’s fall or 5,000 pounds, whichever is greater. Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee’s fall, or 5,000 pounds.
- All components of the fall restraint system including connectors, d-rings, snap hooks, lanyards, and body harnesses/belts shall meet all applicable ANSI and OSHA requirements.
- Fall protection equipment shall not be used to hoist equipment or tools to an elevated work surface. This includes window washing equipment.
- Fall protection equipment including restraint lanyards and body harnesses should be stored in a well-ventilated, clean, dry area free from temperature and humidity extremes, corrosive materials, or other contaminants.

C. Personal Fall Arrest Systems

If a fall occurs, the employee must not be able to freefall more than 6 feet, nor contact a lower level. To ensure this, the employee and competent person will add the height of the worker, the lanyard length, and an elongation length of 3.5 feet to determine the anchorage point.



All personal fall arrest system components that are subjected to an impact load must be removed from service immediately. Personal fall arrest systems will be inspected prior to each use, and damaged or deteriorated components removed from service and destroyed.

There are three main components to a personal fall arrest system: anchorage point, body harness, and connecting devices.

All personal fall arrest system components must meet the requirements of the ANSI Z359 Standards.

- Anchorages

  Secure anchor points are the most critical component when employees must use fall arrest equipment. Some newer LU buildings have existing identified anchor structures. Other work locations may require the installation of a temporary or permanent anchor.

  All anchor points will be:

  - Sound and capable of withstanding a 5,000 lb. static load per employee attached and independent of any anchorage used to support or suspend platforms.
  - Easily accessible by employees to avoid fall hazards during hook-up.
  - Free of sharp edges that could reduce breaking strength when tying off. Chafing pads or abrasion-resistant straps must be used on any sharp-edged structures to prevent cutting of safety lanyards or lifelines.
  - At the worker's shoulder level or higher to limit freefall to 6 feet or less and prevent contact with any lower level (except when using a self-retracting lifeline or 3-foot lanyard).

- Able to prevent or limit swing fall hazards. Horizontal lifelines will be used to keep the attachment point overhead and limit the fall vertically.

- Guardrails and hoists cannot be used as anchorage points.

In addition to all the criteria listed above, permanent anchor points will be periodically inspected and re-certified to meet static load requirements. They will be visibly labeled as permanent anchors and all anchors must be immediately removed from service and re-certified if subjected to fall arrest forces.

- Body Harness

    - A full body harness is required. The use of body belts is prohibited.
    - The only attachment point allowed on the body harness is the center D-ring on the harness back.
    - Employees must always tie off, at, or above the D ring of the harness except when using lanyards 3 feet or less in length.
    - Fall protection equipment will never be load tested.

- Connecting Devices

    - Allowable devices include rope or web lanyards, rope grabs or retractable lifelines.
    - All snap hooks must be self-locking.
    - Horizontal lifelines will be designed by a qualified person and installed in accordance with the design requirements.
    - Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.
    - The length of a single lanyard will not exceed six feet.
    - The use of steel lanyards is prohibited.
    - A lanyard may not be clipped back to itself (e.g., around an anchor point) unless specifically designed to do so.
    - If vertical lifelines are used, each employee must be attached to a separate lifeline.
    - Lifelines must be protected against cuts and abrasion.

Personal Fall Arrest System Inspection

Employees must visually inspect their entire personal fall arrest system prior to every use. The inspection will follow the manufacturer's recommendations. Every 6 months fall protection equipment should have a documented inspection by a competent inspector trained in the proper inspection procedures. An inspector cannot inspect their own gear. These inspections can be documented using the forms on the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Forms. These inspections will be maintained by the department with copies sent to EHS at lusafety@liberty.edu. Documentation must be maintained for two years. Any damaged components must be removed from service immediately.

- Webbing The entire surface of webbing must be inspected for damage. Beginning at one end, bend the webbing in an inverted “U.” Holding the body side of the belt toward you, grasp the belt with your hands six to eight inches apart. This surface tension makes the damaged fibers or cuts easier to see. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns and chemical damage. Check the tongue for loose, distorted, or broken grommets. The webbing cannot have any additional punched holes.
- D-Rings/Back Pads D-rings will be checked for distortion, cracks, breaks, and rough or sharp edges. The D-ring should pivot freely. D-ring back pads should also be inspected for damage.
- Buckles will be inspected to identify any unusual wear, frayed, or cut fibers or distortion. Buckle tongues must be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. The roller should turn freely on the frame. Friction and mating buckles must be inspected to ensure the outer bars and center bars are straight. Pay special attention to corners and attachment points of the center bar.
- Snaps Must be inspected closely for hook-and-eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper locks must prevent the keeper from opening when the keeper closes.
- Thimbles The thimble must be firmly seated in the eye of the splice, and splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.
- Web Lanyard Inspect the lanyard by bending the webbing over a curved surface, such as a pipe, observing each side of the webbed lanyard for any cuts or breaks. Examine the webbing for swelling, discoloration, cracks or burns. Check closely for any breaks in the stitching.
- Rope Lanyard Rotate the rope lanyard while inspecting from end to end. This will make any fuzzy, worn, broken, or cut fibers more apparent. The rope diameter should be uniform throughout, following a short break-in period. Weakened areas from extreme loads will appear as a noticeable change from the original diameter. Make sure the rope has no knots tied in it. Knots can reduce the strength of the rope by up to 60 percent.
- Shock-Absorbing Lanyard Shock-absorbing lanyards should be examined similarly to a web lanyard. However, also look for signs of deployment. If the lanyard shows signs of having been put under load (e.g., torn out stitching), remove it from service.
- Self-Retracting Lanyard/Lifeline The lanyard housing must be inspected to ensure that casing bolts are tight and that there are no loose fasteners, missing parts, cracks or excessive wear or corrosion. Webbing must be inspected for cuts, nicks, or tears as well as for any broken fibers, stitching or fraying. Steel lanyards will be inspected for cuts, fraying, broken wires, overall deterioration, and excessive wear. Check fittings for wear or cracks and obvious damage. Employees will follow manufacturer’s recommendations for additional inspection tasks and for any requirements that the unit be sent into the manufacturer for periodic inspection.

SPECIALIZED FALL PROTECTION SYSTEMS:

D. Warning line system

Warning line systems are typically composed of a physical barrier located near an unprotected side or edge to warn employees they are approaching a fall hazard area during roofing projects affecting large areas of the roof. Warning line system use is restricted to low slope roof top work and shall be used in conjunction with a safety monitoring system at a minimum. These systems may also utilize a guardrail or personal fall arrest system to minimize/eliminate the fall hazard.

- Warning line systems shall be erected around all open sides of the roof work area not less than 6 feet from the roof edge.
    - If mechanical equipment is being utilized on the roof top, the warning line shall be not less than 6 feet from the roof edge parallel to the direction of equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of the equipment operation.

- Points of access, material handling areas, storage areas and hoisting areas shall be clearly delineated and connected to the work area by an access path formed by two warning lines.

    - When the path or point of access is not in use; a rope, wire, chain or other barricade equivalent in strength and height to the warning line shall be placed across the path.
- Warning lines shall consist of ropes, wires or chains and supported by stanchions.

    - The line shall be flagged every 6 feet with high visibility material.
    - The line shall be supported to ensure the lowest point is not less than 34 inches above the work surface; and not more than 39 inches at its highest point.
    - After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge.
    - The rope, wire, or chain shall have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions.
    - The line shall be attached at each stanchion in such a way that pulling on one section of the line will not result in slack being taken up in adjacent sections.

- Employees are not permitted to enter the area between the roof edge and warning line unless work is being conducted on that portion of the roof and adequate fall protection measures are in place.

Warning line systems and work in controlled access zones will be developed, based on the task, in accordance with OSHA regulation 1926.502 before employees are exposed to fall hazards.

Control zone systems must comply with the following:

- Controlled access zones will be defined by a control line or other means that restricts access.
- Control lines will extend the entire length of the unprotected or leading edge and be approximately parallel to the unprotected or leading edge.
- Control lines must be connected on each side to a guardrail system or wall.
- Control lines may consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions.
- Control lines must be flagged or otherwise clearly marked at 6-foot intervals (maximum) with high-visibility material.
- Control lines must be rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches from the walking/working surface and the highest point is not more than 45 inches above the walking/working surface.
- Control lines must have a minimum breaking strength of 200 pounds.

E. Safety Nets

When safety nets are the appropriate option for fall protection, they will be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet below such level.

Safety nets must meet the following criteria:

- Pass a 400-pound drop test or certified by employer or Competent Person before being used as a fall protection system, whenever relocated, after major repairs or at 6-month intervals if left in place.
- Extend sufficiently from outer edge of the walking/working surface to catch a falling employee.
- Have a maximum mesh size not to exceed 6 inches by 6 inches.
- Be inspected at least weekly for wear, deterioration, and damage.
- All objects must be removed from net by the end of the shift.
- Have a 5,000-pound minimum breaking strength of border rope.
- Have an unobstructed fall area.

Net deflection must be considered when applying this type of system.

F. Safety monitoring system

A safety monitoring system relies on a Competent Person to monitor the work area and ensure employees are aware of fall hazards as they are working. This system **may only be utilized on a low-slope roof and should be considered a last resort for protecting employees from fall hazards**.

- A Competent Person must be designated prior to work taking place on a roof top. The Competent Person, or their designee who has received adequate training and possesses sufficient knowledge, will act as a safety monitor during work and shall:

- Be competent to recognize fall hazards.
- Warn the employee when it appears, they are unaware of a fall hazard or are acting in an unsafe manner.
- Be on the same working surface and within visual distance of the employees performing work.
- Be close enough to communicate verbally with the employees.
- Ensure no unauthorized personnel access the work area.
- Have no other responsibilities which may distract them while performing safety monitoring duties.
- Have the responsibility to order work stoppage and personnel removal from elevated work areas in the event of dangerous, hazardous, or life-threatening circumstances.
- **At NO TIME can a Competent Person (safety monitor) utilize a cell phone while performing said duties.**

- Mechanical equipment shall not be utilized where a safety monitoring system is being used as the fall protection method. Additional fall protection measures are required in these situations such as guardrail systems, fall restraint systems, fall arrest systems or warning line systems.

G. Fall Arrest Systems

These systems are employed to prevent injury to employees if a fall from an elevated work surface occurs. The use of a fall arrest system requires a full body harness system to be worn by the employee. Body belts are not permitted to be used with fall arrest systems. Fall arrest systems shall be engineered and constructed to prevent employees from reaching the work surface below if a fall occurs.

- All components of a fall arrest system including connectors, d-rings, snap hooks, lanyards, body harnesses, lifelines, ropes, and straps shall be designed and engineered for use with a fall arrest system and meet all applicable ANSI and OSHA requirements.
- **Employees utilizing personal fall arrest systems shall not perform work alone.**
- Lifeline systems used as a component of a fall arrest system shall be designed and installed under the supervision of a qualified person; and used under the supervision of a Competent Person as part of a fall protection program.
  - Lifelines shall be protected from cutting and abrasion.
  - Lifelines or other components of a fall arrest system should not be attached to guardrail systems, ladders, scaffolding components, building fixtures, conduit or plumbing, other lanyards, roof stacks/vents/pipes or other unauthorized anchor points.

- Anchor points used for attachment of fall arrest equipment shall be independent of any other anchor point and capable of supporting at least 5,000 pounds per employee attached.
- When stopping a fall, personal fall arrest systems shall:
    - Limit maximum arresting force on an employee to 1,800 pounds.
    - Ensure employees can neither free fall more than 6 feet or contact any lower level as a result of a fall.
    - Bring an employee to a complete stop and limit maximum deceleration distance to 3.5 feet.
    - Be capable of withstanding twice the potential impact energy of an employee, falling a distance of 6-feet or the fall distance permitted by the system, whichever is less.
- The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level.
- Fall arrest systems are to only be used as personal protective equipment and not to hoist equipment or tools to elevated work surfaces.
- Fall protection equipment including restraint lanyards and body harnesses should be stored in a clean, dry area free from temperature and humidity extremes, corrosive materials, or other contaminants.

Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a Competent Person to be undamaged and suitable for reuse.

H. Mobile, temporary anchor point

Temporary anchor points may be necessary on certain LU projects where work must be done within 10 feet of a roof edge and no fall protection equipment is provided on the roof.

- A Competent Person must oversee the set up and use of temporary anchor points.
- Temporary anchor points must be ANSI approved and meet all applicable standards for a fall protection anchor point.
- Lanyards utilized with a temporary anchor point must not introduce additional hazards to the worker.

VIII. Ladders

All ladders used by LU employees will meet the following requirements:

- Rated greater than the weight of the worker and any tools or equipment carried by the worker.
- Appropriate ladder style for the job (i.e., step ladders will not be used in a folded position, step ladders will be tall enough to perform work without standing on the top step, extension ladders will extend a minimum of three feet above the discharge point, etc.).
- Visually inspected prior to each use.
- Metal ladders will not be used near electrical lines or sources.
- All safety feet must be in place, secure and in sound condition.

Ladders must be set up on a surface that is firm, flat and is not slippery. The top of extension ladders must be against a solid, fixed surface and extend at least three feet above the landing surface. Extension ladders will be set up using the 4-to-1 rule (base of the ladder placed at a distance from the wall that is equal to one fourth of the height that the ladder is extended). When employees are on extension ladders at heights of 20 feet or higher, either a second person must steady the ladder base, or the top of the ladder must be effectively tied off to a sound anchor point. For more information regarding use and inspection of ladders see the Liberty University Ladder Safety Standard Operating Procedures for Safe use of ladders located on the EHS website https://www.liberty.edu/security-public-safety/environmental-health-safety/ under Policies Programs & SOP's.

IX. Scaffolds

Scaffolds are complex systems with multiple connection points, subject to a number of factors that could affect their stability and reliability. Liberty University will use only a Competent Person/company who has received specific training to erect scaffolds.

Basic requirements:

- The working edge of the scaffold will be places no more than 14 inches from the front of the building or structure.
- Platforms will extend over the end supports by at least 6 inches, and not more than 12 inches, unless cleated or restrained.
- All components that are supplied by the manufacturer will be used unless they are parts specifically designed for optional uses and are not being used at the time.
- All parts, including casters, pipes/poles, rails, toe boards, platforms, cams, locking pins and all connection devices must be inspected and found to be in good condition prior to each use.
- A workplace inspection will be conducted and documented prior and during the erection of the scaffolding, as well as prior to each use.
- Guardrails are to be placed between 36 and 45 inches high and placed at the open ends and sides of the platform and must be able to withstand a force of 200 pounds. Midrails will be placed halfway between the top rail and the toe board. Toe boards must be in place where employees working below are exposed to falling objects.
- Cross bracing and railings should not be used as a means of climbing to or accessing the platform. Workers will only use the installed ladders.
- For mobile scaffolds, the caster wheels must be locked and all locking pins in place prior to use.
- Fall protection systems are required when employees erect and disassemble scaffolding.
- Hard hats are to be worn at all times while working on or around scaffolding.

X. Protection from falling objects

When elevated work is taking place and there is the potential for falling objects to create a hazard to persons on lower levels to an elevated work surface, precaution must be taken to ensure injuries do not occur.

- Where the work site is restricted to employees and the public is not allowed access, and the employees are exposed to falling object hazards one of the following precautions should be implemented.

    - Employees shall wear a hard hat at all times.

    - Toe boards, screens or guardrail systems are placed on the elevated work surface to prevent objects from falling.

    - A canopy structure, capable of withstanding a falling object without collapse or penetration, is erected to keep potential fall objects far enough from the edge or the elevated work surface so as not to create a fall hazard.

    - The area to which objects can fall is barricaded and access to the area is not authorized any time work is being done on an elevated work surface.

    - Where tolls, equipment, or materials are stacked higher than the top edge of a toe board, paneling or screening shall be erected from the walking/working surface or toe board to the top of the guardrail system's top rail or midrail, for a distance sufficient to protect persons below.

- When the elevated work area creates a potential fall hazard where the public may be exposed to falling object hazards one of the following precautions should be implemented.

    - Redirect public traffic through a barrier system to ensure they do not enter areas where falling object hazards exist.

    - Erect a structure capable of withstanding impact from a fallen object under which the public may travel.

XI. Acquisition of Fall Protection Equipment

Each department can purchase their own equipment for their staff. However, for consistency it is recommended that you get fundamental fall protection from EHS such as harness, lanyard, retractable lifeline, beam strap, etc. Specialty fall protection equipment such as beam clamp, 25-foot retractable, etc. can be signed out from EHS. If there is a piece of fall protection equipment needed that EHS does not have, it will be evaluated to determine if it will be purchased by EHS or the department needing it. This is based on frequency of need and use.

The following is a list of the most common fall protection equipment issued by EHS along with links to information on the piece of equipment:

Harnesses:

1. Brand: Safewaze
   Item No.: FS-FLEX280
   Sizes: S/M, L/XL, XXL

Link: http://safewaze.com/downloads/technical-data-sheets/SAFEWAZE%20PRO+%20FS-FLEX280%20TECH%20DATA%20SHEET.pdf

Retractables:

1. Brand: FallTech
   Item No.: 74709SG8
   9ft. SRL with steel 5k Carabiner
   Link: https://falltech.com/Product/74709sg8/

2. Brand: FallTech
   Item No.: 72706SG6
   6ft. SRL with aluminum Carabiner
   Link: https://falltech.com/product/72706sg6/

3. Brand: Safewaze
   Item No.: FS-FSP1230-G
   30ft. Cable Retractable
   Link: https://safewaze.com/downloads/technical-data-sheets/SAFEWAZE%20FS-FSP1230-G%20TECH%20DATA%20SHEET.pdf

4. Brand: Safewaze
   Item No.: FS-FSP9050
   Class B 50ft. Cable Leading Edge SRL
   Link: https://safewaze.com/product/connectors/class-b-50-cable-leading-edge-srl-2/

Shock Absorbing Lanyard

2. Brand: FallTech
   Item No.: 8241
   6ft. Energy Absorbing Lanyard
   Link: https://falltech.com/Product/8241/

Beam Straps:

1. Brand: FallTech
   Item No.: 7336
   3ft. Pass through Anchor Sling
   Link: https://www.globalindustrial.com/p/fallte-7336-web-pass-through-anchor-sling-with-2-d-rings-and-3-wear-pad-3-long?gclid=CjwKCAjwtfqKBhBoEiwAZuesiOdW-t8bNEj9tIqFDqXPeWHT_-BBd401YlPSHEOqwQEdgfPJOE5AexoCoAsQAvD_BwE

2. Brand: FallTech
   Item No.: 7372
   6ft. Pass through Anchor Sling
   Link: https://www.globalindustrial.com/p/fallte-7372-web-pass-through-anchor-sling-with-2-d-rings-and-3-wear-pad-6-long?gclid=CjwKCAjwtfqKBhBoEiwAZuesiPlgIH-1044hHjZqiNYPnfwEERdh2zYqZhXSNU6sir80C13Ap6OUrxoCCKgQAvD_BwE

3. Brand: FallTech
   Item No.: 7373
   12ft. Pass through Anchor Sling
   Link: https://www.industrialsafetyproducts.com/falltech-7373-web-pass-through-anchor-sling-12-with-d-rings-and-3-pad-freeship/

Support Straps/Pads:

1. Brand: Safewaze
   Item No.: FS902
   Suspension Trauma Steps
   Link: https://safewaze.com/product/specialty/suspension-trauma-steps/

2. Brand: Safewaze
   Item No.: SW111
   Removable Comfort Harness Leg Pads
   Link: https://safewaze.com/product/harnesses/comfort-harness-leg-pads/

Beam Clamps:

1. Brand: Honeywell Miller
   Item No.: 8816-14
   Sliding Beam Anchor, Beam Clamp
   Link: https://www.grainger.com/product/3AE99?s_kwcid=AL!2966!3!335677199215!p!!g!!8816-14%2F&ef_id=CjwKCAjwtfqKBhBoEiwAZuesiPxlPovcb1FX9vVYJEBvH08UthlRjtQ9poM-NzAPAagddpIDmZad2RoCpwAQAvD_BwE:G:s&s_kwcid=AL!2966!3!335677199215!p!!g!!8816-14%2F&gucid=N:N:PS:Paid:GGL:CSM-2296:AB578S:20500731&gclid=CjwKCAjwtfqKBhBoEiwAZuesiPxlPovcb1FX9vVYJEBvH08UthlRjtQ9poM-NzAPAagddpIDmZad2RoCpwAQAvD_BwE&gclsrc=aw.ds

XII. Training

Training shall be provided to all employees performing work on an elevated work surface or who may be exposed to a fall hazard. Training is provided by the Environmental Health & Safety Department. The training program should enable employees to recognize fall hazards and provide the requirements to be followed to minimize these hazards. Training must be completed and documented prior to employees working in areas where fall hazards exist.

- Authorized person: Employees exposed to fall hazards as part of their job duties shall require Fall Protection Fundamentals Training (2 ½ hours) by Environmental Health and Safety. This training shall consist of:
  - Recognizing fall hazards.
  - Fundamentals of fall protection.
  - Regulatory requirements for fall protection.
  - Responsible persons.
  - Hierarchy of fall protection.
  - Anchorage Requirements.

- Energy absorbing lanyards.
- Function and purpose of energy absorbers.
- Fall protection hardware compatibility.
- Work positioning systems.
- Inspecting fall protection systems.
- Donning a full body harness.
- Self-Retracting lifelines.
- Vertical lifelines.
- Horizontal lifelines.
- Ladder safety systems.

- Advanced Fall Protection (Competent Person) Training (5 hours) must be completed by all employees designated by their employer to become a Competent Person and must cover the following topics.

    - Regulations relating to fall protection.
    - Fall hazard elimination and control methods.
    - Fall protection systems assessments and determining when a system is unsafe.
    - Fall protection rescue procedures.
    - Fall hazard surveys (JHA).
    - Hierarchy of Fall Protection.
    - Passive vs. Active Fall Protection Systems.
    - Fall Restraint vs. Fall Arrest Criteria.
    - Fall clearance and swing fall calculations.
    - Use of conventional and non-conventional Fall Protection Systems.
    - Roles and responsibilities of authorized person and Competent Person.
    - Hazard evaluation, identification, and elimination.
    - Proper donning of fall protection equipment.
    - Construct and evaluate Fall Protection Hazard Assessments (AHA).
    - Equipment selection, evaluation, use and inspection.
    - Selection and use of certified and non-certified anchors.
    - Fall protection for aerial lifts and ladders.

- The Competent Person (supervisor or designee) must provide the authorized person training in the fall plan and equipment that will be utilized on a specific project. This must be done on every project. This training shall consist of:
    - The nature of fall hazards in the work area.
    - Procedures for erecting, maintaining, disassembling, and inspecting fall protection systems being utilized.
    - The use and operation of guardrail systems, fall restraint systems, personal fall arrest systems, warning line systems, safety monitoring systems, and other protection to be used.
    - The role of each employee in the safety monitoring program, if being incorporated into the fall protection program for the work to be performed.
    - Limitations on the use of mechanical equipment during roof work on low-sloped roof tops.
    - Procedures for handling and storage of equipment and materials and the erection of overhead protection.

- The employee's role in the fall protection program.
- The applicable standards and regulations affecting the work to be performed.
- Limitations of fall protection equipment.
- Personal protective equipment specific to fall protection including use, inspection, care, and storage requirements.
- This training is required initially and when changes to the plan occur.

- Employees must demonstrate competency on the proper use of fall protection systems and understanding of this fall protection program.

- Competent individuals shall be trained specifically for the fall protection systems under their responsibilities.

    - Training shall address inspection and maintenance needs.

- A written certificate of training shall be maintained for all employees exposed to fall hazards. The certificate must include the employee's name, date of training, and signature of trainer and employee.

    - The supervisor must maintain the latest certification for all their employees.

- Retraining shall be completed when the following occur:

    - **Authorized persons shall complete annual refresher training**.

    - It is suspected that any affected employee who has already received training is no longer competent in the fall protection program or inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the understanding or skill required.

    - Changes in the workplace render the current training insufficient.

    - Changes in the types of fall protection systems or equipment to be used render previous training obsolete.

- Installations of new fall protection systems installed on LU buildings require retraining of the competent individuals by the installing fall protection company or their representative.

XIII. Maintenance & Inspection

LU has an ongoing responsibility to maintain employee proficiency in the use and care of fall protection equipment. Supervisors are responsible for assuring that their employees maintain this proficiency. It is the responsibility of LU Facilities Management to maintain all fall protection systems in place on LU buildings. This can be accomplished through assigning a Competent Person who has completed all relevant training or utilizing contractors known to perform these operations.

- Fall protection systems permanently installed on LU buildings.

- Systems must be certified by a qualified person (professional engineer) upon completion of installation. Re-certification must be completed every 10 years or as required by the manufacturer and if the system has been placed under tension because of a fall incident. Re-certification must be performed by a qualified person who is certified through the manufacturer of the specific fall protection system to perform such inspections.

- Fall protection systems must be inspected annually by a competent individual who is someone other than the user. Annual inspections should address all components of a fall protection system including, but not limited to, anchor points, lifelines, structural components, and personal protective equipment. Any deficiencies identified during the inspection or certification process must be addressed prior to the fall protection system being used by an employee.

- Additional inspection requirements may be required by the equipment manufacturer. Adhere to all manufacturer recommendations when performing annual inspections. Always maintain proper maintenance and inspection records.

A visual inspection shall consist of the following:

Full Body Harnesses

- Inspect before each use.
- Closely examine all the nylon webbing to ensure there are no burn marks, which could weaken the material.
- Verify there are no torn, frayed, broken fibers, pulled stitches, or frayed edges anywhere on the harness.
- Examine D-ring for excessive wear, pits, deterioration, or cracks.
- Verify that buckles are not deformed, cracked, and will operate correctly.
- Check to see that all grommets (if present) are secure and not deformed from abuse or a fall.
- Harness should never have additional punched holes.
- All rivets should be tight, not deformed.
- Check tongue/straps for excessive wear from repeated buckling.

Lanyards/Shock Absorbing Lanyards

- Inspect before each use.
- Check lanyard material for cuts, burns, abrasions, kinks, knots, broken stitches, and excessive wear.
- Inspect the snap hooks for hook, lock, and eye distortion.
- Check carabineer for excessive wear, distortion, and lock operation.
- Ensure that all locking mechanisms seat and lock properly.

- Once locked, locking mechanism should prevent hook from opening.
- Visually inspect shock absorber for any signs of damage, paying close attention to where the shock absorber attaches to the lanyard.
- Verify that points where the lanyard attaches to the snap hooks are free of detects.

Snap Hooks/Carabineers

- Inspect before each use.
- Inspect snap hook for any hook and eye distortions.
- Verify there are no cracks, pitted surfaces, and eye distortions.
- The keeper latch should not be bent, distorted, or obstructed.
- Verify that the keeper latch seats into the nose without binding.
- Verify that the keeper spring securely closes the keeper latch.
- Test the locking mechanism to verify that the keeper latch locks properly.

Self-Retracting Lanyards

- Inspect before each use.
- Visually inspect the body to ensure there is no physical damage to the body.
- Make sure all back nuts or rivets are tight.
- Make sure the entire length of the nylon strap is free of any cuts, burns, abrasions, kinks, knots, broken stitches, and excessive wear, and retracts freely.
- Test the unit by pulling sharply on the lanyard to verify that the locking mechanism is operating correctly.

Tie-off Adaptors/Anchorages

- Inspect for integrity and attachment to solid surface.

Articulating Man-Lift

- Inspect before each use. Inspect/service according to manufacturer guidelines.
- Forklift, scissors lifts, and safety nets will be inspected at the beginning of each shift in use. Structural integrity or basket will be checked per same schedule.

Horizontal Lifelines

- Inspect before each use for structural integrity of line and anchors.

Guardrails

- Temporary systems – Daily visual inspection will be completed by a Competent Person.

- Temporary systems – Weekly, a complete structural inspection will be completed by a Competent Person.

- Fall protection equipment including lifelines, lanyards, body belts/harnesses, snap hooks and D rings shall be inspected prior to each use by the user. Defective equipment shall be taken out of service and rendered not useable. Refer to Appendix A for Safewaze inspection forms to be utilized for inspection purposes. Modify as necessary with different manufacturer's equipment. .

- Storage and General Use

  - All equipment must be stored in a clean, dry place that is free from abrasive or cutting materials and excessive heat.
  - Never store the personal fall arrest equipment in the bottom of a toolbox, on the ground, or outside exposed to the elements (i.e., sun, rain, snow, etc.).
  - Hang equipment in a cool, dry location in a way that retains its shape.
  - Always follow manufacturer recommendations for inspection.
  - Clean according to manufacturer recommendations, typically with a mild, nonabrasive soap, and hang to dry.
  - Never dry using heat or sun exposure or use strong detergents in cleaning.
  - Never store equipment near excessive heat, chemicals, moisture, or sunlight.
  - Never store in an area with exposures to fumes or corrosives elements.
  - Avoid dirt and build-up on equipment.
  - Never use this equipment for any purpose other than personal fall arrest.

- If an employee is involved in an accident where a fall from an elevated work surface occurs, the fall protection system must be placed out of service and inspected by a qualified person to provide service and certify the system is safe for use. Harnesses, lanyards, or other PPE involved in a fall incident **may not be placed back into service**. PPE involved in a fall or placed under tension, must be rendered useless and discarded.

- Temporary fall protection equipment such as warning lines shall be inspected upon erection by a competent individual. If the system is placed under tension because of an accident or near miss, the system should be re-inspected to ensure it meets all applicable requirements.

- Guardrail systems or parapets should be visually inspected prior to work on an elevated surface. Any deterioration or deficiencies noted, which may cause the fall protection system to fail should be addressed prior to work commencing.

XIV. Recordkeeping

It is the responsibility of each LU department to maintain applicable records for employees and fall protection systems.

- Employee training must be maintained for all employees exposed to fall hazards.
- All inspection and certification records must be maintained for fall protection systems and PPE.
- An inventory of all fall protection systems on LU buildings should be maintained.
- Information to be included in fall protection system tracking includes the following:
    - Building name
    - Building number
    - Status
        - Installed complete roof.
        - Partial roof protection.
        - In progress.
        - Certified.
    - Type of design/system
    - Year installed.
    - Latest annual inspection date
    - Latest qualified person certification date
    - Equipment manufacturer
    - Competent Person
- Written fall protection procedures should be developed for specific operations being conducted within individual departments to address measures taken to eliminate fall hazards.
- Written rescue operations must be developed by the Competent Person for each system or project where fall hazards exist.

- Fall protection PPE is assigned to individuals. It is required that the equipment be inspected prior to use. Refer to Appendix A for Safewaze inspection forms to be utilized for inspection purposes. Modify as necessary with different manufacturer's equipment.

    - It is recommended that employees have individual lockers for their fall protection PPE to keep it protected. Equipment should not be kept in gang boxes or in vehicles.

XV. Rescue operations

When a personal fall arrest system is utilized as a fall protection measure, the Competent Person must develop written rescue operations to ensure employees can be safely rescued from the fall. Rescue operations can be accomplished in a variety of ways. Specific operations, "Rescue Plans", should be developed based on the job being performed to ensure the safest method of rescue is employed. Rescue Plans should be thoroughly thought out for each area where fall protection systems are installed. A "one plan fits all" approach will not result in a successful Rescue Plan.

- Employers are responsible for providing prompt rescue of employees in the event of a fall or assuring that employees can rescue themselves. Each Rescue Plan should be a written document detailing the rescue procedure, equipment needed to perform rescues and the personnel to be involved in the rescue.
- A Rescue Plan is a preplanned strategy to safely retrieve an individual or individuals in the event of a fall and can include the following elements.

    - Self-Rescue: If the fallen employee can rescue themselves by utilizing existing fall protection equipment or self-provided rescue equipment.

    - Assisted Rescue: If the fallen employee is unable to perform self-rescue, other trained personnel ensure the fallen employee is brought to safety using adequate means.

    - Calling "9-1-1" is NOT a Rescue Plan, although paramedics should be called in the event of a fall to treat the fallen employee(s) for any injuries sustained.

- Requirements of a Rescue Plan include the following:

    - Identify a fall has occurred within 2 minutes of the fall.

    - Reach the fallen employee within 5 minutes of the fall.

    - Successfully rescue the fallen employee within 10 minutes of the fall.

- Other elements or considerations to keep in mind when developing Rescue Plans include:

    - The type of work environment present:

        - Indoors vs. outdoors

        - Weather conditions

- Day vs. night
- Is the employee working in a confined space, is so the employee(s) must comply with the LU Confined Space Entry Policy/Program that can be found on the LU EHS website at https://www.liberty.edu/security-public-safety/environmental-health-safety/.

- Keeping first responders trained

- Maintaining rescue equipment so that it is reliable when it is needed during a rescue.

XVI. Contractors

Contractors performing work on LU buildings equipped with fall protection systems must be fully trained prior to conducting work and must comply with the fall protection system standards. Contractors performing work as part of a construction project where fall hazards exist must develop and implement a fall protection program to protect contract employees from fall hazards. Contractors are responsible for supplying and maintaining their equipment as required by OSHA and ANSI regulations and standards.

XVII. Periodic Program Review

At least annually, the Environmental Health and Safety Program Administrator will conduct a review to assess the plan's effectiveness. The annual review will be evaluated, and program updated as needed.

XVIII. Enforcement

Failure to follow the Liberty University Fall Protection Program and Procedures can result in life threatening or serious injury to staff, faculty, students, and visitors. Failure to follow the Fall Protection Program and Procedures can result in disciplinary action up to and including discharge from employment.

XIX. Quick Reference Guide

Quick reference guides are 1-to-4-page documents at the end of the policy or SOP that has some of the key points of reference to the policy requirements and where to find them in the document.

QUICK REFERENCE GUIDE

LU FALL PROTECTION PROGRAM & PROCEDURES

LIBERTY UNIVERSITY

TOPIC	INFORMATION	LU FPP&P LOCATION
Authorized Person	A person assigned to perform duties where they will be exposed to a fall hazard. Requires 2 ½ hours of fall protection training.	Pgs. 5-6
Competent Person	One capable of identifying existing & predictable hazards and is responsible for inspecting fall protection systems and taking corrective action. This person is a supervisor, or someone assigned by supervisor. Requires 5 hours of training	Pg. 5
Unprotected Sides & Edges	Any work surface or unprotected side or edge 4 feet or more above a lower level, 6 feet if construction shall be protected from falling by use of guardrail system, personal fall restraint or fall arrest system.	Pgs. 12-13
Holes & Excavations	Floor openings, holes, roof hatches and skylights 4 feet or greater shall be protected from falling by guardrail systems erected around the holes, covers over the openings, or by personal fall arrest systems. Employees working at the edge of an excavation 4 feet or greater shall be protected from falling by guardrail systems, fences, barricades, or personal fall arrest systems.	Pgs. 11, 13-14
Fall Protection Equipment Issue	Issued to individual (harness, lanyard and or retractable lifeline) through EHS. Other types of fall protection equipment can be signed out through EHS or purchased by the department needing the equipment.	Pg. 27
Anchorage Points	Secure point of attachment for lifelines, lanyards, or deceleration devices. Must support at least 5000 pounds per employee attached.	Pg. 25
Fall Protection Equipment Inspection	Fall protection equipment must be inspected prior to each use.	Pg. 20
Lone Worker	Employees utilizing personal fall arrest systems shall not perform work alone.	Pg. 24
Types of Fall Protection	1. Standard Guardrail System 2. Fall Restraint System 3. Personal Fall Arrest System 4. Warning Line System 5. Safety Net System 6. Safety Monitoring System (Use only as a last resort when there are no other options) 7. Mobile, temporary anchor point	Pgs. 15-25
Protection from Falling Objects	When elevated work is taking place and there is the potential for falling objects to create a hazard to persons on lower levels to an elevated work surface, precautions must be taken to ensure injuries do not occur.	Pgs. 26-27
Rescue Operations	When a personal fall arrest system is utilized as a fall protection measure, the Competent Person must develop written rescue operations to ensure employees can be safely rescued from the fall. **Calling the Fire Department is not a rescue plan. A "one plan fits all" approach will not result in a successful Rescue Plan and is not acceptable.**	Pgs. 34-35

Liberty University Fall Protection Program and Procedures

Revision Tracking

Revision Number	Revision Description	Revision Location	Date Originated/Revised	Policy Author/Reviser:	Policy Approvers
Original			March 2022	Greg Bennett Bob Drane Dana Burgess	Ronald Sloan John Peterson Greg Bennett