



Fall Protection

Section: Campus Safety and Security Policies

Policy Name: Fall Protection **(DEHS) Date of Origination:** 1/30/2023

1.0 Purpose

The purpose of this procedure is to protect personnel from injury when performing elevated work or work near holes or excavations, where there is a potential free fall of 6 feet or greater, in conformance with OSHA and ACC Responsible Care® Employee Health and Safety Code requirements, and to establish minimum requirements for the construction, use and maintenance of tube and coupler scaffolds.

2.0 Scope

This procedure is applicable to University of Delaware employees and contractor personnel located at all University of Delaware campuses and all off-campus research activities.

3.0 Definitions

- 3.1 Anchorage - A secure point of attachment for lifelines, lanyards, or deceleration devices, capable of supporting a weight of 5,000 pounds per worker attached.
- 3.2 Body Harness - Straps which are secured about an employee in a manner that will distribute any fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with a means for attaching it to other components of a personnel fall arrest system.
- 3.3 Competent Person - One who is capable of identifying existing and predictable fall hazards in the surroundings or work conditions which are dangerous to employees and other persons in the area, and who has authorization to take prompt corrective measures to eliminate them.
- 3.4 Deceleration Device - Any mechanism, such as a rope grab, tearing or deforming lanyards, etc., which dissipates energy or limits the energy imposed on an individual during a fall arrest.
- 3.5 Fall Protection System - Systems such guardrails, safety nets, personal fall arrest systems, warning lines, safety monitoring or covers which are designed to prevent or minimize the effect of falling from height.
- 3.6 Guardrail System - A vertical barrier erected to prevent employees from falling to a lower level and capable of withstanding without failure a force of 200 pounds applied within two inches from the top edge. Height above ground or platform is 42 in. \pm 3 in. and has a midrail halfway between the top rail and the ground or platform
- 3.7 Hole - A gap of two inches or more in a floor, roof or other work surface.
- 3.8 Lanyard - A flexible length of rope, wire or strap that connects a body harness to an anchorage point, lifeline or deceleration device.
- 3.9 Leading Edge – The edge of a floor, roof or form work for a floor or other walking surface which changes location as additional floor, roof, decking or form work sections are



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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.

- 3.10 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), and which serves as a means for connecting other components of a Personal Fall Arrest System to the anchorage.
- 3.11 Personal Fall Arrest System - A wearable system to limit or prevent a person's fall and consists of a full body harness, lanyards, connectors, and anchorage point and may include a deceleration device. The Personal Fall Arrest System must meet the requirements of 29 CFR 1926.502.
- 3.12 Personal Fall Limiter – A type of self-retracting lanyard where the housing end of the device is connected to the D-ring on the back of a worker’s harness and is lighter in weight than a self-retracting lanyard.
- 3.13 Qualified Person – A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to resolve problems relating to the design and application of fall protection systems. For the purposes of this standard, a Qualified Person is a licensed professional engineer in the State of Delaware with experience with fall protection systems..
- 3.14 Safety Monitoring System – Employs a person rather than a mechanical system to warn workers when they are within six feet of a roof or platform edge. The safety monitor, who must be a competent person, is responsible for recognizing fall hazards and warning workers about them. The safety monitor shall:
 - 3.14.1 Be competent in the recognition of fall hazards.
 - 3.14.2 Be capable of warning workers of fall hazard dangers and in detecting unsafe work practices.
 - 3.14.3 Be on the same walking/working surface and in visual sighting distance of the employees being monitored.
 - 3.14.4 Be close enough to work operations to communicate orally with workers and has no other duties to distract from the monitoring function.
- 3.15 Scaffold - Any temporary elevated work platform and its supporting tube and coupler structure.
- 3.16 Self-retracting Lanyard or Self-retracting lifelines (SRL) – Devices that are designed using webbing, wire rope, or a cable that automatically retracts into a housing unit, never allowing for any slack in the line. The lifeline, much like the seat and shoulder belt in a car, also pulls out and retracts easily and limits the fall distance to less than 1 ft. The SRL’s housing end is usually not worn by a worker due to its weight.
- 3.17 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.



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- 3.18 Warning Line System – A barrier (wire, rope or chain and supporting stanchions) erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which the roof work may take place without the use of guardrails, personal fall arrest system, or safety net systems to protect employees in the area.
- 3.19 Walking/Working Surfaces – Any surface, whether horizontal or vertical, on which a person walks or works, including but not limited to floors, grating, roofs, ramps, bridges, runways, form work, and concrete reinforcing steel, but does not include fixed ladders, vehicles, or trailers on which personnel must be located to perform their work duties.

4.0 Responsibility

4.1 EHS Department:

- 4.1.1 Ensures that guidance is provided to other departments, upon request, regarding this policy.
- 4.1.2 Ensures that training to University personnel is provided in accordance with section 8.0.
- 4.1.3 Maintains Fall Protection training records for University personnel after the satisfactory completion of training.

4.2 Managers of Affected Departments:

- 4.2.1 Ensure that department personnel are trained and conform to this policy and that department fall protection equipment is maintained properly.

4.3 Employees:

- 4.3.1 Comply with the provisions of this policy.

4.4 UD Contract Managers, Project Managers and anyone who hires contactors:

- 4.4.1 Ensure that contractor personnel conform to this policy.

4.5 Contractors:

- 4.5.1 Provide their own fall protection equipment and conform to this policy.

5.0 References

5.1 29 CFR 1910.21 to 1910.32 - Walking-Working Surfaces

5.2 29 CFR 1926.104 - Safety belts, lifelines, and lanyards

5.3 29 CFR 1926.450 to 454 - Scaffolds

5.4 29 CFR 1926.500 to 503 - Fall Protection

5.5 29 CFR 1926.550 Cranes and derricks

6.0 Procedure

6.1 General



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- 6.1.1 Fall protection is required when the feet of personnel are positioned six feet or more above a lower level; or on roofs where personnel must work within ten feet of non-guard rail protected skylights, roof edges, shafts, leading edges and floors, etc.
- 6.1.2 Personnel working within six feet of excavations, wells, pits, shafts, etc. must be protected from falling by guardrail systems, fences, barricades, covers or a personal fall arrest system.
- 6.1.3 Personnel working less than six feet above dangerous equipment (e.g. rotating blades, sharp objects, impalement hazards, etc.) must be protected by a guardrail system or equipment guards.
- 6.1.4 Personnel working six feet or more above dangerous equipment must be protected by a guardrail system or a personal fall arrest system.
- 6.1.5 Personal fall arrest systems must be worn when working six feet or more above a lower level from a temporary or moveable structure or equipment such as a scaffold, bucket truck, scissor lift, or mobile lift. This requirement applies regardless of whether guardrail systems are in place or not.
- 6.2 Acceptable personnel fall protection practices include the use of guardrail systems or walls 42 ± 3 inches high, personal fall arrest systems or safety net systems
 - 6.2.1 When conditions warrant, the height of guardrails or walls may exceed 45 inches, provided all other conditions for their construction are met.
- 6.3 Other Protective Measures- The following measures to minimize injury must also be considered in the planning stages for elevated work.
 - 6.3.1 Cordoning off of the area below elevated work with barrier tape and cones to keep personnel and vehicular traffic out.
 - 6.3.2 Adequate lighting.
 - 6.3.3 Clear access to the job site, including proper clearance from electrical wires. Personnel must not come within 20 feet of any overhead electrical wire, without permission from the Electrical Department and the EH&S Department.
 - 6.3.4 Maintenance of work areas free of debris, tools and other tripping hazards.
 - 6.3.5 Installation of toe boards, screening, canopies, etc. to protect employees and equipment below from falling objects.
 - 6.3.6 Gates to elevated platforms must be self-closing.
 - 6.3.7 Avoidance of hazardous weather conditions.
 - 6.3.7.1. Exterior elevated work shall not be performed if weather conditions make climbing and work surfaces hazardous.
 - 6.3.7.2. Exposed elevated work should not be performed when high wind speeds or gusts are likely or during severe inclement weather.
- 6.4 Guardrail Construction- When guardrails are used for fall protection, screening, mesh, middle rails, intermediate vertical members or similar construction must be installed



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between the rail and the walkway or working surface. No opening in the handrail system shall be wider than 19".

- 6.4.1 Midrails must be installed midway between the top rail and the walking/working surface. The ends of top rails and midrails shall not overhang the terminal posts.
- 6.4.2 Screen and mesh, when used in lieu of midrails, must extend from the top rail to the walking/working surface along the entire opening between top rail supports.
- 6.4.3 Guardrails must be capable of withstanding a force of at least 200 lbs horizontally and vertically along the top edge and a force of 150 lbs. at any point in the system.
- 6.4.4 Guardrail systems must be smooth so as not to cause punctures, lacerations, or other injuries to personnel.
- 6.4.5 Openings in the working surface must be protected on all sides by handrails or have a cover marked "HOLE" or "COVER". No more than two of the sides if a handrail system may be removable for allowing the passage of materials.
- 6.4.6 If a person must lean through an opening in a guardrail system, they must be protected by a personal fall arrest system.

6.5 Personal Fall Arrest Systems

NOTE: Personnel working from moveable or temporary elevated work surfaces must use a personal fall arrest system at all times.

- 6.5.1 A personal fall arrest system consists of a full body harness, with a lanyard/lifeline attached to a secure anchoring point. Each individual must be attached to a separate lifeline.
- 6.5.2 Only EH&S approved personal fall arrest systems (based upon industry standards) shall be used by University personnel.
- 6.5.3 All equipment must be inspected prior to use for cuts, fraying, or other visible signs of wear. **WARNING: IF FALL PROTECTION EQUIPMENT HAS ARRESTED A FALL, IT MUST NOT BE REUSED. TAG IT OUT OF SERVICE AND DISCARD IT.**
- 6.5.4 To don the harness, personnel hold the top back D-ring and put their arms through the shoulder straps, ensuring that the upper straps are crossed at the back and that the harness is not inside out.

Personnel then sit against the back strap and take each thigh strap from between their legs and fasten it across their thighs with the attachment buckles. The straps are checked to ensure that they are not twisted and are adjusted as necessary.

The shock absorbing end of the lanyard, the housing end of a personal fall limiter or the snap hook of a self-retracting lanyard is then attached to the D-ring on the back of the harness and the other end is attached to the lifeline or anchor point.



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- 6.5.5 The anchor point of a primary fall protection system must be capable of supporting at least 5,000 lbs per person.
 - 6.5.5.1 Anchor points are inspected annually by EH&S. Do not use an anchor point tagged "Out of service".
- 6.5.6 In some instances, for example when moving around an obstruction, a double legged lanyard system is necessary. Before one snap hook is removed, the other is attached to a proper anchor point on the other side of the obstruction. This type of hook up meets the requirement of 100% fall protection.
- 6.6 Lifting Personnel- Only approved ladders, scaffolds, stairs or mechanical devices especially designed for lifting personnel (such as a Genie Lift) may be used to access elevated locations.
 - 6.6.1 The lifting of personnel by cranes is prohibited, unless conventional means of reaching an elevated worksite by personnel hoist, ladder, stairs, aerial lift, elevating work platform, or scaffold would be more hazardous or not possible. Prior EH&S approval is required for personnel lifts by crane.
 - 6.6.2 If a crane must be used to lift personnel, a platform, specifically designed by a person qualified in structural design, must be constructed and used in accordance with the requirements listed in 29 CFR 1926.550 (g).

7.0 Scaffold Safety

- 7.1 After erection, scaffold construction must be certified by a competent person using the tag shown in ATTACHMENT 1.
- 7.2 Scaffolds must be inspected by a competent person before each work shift. The inspection must be documented on a tag the color of which conforms to the following:
 - 7.2.1 Green: OK to use without personal fall arrest system
 - 7.2.2 Yellow: OK to use with a personal fall arrest system
 - 7.2.3 Red: Not OK to use until appropriate modifications or repairs are completed ("Out of service")
- 7.3 Personal fall arrest systems must be worn when working on a scaffold 6 feet or more above a lower level. This requirement applies regardless of whether guardrail systems are in place or not.
- 7.4 Scaffolds may not be used during adverse weather conditions, such as storms, high winds, or when ice or snow covered.
- 7.5 Tools, materials and debris must not be permitted to accumulate in quantities sufficient to be a hazard. Slippery walking conditions on planking must be remedied immediately.
- 7.6 Ladders must not be used on scaffolds to increase the working height, unless approved by the EH&S Department.
- 7.7 The area below the scaffold must be barricaded to prevent employees and other personnel from entering the area.



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- 7.8 Scaffolds must not be moved while employees are on them unless they are specifically designed for such movement and personnel are trained in the proper process for moving the scaffold.
- 7.9 All scaffolding must be erected in accordance with Reference 5.3 (29 CFR 1926.450 to 454 - Scaffolds). The following are general OSHA requirements contained in the reference:
 - 7.9.1 The footing or anchorage for scaffolds shall be plumb and level on a rigid, stable surface, capable of carrying the intended load without settling or displacement.
 - 7.9.2 Base plates and cross and longitudinal bracing shall be used on all scaffolds.
 - 7.9.3 Poles, legs, and uprights shall be plumb and securely braced to prevent swaying.
 - 7.9.4 Guardrails, midrails and toe boards shall be used on all scaffolds that are more than six feet high. Toe boards shall be a minimum of 4 inches high.
 - 7.9.5 Scaffolds and their components shall be capable of supporting at least four times the maximum intended load.
 - 7.9.6 Platforms shall be fully planked and securely cleated. Platform units (scaffold grade planks, fabricated decking, etc.) shall be installed so that the space between the adjacent units is less than 1 inch, unless approved by the EH&S Department.
 - 7.9.7 Planking ends shall be overlapped a minimum of 12 inches or be secured from movement. Planks shall extend over their end supports by not less than six inches or more than 18 inches.
 - 7.9.8 Platforms and walkways shall be at least 18 inches wide, unless approved by the EH&S Department.
 - 7.9.9 The space between the platform and work surface shall not exceed 14 inches.
 - 7.9.10 An access ladder or equivalent safe access shall be provided. Access ladders must be designed with rungs capable to withstand 300 lbs. working loads and remain free of grease and oils.
 - 7.9.11 Access ladders greater than 30 feet in height shall have landing platforms installed at intervals not exceeding 30 feet. Access ladders shall be secured within two feet of their top and bottom. Access ladders greater than 10 feet in height require securing near their midpoint.
 - 7.9.12 Supported scaffolding with a height to base ratio of more than 4 to 1 shall be restrained from tipping by guying, tying, bracing, or equivalent means. Both tension and compression bracing must be used.
- 7.10 Scaffolds shall be tied to and securely braced against the structure at intervals not to exceed 30 feet horizontally and 26 feet vertically. Scaffolds must not be erected within 20 feet of energized overhead electrical wires without approval from the Electrical Department Supervisor, or delegate, and a representative of EH&S.



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8.0 Training

8.1 All University personnel must be fully trained in these Fall Protection Guidelines prior to commencing any work at height.

8.2 Training for employees exposed to fall hazards includes:

8.2.1 The nature of workplace fall hazards.

8.2.2 Procedures for erecting, maintaining, disassembling and inspecting fall protection systems used onsite

8.2.3 Use and operation of fall protection systems and their respective advantages and disadvantages.

8.3 Employees must be retrained when:

8.3.1 It appears that an employee that has been trained may not be fully aware of fall protection requirements, or

8.3.2 Changes in the workplace or type of fall protection used render previous training obsolete.

8.4 Training for employees utilizing portable ladders and/or scaffolding shall occur before use of ladders and/or scaffolding and include the requirements of this procedure.

9.0 Records Maintenance

9.1 Training records for University personnel are maintained by EH&S and each affected Department after the satisfactory completion of training.

10.0 Revision History

Rev No.	Summary of Change	Revised by	Effective Date
0	Initial	J. Verdi	1/30/2023



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11.0 ATTACHMENT 1

12.0 SCAFFOLD CERTIFICATION TAG (BLUE)

<p>○</p> <p>THIS SCAFFOLD IS CONSTRUCTED IN ACCORDANCE WITH OSHA REQUIREMENTS</p>
BY (COMPANY) _____
NAME (COMPETENT PERSON-PRINT) _____
SIGNATURE _____
DATE _____
EXPECTED DURATION OF USE FOR JOB _____