Fall Protection and Elevated Work Safety

PART 1 – FALL PROTECTION

1.0 Introduction

1.1 It is the policy of Facilities Management to take precautions to eliminate fall hazards from elevated work locations. This Fall Protection Program prescribes the duty to provide fall protection; sets the criteria and practices for fall protection; and outlines required training and recordkeeping.

1.2 Purpose: The purpose of this program is to outline the fall protection requirements to minimize/eliminate fall related injuries. This program is developed in accordance with the following Occupational Safety and Health Administration (OSHA) regulations:

- 29 CFR 1910 Subpart D, "Walking-Working Surfaces"
- 29 CFR 1910 Subpart F, "Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms"
- 29 CFR 1910.132 "Personal Protective Equipment"
- 29 CFR 1926 Subpart M, "Fall Protection"
- ANSI/ASSE Z359 Fall Protection

1.3 Scope: This Fall Protection Program establishes and outlines the shop, supervisor, competent person, and authorized person responsibilities; identification of fall hazards and control measures; and training, inspection and recordkeeping related to fall protection on/in buildings. The program applies to all Facilities Management employees whose duties require them to work at unprotected heights greater than four (4) feet. The use of ladders, scaffolds and aerial lifts are not covered in detail within this program.

2.0 Responsibilities

2.1 Facilities Management Safety Officer:

2.1.1 Provides program oversight and consultation to working units with fall protection components including training;

2.1.2 Maintains applicable records;

2.1.3 Performs program reviews and updates as necessary

2.1.4 Provides recommendations for fall protection on existing facilities

2.2 Shops:

2.2.1 The working unit responsible for each building where fall protection is provided, or where fall hazards exist as part of an employee's job duties, shall be responsible for implementing the fall protection program and ensuring specific fall hazards are identified and adequately controlled through engineering and/or administrative controls.

2.2.2 Working units shall assign a "competent person(s)" responsible for departmental fall protection program administration, implementation and maintenance including equipment inspections, inventory, training and recordkeeping.

2.3 Supervisors

2.3.1 Employees who supervise personnel with responsibilities to work where fall hazards exist must be informed of the contents of this program; identify a competent person to address fall hazards; and ensure compliance with the fall protection program and related standards.

2.3.2 Supervisors are responsible for ensuring all persons affected by the fall protection program are properly trained prior to encountering fall hazards.

2.4 Authorized Person

2.4.1 Employees working where fall hazards exist must comply with the provisions of this program including the use of personal protective equipment (PPE), fall protection equipment and rescue systems/operations; completion of equipment inspections; training

2.4.2 Reporting of any concerns related to fall protection.

2.5 Competent Person

2.5.1 Employees delegated the competent person shall be responsible for the implementation of the shop fall protection program

2.5.2 The competent person shall:

2.5.2.1 Be knowledgeable through training and experience of applicable fall protection standards and regulations applicable to their operation(s)

2.5.2.2 Conduct fall hazard surveys to identify fall hazards before authorized persons are exposed to fall hazards.

2.5.2.3 Have the authority to stop work immediately if it is determined unsafe to proceed.

2.5.2.4 Ensure a rescue plan is developed for situations where fall hazards exist.

2.5.2.5 Supervise the selection, installation, use and inspection of noncertified anchor points.

2.5.2.6 Verify and ensure all authorized persons working at heights are trained and authorized to do so.

2.5.2.7 Ensure a prompt rescue of authorized persons can be accomplished through adequate rescue operations.

2.5.2.8 Immediately remove from service any fall protection equipment found defective or subjected to forces as a result of a fall from elevated work.

2.5.2.9 Inspect fall protection equipment as recommended by the manufacturer and specified in this plan.

3.0 Definitions

3.1 *Anchorage/Anchor point*: secure point of attachment for lifelines, lanyards or deceleration devices.

3.2 *Authorized person*: a person assigned by employer to perform duties at a location where the person will be exposed to a fall hazard.

3.3 *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.

3.4 *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.

3.5 *Competent Person/Individual*: one who is capable of identifying existing and predictable hazards in the work environment and who has the responsibility to inspect fall protection systems for certification purposes. Persons/individuals are deemed competent through a combination of training and hands-on experience to possess knowledge about all aspects of the fall protection program and fall protection equipment.

3.6 *Dangerous equipment*: equipment (such as cooling towers, fuel storage tanks, silos, etc.) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

3.7 *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.

3.8 *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.

3.9 *Free fall*: the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

3.10 *Guardrail system*: a barrier erected to prevent employees from falling to lower levels.

3.11 *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.

3.12 *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.

3.13 *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.

3.14 *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.

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

3.16 *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.

3.17 *Mechanical equipment*: all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mop carts.

3.18 *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.

3.19 *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. Fall arrest systems are

engineered to be compatible between the permanent system and the personal protective equipment. Interchanging the components is not permitted.

3.20 *Personal fall restraint system*: fall protection system, which prevents an employee from approaching a fall hazard through the use of a lanyard and body harness.

3.21 *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.

3.22 *Qualified person*: a person with a recognized degree or professional certificate AND with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems.

3.23 *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.

3.24 *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.

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

3.26 *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.

3.27 *Shock-absorbing lanyard*: a lanyard with energy absorbing capacity

3.28 *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:

- 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 snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

3.29 *Standard Railing:* railing or safety railing system which meets the requirements for top rail, mid-rail, and toeboard specifications.

3.30 *Toeboard*: a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

3.31 *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.

3.32 *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.

3.33 *Warning line system*: a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, or body belt,

systems to protect employees in the area.

4.0 Fall Hazard Identification & Control Measures

4.1 It is the intent of this program is to ensure all fall hazards are appropriately addressed to protect workers from injury. All newly constructed buildings, building renovations as well as roof repair or replacement projects should comply with Federal OSHA, consensus industry standards and provide safe work areas. The following addresses potential fall hazards and applicable control measures.

4.2 Unprotected sides and edges

4.2.1 Employees on a work surface with an unprotected side or edge which is 4 feet (48 in) or more above a lower level should be protected from falling by the use of a guardrail system or personal fall restraint or arrest system.

4.2.2 If one of these systems is not available or is infeasible during leading edge work, a specialized fall protection plan must be developed and implemented to protect workers from fall hazards.

4.2.3 Hoist areas should be protected by guardrail or personal fall arrest systems. If guardrail systems or portions of guardrail systems are removed to facilitate the hoisting process creating a potential fall hazard for the employee, that employee must be protected by a personal fall arrest system.

4.2.4 Unprotected sides and edges 4 feet (48 in) above the lower level shall be protected by a guardrail system. Loading docks more than 4 feet above a lower level are not required to have a guardrail system on the working side of the dock where it can be demonstrated that the presence of guardrails would prevent the performance of work. All non-working sides of a loading dock should have a guardrail system. Dock doors should remain closed when not in use to minimize the fall hazard and all personnel working around loading docks should be trained to recognize and avoid the applicable fall hazards.

4.3 Holes and excavations

4.2.1 Floor openings, holes, manholes, roof hatches, and skylights. Employees on a work surface where floor openings, holes, manholes, roof hatches and skylights present fall hazards of 4 feet (48 in) or more should be protected from falling by guardrail systems erected around the hole, covers over the openings, or by personal fall arrest systems.

4.2.2 Where covers are used as fall protection measures, they shall remain in place when not in use. If removed, the fall hazard must be attended by a designated employee who is protected by a removable guardrail system.

4.2.3 Where skylights are in place, their design must meet applicable building codes, and should be of suitable strength to prevent a fall, protected by a guardrail system, or require the use of a personal fall arrest system.

4.2.4 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

4.2.5 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.

4.2.6 All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment or employees

4.2.7 All covers should be color coded or be marked with the work “HOLE” or “COVER” to provide warning of the hazard. NOTE: These provisions do not apply to cast iron manhole covers or steel grates used on streets or

roadways.

4.2.8 Excavations. Employees working at the edge of an excavation 4 feet (48 in) or more in depth shall be protected from falling by guardrail systems, fences, barricades, or personal fall arrest system. This includes trenches, wells, pits, shafts or other similar excavations.

4.2.9 Excavations where the public may be exposed shall be addressed.

4.4 Dangerous equipment

4.3.1 Employees less than 4 feet (48 in) above dangerous equipment shall be protected from falling into or onto the equipment by guardrail systems or equipment guards.

4.3.2 Employees more than 4 feet above dangerous equipment shall be protected from fall hazards by guardrail, personal fall arrest, or warning line systems.

4.5 Scaffolds, aerial lifts, and ladders

4.5.1 Fall hazards on scaffolds shall be addressed by the installation of a guardrail system. Fall arrest systems may also be warranted based on the type of work being conducted.

4.5.2 Employees utilizing aerial lifts shall be protected from fall hazards according to the manufacturer's recommendations including guardrail systems, fall restraint systems, and fall arrest systems.

4.6 Building rooftops

4.6.1 On buildings where fall restraint or fall protection is installed, only authorized personnel may perform work. Fall protection system inspections and personnel training are addressed in sections 7 and 8 of this program.

4.6.2 Equipment designed and engineered for use as a fall protection system on a rooftop may not be interchanged with other fall protection systems. Including fall restraint systems and personal protective equipment.

4.6.3 On buildings where no rooftop fall protection is provided by a permanent guardrail system (including parapets) or fall arrest/restraint system, the supervisor must create a fall protection plan, based on the work being done, prior to employees accessing a rooftop. This may include the use of a mobile anchor point; temporary guardrail and/or a safety monitoring system (see section 5). In addition, roof tops may have designated walk paths.

4.6.4 Employees utilizing the walk paths are not required to be in fall protection equipment. Any time employees must access rooftop areas between the roof edge and the walk path, fall protection equipment is required.

5.0 Fall Protection System Type & Use

5.1 Fall protection systems incorporated into building or facility design shall meet all applicable standards including, but not limited to, ANSI A10.32-2004 Fall protection systems for construction and demolition operations; ANSI Z359 Fall Protection Code; OSHA 29 CFR Part 1910 Subpart D-Walking and working surfaces; OSHA 29 CFR 1910 Subpart I-Personal protective equipment; OSHA 29 CFR 1926 Subpart M-Fall protection

5.2 Choosing fall protection systems. The hierarchy of controls, or preferred order of controls, shall be used to choose methods to eliminate or control fall hazards.

5.3 Conventional fall protection systems. Conventional fall protection systems provide the greatest protection against fall hazards and should be considered a priority when addressing employee protection.

5.3.1 Standard guardrail system

5.3.2 Fall restraint system

5.3.3 Personal fall arrest system

5.4 Specialized fall protection systems. If conventional fall protection systems are not practical or feasible, the use of a specialized fall protection system including a warning line system or safety monitoring system must be utilized to protect employees from fall hazards.

5.4.1 Warning line system

5.4.2 Safety monitoring system

5.4.3 Mobile, temporary anchor point

Conventional fall protection systems:

5.5 Guardrail systems. Installed and temporary guardrail systems shall comply with OSHA 29 CFR 1910.23-Guarding floor and wall openings and holes. Guardrail systems installed during construction projects and activities shall comply with OSHA 29 CFR 1926.502-Fall protection systems criteria and practices. Guardrail systems provide a barrier to prevent employees from falling to lower levels, and which designates an area in which work may take place without the use of additional fall protection PPE.

5.5.1 Where guardrail systems are in place as a fall protection measure, the railing shall have a vertical height of 42 inches (+/-3 inches) measured from the upper surface of the top rail to the working surface and consist of a top rail, intermediate rail, and posts.

5.5.2 Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is not wall or parapet wall at least 21 inches high. Guardrails shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

5.5.3 The intermediate rail shall be approximately halfway between the top rail and the working surface.

5.5.4 Guardrail systems must be capable of withstanding, without failure, a force of at least 200 pounds in any direction. Refer to Table 1 for material specifications for guardrail systems.

5.5.5 When 200 pounds of force is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the working surface.

5.5.6 The ends of all top rails and midrails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.

5.5.7 Top rails and midrails shall be at least ¼ inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is utilized for top rails, it shall be flagged at not more than 6 foot intervals with high- visibility material.

5.5.8 Stair railings shall be not more than 34 inches or less than 30 inches from the upper surface of the top rail to the forward edge of the tread surface.

5.5.9 A standard toeboard shall be provided on all guardrail systems where persons can pass under the work surface; there is moving machinery; and/or equipment utilized on the elevated surface with which falling equipment creates a hazard. Toeboards shall be 3.5 inches nominal in vertical height and securely fastened in place with

not more than ¼ inch clearance above the working surface. Where material is stored near the guardrail system, at heights exceeding the toeboard, paneling from the work surface to the intermediate rail shall be provided.

5.5.10 Toeboards shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toe board.

5.5.11 Engineered guardrail systems may be utilized provided they meet these requirements and are installed as per the manufacturer's specifications.

Table 1: Guardrail system specifications

Material of construction	Post requirements	Top rail requirements	Intermediate rail requirements	Additional requirements
Wood	2-inch by 4-inch stock spaced 6 feet apart	2-inch by 4-inch stock	2-inch by 4-inch stock	If top rail is two right angle pieces of 1"x4", posts may be spaced 8 feet on center. Wood components shall be min. 1500 lb- ft/in^2 fiber (stress grade)
Pipe	1 ½ inches nominal diameter spaced not more than 8 feet on center	1 ½ inches nominal	1 ½ inches nominal	
Structural Steel	2"x2"x3/8" angles spaced not more than 8 feet on center	2"x2"x3/8" angles	2"x2"x3/8" angles	
Other	Provide strength to top rail to support 200 pounds applied in any direction	Smooth surface at a height 42-inches above the work surface, capable of withstanding 200 pounds top rail pressure	Protection between top rail and floor equivalent to that afforded by standard intermediate rails	

5.5.12 Portable guardrail systems may be utilized as a fall protection measure provided they meet the OSHA and ANSI guardrail specification requirements.

5.6 Fall restraint systems. These systems are typically installed on aerial lifts and boom lifts. Fall restraint systems may also be utilized on elevated work surfaces as a preventative measure against fall hazards or as a positioning device system. These systems prevent an employee from approaching a fall hazard through the use of a lanyard and body harness.

5.6.1 The restraint lanyard must be short enough to prevent a fall from occurring; be protected against cutting and abrasion; and attach the body harness directly to the anchor point independently of any other lines.

5.6.2 When used as a positioning device system, the lanyard length shall be rigged such that an employee cannot free fall more than 2 feet (24 in).

5.6.3 Full body harness or belt use is required when utilizing fall restraint systems.

5.6.4 Anchor points must be capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater. Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall, or 3,000 pounds.

5.6.5 All components of the fall restraint system including connectors, dee-rings, snaphooks, lanyards and body harnesses/belts shall meet all applicable ANSI and OSHA requirements.

5.6.6 Fall protection equipment shall not be used to hoist equipment or tools to an elevated work surface. This includes window washing equipment.

5.6.7 Fall protection equipment including restraint lanyards and body harnesses should be stored in a well-ventilated, clean, dry area free from temperature and humidity extremes, corrosive materials or other contaminants. Newly installed fall protection systems require storage of equipment be in a lockable, ventilated metal cabinet

5.7 Fall arrest system. These systems are employed to prevent injury to employees if a fall from an elevated work surface occurs. The use of a fall arrest system requires a full body harness system to be worn by the employee. Body belts are not permitted to be used with fall arrest systems. Fall arrest systems shall be engineered and constructed to prevent employees from reaching the work surface below if a fall occurs.

5.7.1 All components of a fall arrest system including connectors, dee-rings, snaphooks, lanyards, body harnesses, life lines, ropes and straps shall be designed and engineered for use with a fall arrest system and meet all applicable ANSI and OSHA requirements.

5.7.2 Employees utilizing personal fall arrest systems shall not perform work alone.

5.7.3 Life line systems used as a component of a fall arrest system shall be designed and installed under the supervision of a qualified person; and used under the supervision of a competent person as part of a fall protection program.

5.7.3.1 Life lines shall be protected from cutting and abrasion.

5.7.3.2 Life lines or other components of a fall arrest system should not be attached to guardrail systems, ladders, scaffolding components, building fixtures, conduit or plumbing, other lanyards, roof stacks/vents/pipes or other unauthorized anchor points.

5.7.4 Anchor points used for attachment of fall arrest equipment shall be independent of any other anchor point and capable of supporting at least 5,000 pounds per employee attached.

5.7.5 When stopping a fall, personal fall arrest systems shall:

5.7.5.1 Limit maximum arresting force on an employee to 1,800 pounds

5.7.5.2 Ensure employees can neither free fall more than 6 feet (72 in) or contact any lower level as a result of a fall.

5.7.5.3 Bring an employee to a complete stop and limit maximum deceleration distance to 3.5 feet (42 in).

5.7.5.4 Be capable of withstanding twice the potential impact energy of an employee, falling a distance of 6-feet or the fall distance permitted by the system, whichever is less.

5.7.6 The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level.

5.7.7 Fall arrest systems are to only be used as personal protective equipment and not to hoist equipment or tools to elevated work surfaces.

5.7.8 Fall protection equipment including restraint lanyards and body harnesses should be stored in a clean, dry area free from temperature and humidity extremes, corrosive materials or other contaminants.

5.7.9 Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.

Specialized fall protection systems:

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

5.8.1 Warning line systems shall be erected around all open sides of the roof work area not less than 6 feet (72 in) from the roof edge.

5.8.1.1 If mechanical equipment is being utilized on the roof top, the warning line shall be not less than 6 feet (72 in) from the roof edge parallel to the direction of equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of the equipment operation.

5.8.2 Points of access, material handling areas, storage areas and hoisting areas shall be clearly delineated and connected to the work area by an access path formed by two warning lines.

5.8.2.1 When the path or point of access is not in use; a rope, wire, chain or other barricade equivalent in strength and height to the warning line shall be placed across the path.

5.8.3 Warning lines shall consist of ropes, wires or chains and supported by stanchions.

5.8.3.1 The line shall be flagged every 6 feet (72 in) with high visibility material.

5.8.3.2 The line shall be supported to ensure the lowest point is not less than 34 inches above the work surface; and not more than 39 inches at its highest point.

5.8.3.3 After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge.

5.8.3.4 The rope, wire, or chain shall have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions.

5.8.3.5 The line shall be attached at each stanchion in such a way that pulling on one section of the line will not result in slack being taken up in adjacent sections.

5.8.4 Employees are not permitted to enter the area between the roof edge and warning line unless work is being conducted on that portion of the roof and adequate fall protection measures are in place.

5.9 Safety monitoring system. A safety monitoring system relies on a competent person to monitor the work area and ensure employees are aware of fall hazards as they are working. This system may only be utilized on a low-slope roof and should be considered a last resort for protecting employees from fall hazards.

5.9.1 A competent person must be designated prior to work taking place on a roof top. The competent person, or their designee, who has received adequate training and possesses sufficient knowledge, will act as a safety monitor during work and shall:

5.9.1.1 Be competent to recognize fall hazards;

5.9.1.2 Warn the employee when it appears they are unaware of a fall hazard or are acting in an unsafe manner;

5.9.1.3 Be on the same working surface and within visual distance of the employees performing work;

5.9.1.4 Be close enough to communicate verbally with the employees;

5.9.1.5 Ensure no unauthorized personnel access the work area;

5.9.1.6 Have no other responsibilities which may distract them while performing safety monitoring duties.

5.9.1.7 Have the responsibility to order work stoppage and personnel removal from elevated work areas in the event of dangerous, hazardous, or life threatening circumstances.

5.9.2 Mechanical equipment shall not be utilized where a safety monitoring system is being used as the fall protection method. Additional fall protection measures are required in these situations such as guardrail systems, fall restraint systems, fall arrest systems or warning line systems.

5.10 Mobile, temporary anchor point. Temporary anchor points may be necessary on certain buildings where work must be done within 10 feet of a roof edge and no fall protection equipment is provided on the roof.

5.10.1 A competent person must oversee the set up and use of temporary anchor points.

5.10.2 Temporary anchor points must be ANSI approved and meet all applicable standards for a fall protection anchor point.

5.10.3 Lanyards utilized with a temporary anchor point must not introduce additional hazards to the worker.

6.0 Protection from falling objects

6.1 When elevated work is taking place and there is the potential for falling objects to create a hazard to persons on lower

levels to an elevated work surface, precaution must be taken to ensure injuries do not occur.

6.2 Where the work site is restricted to employees and the public is not allowed access, and the employees are exposed to falling object hazards one of the following precautions should be implemented.

6.2.1 Employees shall wear a hard hat at all times;

6.2.2 Toeboards, screens or guardrail systems are placed on the elevated work surface to prevent objects from falling;

6.2.3 A canopy structure, capable of withstanding a falling object without collapse or penetration, is erected to keep potential fall objects far enough from the edge or the elevated work surface so as not to create a fall hazard;

6.2.4 The area to which objects can fall is barricaded and access to the area is not authorized any time work is being done on an elevated work surface.

6.2.5 Where tolls, equipment, or materials are stacked higher than the top edge of a toe board, paneling or screening shall be erected from the walking/working surface or toe board to the top of the guardrail system's top rail or midrail, for a distance sufficient to protect persons below.

6.3 When the elevated work area creates a potential fall hazards where the public may be exposed to falling object hazards one of the following precautions should be implemented.

6.3.1 Redirect public traffic through a barrier system to ensure they do not enter areas where falling object hazards exist;

6.3.2 Erect a structure capable of withstanding impact from a fallen object under which the public may travel.

7.0 Training

7.1 Training shall be provided to all employees performing work on an elevated work surface or who may be exposed to a fall hazard. The training program should enable employees to recognize fall hazards and provide the requirements to be followed to minimize these hazards. Training must be completed and documented prior to employees working in areas where fall hazards exist.

7.2 Competent person training should cover the following topics

7.2.1 Fall protection definitions and responsibilities; fall protection standards; harness fitting; inspection, maintenance and storage of fall protection equipment; citations and penalties; types of fall protection systems; testing; rescue operations.

7.2.2 Competent person training is required initially and when changes to the plan occur or as directed by a manager.

7.3 Authorized person: Employees exposed to fall hazards as part of their job duties shall be trained in the following areas under the direction of a competent person, to become an authorized person;

7.3.1 The nature of fall hazards in the work area;

7.3.2 Procedures for erecting, maintaining, disassembling and inspecting fall protection systems being utilized;

7.3.3 The use and operation of guardrail systems, fall restraint systems, personal fall arrest systems, warning line systems, safety monitoring systems, and other protection to be used;

7.3.4 The role of each employee in the safety monitoring program, if being incorporated into the fall protection

program for the work to be performed;

7.3.5 Limitations on the use of mechanical equipment during roof work on low-sloped roof tops;

7.3.6 Procedures for handling and storage of equipment and materials and the erection of overhead protection;

7.3.7 The employee's role in the fall protection program;

7.3.8 The applicable standards and regulations affecting the work to be performed;

7.3.9 Limitations of fall protection equipment;

7.3.10 Personal protective equipment specific to fall protection including use, inspection, care and storage requirements;

7.3.11 Authorized person training is required initially and when changes to the plan occur or as directed by a manager.

7.4 Employees must demonstrate competency on the proper use of fall protection systems and understanding of this fall protection program.

7.5 In addition to the requirements in 7.1, competent individuals shall be trained specifically for the fall protection systems in their work places.

7.5.1 Training shall address inspection and maintenance needs.

7.6 Documentation of training shall be maintained for all employees exposed to fall hazards. The documentation must include the employee name, date of training, and name of trainer or employee.

7.6.1 The supervisor must maintain the latest training for all their employees.

7.7 Retraining shall be completed when the following occur:

7.7.1 Authorized persons shall complete annual refresher training.

7.7.2 It is suspected that any affected employee who has already received training is no longer competent in the fall protection program;

7.7.3 Changes in the workplace render the current training insufficient;

7.7.4 Changes in the types of fall protection systems in place.

7.8 Installations of new fall protection systems are installed on buildings require retraining of the competent individuals by the installing fall protection company or their representative.

8.0 Maintenance & Inspection

8.1 It is the responsibility of Facilities Management to maintain all fall protection systems in place on buildings.

8.2 Fall protection equipment including life lines, lanyards, body belts/harnesses, snaphooks and dee- rings shall be inspected prior to each use by the user. Defective equipment shall be taken out of service and rendered not useable. Refer to Appendix A for a sample inspection checklist.

8.3 If an employee is involved in an accident where a fall from an elevated work surface occurs, the fall protection system must be placed out of service and inspected by a qualified person to provide service and certify the system is safe for use.

Harnesses, lanyards or other PPE involved in a fall incident may not be placed back into service. PPE involved in a fall or placed under tension, must be rendered useless and discarded.

8.4 Temporary fall protection equipment such as warning lines shall be inspected upon erection by a competent individual. If the system is placed under tension as a result of an accident or near miss, the system should be re-inspected to ensure it meets all applicable requirements.

8.5 Guardrail systems or parapets should be visually inspected prior to work on an elevated surface. Any deterioration or deficiencies noted, which may cause the fall protection system to fail should be addressed prior to work commencing.

9.0 Recordkeeping

9.1 It is the responsibility of each shop to maintain applicable records for employees and fall protection systems.

9.2 Employee training must be maintained for all employees exposed to fall hazards.

9.3 All inspection and certification records must be maintained for fall protection systems and PPE.

9.3.1 Information to be included in fall protection system tracking includes the following:

9.3.1.1 Building name

9.3.1.2 Building number

9.3.1.3 Status

- Installed complete roof
- Partial roof protection
- In progress
- Certified

9.3.1.4 Type of design/system

9.3.1.5 Year installed

9.3.1.6 Latest annual inspection date

9.3.1.7 Latest qualified person certification date

9.3.1.8 Equipment manufacturer

9.3.1.9 Competent person

9.4 Rescue operations must be developed by the competent person for each system or project where fall hazards exist.

10.0 Rescue Operations

10.1 When a personal fall arrest system is utilized as a fall protection measure, the competent person must develop rescue operations to ensure employees can be safely rescued from the fall. Rescue operations can be accomplished in a variety of ways. Specific operations, “Rescue Plans”, should be developed based on the job being performed to ensure the safest method of rescue is employed. Rescue Plans should be thoroughly thought out for each area where fall protection systems are installed. A “one plan fits all” approach will not result in a successful Rescue Plan.

10.2 Employers are responsible for providing prompt rescue of employees in the event of a fall or assuring that employees are able to rescue themselves. Each Rescue Plan should be a written document detailing the rescue procedure, equipment needed to perform rescues and the personnel to be involved in the rescue.

10.3 A Rescue Plan is a preplanned strategy to safely retrieve an individual or individuals in the event of a fall and can include the following elements.

10.3.1 Self-Rescue: If the fallen employee is capable of rescuing themselves by utilizing existing fall protection equipment or self-provided rescue equipment.

10.3.2 Assisted Rescue: If the fallen employee is unable to perform self-rescue, other trained personnel ensure the fallen employee is brought to safety using adequate means.

10.3.3 Calling "9-1-1" is NOT a Rescue Plan, although paramedics should be called in the event of a fall to treat the fallen employee(s) for any injuries sustained.

10.4 Requirements of a Rescue Plan include the following:

10.4.1 Identify a fall has occurred within 2 minutes of the fall.

10.4.2 Reach the fallen employee within 5 minutes of the fall.

10.4.3 Successfully rescue the fallen employee within 10 minutes of the fall.

10.5 Other elements or considerations to keep in mind when developing Rescue Plans include:

10.5.1 The type of work environment is present:

10.5.1.1 Indoors vs. outdoors

10.5.1.2 Weather conditions

10.5.1.3 Day vs. night

11.0 Contractors

11.1 Contractors performing work on buildings equipped with fall protection systems must be fully trained prior to conducting work and must comply with the fall protection system standards.

11.2 Contractors performing work as part of a construction project where fall hazards exist must develop and implement a fall protection program to protect contract employees from fall hazards.

11.3 Contractors are responsible for supplying and maintaining their equipment as required by OSHA and ANSI regulations and standards.

PART 2 – ELEVATED WORK

1.0 Introduction

1.1 Elevated work poses a safety hazard if the equipment is not utilized and maintained properly. This program provides information for users of elevated work equipment to safely perform their job duties.

1.2 Elevated work involves any work conducted above the substrate. Equipment used to vertically elevate a worker above the substrate includes, but is not limited to, aerial devices (i.e. scissor lifts, aerial lifts, boom buckets), scaffolding and ladders.

1.3 Purpose: The elevated work program is developed and maintained to provide safety related information to users of these devices and minimize injuries as a result of improper use.

1.4 Scope: This program covers all Facilities Management personnel including staff and contractors utilizing equipment to perform elevated work on under Facilities Management work orders, projects and contracts.

2.0 Responsibilities

2.1 Facilities Management Safety Officer:

2.1.1 Responsible for program development, consultation and plan update assistance.

2.1.2 Provide training and program implementation assistance to all departments within Facilities Management.

2.2 Shops:

2.2.1 Elevated work program implementation;

2.2.2 Maintenance of equipment;

2.2.3 Training of personnel assigned to conduct elevated work; and

2.2.4 Inspections and safe use of equipment.

2.3 Supervisor:

2.3.1 Supervisors of employees required to utilize elevated work equipment must be knowledgeable in this program and be capable of recognizing hazards associated with elevated work equipment and share this information with employees in their department.

2.3.2 Act as, or another delegate employee as the “competent person” - experienced, trained and competent with elevated work equipment through appropriate training and hands-on experience

2.3.3 Responsible for implementation and ensuring shop employees have received the proper elevated work training prior to use of equipment.

2.4 Employees:

2.4.1 Must be appropriately trained in the contents of this program, knowledgeable of the specific equipment they work with and able to recognize hazards and equipment deficiencies related to elevated work.

2.4.2 Employees will not use elevated work equipment when it is not safe to do so and will report all unsafe

conditions to their supervisors.

3.0 Definitions

3.1 *Aerial lift:* any device (vehicle-mounted; telescoping or articulating) used to position personnel.

3.2 *Anchor point/Anchorage:* secure point of attachment for lifelines, lanyards or deceleration devices.

3.3 *ANSI:* American National Standards Institute.

3.4 *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.

3.5 *Certified operator:* a person who is trained to operate aerial lifts and utilize elevated work platforms.

3.6 *Competent person:* a person who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are hazardous to employees and has the authorization to take prompt corrective measures to correct them.

3.7 *Elevated work platform:* surfaces on which operators work as part of an aerial device.

3.8 *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.

3.9 *Fall restraint system:* fall protection system, which prevents an employee from approaching a fall hazard through the use of a lanyard and body harness.

3.10 *Ladder:* Ladders are structures made of fiberglass, wood, metal, etc., commonly consisting of two sidepieces between which a series of bars or rungs are set at suitable distances, forming a means of climbing up or down to access elevated work surfaces.

3.11 *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.

3.12 *Load:* for all ladders (fold out, leaning and fixed), the load to be placed on the ladder equals the person's body weight plus materials and tools being used; scaffolds must be able to support at least four times the maximum intended load.

3.13 *Mobile lift:* a combination of an aerial device, its vehicle and related equipment.

3.14 *Observation tower:* engineered stationary elevated work platforms to be used for observing surrounding events.

3.15 *OSHA:* Occupational Safety and Health Administration.

3.16 *Scaffolding:* system composed of poles and planks to provide elevated work platforms.

4.0 Mobile Lifts

4.1 Mobile lifts include a variety of equipment including, but not limited to, scissor lifts, articulating boom lifts, truck mounted lifts, etc. Mobile lifts may be powered or manual and serve to elevate the worker to the required area while providing specific safety features to minimize/eliminate the risk of injury.

4.2 This section addresses the general use, inspection, maintenance and personal protective equipment associated with the

use of aerial lifts. It is the responsibility of the operator, their supervisor and the department to adhere to the manufacturer's specific instructions and safety precautions at all times during the use of aerial lifts.

4.3 Aerial lifts must meet all applicable design criteria including, but not limited to the following:

- OSHA 29 CFR 1910.67-Powered platforms, Manlifts and vehicle-mounted work platforms
- ANSI A92.5-2006: Boom supported elevating work platforms
- ANSI A92.6-2006: Self-propelled elevating work platforms
- ANSI A92.2-2009: Vehicle-mounted elevating and rotating aerial devices
- ANSI A92.3-2006: Manual propelled elevating aerial platforms

4.4 Pre-use inspection: Each aerial lift will be inspected prior to use by the certified operator. The purpose of the pre-use inspection is to ensure there are no deficiencies related to the lift equipment and no additional hazards associated with the task being completed using the lift. Additional hazards include adverse weather, electrical, vehicular and pedestrian traffic control and surface conditions and are covered in detail in Section 8 of this plan.

4.2.1 The pre-use inspection will identify conditions, which may render the use of the equipment unsafe. If any condition is noted during the pre-use inspection, which may render the equipment unsafe, the equipment will be tagged "out of service", the operator will notify their supervisor of the deficiency and the equipment will not be utilized until deficiencies are corrected.

4.2.2 Pre-use inspections will consist of visual and operational checks of all components of the aerial lift system and associated work conditions. Manufacturer recommendations should be followed to address specific items to be included during the pre-use inspections. It is the responsibility of the department's staff to develop comprehensive inspections to be used for each type of aerial lift. Appendix A provides an example of an aerial lift pre-use inspection checklist. At a minimum, the inspection process should address the following areas:

4.2.2.1 Visual checks:

- Cracked welds
- Bent or broken structural components
- Hydraulic and fuel lines
- Controls and cables
- Wiring
- Tire condition
- Fuel
- Platform condition
- Personal protective equipment
- Guardrail systems

4.2.2.2 **Operational checks**: platform and ground controls should be operated while in a lowered position to ensure they perform their intended functions.

4.2.2.3 **Work condition checks**: this portion of the inspection deals with the conditions in which the lift will be operated and the surrounding environment. Specific details regarding hazards associated with aerial lift use are provided in Section 8 of this plan and includes:

- Uneven surfaces
- Ditches, drop-offs, and holes in the driving surface

- Debris
- Overhead obstructions, including electrical lines
- Safe clearance
- Adverse weather
- Vehicular and pedestrian traffic control

4.5 General requirements for use. It is the responsibility of the operator to review the manufacturer specifications for the aerial lift being used and be familiar with the safe operation of the equipment. The following general requirements for use of an aerial lift should be followed at all times:

4.5.1 Operators will not wear loose clothing or accessories, which may become caught in moving parts. Long hair must be tied back and protected against being caught in moving parts.

4.5.2 Guardrails must be installed and access gates or openings must be closed prior to raising the platform.

4.5.3 The manufacturer's load capacity will not be exceeded.

4.5.4 The operator(s) will maintain footing on the lift floor during operation. The use of railings, planks, ladders or any other devices on the platform for achieving additional height is prohibited.

4.5.5 Appropriate fall protection (lanyard and body harness) will be made available to the operator and used by aerial lift operators when required/recommended as per the manufacturer's specifications.

4.5.5.1 Anchor points designed for use with a fall protection system will be used as a tie-off point. Use of railings or points outside the lift cage as an anchor point is prohibited.

4.5.6 The operator will not exit the work platform while elevated unless the elevated work area is inaccessible by other means; exiting is being used as an anti-fatigue measure; it is a safer method of reaching an elevated work area; and the operation is approved by the supervisor.

4.5.6.1 If exiting the lift platform is approved, appropriate fall protection must be provided.

4.5.6.2 Exit from an elevated platform will occur only through a gate.

4.5.6.3 Fall protection must be transferred from the aerial lift to the elevated work area prior to exiting the lift platform.

4.5.7 Aerial lifts should be moved in the lowered position. Only aerial lifts equipped with manufacturer installed platform controls for horizontal movement may be moved while in the elevated position.

4.5.7.1 If the lift is to be moved in an elevated position, the operator will ensure a clear path of travel and safe clearances from ground and overhead obstacles.

4.5.7.2 A ground level spotter should be utilized during elevated movement operations.

4.5.8 If the aerial lift is equipped with outriggers or stabilizers, they will be used as per the manufacturer's specifications.

4.5.9 Surface slope should be taken into consideration when using an aerial lift and operation should only occur on smooth level surfaces or within the slope limitations provided by the manufacturer specifications.

4.5.10 Vehicle mounted aerial lifts will have the brakes set and wheels chocked prior to elevating the platform.

4.5.11 Altering, modifying or disabling safety devices on the aerial lift are prohibited.

4.5.12 At no time should the work platform be positioned against another object to steady the platform.

4.5.13 Two persons will be present during aerial lift operation.

4.5.14 Prior to lowering the work platform, the operator will ensure appropriate clearance below the work area.

4.5.15 Horseplay and/or stunt driving is prohibited.

4.6 Aerial lift maintenance. Aerial lifts utilized from an equipment rental company should be appropriately maintained by the equipment owner.

4.6.1 The shop will ensure any equipment rented is appropriately maintained.

4.6.2 Aerial lifts will be maintained as required by the equipment manufacturer by a competent individual.

4.6.3 Deficiencies noted during pre-inspection or during operation will be addressed by the competent person prior to placing the equipment back in service.

4.7 Personal protective equipment.

4.7.1 Fall protection will be used when operating aerial lifts.

4.7.1.1 When an anchor point is provided on the lift by the equipment manufacturer, an appropriate fall arrest or fall restraint system must be utilized by the operator. The operator will be trained in the safe use of a fall protection system prior to operating the lift.

4.7.1.2 In some cases, the guardrail system installed on the lift is suitable fall protection equipment. If the lift is equipped with an anchor point in addition to a guardrail system, fall arrest/restraint devices including lanyards and body harness/belt will be used by the operator.

- Tying a lanyard off to an adjacent pole, structure, or equipment while operating the lift is prohibited.

4.7.1.3 It is the responsibility of the supervisor to develop rescue operations for situations if a fall occurs..

4.7.2 Other types of personal protective equipment including head, eye and hand protection will be utilized based on the work being performed by the operator.

5.0 Ladders

5.1 Ladders are structures made of fiberglass, wood, metal, etc., commonly consisting of two sidepieces between which a series of bars or rungs are set at suitable distances, forming a means of climbing up or down to access elevated work surfaces. Typically, ladders are self- supporting (foldout), non-self-supporting (leaning) and mounted (fixed).

5.2 All ladders used by department personnel or contractors, must meet the requirements set forth by OSHA 29 CFR 1926.1053-Ladders.

5.3 General requirements. The weight of the person and the equipment/materials being used will not exceed the manufactures load rating. The following outlines ladder load ratings:

Type	Load Rating	Working Load (pounds)
IAA	Industrial – Special Heavy Duty	375
IA	Industrial – Extra Heavy Duty	300
I	Industrial – Heavy Duty	250
II	Commercial – Medium Duty	225
III	Household – Light Duty	200

5.4 Specific types of ladders.

5.4.1 Step Ladders

5.4.1.1 Do not use the top or top step of a step ladder as a step

5.4.1.2 Do not use the cross bracing for climbing unless specifically designed with steps on the front and rear for climbing

5.4.1.3 Metal spread bars or locking devices must be provided on step ladders to hold the front and back sections in an open position when the ladder is being used

5.4.1.4 Do not use a step ladder without the metal spread bar or locking device in a locked position

5.4.2 Portable ladders

5.4.2.1 The minimum clear distance between side rails for all portable ladders must be 11.5 inches. In addition, the rungs and steps of portable metal ladders must be corrugated, knurled, dimpled, coated with skid-resistant material or treated to minimize slipping.

5.4.2.2 When portable ladders are used for access to an upper landing surface, the side rails must extend at least three feet above the upper landing surface. When such an extension is not possible, the ladder must be secured and a grasping device, such as a grab rail, must be provided to assist workers in mounting and dismounting the ladder.

5.4.3 Fixed ladders

5.4.3.1 If the total length of the climb on a fixed ladder equals or exceeds 24 feet, it must be equipped with ladder safety devices (i.e. fall protection). An alternative to the aforementioned ladder safety device would include a self-retracting lifeline and rest platforms set at intervals not to exceed 150 feet. Another alternative would include a cage or well and multiple ladder sections with each ladder section not to exceed 50 feet. However, these ladder sections must be offset from adjacent sections and must have landing platforms at maximum intervals of 50 feet.

5.4.3.2 Individual rungs on fixed ladders must extend 42 inches above the access level or landing platform either by a continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that have the same spacing as the horizontal grab bars.

5.4.3.3 Step-across distance between the center of the steps or rungs of fixed ladders and the nearest edge of a landing area must be no less than seven inches and no more than 12 inches. A landing platform must be provided if the step-across distance exceeds 12 inches.

5.4.3.4 Fixed ladders must be used at a pitch no greater than 90 degrees from the horizontal, measured from the back side of the ladder.

5.5 Ladder Safety. Whenever ladders are used, the following safety guidelines will be followed for all types of ladders:

- Always read and follow all manufactures labels/markings on the ladder
- Always look for overhead power lines before moving or setting up a ladder
- Avoid using a metal ladder near power lines or exposed energized electrical equipment
- Always inspect a ladder prior to use (see Pre-Use Ladder Checklist in Appendix B)
- A damaged ladder must be tagged as "Do Not Use" and taken out of service until repaired or discarded
- Always maintain a three point contact with the ladder (two hands and one foot or two feet and one hand)
- Keep your body near the middle of the step and always face the ladder while climbing
- Ladders must be free of any slippery material on the rungs, steps or feet
- Do not use a step ladder as a single ladder or in a partially closed position
- Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement
- Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height
- Do not move or shift a ladder while a person or equipment is on the ladder
- A leaning ladder used to access an elevated surface must extend at least three feet above the point of support
- Do not stand on the three top rungs of a leaning ladder
- Always set the base of a leaning ladder one-foot out horizontally from the support for every four feet the ladder extends vertically
- A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder
- Be sure that all locks on a non-self-supporting ladder are properly engaged
- Ladders should never be painted (with the exception of metal ladders) due to potential of masking damage (i.e. dry rot, cracks or splinters)

5.6 Training

5.6.1 It is the responsibility of supervisors (or a competent person) to train all personnel using ladders to recognize the hazards associated with the type of ladder being used and be instructed on how to minimize hazards.

6.0 Scaffolding

6.1 Scaffolding is a temporary structure for holding workers and materials during the erection, repair or decoration of a building. Scaffolding will be erected by a competent person who is properly trained. All scaffolding exceeding 125 feet in height must be designed by a registered professional engineer. All scaffolding must meet the construction requirements as set forth by OSHA 29 CFR 1926 Subpart L – Scaffolds.

6.2 Fall protection or fall arrest. All employees working 10 feet above the ground or above the next lower level will be protected from falls by using either guardrails or a fall arrest system.

6.2.1 Guardrail height. The height of the top rail for scaffolds must be between 36 inches and 45 inches.

6.2.2 Crossbracing. When the cross point of the crossbracing is going to be used as a top rail, it must be between 38

inches and 48 inches above the working surface.

6.2.3 Midrails. Midrails must be installed halfway between the top rail and the working surface. When the cross point of the crossbracing is going to be used as a midrail, it must be between 20 inches and 30 inches above the working surface.

6.2.4 Guardrails are not required when the front end of the working surface is less than 14 inches from the face of the work.

6.3 Footings. Support scaffold footings will be level and capable of supporting the loaded scaffold without settling or displacement. The legs, poles, frames and uprights will be placed on the base plates, mud sills or other adequate firm foundations.

6.4 Platforms (working surfaces). Supported scaffold working surfaces will be fully planked or decked.

6.4.1 The space between the working surface and the uprights must not exceed one inch in width.

6.4.2 Scaffolding planking must be able to support its own weight and at least four times the intended load without failure.

6.4.3 Solid sawn-wood, fabricated planks and fabricated work surfaces may be used as scaffolding planks following the recommendations by the manufacturer or a lumber grading association or inspection agency.

6.4.4 The planking material for the working surface must not deflect more than $1/60^{th}$ of the span when loaded.

6.4.5 All scaffolding work surfaces and walkways must be at least 18 inches wide. When the area is less than 18 inches wide, guardrails and/or fall arrest systems must be used.

6.5 Guying ties and braces. Supported scaffolding with a height to base ratio of more than 4:1 will be restrained from tipping by guying, tying, bracing or some equivalent means.

6.6 Inspections. Before each work shift and after any occurrence that could affect the structural integrity of a scaffold, a competent person must inspect the scaffold and scaffold components for visible defects. Any defects will be corrected prior to use.

6.7 Erecting and dismantling. When erecting or dismantling supported scaffolds, a competent person must determine the feasibility of providing a safe means of access and fall protection for these operations.

6.8 Falling object protection. To protect employees from falling objects, toeboards must be installed on the working surfaces. Toeboards must be at least four inches wide.

6.8.1 Other acceptable falling object protection methods include screens, debris nets, catch platforms, canopy structures or the use of barricades.

6.9 Inspections and maintenance.

6.9.1 Prior to use, the operator/user will perform a visual inspection of the scaffolding system to ensure no deficiencies are present.

6.9.2 Scaffolding will be certified upon erection by a competent person. Scaffolds in place for more than one year require an annual certification by a competent person.

7.0 Hazards

7.1 Elevated work being conducted must take into consideration additional hazards, which may affect the safety of the individual performing the work. The following hazards will be addressed prior to and during use of elevated work equipment. It is the policy of Facilities Management to minimize the risk of injury to employees and contractors utilizing these systems. Their use is not permitted if the following hazards are not appropriately addressed or controlled.

7.2 Inclement weather. Elevated work equipment for use outdoors must address inclement weather as a prerequisite of operating the elevated work equipment. It is the shop's responsibility to maintain "on-call" individual(s) for all activities when outdoor use of elevated work equipment is conducted. It is the responsibility of the on- call individual to monitor the weather and determine if changes occur, which may create unsafe work conditions and to alert aerial lift/elevated work platform users when these conditions arise.

7.2.1 **Wind**: Aerial lifts, scaffolds and observations towers must have a posted wind speed limitation. The equipment manufacturer is responsible for supplying this information to the department. If wind speeds exceed 25 miles per hour, use of an aerial lift or elevated work platform is not recommended as per the department's policy. Refer to the manufacturer's specifications or design criteria for specific wind limitations.

7.2.1.1 All operators and users of aerial lift/elevated work platforms will be informed of these limitations and have suitable means for detecting elevated wind speeds prior to performing elevated work through approved wind gauges, up-to-date weather reports or other approved methods.

7.2.2 **Precipitation**: Rain, snow, hail, sleet or fog, which may adversely affect the safe use of aerial lifts/elevated work platforms, will be appropriately addressed prior to elevated work being performed. If these conditions cannot be appropriately addressed, work will not be performed until weather conditions improve.

7.2.3 **Lightening**. Use of lifts is prohibited when lightening is within 5 miles of the campus.

7.2.4 It is the responsibility of the aerial lift operator or elevated work platform user and their supervisor to determine when inclement weather will render elevated work platforms unsafe.

7.2.5 Suitable means of communication between the aerial lift/elevated work platform user and their supervisor(s) must be maintained and available for use at all times to convey pertinent information.

7.3 Electrical hazards.

7.3.1 Only personnel certified to work on electrical lines will be permitted to approach electrical lines during aerial work platform operations.

7.3.2 Elevated work equipment will not come within 10 feet of overhead electrical lines at any time, unless approved to work on overhead electrical lines.

7.3.3 Electrical lines carrying voltages greater than 50 kV will be addressed by a certified individual prior to elevated work being performed.

7.3.4 It is the responsibility of the employee to ensure overhead electrical lines are addressed prior to elevated equipment use, and avoided during use.

7.4 Vehicular and pedestrian traffic. At all times during the use of elevated work equipment, the employee will ensure vehicular and pedestrian traffic does not create additional hazards.

7.4.1 During the use of mobile lifts, the operator will ensure the path of travel is not made unsafe due to excess vehicular or pedestrian traffic.

7.4.2 Stationary elevated work platforms will be constructed and protected to ensure vehicular and pedestrian traffic is restricted.

8.0 Training

8.1 All employees and users of elevated work equipment will receive training prior to any use of this equipment.

8.1.1 Aerial/mobile lift training consists of hands-on training and practical evaluation. Training will be provided by a competent trainer, the equipment manufacturer or training consultant.

8.1.1.1 Training should address the following areas of safe use:

- Review of equipment manuals
- Pre-use inspections
- Operator responsibilities
- Stability
- Warning signs
- Safe use
- Fall protection
- Equipment limitations (wind, occupancy, surface slope, etc.)

8.1.1.2 Hands-on training should provide the trainee with the experience to allow them to safety operate the lift.

8.1.1.3 Practical evaluations will be provided to the trainee as a certification step in the training process

8.1.1.4 Upon successful completion of training, operators will be certified to operate aerial lifts.

8.1.1.5 Training records must be maintained by the department supervisor.

8.1.1.6 Operator recertification will be completed every three years or when one of the following occurs:

- The operator is observed using the lift in an unsafe manner
- The operator is involved in an accident or near miss
- The equipment changes
- Workplace conditions change resulting in unsafe work conditions.

8.1.2 Stationary elevated work platform training will be provided to all personnel utilizing/maintaining the platforms. Training should be conducted by a competent individual and address the following topics.

- Safe equipment use
- Equipment limitations (wind, precipitation, occupancy, etc.)
- Restricting access when in use and not in use

10.0 Recordkeeping

10.1 It is the responsibility of the supervisor to ensure training for all aerial lifts, elevated work platforms reach employee training records.

10.2 Shop records should include:

- Inventory of all aerial lifts, elevated work platforms, scaffolds and ladders.

- Manufacturer specifications/engineering design for all elevated work systems
- Employee training, to include:
  - Employee/operator name
  - Dates of training
  - Trainer
  - Aerial lifts/elevated work systems covered in training
  - Testing results
- Department specific Standard Operating Procedures for elevated work systems
- Equipment inspection records
  - Pre-use inspection records
  - Annual inspection/certification records
- Equipment maintenance records

11.0 Contractors

11.1 Contractors utilizing their own equipment must have their own safety policy and be capable of providing training records for all employees utilizing the equipment.

11.2 At no time will an employee be authorized to utilize elevated work equipment unless formal training is completed and documented.

Appendix A

Aerial Lift pre-use inspection checklist

A pre-use inspection of each aerial lift will be performed prior to each use by an authorized and certified lift user. Documentation of the inspection will be maintained by the department (supervisor) and copies of previous inspections must be made available to all operators.

Any items noted as deficient must result in the lift being taken out of service until proper maintenance has been performed to provide a lift in proper working order. A sign clearly indicating the lift is unsafe will be affixed to the lift anytime it is deemed unsafe.

Aerial lift user:		Make of lift:	
Lift serial #:		Model of lift:	
Inspector name:		Date of inspection:	

Inspection item	Pass	Fail	N/A	Comments
Operating controls				
Emergency controls				
Safety devices				
Personal protective devices				
Pneumatic system (leak check)				
Hydraulic system (leak check)				
Fuel system (leak check)				
Fluid levels				
Cables and hoses				
Wiring harness				
Loose/missing parts (locking pins, bolts, welds)				
Tire and wheel condition				
Placards and warning signs				
Operational manual stored on lift				
Outriggers/stabilizers				
Guardrail system and locking gate				
Warning system (beacons, lights, horn, etc.)				
Load capacity for job				
Work hazard inspection (weather, overhead, electrical, pedestrian/vehicular traffic, etc.)				
Wind speed less than 28 mph				
Comments:				
Inspector signature:			Date:	

Appendix B

Pre-Use Ladder Checklist

This checklist serves as an example of items to be inspected on a ladder. Refer to the manufacturer's specifications for additional inspection points.

Ladder owner:		Make of ladder:	
Ladder serial #:		Model of ladder:	
Inspector name:		Date of inspection:	

Inspection item	Pass	Fail	N/A	Comments
General				
Manufactures labels present and legible				
Can the ladder support the expected load				
Has the ladder been set-up on a stable and level surface				
Are ladders free of oil, grease, and other slipping hazards				
Are there loose steps/rungs (can they be moved by hand)				
Are there loose nails, screws, bolts or other metal parts				
Are there cracked, split or broken uprights				
Are there cracked, split or broken steps/rungs				
Are there slivers on the uprights or steps/rungs				
Is the ladder long enough to safely reach the intended working height				
Has the ladder been properly secured or barricaded in a high traffic areas				
If a ladder is found to be damaged, has it been placed out of service and labeled as "**DO NOT USE"**				
Step ladders				
Is the ladder wobbly (from strain)				
Are there loose or bent hinge spreaders				

Inspection item	Pass	Fail	N/A	Comments
Are the stops on the hinge spreaders loose or broken				
Are the hinges loose or broken				
Extension ladders				
Loose, broken or missing extension locks				
Are there defective locks that do not seat properly when the ladder is extended				
Has the extension rope deteriorated				
Check springs on ladder rung holders				
Comments:				
Inspector signature:			Date:	

Appendix C

Pre-use Scaffold Checklist

Sample scaffold pre-use inspection checklist

This checklist serves as an example of items to be inspected on an aerial lift. Refer to the manufacturer's specifications for additional inspection points.

Scaffold owner:		Make of scaffold:	
scaffold serial #:		Model of scaffold:	
Inspector name:		Date of inspection:	

Inspection item	Pass	Fail	N/A	Comments
Has the scaffolding been erected per the manufacturer's instructions				
Has the scaffolding been constructed by a qualified person				
Are the scaffolding planks free of splits, twists and bows				
Is the scaffold in good repair				
Footing and anchors are sound, rigid, and capable of carrying 4 times the maximum intended load without settling or displacement				
Has the scaffold been set up on an adequate flat base with baseplates on mudsills, screw jacks, etc.				
Have all connections been pinned or fastened securely				
Are cross braces in place				
If wheels are in use, have they been locked into place				
If the base of scaffolding is on the ground, has it been supported by appropriate mud sills				
Are scaffold planks certified scaffold planks or structural lumber				
Do planks overlap the end of the scaffold no less than 6 inches and no more than 12 inches				
Has the working surface of the scaffold been fully planked				
Have the planks been secured to prevent slipping				
Is the gap between planks is less than 1 inch to prevent tools, etc., from falling through				

Inspection item	Pass	Fail	N/A	Comments
Is the distance between the scaffold and the working surface is less than 14 inches				
Are gates or bars used to enclose the top level				
Has the scaffold been tied off if it is more than four times the width of the base				
Do all open sides and ends of scaffold more than 10 feet above the base have top rails, midrails, and toeboards				
Are guardrails capable of withstanding 200 pounds of force anywhere along the top rail				
Comments:				
Inspector signature:			Date:	