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# Procedure

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## 1. Purpose

To minimize the potential for injuries due to serious falls at the University of Utah, to assist departments in understanding what measures must be taken to protect their employees and to assist departments with completing the Task Specific procedures for their areas of responsibility and to enhance existing permanent fall protection systems.

## 2. Rule

### A. Definitions

**Anchorage:** A secure point of attachment for lifelines, lanyards or deceleration devices capable of withstanding 5000lbs of force.

**Authorized Person:** A person that is required to do work that warrants fall protection and has been trained to do so.

**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.

**Competent Person:** One who has proper training and a demonstrated ability to identify existing and predictable hazards in the surroundings, or working conditions which are hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

**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 or others from falling to lower levels.

**Hole:** A gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface. *Note: holes meeting the smallest dimensions are guarded to*

*prevent items from being kicked or dropped down them, and to prevent individuals from twisting their ankle, or receiving a similar injury.*

Infeasible: That it is impossible to perform the 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 each 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 January 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

**Rope grab:** A deceleration device which 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.

**Snaphook:** A connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are generally one of two types: 1) 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 2) 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 snaphook 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).

**Toeboard:** 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.

## **B. Roles and Responsibilities:**

### **1. Departments**

1. Identify all tasks performed by their employees that are in need of systems and equipment for protecting against falls of 4-feet or more.
2. Provide necessary funding for purchase and installation of systems and equipment utilized for fall protection.
3. Provide the necessary annual training and maintain training records.
4. Maintain manufacturer instructions and manuals that are included with fall protection systems, and make them readily available to those employees who may need to reference such materials.
5. In association with Occupational and Environmental Health and Safety, investigate incidents involving falls or near falls and take corrective actions as necessary to prevent future falls from occurring.
6. Select a competent person, or persons, who will provide requisite fall protection training.

### **2. Competent Persons**

1. Identify existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to individuals.
2. Take prompt corrective measures to eliminate the identified hazards.
3. Working with the department and area supervisors, develop Specific Fall Protection Plans as necessary, submit these plans to OEHS for review and include any such plans in Appendix B of this program.
4. When needed, develop alternative task specific fall protection plans and include them in Appendix B of this program.

*Note: An alternative task specific fall protection plan is needed when individuals cannot use the fall protection systems and procedures outlined in Appendix B of this program.*

### **3. Supervisors**

1. Ensure that fall protection equipment is used in accordance with manufacturer recommendations (see equipment user manuals for details).

2. Ensure new and existing employees receive fall protection training as outlined in this program prior to conducting work where the potential for a fall in excess of 4 feet exists.
3. Ensure that fall protection is available and properly utilized for work that exposes individuals to the potential for a fall in excess of 4 feet.
4. Review and approve all task specific and alternate task specific fall protection plans.
5. Ensure personal fall arrest systems are maintained according to manufacturer recommendations.
6. Monitor individual worksites for compliance with the requirements of this program.
7. Complete the Supervisor Checklist (Appendix A) at least once per year and keep on file with this program in their respective areas.

**4. University Employees – Authorized Persons**

1. Inspect fall protection equipment each time it is used.
2. Properly maintain issued fall protection equipment.
3. Remove damaged equipment from service, mark as damaged and report to the supervisor that the equipment is damaged and has been removed from service.
4. Participate in all fall protection training.
5. Report any incidents to your supervisor and OEHS.

**5. Occupational and Environmental Health and Safety**

1. Assist with the selection of proper fall protection equipment and systems as requested.
2. Monitor implementation of this program and collect information regarding campus fall protection needs.
3. Conduct random assessment of field activities related to fall protection and provide feedback to the respective departments.
4. Review and respond to comments and suggestions for program improvement.
5. Revise this program as needed.

**C. Procedure**

**1. General Fall Protection**

- a. Individual workplaces and the work being performed should be assessed to identify areas where individuals are exposed to a potential fall of 4-feet or more.
- b. Individuals must receive the proper training prior to engaging in work where they will be exposed to a potential fall of 4-feet or more.
- c. Where feasible, permanent protective systems should be installed to prevent individuals from falling – permanent protective systems include fixed ladders (with cages if longer than 20-feet), hole-covers, standard guardrails and other barriers such as fencing.

- d. If permanent protective systems are not feasible then temporary protective systems must be in place while individuals are exposed (where feasible) to prevent individuals from falling. Temporary protective systems include restraint systems, scaffolding, safety nets, hole-covers, and temporary guardrails.
- e. Individuals must utilize a personal fall arrest system when permanent and/or temporary protective systems are not feasible and/or are inadequate – a personal fall arrest system includes a full body harness, lanyard, and lifeline (or equivalent gear).  
*Note: a safety belt cannot be utilized as part of a personal fall arrest system.*
- f. Prior to beginning roof construction, repair, or maintenance, the crew chief, foreman, or person in charge of the project must insure that the area below the work site is isolated to help prevent unauthorized entry. Barrier tape or other means may be used.
- g. Employees shall not be involved in outdoor work that involves the use of ladders, bucket trucks, man-lifts, etc., or fall protection systems during periods of winds in excess of 28mph (sustained), when a wind advisory has been issued by the National Weather Service (NWS), lightning storms, snow storms, or other potentially hazardous weather conditions. Hazards are assessed by the supervisor.
- h. All systems and equipment utilized for fall protection must be rated and approved by the manufacturer for their intended use.
- i. Maintain fall protection in accordance with manufacturer recommendations.

*Note: occasionally there is an area where a guardrail or other permanent fall protection system cannot be installed and a personal fall arrest system is not feasible (i.e. the leading edge of a theatrical stage). For such situations an alternative fall protection plan must be developed by the Department responsible for the area/work. If you have any questions regarding what type of fall protection to utilize please contact Occupational and Environmental Health and Safety at for an assessment and recommendations.*

## **2. Controlled Access Zone**

- a. A fall protection plan, which involves controlled access zones, can be created and utilized only when workers are engaged in leading edge work, pre-cast concrete erection work, residential construction work, or where it can be demonstrated that it is not feasible, or creates a greater hazard, to use a conventional fall protection system. If a fall protection plan utilizing controlled access zones is needed then department is responsible for creating the document, by following the guidance found in OSHA's Fall Protection standard 29 CFR 1926.502(k), which is available online at [www.osha.gov](http://www.osha.gov), and submitting it to Occupational and Environmental Health and Safety for review prior to implementation.

### **3. Boatswain's Chairs**

- a. Boatswain's chairs may only be used for applications specified by the manufacturer (i.e. window washing applications).

### **4. Catch Platforms**

- a. A substantial catch platform shall be installed below the working area of roofs more than 20 feet from ground to eaves without a parapet, or 16 feet from ground to eaves with a slope greater than 4 inches in 12 without a parapet. The platform shall extend 2 feet in width beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a fall restraint or fall arrest system.

### **5. Hole Covers**

- a. When not guarded by a standard guardrail system (or equivalent), floor holes must be guarded by a cover that is of standard strength. A cover of standard strength is able to safely support any persons and their loads that may be placed on the cover. Hole-covers must be fixed in place to prevent them from being accidentally displaced. Temporary hole covers must be signed "Floor Hole". When hole covers are opened, floor holes must be guarded using a standard guardrail system, or by having an attendant at the opening of the hole until the proper guarding is once again put back into place.
- b. Manholes must be guarded using a standard manhole cover or guardrail system when open.
- c. Skylights qualify as floor holes and can be guarded by using a standard guardrail system, cover of standard strength, or any other equally effective means.

### **6. Use of Hoisting Lines**

- a. When hoisting lines are used to raise tools or materials to a roof greater than 16 feet from ground to eaves without a parapet (or with a parapet less than 30 inches in height), the employee on the roof shall be secured by an approved body harness attached to a lifeline.
- b. The lanyard shall be a minimum of 1/2- inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

### **7. Ladders**

#### *a. General*

- i. Ladders must be ascended and descended while facing the rungs.
- ii. Individuals must use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- iii. Not more than one person is allowed on a ladder.
- iv. Tool belts or other equally effective means must be used to carry equipment up and/or down the ladder. Equipment that is awkward and/or heavy enough to cause an individual to lose their balance must not be carried up or down a ladder.

- v. Portable ladders must be replaced by fixed ladders when the ladders will be needed on a permanent basis.

*b. Portable Ladders*

- i. Prior to using any ladder, the user is to inspect the ladder to ensure that it is in good working order, in accordance with the ladder manufacturer recommendations. The user must also read the labels attached to a ladder prior to using the ladder. If the labels are missing then the ladder must not to be used
- ii. Damaged ladders are not to be used, instead they are to be removed from service and either repaired and/or replaced
- iii. Once a portable ladder has been positioned for use, the user must ensure that the ladder footing is firm, level, and stable
- iv. The area surrounding the top and bottom of a ladder must be kept clear at all times.
- v. The top of a portable extension ladder must be anchored to the surface being accessed at the top when it is used under windy conditions, and/or when the ladder is susceptible to being displaced
- vi. Do not place portable ladders on top of other objects to obtain additional height (e.g. boxes, barrels, and scaffolding)
- vii. Extension ladders must be set up so that for each four feet in height, the base is brought out one foot (the rise and run are at a 4:1 ratio)
- viii. Extension ladders must extend beyond the surface being accessed by at least three feet.
- ix. Provisions must be taken to ensure that the base of a ladder is secure and separated from traffic to prevent the ladder from being displaced
- x. If the ladder must be set up in front of a door then measures must be taken to block use of the door and signs must be posted indicating that the door is out of service while the ladder is present. Once the work is completed, the ladder must be removed, the door reinstated for use and the signage removed as soon as possible
- xi. A person working from a ladder must not lean to the side in a manner that puts their center of gravity beyond the side rails of the ladder unless the person is also properly using a personal fall arrest system
- xii. Ladders must not be tampered with while occupied
- xiii. Ladder must not be used as horizontal work platforms
- xiv. Only use non-conductive ladders around open live electrical sources
- xv. Ladders must not be spliced together under any circumstances

*c. Fixed Ladders*

- i. All fixed ladders must be designed and installed in accordance with 29 CFR 1910.23

## 8. Personal Fall Arrest Systems

A personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and a body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations thereof.

Self-made personal fall arrest systems, and components thereof, are prohibited

*Note: the use of a body belt for fall arrest is prohibited.*

- a. Components of a personal fall arrest system must be manufactured and approved for fall protection, and must only be used for the purpose intended by the manufacturer.
- b. Personal fall arrest systems and components subjected to impact loading (ANY Fall) must be immediately removed from service and not used again until inspected and determined by a competent person to be undamaged and suitable for use.
- c. Fall protection equipment must be inspected prior to each use. If, upon inspection, a piece of equipment shows any signs of wear it must immediately be removed from service and the supervisor notified.
- d. Personal fall arrest system components must meet the following requirements:
- e. Components (i.e. full body harnesses, connectors, Dee-rings, snaphooks, and anchorages) of a personal fall arrest system must be manufactured by a reputable company, and used only in accordance with manufacturer recommendations;
- f. Anchorages used for attachment must be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or must be designed, installed, and used as follows:
  - i. As part of a complete personal fall arrest system that maintains a safety factor of at least two
  - ii. Under the supervision of a competent person
- g. Connectors must have a corrosion-resistant finish, and all surfaces and edges must be smooth to prevent damage to interfacing parts of the system.
- h. Dee-rings and snaphooks must be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- i. Snaphooks must be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or must be a locking type snaphook designed and used to prevent disengagement of the snaphook by the contact of the snaphook keeper by the connected member.
- j. Unless the snaphook is a locking type and designed for the following connections, snaphooks must not be engaged:
  - i. Directly to webbing, rope or wire rope

- ii. To each other
  - iii. To a dee-ring to which another snaphook or other connector is attached
  - iv. To a horizontal lifeline
  - v. To any object that is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself
- k. On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline must be capable of locking in both directions on the lifeline.
- l. Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.
- m. When vertical lifelines are used, each employee must be attached to a separate lifeline, except when constructing elevator shafts. Two employees may be attached to a single vertical lifeline in the hoistway of an elevator shaft that is being constructed, provided both employees are working atop a false car that is equipped with guardrails; the strength of the lifeline is 10,000 pounds and all other criteria have been met.
- n. Self-retracting lifelines and lanyards that automatically limit free fall distance to 2- feet or less must be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position. Those (ripstich, tearing, and deforming lanyards) that don't limit free fall distance to 2-feet or less must be able to sustain a minimum tensile load of 5,000 pounds applied in the fully extended position.
- o. The attachment point of a body harness must be located in the center of the wearer's back near shoulder level, or above the wearer's head. The opposite attachment point must not be to guardrail systems, nor to hoists. .
- p. At hoist areas, the personal fall arrest system must be rigged to allow the movement of the employee only as far as the edge of the walking working surface.
- q. Personal fall arrest systems, when stopping a fall must:
  - i. Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness;
  - ii. Be rigged such that an employee can neither free fall more than 6-feet, nor contact any lower level or object
  - iii. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet
  - iv. Have sufficient strength to withstand twice the potential impact energy of an employee free fall at a distance of 6-feet, or the free fall distance permitted by the system, whichever is less
- r. **Roof Brackets**
  - i. Roofing brackets must be constructed to fit the pitch of the roof.

- ii. In addition to the pointed metal projections, brackets must be secured by nailing in place. The nails shall be driven full length into the roof.
- iii. If rope supports are used, they shall consist of first-grade manila of at least 3/4-inch diameter, or equivalent

**s. Safety Belts**

- i. Safety belts are NOT approved for use by University of Utah personnel.

**t. Safety Nets**

- i. Safety nets are not approved for use by University of Utah personnel except in cases where other systems are not feasible. Special requirements exist for safety net systems contact OEHS for assistance.

**u. Designated Areas**

- i. As an alternative to installing guardrails, a designated area may be established. The following conditions and requirements must be met in order to use designated areas in lieu of other fall protection measures:
  - 1. The work must be of a temporary nature, such as maintenance on roof top equipment;
  - 2. Designated areas shall be established only on surfaces that have a slope from horizontal of 10 degrees or less; and
  - 3. The designated area shall consist of an area surrounded by a rope, wire, or chain and supporting stanchions and shall meet the following requirements:
    - a. After being erected with the line attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion
    - b. The line shall have a minimum breaking or tensile strength of 500 pounds
    - c. The line shall be attached at 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 adjacent sections before the stanchion tips over
    - d. The line shall be installed in such a manner that its lowest point is no less than 34 inches nor more than 39 inches from the work surface
    - e. The line forming the designated area shall be clearly visible from any unobstructed location within the designated area up to 25 feet away
    - f. The stanchions shall be erected as close to the work area as is permitted by the task
    - g. The perimeter of the designated area shall be erected no less than 6 feet from the unprotected side or edge

- h. Access to the designated area shall be by a clear path formed by two lines attached to stanchions.

**v. Travel Restraint Systems**

- i. A restraint line is a device which is attached between the employee and an anchorage point to prevent the employee from walking or falling off an elevated surface. It does not support an employee at an elevated surface, but rather, prevents the employee from leaving the elevated surface or work position.

**9. Scaffolding**

Because of the complexities involved in proper scaffolding construction, maintenance, etc. it is recommended that University entities with a need for scaffolding contract with a professional scaffolding contractor for any scaffolding needs.

- a. Individuals ascending/descending a scaffold must maintain three points of contact at all times and use the scaffold ladder or stairs.
- b. Any scaffolding utilized as fall protection must include a guardrail system on all open sides, which includes a toe board as recommended by the manufacturer.
- c. Scaffolds and their components must be capable of supporting without failure at least four times the maximum intended load (six times the maximum intended load if using a wire or fiber rope for suspension of the scaffold), and must not be overloaded. The proper scaffold selected for the task by the competent person is based upon the type of work to be conducted and the working load to be supported.
  - i. Light duty scaffolds are intended for workers and tools only. The design load should be that it will support a working load of 25 pounds per square foot;
  - ii. Medium duty scaffolds are intended for workers, tools and construction materials. The design load should be that it will support a working load of 50 pounds per square foot; and
  - iii. Heavy duty scaffolds are intended for workers, tools, stored materials, and construction materials. The design load of the scaffold should be that it will support a working load of 75 pounds per square foot.
- d. Scaffolding must meet the following criteria:
  - i. Self-made scaffolding must not be used.
  - ii. A complete scaffold consists of all necessary components having been properly mounted in accordance with the manufacturers design specifications. Incomplete scaffolds must not be used
  - iii. All scaffolding components must be in good proper working condition – damaged components/scaffolding must not be used
  - iv. Any required scaffold repairs must be done by a qualified person
  - v. Scaffolding must only be used for the purpose intended by the manufacturer of the scaffold.

- vi. Unstable objects such as barrels, boxes, loose brick, concrete block, etc. must not be used to support scaffolding or planks.
  - vii. The footing or anchorage must be sound, rigid and capable of carrying the maximum intended load without setting or displacement.
  - viii. Scaffolds must not be altered or moved horizontally while they are in use/occupied.
  - ix. All wooden planking must be of the proper Scaffold Grade.
  - x. All planking/platforms must be overlapped a minimum of 12-inches or be secured from movement. And, planks must extend over their end supports between 6-18 inches.
  - xi. Access onto the scaffolding must be via a (safe) access ladder.
  - xii. Scaffold poles, legs, or uprights must be plumb, and securely and rigidly braced to prevent swaying and displacement. Scaffolds must be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means (window cleaners' anchor bolts must not be used).
  - xiii. Materials being hoisted onto a scaffold must have a tag line.
  - xiv. Overhead protection must be provided when needed – including a screen between the upper rail and toe board if persons will pass below.
  - xv. Persons must not work on scaffolds during storms, high winds, or when the scaffold is covered with snow/ice.
  - xvi. Tools and materials must not be allowed to accumulate on scaffolding
  - xvii. Work platforms should be a minimum of two feet in width, have a non-slip surface and be secured into position.
- e. All scaffolding must be inspected prior to use and daily thereafter. The inspection should include at a minimum:
- i. Carefully examine the scaffold for broken or missing cross bracing, broken supporting structure, working platform, and other damaged parts. In addition, all walking and working surfaces must be free of grease, oil, paint, or other slippery substances;
  - ii. The scaffold should be equipped with positive wheel lock casters that are secured in place;
  - iii. The joint between working platform and supporting structure must be tight, and all hardware and fittings should be attached firmly. Movable parts should operate freely without binding or undue play;
  - iv. All wood parts must be free of sharp edges and splinters. Visually inspect the scaffold to be free of shakes, warpage, decay or other irregularities. Metal parts must be free of sharp edges, burrs and corrosion. Inspect for dents or bends in supporting structure, cross braces and walking/working surfaces;

- v. Check all working platform to support structure connections, hardware connections and rivets. If a scaffold tips over, inspect the scaffold for damage before continuing work; and
- vi. Damaged scaffolds must be withdrawn from service and either repaired or destroyed. When a defect or unsafe condition is found, personnel shall tag or mark the scaffold so that it will not be used until corrective action is taken. Defective or unsafe situations shall be reported to the supervisor. Field repairs and the fabrication of improvised scaffolds is prohibited.

## **10. Standard Guardrail Systems**

- a. When they can be used, standard guardrail systems are the preferred protective system.
- b. A standard guardrail system consists of a top rail, intermediate rail, and posts. Other than the railing on staircases, the top rail must have a vertical height of 42 inches nominal as measured from the working surface (floor, platform, ramp, etc.) to the top surface of the top rail. The top rail on a staircase must be positioned between 30 and 34 inches in height, as measured from the forward edge of the stair tread to the upper surface of the top rail. Top rails must have a smooth surface. The intermediate rail (or mid-rail) must be approximately halfway between the top rail and the working surface. Railing must not constitute a projection hazard. And, the railing system must be able to withstand a load of 200 pounds of pressure, applied in any direction at any point on the top rail.
- c. Standard guardrail systems must be equipped with a 2-inch toe-board when persons will be located below.

*Note: construction sites, and similar temporary work, may construct a temporary guardrail system however if a guardrail system is used in other areas a permanent system must be installed.*

## **11. Aerial Lifts**

- a. Aerial lifts include the following types of vehicle mounted aerial devices used to elevate personnel to job sites above ground:
  - i. Articulating boom platforms are designed to reach up and over obstacles
  - ii. Extensible or telescoping boom platforms may extend over one hundred feet
  - iii. Vehicle mounted bucket lifts are used to repair utility lines
  - iv. Scissor lifts extend into the air via a series of crisscross supports
  - v. Personal man lifts are lightweight and designed for one person use indoors
- b. Aerial ladders shall be secured in the lower traveling position before the truck is moved for highway travel.

- c. Lift controls shall be tested prior to use.
- d. Only personnel authorized by a fall protection competent person shall operate an aerial lift.
- e. Employees shall always stand firmly on the floor of the basket and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.
- f. A full-body harness shall be worn and a lanyard attached to the boom or basket when working from an aerial lift).
- g. Aerial lifts shall not be utilized outdoors when sustained winds are in excess of 28mph, or when a wind or thunderstorm advisory has been issued by the national weather service.
- h. Belting off to an adjacent pole structure, or equipment while working from an aerial lift shall not be permitted.
- i. Boom and basket load limits specified by the manufacturer shall not be exceeded.
- j. The brakes shall be set and when outriggers are used, they shall be positioned on pads or other solid surface. Wheel chocks shall be installed when using an aerial lift on an incline.
- k. An aerial lift truck shall not be moved when the boom is elevated in a working position, except for equipment which is specifically designed for this type of operation.
- l. Articulating and extensible boom platforms shall have both platform and ground controls.
- m. Before moving an aerial lift for travel, the boom shall be inspected to ensure that it is properly cradled and outriggers are in the stowed position.
- n. The minimum safe approach distances to energized power lines and parts must be maintained.

<b>Voltage Range (phase to phase)</b>	<b>Minimum Safe Approach Distance (Feet)</b>
0 to 300 V	Avoid Contact
Over 300V to 50 kV	10

- o. If the use of the protective systems listed above is infeasible or the use thereof would create a greater hazard, then alternative fall protection systems, such as but not limited to warning line systems and safety monitoring systems, can be utilized. However, if an alternative method is used then the department is responsible for creating a plan for proper use of the system, submitting the plan to OEHS for review, and attaching the plan to this program in Appendix B. Contact OEHS for assistance in creating a plan.

*Note: Ladder-jack scaffolds must be limited to light duty and must not exceed a height of 20-feet above the floor or ground.*

## **D. Training**

### **a. Authorized Persons**

All authorized users of personal fall arrest systems, scaffolding, ladders, or other fall protection systems must receive fall protection training prior to engaging in activities where they are exposed, or potentially exposed to a fall of 4 feet or more.

This training shall include but not be limited to:

- i. The nature of the fall hazards in the work area
- ii. Correct procedures for erecting, maintaining, disassembling, and inspecting systems and equipment utilized for fall protection
- iii. As applicable, the use and operation of permanent, temporary, and personal fall arrest systems
- iv. Any limitations of the systems or equipment being used for fall protection
- v. Any roles assigned to employees
- vi. The correct procedures necessary for handling, maintenance, and storage of fall protection equipment and materials
- vii. All information provided by the manufacturer for safe and proper use of systems and/or equipment being utilized for fall protection

### **b. Competent Persons**

Competent persons must receive additional training that allows them to identify existing and predictable hazards or adverse working conditions in the work area.

### **c. Recordkeeping**

Training must be documented by creating a training record that contains the individual's name, university identification number, date of training, and signature. The record must also contain the name and signature of the competent person providing the training. Annual training records should be kept for a minimum of 10 years.

### **d. Retraining**

Retraining is needed anytime a worker demonstrates that they lack the knowledge necessary to use the protective system or equipment in accordance with manufacturer recommendations or when changes in the workplace render previous training obsolete.

## **3. References:**

29 CFR 1910 Subparts D & F  
29 CFR 1926 Subparts M & X

## **4. University of Utah Contacts:**

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## **APPENDIX A**

## Annual Supervisor Checklist Fall Protection Program

Date of Assessment:

Name of Assessor:

*Note: "No" answers are indicate the need for improvement.*

Yes	No	Questions
		1. Have work tasks been evaluated to determine those that require the use of fall protection?
		2. Are fall protection needs relayed from employees to supervisors then to department managers?
		3. Are fall protection needs addressed before allowing individuals to engage in work where they are exposed to a fall potential of 4-feet or more?
		4. Do all individuals utilize fall protection when needed?
		5. Are employees trained in accordance with manufacturer recommendations prior to using or installing fall protection devices?
		6. Are fall protection devices inspected and maintained in accordance with manufacturer recommendations?
		7. Are ladders 20-feet (or longer) equipped with a cage, or do individuals who ascend/descend cage-less ladders (20-feet or longer) use a drop rope, rope grab, and full body harness?
		8. If used, are ladders and scaffolds properly secured in place prior to use?
		9. If using a personal fall arrest system, is the lanyard anchor point rated to 5000 lbs. or more?

Note: This checklist is not intended to be a comprehensive checklist, but has been provided as a tool for Supervisors/Departments as a quick assessment of procedures or plans that are in place and as a continuous improvement tool.

## **APPENDIX B**

Appendix B is where specific fall protection procedures should be placed.

Include specific procedures for specific tasks, procedures for obtaining/maintaining/storing fall protection equipment for your area, etc. and an example procedure if provided for reference purposes.

Note: This is a sample procedure only and does not represent any actual piece of equipment – it is provided for reference purposes only as guide for use in preparation of actual procedures.

University of Utah Fall Protection Procedure				
Task:	Prepared by:	Date:	Reviewed by:	Date:
Operation of Aerial Lift on the Bucket truck for tree trimming	James Cricket	01.15.17	Robert Pine	01.15.17

Only properly trained, qualified persons are authorized operate this equipment. Contact your supervisor if you have not been trained. Manufacturer’s recommendations for the equipment must be followed at all times. The aerial lift must not be altered or modified in any way.

Procedure:

1. Prior to use, inspect the lift carefully look for damaged parts or systems. Do not use a lift that is damaged in any way. Inspect the truck as well.
2. Note the load limits of both the lift and the basket – DO NOT exceed the load limits.
3. Turn on the lift and allow for a warm-up period of 10-15 minutes. Inspect the hydraulic system for leaks and test the lift controls to ensure they are functioning properly. If any problems are noted, turn off the lift and report the problems for maintenance – do not use a damaged lift.
4. Ensure that the lift is properly secured prior to moving the truck.
5. While using the lift maintain the truck on a level surface. Properly place outriggers on a solid surface or appropriate pads and ensure that the truck cannot move while the lift is in operation by engaging the truck’s emergency brake and chocking the wheels.
6. Lower level controls are not to be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
7. The truck shall not be moved unless the boom is lowered, the basket cradled and secured, and the outriggers retracted.
8. While working in the lift bucket, all employees must utilize a fall protection harness and lanyard secured to the bucket or boom.
9. When moving the bucket the employee must face in the direction travel and must be able to clearly see the path of travel for the boom and the bucket.
10. Employees shall not ride in the bucket when the truck is moving.
11. Employees shall not stand or sit on the top or the edge of the basket or on ladders placed in the bucket. Employees’ feet shall remain on the floor of the bucket the entire time that they are in the bucket.
12. In situations where two workers are in the bucket (do not exceed weight restrictions), one of them shall be designated to operate the controls.
13. Care shall be taken to position the lift truck such as to avoid energized conductors such as power lines or other hazards.
14. Once tree trimming activities are complete, properly stow and secure the lift on the truck. Secure outriggers and wheel chocks. Disengage emergency brake.