Environmental Health & Safety

Fall Protection Program

The University Of Iowa
Environmental Health & Safety
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1. Summary

Falls from heights and on the same level (a working surface) are among the leading causes of serious work-related injuries and deaths. The Occupational Safety and Health Administration's (OSHA's) standards on Walking-Working Surfaces and Personal Fall Protection Systems protect workers in general industry from these hazards.

As much as possible, OSHA has aligned fall protection requirements for general industry with those for construction, easing compliance for employers who perform both types of activities. For example, OSHA's final rule on this replaces the outdated general industry scaffold standards with a requirement that employers comply with OSHA's construction scaffold standards. Specifically, it updates general industry standards addressing slip, trip, and fall hazards (subpart D), and adds requirements for personal fall protection systems (subpart I).

2. Scope

This program is designed to protect workers from fall hazards along unprotected sides or edges that are at least 4 feet above a lower level.

When an employee is required to work from a leading horizontal edge or vertical height of 4 feet or more above a lower level, fall protection must be provided.

Examples of fall protection include guardrail systems, travel restraint systems, safety net systems, and personal fall arrest systems.

3. Policy and Regulation

University of Iowa Operations Manual, Part III Human Resources, Division II Standards and Ethics, Chapter 16.4.d Policy on Ethics and Responsibilities for University of Iowa Staff.

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

4. Definitions

Authorized person: An employee using fall protection equipment who has a working understanding of the employer's policy, procedures, and instructions from the competent person regarding the use of fall protection and rescue systems.

Aerial lift device: 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. The use of a body belt in a positioning restraint device system is acceptable and is regulated under paragraph (e) of 29 CFR 1926.502. Body belts cannot be used as part of personal fall arrest system.

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.

Connector: A device that is used to connect parts of a personal fall arrest system together (i.e. 0-rings, and snap hooks).

Competent person: An individual designated by the employer to be responsible for the immediate supervision, implementation and monitoring of the employer’s managed fall protection program who, through training and knowledge, is capable of identifying, evaluating and addressing existing and potential fall hazards, AND who has the employer’s authority to take prompt corrective action with regard to such hazards.

Deceleration device: Any mechanism, such as a rope, grabbing device, rip stitch 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. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

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

Fall Restraint: Fall restraint is equipment that is used to keep someone from approaching a fall hazard. Restraint equipment is different from arrest equipment in that a body belt may be used as well as a lanyard that does not contain a shock absorber. The lanyard must be short enough to keep the individual from reaching the leading edge. The concept behind the restraint is it allows someone to do work, but keeps the individual from the potential of falling.

Fall Arrest: Fall arrest is equipment that is used to stop a fall after someone has fallen. It is designed to stop someone before they strike the level below.

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

Guardrail: 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: 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.

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.

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

Mechanical equipment: 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.

Orthostatic Intolerance: Orthostatic intolerance may be defined as "the development of symptoms such as light-headedness, palpitations, tremulousness, poor concentration, fatigue, nausea, dizziness, headache, sweating, weakness and occasionally fainting during upright standing". While in a sedentary position, blood can accumulate in the veins, which is commonly called "venous pooling," and cause orthostatic intolerance. Orthostatic intolerance also can occur when an individual moves suddenly after being sedentary for a long time. For example, a person may experience orthostatic intolerance when they stand up quickly after sitting still for a long time.

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

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

Program Administrator: The person responsible for the development, implementation, monitoring, and evaluation of the managed fall protection program.

Qualified person: One with a recognized degree or professional certificate (Professional engineer PE) and extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems to the extent required by these standards.

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: The exterior surface on the top of a building.

Roofing work: 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: Any temporary elevated or suspended platform, and 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).

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.

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

Suspension Trauma: Suspension trauma, also known as **harness hang syndrome (HHS)** is an effect, which occurs when the human body is held upright without any movement for a period. If the person is strapped into a harness or tied to an upright object, they will eventually suffer the Central Ischemic Response (commonly known as fainting). If one faints but remains vertical, one risks death due to one's brain not receiving the oxygen it requires.

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

Toe board: 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 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: 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.

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, or body belt, systems to protect employees in the area.

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

5. Roles and Responsibilities

Deans, Directors and Department Heads are responsible to:

- Designate and empower the department's Health and Safety Coordinator (or Program Coordinator or equivalent) and supervisors.
- Actively support these procedures within individual units.
- Ensure an environment where employees are encouraged to follow these procedures.

The Department Fall Protection Administrator is responsible to:

- Act as an administrative liaison between the department and EHS.
- Provide the development, implementation, monitoring, and evaluation of the managed fall protection program.

Competent Person

- Provide an operations level of safety expertise in the subject of fall protection work for day-to-day operations in the department.
- Provide training to authorized employees.
- Facilitate the correction of safety problems within the department.
- Conduct assessments on elevated work surfaces that meet the criteria and where trained/ authorized employees will be exposed to fall related hazards.
- Conduct inspections of Fall Arrest Equipment (Lanyards, Anchor Points, Harness).

Supervisors are responsible to:

- Implement these procedures.
- Assure that staff is aware of this program and provided with training and the personal protective equipment.
- Maintain documentation and records as required.

Authorized Persons/Employees are responsible to:

- Comply with these procedures and any further safety requirements set by the Competent Person and supervisors.

EHS is responsible to:

- Provide procedural guidelines, educational offerings, administrative consultations and reviews, and select technical and field services.
- Exercise surveillance over health and safety issues at the University.

6. Fall Hazards

Fall hazards will be evaluated by the Program Administrator to determine the best method to protect the employee. When selecting what type of fall protection to use, the Program Administrator will consider the hierarchy of hazard control, which organizes risk control techniques from most to least effective (examples are shown below in order of decreasing effectiveness and preference).

1. Elimination of the fall hazard by bringing the work down to safe ground level.
2. Passive fall protection systems, such as guard rails, that do not require active participation by the worker
3. Fall restraint that prevents a person from reaching a fall hazard
4. Fall arrest that utilizes equipment to stop a fall after it occurs
5. Administrative controls such as work practices or procedures to signal or warn a worker to avoid approaching a potential fall hazard

Leading Edges - Each worker working on or near a leading edge 4 feet or more above a lower level will be protected by guardrail systems, safety net systems or personal fall arrest systems.

Building Rooftops - On buildings where fall restraint or fall protection is installed, only authorized personnel may perform work. Equipment designed and engineered for use as a fall protection system on a rooftop may not be interchanged with other fall protection systems. Including fall restraint systems and personal protective equipment.

On buildings where no rooftop fall protection is provided by a permanent guardrail system (including parapets) or fall arrest/restraint system, the supervisor must create a fall protection plan, based on the work being done, prior to employees accessing a rooftop. This may include the use of a mobile anchor point; temporary guardrail and/or a safety monitoring system. In addition, many of the rooftops on campus buildings have designated walk paths. Employees utilizing the walk paths are not required to be in fall

protection equipment. Any time employees must access rooftop areas between the roof edge and the walk path, fall protection equipment is required.

- **Low-Slope Roofs** - Workers on a low-slope (less than or equal to 4/12 pitch) roof that has one or more unprotected side or edge shall be protected from falling by one of the following:
  - Guardrail system
  - Safety net system
  - Personal fall arrest system
  - A combination of conventional fall protection system and warning line system
  - A warning line system and a safety monitoring system (Note: W*hen engaged in roofing work on low-slope roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted)*

- **Steep Roofs** - Workers on a steep roof (greater than 4/12 pitch) that has one or more unprotected side or edge shall be protected from fall by one of the following:
  - Guardrail systems with toeboards
  - Safety net systems
  - Personal fall arrest systems

Wall Openings - All wall openings 4 feet or more above an adjacent surface will be guarded. A rail, picket fence, half door or equivalent barrier will be placed across the wall opening. If the wall opening extends to the floor, a toe board at least four inches high shall be installed to prevent materials accidental falling from the edge.

All workers working on, at, above or near wall openings (including those with chutes attached), where the bottom edge of the wall opening is less than 39 inches above the walking /working surface, must be protected by a guardrail system, safety net system or personal fall arrest system.

Floor Openings - All floor holes two inches in diameter or more will be guarded by one of the following:

- A standard railing with toeboard on all exposed sides
- A covering of sufficient strength and construction to handle the heaviest load that could be placed on it (*Note: While the cover is not in place, the floor hole must be constantly attended by someone or protected by a standard railing)*

Excavations - Excavations 4 feet or more deep shall be protected by a guardrail system, fence or barricade when the excavation cannot be readily seen because of plant growth or other visual barrier. Workers at the edge of a well, pit, shaft or similar

excavation 4 feet or more deep will be protected from falling by a guardrail system, fence, barricade or cover.

Dangerous Equipment or Materials - When working at any height above dangerous equipment or materials, each worker will be protected from falling into or onto the dangerous equipment or materials by a guardrail system, equipment guards, safety net system or personal fall arrest system.

Loading docks - Loading docks will be protected by a guardrail or barricade system. The system must be removable to provide access for loading vehicles, but must remain in place when loading is not in progress and the dock door is kept open.

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

Aerial Lifts and Self-Powered Work Platforms - Body harnesses must be worn with a lanyard, not to exceed 3 feet in length, or a self-retracting lifeline when working from all elevated mobile work platforms. The point of attachment must be the anchor point installed and designated by the equipment manufacturer. Personnel will not attach lanyards to adjacent poles, structures or equipment while they are working from the aerial lift. Personnel will not move an aerial lift while the boom is in an elevated working position and the operator is inside the lift platform. Scissor lifts and telescoping lifts that can only move vertically do not require the use of a harness and lanyard as long as the work platform is protected by a proper guardrail system; however, certain departments may still require these.

7. Fall Protection Systems

Fall protection may also be defined as “active” or “passive”

- Passive Fall Protection – already in place or put in place and designed to prevent a fall; does **not** require individual to use special equipment such as harnesses, lanyards, etc.
    - Guardrails
    - Safety Nets
    - Hole covers

- Active Fall Protection – requires individual involvement, training and understanding of equipment and proper use of harnesses, lanyards, self-retracting lanyards, etc.
    - Restraint systems

- Arrest systems
- Positioning systems

Guardrail Systems

- Toprail is 42 inches, +/- 3 inches above the walking/working level.
- Midrail is located midway between the top rail and the walking/working level.
- Toprails and midrails will be constructed of materials at least one-quarter (0.25) inch in thickness or diameter. If wire rope is used for toprails, it must be flagged with a high-visibility material at least every 6 feet and can have no more than 3" of deflection.
- The toprail must be capable of withstanding a force of 200 pounds when applied in any downward or outward direction.
- The midrail must withstand a force of 150 pounds 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 4 inches in height and must be securely fastened.
- The system will be smooth to prevent punctures, lacerations or snagging of clothing.
- The ends of the top rail should not 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.

Safety Nets

When safety nets are the appropriate option for fall protection, they will be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet below such level. Safety nets must meet the following criteria:

- Pass a 400-pound drop test or certified by employer or competent person before being used as a fall protection system, whenever relocated, after major repairs or at 6-month intervals if left in place. The item used for the test should be dropped from the highest walking/working surface at which workers are exposed, but not from less than 42 inches above that level.

- Items that have fallen into safety nets including, but not restricted to, materials, scrap, equipment, and tools, must be removed as soon as possible and at least before the next work shift.
- Extend sufficiently from outer edge of the walking/working surface to catch a falling employee
- Have a maximum mesh size not exceed 6 inches by 6 inches
- Be inspected at least weekly for wear, deterioration and damage
- All objects must be removed from net by the end of the shift
- Have a 5,000 pounds minimum breaking strength of border rope
- Have an unobstructed fall area

Hole Covers

All hole and wall covers are secured to prevent accidental displacement.

- Covers are color-coded or bear the markings “HOLE” or “COVER”.
- Covers are able to support twice the weight of employees, equipment, and materials that might cross them.
- Covers located in roadways are able to support twice the axle load of the largest vehicle that might cross them.

Restraint Systems

Restraint systems prevent workers from falling by keeping them from reaching an area where the fall hazard exists. Body harness systems are set up so that an employee is secured to an anchorage capable of supporting twice the potential impact load or 3000 pounds, whichever is greater.

- Securing the individual to an anchorage point using a lanyard short enough to prevent the person’s center of gravity from reaching the fall hazard.
- Leading edge work where there are no guardrails.
- Within aerial boom lifts so center of gravity cannot move beyond the bucket rails.
- Restraint is typically the preferred fall protection system when the environment allows because a fall is completely avoided.

Personal Fall Arrest Systems

Personal fall arrest systems consist of anchorage, connectors, body harness, deceleration device, lifeline, or suitable combinations.
Personal fall arrest systems:

- limit the maximum arresting force to 1,800 pounds;
- are rigged so an employee cannot free fall more than four (4) feet or contact any lower level;

- bring an employee to a complete stop and limit the maximum deceleration distance traveled to three and a half (3 ½) feet;
- are strong enough to withstand twice the potential impact energy of an employee free falling four (4) feet (or the free fall distance permitted by the system, whichever is less);
- are inspected prior to each use for damage and deterioration; and
- are removed from service if any damaged components are detected.

All components of a fall arrest system meet the specifications of the OSHA Fall Protection Standard, and are used in accordance with the manufacturer's instructions.

The use of non-locking snaphooks is prohibited.

Dee-rings and locking snaphooks:

- have a minimum tensile strength of 5,000 pounds; and
- are proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or suffering permanent deformation.

Lifelines are:

- designed, installed, and used under the supervision of a qualified person – one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- protected against cuts and abrasions; and
- equipped with horizontal lifeline connection devices capable of locking in both directions on the lifeline when used on suspended scaffolds or similar work platforms that have horizontal lifelines that may become vertical lifelines.
- Self-retracting lifelines and lanyards have ropes and straps (webbing) made of synthetic fibers, and
- sustain a minimum tensile load of 3,600 pounds if they automatically limit free fall distance to two (2) feet; or
- sustain a minimum tensile load of 5,000 pounds (includes ripstitch, tearing, and deforming lanyards).

Anchorages support at least 5,000 pounds per person attached and are:

- designed, installed, and used under the supervision of a qualified person
- capable of supporting twice the weight expected to be imposed on it; and
- independent of any anchorage used to support or suspend platforms.

Positioning System

A positioning device is not a substitute for a personal arrest system and is limited to use as system rigged to allow an employee to be supported on an elevated vertical face, such as a wall, and work with both hands free while leaning. Where positioning device is used, it shall comply with the following:

- **Body Harness** - Only a full-body harness shall be worn as part of a positioning device system. Body belts are not acceptable;
- **Connecting Device** - Positioning devices shall be rigged such that a free fall cannot be more than 2 feet; and
- **Anchorage** - 3,000 lbs. of static strength (non-certified), static strength 2X foreseeable force (certified).

Suspension System

Personal suspension systems are used for window washing and painting and are designed to lower and support a worker to perform tasks. The components of a suspension system are:

- Full-Body Harness;
- Work line;
- Anchorage; and
- Positioning device such as a boatswain's chair.
  A boatswain's chair system is considered a single-point adjustable suspended scaffold. Since the suspension system components are not designed to arrest a free fall, a back-up fall arrest system should be used in conjunction with the personal suspension system that would activate only if the worker were to experience a free fall.

Warning Line Systems

Warning line systems are typically composed of a physical barrier located near an unprotected side or edge to warn employees they are approaching a fall hazard area during roofing projects affecting large areas of the roof. Warning line system use is restricted to low slope roof top work and shall be used in conjunction with a safety monitoring system at a minimum. These systems may also utilize a guardrail or personal fall arrest system to minimize/eliminate the fall hazard. Warning line systems consisting of supporting stanchions and ropes, wires, or chains are erected around all sides of open edged work areas.

- Lines are flagged at no more than six (6) foot intervals with high-visibility materials.
- The lowest point of the line (including sag) is between 34 and 39 inches from the walking/working surface.
- Stanchions of warning line systems are capable of resisting at least 16 pounds of force.
- Ropes, wires, or chains have a minimum tensile strength of 500 pounds.
- Warning line systems are erected at least six (6) feet from the edge, except in areas where mechanical equipment is in use. When mechanical equipment is in use, warning line systems are erected at least six (6) feet from the parallel edge, and at least ten (10) feet from the perpendicular edge.

8. Process for using Fall Protection Equipment

An Elevated Working Surface Fall Hazard Assessment must be completed by a Competent Person prior to starting the job.

- Calculate fall distance accordingly so the proper equipment is worn.
- The person who experiences a fall arrest has 20 minutes to be rescued before there is either loss of life or permanent damage to internal organs and/or limbs.
- If a fall arrest event occurs, immediately call 911. Be very accurate with the fall arrest location information

All jobs requiring the wear and use of Fall Protection shall have two people, for safety reasons, to accomplish them.

- One shall be the ground person or spotter.
- Two are required to be on scaffolding, it is recommended to have three people, one of which is the ground person.

Correct use of fall arrest concrete anchor bolts

- The concrete anchor will be inspected prior to use. The user will ensure the green installation indicator is present and that the yellow tag is present when used for fall arrest.
- The concrete anchor user will also ensure that work remains under the anchor point to the extent possible to prevent swing falls.

Personal Fall Protection Systems/Equipment
All employees on any project that will be required to wear a personal fall arrest or restraint system will follow these guidelines:

- A full body harness will be used at all times. (Use of body belts is prohibited for use as a fall arrest device)

- The employee will inspect all personal fall systems before each use. Any deteriorated, bent, damaged, impacted and/or harness showing excessive wear will be removed from service.
- Connectors will be inspected to ensure they are drop forged, pressed, or formed steel or are made of equivalent materials and that they have a corrosion resistant finish as well as that all surfaces and edges are smooth to prevent damage to interfacing parts of the system.
- Verify that D rings and snap hooks have a minimum tensile strength of 5,000 lbs. and that the D rings and snap hooks are proof tested to a minimum tensile load of 3,600 lbs. without cracking, breaking, or taking permanent deformation.
- Only shock absorbing lanyards or retractable lanyards are to be used to keep impact forces at a minimum on the body (fall arrest systems).
- All lanyards will have self-locking snap hooks.
    - Verify that unintentional disengagement of snap hooks is prevented by either of the following means:
        - Snap hooks are a compatible size for the member to which they are connected.
        - Locking type snap hooks are used.

9. Inspection of Fall Protection Systems

Always follow manufacturer recommendations for inspection.

Pre-use Inspection

- The employee will inspect all personal fall systems before each use. Any deteriorated, bent, damaged, impacted and/or harness showing excessive wear will be removed from service.

Formal Fall Arrest Equipment Inspection by a Competent Person

- An inventory of all Fall Arrest Equipment will be completed and documented for each area (See Appendix A)
- A Competent Person will be assigned to use the fall protection inventory to complete a formal documented inspection every year. (See Appendix B).
- The Manager will maintain documentation of all completed inspections and make these available during the annual EHS Safety Review.

10. Storage of Fall Protection Systems

Harnesses and Lanyards will be hung in an assigned location.

- Never store the personal fall arrest equipment in the bottom of a toolbox, on the ground, or outside exposed to the elements (i.e., sun, rain, snow).
- Hang equipment in a cool dry location in a manner that retains its shape.
- Clean with a mild, nonabrasive soap, and hang to dry.

- Never force dry or use strong detergents in cleaning.
- Never store equipment near excessive heat, chemicals, moisture, or sunlight.
- Never store in an area with exposures to fumes or corrosives elements.
- Avoid dirt and build-up on equipment.
- Never use this equipment for any purpose other than personal fall arrest.
- Once exposed to a fall, remove equipment from service immediately.

11. Rescue Plan and Procedures

A Fall Protection Hazard Assessment and Rescue Plan form (Appendix C), must be completed by a Competent Person prior to starting a job that requires fall protection. This shall include all methods for rescue.

- All jobs will be done in pairs with an authorized person acting as an observer.
- Call 911 immediately.
- Follow the procedures identified in the Rescue Plan form
- In the unlikely event that a fall arrest occurs, all employees will attempt to use the attached Relief Straps on the fall protection equipment to relieve pressure and reduce the risk of suspension trauma.
- Rescue shall be completed as soon as possible to prevent the onset of orthostatic intolerance.

12. Outside Contractors

General Requirements

- The University of Iowa will not lend or otherwise provide any equipment to any contractor performing work.
- Contractors performing work as part of a project where fall hazards exist must develop and implement a fall protection program to protect contract employees from fall hazards. Contractors are responsible for supplying and maintaining their equipment as required by OSHA and ANSI regulations and standards.

13. Training

A Competent Person shall train every employee who is involved in the use of fall protection. Training shall be done prior to use. It shall pertain to the specific fall protection system used and equipment selected. The training shall be documented. At a minimum the following must be covered in the training:

- How to recognize and minimize fall hazards.
- Procedures for donning equipment, erecting materials, maintaining, disassembling and inspecting the specific fall protection system used.
- The use, operation, and limitations of the fall protection system.
- The user’s role in fall protection system.

Retraining is required under the following conditions:

- Changes in the workplace render previous training obsolete.
- Changes in the types of fall protection systems or equipment to be used render previous training obsolete.
- Inadequacies in an employee's knowledge of the use of the fall protection system or equipment or observed behavior indicating the employee has not retained the required training.
- All employees should receive refresher training at least every 2 years.

The Department will maintain all training records.

- The record shall contain the following information: The name or other identity of the employee trained the date(s) of the training; and the signature of the person who conducted the training.

Appendix A - Fall Arrest Equipment Inventory List

Fall Arrest Equipment Inventory List

Completed By: ______________________ Date of Inventory: _________

Dept.	Sub-Dept.	Employee	Equipment	Serial#

Appendix B – Fall Protection Inspection Form

Name of Inspector: _____ Annual Inspection Date: _____
Serial Number: _____

Body Harness

- ☐ Body harness is fully intact and not modified by user
- ☐ No missing straps
- ☐ No unintended holes on the harness
- ☐ No discoloration of any harness straps on the discolored
- ☐ No fraying on harness components
- ☐ No burnt or melted fibers
- ☐ All clips and attachment points present
- ☐ All springs in working condition
- ☐ No cracked/bent clips or buckles

Lanyards

- ☐ Lanyard is fully intact and not modified by user
- ☐ No broken or cut fibers
- ☐ No kinks or knots
- ☐ No burnt or melted fibers
- ☐ No discoloration, fraying or holes in fabric
- ☐ No bent or stretched links (if metal links)
- ☐ Cable lines not snapped or frayed
- ☐ Retracting feature functions properly
- ☐ Clips and attachments are not cracked or bent

Connectors

- ☐ All hooks and carabineers are intact and not modified by user
- ☐ Locking mechanism is present and in working order
- ☐ Connectors are not stretched, cracked or modified
- ☐ Stitching is not torn or ripped
- ☐ No cracks or excessive wear

Pass: _____ **Fail:** _____ (immediately remove from service)

Appendix C - Fall Protection Hazard Assessment and Rescue Plan Form