



University of Vermont
Department of Physical Plant
Burlington, Vermont

FALL PROTECTION PROGRAM

in accordance with
VOSHA 29 CFR 1926.500
VOSHA 29 CFR 1910.21
VOSHA 29 CFR 1910.66
VOSHA 29 CFR 1910.268
VOSHA 29 CFR 1926.450

REVISED AND DISTRIBUTED BY:
THE UNIVERSITY OF VERMONT
DEPARTMENT OF PHYSICAL PLANT
TRAINING AND COMPLIANCE OFFICE

REVIEWED BY:
THE UNIVERSITY OF VERMONT

April, 2016

Table of Contents

Emergency and Assistance - Post Fall Rescue & Emergency Telephone Numbers	4
Program Statement	5
I. Purpose	5
II. Scope	5
III. Program	6
IV. Duties and Responsibilities	6
V. Information and Training	7
Glossary of Terms	8
Information and Training	12
Fall Hazards	14
Engineering Controls	15
Personal Protection Equipment	16
I. Fall Arrest	16
II. Positioning	17
III. Retrieval	18
IV. Restraint	18
Roofing	19
I. Low-slope or Flat Roofs	19
II. Steep Roofs	19
III. Personal Fall Arrest Systems	19
IV. Designated Areas	19

Scaffolds	20
I. Use of Scaffolds	20
II. Inspection of Scaffolds	21
III. Maintenance of Scaffolds	22
IV. Storage of Scaffolds	22
Aerial Lifts	22
I. Specific Requirements	22
II. Minimum Safe Approach Distance	23
Portable Ladders	23
I. Use of Portable Ladders	23
II. Inspection of Ladders	24
III. Maintenance of Ladders	25
IV. Storage of Ladders	25
Fixed Ladders and Stairs	25
I. Fixed Ladders	25
II. Fixed Industrial Stairs	26
III. Flights of Stairs Having Four or More Risers	26
IV. Embedded Stairs	26
V. Alternating Tread Stairs	26
Walking and Working Surfaces	27
Appendix A	28
“Job Specific Emergency Action Plan”	29
Emergency and Assistance Post Fall Rescue & Emergency Telephone Numbers	
Appendix B	31
Aerial Lift Equipment Inspection Checklist	32

EMERGENCY AND ASSISTANCE POST FALL RESCUE & EMERGENCY TELEPHONE NUMBERS

No work shall be performed where an emergency cannot be immediately observed and prompt rescue assistance summoned.

A rescue plan should be in place prior to beginning any work where a fall hazard exists. The rescue plan must be well thought out, documented in the “Job Specific Emergency Action Plan” (Appendix A) and all individuals involved must thoroughly understand the rescue plan. Prompt rescue shall be provided for personnel who have fallen.

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE

CALL IMMEDIATELY FOR ANY EMERGENCY
INCLUDING CHEMICAL SPILL, FIRE, INJURED,
TRAPPED OR SICK PERSON.

* From the University of Vermont In-House Phone System

9-1-1

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE

From Cellular Phone Service

(802)-656-3473

CALL IMMEDIATELY FOR ANY EMERGENCY
INCLUDING CHEMICAL SPILL, FIRE, INJURED,
TRAPPED OR SICK PERSON.

* When using cellular phone service 911 will be directed to Williston State Police.

Physical Plant Department Training and Compliance Office (Asbestos and Lead Management, mold remediation, Occupational Safety and Health)	(802)656-SAFE (7233)
Environmental Safety Facility (Chemical cleanup, disposal and storage)	(802)656-5400
Department of Risk Management (Accident investigations, insurance services)	(802)656-3242
Concentra Medical Center (Medical Consultation and Evaluation)	(802)658-5756
Service Operations Support (Physical Plant Department)	(802)656-2649

Program Statement

I. Purpose

This written program is a means to analyze elevated work tasks and determine appropriate personal protection against falls in accordance with Vermont Occupational Safety and Health Administration (VOSHA) regulations:

"Fall Protection," 29 CFR 1926 Subpart M

"Walking and Working Surfaces," 29 CFR 1910 Subpart D

"Powered Platforms, Manlifts, and Vehicle-Mounted Platforms," CFR 1910 Subpart F

"Scaffolds," 29 CFR 1926 Subpart L

"Telecommunications," 29 CFR 1910.268 Subpart R

II. Scope

The University of Vermont's Physical Plant Department Fall Protection Program shall apply to all Physical Plant employees who are exposed to unprotected sides or edges of surfaces that present a falling hazard of six feet or more to a lower level. Employees will not be required, nor allowed to perform any duties which require the employee to get closer than six feet to an unprotected edge, platform, and walkway of any building or utilize elevated equipment unless the employee is properly secured from falling.

Exceptions to this requirement include the working sides of loading docks and exposed perimeters of entertainment stages. Employees may use portable ladders without fall protection equipment up to sixty feet. Employees may work on scaffolds and aerial lifts up to 6 feet in height and on the edge of an excavation up to 6 feet in depth without fall protection.

Additionally, the Fall Protection Program shall apply to all employees in order to minimize slips, trips and falls on the same elevation. All employees shall control fall hazards in their work area by maintaining good housekeeping and shall report conditions that may lead to slips, trips and falls to the appropriate facilities maintenance unit.

Contractors for the University of Vermont are required to comply with all applicable VOSHA regulations and shall have their own fall protection program.

III. Policy

The Physical Plant Department is dedicated to providing safe work facilities for students, employees, and visitors, and complying with federal and state occupational health and safety standards. Administrators, faculty, staff, union representatives and students all share a responsibility to reduce the hazards associated with falls.

Fall hazards must first be controlled through engineering controls if feasible. When engineering controls are not feasible, then personal fall arrest systems, administrative controls and training must be instituted.

IV. Duties and Responsibilities

A. Physical Plant Department Administration

1. Maintain and update Design Guidelines requiring that projects be designed according to current VOSHA standards and that engineering controls for fall protection such as guardrails and anchorage points for occupant use and maintenance work be designed into projects wherever feasible; and
2. Provide administrative and financial support for this program within individual units; and
3. Ensure that Fall Protection is implemented and maintained within the department.
4. Support disciplinary action in the event that proper procedures are obviously not followed.

B. Training and Compliance Office (TCO)

1. Designate and empower individuals who will act as competent and/or qualified persons who will be responsible for the preparation and implementation of the Fall Protection Program;
2. Ensure that employees who will act as competent and/or qualified persons are adequately trained and/or qualified;
3. Ensure the Fall Protection Program is implemented and maintained within the department.
4. Consult with outside entities on fall protection designs as needed.
5. Review Fall Protection Program annually.

C. Designated Competent Persons

1. Implement all aspects of the program for work areas under their control;
2. Receive training for "competent person" as defined by VOSHA 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.

D. Designated Qualified Persons

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*.

E. Physical Plant Managers and Supervisors

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; and
3. Complete a "First Report of Injury" report and produce any additional documentation needed to investigate and work related injuries and illnesses.

F. Physical Plant Employees

1. Comply with the Fall Protection Program and any further safety recommendation provided by the supervisor and/or TCO regarding fall protection;
2. Complete fall protection training requirements and request further instruction if unclear;
3. Conduct assigned tasks in a safe manner and wear all assigned personal protection equipment; and
4. Report any unsafe or unhealthy work conditions and job related injuries or illnesses to the supervisor immediately.

V. Information and Training

Assistance will be provided by the Training and Compliance Office to any unit or individual requesting guidance or training to satisfy implementation of this program.

Call TCO at 802-656-SAFE (7233) or send electronic mail to [Vincent Brennan](mailto:Vincent.Brennan@uvm.edu) vincent.brennan@uvm.edu or view the TCO home page at <http://tco.w3.uvm.edu/>

Glossary of Terms

Aerial lift device: means equipment such as powered platforms, vehicle-mounted elevated and rotating work platforms, extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers and powered industrial truck platforms.

Anchor point: A secure point of attachment for lifelines, lanyards or deceleration (grabbing) devices.

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

Body harness (also referred as Full-body harness): An interconnected set of straps that may be secured about a person in a manner that distributes the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with a means for attaching the harness to other components of a personal fall arrest system.

Competent person: A person who is capable of recognizing existing and predictable hazards and has the authority to take corrective action. Additionally, a person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof as well as in their application and use with related equipment. To be considered a competent person, an 8 hour training class must be completed for general fall protection and an additional 4 hour training class must be completed. To be considered a competent person for equipment inspections, the manufacturer's training guidelines shall be followed.

Connector: A device that is used to connect parts of a personal fall arrest system together (i.e. D-rings, and snaphooks).

Controlled access zone (CAZ): means an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

Deceleration device: Any mechanism, such as a rope, grabbing device, ripstitch lanyard, specially woven lanyard or automatic self-retracting lifeline/lanyard, which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limits the energy imposed on an employee during fall arrest.

Deceleration distance: The additional vertical distance a falling person travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which a deceleration device begins to operate.

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

Fixed ladder: a ladder, including individual rung ladders that is permanently attached to a structure, building, or equipment. It does not include ship's stairs or manhole steps.

Guard rail: A barrier erected to prevent personnel from falling to lower levels.

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

Horizontal lifeline: a flexible line between two horizontal fixed anchorages to which a fall arrest device is connected.

Infeasible: means that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.

Ladder: a device typically used to gain access to a different elevation consisting of two or more structural members crossed by rungs, steps, or cleats.

Lanyard: A flexible line of rope or strap that generally has a connector at each end for connecting the body harness to a deceleration device, lifeline or anchor point.

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

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

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

Opening: A gap or void 30 inches or more high and 18 inches or more wide in a wall or partition, through which personnel can fall to a lower level.

Positioning device system: means a 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.

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, body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

Qualified person: one with a recognized degree or professional certificate and knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project or product.

Restraint line: a device which is attached between the employee and an anchorage to prevent the employee from walking or falling off an elevated surface.

Roof: means the exterior surface on the top of a building.

Roofing work: means 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.

Rope grab (grabbing device): A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest a fall.

Scaffold: means any temporary elevated or suspended platform, at its supporting structures, used for supporting employees or materials or both.

Self-retracting lifeline/lanyard: A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under minimal tension during normal movement and which, after onset of a fall, automatically locks the drum and arrests the fall(usually within two feet or less).

Standard railing: A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

Steep roof: means a roof having a slope greater than 4 in 12 (vertical to horizontal).

Snap hook: A connector consisting 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. **Only locking snap hooks are permitted at the University of Vermont.**

Toe board: A low protective barrier that prevents material and equipment from falling to lower levels and which protects personnel from falling.

Tie-Off: A procedure of connecting directly or indirectly to an anchorage point.

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.

Vertical Lifeline: A component consisting of a flexible line for connection to an anchor point at one end to hang vertically and that serves as a means for connecting other components of a personal fall arrest system to the anchor point.

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, form work 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.

Information and Training

- I. **Physical Plant Employees who work on Ladders:** All Physical Plant employees who use ladders with a working height of six feet or more shall be knowledgeable of the following:
 - A. How to inspect ladders for visible defects; and
 - B. How to use ladders properly.
 - C. How to properly store and maintain ladders.
- II. **Physical Plant Employees who use Fall Protection Personal Protective Equipment to control fall hazards in their work area:** Employees should be knowledgeable of the following:
 - A. The application limits of the equipment;
 - B. The proper hook-up, anchoring and tie-off techniques including determination of elongation and deceleration distance;
 - C. Methods of use; and
 - D. Inspection and storage of equipment.
 - E. How to fill out the Physical Plant's "Job Specific Emergency Action Plan." (Appendix A)
- III. **Physical Plant Employees who use Aerial Lifts:** Employees should be knowledgeable of the following:
 - A. The manufacturer's operating instructions;
 - B. Always close lift platform chains or doors;
 - C. Pre-start inspection of the lift;
 - D. How to fill out the Physical Plant's "Aerial Lift Equipment Inspection Checklist" (Appendix B);
 - E. Inspection of the work area for dangerous conditions such as uneven surfaces, overhead obstructions such as power lines, and severe weather;
 - F. Load capacities of the equipment;
 - G. How to safely move the equipment;
 - H. How to prevent falls and use appropriate fall protection personal protective equipment (full body harness required);
 - I. Non electrical workers must stay a minimum of 10 feet from energized power lines.
 - J. If working near pedestrian or vehicle traffic, setup work zone warnings, such as cones and signs;
 - K. How to fill out the Physical Plant's "Job Specific Emergency Action Plan." (Appendix A)
- IV. **Physical Plant Employees who work on Scaffolds:** Site specific training given by the scaffold competent person is required in the following:
 - A. The nature of all job site hazards including any physical, electrical, fall, falling object hazards, and approaching severe weather;
 - B. The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used;
 - C. The proper use of the scaffold, and the proper handling of materials on the scaffold; and
 - D. Permissible access points and all walking working surfaces.
 - E. The maximum intended load and the load carrying capacities of the scaffolds.
 - F. How to fill out the Physical Plant's "Job Specific Emergency Action Plan." (Appendix A)
- V. **Physical Plant Employees Assigned as Fall Protection Competent Persons:** Employees who act as the competent person for a work area or job site shall be trained and certified. To be considered a competent person, an OSHA 7405 "Fall Hazard Awareness for Construction Industry" (or equivalent) training class and an OSHA NCSH 406 "Scaffold User Course" (or equivalent) must be completed. In addition, the competent person must be knowledgeable of the following:
 - A. The nature of falls in the work area;
 - B. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems used;

- C. The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
 - D. The role of each employee in the safety monitoring system when this system is used;
 - E. The limitations on the use of mechanical equipment during the performance of roofing work on low sloped roofs;
 - F. The correct procedures for the handling and storage of equipment and material, and the erection of overhead protection;
 - G. The role of employees in fall protection plans; and
 - H. The appropriate VOSHA standards.
 - I. Completing Physical Plant's "Job Specific Emergency Action Plan." (Appendix A)
- VI. **Physical Plant Employees Assigned as Scaffold Competent Persons:** Employees who act as a scaffold competent person for a work area or job site shall be trained and certified. To be considered a competent person, an OSHA 7405 "Fall Hazard Awareness for Construction Industry" (or equivalent) training class and an OSHA NCSH 406 "Scaffold User Course" (or equivalent) must be completed. In addition, the competent person must be knowledgeable of the following:
- A. The proper selection of scaffold for the task based upon the type of work to be conducted and the working load to be supported;
 - B. The correct procedures for the erection of scaffolds;
 - C. The correct procedures for the dismantling of scaffolds;
 - D. The correct procedures for the moving of scaffolds;
 - E. The correct procedures for the altering of scaffolds; and
 - F. The VOSHA standards.
 - G. Completing Physical Plant's "Job Specific Emergency Action Plan." (Appendix A)
- VII. Employees will require retraining under any of the following conditions:
- A. Changes in the workplace render previous training obsolete;
 - B. Changes in the types of fall protection systems or equipment to be used render previous training obsolete;
 - C. Inadequacies in an employee's knowledge of use of fall protection systems or equipment or observed behavior indicate that the employee has not retained the required training.
 - D. Not following the written "Job Specific Emergency Action Plan." (Appendix A) before work begins.

Training records will be maintained at the Training and Compliance Office (TCO). Contact TCO at (802)656-SAFE(7233) for more information on training requirements, and scheduling.

Fall Hazards

Each employee shall be responsible to inspect for potential fall hazards and to have each potential fall hazard evaluated by a competent person.

Falls may be classified into three general categories:

1. Slips, trips and falls on the same level;
2. Falls on stairs; and
3. Falls from elevations.

Slips and trips are generally caused by a lack of good housekeeping and inadequate maintenance of walking and working surfaces. Employees should keep their area clean and orderly. If they are not equipped to eliminate a hazard, they should contact the appropriate maintenance personnel to correct the problem. These hazards may include icy sidewalks, wet floors, torn floor coverings and stair treads, and missing or broken hand rails and guard rails.

Fall hazards from elevations include, but are not limited to, unprotected sides and edges of roofs, excavations, skylights, floor holes, wall openings, and all other walking or working surfaces where personnel can possibly fall four feet or more to a lower level.

Personnel should alert their supervisors to potential fall hazards not already identified and controlled. The following are fall hazards which require protection:

- Open sided floors, platforms, and runways four feet or more in height.
- Open sided floors, ramps, walkways etc. that are adjacent to or above dangerous operations must be guarded regardless of height.
- Wall openings from where there is a drop of more than 4 feet.
- Open windows from which there is a drop of more than 4 feet and the bottom of the window is less than 3 feet above the floor or platform.
- Hatchways, chutes, and other floor openings.
- Any opening more than 4 feet in elevation where a significant portion of the body is leaning over or through to perform work.
- Skylights that are even with the roof surface or that may otherwise serve as a walking/working surface.
- Scaffolds over 6 feet.
- Aerial lift devices.

Protection from overhead falling hazards must be provided.

- Placement of toe boards and the use of hard hats shall be required.
- Equipment shall not be stored within six feet of an unprotected edge.
- Canopy structures may be required in high traffic areas.
- The area to which objects could fall must be barricaded and individuals prohibited from entering.
 - If individuals need to access the barricaded area, then all overhead work must cease.

Engineering Controls

Each employee shall have a competent person determine if engineering controls can eliminate or lessen the hazard of the work area or job site. Engineering controls shall be provided where possible to minimize fall hazards. Engineering controls of fall hazards consist of the following:

- I. **Guardrails and Toeboards:** These requirements apply to temporary controls on job sites as well as permanent fixtures in general work areas.
 - A. A standard railing consists of a top rail, mid rail, and posts and is 42 inches high from the top of the rail to the floor, platform, runway or ramp. Nominal height of the mid rail is 21 inches;
 - B. Standard toeboards must be a minimum of 3.5 inches high, no more than 1/4 inch clearance to the floor. If a mesh material is used, the opening must be less than 1 inch;
 - C. The anchoring of posts and framing of members for railings of all types must be of such construction that the completed structure is capable of withstanding a load of 200 pounds applied in any direction at any point on the top rail;
 - D. Guardrail systems have a surface that prevents injuries such as punctures and lacerations and prevents snagging of clothing; and
 - E. When guardrail systems are in hoisting areas, a chain gate or removable guardrail section shall be in place when not being used.
- II. **Skylights**
 - A. Skylights in the work zone must be protected by;
 - I. a standard railing, standard skylight screen, grill work with 4 by 4 inch openings or slatwork with 2-inch openings; and
 - II. standard skylight screens must be capable of withstanding minimum load of 200 pounds applied perpendicular to any point on the screen and will not deflect under ordinary loads and impacts and break glass.
- III. **Covers**
 - A. Covers for holes, including grates, 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;
 - B. Covers located on 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 it;
 - C. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees;
 - D. Covers shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard when it is not readily apparent; and
 - E. While a cover is not in place, the pit or trap opening shall be constantly attended by someone or shall be protected on all exposed sides by removable standard railings.

IV. Designated Areas and Controlled Access Zone

As an alternative to installing guardrails, a controlled access zone may be established. The following conditions and requirements must be met in order to use designated areas and controlled access zones 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; and
- C. The designated area shall consist of an area surrounded by a rope, wire, or chain and supporting stanchions.
 - I. After being erected with the line attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion;
 - II. The line shall have a minimum breaking or tensile strength of 500 pounds;
 - III. 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;
 - IV. The line shall be installed in such a manner that its lowest point is no less than 34 inches nor more than 39 inches from the work surface;
 - V. The line forming the designated area shall be clearly visible from any unobstructed location within the designated area up to 25 feet away;
 - VI. The stanchions shall be erected as close to the work area as is permitted by the task;
 - VII. The perimeter of the designated area shall be erected no less than 6 feet from the unprotected side or edge; and
 - VIII. Access to the designated area shall be by a clear path formed by two lines attached to stanchions.
 - IX. Work within the controlled access zone with a safety monitor must be pre-approved by the Training and Compliance Office.

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.

Fall protection equipment includes: 1. Restraint, 2. Fall Arrest, 3. Positioning, and 4. Suspension.

I. Restraint

A restraint line is a device which is attached between the employee and an anchorage point to prevent the employee from walking or falling off an elevated surface. It does not support an employee at an elevated surface, but rather, prevents the employee from leaving the elevated surface or work position.

II. Fall Arrest

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. Physical plant 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 is prohibited.
- B. **Connecting Device** - Shock-absorbing lanyards and lifelines
 1. Lanyards and lifelines shall have a minimum breaking strength of 5,000 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. Self-retracting lifelines and lanyards shall have a tensile strength of at least 3,000 pounds and limit free fall to two feet or less (5,000 pounds for ripstich lanyards, and tearing and deforming lanyards);
 6. Personal fall arrest systems shall limit the maximum arresting forces to 1,800 pounds with a full body harness;
 7. The maximum free fall distance is six feet for all systems;
 8. The maximum deceleration distance is 3.5 feet;
 9. Personal fall arrest systems shall have sufficient strength to withstand twice the potential impact energy of the falling employee;
 10. Lifelines shall be protected against cutting and abrasions;
 11. Horizontal lifelines shall be designed, installed and used under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of two. On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline; and
 12. Each employee shall be attached to a separate lifeline when vertical lifelines are used. On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

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 5,000 pounds per employee attached, or shall be designed, installed (temporarily or permanently), and used as part of a complete fall arrest system which maintains a factor of two and under the supervision of a qualified person;
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.

III. **Positioning (not applicable to this written program)**

IV. **Suspension (not applicable to this written program)**

Any other personal protective equipment deemed necessary for the task under the Personal Protective Equipment Standard must be worn. This includes but is not limited to hard hats, gloves, safety glasses, and steel toed boots. Hard hats shall be worn within an area beneath elevated work where objects could fall from a height and strike a worker.

Equipment Inspections and Maintenance

I. **Impact Loading**

Any fall arrest system or component that has been used to arrest a fall (impact loading) shall be immediately removed from service.

II. **Inspection**

Visual equipment inspections shall be conducted by personnel prior to each use. If, upon inspection, a piece of equipment shows any signs of wear it must immediately be removed from service and the supervisor notified.

III. **Maintenance**

When needed, fall protection devices should be washed in warm water using a mild detergent, rinsed thoroughly in clean warm water and allowed to dry at room temperature. Stow equipment in clean area away from strong sunlight and extreme temperatures which could degrade materials. Check the manufacturer's recommendations for cleaning, maintenance and storage information.

Roofing

The hazards associated with work on roofs include falling through openings and falling off edges. The protection of openings is discussed in the engineering controls section of this program.

Effective roof work fall protection techniques are intended to protect workers while providing the mobility and comfort necessary to perform work tasks. Site specific evaluations shall be conducted to determine the most feasible fall protection method. The Physical Plant prefers the utilization of engineering controls to eliminate fall hazards (see section above). Several techniques are available and are described below.

I. Low-slope or Flat Roofs

Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by:

1. Guardrail systems,
2. Restraint system,
3. Personal fall arrest systems,
4. Warning line system and safety monitoring system (must be pre-approved by The Training and Compliance Office).

II. Steep roofs

Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems with toeboards or personal fall arrest systems.

Scaffolds

I. Use of Scaffolds

A. Selection

The proper scaffold selected for the task by the competent person is based upon the type of work to be conducted and the working load to be supported.

1. Light duty scaffolds are intended for workers and tools only. The design load should be that it will support a working load of 25 pounds per square foot;
2. Medium duty scaffolds are intended for workers, tools and construction materials. The design load should be that it will support a working load of 50 pounds per square foot; and
3. Heavy duty scaffolds are intended for workers, tools, stored materials, and construction materials. The design load of the scaffold should be that it will support a working load of 75 pounds per square foot.

All scaffolds must be capable of supporting at least four times the design load.

B. General Requirements

1. Fall protection is required for all scaffold use 6 feet above a lower level.
2. All scaffolds, where work is conducted in excess of 6 feet in height, shall have at least a 3.5 inch toeboards or mesh netting;

3. Toeboards should be sized based on objects or materials on the scaffolding;
4. A scaffold shall not be moved while personnel are on it;
5. Follow all manufacturer's guidelines and special warnings if the scaffold is commercially produced;
6. The maximum work level height shall not exceed 4 times the least base dimension of the scaffold. Example: a four foot by six foot scaffold cannot exceed sixteen feet in height at the work platform level;
7. The minimum working platform width is two feet;
8. The supporting structure for the scaffold must be rigidly braced, using adequate cross bracing or diagonal bracing with rigid platforms at each work level;
9. Working platforms should have a nonslip surface;
10. The platform surface should be kept clear of extraneous tools and materials;
11. The work level platform shall be wood, aluminum, plywood planking, steel or expanded metal for the full width of the scaffold, except for necessary protected openings
12. Work platforms shall be secured in position;
13. All work platform planking shall be compliance grade lumber. Planks shall be overlapped a minimum of 12 inches and extended over supports 6 - 12 inches;
14. Follow all manufacturer guidelines in the assembly of the scaffold. Do not use or assemble the scaffold, if unsure of the correct assembly procedure;
15. Hard hats must be worn within an area beneath elevated work where objects could fall from a height and strike a worker; and
16. Mobile scaffolds shall not be moved unless the surface of travel is within 3 degrees of level and free of pits, holes and obstructions, and the employee on the scaffold has advanced knowledge of the movement.

II. Inspection of Scaffolds

Prior to the use of any scaffold, an inspection must be conducted, and then daily during usage of the scaffold.

- A. Carefully examine the scaffold for broken or missing cross bracing, broken supporting structure, working platform, and other damaged parts. In addition, all walking and working surfaces must be free of grease, oil, paint, or other slippery substances;
- B. Mobile scaffolds should be equipped with positive wheel lock casters that are secured in place;
- C. The joint between working platform and supporting structure must be tight, and all hardware and fittings should be attached firmly. Movable parts should operate freely without binding or undue play;
- D. All wood parts must be free of sharp edges and splinters. Visually inspect the scaffold to be free of shakes, warpage, decay or other irregularities. Metal parts must be free of sharp edges, burrs and corrosion. Inspect for dents or bends in supporting structure, cross braces and walking/working surfaces;
- E. Check all working platform to support structure connections, hardware connections and rivets. If a scaffold tips over, inspect the scaffold for damage before continuing work; and
- F. Damaged scaffolds must be withdrawn from service and either repaired or destroyed. When a defect or unsafe condition is found, personnel shall tag or mark the scaffold so that it will not be used until corrective action is taken. Defective or unsafe situations shall be reported to the supervisor. Field repairs and the fabrication of improvised scaffold are prohibited.

III. Maintenance of Scaffolds

All scaffold repairs must be done by a qualified person.

IV. Storage of Scaffolds

Scaffolds should be disassembled prior to storage. Scaffolds should be stored where they can be inspected easily and can be reached without causing accidents. The storage area should be well ventilated and away from sources of heat and moisture.

Aerial 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.**
- **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 ladders 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 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 boom or 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;
- 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.

II. Minimum Safe Approach Distances (M.S.A.D)

The minimum safe approach distances to energized power lines and parts must be 10 feet and maintained at all times. When working within the 10 feet range contact local utilities to insulate the power line.

Portable Ladders

I. Use of Portable Ladders

The proper ladder must be selected for the task. General rules include the following:

- A. The ladder chosen must be long enough to provide access to the work area without necessitating standing on the top two steps of a stepladder or the top three rungs of a straight ladder;
- B. The ladder selected must be sufficient for the weight of the employee plus the weight of any tools and materials:
 - 1. TYPE 1A-Extra-heavy industrial ladder will support 300 lbs.
 - 2. TYPE 1-Heavy-duty industrial ladder will support 250 lbs.
 - 3. TYPE 2-Medium-duty commercial ladder will support 225 lbs.
 - 4. TYPE 3-Light-duty household ladder will support 200 lbs.;
- C. When a straight ladder is used to gain access to a roof, the side rails should extend at least three feet above the support point at the eave, gutter, or roof line;
- D. Never splice together short ladders to form a longer ladder;
- E. Never place ladders on boxes, barrels, or other unstable bases for additional height;
- F. Ladders must be placed on level surfaces. Although ladder feet or shoes provide an important measure of safety, they cannot compensate for uneven ground unless they are designed with adjustable feet;
- G. Be alert to slippery surfaces. Nonslip bases are not a substitute for safety in placing, lashing, or holding a ladder on oily, metal, concrete, or other slippery surfaces;
- H. Do not use ladders for unintended purposes;
 - I. Do not use a metal ladder when working on or near electrical equipment, only use a properly rated non-conductive ladder should be used;
- J. The distance from the bottom of a straight ladder to its support wall shall be one-quarter the working length of the ladder;
- K. Where possible, straight ladders should be secured with a rope or wire at the top and blocked at the bottom;
- L. The top two steps and platform of a stepladder shall not be used, and the top three rungs of a straight ladder shall not be used;
- M. Do not over-reach, jump or slide a ladder while on it. Ladders shall not be moved, shifted, or extended while occupied;
- N. Always face the ladder and use both hands while ascending and descending.
- O. Tools or materials should be raised by means of a rope after the climber has reached the working position. Carrying heavy loads up or down ladders is prohibited;
- P. Barricades and warning signs should be posted when ladders are placed near doors or other locations where they could be struck;
- Q. Two workers shall handle and set up all extension ladders;
- R. Ladders should not be used by more than one person at a time unless they are designed for such use;
- S. The bracing on the back side rails of stepladders is designed only for increasing stability, not for climbing;
- T. Ladders shall not be used horizontally as platforms, runways, or scaffolds.
Extension ladders must have proper overlap.
 - 1. Three foot overlap for 32 foot ladder;
 - 2. Four foot overlap for 32 to 36 foot ladder;
 - 3. Five foot overlap for 36 to 48 foot ladder; and
 - 4. Six foot overlap for 48 foot ladder;

- U. Make certain that both automatic locks of the extension ladder are in proper position before ascending the ladder;
- V. Straight ladders and stepladders that exceed 10 feet may be held by another person for steadying;
- W. The area around the top and bottom of the ladder shall be kept clear; and
- X. Hard hats must be worn within an area beneath elevated work where objects could fall from a height and strike a worker.

II. Inspection of Ladders

Prior to use of any ladder, an inspection must be performed:

- A. Carefully examine the ladder for broken or missing rungs or cleats, broken side rails, and other damaged parts;
- B. All cleats, rungs, and side rails must be free of grease, oil, paint, or other slippery substances;
- C. The ladder should be equipped with feet that are secured in place;
- D. The joint between steps and side rails must be tight, and all hardware and fittings should be attached firmly. Movable parts should operate freely without binding or undue play;
- E. All wood parts must be free of sharp edges and splinters;
- F. Visually inspect the ladder to be free of shakes, warpage, decay or other irregularities;
- G. Metal ladders must be free of sharp edges, burrs and corrosion;
- H. Inspect for dents or bends in side rails, rungs or cleats;
- I. Check step to side rail connections, hardware connections and rivets; and
- J. If a ladder tips over, inspect the ladder for damage before continuing work.

III. Maintenance of Ladders

Damaged ladders must be withdrawn from service and either repaired or destroyed. When a defect or unsafe condition is found, personnel should tag or mark the ladder so that it will not be used until the corrective action is taken. Defective or unsafe conditions must be reported to the supervisor. Field repairs and the fabrication of improvised ladders is prohibited. Never try to straighten a bent or bowed ladder. Remove it from service immediately. Do not paint wooden ladders with solid color paints. This may mask cracks in the wood and make them hard to see. Clear wood preservative can be used to protect bare wood.

If exposed to greases, oils or other slippery substances, the ladder must be cleaned of the substance with solvents or steam. If the slippery substance is not completely removed, the ladder must be removed from service.

IV. Storage of Ladders

Ladders should be stored where they can be inspected easily and can be reached without causing accidents.

Fixed Ladders and Stairs

I. Fixed Ladders

- A. Fixed ladders should be designed to withstand a single concentrated load of at least 200 lbs;
- B. Rungs of metal ladders must have minimal diameter of three quarters inch. Rungs must be at least 16 inches wide, be spaced 12 inches apart;
- C. Fixed Ladders, when their location so demands, must be painted or treated with a preservative to resist deterioration;
- D. The preferred pitch for a safe descent is 75 to 90 degrees. Ladders with 90 degree pitch must have two and one half feet of clearance on the climbing side. There must be a three foot clearance on ladders with a 75 degree pitch;
- E. There must be at least a seven inch clearance in back of the ladder to provide adequate toe space;
- F. There must be a clear width of 15 inches on each side of the center line of the ladder, unless the ladder is equipped with a cage or well;
- G. Fixed ladders must have cages if they are longer than 20 feet. Landing platforms must be provided on ladders greater than 20 feet long. A platform is required every 30 feet for caged ladders and every 20 feet for unprotected ladders; and
- H. Side rails must extend at least 42 inches above the landing.

II. Fixed industrial stairs

The following applies to all stairs around equipment, machinery, tanks etc. They do not apply to stairs used for fire exits:

- A. Riser height and tread width of fixed industrial stairs should be uniform throughout any flight of stairs. All treads must be reasonably slip resistant;
- B. The minimum permissible width of a stairway is 22 inches;
- C. The angle to the horizontal made by the stairs must be between 30 and 50 degrees;
- D. All stairs should have adequate lighting; and
- E. If the tread is less than 9 inches wide the risers should be open.

III. Alternating Tread Stairs

Alternating tread type stairs are permitted if they are installed, used, and maintained according to the manufacturer's recommendations:

- A. The stair must be installed at an angle of 70 degrees or less; and
- B. The stairs must be equipped with a handrail at each side to assist the workers in climbing or descending.

WALKING AND WORKING SURFACES

In general, all areas of the workplace should be kept clean, orderly sanitary, and as dry as possible. These guidelines apply to work areas, passageways, store rooms, and service rooms:

1. All spills should be cleaned promptly. Floors in work areas must be kept free of scraps, chips, oil spills, and other debris;
2. Boxes, chairs, buckets, desks or any other device not specifically intended for use in extending reach shall not be used;
3. Areas which are constantly wet should have non-slip surfaces or mats where workers may walk or work. Where wet processes are used good drainage must be maintained;
4. Every floor, working place, and passageway must be maintained free from protruding nails, splinters, holes, and loose boards;
5. Where mechanical handling equipment is used, such as lift trucks, sufficient safe clearance must be provided for foot and vehicular traffic;
6. No obstructions that could create a hazard are permitted in aisles. All permanent aisles must be easily recognizable; and
7. As a general condition, a standard toe board or mesh netting and guard rail are required where ever people walk near or beneath the open sides of a platform or similar structures; where things could fall from a structure; or where things could fall from a structure into machinery below.

APPENDIX A
“Job Specific Emergency Action Plan”



**FALL PROTECTION PLAN
(Location)**

Name: _____

Date: _____

Insert Picture

Problem:

Corrective Action:

Applicable VOSHA Regulation:

1926.501(b)(4)(i)

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.

**EMERGENCY AND ASSISTANCE
POST FALL RESCUE & EMERGENCY TELEPHONE NUMBERS**

No work shall be performed where an emergency cannot be immediately observed and prompt rescue assistance summoned.

A rescue plan should be in place prior to beginning any work where a fall hazard exists. The rescue plan must be well thought out, documented in the “Job Specific Emergency Action Plan” (Appendix A) and all individuals involved must thoroughly understand the rescue plan. Prompt rescue shall be provided for personnel who have fallen.

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE

CALL IMMEDIATELY FOR ANY EMERGENCY
INCLUDING CHEMICAL SPILL, FIRE, INJURED,
TRAPPED OR SICK PERSON.

* From the University of Vermont In-House Phone System

9-1-1

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE

From Cellular Phone Service

(802)-656-3473

CALL IMMEDIATELY FOR ANY EMERGENCY
INCLUDING CHEMICAL SPILL, FIRE, INJURED,
TRAPPED OR SICK PERSON.

* When using cellular phone service 911 will be directed to Williston State Police.

Physical Plant Department Training and Compliance Office (802)656-SAFE (7233)
(Asbestos and Lead Management, mold remediation,
Occupational Safety and Health)

Environmental Safety Facility (802)656-5400
(Chemical cleanup, disposal and storage)

Department of Risk Management (802)656-3242
(Accident investigations, insurance services)

Concentra Medical Center (802) 658-5756
(Medical Consultation and Evaluation)

Service Operations Support (Physical Plant Department) (802)656-2649

Appendix B
“Aerial Lift Equipment Inspection Checklist”



Aerial Lift Equipment Inspection Checklist

- To be completed by operator when checking out and checking in equipment.
- Inspect equipment periodically.
- Use only equipment which is in safe working condition.
- DO NOT operate equipment if any items inspected need repair.
- Notify equipment yard attendant of any needed repairs or in his absence, the maintenance mechanics in B-519.

Equipment Number/Type of Vehicle	
Location of Use	
Operators Name (Please Print)	Phone #
Badge #	Pager #
Inspection Date/Out	Inspection Date/In
Hour Meter/Out	Hour Meter/In

Check (Add if necessary)	OUT O.K.	Repair Needed	IN O.K.
Oil Level			
Fuel Level			
Coolant Level (DO NOT CHECK IF HOT)			
Tire Pressure/Condition			
Hydraulic Level			
Leaks			
CHECK OPERATIONS:			

Horn			
Gauges			
Brakes			
Lights			
Steering			
Attachments			
Accessories			
Backup Alarm			
Warning Lights			
Warning Buzzer			

RECORD MALFUNCTIONS, DAMAGE, OR PROBLEMS:
