Fall Protection Plan

Policy 303.11

1 Introduction

1.1 Statement of University Policy

1.1.1 Appalachian State University Physical Plant is dedicated to the protection of its employees from on-the-job injuries. All employees of Appalachian State University have the responsibility to work safely on the job. The purpose of this plan is: (a) To supplement our standard safety policy by providing safety standards specifically designed to cover fall protection on all jobs and; (b) to ensure that each employee is trained and made aware of the safety provisions which are to be implemented by this plan prior to the start of construction or maintenance work.

1.1.2 This Fall Protection Plan addresses the use of conventional and other fall protection safeguards in a number of areas, as well as identifying specific activities that require various types of fall protection.

1.1.3 This plan is designed to enable supervisors and employees to recognize the fall hazards on their jobs and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces. All accidents that result in injury to workers, regardless of their nature, shall be investigated by supervisors and reported to the Safety & Workers' Compensation Office. In the event that an employee falls or there is some other related, serious incident occurring, this plan shall be reviewed to determine if additional practices, procedures or training need to be implemented to prevent similar types of falls or incidents from occurring. It is an integral part of any safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent a reoccurrence. Each employee will be trained in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee is to notify their supervisor of the concern and the concern addressed before proceeding.

1.1.4 Safety policy and procedures on any one project cannot be administered, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to the last employee. Each employee must understand their value to ASU; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through pre-planning, training, understanding and cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

1.1.5 It is the responsibility of the supervisor to implement this Fall Protection Plan. The supervisor is responsible for continual observational safety checks of their work operations and to enforce the safety policy and procedures. The supervisor also is responsible to correct any unsafe acts or conditions immediately. It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instructions of the supervisor. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or acts that may cause injury to either themselves or any other employees. Any changes to this Fall Protection Plan must be approved by Physical Plant Administrators and the Appalachian State University Safety and Workers' Compensation Office. This plan shall be reviewed on a yearly basis by supervisors to determine if additional practices, procedures or training needs to be implemented to improve or provide additional fall protection. Employees shall be notified and trained, as needed, in the new procedures. A copy of this plan and all approved changes shall be maintained in the Physical Plant and in the Safety and Workers' Compensation Office.

1.1.6 In the construction and maintenance industry in the U.S., falls are the leading cause of worker fatalities. ASU recognizes that accidents involving falls are generally complex events frequently involving a variety of factors. Consequently the standard for fall protection deals with both the human and equipment-related issues in protecting workers from fall hazards. For example, the University and the employees need to do the following:

1.1.7 Where protection is required, select fall protection systems appropriate for given situations.

1. Use proper construction, maintenance, and installation of safety systems.
2. Supervise employees properly.
3. Use safe work procedures.
4. Train workers in the proper selection, use, and maintenance of all protection systems.

2 Scope

2.1 OSHA has revised its construction and maintenance industry safety standards (29 Code of Federal Regulations, Subpart M, Fall Protection, 1926.500, 1926.501, 1926.502, 1926.503 and general industry standard 1910 applicable to 1926 standard) and developed systems and procedures designed to prevent employees from falling off, onto, or through working levels and to protect employees from being struck by falling objects. The performance-oriented requirements make it easier for ASU to provide the necessary protection.

2.2 The rule covers most construction and maintenance workers except those inspecting, investigating, or assessing workplace conditions prior to the actual start of work or after all work has been completed.

2.3 The rule identifies areas or activities where fall protection is needed. These include, but are not limited to elevated walkways; leading edge work; unprotected sides and edges; elevated platforms; and related work; roofing work; and other elevated walking/working surfaces. The rule sets a uniform threshold height of 4 feet, thereby providing consistent protection. This means that construction and maintenance employers must protect their employees from fall hazards and falling objects whenever an affected employee is 4 feet or more above a lower level. Protection must also be provided for construction and maintenance workers who are exposed to the hazard of falling into dangerous equipment.

2.4 Under the new standard, supervisors will be able to select fall protection measures compatible with the type of work being performed. Fall protection generally can be provided through the use of personal fall arrest systems, positioning device systems, and warning line systems, among others.

2.5 The OSHA rule clarifies what an employer must do to provide fall protection for employees, such as identifying and evaluating fall hazards and providing specific training. Appalachian State University (ASU) is required to provide fall protection for workers on scaffolds, elevated platforms, and fixed ladders used for all construction and maintenance and repair of buildings and equipment as noted in general industry standard 1910.

3 Definitions

3.1 Anchorage

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

3.2 Body Harness

Straps that may be secured about the person in a manner that distributes the fall-arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with a means for attaching the harness to other components of a personal fall arrest system.

3.3 Connector

A device that is used to couple (connect) parts of a personal fall arrest system or positioning device system together (e.g. carabineer, dee ring or snaphook devices).

3.4 Controlled Access Zone

A work area designated and clearly marked in which certain types of work (such as overhand bricklaying) may take place without the use of conventional fall protection systems--guardrail, personal fall arrest or positioning device system--to protect the employees working in the zone in which access to the zone is controlled.

3.5 Deceleration Device

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

3.6 Deceleration Distance

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

3.7 Lanyard

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

3.8 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.

3.9 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 that serves as a means for connecting other components of a personal fall arrest system to the anchorage.

3.10 Low-Slope Roof

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

3.11 Personal Fall Arrest System

A system including but not limited to an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline or suitable combinations used to arrest an employee in a fall from a working level.

3.12 Positioning Device System

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

3.13 Rope Grab

A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest a fall.

3.14 Safety-Monitoring System

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

3.15 Self-Retracting Lifeline/Lanyard

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

3.16 Snaphook

A connector consisting of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released automatically closes to retain the object. The use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

3.17 Steep Roof

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

3.18 Unprotected Sides and Edges

Any side or edge (except at entrances to points of access) of a walking/working surface (e.g. floor, roof,) where there is no wall or guardrail system at least 39 inches high.

3.19 Elevated Walking/Working Surface

Any surface, whether horizontal or vertical, on which an employee walks or works, including but not limited to floors, roofs, and concrete reinforcing steel. Does not include ladders, vehicles, or trailers on which employees must be located to perform their work duties.

3.20 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 a personal fall arrest system.

4 Policy and Procedure Statements

4.1 Provisions of the Standard

4.1.1 These standards prescribes the duty to provide fall protection, sets the criteria and practices for fall protection systems, and requires training. It covers hazard assessment and pre-planning for fall protection and safety monitoring systems. Also addressed are controlled access zones, personal fall arrest systems, warning lines, positioning device systems, and 5,000 lb. Anchor point per employee attached.

4.2 Duty to Have Fall Protection

4.2.1 Supervisors are required to assess the workplace to determine if the elevated walking/working surfaces on which employees are to work have the strength and structural integrity to safely support workers. Employees are not permitted to work on those surfaces until it has been determined that the surfaces have the requisite strength and structural integrity to support the workers. Once supervisors have determined that the surface is safe for employees to work on, the supervisor must select one of the options listed for the work operation if a fall hazard is present.

4.2.2 For example, if an employee is exposed to falling 4 feet or more from an unprotected side or edge, the supervisor must select a personal fall arrest system to protect the worker. Similar requirements are prescribed for other fall hazards as follows.

4.3 Controlled Access Zones

4.3.1 A Controlled access zone is a work area designated and clearly marked in which certain types of work (such as roof repair or equipment maintenance) may take place without the use of conventional fall protection systems-- personal fall arrest system or positioning device system--to protect the employees working in the zone.

4.3.2 Controlled access zones, when created to limit entrance to areas where leading edge work and other operations are taking place, must be defined by a control line or by any other means that restrict access. Control lines shall consist of ropes, wires, tapes or equivalent materials, and supporting stanchions, and each must be:

4.3.3 Flagged or otherwise clearly marked at not more than 6-foot intervals with high-visibility material;

4.3.4 Rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches (1 meter) from the walking/working surface and the highest point is not more than 45 inches--nor more than 50 inches when maintenance and repair operations are being performed--from the walking/working surface;

4.3.5 Control lines also must be connected on each side to the building structure.

4.3.6 When control lines are used, they shall be erected not less than 6 feet (1.8 meters) nor more than 25 feet from the unprotected leading edge.

4.3.7 Controlled access zones when used to determine access to areas where maintenance and repair or related work are taking place are to be defined by a control line erected not less than 10 feet (3 meters) nor more than 15 feet (4.6 meters) from the working edge. Additional control lines must be erected at each end to enclose the controlled access zone. Only employees engaged in roof repair and general maintenance/repair or related work are permitted in the controlled access zones.

4.4 Excavations

4.4.1 Each employee at the edge of an excavation 4 feet or more deep shall be protected from falling by fences, barricades, or covers. Where walkways are provided to permit employees to cross over excavations, guardrails are required on the walkway if it is 6 feet or more above the excavation.

4.5 Hoist Areas

4.5.1 Each employee in a hoist area shall be protected from falling 4 feet or more by a personal fall arrest system, warning line or a combination of both.

4.6 Holes

4.6.1 Personal fall arrest systems, warning lines or a combination of both shall be used around holes (including skylights) that are more than 4 feet above lower levels to protect employees from tripping in or stepping into or through holes and provide

protection from objects falling through holes, such as skylights.

4.7 Leading Edges

4.7.1 Each employee on a walking/working surface 4 feet or more above a lower level where leading edges are either completed or under construction, but who is not engaged in the leading edge work, shall be protected from falling by a personal fall arrest system. A controlled access zone must be established for leading edge work; the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

4.8 Roofing

4.8.1 Low-slope Roofs

4.8.1.1 Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges 4 feet or more above lower levels shall be protected from falling by personal fall arrest systems or a combination of a warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet (15.24 meters) or less in width, the use of a safety monitoring system without a warning line system is permitted.

4.8.2 Steep Roofs

4.8.2.1 Each employee on a steep roof with unprotected sides and edges 4 feet or more above lower levels shall be protected from falling by a personal fall arrest system.

4.9 Dangerous Equipment

4.9.1 Each employee less than 4 feet above dangerous equipment shall be protected from falling into or onto the dangerous equipment by a personal fall arrest system or by equipment guards. Each employee 4 feet or more above dangerous equipment shall be protected from fall hazards by a personal fall arrest system.

4.10 Personal Fall Arrest Systems

4.10.1 These consist of an anchorage, connectors, and a body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations. Effective January 1, 1998, body belts are not acceptable as part of a personal fall arrest system. If a personal fall arrest system is used for fall protection, it must do the following: (This is from the OSHA Standard)

4.10.2 Limit maximum arresting force on an employee to 1,800 pounds (8 kilonewtons) when used with a body harness;

4.10.3 Be rigged so that an employee can neither free fall more than 6 feet nor contact any lower level;

4.10.4 Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 meters); and

4.10.5 Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet or the free fall distance permitted by the system, whichever is less.

4.10.6 Personal fall arrest systems must be inspected prior to each use for wear, damage, and other deterioration. Defective components must be removed from service. Dee-rings and snaphooks must have a minimum tensile strength of 5,000 pounds (22.2 kilonewtons). Dee-rings and snaphooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kilonewtons) without cracking, breaking, or suffering permanent deformation.

4.10.7 Snaphooks shall be sized to be compatible with the member to which they will be connected, or shall be of a locking configuration.

4.10.8 The snaphook must be a locking type and designed for the following connections, (a) directly to webbing, rope or wire rope; (b) to each other; (c) to a dee-ring to which another snaphook or other connecter is attached; (d) to a horizontal lifeline; or (e) to any object incompatible in shape or dimension relative to the snaphook, thereby causing the connected object to depress the snaphook keeper and release unintentionally.

4.10.9 Snap hooks are compatible when the diameter of the dee-ring to which the snaphook is attached is greater than the inside length of the snaphook when measured from the bottom (hinged end) of the snaphook keeper to the inside curve of the top of the snaphook. Thus, no matter how the dee-ring is positioned or moved (rolls) with the snaphook attached, the dee-ring cannot touch the outside of the keeper, thus depressing it open.

4.10.10 On fixed or rolling scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

4.10.11 Horizontal lifelines shall be designed, installed, and used under the supervision of a supervisor, as part of a complete personal fall arrest system that maintains a safety factor of at least two, i.e., capable of supporting at least twice the weight expected to be imposed on it. Lifelines shall be protected against being cut or abraded.

4.10.12 Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet or less shall 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.

4.10.13 Self-retracting lifelines and lanyards that do not limit free fall distance to 2 feet or less, ripstitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

4.10.14 Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body harnesses shall be made of synthetic fibers.

4.10.15 Anchorages shall be designed, installed, and used under the supervision of a supervisor, as part of a complete personal fall arrest system that maintains a safety factor of at least two, i.e., capable of supporting at least twice the weight expected to be imposed upon it. Anchorages used to attach personal fall arrest systems shall be independent of any anchorage being used to support or suspend platforms and must be capable of supporting at least 5,000 pounds per person attached.

4.10.16 The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

4.10.17 Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds. When vertical lifelines are used, each employee shall be attached to a separate lifeline.

4.10.18 Body harnesses, and components shall be used only for employee protection (as part of a positioning device system) and not to hoist materials.

4.10.19 The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

4.11 Positioning Device Systems

4.11.1 Body harness systems are to be set up so that a worker can free fall no farther than 2 feet. They 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, whichever is greater. Requirements for snaphooks, dee-rings, and other connectors used with positioning device systems must meet the same criteria as those for personal fall arrest systems.

4.12 Safety Monitoring Systems

4.12.1 When no other alternative fall protection safeguard has been implemented for low slope roofs, the supervisor shall implement a safety monitoring system. Per OSHA Standards, safety monitoring systems are to be used on low-slope roofs only. Supervisors must appoint a competent person to monitor the safety of workers and the employer shall ensure that the safety monitor has been trained in the proper use of the safety monitoring system and complies with the following:

1. Is competent in the recognition of fall hazards;
2. Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices;
3. Is operating on the same walking/working surface as the employees and within visual sight distance;
4. Is close enough to work operations to communicate orally with workers and has no other duties to distract from the monitoring function.

4.12.2 Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.

4.12.3 No worker, other than one engaged in roofing work (on low-sloped roofs) or one covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

4.12.4 All workers in a controlled access zone shall be instructed to promptly comply with fall hazard warnings issued by safety monitors.

4.13 Warning Line Systems

4.13.1 Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

4.13.2 Flagged at not more than 6-foot intervals with high-visibility material;

4.13.3 Rigged and supported so that the lowest point (including sag) is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface.

4.13.4 Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches (0.8 meters) above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge;

4.13.5 The rope, wire, or chain shall have a minimum tensile strength of 500 pounds and after being attached to the stanchions, must support without breaking, the load applied to the stanchions as prescribed above.

4.13.6 Shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

4.13.7 Warning lines shall be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation.

4.13.8 When mechanical equipment is not being used, the warning line must be erected not less than 6 feet from the roof edge.

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

4.13.10 When the path to a 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 at the point where the path intersects the warning line erected around the work area, or the path shall be offset such that a person cannot walk directly into the work area.

4.13.11 No employee shall be allowed in the area between a roof edge and a warning line unless the employee is performing roofing work in that area.

4.13.12 Mechanical equipment on roofs shall be used or stored only in areas where employees are protected by a warning line system, or personal fall arrest system.

4.13.13 During roofing work, materials and equipment shall not be stored within 6 feet of a roof edge, and materials piled, grouped, or stacked near a roof edge must be stable and self-supporting.

4.14 Training

4.14.1 The Physical Plant will provide a training program that teaches employees who might be exposed to fall hazards how to recognize such hazards and how to minimize them. Employees must be trained in the following areas: (a) the nature of fall hazards in the work area; (b) the correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems; (c) the use and operation of controlled access zones, personal fall arrest, warning line, safety monitoring systems, controlled access zones; and other protection to be used; (d) the role of each employee in the safety monitoring system when the system is in use; (e) the limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs; (f) the correct procedures for equipment and materials handling and storage and the erection of overhead protection; (g) employees' role in fall protection plans; and (h) overview of the standard's requirements.

4.14.2 The Physical Plant will prepare a written certification that identifies the employee trained and the date of the training. The employer or trainer must sign the certification record. Retraining also must be provided when necessary. Circumstances where retraining of employees is required include, but is not limited to, situations where: (1) Changes in the workplace render previous training obsolete; or (2) Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or (3) Inadequacies in an affected employees' knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill. A record of the completed training program will be maintained in the Physical Plant and a copy forwarded to the Safety and Workers' Compensation Office.

4.15 General Use Requirements

4.15.1 ANSI/SIA A92.5-1992 (Boom Supported Elevating Work Platforms), including Appendix items, specify the design and construction requirments for aerial lift devices.

4.15.2 Aerial lift devices are used to elevate personnel to job sites above the ground. These include extensible boom platforms, aerial ladders, aerial ladder trucks, articulating boom platforms, vertical towers, and any combination of these devices.

4.15.3 Aerial lift devices may be constructed of metal, wood, fiberglass, reinforced plastic (RFP), or other materials.

4.15.4 Aerial lift devices may be "field modified" for use other than those intended by the manufacturer provided the modification has been approved, in writing, by the manufacturer or by an equivalent authority, such as a nationally recognized testing

laboratory, to be in conformity with ANSI/SIA A92.5-1992 requirements, to be least as safe as the equipment prior to modification.

4.15.5 Aerial lift devices and personnel working near electrical power lines must meet the requirements contained in the OSHA Standard 1910.333 (c) (3), Subpart S-Electrical, Selection and Use of Work Practices (e.g. de-energizing procedures; grounding overhead lines; required work distances relative to overhead electrical power lines; unqualified and qualified employees working in the vicinity of overhead electrical power lines; and vehicular and mechanical equipment in the vicinity of overhead power lines). Consult with New River Light and Power Company officials prior to performing work near energized power lines. See OSHA Standard 1910.333 (c) (3) for details.

4.16 General Aerial Lift Device Use Practices Include

1. On ladder trucks and lower trucks, secure aerial ladders in the lower traveling position by locking the device on top of the truck cab, and the manually operated device at the base of the ladder prior to moving the truck. Insure outrigger devices (if equipped) are properly stored prior to moving.
2. Set the brakes and position the outrigger devices (if equipped) on pads or similar solid surfaces and install the wheel chocks before using aerial lift equipment (especially on inclines).
3. Do not move aerial lift trucks with employees located in the elevated work boom position, except for equipment specifically designed or certified as "field modified" for this type of operation.
4. Insure that aerial lift devices equipped with working elevated platforms contain both elevated platform (upper) and lower controls. Upper controls are located in or beside the elevated platform, within easy reach of the operator. Lower controls are designed to override the upper controls.
5. Check to be sure that controls are plainly marked as to their function.
6. Test lift controls each day prior to use to insure safe working conditions.
7. Insure loads and distribution on working platforms and platform extensions are in accordance with manufacturer's rated capacity and do not exceed rated load limits. Affix stickers to vehicle that indicate manufacturer's rated load capacity of the working elevated platform and/or elevated platform extensions.
8. Insure all personnel in the working elevated platform are wearing appropriate personal protective devices at all times (e.g. hard hats to protect from overhead falling objects, being struck with nearby objects, struck by flying objects; safety shoe/boots; goggles/safety glasses with side shields/hard hat with shield; gloves; other protective clothing).
9. Insure that each employee uses an appropriate body belt/harness and lanyard device attached to the boom or basket or other appropriate passenger device as fall protection when working from an aerial lift device.
10. Insure that only trained and authorized employees operate aerial lift devices.
11. Keep feet firmly on the floor of the basket or elevated platform at all times.
12. Do not sit, climb or position yourself on the edge of the basket or elevated platform.
13. Do not use planks, ladders or other devices as substitute work positions.
14. Do not operate lower controls unless permission has been obtained from the employee(s) in the elevated platform, except in case of an emergency.
15. Do not position the aerial lift device against another object to steady the elevated platform.
16. Do not use aerial lift devices as a crane or other lifting device.
17. Do not operate aerial lift devices from trucks, scaffolds, or similar equipment unless approved in writing by the manufacturer.
18. Limit travel speeds of aerial lift devices according the conditions of the ground surface, congestion, visibility, slope, location of personnel and other factors that may cause hazards to other nearby personnel.
19. Shut down the aerial lift device engine prior to fueling. Fuel engines or charge fuel cylinders in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.
20. Charge batteries in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.
21. Be sure to maintain a clear view of the path of travel, maintain a safe distance from other obstacles, debris, drop offs, holes, depressions, slopes and other hazards. Maintain a safe distance from overhead obstacles (including overhead electrical power lines.
22. Stunt driving and horseplay are prohibited.
23. Do not position booms and elevated platform devices in an attempt to jack the wheels off the ground.
24. Do not operate aerial lift devices on grades, side slopes, or ramps that exceed the manufacturer's recommendations.
25. If elevated platforms or elevated work areas become caught, snagged or otherwise do not operate properly, remove personnel from the platform prior to freeing the elevated platform using ground controls.
26. Do not alter the insulated portion of an aerial lift device in any manner that might reduce its insulating effectiveness.
27. Insure the area surrounding the elevated platform is clear of personnel and equipment prior to lowering the elevated platform.
28. Perform inspections or aerial life devices per manufacturer's, ANSI/SIA and other regulatory agency schedules. Make repairs immediately.
29. Do not operate aerial lift devices with noted, reported deficiencies until repairs are made and equipment is authorized for use.
30. Perform electrical system safety tests on aerial lift devices per ANSI/SIA A92.5-1992 requirements.
31. Inspect hydraulic and pneumatic system components (Bursting Safety Factor) on aerial lift devices per ANSI/SIA A92.5-

1992 requirements.
32. Conduct welding operations on aerial lift devices per Automotive Welding Society (AWS) Standards.

4.17 Training - Employees Using Aerial Lift Devices

1. Employees authorized to use aerial lift devices will receive training in accordance with manufacturer's operating instructions and routine maintenance requirements (as appropriate) prior to actual operation.
2. Employees authorized to use aerial lift devices will receive hands on training on the actual aerial lift device (or duplicate model) he/she will be expected to operate prior to actual use.
3. Training will be under the direction of a qualified, competent individual capable of determining an employee's proficiency in knowledge and actual operation of the aerial lift device.
4. Only properly trained and authorized employees are permitted to operate aerial lift devices. Employees will be given and display, when requested, cards, certificates or other form of identification that denotes successful completion and authorization to operate specific aerial lift devices.

4.18 Records Retention

4.18.1 Departments will retain initial employee training records for individuals authorized to operate specific aerial lift devices for a minimum of 3 years. Subsequent refresher and other specialized training records will be maintained for a similar period. Previous employee training records may be replaced with copies of subsequent and other specialized training records.

4.18.2 Departments will retain written records of initial and subsequent inspections performed on each aerial lift device for a minimum of 3 years. Subsequent inspection records will be maintained for a similar period. Previous inspection records may be replaced with copies of subsequent inspection records.

4.18.3 Departments will retain written records or repairs performed on each aerial lift device for a minimum of 3 years. Records will include the date of repair, a description of the work accomplished and identification of persons performing the repair. Previous repair records may be replaced with copies of subsequent repair records.

4.18.4 Departments will retain written records of al paperwork in connection with authorized "field modifications" made with respect to specific aerial lift devices.

4.19 OSHA Standard 29 CFR 1910.333 (c) (3) - Subpart S - Electrical, Selection and Use of Work Practices

4.19.1 (c) (3) "Overhead lines." if work is to be performed near overhead lines, the lines shall be de- energized and grounded, or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

4.19.2 Note: The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines are covered by 1910.269 of this Part, not by 1910.332 through 1910.335 of this Part. Under paragraph (c)(2) of this section, unqualified persons are prohibited from performing this type of work.

4.19.3 (c)(3)(i) "Unqualified persons."

4.19.4 (c)(3)(i)(A) When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

4.19.5 (c)(3)(i)(A)(1) For voltages to ground 50kV or below - 10 feet (305 cm);

4.19.6 (c)(3)(i)(A)(2) For voltages to ground over 50kV - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV.

4.19.7 ..1910.333(c)(3)(i)(B)

4.19.8 (c)(3)(i)(B) When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in paragraph (c)(3)(i)(A) of this section.

4.19.9 Note: For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

4.19.10 (c)(3)(ii) "Qualified persons." When a qualified person is working in the vicinity of overhead lines, whether in an elevated

position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S-5 unless:

4.19.11 (c)(3)(ii)(A) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or

4.19.12 (c)(3)(ii)(B) The energized part is insulated both from all other conductive objects at a different potential and from the person, or

4.19.13 (c)(3)(ii)(C) The person is insulated from all conductive objects at a potential different from that of the energized part.

4.19.14 TABLE S-5 - APPROACH DISTANCES FOR QUALIFIED EMPLOYEES - ALTERNATING CURRENT

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

4.19.15 ..1910.333(c)(3)(iii)

4.19.16 (c)(3)(iii)

4.19.17 "Vehicular and mechanical equipment."

4.19.18 (c)(3)(iii)(A) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

4.19.19 (c)(3)(iii)(A)(1) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage.

4.19.20 (c)(3)(iii)(A)(2) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

4.19.21 (c)(3)(iii)(A)(3) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.

4.19.22 (c)(3)(iii)(B) Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

4.19.23 (c)(3)(iii)(B)(1) The employee is using protective equipment rated for the voltage; or

4.19.24 ..1910.333(c)(3)(iii)(B)(2)

4.19.25 (c)(3)(iii)(B)(2) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in paragraph (c)(3)(iii) of this section.

4.19.26 (c)(3)(iii)(C) If any vehicle or mechanical equipment capable of having parts of its structureelevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(Revised 10/22/2001)

ATTACHMENT 2

4.20 General Safety Guidelines - Safe Use of Scaffolds

4.20.1 (Per OSHA Standards 1910.28, 1919.29 and 1926.451)

4.20.2 Training - Employees using scaffolds shall be trained in:

1. Types of scaffolds to be used on job sites
2. Proper erection, handling, use and care of scaffolds
3. Scaffold inspections
4. Installation of fall protection devices, guardrails
5. Proper use and care of fall arrest equipment

4.20.3 NOTE: Training is to provided at time of initial employment and/or job assignment. Periodic refresher training is to be provided as needed.

4.20.4 NOTE: The competent person(s) should receive additional training in the following areas: selection of scaffolds, recognition of site conditions, recognition of scaffold hazards, protection of exposed employees and others, repair and replacement options and applicable OSHA standards.

4.20.5 Scaffold Types - 3 major categories:

1. Self-supporting scaffolds
2. Suspension scaffolds
3. Special use scaffolds

4.20.6 Self-supporing scaffolds - One or more working platforms supported from below by outriggers, brackets, poles, legs uprights, posts, frames or similar supports. Types include: fabricated frame; tube and coupler; mobile; and pole.

4.20.7 Suspension scaffolds - One or more working platforms suspended by ropes or other means from an overhead structure(s). Types include: single point; adjustable (boatswain's chairs); two point adjustable (swing chair); multiple point adjustable; multi lend; category; float (ship); interior hung; and needle beam.

4.20.8 Special use scaffolds - Capable of supporting their own weight and at least four times the maximum intended load. Types include: form and carpenter bracket; roof bracket; outrigger; pump jack; ladder jack; window jack; horse; crawling boards; and step, platforms and trestle ladder.

4.20.9 The design loads of all scaffolds is calculated on the basis of:

1. Light - Designed and constructed to carry a working load of 25 pounds per square foot
2. Medium - Designed and constructed to carry a working load of 50 pounds per square foot
3. Heavy - Designed and constructed to carry a working load of 75 pounds per square foot

4.20.10 NOTE: Scaffolds are erected to perform work that cannot be done safely from the ground or from ladders. Scaffolds are to comply with current OSHA safety regulations.

4.20.11 General Use Requirements

4.20.12 Use sound, secure and rigidly braced poles, legs, uprights or other supports as footing or anchorage for scaffolds to prevent swaying and displacement. Use footing or anchorage devices that are capable of carrying the maximum intended load without settling or displacement. Do not use objects such as barrels, boxes, loose brick or concrete blocks to support scaffolds or planks.

4.20.13 Do not erect, move, dismantle or alter scaffolds, except under the supervision of competent persons or as requested for corrective reasons by Department administrative officials or Safety & Workers' Compensation personnel.

4.20.14 Install guardrails and toeboards on all open sides and ends of platforms more than 10 feet above the ground or floor, except on needle beam scaffolds and floats. Install standard guardrails on all open sides and ends of platforms on scaffolds four to ten feet in height having a minimum horizontal dimension in either direction of less than 45 inches.

4.20.15 Guardrail measurements - 2 x 4 inches, or the equivalent, not less than 36 inches or more than approximately 42 inches high, with a midrail, when required, of 1 x 4 inch lumber, or the equivalent. Install supports at intervals not to exceed 8 feet. Extend the toeboard and the guardrail along the entire opening.

4.20.16 Scaffolds and their components (e.g. workers, materials, equipment) must be capable of supporting, without failure, at least four times the maximum intended load. Do not load scaffolds in excess of the working load for which they are intended.

4.20.17 Repair or immediately replace any scaffold, including accessories such as brackets, trusses, screw legs, ladders, couplers, etc., damaged or weakened from any cause. Do not use until repairs have been completed.

4.20.18 Construct and erect wood pole scaffolds 60 feet or less in height in accordance with OSHA requirements (NOTE: Refer to OSHA Standard 1910.28 for details). If over 60 feet in height; use a registered professional engineer to design the scaffold; construct and erect the scaffold in accordance with such design.

4.20.19 Do not erect scaffolds beyond the reach of effective firefighting apparatus.

4.20.20 Use a minimum of 1,500 fiber (Stress Grade) construction grade lumber for all load carrying timber members of scaffold framing.

4.20.21 Use Scaffold Grades, or equivalent, as recognized by approved grading rules for the species of wood used, as planking. The maximum permissible span for 2 x 9 inch or wider planks is specified in OSHA Standard 1910.28, according to the design loads of scaffolds (Refer to OSHA Standard 1910.28 for details).

4.20.22 Use 1-1/4 x 9 inch or wider planking of full thickness with a maximum permissible span of four feet in situations requiring medium duty loading of 50 p.s.f.

4.20.23 Overlap planking or platforms a minimum 12 inches or secure them from movement.

4.20.24 **General Scaffold Use Practices include**:

1. Provide an access ladder or equivalent safe access for employees on scaffolds. NOTE: OSHA Standards restrict the use of two-section portable wooden extension ladders and over two-section metal portable extension ladders to a maximum height of 60 feet.
2. Extend scaffold planks over their end supports a minimum of 6 inches-but not more than 18 inches.
3. Use overhead protection to protect employees on a scaffold exposed to overhead hazards.
4. Maintain a safe distance from energized power lines.
5. Use hard hats when working on a scaffold or near one.
6. Wear non-skid safety shoes when working on a scaffold or near one.
7. Never overload the scaffold. Keep only the tools, materials, supplies and equipment you need to use on the scaffold.
8. Always watch out below.
9. Use tag lines to hoist materials in order to prevent contact.
10. Do not work on scaffolds during high winds, storms or when they are covered with ice or snow unless all ice or snow is removed and planking is sanded to prevent employees from slipping.
11. Do not use ladders and other devices to increase the working heights on scaffold platforms.
12. Do not permit loose materials, debris, supplies, tools and equipment to accumulate and cause a hazard. Remove all equipment, tools, materials and supplies from the scaffold at the end of your shift.
13. Eliminate slippery and other hazardous conditions on scaffolds immediately after they occur.
14. Do not perform welding, burning, riveting or open flame work on any staging suspended by means of fiber or synthetic rope. Use only treated or protected fiber or synthetic ropes for or near any work involving the use of corrosive substances or chemicals.
15. Use wire synthetic of fiber rope capable of supporting at least six times the intended load as scaffold suspension.
16. Provide a screen between the toeboard and guardrail that extends along the entire opening, consisting of No. 18 gauge U.S. Standard wire 1/2 inch mesh or the equivalent on scaffolds, when personnel are required to work or pass underneath the scaffolds.
17. Use a fall arrest system with employees who work on suspended scaffolds 10 feet or higher above the ground or surface level.
18. Do not mix or force scaffold components to fit - this may reduce design strength of scaffolds.
19. Inspect scaffolds and components at the erection location. Inspect scaffolds before each work shift, after changing weather conditions and after prolonged work interruptions.
20. Pin or otherwise secure casters and wheel stems in scaffold legs. Positively lock casters and wheels that are in stationary positions.
21. Tie and securely brace tube and coupler scaffolds against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

4.21 General Safety Guidelines - Safe Use of Ladders

4.21.1 **(Per OSHA Standards 1910.25-27 and 1926.1053)**

4.21.2 Training - Employees Using Ladders shall be trained in:

1. Proper Use of Ladders
2. Type of Ladder to Use
3. Ladder Set Up Procedures

4. Ladder Inspection
5. Ladder Maintenance

4.21.3 NOTE: Training is to be provided at time of initial employment and/or job assignment. Refresher training is to be provided as needed.

4.21.4 Ladder Types - Choose the correct type of ladder and be sure it rated for the task.

1. Type IA - Extra heavy duty industrial ladder capable of supporting 300 lbs.
2. Type 1 - Hevy duty industrial ladder capable of supporting 250 lbs.
3. Type 2 - Medium duty industrial ladder capable of supporting 225 lbs.
4. Type 3 - Light duty household ladder meant to support only 200 lbs.

4.21.5 NOTE: The rated load capacity includes tools, materials and the user. Ladders are classified by material of construction (wood, metal, fiberglass), load capacity, function and design.

4.21.6 General Use Requirements

1. Short ladders are **not** permitted to be spliced together to provide long secions.
2. Painter's stepladders longer than 12 feet are **not** to be used in state facilities.
3. Portable stepladders longer than 20 feet are **not** to be used in state facilities.
4. Portable straight wooden and metal ladders (or individual sections of ladders) longer than 30 feet are **not** to be used in state facilities.
5. Portable two-section wooden extension ladders longer than 60 feet are **not** to be used in state facilities.
6. Portable two-section metal extension ladders londer than 48 feet are **not'** to be used in state facilities.
7. Portable metal extension ladders over two-sections longer than 60 feet are **not** to be used in state facilities.
8. Mason's portable wooden ladders longer than 40 feet are **not** to be used in state facilities.
9. Trestle ladders or extension sections or base sections of extension trestle ladders longer than 20 feet are **not** to be used in state facilities.
10. Trolly and slide rolling ladders longer than 20 feet are **not** to be used in state facilities.
11. Type 1 industrial ladders are recommended for use in state facilities except Type 2 may be used in office environments for painting or light duty operations.
12. Type 3 household ladders are not to be used in state facilities.

4.21.7 General Ladder Use Practices include:

1. Inspect ladder for defects prior to use. Ladders are to be maintained in good condition at all times.
2. Use only wooden or fiberglass ladders when working around power lines or other electrical sources.
3. Never use ladders during a strong wind except in an emergency and then only when they are securely fastened.
4. Do not allow more than one person on a ladder at a times.
5. Never use a defective ladder. Tag or mark it so that it will be properly repaired or destroyed. Improvised repairs are not to be made.
6. Always face the ladder when ascending or descending.
7. Hold on with both hands when ascending or descending ladders. If materials must me handled, raise or lower it with a rope.
8. Never slide down a ladder.
9. Be sure shoes are clean and not greasy, muddy or slippery when climbing.
10. Be sure that a stepladder is fully open and the metal spreader locked before starting to climb.
11. Adjust extension ladders at the base of the ladder so that proper engagement of locking devices can be made.
12. Do not climb higher than the third rung from the top on straight or extension ladders, or the second treat from the top on stepladders.
13. Carry tools on a tool belt, not in the hand(s).
14. Never lean too far to the sides. Keep your belt buckle within the side rails.
15. Never attempt to adjust a ladder when standing on the ladder.
16. Never jump from a ladder. Always dismount from the bottom rung.
17. Never leave placed ladders unattended. Remove or place ladder in an inaccessible location when leaving job site.
18. Use a 4 to 1 ratio when leaning a single or extension ladder against a wall or other object (e.g. place a 12 foot ladder so that the bottom is 3 feet away from the object the ladder is leaning against.
19. Do not use a ladder to gain access to a roof unless the top of the ladder extends at least 3 feet above the point of support, at eave, gutter or roofline.
20. Place ladders on a smooth, level surface to prevent slipping. Ladders need to be lashed, or held in position. Be sure ladder is equipped with useable non-slip safety feet or bases.
21. Do not place ladders on boxes, barrels or other unstable bases to obtain additional height.
22. Do not place ladders in front of door openings unless the door is blocked, guarded, or other provisions are made to insure there is no traffic using the door.

23. Do not use ladders in horizontal position as platforms, runways or scaffolds.
24. Ladders are not to be used as guys, braces, skids or for other than their intended purposes.

4.21. 8 Ladder Safety Devices

1. Safety devices are available for both portable and fixed ladders to prevent falling. Safety devices for portable ladders include slip resistant bases, safety tops and other devices to increase ladder stability.
2. Portable ladders positioned at locations where they can be tipped over by work activities or outside elements need to be securely fastened at the top and the bottom.
3. Safety devices for fixed ladders include cages (which enclose the stairwell) or a restraint belt attached to a sliding fixture anchored to the ladder.

4.21.9 Note: Employees may use portable ladders up to the allowed standing height of ladder without the use of fall protection (e.g. employees can use portable step ladders up to 20 feet in height, except for the top two steps without fall protection).

4.21.10 Inspection

1. Ladders should be inspected as required or based on frequency of use.
2. Weak, improperly repaired, damaged, those with missing rungs or appear unsafe should be removed from service for repair or disposal.
3. Before discarding a wooden ladder, cut it up so no one can use it again.
4. Maintain portable ladders in good condition and inspect them regularly.
5. Tag defective, ladders unsafe for use with the following words:**DANGEROUS-DO NOT USE** and remove from service for repair or disposal.
6. Inspect portable wooden ladders for sharp edges, loose components, splinters, compression failures, decay or other irregularities
7. Inspect portable metal ladders for structural defects, sharp edges, burrs or other irregularities.
8. Inspect fixed ladders to insure wooden parts meet the same criteria as other wooden ladders and that metal parts meet the same criteria as other metal ladders.

4.21.11 Maintenance

1. Portable wooden ladders may be coated with a water repellent preservative to provide a suitable protective material.
2. Metal ladders and metal parts on wooden ladders should be corrosion resistant and kept free from nicks. If nicks occur, provide prompt treatment to prevent possible metal fatigue due to rust.

5 Additional References

6 Authority

7 Contact Information

8 Original Effective Date

9 Revision Dates

Updated 11/15/2002