



VCU

Safety and Risk Management

Fall Protection Safety Program

Introduction

Virginia Occupational Safety and Health (VOSH) has Fall Protection Safety regulations that ensure safe-work activities when the possibility of falling is present. Virginia Commonwealth University (VCU) has developed this Fall Protection Safety Program to establish a system for fall risk recognition and mitigation, program roles and responsibilities, safe work practices, fall protection equipment (FPE) selection and inspection, and record keeping for common fall hazards at the university.

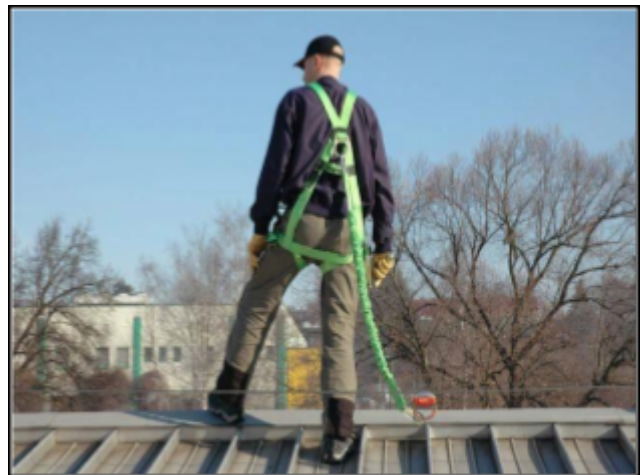
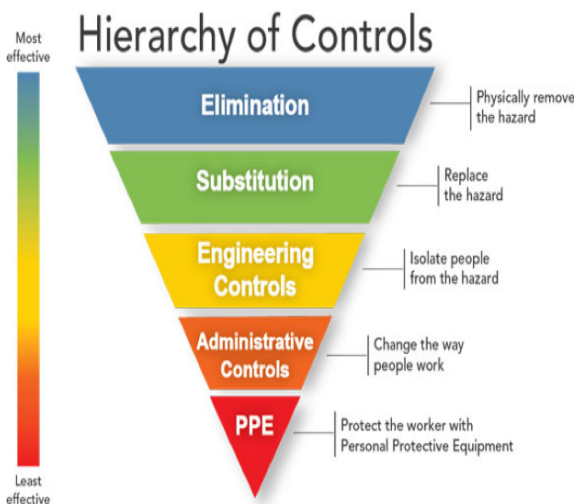


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I. Purpose

Nationally, Slips, Trips and Falls are one of the leading causes of occupational fatalities and a major source of occupational injury at VCU. Under most working conditions, anyone exposed to a fall hazard of 4 feet or more are required to mitigate fall hazards using one or more techniques:



- Elimination of fall hazards may be achieved at the design phase of a large project, but often cannot be completely avoided
- Engineering controls, such as guardrails and parapets are preferred where fall hazards cannot be designed out of the environment
- Limiting access to only those individuals who are trained and qualified is an administrative control
- PPE, such as Safety Harnesses, Fall Prevention lanyards and Fall Arrest Systems
- *Designated Areas* are an administrative Fall Protection control, but for the fall protection program specifically, are not as desirable as other mitigation solutions

II. Applicability/Scope

This VCU Fall Protection Program applies to all employees, faculty, students and contractors on VCU property who are exposed to fall hazards and/or where activities may result in injuries from falls.

III. Roles/Responsibilities

A. Safety Program Roles & Responsibilities - General:

Roles and Responsibilities for the safety program in every department may be administered differently, depending on specific hazards, departmental expertise, staffing and program scope. All safety programs at VCU should adhere to the general Safety Program Administration guidelines outlined [here](#)

B. VCU Fall Protection Program Specific Roles & Responsibilities:

1. Owner Department

The "Owner Department" is a VCU School or Department that owns FPE and/or

has operational control over identified fall hazards. The Owner Department is responsible to identify fall hazards/activities in their workplace and design into locations engineering controls such as guardrails, fall barriers, edge protection, etc., to prevent access to a fall hazard. Only when engineering controls cannot be used/implemented is FPE to be used to control fall hazards to personnel in a department's operations/facilities.

The department owning or exposing personnel to fall hazards is responsible for the selection of the proper FPE based upon a [hazard analysis](#) of work tasks. In addition, Owner Departments must ensure training is provided to their personnel who use the equipment, keep the records of training completed, and schedule annual inspections of all FPE under their ownership/control by a competent inspector.

Toward this end, the Department owning the FPE must:

Perform Fall Risk Assessment, Plan and Mitigations:

- Assure work-tasks are evaluated for hazards and that work tasks requiring fall protection to be worn are identified
- Provide alternative access when an FPE user determines use of FPE can be avoided by providing other means of access or workspace operations such as a scaffold, lift pod or bucket truck
- Establish a general [Rescue Plan](#) and include its adaptation to specific FPE use sites

Provide FPE and Maintenance:

- Ensure that FPE purchased are code-complaint and appropriate for the needed safe-work tasks
- Notify SRM when new equipment is purchased so that it can be inspected by a certified FPE inspector and added to the SRM FPE inventory
- Schedule with SRM an annual inspection by a certified FPE inspector for all FPE in their control/ownership
- Render unusable and then dispose of any FPE that is in any way questionably safe as determined by a certified FPE inspector or the person using the equipment

Provide Training for Personnel:

- Provide training to all personnel using their FPE as required to safely execute their assigned work tasks and roles within the Fall Protection Program
- Only allow persons who have successfully completed Fall Protection training to use FPE and conduct work use of FPE
- Keep attendance records of all training

2. Every User of Fall Protection Equipment (FPE)

FPE users are required to follow safe-work procedures as outlined in this program, to alert Owner Department management whenever they discover damaged

equipment and to follow the safe work practices developed by their department concerning fall protection use. Toward this end, FPE users:

- Assess planned work to determine if FPE should be worn, and seek alternative access or work-methods to avoid the use of FPE whenever possible
- Are trained on and apply safe work practices on fall risk hazard assessment, FPE application and use, and equipment used in the field (ladders, lifts, scaffolding, FPE, etc.)
- Document the use of the Department's Rescue Plan and when it applies to their work activities
- Always select, inspect, and use FPE in a safe manner
- Alert Owner-Department Management when FPE has any damage or weakness requiring repair/replacement
- Refuse to do unsafe work using FPE. And, instead, use other methods of access such as a scaffold, lift pod or bucket truck and thus avoid the need to use FPE.

3. SRM

- Consults with the Owner Department regarding proper FPE selection, use, stocking, and safe-work practices unique to the Owner Department's work activities
- Performs and documents annual inspections of FPE
- Maintains campus inventory data base of FPE and inspection records
- Assist in training development, delivery, training strategies, and content to ensure compliance and safe work practices.
- Maintains and updates this Program as need dictates, or as compliance codes change

IV. Types of Fall Protection Equipment (FPE)

A Personal Fall Protection System is comprised of three (3) key components

1. Anchorage connector
2. Body wear
3. Connecting device to join them

FPE is selected and used to meet the design requirements for the following four categories of Fall Protection Systems:

- Fall Restraint System
- Fall Arrest System
- Positioning System
- Suspension



A. Fall Restraint / Travel Restraint System

A Fall Restraint System (also called a Travel Restraint System) is the preferred method of Fall Protection where engineered mitigations are unavailable. A restraint system is used to restrict the worker's movement to prevent reaching a location where a fall hazard exists. Restraint systems are not designed for fall arrest. If the travel restraint allows a worker to reach the fall edge, a back-up fall arrest system must be used. A typical restraint system consists of:

Body wear (full-body harness or body belt)

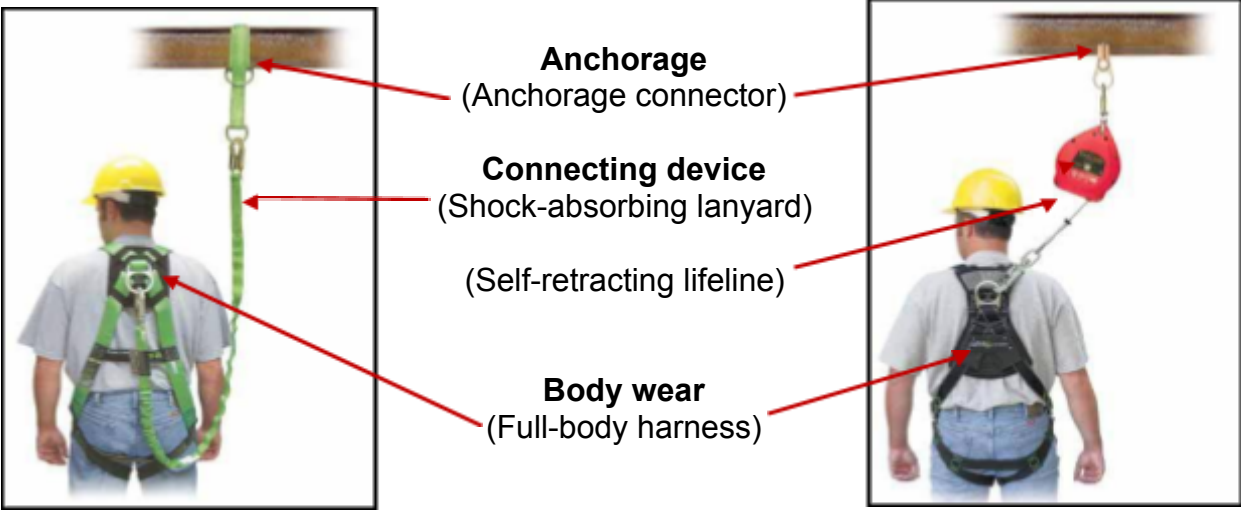
Connecting device (restraint lanyard)

Anchorage/anchorage connector
Horizontal Fall Line



B. Fall Arrest System

A personal Fall Arrest System is used to slow and stop a person during a fall from an elevated location. Since the Fall Arrest System exposes workers to a potential fall, they are less desirable than a Fall Restraint System. As general rule, it is recommended that a Fall Arrest System be used at working heights of four (4) feet or more; however, regulatory agencies vary the height-use requirements based on tasks or industries. Contact SRM to assure compliance with codes prior to procuring and using Fall Arrest Equipment. The Fall Arrest System consists of:



C. Positioning System

A positioning system is used to hold a worker in place while allowing a hands-free work environment at elevated heights. The positioning systems are not designed for fall arrest and, therefore, a back-up fall arrest system must be used. A typical positioning system consists of:

- Anchorage/anchorage connector**
- Body wear (full-body harness)**
- Connecting device (positioning lanyard)**



D. Suspension System

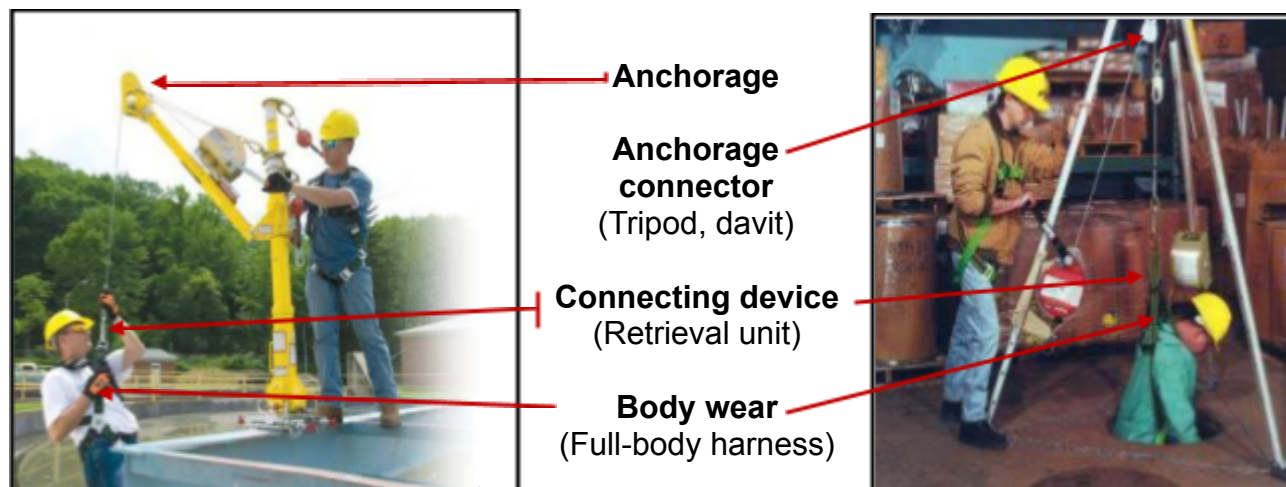
Suspension systems are used widely in the window washing and painting industries and are designed to lower and support a worker while allowing a hands-free work environment. The positioning and suspension systems are not designed for fall arrest and, therefore, a back-up fall arrest system must be used. A typical suspension system includes:

- Anchorage/anchorage connector**
- Body wear (full-body harness)**
- Suspension device (Boatswain chair)**



E. Retrieval System

The retrieval system is primarily used in confined space applications where workers must enter tanks, manholes, etc., and may require retrieval from above should an emergency occur. Retrieval Systems may also be used in rescue after a fall has occurred and the victim is hanging by the Fall Arrest System in suspension. A retrieval system typically consists of:



V. Selection/Procurement of FPE

FPE is designed and constructed according to the American National Standards Institute (ANSI) standards to safely hold greater than twice the expected load in positioning systems and a specific amount of weight in fall arrest systems in the event of a fall. The design-load capacity includes a person's fully clothed weight plus the weight of any tools and materials that are carried that could be part of the load on the FPE during a fall.

Additional information is available in Appendix B – FPE Types and Selection for Use

If there are any questions regarding the correct FPE to use for a particular application, contact SRM Occupational Safety.

VI. Fall Hazard Assessment

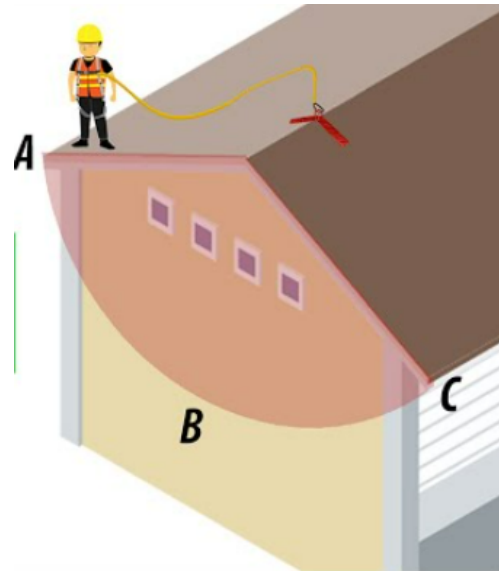
Before engaging in tasks that expose workers to fall risks, a Fall Hazard Assessment must be conducted. This is a simple process that encourages workers to consider the risk(s) and select the right equipment, PFE, and tools to safely conduct the work. The basics of a Fall Hazard Assessment are as follows:

1. Determine if the work includes a fall risk of >4 ft or if it is over hazardous machinery.
2. Determine mitigations to the fall hazard using the hierarchy of controls outlined in

Section I.

3. If FPE is to be used, select the appropriate:
 - a. Anchor point - Code requires the load rating must be attached or permanently printed on each piece of equipment and must be readable by the person using the equipment. The user must be able to plan the use of the equipment based on the load capacity.
 - b. Select the FPE – Fall Restraint (Travel Restraint) > Fall Arrest System
 - c. If Fall Arrest is to be used, the kind of personal fall arrest system selected should match the particular work situation, and any possible free fall distance should be kept to a minimum.

- i. Swing radius must also be calculated to ensure the horizontal travel of the work does not exceed the calculated distance from the anchor point to the surface/ground below ($A < B$)



- ii. Consideration must also be given to the particular work environment, the presence of acids, dirt, moisture, oil, grease, slope, etc., and their effect on the work and/or FPE system. Hot or cold environments may also have an adverse effect on the system. Wire rope should not be used where an electrical hazard is anticipated, etc.

A template Fall Hazard Analysis is available in [Appendix D](#).

VII. Fall Program Protection General Requirements and Standard Operating Procedures

A. General Requirements:

1. Fall Protection Equipment User's Safe-Work Rules

- FPE is selected so that it fits comfortably, can be adjusted and has attachment points appropriate for its use.
- Prior to use each FPE device is inspected for the following:

- o Operation of snap-hooks or any other means of attachment
- o Condition of webbing, straps and buckles
- o Operation of brakes and ratchets in self-retracting lanyards and winches
- Damaged, defective, or in any way questionable FPE is removed from use and Owner Department management is notified of the problem.
- The work area is prepared and cleared of unnecessary obstructions.
- Cordon off the area below to alert people passing below of potentially falling items.
- Clear or shield obstacles that could affect the safe use of the FPE. This includes obstacles at a landing point if using a controlled decent device or sharp/abrasive surfaces that could impact a lanyard.
- Lanyards are never clipped together.
- When working aloft, tools and supplies are secured with tool lanyards so they cannot fall.
- FPE is not used for any operation that it was not designed for.

2. Owner Department Requirements

The Department owning FPE is responsible for the following actions:

- Creation of a Rescue Plan
- Ensures that FPE purchased and used in the department are code-compliant and appropriate for the needed safe-work tasks.
- Consults with SRM Occupational Safety as needed to assess proper FPE use and procurement specifications.
- Only allows persons who have successfully completed documented Fall Protection training to use FPE and conduct work requiring use of FPE.
- At least annually reminds the FPE users of their requirements under this program.

3. Rescue Plan

Rescue plans are required due to the risk of suspension trauma. If a person has fallen and is suspended in a harness for a relatively short period of time, even two to ten minutes, they may experience suspension trauma. Suspension trauma can result in loss of consciousness and potential death; therefore, a rescue plan and its implementation are required by code whenever someone using FPE may not be able to rescue themselves after a fall.

A rescue plan must be written (see [Appendix E](#)) and include the following:

- A second person (attendant) must accompany the person using the FPE and be in direct communication with that person.
- The attendant must have been trained in the recognition of the pre-fainting symptoms (pre-syncope).
- The attendant must have immediate access to paramedic emergency services.

- The attendant must have some means of immediate rescue assuming the person who has fallen is not able to assist in the rescue.

4. Maintenance and Care of FPE

- FPE is not stored in the sunlight or in another source of ultraviolet light. Ultraviolet light degrades the condition of synthetic webbing. Store FPE in a dry clean place not subject to dust or weather. Hanging on storage hooks is a good idea for webbing devices.
- FPE is not stored with weight over folded webbing. The webbing can be creased and therefore be damaged.
- FPE is not exposed to any solvents that could breakdown webbing. This includes products containing acetone, MEK, lacquer thinner or other similar solvents.
- FPE is not subjected to hot surfaces or welding splatter. Any burn marks on or stiffening of webbing due to heat will make the device unusable.

B. Specific SOPs / Reference

1. Roof Safety & Controlled Access Zones

2. Ladder Safety

3. Slips, Trips Falls

4. Scissor Lifts & Boom Lifts

VIII. Training Requirements

The Department that owns the FPE has the option of providing FPE user training by a training provider outside the University, within the department (assuming the trainer is an FPE-skilled person), or by SRM. All safety training should be coordinated with SRM to ensure proper documentation.

Regardless of the source, the complete contents and safe-work procedures outlined in this program must be part of any fall protection safety training at VCU. Training content and attendance is documented and kept in a readily accessible location (preferably in the SRM electronic training database) by the Owner Department for reference as needed by department management, SRM, or regulatory agency (e.g., VOSH/OSHA).

For any FPE/Fall Protection Safety Program training, a list of training attendees with their name, department, job title, and the date will be recorded and provided to SRM.

IX. Record Keeping Requirements

Department Requirements

In conjunction with SRM, retain records of trained individuals, which include a list of training attendees' name, department and job title. SRM maintains the master training records in BioRaft, which department personnel have access to.

SRM Requirements

Retain:

- Records of training provided by SRM and other entities
- Historical documents and revisions of the Fall Protection Program
- Records of annual FPE inspection

X. References

OSHA Fall Protection Regulations

- This document was created in collaboration with the University of California, Berkeley. [VCU Occupational Safety](#) thanks the [EH&S team](#) at UCB for their effort and expertise.
- OSHA Regulation, 29 CFR Subpart D, 1910.21 - 1910.30 - Walking Working Surfaces
- OSHA Standard, 29 CFR Subpart I, 1910.140 – Personal Fall Protection Systems
- OSHA Standard, 29 CFR Subpart F, 1910.67 – Vehicle Mounted Elevating and Rotating Work Platform
- OSHA Regulation 29 CFR 1926 Subpart M, 1926.500 - 1926.503 - Fall Protection
- ANSI/ASSE Z359 Fall Protection

XI. Appendices

- a. Appendix A - Definitions
- b. Appendix B - FPE Types and Selection for Use
- c. Appendix C - Self Inspecting Fall Protection Equipment
- d. Appendix D – Fall Hazard Analysis
- e. Appendix E – Fall Protection Rescue Plan

Appendix A - Definitions

Approved

Tested and approved by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratory (UL).

Anchorage

A secure point of attachment for lifelines, lanyards or deceleration devices. May also be a “Bearer Bracket” or a “Roofing Bracket”.

Bearer Bracket

A bracket used in slope roof construction, having provisions for fastening it over the roof-ridge and being secured to some suitable object; also known as “Roofing Bracket”.

Body Belt

A simple or compound strap with means for securing it about the waist and for securing a lanyard to it. The use of a body belt for fall restraint/prevention is allowed, but it cannot be used for fall arrest.

Body Harness

Straps which may be secured about a person’s torso and buttocks in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Buckle

Any device for holding the body belt or body harness closed around the employee's body.

Catenary Line

See “Lifeline”.

Carabineer

See “Snaphook”.

Free-Fall

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

Free-Fall Distance

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

Guardrail

A barrier consisting of a top rail at 42" and a midrail secured to uprights and erected along the exposed sides and ends of platforms.

Handrail

A rail used to provide employees with a handhold for support.

Hole

Any area in a floor or platform that is open to an area below but is smaller in size than an "opening" as defined by the OSHA Fall Protection codes.

Lanyard

A flexible line to secure a wearer of a safety belt or harness to a drop line, lifeline, or fixed anchorage.

Leading Edge

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

Lifeline

Usually a horizontal steel-wire rope (i.e., Catenary line) located between two fixed anchorages and suspended above the work surface, to which the lanyard is secured

either by tying off or by means of a suitable sliding connection. A lifeline may be vertical when used with a rope-grab attached by lanyard to a body harness.

Linemen's Body Belt

A leather or web (cotton or nylon) belt designed specifically for employees working on poles. It consists of a waist belt, generally cushioned, with a front buckle, two D rings for attaching safety straps and a multiple-looped strap for holding, rings, snaphooks, holsters and other tool holding devices.

Lower Levels

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

Midrail

A rail approximately midway between the top rail and platform that is secured to the uprights erected along the exposed sides and ends of platforms.

Opening

An open area in any floor or platform 12 inches or more in the least horizontal dimension. It includes: stairway floor openings, ladder-way floor openings, hatchways and chute floor openings.

Personal Fall Arrest System

A system used to slow and stop a person during a fall from elevated location. It consists of an anchorage, connectors, a body harness, and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. The use of a body belt for fall arrest is prohibited by law.

Personal Fall Restraint System

A system used to prevent an employee from access to a leading edge or other fall-hazard location. It consists of anchorages, connectors, body belt/harness. It may include, lanyards, lifelines, and rope grabs designed for that purpose.

Personal Fall Protection System

A generic term for any designed fall protection system that might include fall arrest systems, positioning device systems, fall restraint systems, safety nets, guardrails, etc.

Personal Protective Equipment (PPE)

As this term applies to Fall Protection Equipment, it defines the safeguarding obtained by use of fall protection safety devices worn by a person and that safeguards them from a fall hazard, and is of such design, strength, and quality as to eliminate, preclude, or mitigate the hazard.

Positioning Device System

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

Qualified Person, Attendant or Operator

A person designated by the Owner Department who, by reason of training, experience or instruction, has demonstrated the ability to safely perform all assigned duties and, when required, is properly licensed in accordance with federal, state, or local laws and regulations.

Railing

(See "Guardrail")

Ramp

A surfaced sloping passageway connecting two different levels.

Roofing Bracket

(See "Bearer Bracket").

Rope

Refers to steel-wire rope unless otherwise specified.

Rope Grab

A deceleration device which travels on a vertical lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety Belt or Harness

A device specifically for the purpose of securing, suspending, or retrieving a worker in or from a hazardous work area.

Safety Factor

Ratio of the ultimate breaking strength of a structural member, piece of material or equipment to the actual working stress or safe load when in use.

Safety Line

A vertical line most often of polypropylene or other woven synthetic material provided to protect a person from falls caused by failure of suspended scaffolds, working platforms, or loss of balance, and that extend to within four feet of ground or other stable rescue surface.

Self-Retracting Lifeline/Lanyard

A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal movement by the user/wearer, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Safety Strap

A web strap designed specifically for use in conjunction with a lineman's belt as an aid in climbing poles and to secure the employee to the pole in a manner that permits hands-free work using both hands.

Snaphook

A connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object; also known as a "Carabineer".

Unprotected Sides and Edges

Any side or edge (except at entrances to points of access) of a walking/working surface (e.g., floor, roof, ramp, or runway) where there is no wall, parapet, or standard guardrail of at least 42" provided.

Wall opening

Opening means a gap or open space in a wall, partition, vertical walking-working surface, or similar surface that is at least 30 inches (76 cm) high and at least 18 inches (46 cm) wide, through which an employee can fall to a lower level.

Appendix B - FPE Types and Selection for Use

When selecting new FPE, SRM is available for the following:

- Consultation with the Owner Department to determine proper FPE selection, use, stocking, and safe-work practices unique to the Owner Department's work activities
- Performs and documents annual inspections of FPE
- Maintains campus inventory data base of FPE and inspection records

Harnesses

Vest Harness

A harness is built into the vest to create a no-tangle body wear system.

The leg straps of the Vest Harness zip to the back of the harness for easy storage when not in use.

Used the same as any other fall protection harness, but offers pockets and can be used as visibility vests for use on construction.



<p><i>Retrieval harness</i></p> <p>This harness has spring loaded "stand-up" dorsal retrieval D-rings for quick rescue in the event of a fall or retraction (retrieval) from a confined space</p> <p>Can be used as a fall arrest harness in man-holes and other confined spaces.</p>	
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Welding Harness

Edge Flame Resistant Harness is designed with welding applications in mind and features a replaceable outer shell to prolong the life of the harness by shielding the webbing from high intensity ultraviolet light, slag, and sparks produced by welding. Used as a fall protection harness on steel structures such as bridges where the person wearing the harness is welding.



Tower Harness

Tower Harness for climbing, work positioning, and suspension has an extra comfortable saddle and a body belt for positioning.

Typically used on broadcast towers and theater/concert production in instances where lifelines and positioning/restraint systems are used.



Body Belt

Body belts can only be used for fall restraint or positioning systems, not for fall arrest.

Body belts (single or double D-ring) are designed to restrain a person in a hazardous work location and to reduce their inadvertent access to a fall hazard.



Lineman Harness

The extra wide cradle seat adds comfort to the lineman harness and includes four attached side positioning D-rings and a permanently attached tool belt.

These are mostly used for work from poles or in trees.



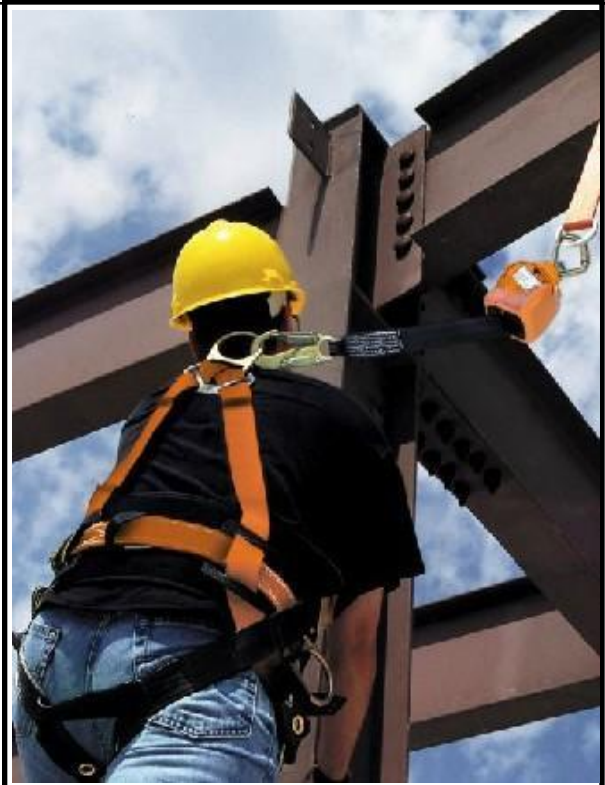
Connectors

Fall limiter

A short version of a self-retracting lanyard. The one shown here is attached to an elbow strap around the beam.

These are used in lieu of shock absorbing lanyards. They are designed to lock quicker (within two inches) than self-retracting lanyards.

<http://www.youtube.com/watch?v=c-IPMQ4YZEA>



Rope Grab Lanyard

A deceleration device which travels on a lifeline used to safely ascend or descend ladders or sloped surfaces and automatically, by friction, engage the lifeline and lock so as to arrest the fall of an employee.

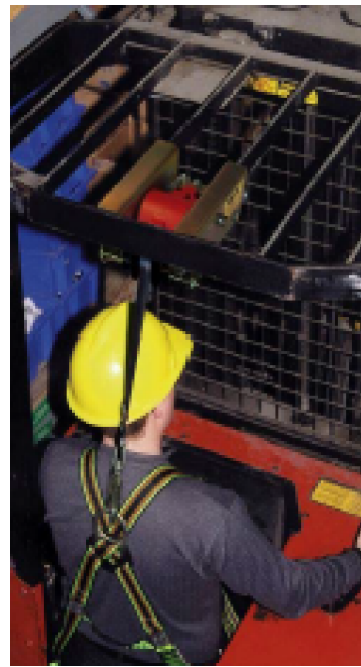
These are used for fixed ladders.



Cab Mount Lanyard

Designed to secure an operator into a cab of a forklift as shown in the picture.

It is a version of a fall-limiter. They are designed to lock quicker (within two inches) than self-retracting lanyards



Self-Retracting Lanyard

A Retractable Lifeline System that gives fall protection and mobility to the user when working at height or in areas where there is a danger of falling.



Positioning Lanyard

These clip to both sides of waist D rings so the center clip can attach to ladder rungs or rebar. A person can be positioned so they can work with both hands free while secured to a vertical surface.

These are used for tying rebar or working off towers and allow hands free work.



Double legged Shock Absorbing Lanyard

Are attached to a dorsal D ring and used to alternate attachment when necessary.

Most often used for horizontal lifelines and having to detach from one line to reach around something like a vertical beam to attach to another line.



StopFall

A lanyard that cinches a pole while attached to the belt rings of a climbing belt or harness.

A positioning system lanyard used for "hitchhiking" trees and poles



Vertical Lifeline

These attach to an anchor point on a roof, a beam, or something similar. A rope grab and/or a descender operates on the rope.

These are used as lifelines for temporary means of access such as suspended scaffolding and extension ladders.



Shock Absorbing lanyard

This type of connector, or alternatives such as fall limiters or self-retracting lanyards, is required for all fall arrest systems. The shock absorber is sewn layers of fabric in the black part of this lanyard. The snaphook at the opposite end is engineered to attach to webbing or anchor points.



Self-Locking Carabineers

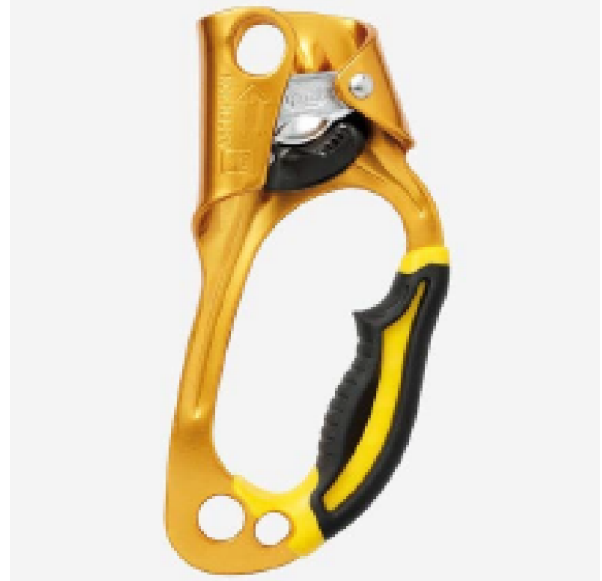
This is a prime connecting device and may be used to connect harnesses to lanyards, lanyards to anchors or decent devices.



Rescue Devices

Handled Ascender

Designed for ascending or descending along a rope or lifeline and, occasionally, for hauling (progress capture).



ASAP

Mobile fall arrest device for rope used as a lifeline. Stops a fall, a slide or uncontrolled descent. It locks even if the device is grabbed during a fall.

Works on vertical or angled rope. Moves up and down along the rope without manual intervention. Easy to install and remove at any point on the rope. Can be used with an energy absorbing lanyard.

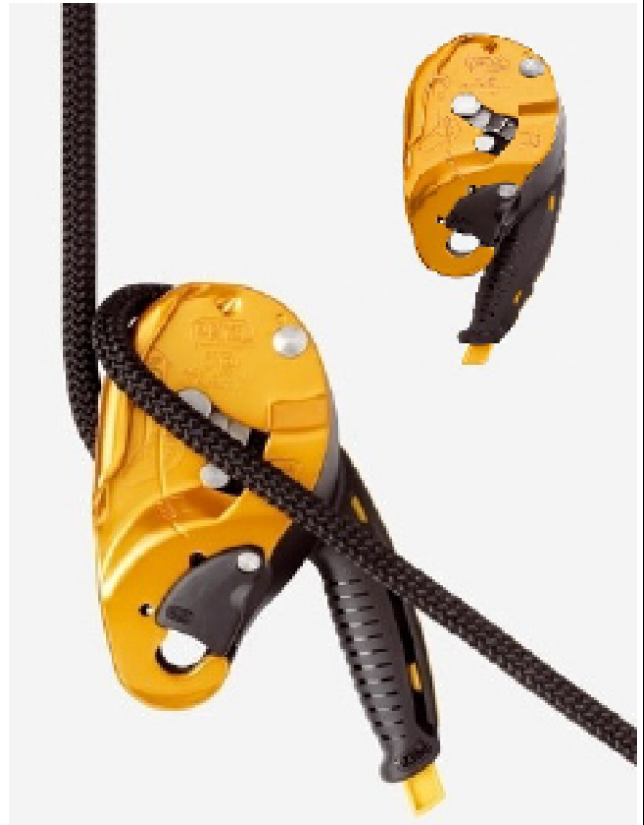


Self-braking Descender

Self-braking Descender with anti-panic function for working on fixed ropes. Designed for work on a rope, the gate on the swinging side plate helps prevent dropping the device.

Multi-functional handle allows the user to:

- Unblock the rope and control the descent with the hand on the braking side of the rope
- Move more easily on horizontal or low-angle terrain thanks to the button on the handle
- Position themselves while on the rope



Self-Rescue Device

This attaches to a harness and provides a means of self-rescue controlled descent as well as a means of rescue if the person using it is unconscious.

This may be used in any situation where a harness is used in addition to the harness itself.

<http://www.pksafety.com/latchways-rescue-harness-rh3-68203.html>



Self-Rescue Emergency Controlled Decent Device

Designed for smooth, automatic vertical and angular controlled descent from overhead cranes, towers, aerial lifts, oil derricks, platforms or other elevated work areas.

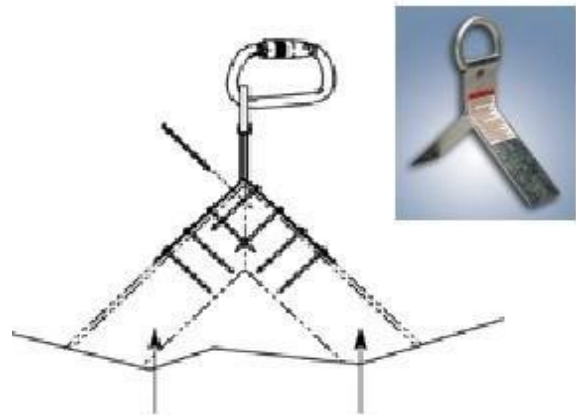
This is specialized equipment for emergency use only.



Anchors

Temporary Roof Anchor

Attached to the crest of a roof by nails or screws and provides an anchor point while working on a roof.



Reusable Temporary Roof Anchor, Steep Pitched Roof



Permanent Roof Crest Double D



Tie-Back, or Elbow Strap Lanyards

These are designed to serve as an anchorage connector and wrap around beams or pipe that can support the 5,000 or 3,000 pound load depending on the fall protection system being used.



Permanent Anchorage Connectors

There are many designs for retrofit D rings. These two are designed to be secured through a hole in a steel structural member.



Fixed Beam, adjustable Anchors

These are attached to I beams and are load rated to 5,000 lbs. so they can be used in a fall arrest system



Snap-hook for choking

This shows a type of snap-hook that is flattened on one end to be used for choking webbing lanyards



Accessories and Their Uses

Relief Step Strap

The strap is a webbing loop that unfurls from the harness and provides a means for the person suspended after a fall to reduce/avoid suspension trauma.



Tool Lanyards

Used to prevent tools from falling and possibly injuring others below.



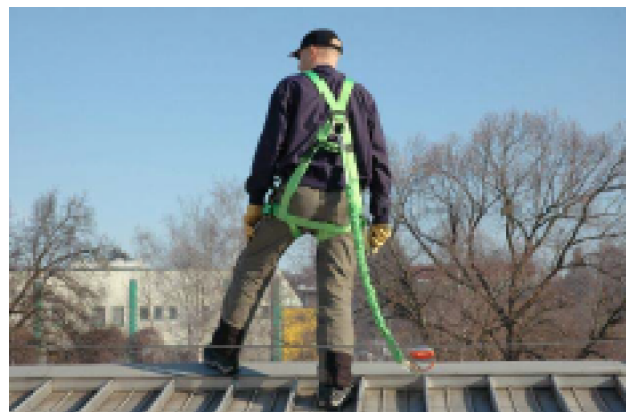
Fixed Ladder Climbing System

When climbing a ladder, rail systems can be used on any fixed ladder as well as curved surfaces as a reliable method of fall prevention.



Horizontal Lifeline System

Temporary or permanent. A horizontal rope mounted to anchor points and allows movement all along its line while attached to the line.



Continuous Pass-Through for Horizontal Lifelines

This allows movement along a horizontal lifeline without detaching or using a double legged lanyard to alternate attachments.



Temporary Horizontal Lifeline

A horizontal rope mounted to anchor points and allows movement all along its line while attached to the line. It's also known as a Catenary lifeline.



Trolley

Attachment point for a horizontal lifeline that allows continuous attachment.



Appendix C – Self Inspecting Fall Protection Equipment

Body wear and connecting devices must have an undocumented inspection before each use by the FPE user, and a documented inspection semi-annually by a certified inspector. Both inspections follow the same inspection protocol as outlined below.

Harness (and Body Belt) Inspection

To inspect your harness or body belt, perform the following procedures:

Webbing – Grasp the webbing with your hands 6 inches (152 mm) to 8 inches (203 mm) apart. Bend the webbing in an inverted “U” as shown. The surface tension resulting makes damaged fibers or cuts easier to detect. Follow this procedure the entire length of the webbing, inspecting both sides of each strap. Look 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 – Inspect for any unusual wear, frayed or cut fibers, or broken stitching of the buckle or D-ring attachments.

Tongue/Grommets – The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Webbing should not have additional punched holes.



Tongue Buckles – 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. Roller should turn freely on 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 at the center bar.

Quick-Connect Buckles – Inspect the buckle for distortion. The outer bars and center bars must be straight. Make sure dual-tab release mechanism is free of debris and engages properly.



Lanyard Inspection

When inspecting lanyards, begin at one end and work to the opposite end, slowly rotating the lanyard so that the entire circumference is checked. Additionally, follow the procedures below.

Hardware –

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.



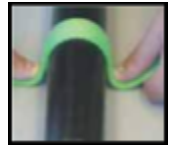
Thimbles – The thimble must be firmly seated in the eye of the splice, and the splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.



Wire Rope Lanyard – While rotating the wire rope lanyard, watch for cuts, frayed areas, or unusual wearing patterns on the wire. Broken strands will separate from the body of the lanyard.



Web Lanyard – While bending webbing over a pipe or mandrel, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks and charring are obvious signs of chemical or heat damage. Observe closely for any breaks in stitching.



Rope Lanyard – Rotate the rope lanyard while inspecting from end-to-end for any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period.

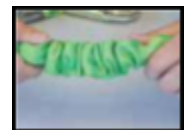


Inspection of Fall Arrest System

Shock Absorber Pack – The outer portion of the pack should be examined for burn holes and tears. Stitching on areas where the pack is sewn to D-rings, belts or lanyards should be examined for loose strands, rips and deterioration.



Shock-Absorbing Lanyard – Shock-absorbing lanyards should be examined as a web lanyard (described in Item 3 above); however, also look for the warning flag or signs of deployment. If the flag has been activated, remove this shock-absorbing lanyard from service.



Self-Retracting Lifeline Inspection

Check Housing – Before every use, inspect the unit’s housing for loose fasteners and bent, cracked, distorted, worn, malfunctioning or damaged parts.



Lifeline – Test the lifeline retraction and tension by pulling out several feet of the lifeline and allow it to retract back into the unit. Always maintain a light tension on the lifeline as it retracts. The lifeline should pull out freely and retract all the way back into the unit. Do not use the unit if the lifeline does not retract. The lifeline must be checked regularly for signs of damage. Inspect for cuts, burns, corrosion, kinks, frays or worn areas.



Inspect any sewing (web lifelines) for loose, broken or damaged stitching.

Braking Mechanism – The braking mechanism must be tested by grasping the lifeline above the impact indicator and applying a sharp steady pull downward which will engage the brakes. There should be no slippage of the lifeline while the brakes are engaged; once tension is released, the brakes will disengage and the unit will return to the retractable mode. Do not use the unit if the brakes do not engage.



Check the hardware as directed above. The snap hook load indicator is located in the swivel of the snap hook. The swivel eye will elongate and expose a red area when subjected to fall arresting forces. Do not use the unit if the load impact indicator has been activated.

Appendix D - Fall Hazard Analysis Template

The Fall Hazard Analysis Template is available for use [here](#).

Appendix E - Fall Protection Rescue Plan

A rescue plan must be developed whenever fall arrest systems are in use and when personnel may not be able to self-rescue should a fall occur. What is the emergency contact information of professional rescue services available, such as the local Fire Department, and what are the instructions for summoning immediate assistance?

Worker using FPE and may fall: _____

Attendant: _____

Date: _____

Building/Location: _____

Is rescue equipment immediately available for this location?

(E.g., Ladders, aerial devices, elevating work platforms, tripods, additional harnesses, controlled descent devices, winches, pulleys, etc.)

List Rescue Equipment Available:

Who to contact for equipment use? _____

Their phone number: _____

What obstructions are in the way reaching the suspended worker?

How will rescue be assured within 15 minutes of the occurrence of a fall to minimize the risk of further injury or death due to suspension trauma?

Who to Call: _____

Their Phone Number: _____

How will the safety of the rescuers be assured as well as that of the suspended worker?

What communication systems will be used between the suspended worker and rescue team?
