



FALL PROTECTION PROGRAM

Fall Protection Program

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Fall Protection Program

I. Applicability

This program establishes a means to analyze elevated work tasks and determine appropriate personal protection against falls in accordance with Occupational Safety and Health Administration (OSHA) Construction and General Industry regulations:

- “Fall Protection,” 29 CFR 1926 Subpart M
- “Walking and Working Surfaces,” 29 CFR 1910 Subpart D
- “Powered Platform, Man lifts, & Vehicle-Mounted Platforms,” 29 CFR 1910 Subpart F

II. Overview

Conformance to this Procedure will aid Tufts University in preventing falls by avoiding work at heights where possible; use work equipment or other controls to prevent falls; and minimize the consequences if a fall should occur. This procedure applies to Tufts employees and contractors working at heights above 4 feet or 6 feet for construction related activities.

Employees will not be required, nor allowed to perform any duties which require the employee to get closer than fifteen feet to an unprotected edge, platform, and walkway of any building or utilize elevated equipment unless the employee is properly secured from falling.

Warning systems must be in place on a roof 15 feet from the edge to warn employees that they are approaching an unprotected opening (including skylights), roof side or edge, and which designates an area in where roofing work may take place without the use of guardrails, fall arrest, or safety net systems to protect employees in the area.

Employees working from a mobile elevated work structure (i.e. scissor lift, boom, etc.) must wear a harness and lanyard, which is tied off to the platform of the elevated work structure.

Falls from roofs are generally fatal or can result in serious injury and permanent disability. Hence actions must be taken to prevent faculty, students, contractors and visitors from sustaining injury or death as a result of a fall from a roof at Tufts University.

Members of Tufts community, their guests and visitors, are prohibited from accessing areas of the campus which are not designed for regular access, such as roofs. Exceptions to this policy are specifically allowed by applicable policy, and for roofs, only after a person needing access to a roof has been trained and authorized to access roofs.

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Tufts University roofs are restricted area and not accessible to any person unless that person received specific authorization and training by Tufts Facility Services personnel regarding the safety requirements of accessing and performing work on university roofs.

All access doors and hatches to roofs will be secured from unauthorized access.

In accordance with Facilities Services, all persons accessing Tufts roofs will complete a risk assessment using attachment 1.1 each time the operation on the roof is conducted.

The hazards associated with work on roofs includes falling through openings and falling off edges. The protection of openings is discussed in the Risk Management section of this program.

III. Definitions

Anchorage

A secure point of attachment for lifelines, lanyards or deceleration devices.

Competent Person

A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions associated with the work at height which are hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to solve work at height problems. (for example – supervisor or team leader of authorized person)

Construction Related Activities

Activities that involve building, erecting new structures or processes, relocation of equipment or processes, installation of new processes, etc. This does not include typical maintenance activities such as painting, changing of light bulbs or related fixtures, electrical work, preventive maintenance activities, etc.

Fall Arrest System

A fall arrest system includes the proper anchorage, body support (harness), and connecting means (lanyards/lifelines) interconnected and rigged to arrest a free fall. The primary function of a fall arrest system is to minimize the consequences of a fall rather than preventing its occurrence. The use of fall arrest equipment should be recognized as a means of minimizing injuries sustained from a fall. It does not prevent the fall.

Full Body Harness

An engineered design of straps which are secured about the employee in a manner that will distribute the fall arrest forces over the thighs, pelvis, waist, chest and shoulders with means of attaching it to other components of a personal fall arrest system.

Guard Rail System

A barrier erected to prevent employees from falling to lower levels. Design requirements must meet local engineering codes and applicable OSHA

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regulations.

High Angle Rescue

A situation where a victim is elevated above ground greater than 10 feet or below ground and must be moved and/or rescued by the use of rope and/or mechanical advantage systems and rigging.

Leading Edge

Means the edge of a floor or roof.

Low-Slope Roof

A roof having a slope less than or equal to 4:12 (vertical to horizontal).

Mobile Elevated Work Platforms

Vehicle mounted aerial devices, elevating rolling work platform, boom-type elevating work platform, or self-propelled elevating work platform.

Personal Fall Arrest System

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

Personal Fall Restraint System

System that prevents a worker from reaching an unprotected leading edge on a horizontal surface, such as a roof. May include guard rails, cable systems, and fixed anchor points.

Program Administrator

Responsible for all phases of the fall protection plan, including its development, implementation and ongoing monitoring. Additionally, the administrator must have a working knowledge of fall protection regulations, standards, equipment and systems.

Qualified Person

A person who, by extensive knowledge, training and experience, has successfully demonstrated to the organization or the organization's designee the ability to resolve problems relating to work at height or the project. (for example - EHS professional, Engineer, Subject Matter Expert, 3rd Party)

Self-Rescue

Reach the fallen worker from the structure and pull the victim back to the safety of the structure.

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 or guardrail system at least 42 inches (105 cm) high.

Warning Line System

A physical warning on a roof 15 feet from the edge to warn employees that they are approaching an unprotected opening (including skylights), roof side or edge, and which designates an area in where roofing work may take place without the use of guardrails, fall arrest, or safety net systems to protect employees in the area.

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Work At Heights

Work performed at a height equal to or greater than 4 feet or 6 feet for construction related activities in terms of risk assessment and risk management.

IV. Responsibilities

Competent Persons shall:

1. Implement all aspects of the program for work areas under their control;
2. Receive training for “competent person” as defined by OSHA for fall protection;
3. Act as the “competent person” for job sites under their control that contain fall hazards;
4. Evaluate fall hazards in work areas under their control; and
5. Ensure that employees are informed, trained, and provided with the appropriate fall protection systems and equipment to be protected from potential fall hazards associated with job tasks.

Qualified Persons shall:

1. Maintain professional certification or other requirements in their subject field;
2. Provide design, analysis, evaluation and specification in their subject field;
3. Maintain records of their designs, analyses, evaluations, and specifications according to the requirements of the *Fall Protection Program*.

Supervisors shall:

1. Ensure that employees are informed, trained, and provided with the appropriate fall protection systems and equipment to be protected from potential fall hazards associated with job tasks; and
2. Coordinate the correction of fall hazards brought to their attention by employees.

Employees shall:

1. Use a means of fall protection (guardrails, personal fall arrest/restraint systems, or safety monitor) for all work from elevated heights greater than 6 feet for construction work and 4 feet for industrial maintenance work;
2. Alert their supervisors when requested to work from heights without a means of fall protection;
3. Alert their supervisor about the level of fall protection training they have or have not received when requested to work from elevated heights;
4. Report incidents relating to fall hazards to their supervisor.

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Contractors shall:

1. Be aware of the requirements outlined in this program,
2. Provide all personal fall arrest systems to their employees,
3. Submit site specific fall protection plan for review by persons with authorized oversight,
4. Wear fall protection consistent with the requirements outlined in this document and all other applicable regulations.
5. Provide a competent person for fall protection onsite when providing constructions services while working on roofs or contact Tufts EHS or Facilities Services for guidance.

V. Risk Assessment

All work at height tasks being performed shall be assessed initially and upon any task changes by a Competent Person prior to the work (using attachment 1.1) commencing to identify if there is a risk of a fall and the control measures to be implemented.

VI. Risk Management

This risk assessment can be done as part of a site-wide risk assessment for all routine tasks. For non-routine or modified tasks, the risk assessment shall be done prior to the task being undertaken.

Where the risk of a fall from work at height is identified, a hazard identification and risk assessment shall be documented for the intended task(s) and the following hierarchy of risk control measures shall be applied (in descending order) to either eliminate the risk or reduce the chance of a fall to as low as reasonably practicable. Only where it is not reasonably practical to use a higher order control may you then use a control at the next lower level:

Elimination

Eliminate the risk of a fall completely, e.g. relocate the work to a safe working height, to the ground or existing solid construction with guardrail/walls, etc.

Engineering or Substitution

If it is not reasonably practical to eliminate the risk of a fall, reduce the risk by the use of passive fall protection equipment e.g. guard-railing, scissor lifts, elevated work platforms, scaffolds, etc. Work from any mobile elevated work structure, shall require the additional use of a Personal Fall Arrest System.

Work Positioning System

If it is not reasonably practical to eliminate the risk or use passive fall protection, use work positioning systems to physically prevent a fall from occurring.

Personal Fall Arrest System

If it is not reasonably practical to use the above options, the use of Personal Fall Arrest Systems to arrest a fall after it occurs shall be used. Body belts are not permitted for use as part of a Personal Fall Arrest System.

Administrative Controls

If none of the above measures are reasonably practical, or the risk of a fall still remains, the risk shall be reduced by the use of documented administrative controls that specify the procedures to be used to mitigate the risk, such as Warning Line System, Fall Protection Plan, Work at Heights Permit, Job Safety Analysis, etc.

Personal Protective Equipment

Personal protective equipment shall be used to minimize fall hazards where engineering controls do not eliminate the hazard or in conjunction with engineering controls.

Personal Fall Arrest System

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The use of a personal fall arrest system is the required personal protective equipment for fall hazards at Tufts University. A personal fall arrest system consists of a full-body harness, lanyard, and anchor point OR a full-body harness, lanyard, lifeline, anchor point, and deceleration/grabbing device. All fall protection equipment shall meet or exceed appropriate American National Standards Institute (ANSI) standards. Tufts employees shall use only commercially manufactured equipment specifically designed for fall protection and certified by a nationally recognized testing laboratory. All fall protection equipment must bear the marking of the manufacturer and approvals for specified use. Requirements for a personal fall arrest system include but are not limited to the following:

- A. Body Harness** - Only full-body harnesses shall be used. The use of a body belt as fall protection is prohibited.
- B. Connecting Device** - Shock-absorbing lanyards and lifelines
 1. Lanyards and lifelines shall have a minimum breaking strength of 5000 pounds;
 2. Lanyards shall not exceed six feet in length. Lanyards used on aerial lift devices should not exceed 4 feet in length to reduce slack;
 3. Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers;
 4. Connecting assemblies shall have a minimum tensile strength of 5,000 pounds;
 5. The maximum free fall distance is six feet for all systems;
 6. The maximum deceleration distance is 3.5 feet;
 7. Personal fall arrest systems shall have sufficient strength to withstand twice the potential impact energy of the falling employee;
- C. Anchorage** - Anchorage point and anchorage connector
 1. Anchorages used for personal fall arrest systems shall be independent of any anchorage being used to support or suspend platforms and be capable of supporting at least 5000 pounds per employee attached;
 2. A qualified person shall determine all anchor points, both temporary and permanent. Permanent anchor points shall be properly marked;
 3. Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists except as specified in other regulations.

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Maintenance and Inspection

Personal Fall Arrest Systems and associated devices/equipment shall be visually inspected prior to each use, and periodically per manufacturers' specifications, for excessive wear, damage and other sign of deterioration. (see attachment 1.2)

- Periodic inspections (attachment 1.2) shall be documented.
- Defective or out of date equipment shall be immediately removed from service and tagged.
- Personal Fall Arrest Systems that are involved in a fall arrest incident must be taken out of service immediately and permanently. Retractable lifelines must be sent back to the manufacturer for repair and re-certification or destroyed.
- Harnesses, lanyards, and retractable devices must have a legible tag or data plate attached to the device or it must be taken out of service.
- Fall protection equipment must be replaced as required per the manufacturer's instructions.

Fall protection equipment must be used in accordance with the manufacturer's instructions. This includes weight and size limitations, and must not be altered in any way without the manufacturer's written authorization.

VII. Roof Access Procedure

Tufts limits the access to roofs to those individuals who have a specific purpose on the roof and when work can be performed safely, under lighting and weather conditions that exist at the time of the operation. Facilities Service staff and/or their contractors are the primary users of roofs at Tufts, therefore Facilities Service personnel are responsible for training and authorizing personnel before roof access is permitted.

1. All Facilities Service staff whose job requires roof access will participate in annual training on the requirements of the Fall Protection Program and how to use the information in the posted Risk Assessment for each building.
2. All non-Facilities Service employees requiring access to a roof will contact Facilities Services work control and arrange for a Facilities Service staff member to meet at the access point with a copy of the risk assessment for that building and roof.

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3. Limitations to access due to inclement weather i.e. wind, rain, ice, snow will be noted on the risk assessment form. Roof access may have to be postponed until weather and roof conditions improve.
4. In some cases, access to roof areas with slate or extreme pitch will be denied and access will require the use of scaffolding or aerial lifts.

Effective roof work fall protection techniques are intended to protect workers while providing the mobility and comfort necessary to perform work tasks. Several techniques are available and are described below.

I. Low-slope or Flat Roofs (slope less than or equal to 4:12 vertical to horizontal)

Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by guardrail systems, parapets (minimum height 39 inches and able to support 200 pounds), safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system. Or, on roofs 50-foot or less in width the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.

II. Steep roofs (slope greater than 4:12 vertical to horizontal)

Each employee on a steep roof with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by guardrail systems with toe boards, safety net systems, or personal fall arrest systems.

III. Slate roofs Tufts University has slate roofs that area easily damaged by foot traffic, climbing devices and scaffolding. A mechanical lift shall be used to inspect and repair slate roofs.

IV. Personal Fall Arrest System

A. The system of choice for fall protection on roofs is a standard handrail, in the absence of a handrail the preferred protection is a personal fall arrest system;

B. Requirements for personal fall arrest systems are found in the Fall Protection Personal Protection Equipment section of this program; and

C. Personal fall arrest systems for roof work must be designed by a qualified person.

V. Designated Areas

As an alternative to installing guardrails, a designated area may be established. Designated areas are of a temporary nature only. The following condition and requirements must be met in order to use designated areas in lieu of other fall protection measures:

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- 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; and
- C. The designated area shall consist of an area surrounded by a rope, wire, or chain and supporting stanchions.
 - 1. Shall be constructed with ropes, wires or chains of 500-lb tensile strength. Barrier tape is strictly prohibited;
 - 2. The warning line system of the designated area will have uprights capable of withstanding withstand 16-lb force at 30-in. height. The line will be of rope, wire, chain of 500-lb tensile strength. The line shall be flagged at 6-ft intervals. Height of the warning line shall be 34-39 inches. The line will be attached to uprights with no line slip;
 - 3. After being erected with the line attached, stanchions shall be capable or resisting, without tipping over, a force of at least 16 pounds applied 30 inches above the base;
 - 4. 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;
 - 5. The line forming the designated area shall be clearly visible from any unobstructed location within the designated area up to 25 feet away;
 - 6. The stanchions shall be erected as close to the work area as is permitted by the task;
 - 7. The perimeter of the designated area shall be erected no less than 15 feet from the unprotected side or edge; and
 - 8. Access to the designated area shall be by a clear path formed by two lines attached to stanchions.

VIII. Rescue

Qualified personnel must ensure that appropriate emergency procedures are established, documented, and communicated to all affected employees, before any work at height is undertaken.

Qualified personnel must ensure that emergency procedures:

- enable the rescue of an employee in the event of a fall, and
- provide for first aid to an employee who has fallen

Qualified personnel must ensure that emergency response shall commence within 15 minutes.

The following are examples of emergency response that can be used:

- self-rescue
- assisted rescue
- self-descent device
- high-angle rescue

IV. Ariel Lifts

Aerial lifts include the following types of vehicle mounted aerial devices used to elevate personnel to job sites above ground:

- **Articulating boom platforms** are designed to reach up and over obstacles.
- **Extensible or telescoping boom platforms** may extend over one hundred feet.
- **Vehicle mounted bucket lifts** are used to repair utility lines.
- **Scissor lifts** extend into the air via a series of crisscross supports.
- **Personal man lifts** are lightweight and designed for one person to use indoor.

I. Specific requirements

- A. Aerial lifts shall be secured in the lower traveling position before the truck is moved for highway travel;
- B. Lift controls shall be tested each day prior to use;
- C. Only personnel authorized by a fall protection competent person and trained in the operations of the lift shall operate an aerial lift;
- D. Employees shall always stand firmly on the floor of the basket and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position;
- E. A full-body harness shall be worn and a lanyard attached to the engineered anchor point in the basket when working from an aerial lift (exception: a harness is not required in a scissor lift or personal man lift with surrounding guardrail system and closing gate or latch chain);
- F. Belting off to an adjacent pole structure, or equipment while working from an aerial lift shall not be permitted;

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- G. Boom and basket load limits specified by the manufacturer shall not be exceeded;
- H. The brakes shall be set and when outriggers are used, they shall be positioned on pads or other solid surface. Wheel chocks shall be installed when using an aerial lift on an incline;
- I. An aerial lift truck shall not be moved when the boom is elevated in a working position, except for equipment which is specifically designed for this type of operation;
- J. Articulating and extensible boom platforms shall have both platform and ground controls; and
- K. Before moving an aerial lift for travel, the boom shall be inspected to ensure that it is properly cradled and outriggers are in the stowed position.

IX. Training

Personnel performing work at height shall be trained in site-specific fall protection procedures, and any task specific procedures that are established, prior to performing any work at height.

Employees shall demonstrate an understanding of the training and use of the equipment. This shall be accomplished through a documented exam and documented practical demonstration.

Refresher training shall be provided when;

- Changes in the workplace render previous training obsolete,
- Changes in the types of Fall Protection equipment to be used render previous training obsolete, Workplace observations indicate that employees have not retained an understanding of the skills acquired through their initial training,
- Changes are made to the Fall Protection Program, or
- Qualified or competent personnel identify the need.

Personnel who maintain and inspect Personal Fall Arrest Systems must receive formal training on how to properly maintain and inspect Personal Fall Arrest Systems. The training shall be conducted by a Qualified person, a Competent person, or outside resource. Tufts EHS will provide advice and guidance on required training for personnel involved with working at heights.

X. Program Audit

Tufts shall perform a documented annual evaluation of the entire Fall Protection Program. The annual evaluation shall include a thorough review of the following:

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Document:

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- The Fall Protection Program to determine if it is complete and up to date.
- Fall protection risk assessments to evaluate the thoroughness and completeness of the assessment.
- Equipment inspection checklists to evaluate the thoroughness and completeness.
- Training records to determine if all required training was appropriately conducted and attended.

Revision Log

Revision #	Date	Description of Change	Written by

Document Responsibility

Owner			
Approved by			