

Fall Protection–6FP00-5.2

Associated OHS General Industry and Process: Construction Safety

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1. Summary

The policy of Facilities Management (FM) at the University of Virginia (UVA) is to take every precautionary measure to protect the health and safety of all employees working at height and exposed to fall hazards. Implicit in the fall protection policy is the requirement that employees shall always be protected from falls to a lower level when working at heights at or above the threshold indicated in this document.

1.1 Objective

The purpose of this program is to provide fall protection procedures and concepts to prevent injury to FM employees and other affected parties while performing work assignments at elevated working levels.

1.2 Scope

This program applies to all University of Virginia Facilities Management employees when work assignments expose them to fall hazards exceeding four (4) feet. This includes work considered industrial or construction in nature.

Potential fall hazards include floor openings, wall openings, holes in any working/walking surface, aerial platforms, rooftop work, ladders when work on the ladder requires employees to over-reach or are not able to use the ladder properly, and any other task that may require employees to work at height.

2. Regulations & Other Requirements

2.1 Occupational Safety & Health Administration (OSHA)

This Fall Protection Program complies with OSHA Standards 29CFR1910, *Subpart D, Walking-Working Surfaces* and 29CFR1926, *Subpart M, Fall Protection*

2.2 University of Virginia

This Fall Protection Program complies with UVA-FM requirements.

3. Roles and Responsibilities

3.1 Facilities Management Occupational Health & Safety (FM-OHS)

- a) Develop, administer, and annually review this Fall Protection Program.
- b) Provide observational safety checks of work operations and rigid enforcement of safety policies and procedures.
- c) Coordinate training as required by this program.
- d) Provide consultation on work that requires fall protection as requested to include assistance with suitable anchor points, PPE, job hazard analyses, and other fall protection strategies.
- e) Assist with inspection of jobsite areas and fall protection equipment.

3.2 Competent Person

Within UVA Facilities Management there will be *at least one person trained to the level of Competent Person for each functional group that utilizes fall protection*. A Competent Person is one who can identify and predict hazards and has the authority to take corrective action. Any project that uses fall protection should designate which person is acting as the Competent Person.

The Competent Person shall be responsible for the immediate supervision, implementation, and monitoring of the Fall Protection Program. A Competent Person at UVA is typically a supervisor, lead, or other individual experienced in fall protection and is in a position of authority. The number of Competent Persons required will vary according to the number and type of fall hazards, frequency of fall hazard exposure, and the distances between fall hazard locations and facilities. The intent is that there is adequate supervision and support for

Authorized Persons performing work at height. Additional intent is to communicate that the frequency of a Fall Hazard Survey and/or procedures review is dependent upon how often the work is done, its complexity, the skills of the worker, and other factors. The review should be frequent enough to keep the Authorized Person adequately informed about the fall protection and rescue procedures for workplace activities.

The responsibilities of this Competent Person will include, but not be limited to:

- a) Ensuring that employees in their functional group inspect their PPE prior to each use as well as annually;
- b) Providing copies of annual inspections to FM-OHS upon request
 - All annual inspections should be completed in May of each year, but no later than May 31.
- c) Ensuring proper and adequate levels of training for members of their group;
- d) Verifying available fall clearance is adequate before Authorized Persons work at height;
- e) Ensuring that a prompt rescue can be performed;
- f) Immediately removing from service all personal fall protection systems and components that are damaged;
- g) Conducting a fall hazard survey to identify all potential fall hazards before the Authorized Persons are exposed to those hazards.
 - A Fall Hazard Survey allows the Competent Person to identify all fall hazards and other associated hazards and then provide specific means to control those hazards (PPE, engineering controls, etc.) as well as to account for rescue procedures.
 - A Fall Hazard Survey should be completed whenever workers are exposed to falls that require active fall protection such as using a harness and lanyard or any other situation where the means of fall protection are not passive (such as when there are already guardrails or other barriers in place).
 - See the Fall Hazard Survey located in Appendix B of this document. A copy should be completed by the Competent Person and kept at the jobsite until the completion of work.
- h) Stopping work immediately and taking prompt corrective measures to mitigate fall hazards;
- i) Preparing, updating, reviewing, and approving written fall protection procedures;
- j) Specifying in written fall protection procedures the selected systems, connecting means, body supports, and other fall protection equipment that authorized persons are required to use when they are exposed to fall hazards.

3.3 Authorized Persons

Authorized Persons shall ensure they have and use the fall protection equipment as required by this program and:

- a) Understand the potential hazards of working at elevated levels as well as when gaining access to and from the work location;
- b) Pre-plan the job with his/her supervisor to agree that the job can be done safely;
- c) Understand the use and limitations of fall protection equipment;
- d) Understand when to bring to the Competent Person's attention all unsafe or hazardous conditions, actions, or unsafe work practices
- e) Inspect such equipment before each use and to report defective equipment immediately to their supervisor

3.4 Supervisor

The supervisor shall ensure that they provide full support to Authorized and Competent Persons and commit to ensuring the safety of those individuals when working at height. The Supervisor should:

- a) Ensure that fall protection equipment is available and in safe working condition;
- b) Ensure that all employees have required training;
- c) Communicate upcoming projects that require active fall protection to Competent Persons and OHS as necessary.

4. Fall Protection

4.1 Eliminating and Controlling Fall Hazards

4.1.1 Fall Hazard Hierarchy of Controls

- a) The fall hazard hierarchy of controls should be considered when designing fall protection solutions for both existing and new facilities. The methods listed below are in decreasing order of preference:
 - 1) Prevent or eliminate exposure through design that disallows fall exposures
 - 2) Passive fall protection (guardrails and parapets)
 - 3) Fall Restraint Systems
 - 4) Fall Arrest Systems
 - 5) Administrative Systems (warning lines)

4.1.2 Fall Hazard Elimination

Fall hazards can be prevented or reduced by effectively eliminating the hazard through several methods. For example:

- a) Complete as much work on the floor or ground as possible to eliminate or reduce the time working above ground;
- b) Build and lift sub-assemblies into place rather than placing piece-by-piece above the ground;
- c) Establish an effective guard railing system or walls that are at least 39 inches high.

4.1.3 Passive Fall Protection

Passive fall protection requires no action by the user to be effective. It is important, however, that when passive fall protection is used that the parameters of that system meet all OSHA requirements as indicated in this document. Examples of passive fall protection include guardrails and parapets. Note that parapets must be at least 39 inches tall to be considered suitable for fall protection.

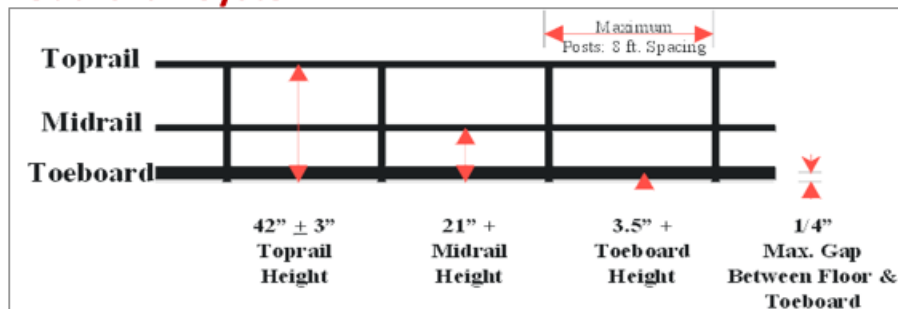
4.1.4 Guardrail Systems

- a) Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.
- b) The railing shall be provided with a toeboard wherever, beneath the open sides, persons can pass, there is moving machinery below, or there is equipment with which falling materials could create a hazard.
- c) A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 42 inches nominal from upper surface of top rail to floor, platform, runway, or ramp level.
- d) The top rail shall be smooth-surfaced throughout the length of the railing. The intermediate rail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.
- e) For wood railings, the posts shall be of at least 2-inch by 4-inch stock spaced not to exceed 6 feet; the top and intermediate rails shall be of at least 2-inch by 4-inch stock. If top rail is made of two

right-angle pieces of 1-inch by 4-inch stock, posts may be spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.

- f) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal diameter with posts spaced not more than 8 feet on centers.
- g) For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers.
- h) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail.
- i) A standard toeboard shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and with not more than 1/4-inch clearance above floor level. It may be made of any substantial material either solid or with openings not over 1 inch in greatest dimension.
- j) Guardrail systems may be temporary and erected for specific tasks. They must meet the same height and performance requirements as permanent guardrails.
- k) Guardrail height must be adjusted to accommodate the height of stilts, if they are in use.

Guardrail System



- **Top Rails between 39 and 45 inches tall**
- **Top Rail withstand 200 lbs lateral force**
- **Mid Rail withstand 150 lbs force**
- **Toeboard – prevent the fall of material or equipment**
- **Toeboards at least 3 1/2 inches high with a maximum 1/4 inch gap**

4.1.5 Guardrail examples



Ballasted guardrail.

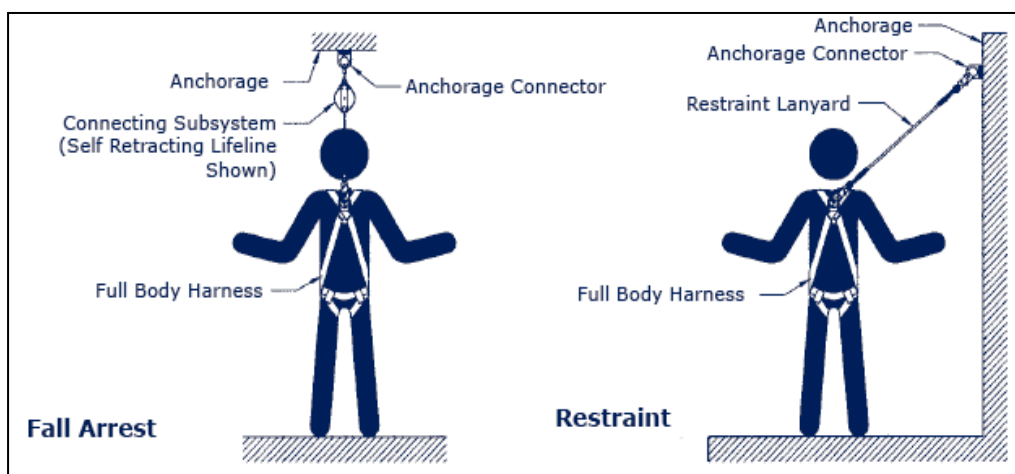


Parapet clamp.

4.1.6 Fall Restraint Systems

Where workers must work at an elevated working surface while exposed to fall hazards and a guardrail system isn't feasible, a fall restraint system may be considered, if appropriate. A fall restraint system is arranged to not allow the worker to reach the edge where a fall is possible. Fall restraint systems require:

- A Competent Person to assess the work area to ensure that a fall restraint system is feasible and to assist the worker in designating a suitable anchor point and system components.
- A connecting lanyard that is adjusted to a length that will not allow the worker to reach the edge where a free fall is possible.
- A full-body harness.
- An anchor system that is rated to at least 3000 lbs for standard restraint system.

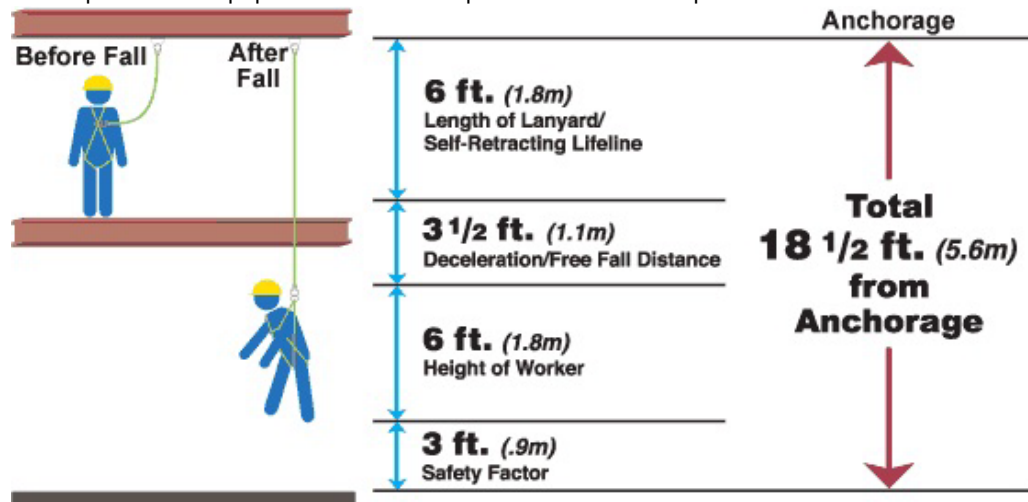


Personal Fall Arrest System v. Fall Restraint System

4.1.7 Personal Fall Arrest Systems (PFAS)

Personal Fall Arrest Systems (PFAS) are designed to protect workers that suffer a fall. PFAS employ the use of a full-body harness, a connecting lanyard and a suitable anchor point.

- a) All fall protection equipment must meet applicable OSHA standards.
- b) The anchor point must be capable of supporting at least 5000 lbs for each employee attached.
- c) The fall arrest system shall be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level.
- d) Preference shall always be for the use of a self-retracting lanyard (SRL), due to the greater limit to free-fall and the shorter deceleration distance.
- e) The fall arrest system shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet. **ALL fixed-length lanyards used by UVA workers will be equipped with a deceleration device designed to reduce the arresting forces on the body to less than 900ft/lbs.**
- f) The anchor point should be overhead and as close as possible to reduce fall arresting forces in the event a fall should occur. If an anchor point cannot be located overhead, then a self-retracting lanyard (SRL) is required to be used.
- g) Avoid anchor points where a fall may result in a pendulum motion that could cause serious injury.
- h) All fall protection equipment must be inspected and used as per the manufacturer.



Calculating Fall Distance When Using a Personal Fall Arrest System.

4.1.8 Harnesses

Obtaining the correct fit of a harness is vitally important. A harness that doesn't fit properly, or is worn improperly, is less likely to be used. Harnesses should be inspected before each use and an annual inspection should be conducted and documented. Use the inspection checklist located in Appendix C of this document.

The following should be considered when using and maintaining harnesses:

- a) Properly store harnesses in a location that is free from moisture and away from extreme temperatures. It is recommended that harnesses be stored by hanging or laying flat or neatly folded.
- b) Most harnesses are rated for users that are between 130 and 310 pounds. Contact FM-OHS if assistance is needed for users that fall outside of that range.
- c) Fall protection harnesses have a usable service life of five years from the date they were placed in service. The date placed in service should be written on the embedded tag on every harness.
- d) Harnesses are available for either gender and consideration should be made for that as well as any other instances where a traditional harness may not be the best option. Contact FM-OHS for more assistance.

4.1.9 Self-retracting lanyards, rope, and deceleration devices

Self-retracting lanyards (SRL) are available in a variety of configurations: single and double legged made of cable, synthetic webbing, or rope. Whenever possible, SRL should be used with the anchor point overhead. In the event an overhead anchor is not possible, then an SRL can still be used but extra care must be taken to ensure adequate room is available for swing fall. Additionally, it is important that the user is aware of different SRL classifications as follows:

- Standard SRL – best used for situations where the free fall is two feet or less and there are no obstructions and the anchor is overhead.
- SRL – R – This SRL has ‘rescue’ capabilities where the user can activate a mechanism that can slowly lower them to the ground. These are available upon request at UVA-FM. Contact OHS for assistance.
- SRL – LE – These SRLs are designed to be used on leading edges or whenever the anchor is at foot level. These devices can resist cutting if falling over a sharp edge.

Additionally, SRLs are in two classes:

- Class A – allow for a maximum of 24” deceleration distance and average arresting force of 1350 pounds.
- Class B – allow for maximum of 54” deceleration distance and average arresting force of 900 pounds.

If not using an SRL, then an energy absorbing lanyard MUST be used. These lanyards are typically six feet in length and may come with one or two legs. If a worker is wearing a six foot lanyard, then that worker could free fall then entire six foot length before the energy absorber engages which typically adds another 3.5 feet to the fall distance. Therefore, it’s critical to understand the amount of fall distance available before using an energy absorbing lanyard.

4.1.10 Anchor points

Selecting a proper anchor point can be a challenge. There are many types of anchor points commercially available, in addition to anchor points that may already be integral to a given structure. A Competent Person should assess each personal fall arrest system for a suitable anchor point(s). Contact FM-OHS for assistance if needed.

Two anchor point load requirements are referenced by OSHA. If using a lanyard with a shock absorber, then the anchor must be able to support 5,000 pounds per person attached. Additional options are provided where the anchor can support two times the intended load as determined by a Qualified Person. Contact FM-OHS at all times in these instances.

There are also provisions available where, when using a self-retracting lanyard, an anchor point has a load bearing capacity of 3,000 pounds. However, the minimum requirement at UVA is 5,000 pounds unless analyzed by a Qualified person.

Anchor points can be divided into ‘Temporary’ or ‘Permanent’. Examples of each are found below:

4.1.11 Temporary Anchors



1. Residential Anchor Straps.



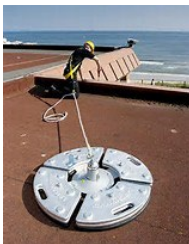
2. Concrete Anchors.



3. Standing Seam Roof System.



4. Beam strap.



5. Ballasted roof anchors.



6. Beam clamps.

4.1.12 Permanent Anchors (post)

Permanent roof anchors can be anchors that were installed for the specific purpose of being a fall protection anchor or a permanent roof anchor could be an integral part of a given structure. Typically, a structural member such as a load-bearing column or beam can be a suitable anchor point. However, a Competent Person must make that determination. Consult FM-OHS if more assistance is needed. There are an ever-increasing number of buildings on the UVA campus that make use of permanent anchors that are installed during new construction, during renovations, or upon request. Most of these anchors are intended for one user.

Below are some examples of permanent roof anchors:



4.1.13 Permanent Anchors (Horizontal Lifeline)

There are several horizontal lifelines installed on rooftops on the UVA campus. These are typically intended for one user at a time only. These lifelines can be used either as fall restraint or fall arrest. If used for fall arrest,

an SRL is the lanyard of choice. Consider whether a double-legged lanyard would be required to maneuver around vertical supports on the lifeline. Consult FM-OHS if assistance is needed when using these lifelines.



Horizontal lifeline on Runk Dining Hall

4.1.14 Warning Lines

Warning lines, when used properly, are an option for flat roofs for both roofing work and non-roofing work. Important distinctions between the two types of work are as follows:

- a) If work is non-roofing in nature, a warning line system can be no closer than 15 feet from the edge. If a worker must proceed outside of the warning line, then they must be protected by a personal fall arrest system or guardrail (see Note in this section).
- b) For roofing work, warning lines may be placed no less than six feet from the edge. If a worker proceeds outside of these warning lines, then they must be protected by a personal fall arrest system or guardrail.
- c) Note: There are allowances for warning lines for non-roofing work to be placed six feet from the edge. See *Designated Areas*.

4.1.15 Designated Areas using Warning Lines

Employees may establish designated areas which comply with the provisions of this paragraph as an alternative to installing guardrails, where the Competent Person demonstrates that employees within the designated areas are not exposed to fall hazards. In addition, the following conditions and requirements must be met in order to use designated areas in lieu of other fall protection measures:

- a) **The work must be of a temporary nature, such as maintenance on roof top equipment.**
- b) Designated areas shall be established only on surfaces that have a slope from horizontal of 10 degrees or less.
- c) The designated area, or any other area where warning lines are used, shall consist of rope, wire or chain and supporting stanchions erected in accordance with the following criteria:
 - 1) Strength
 - d) After being erected with the line (such as rope, wire or chain) attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion. The force shall be applied 30 inches (76 cm) above the work surface and perpendicular to the designated area perimeter, and in the direction of the unprotected side or edge;

- e) The line shall have a minimum breaking or tensile strength of 500 pounds (2.2 kN), and after being attached to the stanchions, shall be capable of supporting the loads applied without breaking; and
 - f) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
- 2) Height
- g) The line shall be installed in such a manner that its lowest point (including sag) is no less than 34 inches (86 cm) nor more than 39 inches (1 m) from the work surface.
- 3) Visibility
- h) The line forming the designated area shall be clearly visible from any unobstructed location within the designated area up to 25 feet (7.6m) away, or at the maximum distance a worker may be positioned away from the line, whichever is less. (One method for meeting the visibility criteria for designated areas is to place a flag made of high visibility material on the rope, or wire or chain at not more than six-foot (1.8 m) intervals.)
- 4) Location
- i) The stanchions shall be erected as close to the work area as is permitted by the task.
 - j) The perimeter of the designated area shall be erected no less than six feet (1.8 m) from the unprotected side or edge.
 - k) Access to the designated area shall be by a clear path, formed by two lines, attached to stanchions, which meet the strength, height and visibility requirements of this paragraph.

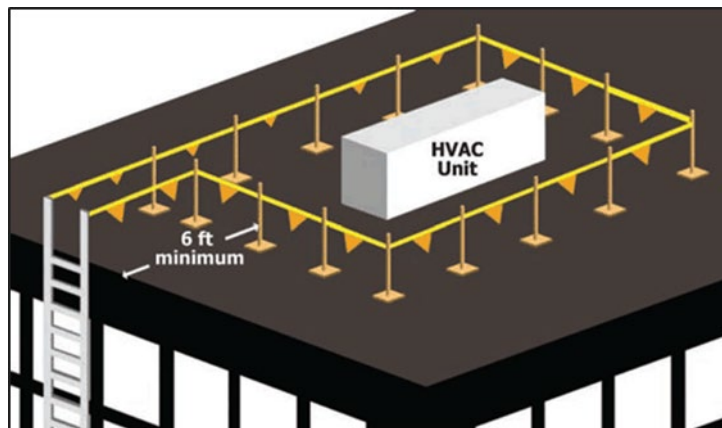


Figure 1: Designated Area

4.1.16 Lone Worker Policy

In any situation where a Facilities Management employee is utilizing a fall arrest system for fall protection, there must be at least one other worker present to notify emergency services if needed. If it is infeasible to have a second worker available, then a second person must be notified.

4.2 Special Circumstances

Roof hatches, when left open, constitute a fall hazard. To eliminate the fall hazard, roof hatches must be kept closed while the work is underway unless the hatch opening is protected by guardrails.

Skylights also represent a fall hazard. When working on or in proximity of skylights, either the skylights effectively covered, protected with permanent or temporary guardrails or workers must wear a restraint system or PFAS.

4.3 Protection from Falling Objects

- a) When employees are required to work in proximity of others working with materials, tools, or equipment at elevated levels, barricades shall be erected around the immediate area of the overhead work to prohibit employees and pedestrians from entering the area where they could be exposed to overhead hazards.
- b) Employees performing work at elevated levels shall keep tools, materials, and equipment away from the edge to keep potential objects from falling over the side. Where practical, tools, etc. shall be secured with rope, wire, etc. to keep them from falling.
- c) Toeboards must be installed on all scaffolds and guard rail systems where workers or pedestrian are exposed to overhead hazards.
- d) ALL workers exposed to overhead hazards must wear head protection (hard hats).

4.4 Elevated Personnel Platforms

- a) Work performed from truck-mounted or self-propelled aerial platforms, including extensible boom or articulating boom lifts, scissor lifts, and work platforms/baskets raised by forklifts or cranes shall require the use of a full-body harness and lanyard connected to the platform. Workers shall NEVER be tied off to adjacent structures.
- b) OSHA considers scissor lifts to be a mobile scaffold and therefore does not require a user to wear a harness and lanyard. HOWEVER, it is the policy of FM-OHS that all scissor lift users wear a harness and lanyard if there is an anchor point available.
- c) On occasion, the safest course of action to access an elevated area could be via the use of an aerial lift or scissor lift, especially if the alternative is a 40-foot extension ladder or similar. In these instances, it is acceptable for personnel to exit the aerial lift onto the flat working surface so long as fall protection is provided for during the transfer from the lift to the surface and so long as fall protection is provided for while on the working surface itself. Given the fact that these scenarios are myriad and there is no one operating procedure that would cover all circumstances, employees that would exit an aerial lift onto another surface MUST contact FM-OHS prior to this operation so that FM-OHS can assess the fall hazards and assist with determining the best course of action for adequate fall protection.

5. Training

A training program shall be provided for each employee who may be exposed to fall hazards. Training shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to follow to minimize these hazards.

- a) All Fm employees will receive at least Fall Hazard Awareness training.
- b) Fall Prevention and Protection training will be offered to all those employees who will be required to use fall protection as part of their work at UVA. This training will cover the following areas:
- c) Training shall consist, at a minimum, of an overview of OSHA and UVA-mandated fall protection requirements, an understanding of the fall protection Hierarchy of Controls, how to inspect fall protection equipment, and how to complete a fall hazard survey.
- d) The nature of fall hazards in the work area
- e) The correct procedures for erecting, maintaining, disassembling and inspecting the fall protection systems to be used

- f) The use and operation of guardrail systems, personal fall arrest systems (PFAS), and other protection to be used
- g) The role of employees in fall protection plans
- h) Review of any previous falls or near-misses and corrective action taken
- i) The OSHA safety standards that address occupational fall protection
- j) Fall Prevention and Protection Competent Person training will be offered to at least one employee from each operational group which utilizes fall protection.

6. Rescue

Prompt rescue of a fallen worker is critical to avoid further injury related to suspension trauma or shock trauma. Competent Rescuer duties may be fulfilled by local emergency services, in-house professionals, competent persons, or contract services. At UVA, prompt local emergency services are typically close enough in response time that this fulfills the basic need of having a Competent Rescuer in place in most instances. However, time is of the essence to rescue the person who had an arrested fall, so the preferred operating procedure for an arrested fall is as follows:

- a) Call 911.
- b) The fallen worker can self-rescue.
- c) If self-rescue is not possible, assisted rescue by another employee that is able to execute the rescue safely and without themselves becoming a fall victim should be considered.
- d) If self-rescue or assisted rescue is not possible, emergency services are the last option. In all cases of a fallen worker, however, 911 should be called as soon as that worker has fallen.
- e) Rescue procedures should be determined and written prior to the start of the project by using the Rescue Plan contained in Appendix B of this document. Examples of projects that need a Rescue Plan include those projects with multiple workers, unusual circumstances such as unique building layouts, working over hazards, unusual anchor points, heights over 30 feet (where access with an aerial lift could be challenging), or any other situation that the Competent Person deems self-rescue or assisted rescue could prove difficult.
- f) In the event of an arrested fall, time is of the essence and trauma may occur if a worker is suspended for longer than five minutes. Exercise care when handling the suspended worker, especially if they are unconscious.
- g) Following any period of post fall suspension, the fallen worker should be taken to a hospital for observation.
- h) The preparer of the written rescue procedures must have a thorough understanding of rescue equipment and techniques to determine whether there are any limitations to accessing the fallen worker due to hazards in the area.

A primary component of the Fall Hazard Survey is accounting for rescue and documenting those procedures. This information is to be recorded in the Rescue Plan contained in the document in Appendix B.

7. Retraining

Retraining shall be provided when management has reason to believe that any affected employee who has already received training does not have the understanding and skill required to perform work and effectively utilize fall protection equipment. Circumstances where retraining is required may include situations where:

- a) Changes in the workplace render previous training obsolete
- b) Changes in the types of fall protection systems or equipment to be used that render previous training obsolete
- c) Inadequacies in an affected employee's performance or knowledge of fall protection systems that may indicate that the employee has not retained the requisite understanding or skill

- d) Deficiencies in the fall protection plan or incident investigations determine that additional retraining is necessary.

8. Certification

- a) UVA shall verify compliance with training requirements by preparing a written certification record. The written certification record shall contain:
 - b) The name of the employees trained.
 - c) The dates of training.
 - d) The name and signature of the person who conducted the training.
 - e) The latest fall protection training certification shall always be maintained and accessible by OHS.

Appendix A: Definitions

Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices.

Authorized Person is a person assigned to perform duties at a location where the person will be exposed to a fall hazard.

Full-Body harness means 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 means any device for holding the body belt or body harness closed around the employee's body.

Carabiner - see Snaphook

Competent Person – A person with the knowledge, training and experience to recognize hazardous conditions to workers and who has authorization to take prompt corrective measures to eliminate them

Connector means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

Deceleration device means 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 means 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.

Designated area means a space which has a perimeter barrier erected to warn employees when they approach an unprotected side or edge and also serves to designate an area where work may be performed without additional fall protection.

Equivalent means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Fall Restraint means a protective system that prevents workers from reaching an edge where a fall is possible. The restraint is generally a line from an anchorage to which the employee is secured in such a way as to prevent the employee from walking or falling off an elevated work surface. A traveling restraint system would refer to a line between two anchorages that would enable the employee to attach to that line yet limit travel in such a manner as to prevent exposure to a fall hazard. Travel restraint systems must be used such that they do not support any portion of the employee's weight. and freely travel between the anchorages while preventing the possibility of a fall.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

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

Free fall distance means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Guardrail system means a barrier erected to prevent employees from falling to lower levels.

Hole means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

Infeasible means that it is impossible to perform the inspection work using a conventional fall protection system (i.e., guardrail system or personal fall arrest system) or that it is technologically impossible to use either of these systems to provide fall protection. **CONTACT UVA Facilities Management before beginning work if you believe that fall protection for your job or task is infeasible.**

Lanyard means 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.

Lifeline means 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.

Lower levels means 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.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a full-body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

Positioning device system means 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.

Qualified Person means one who, by possession of a recognized degree and expertise, has successfully demonstrated his ability and expertise in designing fall protection systems.

Rope grab means 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. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Self-retracting lifeline/lanyard means 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.

Snaphook means 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. Snaphooks are generally one of two types: (1) 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 (2) 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 snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Unprotected sides and edges means 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 or guardrail system at least 39 inches (1.0 m) high.

Walking/working surface means 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.

Work area means that portion of a walking/working surface where job duties are being performed.

Appendix B: Fall Protection Job Hazard Analysis and Rescue Plan

COMPETENT PERSON EVALUATION / PROJECT INFORMATION		
Evaluation Conducted by	Project	Date Issued
Subcontractor	Subcontractor Phone	End Date (1 week max)
SCOPE OF WORK / DESCRIPTION OF ACTIVITY		
What tasks and work areas are associated with the hazards? Identify the equipment, materials, and processes addressed by this analysis.		
HAZARDS AND CONTROLS		
What is the fall distance/exposure to the next lower level? What controls have been established (guardrails, PPE, etc.)?		
If the work cannot be performed as defined in this analysis, or if unexpected conditions are encountered, stop work and review with the competent person. Additional hazard controls may be warranted.		
FALL HAZARD ANALYSIS AND BRIEFING CHECKLIST INSTRUCTIONS		
Use this checklist in your evaluation and as the talking points in the daily briefing to identify the controls established for the elevated work. The briefing and checklist requirements must be reviewed, verified and communicated to the workers on a daily basis, prior to the start of work daily. If the scope of work or location changes reevaluation by the Competent Person is required.		
1. Identify all fall hazards:		
<input type="checkbox"/> Roof Work (within 15 feet of edge)	<input type="checkbox"/> Unprotected Stairways	<input type="checkbox"/> Ladders (portable or fixed)
<input type="checkbox"/> Roof penetration or Skylight (work within 15 ft of unprotected opening)	<input type="checkbox"/> Wall or floor openings (work within 6 ft of unprotected wall or floor opening)	<input type="checkbox"/> Aerial lifts, Scissor lifts and elevating work platforms
<input type="checkbox"/> Scaffold erection / disassembly	<input type="checkbox"/> Leading edge	<input type="checkbox"/> Steel erection
<input type="checkbox"/> Other Describe:		
2. Method of fall protection to be provided:		
<input type="checkbox"/> Passive (guardrail or hole cover)	<input type="checkbox"/> Fall Restraint	<input type="checkbox"/> Ladder Safety Device
<input type="checkbox"/> Positioning System	<input type="checkbox"/> Personal Fall Arrest (PFAS)	<input type="checkbox"/> Warning Lines
<input type="checkbox"/> Comment:		
3. Fall Protection Equipment required (OSHA and ANSI compliant), if applicable:		
<input type="checkbox"/> Anchorage Connector	<input type="checkbox"/> Full Body Harness	<input type="checkbox"/> Restraint Lanyard
<input type="checkbox"/> Shock Absorbing Lanyard	<input type="checkbox"/> Self Retracting Lanyard (SRL)	<input type="checkbox"/> Leading Edge SRL
<input type="checkbox"/> Twin Leg Lanyard	<input type="checkbox"/> Rope Grab	<input type="checkbox"/> Safety Nets
NOTE: The Competent Person must confirm system selection and compatibility.		
4. What anchor are you using?, if applicable		
5. Identify the method of falling object protection below the elevated work:		
<input type="checkbox"/> Guardrails / Barricades	<input type="checkbox"/> Snow Fence or Mesh	<input type="checkbox"/> Toeboards
<input type="checkbox"/> Hard Hats Required	<input type="checkbox"/> Warning Lines	<input type="checkbox"/> Danger Tape
<input type="checkbox"/> Caution Tape	<input type="checkbox"/> Warning Signs	<input type="checkbox"/> Attendant Posted
<input type="checkbox"/> Tool Tethers or Lanyards	<input type="checkbox"/> Other Describe:	

RESCUE PLAN		
Contacts	Rescue Equipment	Critical Rescue Factors
Competent Rescuer(s):	<input type="checkbox"/> Ladder <input type="checkbox"/> Rescue Pole <input type="checkbox"/> Rescue Rope <input type="checkbox"/> Scaffold <input type="checkbox"/> Crane <input type="checkbox"/> Aerial Lift <input type="checkbox"/> Alternative lifting & lowering device <input type="checkbox"/> First Aid Kit <input type="checkbox"/> Life Ring	Where is an anchor point for rescue?
FOR EMERGENCY RESCUE CALL CHARLOTTESVILLE FIRE DEPARTMENT 911		Where is Landing Area?
Emergency Contact(s): 911 should be your 1st call!		Are there any Rescue Obstructions or Hazards?
Method of Contact <input type="checkbox"/> PA <input type="checkbox"/> Verbal / Face to Face <input type="checkbox"/> Radio Channel _____ <input type="checkbox"/> Phone _____ <input type="checkbox"/> Other _____	Location of Equipment <input type="checkbox"/> Jobsite <input type="checkbox"/> Gang Box <input type="checkbox"/> Tool Box <input type="checkbox"/> Other _____	
Check for YES <input type="checkbox"/> Have alternatives to using fall arrest equipment been considered? <input type="checkbox"/> Has rescue equipment been inspected and in good shape? <input type="checkbox"/> Is equipment adequate for the rescue plan? <input type="checkbox"/> Have communication devices been identified, located, and tested? <input type="checkbox"/> Are all rescuers familiar with the use of the rescue equipment?		Comments <hr/> <hr/> <hr/> <hr/>
Describe the tasks that will be done prior to work to prevent a fall and the step-by-step process to be followed in the event of a fall.		
Pre-Work Tasks 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____	Response Procedure 1. Call 911 2. Rescue 3. Medical assessment of person 4. If possible have employee perform self rescue 5. _____ 6. _____	

Appendix C: Inspection Form

Inspection Date:		Inspector:		Contact:	
Equipment Inspected:		<input type="checkbox"/> Full Body Harness <input type="checkbox"/> Lanyard <input type="checkbox"/> Vertical Life Line <input type="checkbox"/> Rope Grab			
Issued to:		Date Issued:			
If the equipment has arrested a fall, the harness and lanyard must be retired and destroyed. Retractable must be inspected before being used again for fall protection					
Harness Info		Rope Grab Info		Ropes	
Make:	Make:	Make:	Make:		
Model:	Model:	Model:	Type:	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> SRL	
Serial #:	Serial #:	Serial:	Serial #:		
Mfg Date:	Mfg Date:	Line Size(dia):	Shock Absorber	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Lot #:	Lot #:				
Inspect: <input checked="" type="checkbox"/> for okay or <input checked="" type="checkbox"/> for not ok	Full Body Harness		Rope Grab		Ropes
<u>Hardware</u> : Includes snap hooks, carabiners, keepers and D-rings. Look for disortion, sharp edges, burrs, cracks, corrosion, and proper operation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Notes:		Notes:		Notes:
<u>Webbing</u> : Inspect for cuts, burns, tears, abrasion, excess soiling, written on, discolorations. Note any writing on webbing, unauthorized modification, partial deployment of shock absorber	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Notes:		Notes:		Notes:
<u>Stitching</u> : Inspect for pulled or cut stitches	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Notes:		Notes:		
<u>Labels/Equipment Information</u> : Inspect to ensure all labels are present and held securely in place, all text is legible, directional indicator is present.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Notes:		Notes:		
<u>Mechanical Components</u> : Locking mechanism functioning, all connectors present and working, gates open/close, system operates as designed.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Notes:		Notes:		Notes:
<u>Ropes</u> : Inspect for frays, cuts and burns.					<input checked="" type="checkbox"/>
					<input type="checkbox"/>
					Notes:
Notes: _____					
Competent Person's Name and Signature: _____					
Supervisor's Name and Signature: _____					