



# ILLINOIS STATE UNIVERSITY FALL PROTECTION PROCEDURE



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## 1. PURPOSE AND SCOPE

The purpose of Illinois State University's (ISU) Fall Protection Procedure is to establish requirements to protect all employees engaged in work activities that expose them to potential falls from elevations. The scope of this Fall Protection Procedure includes all staff engaged in work activities which expose them to falls from heights of four feet or more.

## 2. RESPONSIBILITIES

Everyone involved in a Fall Protection Program has certain responsibilities. It is very important that every individual is familiar with his/her responsibilities.

### a. ENVIRONMENTAL HEALTH AND SAFETY

- Review and update the Illinois State University Fall Protection Procedure to conform to current CFR standards.
- Monitor compliance with standards set forth in the program through periodic worksite inspections.
- Assist Supervisors by providing training as set forth in procedure.
- Give guidance for the proper selection and use of appropriate fall protection equipment.
- Make every effort to engineer out the fall hazard (e.g. guard rail system, move equipment or tasks closer to ground level, etc.).

### b. SUPERVISORS

- Ensure that all employees have received the appropriate training.
- Provide necessary fall protection equipment.
- Continuously monitor the work to assure fall protection is being used properly and safely.
- Take appropriate disciplinary action whenever an employee under his/her direction fails to follow safety precautions outlined in this procedure.

### c. EMPLOYEES

- Use fall protection equipment according to safe work practices outlined in training.
- Inspect all fall protection equipment prior to use, and report any defects or concerns to their supervisor immediately.
- Use all required personal fall protection according to training received.
- Never attempt to alter or repair any fall protection equipment.

### 3. DEFINITIONS

**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 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.

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

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

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

**Guardrail:** A barrier at least 42 inches high erected to prevent personnel from falling from working levels more than 30 inches above the floor, ground, or other working areas of a building.

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

**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 Work:** 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). This serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**Low Sloped Roof:** A roof having a slope of less than or equal to 4 in 12 (vertical to horizontal). A roof with approximately a 19.5-degree slope or less.

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

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

**Personal fall arrest system:** 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.

**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:** Exterior surface on the top of a building.

**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).

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

**Snap hook:** A connector consisting of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released automatically closes to retain the object. Only locking snap hooks are permitted.

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

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

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

**Unprotected sides and edges:** Any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 42 inches high.

**Vertical Lifeline:** A component consisting of a vertically hanging flexible line for connection to an anchor point at one end 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 and, runways.

## 4. TRAINING

- All personnel engaged in operations and exposed to a fall hazard four feet or greater must be properly trained in accordance with this procedure prior to use.
- The training shall include the following topics as applicable:
  - Recognizing the nature of fall hazards.
  - The use and operation of guardrail systems, personnel fall arrest systems, warning line system, safety monitoring systems, and other protection to be used.
  - The correct procedures for selecting, erecting, using, inspecting, disassembling, and storage of fall protection equipment.
  - The limitations of fall protection equipment.
  - The role of each employee in the fall protection procedure.
  - The inspection, care, and storage requirements
  - Other requirements contained in this procedure.
- Retraining shall be conducted every 5 years or:
  - When an employee demonstrates a lack of skill, understanding or where inadequacies in an affected employees work involving fall protection indicates that the employee has not retained proficiency.
  - Changes in the workplace render previous training obsolete.
  - Changes in the types of fall protection systems or equipment to be used.

## 5. INSPECTION AND STORAGE

- Inspection

- All fall protection equipment must be inspected prior to use.
  - Always follow manufacturer's recommendations for inspection.
  - Equipment found to be defective must be immediately removed from service, tagged as defective and repaired, or destroyed and replaced.
- Storage
    - Return fall protection equipment to storage area after use.
    - Never store personnel fall arrest equipment on the ground, or outside exposed to the elements (i.e. sun, rain, snow, ect.)
    - Store harnesses in a vertical position so as to not create a trip hazard.
    - Once exposed to a fall, remove equipment from service.

## 6. PROCEDURES

- The following fall hazards are **not** covered under the scope of this program:
  - Scaffolding (see Scaffolding Procedure)
  - Ladders (see Ladder Procedure).
  - Aerial Lifts (see Aerial Lift Procedure).

Note: Fall protection requirements regarding these situations are found in other procedures. In addition, this program does **not** cover retrieval equipment used for confined spaces on campus.

- General Requirements
  - Purchase of fall arrest equipment must be approved by Environmental Health and Safety.
  - Fall protection is required wherever the potential to fall 4 feet or more exists.
  - All individuals who are exposed to a fall hazard as defined by this plan shall follow the fall protection procedure. If there is a question regarding a specific fall protection situation, PLEASE consult your immediate supervisor or Environmental Health and Safety.
  - Body belts are not considered a means of fall arrest protection and are prohibited from use.

- All components of a personal fall arrest system; i.e. harnesses, lanyards, anchorage, lifelines, and connectors must have a minimum breaking strength of 5000 pounds.
- All fall protection equipment must be designed and used in accordance with this procedure and all applicable manufacturer and regulatory requirements.
- All fall protection equipment shall be designed to meet or exceed American National Standards Institute (ANSI) standards.

- Fall Arrest Systems

A personal fall arrest system consists of a full-body harness, lanyard, and anchor point, or a full-body harness, lanyard, lifeline, anchor point, and deceleration/grabbing device.

- Body Harness
  - Only approved full-body harnesses must be used as protection against falls.
  - Full-body harnesses must be worn properly with the straps tucked in so as not to get caught on equipment.
  - Full-body harnesses must at a minimum be equipped with a “D ring” located in the center of the back.
- Lanyards and Lifelines
  - Lanyards and lifelines must have a minimum breaking strength of 5,000 pounds.
  - Lanyards and lifelines shall be protected against cutting and abrasions.
  - Lanyards and lifelines must be free of knots.
  - Lanyards shall not exceed 6 feet in length.
  - Lanyards must be used in conjunction with a shock absorber or shock absorbing system.
  - Rope lanyards are not allowed.
  - Only one employee may be attached to the same lanyard.



- When not in use, the lanyard must be secured in a fashion as not to cause a tripping hazard or become entangled in equipment.
- Flexible steel lanyards (retractable lanyards) shall not be used on or in proximity of electrical wires.
- Self-retracting lifelines and lanyards must automatically limit free fall distance to 2 feet or less.
- Snap Hooks
  - Only locking type snap hooks may be used.
  - Snap hooks may not be attached in the following manner:
    - ❖ Directly to webbing or steel lanyards. (unless designed for that purpose)
    - ❖ To each other.
    - ❖ To a “D ring in which another snap hook or other connector is attached.
- Anchorage Points
  - Anchorage points used to attach personal fall protection equipment must be capable of supporting 5000 pounds per employee attached.
  - Anchorage points may not be used for any other purpose when being used as a personal fall arrest system.
  - The anchorage point must be inspected prior to each use.
- Warning Line System
  - Warning line systems consist of ropes, wires, chains, and supporting stanchions. The following restrictions apply:
    - ❖ Must be flagged at no more than 6-foot intervals.
    - ❖ Rigged and supported so that the lowest point including sag is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches.
    - ❖ Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds.

- ❖ The rope, wire, or chain shall have a minimum tensile strength of 500 pounds.
- ❖ The rope, wire, or chains shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.
- No employee will be allowed in the area between the roof edge and a warning line unless the employee is performing roofing work, and a safety monitor is assigned.
- Safety Monitoring System

A safety monitoring system is a fall protection system in which a competent person is responsible for recognizing and warning employees of all fall hazards. Safety monitoring system may only be implemented when employees are involved in low sloped roofing activities.

- The duties of a safety monitor are:
  - ❖ Be competent in recognizing fall hazards.
  - ❖ Warn by voice when approaching the open edge in an unsafe manner.
  - ❖ Warn by voice if there is a dangerous situation developing.
  - ❖ Be on the same walking/working surface as the monitored employees and within visual sighting distance of the employees.
  - ❖ Be close enough to communicate orally with the employees.
  - ❖ Not allow other responsibilities to encumber monitoring.

## 7. ROOF WORK

This applies to roofing work such as removal, repairing, or installation of weatherproofing roofing material such as shingles, tile, and tar paper etc..

- Only individuals who have trained to be proficient in the alternative methods of fall protection shall be allowed onto the roof.

- The roof surface shall be inspected for slipping hazards.
  - When adverse weather creates a hazardous condition, roofing operations shall be suspended until the hazardous conditions no longer exist.
  - No one shall ascend or descend the roof's slope within 6 feet of the rake edge.
  - Supplies and material shall not be stored within 6 feet of the rake edge, or three feet where tile roof systems are being installed.
  - The areas below the eaves and rakes shall be kept clear of materials and other objects which could pose impalement or other hazards.
- Low Pitched Roofs
    - Individuals engaged in low-sloped (slope less than or equal to 4 in 12) roofing activities with unprotected sides and edges must be protected by the use of a guardrail system, personal fall arrest system, warning line system, or safety monitor.
    - Individuals working on roofs less than 50 feet can use a safety monitor, warning lines are not required.
    - Roofs greater than 50 feet wide are required to use a warning line system 6 feet from the edge of the roof.
    - Roofs greater than 50 feet and employees working within 6 feet of the edge are required to use a warning line system in conjunction with a safety monitor.
    - A warning line will be erected not less than 10 feet from the roof edge when mechanical equipment is being used.
    - If a guardrail system or personal fall protection is used, the warning line system and safety monitor are not required.
    - When engaged in roofing repairs 6 feet – 25 feet from the edge of a fall hazard, a warning line system can be used as an alternative to personal fall arrest system and the normal warning line system. The following conditions must be met:
      - The warning line must surround the area of work.

- No work can be done outside the warning line without the use of a guardrail system, personal fall arrest system, a new warning line system, or a safety monitor.
- Low-slope guidelines
  - Low-sloped roofs must use either a safety monitoring system, warning line system, or roofing slide guards. These systems may be used in conjunction.
  - Slide guards must be built and installed in accordance with the below guidelines and may not be used by itself. (9.3.10)
- Steep Roofs
  - All individuals performing roofing activities on a steep roof (slope greater than 4 in 12) with unprotected sides and edges must be protected from falling by either a guardrails system with toe boards, safety net systems, or a personal fall arrest system.
  - Slide guards must be built and installed in accordance with the below guidelines.
  - Slide guards must be used in conjunction with a fall arrest system.
  - Roof slope over 8 in 12.
    - No alternatives available.
- Slide Guards
  - Roof Slope: 6 in 12 or less
    - All slide guards must be constructed of 2" x 6" stock.
    - No more than three rows of roofing material shall be applied before installing the slide guards. The roof jacks shall be installed using nails long enough to withstand an employee sliding into the guard.
    - The face of the slide guard must be perpendicular to the surface of the roof.
  - Roof Slope: over 6 in 12 to 8 in 12
    - Slide guards must be constructed of 2" x 6" stock.
    - Continuous slide guards shall be installed as described above.

- Additional slide guards shall be installed below each work area at intervals not to exceed eight feet.
- The face of the slide guard must be perpendicular to the surface of the roof.

## 8. WORKING ON EQUIPMENT LOCATED ON ROOFS

- Low sloped roofs
  - When working on equipment **closer** than 15 feet from the edge of the roof, fall protection system must be used (i.e. arrest system, restraint system)
  - Equipment located **further** than 15 feet from the edge of the building the warning line system can be used or other fall protection systems.
  - No one is allowed to work outside the warning line system.
  - If a building has a parapet wall or guardrail 39" to 42" tall surrounding the work area, fall protection is not required.

## 9. AERIAL LIFTS

- Only authorized personnel who have received training on the operation of an aerial lift device may operate the vehicle.
- Aerial lifts will be inspected prior to use.
- A full-body harness shall be worn, and a lanyard attached to the aerial lift whenever the aerial lift is in operation. (This does not apply to the scissor lift).
- When not engaged in high voltage work the aerial lift will stay a minimum of 10 feet from overhead power lines.
- Always stand firmly on the floor of the basket and never sit or climb on the edge of the basket.
- Never use planks, ladders, or other devices to extend the height of the aerial lift.
- Never exit the aerial lift platform once in an elevated position.
- Boom and platform load limits specified by the manufacturer shall not be exceeded.

- Never use the aerial lift as a crane or other lifting device.