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Fall Protection and Elevated Work Safety Program

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Revised 7/2018

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Introduction

The University of North Carolina at Pembroke's Environmental Health and Safety office (EHS) has developed this Program to ensure a safe work environment and to protect the health and safety of employees who may be required to work in areas where fall hazards are present. UNCP believes that falls can be prevented by proper planning, providing the right fall protection equipment and training all workers to use the equipment safely. It is the intention of this Program to comply with the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Fall Protection standards 29 CFR 1926.500 and 29 CFR 1926.502.

Scope

This Program establishes the required procedures, methods, precautions, training, and responsibilities that shall be used by UNCP employees where fall protection is required. Any deviations from this program must be immediately brought to the attention of the EHS Office.

The following work situations are covered by the university's Fall Protection and Elevated Work Safety Program:

- Fixed ladders – over 20 feet in height;
- Elevating personal platforms - scaffolds, aerial platforms, scissors lifts forklift-mounted platforms, etc.;
- Elevated surfaces – roofs (closer than 6 feet to the edge), catwalks, skylights, boilers, chillers, etc.; and
- Vertical opening - ground level entry into excavations, trenches, holes, pits, vessels, and other confined spaces.

Responsibilities

Leadership

The University of North Carolina at Pembroke has legal responsibility for compliance with the occupational safety and health standards.

Environmental Health & Safety (EHS)

- Developing, implementing and managing the Fall Protection and Elevated Work Safety Program;
- Auditing for compliance and evaluating implementation with this Program and the applicable OSHA standards;
- Ensuring that fall protection devices/systems meet OSHA current regulations;
- Assisting departments in identifying areas/activities that require fall protection;
- Develop training programs on the recognition of fall hazards;

- Determining if there are feasible engineering controls that can eliminate the fall hazard;
- Curtailing or stopping work that pose a clear and imminent danger to the health and safety of the university community; and
- Maintaining employee training records.

Facilities Planning and Construction (FPC)

- Notifying the EHS office during the design stage of new buildings or renovations of existing buildings that require fall protection installations (i.e. roof edge guarding, skylight protection, cabling systems, etc.);
- Ensuring that the appropriate fall protection measures identified by the EHS Office are incorporated into the design of new buildings and renovations of older buildings;
- At the completion of projects that have had fall protection equipment/systems installed, FPC shall:
    - Obtain vendor/manufacturer certifications;
    - Provide vendor/manufacturer training to UNCP employees using the equipment; and
    - Notify Facilities Operations of the installation(s) of fall protection equipment.
- Provide documentation of certifications and training to EHS.

Departments

- Notifying EHS of any activity, equipment or machinery that needs to be evaluated for fall protection measures;
- Ensuring that all affected employees are accurately trained and qualified to comply with the requirements of this Program;
- Ensuring that all affected employees are aware of the locations or equipment where fall protection measures are required;
- Ensuring that all affected employees comply with this Program and OSHA standards by invoking disciplinary action or administrative sanction;
- Developing a rescue plan;
- Conducting annual fall protection inspections;
- Ensuring that employees are trained in the recognition of fall hazards; and
- Providing training records to EHS.

Employees

- Complying with the requirements of this Program;
- Conducting inspections of fall protection equipment;
- Reporting equipment defects and issues in a timely manner to supervisors; and

- Complying with fall protection methods.

Definitions

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

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

Body harness: Straps which may be secured about the employee 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.

Competent Person: A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions.

Connector: A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a buckle or d-ring sewn into a body belt or body harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).

Controlled access zone (CAZ): An area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

Dangerous equipment: Equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

Deceleration device: Any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration distance: The additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or 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.

Equivalent: Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Failure: Load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

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

Hole: An opening measuring less than 12 inches (5.1 cm) but more than 1 inch in its least dimension, in any floor, platform, roof, pavement, or yard, though which materials bit not persons may fall; such as a belt hole, pipe opening, or slot opening.

Infeasible: 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.

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

Leading edge: The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as 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: 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.

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

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.

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 (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

Overhand bricklaying and related work: The process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

Personal fall arrest system: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of Jan. 1, 1998, the use of a body belt for fall arrest is prohibited.

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

Qualified person: A person by possession of a recognized degree, certification, professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated their ability to resolve problems relating to the subject matter, the work, of the project.

Rope grab: A deceleration device that travels on a 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.

Roof: The exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface 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.

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

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

Snap hook: 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. Snap hooks are generally one of two types:

- The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.

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

Toe board: A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Unprotected sides and edges: Any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.

Walking/working surface: Any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel 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, body belt, or safety net systems to protect employees in the area.

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

Procedures

All employees will be protected from falling when working on a surface that has an unprotected side, edge, etc., elevated work platforms four feet or more above an adjacent lower levels, and when working above dangerous equipment while working in general industry.

While preforming construction type activities, all employees will be protected from falling from a surface six feet or more above a lower level. Scaffolds used during construction type activity require fall protection to be used at 10 feet or more above a lower level. In construction activities involving steel erection, employees who are on a walking working surface with an unprotected edge more than 15 feet above a lower level must be protected by conventional fall protection. When working from aerial lifts, review the UNCP Aerial Lift Program for additional guidance.

Fall hazards will be evaluated by the Environmental Health and Safety office and management to determine the best method to protect the employee. When selecting what type of fall protection to use, the Environmental Health and Safety office 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).

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

Fall Hazard Evaluation

The Environmental Health and Safety office and departmental management will assess assigned job task and area for potential fall hazards. This evaluation will document the required steps for protecting employees from the identified fall hazards.

Fall Protection Systems

- Guardrail System: Standard guardrails consist of a top rail, located 42 inches above the floor, and a mid-rail. Screens and mesh may be used to replace the mid-rail, so long as they extend from the top rail to the floor;
- Personal Fall Arrest Systems: Components of a personal fall arresting system include a body harness, lanyard, lifeline, connector, and an anchorage point capable of supporting at least 5,000 pounds;

- Positioning Device Systems: Positioning device systems consist of a body belt or harness rigged to allow work on a vertical surface, such as a wall, with both hands free;
- Warning Line Systems: Warning line systems are made up of lines or ropes installed around a work area on a roof. These act as a barrier to prevent those working on the roof from approaching its edges; and
- Covers: Covers are fastened over holes in the working surface to prevent falls.

Guardrail Systems

Guardrails are the preferred method for the protection of fall hazards. Typical locations that require guardrails include floor openings, wall openings, open-sided floors, platforms and runways.

All guardrail systems used by UNC Pembroke will meet the following criteria:

- Top rail is 42 inches, +/- 3 inches above the walking/working level;
- Mid rail is located midway between the top rail and the walking/working level;
- Top rails and mid rails will be constructed of materials at least one-quarter inch in thickness or diameter. If wire rope is used for top rails it must be flagged with a high-visibility material at least every 6 feet and can have no more than 3" deflection;
- The top rail must be capable of withstanding a force of 200 pounds when applied in any downward of outward direction;
- The mid rail must withstand a force of 150 pounds applied in any downward of outward direction;
- Toe boards are required for all guardrails on elevated walking/working platforms were pedestrians below are exposed to falling objects.
- Toe boards must be 4" 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; and
- 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.

Personal Fall Arrest Systems

If a fall occurs, the employee must not be able to freefall more than 6 feet, nor contact a lower level. All personal fall arrest system components that are subjected to an impact load must be removed from service immediately. Personal fall arrest systems will be inspected prior to each use (see Appendix A), and damaged or deteriorated components removed from service and destroyed.

There are three main components to a personal fall arrest system; anchorage point, body harness, and connecting devices.

All personal fall arrest system components must meet the requirements of the ANSI Z359 Standards.

Anchorages

Secure anchor points are the most critical component when employees must use fall arrest equipment. Some UNC Pembroke buildings have existing identified anchor structures. Other work locations may require the installation of a temporary or permanent anchor.

All anchor points will be:

- Sound and capable of withstanding a 5,000 lb. static load per employee attached and independent of any anchorage used to support of suspend platforms;
- Easily accessible by employees to avoid fall hazards during hook-up;
- Free of sharp edges that could reduce breaking strength when tying off.
- Chafing pads or abrasion-resistant straps must be used on any sharp edged structures to prevent cutting of safety lanyards or lifelines;
- At the employees shoulder level or higher to limit freefall to 6 feet or less and prevent contact with any lower level (except when using a self-retracting lifeline for 3-foot lanyard);
- Able to prevent or limit swing fall hazards;
- Horizontal lifelines will be used to keep the attachment point overhead and limit the fall vertically; and
- Guardrails and hoists cannot be used as anchorage points.

In addition to all the criteria listed above, permanent anchor points will be periodically inspected and re-certified to meet static load requirements. They will be visibly labeled as permanent anchors and all anchors must be immediately removed from service and re-certified if subjected to fall arrest forces.

Body Harness

- A full body harness is required, the use of body belts is prohibited;
- The only attachment point allowed on the body harness is the center D-ring on the harness back;
- Employees must always tie off at or above the D-ring of the harness except when using lanyards 3 feet or less in length; and
- Fall protection equipment will never be load tested.

Connecting Devices

- Allowable devices include rope or web lanyards, rope grabs or retractable lifelines;
- All snap hooks must be self-locking;
- Horizontal lifelines will be designed by a qualified person and installed in accordance with the design requirements;

- Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds;
- The length of a single lanyard will not exceed six feet;
- The use of steel lanyards is prohibited;
- A lanyard may not be clipped back to itself (e.g. around an anchor point) unless specifically designed to do so;
- If vertical lifelines are used, each employee must be attached to a separate lifeline; and
- Lifelines must be protected against cuts and abrasion.

Warning Line Systems and Controlled Access Zones

Warning line systems and work in controlled access zones will be developed, based on the task, in accordance with (OSHA) Fall Protection standard 29 CFR 1926.502 before employees are exposed to fall hazards.

Controlled access zones shall limit entrance to areas where leading edge work and other operations are taking place and shall be defined by a controlling line or other means that restricts access. Control lines shall consist of ropes, wires, tapes or equivalent material, supporting stanchions and each shall:

- Be flagged or otherwise clearly marked at not more than 6-foot intervals with a high visibility material;
- Be rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches from the walking/working surface and the highest point is not more than 50 inches;
- Be strong enough to sustain a stress of not less than 200 pounds;
- Extend along the entire length of the unprotected leading edge and shall be parallel to the unprotected or leading edge;
- Be connected on each side to a guardrail system or wall;
- When control lines are used they shall be erected no less than 6 feet and no more than 25 feet from the unprotected or leading edge, except when precast concrete members are being erected. In the latter case, the control line shall be erected not less than 6 feet and no more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge;
- Controlled access zones when used to access areas where overhand plastering and related work are taking place shall be defined by a control line erected not less than 10 feet and no more than 15 feet from the working edge. Additional control lines shall be erected at each end to enclose the controlled access zone. Only employees engaged in overhand bricklaying or related work are permitted in these zones;
- On floors and roofs where guardrail systems are not in place prior to the start of overhand bricklaying operations, controlled access zones shall be enlarged as necessary to enclose all points of access, material handling areas and storage areas; and

- On floors and roofs where guardrail systems are in place, but need to be removed to allow leading edge work to take place, only the portion of the guardrail necessary to accomplish that day's work shall be removed.

Covers

Covers in floors, roofs, and other walking/working surfaces shall be capable of supporting (without failure) at least twice the weight of employees, equipment and materials that may be on the cover at any one time. Covers in roadways and vehicular aisles shall be capable of supporting (without failure) at least twice the maximum axle load of the largest vehicle expected on the cover. All covers shall be secured when installed to prevent accidental displacement by wind, equipment or employees. Cover shall be color coded or marked with the word, "HOLE" or "COVER."

Ladders

All ladders used by UNC Pembroke employees will meet the following requirements:

- Rated greater than the weight of the worker and any tools or equipment carried by the worker;
- Appropriate ladder style for the job (i.e. step ladders will not be used in a folded position, step ladders will be tall enough to perform work without standing on the top step, extension ladders will extend a minimum of 3 feet above the discharge point, etc.);
- Visually inspected prior to each use;
- Metal ladders will not be used near electrical lines or sources; and
- All safety feet must be in place, secure and in sound condition;

Ladders must be set up on a surface that is firm, flat and is not slippery. The top of extension ladders must be against a solid, fixed surface and extend at least 3 feet above the landing surface. Extension ladders will be set up using the 4-to-1 rule (base of the ladder placed at a distance from the wall that is equal to one fourth of the height that the ladder is extended). When employees are on extension ladders at heights of 20 feet or higher, either a second person must steady the ladder base or the top of the ladder must be effectively tied off to a sound anchor point.

Scaffolds

Scaffolds are complex systems with multiple connection points, subject to a number of factors that could affect their stability and reliability. UNC Pembroke will use only a competent person/vendor who has received specific training to erect scaffolds.

Basic requirements:

- The working edge of the scaffold will be in place no more than 14" from the front of the building or structure;

- Platforms will extend over the end supports by at least 6" and not more the 12" , unless cleated or restrained;
- All components that are supplied by the manufacturer will be used unless they are parts specifically designed for optional uses and are not being used at the time;
- All parts, including casters, pipes/poles, rails, toe boards, platforms, cams, locking pins and all connection devices must be inspected and found to be in good condition prior to each use;
- A workplace inspection will be conducted and documented prior and during the erection of the scaffolding, as well as prior to each use;
- Guardrails are to be placed between 36 and 45" high and placed at the open ends and sides of the platform and must be able to withstand a force of 200 pounds. Mid rails will be placed halfway between the top rail and toe board. Toe boards must be in place where employees working below are exposed to falling objects;
- Cross bracing and railings should not be used as a means of climbing to or accessing the platform. Employees will only use the installed ladders;
- For mobile scaffolds, the caster wheels must be locked and all locking pins in place prior to use;
- Fall protection systems are required when employees erect and disassemble scaffolding; and
- Hard hats are to be worn at all times while working on or around scaffolding.

Personal Fall Arrest System Inspection

Employees must visually inspect their entire personal fall arrest system prior to every use. The inspection will follow the manufacturer's recommendations. Any damaged components must be removed from service immediately.

See Appendix A for a list of common items to look for during the personal fall arrest system inspection.

Protection From Falling Objects

When an employee is exposed to falling objects, it is required that each employee wear a hard hat and implement one of the following measures:

- Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels;
- Erect a canopy structure and keep potential falling objects far enough from the edge of the upper level; or
- Barricade the area where overhead objects could fall and prohibit employees from entering the area.

Notification

EHS shall be notified when it can be clearly demonstrated that the use of these systems is infeasible or creates a greater hazard. Alternative fall protection measures may be implemented.

Rescue

Personnel requiring the use of personal fall protection equipment will use a, "Buddy System," or have an observer to render assistance when and if required. Prior to tying off to perform the work, a means of rescue in the event of a fall must be immediately available if employees cannot be expected to rescue themselves. All components of fall arrest system impacted by a fall event shall be removed from service. The components will be tagged with employee's name, date and activity at time of fall and give the equipment to the EHS office.

Self-Rescue

- Persons working at heights may be able to perform a self-rescue by climbing back up to the level from which they fell, typically a few inches to 3 feet. Employees who fall any distance should return to the ground to be medically evaluated.

Assisted Rescue

- Persons unable to self-rescue will be assisted, if appropriate, by their, "buddy" or other observer. The, "buddy," will immediately contact Campus Police at 910.521.6235 for rescue assistance.

Training and recordkeeping

Training

Employees exposed to fall hazards shall be trained. Training shall be conducted by EHS office or authorized EHS provider and shall include the following:

- The nature of fall hazards in the work area;
- The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems;
- The use and operation of guardrail systems, personal fall arrest systems, and other protection methods; and
- Training shall be documented.

Retraining

Retraining shall be conducted when:

- Inadequacies in employee knowledge prove training to be warranted;
- Any other situation that the supervisor or EHS for your respective campus determine that retraining is warranted;

- Where changes in fall protection usage is necessary due to technological changes of newly purchased fall protection equipment, or specific changes for fall protection usage occur; and
- Changes in the workplace render previous training obsolete;

Recordkeeping

Employee training records shall be retained for the duration of employment. The training records shall be kept by the supervisor and the EHS office.

Outside Contractors

Each contractor who is retained to perform operations that require fall protection shall:

- Review the UNC Pembroke Contractor Notice; and
- Coordinate fall protection with UNC Pembroke Project Manager.

References

OSHA 29 1910 Subpart D, Walking – Working Surfaces;

OSHA 29 CFR 1910 Subpart F, Powered Platforms, Manlifts, and Vehicle Mounted Work Platforms;

OSHA Fall Protection Standards, 29 CFR 1926.500, 1926.501, 1926.502, 1926.503;

OSHA 29 CFR 1926 Subpart L, Scaffolds;

OSHA 29 CFR 1926 Subpart N, Helicopters, Hoists, Elevators, and Conveyors;

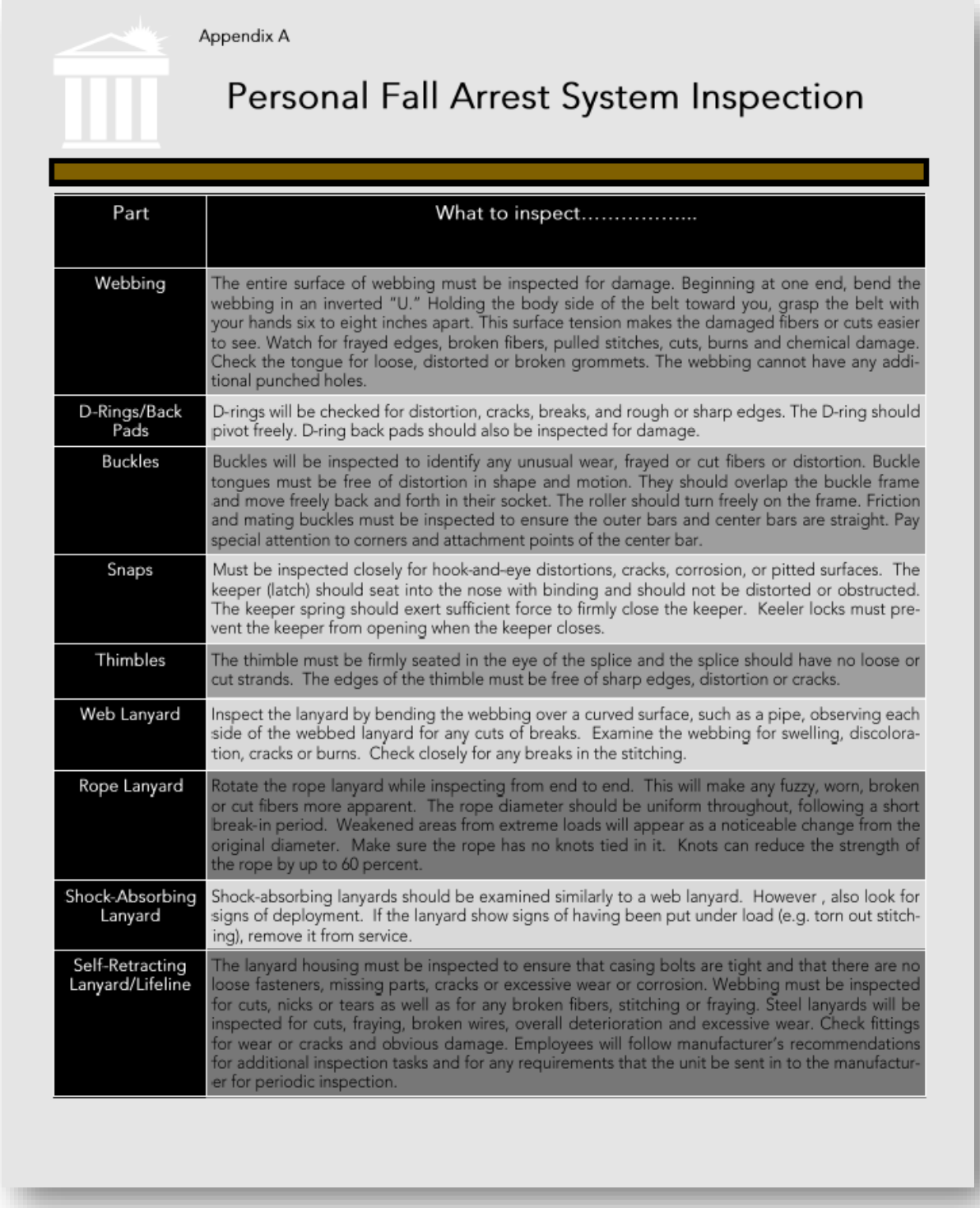
OSHA 29 CFR 1926 Subpart R, Steel Erection;

OSHA 29 CFR 1926 Subpart S, Underground Construction, Caissons, Cofferdams, and Compressed Air; and

OSHA 29 CFR 1926 Subpart X, Stairways and Ladders

Appendices

Appendix A: Fall Protection Inspection



Appendix A

Personal Fall Arrest System Inspection

Part	What to inspect……..
Webbing	The entire surface of webbing must be inspected for damage. Beginning at one end, bend the webbing in an inverted "U." Holding the body side of the belt toward you, grasp the belt with your hands six to eight inches apart. This surface tension makes the damaged fibers or cuts easier to see. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns and chemical damage. Check the tongue for loose, distorted or broken grommets. The webbing cannot have any additional punched holes.
D-Rings/Back Pads	D-rings will be checked 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.
Buckles	Buckles will be inspected to identify any unusual wear, frayed or cut fibers or distortion. Buckle tongues must be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. The roller should turn freely on the frame. Friction and mating buckles must be inspected to ensure the outer bars and center bars are straight. Pay special attention to corners and attachment points of the center bar.
Snaps	Must be inspected closely for hook-and-eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose with binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeler 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.
Web Lanyard	Inspect the lanyard by bending the webbing over a curved surface, such as a pipe, observing each side of the webbed lanyard for any cuts of breaks. Examine the webbing for swelling, discoloration, cracks or burns. Check closely for any breaks in the stitching.
Rope Lanyard	Rotate the rope lanyard while inspecting from end to end. This will make any fuzzy, worn, broken or cut fibers more apparent. The rope diameter should be uniform throughout, following a short break-in period. Weakened areas from extreme loads will appear as a noticeable change from the original diameter. Make sure the rope has no knots tied in it. Knots can reduce the strength of the rope by up to 60 percent.
Shock-Absorbing Lanyard	Shock-absorbing lanyards should be examined similarly to a web lanyard. However , also look for signs of deployment. If the lanyard show signs of having been put under load (e.g. torn out stitching), remove it from service.
Self-Retracting Lanyard/Lifeline	The lanyard housing must be inspected to ensure that casing bolts are tight and that there are no loose fasteners, missing parts, cracks or excessive wear or corrosion. Webbing must be inspected for cuts, nicks or tears as well as for any broken fibers, stitching or fraying. Steel lanyards will be inspected for cuts, fraying, broken wires, overall deterioration and excessive wear. Check fittings for wear or cracks and obvious damage. Employees will follow manufacturer's recommendations for additional inspection tasks and for any requirements that the unit be sent in to the manufacturer for periodic inspection.

Appendix B: General Industry Fall Hazards

Appendix B

General Industry Fall Hazards

Hazard	Ways to protect you.....
Loading Docks	Loading docks will be protected by a guardrail system. The guardrail will have removable sections to provide access for loading vehicles but rails must remain in place when loading is not in progress.
Wall Openings	All wall openings 4 feet or more above an adjacent surface will be guarded by one of the following: 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. Every window wall opening at a stairway landing, floor, platform or balcony from which there is a drop of more than 4 feet and where the bottom of the opening is less than 3 feet above the platform or landing, shall be guarded by standard slats, standard grill work of standard railing.
Dangerous Equipment or Materials	When working at any height above dangerous equipment or materials, each worker will be protected from falling into of onto dangerous equipment or materials by a guardrail system, equipment guards, safety net system or personal fall arrest system.
Skylights	Skylights are considered an opening when present on a roof. Skylight screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied perpendicularly at any one area on the screen. They shall also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork with opening not more than 4" long or of slat work with opening not more than 2" wide with length unrestricted.
Floor Openings	An opening measuring 12" or more in its least dimension, in any floor, platform, pavement or yard, through which materials but not persons may fall; such as a belt hole, pipe opening or slot opening.
Floor Hole	An opening measuring less than 12" but more than 1" in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a belt hole, pipe opening or slot opening. All floor holes will be guarded by one of the following: • A standard railing with toe board 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).

Appendix C: Construction Industry Fall Hazards

Appendix C

Construction Industry Fall Hazards

Hazard	Ways to protect you.....
Leading Edges	Each worker working on or near a leading edge six feet or more above a lower level will be protected by guardrail systems or personal fall arrest systems.
Low-Slope Roofs	Workers on a low-slope (less than or equal to 4/12 pitch) roof that has one or more unprotected sides or edges shall be protected from falling by one of the following: • Guardrail 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: when engaged in roofing work on low-slope roofs 50 feet or less in width, the use of 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 toe boards; and • Personal fall arrest systems.
Wall Openings	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.
Openings	Means a gap or void 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.
Excavations	Excavations 6 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 6 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 or personal fall arrest system.
Holes	Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes. Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers. Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.

Appendix C

Construction Industry Fall Hazards

Hazard	Ways to protect you.....
Covers	Covers for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements: Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover. All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees. All covers shall be color coded or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.
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 and occupants do not stand on above guardrail system.