

PROVIDENCE COLLEGE
FALL PROTECTION POLICY

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Fall Protection Policy

OBJECTIVE

To protect workers by reducing the risk of injury or fatality when working at heights six feet or more above ground level.

POLICY

All employees, and outside contractors working under direct Providence College supervision shall comply with all elements of the Providence College Fall Protection Program.

RESPONSIBILITIES

Environmental Health and Safety

Environmental Health and Safety (EH&S) is responsible for policy development and review and to insure compliance with all applicable federal and state regulations. EH&S will provide technical guidance and assistance in training and methods of compliance. EH&S staff are authorized to halt any unsafe work practice that is not in accordance with this or any other Providence College health and safety policy.

Supervisors

Supervisors must be able to identify and provide the necessary personal fall protection equipment required for working in fall hazard situations. The supervisor is the acting “competent person”, as defined by OSHA, for the assigned work. OSHA defines a competent person as:

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

Employees

Employees are responsible for wearing the appropriate fall protection equipment when directed and for following the procedure specified in this policy. Employees are responsible for the proper care, use and inspection of their assigned fall protection equipment. Employees are expected to report any unsafe conditions to a supervisor.

FALL PROTECTION PROGRAM

General

All work performed from elevated surfaces including pitched roofs, flat roofs, ledges, mobile lifts, ladders, scaffolding and other work platforms shall be in accordance with this policy and with the following Fall Protection Program.

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

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

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

Training

Each employee who may be exposed to fall hazards shall be trained to recognize the hazards and the procedures to follow to minimize the hazards. A competent person will provide the training.

The competent person must train employees in the following areas:

- fall hazards in the work area
- correct procedures for erecting, maintaining, disassembling and inspecting the fall protection systems used
- selection, proper use and care of equipment comprising a personal fall arrest system
- role of employees in fall protection plans
- what rescue procedures to follow in case of a fall
- overview of the OSHA fall protection standards

A training record shall be maintained for each employee. The record will contain the name of the employee trained, date of training and the signature of the person who conducted the training.

Retraining shall be required every three years and if there is a change in the fall protection system being used or if an employee's actions demonstrate that the employee has not retained the understanding or skills important to fall protection.

FALL PROTECTION SYSTEMS

One of the following systems shall be in place whenever an employee is exposed to a fall hazard of six feet or higher.

A. Guardrail systems

The use of guardrail systems is considered a passive method of fall protection and is actually the preferred method for eliminating fall hazards.

Guardrails are needed at the edge of work areas 6 feet or more in height to protect employees from falling. This includes the edge of excavations greater than six feet in depth. Guardrail systems need to meet the following criteria:

- Toprail is 42 inches above the walking/working level
- Midrail is located midway between the top rail and the walking/working level
- It is important to remember that the working level is that level where the work is being done. Someone working on a stepladder next to an edge may raise his/her working surface well above the walking surface.
- Both top and midrails should be constructed of 2x4 wooden stock, or if pipe railings, shall be of 1.5 inches nominal diameter. If wire rope is used for top rails, it needs to be flagged with a high-visibility material at least every 6 feet and can have no more than 3" of deflection
- The top rail needs to withstand a force of 200 pounds when applied in any downward or outward direction.
- The midrail needs to withstand a force of 150 pounds when applied in any downward or outward direction
- Toeboards are required for all guardrails on elevated walking or working platforms where employees working below are exposed to falling objects. Toeboards must be four inches in height and must be securely fastened.
- The system should be smooth to prevent punctures, lacerations or snagging of clothing
- The ends of the top rail shouldn't overhang the terminal posts, except when such overhang does not present a projection hazard
- When a hoisting area is needed, a chain, gate or removable guardrail section must be placed across the access opening when hoisting operations are not taking place.

B. Personal Fall Arrest Systems

Personnel requiring the use of personal fall protection equipment shall employ the "Buddy System" or have an observer to render assistance when and if required.

There are three main components to the personal fall arrest system. This includes the personal protective equipment the employee wears, the connecting devices and the anchorage point. Prior to tying off to perform the work a means of rescue in the event of a fall must be immediately available. All personal fall arrest system components must meet the requirements of the ANSI Z359 Standards. The system needs to meet the following criteria for each component:

Personal Protective Equipment

- Full body harnesses are required. The use of body belts is prohibited.
- The attachment point of the body harness is the center D-ring on the back.
- Employees must always tie off at or above the D ring of the harness except when using lanyards 3 feet or less in length.
- Harnesses or lanyards that have been subjected to an impact load shall be destroyed.
- Load testing shall not be performed on fall protection equipment.

Connecting devices

This device can be a rope or web lanyard, rope grab or retractable lifeline.

- Only locking snap hooks may be used.
- Horizontal lifelines will be designed by a qualified person and installed in accordance with the design requirements.
- Lanyards and vertical lifelines need a minimum breaking strength of 5,000 pounds.
- The length of a single lanyard shall not exceed six feet.
- The use of steel lanyards is prohibited.
- Lanyards may not be clipped back to itself (e.g. around an anchor point) unless specifically designed to do so.
- If vertical lifelines are used, each employee will be attached to a separate lifeline.
- Lifelines need to be protected against being cut or abraded

Anchorage Points

Secure anchor points are the most critical component when employees must use fall arrest equipment. Campus buildings may have permanently fixed anchor points, or existing structures (e.g., steel structural beams) that may meet the criteria for a secure anchor point. Other work locations may require the installation of a temporary or permanent anchor. At a minimum, the following criteria must be considered for each type of anchor point:

- Structure must be sound and capable of withstanding a 5000 lb. static load.
- Structure/anchor must be easily accessible to avoid fall hazards during hook up.
- Direct tying off around sharp edged structures can reduce breaking strength by 70%. Therefore, chafing pads or abrasion resistant straps must be used around sharp edged structures to prevent cutting action against safety lanyards or lifelines.

- Structures used as anchor points must be at the worker's shoulder level or higher to limit free fall to 6 feet or less and prevent contact with any lower level (except when using a self-retracting lifeline or 3 foot lanyard).
- Choose structures for anchor points that will prevent swing fall hazards. Potentially dangerous "pendulum" like swing falls can result when a worker moves horizontally away from a fixed anchor point and falls. The arc of the swing produces as much energy as a vertical free fall and the hazard of swinging into an obstruction becomes a major factor. Raising the height of the anchor point can reduce the angle of the arc and the force of the swing. Horizontal lifelines can help maintain the attachment point overhead and limit the fall vertically. A qualified person must design a horizontal lifeline.

Permanent Anchor Requirements

In addition to all the criteria listed above, the following points must be considered:

- Environmental factors and dissimilarity of materials can degrade exposed anchors.
- Compatibility of permanent anchors with employee's fall arrest equipment.
- Inclusion of permanent anchors into a Preventive Maintenance Program with scheduled annual re-certification.
- Visibly label permanent anchors.
- Roof anchors must be immediately removed from service and re-certified if subjected to fall arrest forces.

Reusable Temporary Anchors

- Reusable temporary roof anchors must be installed and used following the manufacturer's installation guidelines.
- Roof anchors must be compatible with employee's fall arrest equipment.
- Roof anchors must be removed from service at the completion of the job and inspected prior to reuse following the manufacturer's inspection guidelines.
- Roof anchors must be immediately removed from service and disposed of if subjected to fall arrest forces.

Complete system

- If a fall occurs, the employee should not be able to free fall more than 6 feet nor contact a lower level.
- To ensure this, add the height of the worker, the lanyard length and an elongation length of 5.5 feet. Using this formula, a six-foot worker with a 4 foot lanyard would require a tie-off point at least 15.5 feet above the next lower level.
- A personal fall arrest system that was subjected to an impact needs to be removed from service immediately.
- Personal fall arrest systems need to be inspected prior to each use and damaged or deteriorated components removed from service.
- Personal fall arrest systems should not be attached to guardrails or hoists.

Inspection

The employee shall inspect the entire personal fall arrest system prior to every use. A competent person will inspect the entire system in use at the initial installation and prior to use. The visual inspection of a personal fall arrest system shall follow the manufacturer's recommendations. Any components of a personal fall arrest system noted to be damaged shall be removed from service immediately. An example of a complete inspection is in Appendix B.

C. Warning Line Systems and Controlled Access Zones

Warning line systems and work in controlled access zones must be developed in accordance with OSHA regulation 1926.502 and must be approved by EH&S or their designee before employees are exposed to fall hazards.

D. Monitoring System

OSHA emphasizes that safety-monitoring systems are a last resort and may only be used when other systems are infeasible or present a greater hazard. Monitoring systems must be developed in accordance with OSHA regulation 1926.502 and must be approved by EH&S or their designees before employees are exposed to fall hazards.

Work from Aerial Lifts and Self Powered Work Platforms

Training in the proper operation and inspection of the equipment must be received prior to operating or working from an aerial lift or self-powered work platform, regardless of the type.

Body harnesses must be worn with a shock-absorbing lanyard (preferably not to exceed 3 feet in length) and must be worn when working from an elevated work platform (exception: scissor lifts and telescoping lifts that can move only vertically do not require the use of a harness and lanyard as long as the work platform is protected by a guardrail system). The point of attachment must be the anchor point installed by the equipment manufacturer. Personnel cannot attach lanyards to adjacent poles, structures or equipment while they are working from the aerial lift.

Personnel cannot move an aerial lift while the boom is in an elevated working position and the operator is inside of the lift platform.

Loading docks

Loading docks and other open sided floors greater than 6 feet above ground level must be protected. The approved method of protection is the installation of a standard guardrail as described in this section. The guardrail may have removable sections to provide access for loading but rails must remain in place when access is not required.

Skylights

Skylights are considered an opening when present on a roof. A standard guardrail or skylight screens capable of supporting at least 200 pounds must be provided around the opening to prevent workers from falling through to the surface below.

Skylights constructed at least 42 inches above the roof deck with sides capable of supporting 200 pounds do not require additional protection.

Reference

29 CFR 1926 Subpart M (Fall Protection in Construction); 20 CFR 1910 Subpart D (Walking-Working Surfaces – General Industry); 29 CFR 1910.132 (Personal Protective Equipment – General Requirements).

APPENDIX A

TERMS AND DEFINITIONS

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

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

Body harness: straps that may be secured about the 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.

Connector: A device that is used to couple (connect) parts of a personal fall arrest system or positioning device system together.

Deceleration device: any mechanism, such as a rope, grab, ripstitch lanyard, specially-woven lanyard, tearing lanyard, deforming 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.

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

Hole: a void or gap two (2) inches (5.1 centimeters) or more in the least dimension in a floor, roof, or other walking/working surface.

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

Leading edge: the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed.

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

Opening: a gap or void 30 inches (76 centimeters) or more high and 18 inches (46 centimeters) or more wide, in a wall or partition through which employees can fall to a lower level.

Personal fall arrest system: a system including but not limited to an anchorage, connectors, and a body harness used to arrest an employee in a fall from a working level.

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

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

Safety monitoring system: a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

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

Snaphook: a connector consisting of a hook-shaped member with a normally closed keeper, or a similar arrangement, which may be opened to permit the hook to receive an object and, when released automatically, closes to retain the object.

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

Toeboard: a low protective barrier that prevents material and equipment from falling to lower levels and which protects personnel from falling.

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 39 inches (1 meter) high.

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

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

APPENDIX B

PERSONAL FALL ARREST SYSTEM INSPECTION

Harness Inspection

Webbing

Inspect the entire surface of webbing for damage. Beginning at one end, bend the webbing in an inverted “U”. Holding the body side of the belt toward you, grasp the belt with your hands six to eight inches apart. This surface tension makes the damaged fibers or cuts easier to see. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns, and chemical damage.

“D” Rings/Back Pads

Check “D” rings for distortion, cracks, breaks, and rough or sharp edges. The “D” ring should pivot freely. “D” ring back pads should also be inspected for damage.

Attachment of Buckles

Note any unusual wear, frayed or cut fiber, or distortion of the buckles.

Tongue/Grommet

The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. The webbing should not have any additional punched holes.

Tongue Buckle

Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. The roller should turn freely on the frame. Check for distortion or sharp edges.

Friction and Mating Buckles

Inspect the buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.

Lanyard Hardware Inspection

- Snaps: Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper locks must prevent the keeper from opening when the keeper closes.
- Thimbles: The thimble must be firmly seated in the eye of the splice, and splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.

Web Lanyard

While bending the webbing over a curved surface such as a pipe, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Examine the webbing for swelling, discoloration, cracks, or burns. Observe closely for any breaks in the stitching.

Rope Lanyard

Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a noticeable change from the original diameter. The rope diameter should be uniform throughout, following a short break-in period. Make sure the rope has no knots tied in it. Knots can reduce the strength of the rope by up to 60%.

Shock-absorbing Lanyard

Shock-absorbing lanyards should be examined as a web lanyard. However, also look for signs of deployment. If the lanyard shows signs of having been put under load (e.g. torn out stitching), remove it from service.

Self-Retracting Lanyard/Lifeline

- The lanyard housing must be inspected to ensure that casing bolts are tight and that there are no loose fasteners, missing parts, cracks or excessive wear or corrosion.
- Webbing must be inspected for cuts, nicks or tears as well as for any broken fibers, stitching or fraying.
- Steel lanyards should be inspected for cuts, fraying, broken wires and overall deterioration and excessive wear.
- Fittings are to be inspected for wear or cracks and obvious damage.
- Follow manufacturer's recommendations for additional inspection tasks and for any requirements that the unit be sent in to the manufacturer for periodic inspection.