

# FALL PROTECTION PROGRAM (JOBSITES)

**Penn Fencing, Inc.**

647 Pittsburgh Road  
Butler, PA 16002



Prepared by:



Lancaster Safety Consulting, Inc.  
100 Bradford Road, Suite 100  
Wexford, PA 15090  
(888) 403-6026  
[www.LancasterSafety.com](http://www.LancasterSafety.com)



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# FALL PROTECTION PROGRAM

## Penn Fencing, Inc.

### 1.1 INTRODUCTION

This Fall Protection Plan has been prepared for the prevention of injuries associated with falls on Penn Fencing's jobsites. It has been designed according to components established by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1926, Subpart M, Fall Protection. A copy of this standard is provided in Attachment A of this document.

While this plan provides the generic components and parameters for fall protection, it is understood that fall protection must be project-specific, where control measures must be developed and implemented for each identified project and/or job function. In many cases, the fall protection controls are unique to that project and/or job function. A blank site-specific fall plan is located in Attachment E.

The purpose of this plan is to:

- supplement our standard safety policy by providing safety standards specifically designed to cover fall protection, and
- 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 each job.

### 1.2 RESPONSIBILITY

#### PROGRAM ADMINISTRATOR - CHAD GALBREATH

- Conduct continual observational safety checks of work operations
- Enforce safety policies and procedures
- Designate a Competent Person
- Approve changes or revisions to this plan

#### MANAGEMENT

- Provide fall protection systems for employees in work areas where injury from a fall to a lower level is a recognized hazard

#### FOREMEN

- Correct any unsafe acts or conditions immediately

#### EMPLOYEES

- Bring any unsafe/hazardous convictions or acts to management's attention in order to prevent injury to either themselves or any other employees

## **1.3 WALKING WORKING SURFACES**

### GENERAL REQUIREMENTS

Each employee on a walking/working surface which is six feet or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, safety monitoring systems, or personal fall arrest systems for the following exposures:

- Unprotected Sides and Edges
- Leading Edges
- Hoist Areas
- Ramps, Runways and Other Walkways
- Excavations
- Holes
- Roofing Work on Low Slope Roofs
- Steep Roofs
- Wall Openings
- Walking/Working Surfaces Not Otherwise Addressed

### PROTECTION FROM FALLING OBJECTS

Employees who are potentially exposed to injury from falling objects are required to wear a hard hat. One of the following measures must also be designed and installed as per OSHA's fall protection standard as determined by a Competent Person:

- Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels.
- Erect a canopy structure and keep potential fall objects far enough from edge of the higher level so that those objects would not go over the edge if they were accidentally displaced.
- Barricade the area where objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.

## **1.4 CRITERIA AND PRACTICES FOR FALL PROTECTION SYSTEMS**

All fall protection equipment and systems will meet the requirements of applicable ANSI, ASTM, or OSHA requirements. The requirements for specific fall protection systems are outlined below.

### GUARDRAIL SYSTEMS

- Top rail 42 inches above the walking/working level.
- Mid-rail (or suitable alternative) 21 inches above walking/working level.
- Ability to withstand a force of at least 200 pounds in any outward or downward direction.
- So surfaced as to prevent injury from puncture, laceration, or snagging of clothing.
- Designed so as not to constitute a projection hazard.
- Inspected at regular intervals.

## SAFETY NET SYSTEMS

- Installed as close as practicable under the walking/working surface, but in no case more than 30 feet (9.1 meters) below such level.
- Extend outward from outermost projection of the work surface.
- Installed with sufficient clearance under them to prevent contact with the surface due to impact on the net.
- Capable of absorbing an impact force equal to that produced by the drop test specified in OSHA's fall protection standard.
- Inspected at least weekly for wear, damage, and/or deterioration defective components removed.
- Mesh opening not to exceed 36 square inches (230 square centimeters) nor be longer than 6 inches (15 centimeters) on any side.

## PERSONAL FALL ARREST SYSTEMS

A personal fall arrest system is one option of protection that OSHA requires for workers on construction sites who are exposed to vertical drops of 6 feet or more.

- Connectors, D-rings, snap-hooks, lanyards, lifelines and anchorage are designed, constructed and installed according to specifications addressed in OSHA's fall protection standard.
- Limit maximum arresting force on an employee to 900 pounds when used with a body belt (as a positioning device), 1,800 pounds when used with a body harness.
- Rigged such that employees can neither free fall more than 6 feet (1.8 meters) nor contact any lower level.
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 meters); and
- Have sufficient strength to withstand twice the potential impact energy of a person who is free falling a distance of 6 feet (1.8 meters) or the free fall distance permitted by the system, whichever is less.
- The anchorage connector must be attached to a suitable and strong attachment point
- Body belts and related components may be used only for employee positioning and not for fall protection.
- Personal fall arrest systems and components subject to impact loading shall be removed from service until inspected and approved for use by the Competent Person.
- In the event of a fall, employees will be promptly rescued.
- Personal fall arrest systems and their components must be inspected prior to each use for wear, damage and/or deterioration with defective components removed.
- Never attach to a guardrail systems.
- Components of a fall arrest system must be used only for employee fall protection or positioning and not to hoist materials.

## HARNES INSPECTION

**BELTS AND RINGS:** For harness inspections begin at one end, hold the body side of the belt toward you, grasping the belt with your hands six to eight inches apart. Bend the belt in an inverted "U." Watch for frayed edges, broken fibers, pulled stitches, cuts or chemical damage. Check D-rings and D-ring metal wear pads for distortion, cracks, breaks, and rough or sharp edges. The D-ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.

Attachments of buckles and D-rings should be given special attention. Note any unusual wear, frayed or cut fibers, or distortion of the buckles. Rivets should be tight and un-removable with fingers. Body side rivet base and outside rivets should be flat against the material. Bent rivets will fail under stress.

Inspect frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface. Any broken, cut or burnt stitches will be readily seen.

**TONGUE BUCKLE:** Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Rollers should turn freely on the frame. Check for distortion or sharp edges.

**FRICTION BUCKLE:** Inspect the buckle for distortion. The outer bar or center bars must be straight. Pay special attention to corners and attachment points of the center bar.

## LANYARD INSPECTION

When inspecting lanyards, begin at one end and work to the opposite end. Slowly rotate the lanyard so that the entire circumference is checked. Spliced ends require particular attention. Hardware should be examined under procedures detailed below.

### **HARDWARE**

- *Snaps:* Inspect closely for hook and eye distortion, cracks, corrosion, or pitted surfaces. The keeper or latch should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper rocks must provide the keeper from opening when the keeper closes.
- *Thimbles:* The thimble (protective plastic sleeve) must be firmly seated in the eye of the splice, and the splice should have no loose or cut strands. The edges of the thimble should be free of sharp edges, distortion, or cracks.

### **LANYARDS**

- *Steel Lanyards:* While rotating a steel lanyard, watch for cuts, frayed areas, or unusual wear patterns on the wire. The use of steel lanyards for fall protection without a shock-absorbing device is not recommended.
- *Web Lanyard:* While bending webbing over a piece of pipe, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Due to the limited elasticity of the web lanyard, fall protection without the use of a shock absorber is not recommended.

- *Rope Lanyard*: Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period. When a rope lanyard is used for fall protection, a shock-absorbing system should be included.

#### **SHOCK-ABSORBING PACKS**

- The outer portion of the shock-absorbing pack should be examined for burn holes and tears. Stitching on areas where the pack is sewn to the D-ring, belt or lanyard should be examined for loose strands, rips and deterioration.

#### VISUAL INDICATION OF DAMAGE TO WEBBING AND ROPE LANYARDS

**HEAT** - In excessive heat, nylon becomes brittle and has a shriveled brownish appearance. Fibers will break when flexed and should not be used above 180 degrees Fahrenheit.

**CHEMICAL** - Change in color usually appears as a brownish smear or smudge. Transverse cracks appear when belt is bent over tight. This causes a loss of elasticity in the belt.

**ULTRAVIOLET RAYS** - Do not store webbing and rope lanyards in direct sunlight, because ultraviolet rays can reduce the strength of some material.

**MOLTEN METAL OR FLAME** - Webbing and rope strands may be fused together by molten metal or flame. Watch for hard, shiny spots or a hard and brittle feel. Webbing will not support combustion, nylon will.

**PAINT AND SOLVENTS** - Paint will penetrate and dry, restricting movements of fibers. Drying agents and solvents in some paints will appear as chemical damage.

#### CLEANING OF EQUIPMENT

Basic care for fall protection safety equipment will prolong and endure the life of the equipment and contribute toward the performance of its vital safety function. Proper storage and maintenance after use is as important as cleaning the equipment of dirt, corrosives or contaminants. The storage area should be clean, dry and free of exposure to fumes or corrosive elements.

**NYLON AND POLYESTER** - Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion. Then wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat.

**DRYING** - Harness, belts and other equipment should be dried thoroughly without exposure to heat, steam or long periods of sunlight.

System consists of:

- Anchorage Connector
- Shock Absorbing Lanyard
- Full Body Harness

#### **REQUIREMENTS:**

##### POSITIONING DEVICE SYSTEMS

- Rigged such that an employee cannot fall more than 2 feet (.9 meters).
- 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.
- Connectors, D-rings, and snap-hooks are designed, constructed, and installed according to specifications addressed in OSHA's fall protection standard.
- Inspected prior to each use to wear, damage and/or deterioration with defective components removed.

##### WARNING LINE SYSTEMS

- Erected around all sides of the roof work area.
- Erected not less than 6 feet (1.8 meters) from roof edge when mechanical equipment is not being used.
- Points of access, materials handling areas, storage areas and hoisting areas shall be connected to work area by an access path formed by two warning lines.
- Consist of ropes, wires or chains and supporting stanchions erected according to OSHA's fall protection standard.
- No employee allowed in area between roof edge and warning line without fall protection or dedicated safety monitor.
- Mechanical equipment on roofs used or stored only in areas where employees are protected by a warning line system, guardrail system or personal fall arrest system.

##### CONTROLLED ACCESS ZONES

- Defined by a control line or other means that restricts access and flagged at 6-foot intervals for visibility.
- Control line to have a minimum breaking strength of 200 pounds.
- All employees working in a CAZ must comply promptly with fall hazard warnings from safety monitors.

##### SAFETY MONITORING SYSTEMS

- Before using a safety monitoring system, a company official must be notified.
- A Competent Person will be designated to monitor the safety of other employees.

- The Competent Person must not have any other responsibilities that could draw attention away from the safety monitoring duties. Duties include:
  - Recognizing fall hazards
  - Warn employees working under unsafe conditions or performing unsafe acts
  - Remain on same working surface and within visual sighting distance of employees
  - Remain close enough to employees communicate orally
  - Shall not have other responsibilities that could draw attention away from safety monitoring duties

#### COVERS

- Secured when installed so as to prevent accidental displacement by wind, equipment, or employees
- Capable of supporting at least twice the maximum load to which it is exposed (i.e., vehicles, equipment, workers)
- Color-coded or marked with the work "HOLE" or "COVER" to provide warning of the hazard

### 1.5 SCAFFOLDS

An estimated 2.3 million construction workers, or 65 percent of the construction industry, work on scaffolds frequently. Protecting these workers from scaffold-related accidents would prevent 4,500 injuries and 50 deaths every year, at a savings for American employers of \$90 million in workdays not lost. OSHA requirements for scaffolds are provided in Subpart L of 29 CFR.

OSHA's general requirements for scaffolds are summarized below. This includes capacity, construction, criteria for supported scaffolds, criteria for suspension scaffolds, access, use, fall protection, and falling object protection. These standards do not apply to aerial lifts. For complete details and exact language refer to 29 CFR 1926.451. See Attachment A for a copy of these standards.

#### CAPACITY

- Except as provided in the OSHA scaffold regulations, each scaffold and scaffold component must be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.
- Direct connections to roofs and floors, and counterweights used to balance adjustable suspension scaffolds, must be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.
- Each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds must be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.
- Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds must be capable of supporting, without failure, at least 6 times the maximum intended load

applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater.

- The stall load of any scaffold hoist may not exceed 3 times its rated load.
- Scaffolds must be designed by a qualified person and be constructed and loaded in accordance with that design. Non-mandatory Appendix A of the OSHA scaffold standard (see Attachment A of this document) contains examples of criteria that will enable compliance with capacity specifications.

#### SCAFFOLD PLATFORM CONSTRUCTION

- Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports as follows:
  - Each platform unit (e.g., scaffold plank, fabricated plank, fabricated deck, or fabricated platform) shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch (2.5 cm) wide, except where the employer can demonstrate that a wider space is necessary (for example, to fit around uprights when side brackets are used to extend the width of the platform).
  - Where the employer makes the demonstration that a wider space is necessary, the platform must be planked or decked as fully as possible and the remaining open space between the platform and the uprights shall not exceed 9 1/2 inches (24.1 cm).
  - Exception - The requirement to provide full planking or decking does not apply to platforms used solely as walkways or solely by employees performing scaffold erection or dismantling. In these situations, only the planking that is necessary to provide safe working conditions is required.
- Each scaffold platform and walkway must be at least 18 inches (46 cm) wide, except noted below
  - Each ladder jack scaffold, top plate bracket scaffold, roof bracket scaffold, and pump jack scaffold must be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswains' chairs.
  - Exception - Where scaffolds must be used in areas that the employer can demonstrate are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, such platforms and walkways must be as wide as feasible, and employees on those platforms and walkways have to be protected from fall hazards by the use of guardrails and/or personal fall arrest systems.
- All platforms may not be more than 14 inches (36 cm) from the face of the work, unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used to protect employees from falling. Exceptions are noted below.
  - The maximum distance from the face for outrigger scaffolds shall be 3 inches (8 cm);
  - The maximum distance from the face for plastering and lathing operations shall be 18 inches (46 cm).
- Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, should extend over the centerline of its support at least 6 inches (15 cm).

- Each end of a platform 10 feet or less in length may not extend over its support more than 12 inches (30 cm) unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping, or has guardrails which block employee access to the cantilevered end.
- Each platform greater than 10 feet in length should not extend over its support more than 18 inches (46 cm), unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end.
- On scaffolds where scaffold planks are abutted to create a long platform, each abutted end must rest on a separate support surface. This provision does not preclude the use of common support members, such as "T" sections, to support abutting planks, or hook on platforms designed to rest on common supports.
- On scaffolds where platforms are overlapped to create a long platform, the overlap may occur only over supports and not be less than 12 inches (30 cm), unless the platforms are nailed together or otherwise restrained to prevent movement.
- At all points of a scaffold where the platform changes direction, such as turning a corner, any platform that rests on a bearer at an angle other than a right angle shall be laid first, and platforms which rest at right angles over the same bearer shall be laid second, on top of the first platform.
- Wood platforms may not be covered with opaque finishes, except that platform edges except for marking for identification. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.
- Scaffold components manufactured by different manufacturers may not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained by the user. Scaffold components manufactured by different manufacturers are not allowed to be modified in order to inter-mix them unless a competent person determines the resulting scaffold is structurally sound.
- Scaffold components made of dissimilar metals may not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component in accordance with OSHA scaffold standards (see Attachment A of this document).

#### SUPPORTED SCAFFOLDS

- Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) must be restrained from tipping by guying, tying, bracing, or equivalent means, as follows:
  - Guys, ties, and braces shall be installed at locations where horizontal members support both inner and outer legs.
  - Guys, ties, and braces shall be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet (6.1 m) or less thereafter for

scaffolds 3 feet (0.91 m) wide or less, and every 26 feet (7.9 m) or less thereafter for scaffolds greater than 3 feet (0.91 m) wide.

- The top guy, tie or brace of completed scaffolds must be placed no further than the 4:1 height from the top. Such guys, ties and braces should be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1 m) (measured from one end [not both] towards the other).
- Ties, guys, braces, or outriggers have to be used to prevent the tipping of supported scaffolds in all circumstances where an eccentric load, such as a cantilevered work platform, is applied or is transmitted to the scaffold.
- Supported scaffold poles, legs, posts, frames, and uprights must bear on base plates and mud sills or other adequate firm foundation.
- Footings are to be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
- Unstable objects may not be used to support scaffolds or platform units, nor used as working platforms.
- Front-end loaders and similar pieces of equipment may not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use.
- Fork-lifts may not be used to support scaffold platforms unless the entire platform is attached to the fork and the fork-lift is not moved horizontally while the platform is occupied.
- Supported scaffold poles, legs, posts, frames, and uprights must be plumb and braced to prevent swaying and displacement.

#### SUSPENSION SCAFFOLDS

- All suspension scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, must rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).
- Suspension scaffold outrigger beams, when used, may only be made of structural metal or equivalent strength material, and must be restrained to prevent movement.
- The inboard ends of suspension scaffold outrigger beams are to be stabilized by bolts or other direct connections to the floor or roof deck, or must have their inboard ends stabilized by counterweights.
- Masons' multi-point adjustable suspension scaffold outrigger beams may not be stabilized by counterweights.
- Before the scaffold is used, direct connections has to be evaluated by a competent person who is to confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, masons' multi-point adjustable suspension scaffold connections must be designed by an engineer experienced in such scaffold design.
- Counterweights
  - Counterweights are only to be made of non-flowable material. Sand, gravel and similar materials that can be easily dislocated may not be used as counterweights.

- Only those items specifically designed as counterweights may be used to counterweight scaffold systems. Construction materials such as, but not limited to, masonry units and rolls of roofing felt, are not be used as counterweights.
- Counterweights must be secured by mechanical means to the outrigger beams to prevent accidental displacement.
- Counterweights shall not be removed from an outrigger beam until the scaffold is disassembled.
- Outrigger beams which are not stabilized by bolts or other direct connections to the floor or roof deck must be secured by tiebacks.
- Tiebacks have to be equivalent in strength to the suspension ropes.
- Outrigger beams are to be placed perpendicular to its bearing support (usually the face of the building or structure). However, where the employer can demonstrate that it is not possible to place an outrigger beam perpendicular to the face of the building or structure because of obstructions that cannot be moved, the outrigger beam may be placed at some other angle, provided opposing angle tiebacks are used.
- Tiebacks should be secured to a structurally sound anchorage on the building or structure. Sound anchorages include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.
- Tiebacks must be installed perpendicular to the face of the building or structure, or opposing angle tiebacks shall be installed. Single tiebacks installed at an angle are prohibited.
- Suspension scaffold outrigger beams must be equipped with and conform to the following.
  - Stop bolts or shackles at both ends
  - Securely fastened together with the flanges turned out when channel iron beams are used in place of I-beams
  - Installed with all bearing supports perpendicular to the beam center line
  - Set and maintained with the web in a vertical position; and
  - When an outrigger beam is used, the shackle or clevis with which the rope is attached to the outrigger beam shall be placed directly over the center line of the stirrup.
- Suspension scaffold support devices such as cornice hooks, roof hooks, roof irons, parapet clamps, or similar devices shall be the following.
  - Made of steel, wrought iron, or materials of equivalent strength
  - Supported by bearing blocks; and
  - Secured against movement by tiebacks installed at right angles to the face of the building or structure, or opposing angle tiebacks shall be installed and secured to a structurally sound point of anchorage on the building or structure. Sound points of anchorage include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.
- Tiebacks should be equivalent in strength to the hoisting rope.
- When winding drum hoists are used on a suspension scaffold, they have to contain not less than four wraps of the suspension rope at the lowest point of scaffold travel. When other types of

hoists are used, the suspension ropes are to be long enough to allow the scaffold to be lowered to the level below without the rope end passing through the hoist, or the rope end configured or provided with means to prevent the end from passing through the hoist.

- The use of repaired wire rope as suspension rope is prohibited.
- Wire suspension ropes may not be joined together except through the use of eye splice thimbles connected with shackles or cover plates and bolts.
- The load end of wire suspension ropes must be equipped with proper size thimbles and secured by eye splicing or equivalent means.
- Ropes are to be inspected for defects by a competent person prior to each shift and after every occurrence which could affect a rope's integrity.
- Replacement of Ropes - Ropes must be replaced if any of the following conditions exist:
  - Any physical damage which impairs the function and strength of the rope.
  - Kinks that might impair the tracking or wrapping of rope around the drum(s) or sheave(s).
  - Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay.
  - Abrasion, corrosion, scrubbing, flattening or peening causing loss of more than one-third of the original diameter of the outside wires.
  - Heat damage caused by a torch or any damage caused by contact with electrical wires.
  - Evidence that the secondary brake has been activated during an over-speed condition and has engaged the suspension rope.
- Swaged attachments or spliced eyes on wire suspension ropes may not be used unless they are made by the wire rope manufacturer or a qualified person.
- The following applies to wire rope clips are used on suspension scaffolds:
  - There shall be a minimum of 3 wire rope clips installed, with the clips a minimum of 6 rope diameters apart
  - Clips are to be installed according to the manufacturer's recommendations
  - Clips must be retightened to the manufacturer's recommendations after the initial loading
    - Clips are required to be inspected and retightened to the manufacturer's recommendations at the start of each shift thereafter
    - U-bolt clips shall not be used at the point of suspension for any scaffold hoist
    - When U-bolt clips are used, the U-bolt shall be placed over the dead end of the rope, and the saddle shall be placed over the live end of the rope
- Suspension scaffold power-operated hoists and manual hoists must be tested by a qualified testing laboratory.
- Gasoline-powered equipment and hoists may not be used on suspension scaffolds.
- Gears and brakes of power-operated hoists used on suspension scaffolds must be enclosed.
- In addition to the normal operating brake, suspension scaffold power-operated hoists and manually operated hoists have to have a braking device or locking pawl which engages automatically when a hoist makes an instantaneous change in momentum or an accelerated over-speed.

- Manually operated hoists must have a positive crank force to descend.
- Two-point and multi-point suspension scaffolds must be tied or otherwise secured to prevent them from swaying, as determined to be necessary based on an evaluation by a competent person. Window cleaners' anchors may not be used for this purpose.
- Devices whose sole function is to provide emergency escape and rescue shall not be used as working platforms. This provision does not preclude the use of systems which are designed to function both as suspension scaffolds and emergency systems.

## ACCESS

- When scaffold platforms are more than 2 feet (0.6 m) above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers (scaffold stairways/towers), stairway-type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold, structure, personnel hoist, or similar surface have to be used.
- Cross braces may not be used as a means of access.
- Portable, hook-on, and attachable ladders must meet the following criteria.
  - They must be positioned so as not to tip the scaffold and should be positioned so that their bottom rung is not more than 24 inches (61 cm) above the scaffold supporting level;
  - When hook-on and attachable ladders are used on a supported scaffold more than 35 feet (10.7 m) high, they have to have rest platforms at 35-foot (10.7 m) maximum vertical intervals.
  - Hook-on and attachable ladders must be specifically designed for use with the type of scaffold used; have a minimum rung length of 11 1/2 inches (29 cm); and have uniformly spaced rungs with a maximum spacing between rungs of 16 3/4 inches.
- Stairway-type ladders must be positioned such that their bottom step is not more than 24 inches (61 cm) above the scaffold supporting level provided with rest platforms at 12 foot (3.7 m) maximum vertical intervals; have a minimum step width of 16 inches (41 cm), except that mobile scaffold stairway-type ladders have to have a minimum step width of 11 1/2 inches (30 cm); and have slip-resistant treads on all steps and landings.
- Stair towers (scaffold stairway/towers) are to be positioned such that their bottom step is not more than 24 inches (61 cm.) above the scaffold supporting level.
- A railing consisting of a top rail and a mid-rail must be provided on each side of each scaffold stairway.
- The top rail of each stair rail system must also be capable of serving as a handrail, unless a separate handrail is provided.
- Handrails, and top rails that serve as handrails, should provide an adequate handhold for employees grasping them to avoid falling.
- Stair rail systems and handrails are to be surfaced to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing and the ends constructed so that they do not constitute a projection hazard.
- Handrails, and top rails that are used as handrails, must be at least 3 inches (7.6 cm) from other objects.

- Stair rails may be not less than 28 inches (71 cm), nor more than 37 inches (94 cm) from the upper surface of the stair rail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- A landing platform at least 18 inches (45.7 cm) wide by at least 18 inches (45.7 cm) long must be provided at each level.
- Each scaffold stairway has to be at least 18 inches (45.7 cm) wide between stair rails.
- Treads and landings are to have slip-resistant surfaces.
- Stairways must be installed between 40 degrees and 60 degrees from the horizontal.
- Guardrails meeting the requirements of paragraph (g)(4) of this section shall be provided on the open sides and ends of each landing.
- Riser height should be uniform, within 1/4 inch, (0.6 cm) for each flight of stairs. Greater variations in riser height are allowed for the top and bottom steps of the entire system, not for each flight of stairs.
- Tread depth must be uniform, within 1/4 inch, for each flight of stairs.
- Ramps and walkways.
  - Ramps and walkways 6 feet (1.8 m) or more above lower levels must have guardrail systems which comply with the OSHA Fall Protection standards
  - No ramp or walkway is allowed to be inclined more than a slope of one (1) vertical to three (3) horizontal (20 degrees above the horizontal).
  - If the slope of a ramp or a walkway is steeper than one (1) vertical in eight (8) horizontal, the ramp or walkway shall have cleats not more than fourteen (14) inches (35 cm) apart which are securely fastened to the planks to provide footing.
- Integral prefabricated scaffold access frames must:
  - Be specifically designed and constructed for use as ladder rungs
  - Have a rung length of at least 8 inches (20 cm)
  - Not be used as work platforms when rungs are less than 11 1/2 inches in length, unless each affected employee uses fall protection, or a positioning device, which complies with 1926.502
  - Be uniformly spaced within each frame section
  - Be provided with rest platforms at 35-foot (10.7 m) maximum vertical intervals on all supported scaffolds more than 35 feet (10.7 m) high
  - Have a maximum spacing between rungs of 16 3/4 inches (43 cm). Non-uniform rung spacing caused by joining end frames together is allowed, provided the resulting spacing does not exceed 16 3/4 inches (43 cm)
- Steps and rungs of ladder and stairway type access have to line up vertically with each other between rest platforms.
- Direct access to or from another surface may be used only when the scaffold is not more than 14 inches (36 cm) horizontally and not more than 24 inches (61 cm) vertically from the other surface.
- Access for employees erecting or dismantling supported scaffolds should be in accordance with the following:

## USE

- Scaffolds and scaffold components may not be loaded in excess of their maximum intended loads or rated capacities, whichever is less
- The use of shore or lean-to scaffolds is prohibited.
- Scaffolds and scaffold components must be inspected for visible defects by a competent person before each work shift and after any occurrence which could affect a scaffold's structural integrity.
- Any part of a scaffold damaged or weakened such that its strength is less than that required by paragraph (a) of this section has to be immediately repaired or replaced, braced to meet those provisions, or tagged and removed from service until repaired.
- Scaffolds may not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement or, for mobile scaffolds, where the provisions of applicable OSHA standards are followed.
- The clearance between scaffolds and power lines must be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than as detailed in the table below.

*Insulated Lines		
Voltage	Minimum distance	Alternatives
0-300 volts	3 feet (0.9 m)	
300 volts to 50 kV.	10 feet (3.1 m)	
More than 50 kV	10 feet (3.1 m) plus 0.4 inches (1.0 cm) for each 1 kV over 50 kV	Two times the length of the line insulator, but never less than 10 feet.
*Un-insulated Lines		
Voltage	Minimum distance	Alternatives
0-50 kV	10 feet (3.1 m)	
More than 50 kV	10 feet (3.1 m) plus 0.4 inches (1.0 cm) for each 1 kV over 50 kV	Two times the length of the line insulator, but never less than 10 feet.

- **Exception:** Scaffolds and materials may be closer to power lines than specified above where such clearance is necessary for performance of work only after the utility company, or electrical system operator, has been notified of the need to work closer and the utility company, or electrical system operator, has de-energized the lines, relocated the lines, or installed protective coverings to prevent accidental contact with the lines.
  - Scaffolds must be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.
  - Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.

- Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads are to be used.
- Suspension ropes supporting adjustable suspension scaffolds is to be of a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.
- Suspension ropes shall be shielded from heat-producing processes. When acids or other corrosive substances are used on a scaffold, the ropes shall be shielded, treated to protect against the corrosive substances, or must be of a material that will not be damaged by the substance being used.
- Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.
- Debris shall not be allowed to accumulate on platforms.
- Makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height of employees.
- Ladders shall not be used on scaffolds to increase the working level height of employees, except on large area scaffolds where employers have satisfied the following criteria:
  - When the ladder is placed against a structure which is not a part of the scaffold, the scaffold shall be secured against the sideways thrust exerted by the ladder;
  - The platform units shall be secured to the scaffold to prevent their movement;
  - The ladder legs shall be on the same platform or other means shall be provided to stabilize the ladder against unequal platform deflection, and
  - The ladder legs shall be secured to prevent them from slipping or being pushed off the platform.
- Platforms are not allowed to deflect more than 1/60 of the span when loaded.
- To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions are to be taken, as applicable:
  - Use an insulated thimble to attach each suspension wire rope to its hanging support (such as cornice hook or outrigger). Excess suspension wire rope and any additional independent lines from grounding must be insulated;
  - Cover the suspension wire rope with insulating material extending at least 4 feet (1.2 m) above the hoist. If there is a tail line below the hoist, insulate it to prevent contact with the platform. The portion of the tail line that hangs free below the scaffold must be guided or retained, or both, so that it does not become grounded;
  - Cover all hoists with insulated protective covers;
  - In addition to a work lead attachment required by the welding process, a grounding conductor has to be connected from the scaffold to the structure. The

size of this conductor must be at least the size of the welding process work lead, and may not be in series with the welding process or the work piece;

- If the scaffold grounding lead is disconnected at any time, the welding machine must be shut off
- An active welding rod or un-insulated welding lead may not be in contact the scaffold or its suspension system.

## FALL PROTECTION

Each employee on a scaffold more than 10 feet (3.1 m) above a lower level must be protected from falling to that lower level. The paragraphs below provide details on the types of fall protection that OSHA requires for each type of scaffold. Paragraph (g)(2) of this section addresses fall protection for scaffold erectors and dismantlers.

Note: The fall protection requirements for employees installing suspension scaffold support systems on floors, roofs, and other elevated surfaces are set forth in subpart M of the OSHA standards.

- Types of fall protection to be provided to the employees for each type of scaffold
  - Boatswains' chair, catenary scaffold, float scaffold, needle beam scaffold, or ladder jack scaffold - personal fall arrest system
  - Single-point or two-point adjustable suspension scaffold – (1) personal fall arrest system and (2) guardrail system
  - Crawling board (chicken ladder) – (1) personal fall arrest system, (2) guardrail system (with minimum 200 pound top rail capacity), or (3) three-fourth inch (1.9 cm) diameter grab-line or equivalent handhold securely fastened beside each crawling board
  - Self-contained adjustable scaffold – (1) guardrail system (with minimum 200 pound top rail capacity) when the platform is supported by the frame structure, and (2) by both a personal fall arrest system and (3) a guardrail system (with minimum 200 pound top rail capacity) when the platform is supported by ropes
  - Walkway located within a scaffold (1) guardrail system (with minimum 200 pound top rail capacity) installed within 9 1/2 inches (24.1 cm) of and (2) along at least one side of the walkway
  - Overhand bricklaying operations from a supported scaffold - protection from falling from all open sides and ends of the scaffold (except at the side next to the wall being laid) by the use of a personal fall arrest system or guardrail system (with minimum 200 pound top rail capacity)
  - For all scaffolds not otherwise specified above – (1) personal fall arrest systems or (2) guardrail systems meeting the requirements of the OSHA scaffold standards.
- A competent person must determine the feasibility and safety of providing fall protection for employees erecting or dismantling supported scaffolds. Employers are required to provide fall protection for employees erecting or dismantling supported scaffolds where the installation and use of such protection is feasible and does not create a greater hazard.

- Personal fall arrest systems used on scaffolds must be attached by lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member.
- Vertical Lifelines –
  - Vertical lifelines may not be used when overhead components, such as overhead protection or additional platform levels, are part of a single-point or two-point adjustable suspension scaffold.
  - When vertical lifelines are used, they should be fastened to a fixed safe point of anchorage, independent of the scaffold, and protected from sharp edges and abrasion. Safe points of anchorage include structural members of buildings, but do not include standpipes, vents, other piping systems, electrical conduit, outrigger beams, or counterweights.
- Horizontal Lifelines – When horizontal lifelines are used, they must be secured to two or more structural members of the scaffold, or they may be looped around both suspension and independent suspension lines (on scaffolds so equipped) above the hoist and brake attached to the end of the scaffold.
  - They may not be attached only to the suspension ropes.
- Independent Support Lines – When lanyards are connected to horizontal lifelines or structural members on a single-point or two-point adjustable suspension scaffold, the scaffold must be equipped with additional independent support lines and automatic locking devices capable of stopping the fall of the scaffold in the event one or both of the suspension ropes fail. The independent support lines shall be equal in number and strength to the suspension ropes.
- Vertical lifelines, independent support lines, and suspension ropes may not be attached to each other, nor attached to or use the same point of anchorage, nor attached to the same point on the scaffold or personal fall arrest system.
- Guardrail Systems - Guardrail systems built in accordance with Appendix A of the OSHA Scaffold Standard (see Attachment A of this program document) are be deemed to meet the requirements of paragraphs (g)(4)(vii), (viii), and (ix) of the standards):
  - Guardrail systems are to be installed along all open sides and ends of platforms.
  - Guardrail systems shall be installed before the scaffold is released for use by employees other than erection/dismantling crews.
  - The top edge height of top-rails or equivalent member on supported scaffolds must be installed between 38 inches (0.97 m) and 45 inches (1.2 m) above the platform surface.
  - The top edge height on older (pre-2001) supported scaffolds and on all suspended scaffolds where both a guardrail and a personal fall arrest system are required shall be between 36 inches (0.9 m) and 45 inches (1.2 m). When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of paragraph (g)(4).
  - When mid-rails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members are used, they shall be installed between the top edge of the guardrail system and the scaffold platform.

- When mid-rails are used, they shall be installed at a height approximately midway between the top edge of the guardrail system and the platform surface.
- When screens and mesh are used, they shall extend from the top edge of the guardrail system to the scaffold platform, and along the entire opening between the supports.
- When intermediate members (such as balusters or additional rails) are used, they shall not be more than 19 inches (48 cm) apart.
- Each top rail or equivalent member of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along its top edge of at least 100 pounds (445 n) for guardrail systems installed on single-point adjustable suspension scaffolds or two-point adjustable suspension scaffolds, and at least 200 pounds (890 n) for guardrail systems installed on all other scaffolds.
- When the loads specified in paragraph (g)(4)(vii) of this section are applied in a downward direction, the top edge shall not drop below the height above the platform surface that is prescribed in paragraph (g)(4)(ii) of this section.
- Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along the midrail or other member of at least 75 pounds (333 n) for guardrail systems with a minimum 100 pound top rail capacity, and at least 150 pounds (666 n) for guardrail systems with a minimum 200 pound top rail capacity.
- Suspension scaffold hoists and non-walk-through stirrups may be used as end guardrails, if the space between the hoist or stirrup and the side guardrail or structure does not allow passage of an employee to the end of the scaffold.
- Guardrails shall be surfaced to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
- The ends of all rails shall not overhang the terminal posts except when such overhang does not constitute a projection hazard to employees.
- Steel or plastic banding shall not be used as a top rail or midrail.
- Manila or plastic (or other synthetic) rope being used for top rails or midrails shall be inspected by a competent person as frequently as necessary to ensure that it continues to meet the strength requirements of paragraph (g) of this section.
- Crossbracing is acceptable in place of a midrail when the crossing point of two braces is between 20 inches (0.5 m) and 30 inches (0.8 m) above the work platform or as a top rail when the crossing point of two braces is between 38 inches (0.97 m) and 48 inches (1.3 m) above the work platform. The end points at each upright shall be no more than 48 inches (1.3 m) apart.

#### FALLING OBJECT PROTECTION

- In addition to wearing hardhats, each employee on a scaffold must be provided with additional protection from falling hand tools, debris, and other small objects through the installation of

toeboards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect the falling objects.

- When the falling objects are too large, heavy or massive to be contained or deflected by any of the above-listed measures, such potential falling objects must be placed away from the edge of the surface from which they could fall. Those materials must be secured as necessary to prevent their falling.
- Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, the following provisions apply:
  - The area below the scaffold to which objects can fall must be barricaded, and employees may not be permitted to enter the hazard area; or
  - A toeboard is to be erected along the edge of platforms more than 10 feet (3.1 m) above lower levels for a distance sufficient to protect employees below (Exception: float (ship) scaffolds where an edging of 3/4 x 1 1/2 inch (2 x 4 cm) wood or equivalent may be used in lieu of toeboards)
  - Where tools, materials, or equipment are piled to a height higher than the top edge of the toeboard: (1) paneling or screening extending from the toeboard or platform to the top of the guardrail should be erected for a distance sufficient to protect employees below; or (2) a guardrail system must be installed with openings small enough to prevent passage of potential falling objects; or (3) a canopy structure, debris net, or catch platform strong enough to withstand the impact forces of the potential falling objects shall be erected over the employees below.
- Canopies, when used for falling object protection, must meet the following criteria:
  - When canopies are used on suspension scaffolds for falling object protection, the scaffold is to be equipped with additional independent support lines equal in number to the number of points supported, and equivalent in strength to the strength of the suspension ropes.
  - Independent support lines and suspension ropes may not be attached to the same points of anchorage.
  - Canopies must be installed between the falling object hazard and the employees.
- Where used, toeboards shall be:
  - Capable of withstanding, without failure, a force of at least 50 pounds (222 n) applied in any downward or horizontal direction at any point along the toeboard (toeboards built in accordance with Appendix A of the OSHA scaffold standards will be deemed to meet this requirement); and
  - At least three and one-half inches (9 cm) high from the top edge of the toeboard to the level of the walking/working surface. Toeboards shall be securely fastened in place at the outermost edge of the platform and have not more than 1/4 inch (0.7 cm) clearance above the walking/working surface. Toeboards shall be solid or with openings not over one inch (2.5 cm) in the greatest dimension.
- When scaffold platforms are more than 2 feet (0.6 m) above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers (scaffold stairways/towers), stairway-

type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold, structure, personnel hoist, or similar surface have to be used.

## REQUIREMENTS FOR SPECIFIC SCAFFOLDS

In addition to the specifications detailed above, OSHA has specific requirements for certain specific types of scaffolds. Refer to Section 1926.452 of the OSHA Scaffold Standard (in Attachment A of this document) for these requirements. Listed below are the scaffold types with specific requirements under the OSHA scaffold standard.

- Pole Scaffolds
- Plasterers', Decorators', and Large Area Scaffolds
- Roof Bracket Scaffolds
- Ladder Jack Scaffolds
- Step, Platform, & Trestle Ladder Scaffolds
- Multi-Point Adjustable Suspension Scaffolds, Stonesetters' Multi-Point Adjustable Suspension Scaffolds, & Masons' Multi-Point Adjustable Suspension Scaffolds
- Mobile Scaffolds
- Tube & Coupler Scaffolds
- Bricklayers' Square Scaffolds (squares)
- Outrigger Scaffolds
- Window Jack Scaffolds
- Single-Point Adjustable
- Suspension Scaffolds
- Catenary Scaffolds
- Stilts
- Multi-Level Suspended Scaffolds
- Needle Beam Scaffolds
- Repair Bracket Scaffolds
- Fabricated Frame Scaffolds (tubular welded frame scaffolds)
- Horse Scaffolds, Form Scaffolds & Carpenters' Bracket Scaffolds
- Pump Jack Scaffolds
- Crawling Boards (Chicken Ladders)
- Two-Point Adjustable Suspension Scaffolds (Swing Stages)
- Float (Ship) Scaffolds
- Interior Hung Scaffolds

## 1.6 AERIAL LIFTS

Aerial lifts include the following types or combination of any such vehicle-mounted aerial devices used to elevate personnel to job-sites above ground: Vertical towers, Aerial ladders, Articulating boom platforms, and Extensible boom platforms. Aerial equipment is deemed to be an aerial lift whether or not it is capable of rotating about a substantially vertical axis.

**DESIGN & CONSTRUCTION** - Unless otherwise provided in this section, aerial lifts must be designed and constructed in conformance with the applicable requirements of the American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix. Older aerial lifts (pre- January 22, 1973) which do not meet the requirements of ANSI A92.2-1969, may not be used unless they have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969.

Aerial equipment may be made of metal, wood, fiberglass reinforced plastic (FRP), or other material; may be powered or manually operated.

**MODIFICATION** - Aerial lifts may be "field modified" for uses other than those intended by the manufacturer provided the modification has been certified in writing by the manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, to be in conformity with all applicable provisions

of ANSI A92.2-1969 and the OSHA standards and to be at least as safe as the equipment was before modification.

**LADDER TRUCKS AND TOWER TRUCKS** - Aerial ladders must be secured in the lower traveling position by the locking device on top of the truck cab, and the manually operated device at the base of the ladder before the truck is moved for highway travel.

Aerial lift equipment will have a working backup alarm or use a spotter when backing.

**EXTENSIBLE AND ARTICULATING BOOM PLATFORMS** - The following rules apply when operating extensible and articulating boom platforms

- Independent support lines and suspension ropes may not be attached to the same points of anchorage.
- Lift controls are to be tested each day prior to use to determine that such controls are in safe working condition.
- Only authorized persons are allowed to operate an aerial lift.
- Belting off to an adjacent pole, structure, or equipment while working from an aerial lift is not be permitted.
- Employees should always stand firmly on the floor of the basket, and may not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.
- Appropriate fall protection equipment must be worn and a lanyard attached to the boom or basket when working from an aerial lift. (Note: Subpart M of the OSHA standards (1926.502(d)) provides that body belts are not acceptable as part of a personal fall arrest system. The use of a body belt in a tethering system or in a restraint system is acceptable and is regulated under 1926.502(e).
- Boom and basket load limits specified by the manufacturer may not be exceeded.
- The brakes must be set and when outriggers are used, they have to be positioned on pads or a solid surface. Wheel chocks must be installed before using an aerial lift on an incline, provided they can be safely installed.
- An aerial lift truck may not be moved when the boom is elevated in a working position with men in the basket (except for equipment which is specifically designed for this type of operation & in accordance with OSHA standards).
- Articulating boom and extensible boom platforms, primarily designed as personnel carriers, must have both platform (upper) and lower controls. Upper controls have to be in or beside the platform within easy reach of the operator. Lower controls should provide for overriding the upper controls. Controls must be plainly marked as to their function. Lower level controls may not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
- Climbers may not be worn while performing work from an aerial lift.
- The insulated portion of an aerial lift is not to be altered in any manner that might reduce its insulating value.

- Before moving an aerial lift for travel, the boom(s) must be inspected to see that it is properly cradled and outriggers are in stowed position (except as provided in the OSHA scaffold standard).
- Electrical Tests - All electrical tests must conform to the requirements of ANSI A92.2-1969 section 5. (Equivalent d.c.; voltage tests may be used in lieu of the a.c. voltage specified in A92.2-1969; d.c. voltage tests which are approved by the equipment manufacturer or equivalent entity are considered an equivalent test to meet OSHA requirements).
- For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet
- Bursting Safety Factor for Hydraulic & Pneumatic Components - The provisions of the American National Standards Institute standard ANSI A92.2-1969, section 4.9 Bursting Safety Factor applies to all critical hydraulic and pneumatic components. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All non-critical components must have a bursting safety factor of at least 2 to 1.
- Welding Standards. All welding must conform to the following standards as applicable:
  - Standard Qualification Procedure, AWS B3.0-41.
  - Recommended Practices for Automotive Welding Design, AWS D8.4-61.
  - Standard Qualification of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-69.
  - Specifications for Welding Highway and Railway Bridges, AWS D2.0-69.

## 1.7 LADDERS

OSHA's requirements for ladders used in the construction industry are covered under 29 CFR 1926, Subpart X. All ladders used by Penn Fencing must meet OSHA/ANSI specifications. These sections prescribe rules and provide requirements for the construction, care, and use of the common types of these types of ladders. See Attachment A for a copy of these standards. The following paragraphs summarize the major points concerning ladder safety.

### LADDER SET UP

The following precautions should be followed to minimize or prevent ladder incidents.

- Ladders shall be used only for the purpose for which they were designed.
- Place ladder on a clean slip free level surface.
- Secure ladders to prevent accidental movement due to workplace activity.
- Extend the ladder 3-4 feet above the top support, if used to access roof or other elevated surface (Anchor or secure the top of the ladder when the 3-4 foot extension is not possible).
- Quarter Safety Rule – When using an extension ladder, place the ladder base  $\frac{1}{4}$  the height of the ladder from the wall.
- Consider surroundings such as piping, traffic, electric lines, etc.
- Do not block closed doors that might interfere with the ladder.
- Do not set up when others are working under a ladder in use.
- Never tie ladders together to make longer sections, unless designed for such use.

- Spreaders for stepladders should be fully opened and locked in place.

#### SAFE CLIMBING PROCEDURES

- If you have a fear of heights – don't climb a ladder.
- Wear shoes or boots with heels to prevent slippage through the rungs.
- Never allow more than one person on a ladder at a time.
- Climb and descend ladders cautiously. Don't carry anything in the hands when climbing a ladder.
- Face ladder and hold on with both hands and maintain 3 points of contact at all times.
- Carry tools on belt or raise and lower with hand line.
- Use heeled shoes/boots.
- Never reach too far to either side. Do not lean to the side further than your belt buckle
- Never use second step from the top on a step ladder or the third step from the top for a straight/extension ladder.
- Never attempt to move, shift, or extend ladder while in use.

#### LADDER HAZARDS

- Ladders with missing or broken parts.
- Using a ladder with too low a weight rating.
- Using a ladder that is too short for purpose.
- Using metal ladders near energized electrical equipment.
- Objects falling from ladders.

#### LADDER INSPECTIONS

Ladders should be inspected before each use for the following.

- Inspect for items such as: broken side rails, missing steps, corroded components, or defective components.
- Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.
- Ensure that the ladder is not loaded beyond its maximum intended load for which it was built, nor beyond the manufacturer's rated capacity
- Ensure that rungs and steps are free of oil, grease, dirt, etc.
- Confirm that fittings are tight.
- Make sure that spreaders or other locking devices are in place.
- Non-skid safety feet are not damaged.
- Look for structural defects; all support braces should be intact.
- If a ladder is found to be unsafe, inform the foreman. If the unsafe condition is found to be valid, the ladder must be tagged out of service.

## LADDER STORAGE

Ladders should be inspected before each use for the following.

- Store ladders in areas where they cannot be damaged.
- Store to prevent warping or sagging.
- Do not hang anything on ladders that are in storage.

## 1.8 TRAINING

Each employee who may be exposed to fall hazards will be trained. This plan enables each employee to recognize fall hazards; each employee will be trained in the procedures to be followed in order to minimize these hazards.

### TRAINING CURRICULUM

Each employee will be trained, as necessary, by a competent person covering the following curriculum:

- The nature of fall hazards in the work area
- The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.
- The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones and other protection to be used
- The role of each employee in the safety monitoring system when this system is used.
- The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs
- The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
- The role of employees in Penn Fencing's fall protection plan
- The standards contained in OSHA's Fall Protection standard.

### CERTIFICATION OF TRAINING

Management verifies compliance with the training requirements of this plan via training documentation. Management shall maintain a record of the latest training certification for each employee, and that record shall contain:

- The name, and identification number of person being trained
- Signature of person being trained
- The date(s) of the training
- Signature of person conducting training

## RETRAINING

Documented refresher training shall be provided at least annually. In addition to annual refresher training, documented retraining shall be provided and documented under the following circumstances:

- Changes to the workplace that renders the initial training (or previous refresher training or retraining) obsolete
- Changes in the types of fall protection systems or equipment to be used that renders the previous training obsolete
- Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill

## INTERIM TRAINING

Where warranted, the Competent Person will provide interim training in the form of short "toolbox" meetings with the employees in the work area. Topics for these training meetings are determined by the type and scope of job itself, and the need for safety information identified by the employees or perceived by the Competent Person.

All interim training meetings are to be documented using the minutes of the safety meeting. Attachment D provides a document to keep record of such meetings.

## **1.9 ENFORCEMENT**

Constant awareness of and respect for fall hazards, and compliance with this plan (and all company safety rules) are considered conditions of employment. Management reserves the right to issue disciplinary warnings to employees, up to and including, termination, for failure to follow the guidelines of this plan.

## **1.10 ACCIDENT INVESTIGATION REPORTING AND ANALYSIS**

All fall-related incidents shall be documented using the Accident Investigation Report (Attachment C). Each incident will be subsequently investigated using this form. Management shall review each form and provide feedback regarding necessary corrective action. All incidents falling under the parameters of this plan are analyzed at least annually to determine trends and recurring problems and the need for further control measures.

## **1.11 FALL PROTECTION PLAN AUDIT**

Penn Fencing's fall protection plan shall undergo an annual management audit to evaluate the plan's effectiveness and the need for revision and upgrade.

Management shall use the Fall Protection Plan Audit (Attachment B) to evaluate the input of the Competent Person and other representatives of supervision, along with feedback from the employees. This information will be used to gauge the effectiveness of the plan and incorporate the necessary improvements.

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**ATTACHMENT A:      OSHA FALL PROTECTION  
STANDARD**

- 29 CFR 1926 Subpart M
- 29 CFR 1926 Subpart L – Scaffolding
- 29 CFR 1926 Subpart X – Ladders

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ATTACHMENT B: FALL PROTECTION SAFETY  
INSPECTION FORM, FALL  
PROTECTION SAFETY AUDIT  
CHECKLIST, & FALL ARREST  
HARNES INSPECTION FORM

## Fall Protection Safety Inspection Report

**Note: Explain under "Comments" and/or submit recommendations for all items in the "Needs Action" column. Document completion of recommendations and/or "Needs Action" items in "Follow Up" column.**

Department/Location: \_\_\_\_\_

Equipment: \_\_\_\_\_ ID No.: \_\_\_\_\_

	<u>Satisfactory</u>	<u>Needs Action</u>	<u>Follow Up</u>
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____

Comments/Recommendations:

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Inspected By: \_\_\_\_\_

Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Date: \_\_\_\_\_

## Fall Protection Safety Audit Checklist

Location: \_\_\_\_\_

Instructions: Support each "unsatisfactory" component with appropriate plan for corrective action in "Comments" section.

<b>PROGRAM COMPONENTS</b>	Satisfactory	Unsatisfactory
Statement of Company Policy	_____	_____
<b>Fall Protection Systems</b>		
Management Responsibility	_____	_____
Walking/Working Surfaces	_____	_____
Protection from Falling Objects	_____	_____
Criteria and Practices	_____	_____
Guardrail System	_____	_____
Safety Net Systems	_____	_____
Personal Fall Arrest Systems	_____	_____
Positioning Device Systems	_____	_____
Warning Line Systems	_____	_____
Controlled Access Zones	_____	_____
Safety Monitoring Systems	_____	_____
Covers	_____	_____
Training Requirements	_____	_____
Training Curriculum	_____	_____
Certification of Training	_____	_____
Retraining	_____	_____
Interim Training	_____	_____
Program Enforcement	_____	_____
Accident Investigation, Reporting and Analysis	_____	_____
Fall Protection Plan Audit	_____	_____

COMMENTS/CORRECTIVE ACTION:

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Audited By: (Print) \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# Fall Arrest Harness Inspection Report

Department/Location: \_\_\_\_\_

Equipment: \_\_\_\_\_ ID No.: \_\_\_\_\_

<u>Item</u>	<u>Satisfactory</u>	<u>Needs Action</u>	<u>Follow Up</u>
1. Harness Inspection (Belts and Rings)			
2. Harness Inspection (Buckles and 3. D-Ring)			
4. Harness Inspection (Tongue Buckle)			
5. Harness Inspection (Friction Buckle)			
6. Lanyard Inspection (Snaps)			
7. Lanyard Inspection (Thimbles)			
8. Steel Lanyard			
9. Web Lanyard			
10. Rope Lanyard			
11. Shock Absorbing Packs			

Please provide additional comments/recommendations below for all items noted in the "Needs Action" column. Document completion of recommendations and/or "Needs Action" items in "Follow Up" column.

Comments/Recommendations: \_\_\_\_\_

Inspected By: \_\_\_\_\_

Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Date: \_\_\_\_\_

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ATTACHMENT C: FALL PROTECTION ACCIDENT  
INVESTIGATION REPORT

**Fall Protection Accident Investigation Report**

Location: \_\_\_\_\_

Injured: \_\_\_\_\_ Age: \_\_\_\_\_

Department: \_\_\_\_\_

Date of Accident: \_\_\_\_\_ Time: \_\_\_\_\_ AM/PM

Nature of Injury/Illness/Property Damage: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Medical treatment By: \_\_\_\_\_

Location of Treatment: \_\_\_\_\_

Description of Accident: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contributing Factors: \_\_\_\_\_  
\_\_\_\_\_

Loss Severity Potential: High/Major: \_\_\_\_\_ Med./Serious \_\_\_\_\_ Low/Minor: \_\_\_\_\_

Probable Reoccurrence Rate: Frequent: \_\_\_\_\_ Occasional \_\_\_\_\_ Rare: \_\_\_\_\_

Actions Taken to Prevent Reoccurrence: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Foreman (Print): \_\_\_\_\_

Signature: \_\_\_\_\_ • Date: \_\_\_\_\_

Investigated By: \_\_\_\_\_ • Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_ • Date: \_\_\_\_\_

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ATTACHMENT D: FALL PROTECTION SAFETY  
MEETING REPORT



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ATTACHMENT E:      SITE SPECIFIC FALL PROTECTION  
PLAN

# Penn Fencing, Inc.

## Site-Specific Fall Protection Plan

This Fall Protection Plan has been created specifically for the following project:

Location of Job:

Completing Company:

Date Plan Prepared or Modified:

Plan Prepared By:

Plan Approved By:

Foreman/Supervisor:

Foreman Contact #:

### I. Statement of Company Policy

Penn Fencing is dedicated to the protection of its employees from on-the-job injuries. All employees of Penn Fencing 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 this job 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 erection.

### II. Plan Implementation

This plan is designed to enable employers and employees to recognize the fall hazards on this job and to establish the procedures that are to be followed in order to prevent falls to lower levels. 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 the foreman of the concern and the concern addressed before proceeding.

Safety policy and procedure 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 the company; 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 planning, training, understanding and

cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

It is the responsibility of the supervisor on site to implement this Fall Protection Plan. The supervisor on site is responsible for continual observational safety checks of their work operations and to enforce the safety policy and procedures. He 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 foreman. 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 the supervisor on site.

**III. Fall Hazards in the Work Area, including a list of each location where conventional fall protection methods cannot be used.**

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**IV. Methods Taken to Reduce or Eliminate Fall Hazards**

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**V. Method of Inspection**

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**VI. Overhead Protection**

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**VII. Rescue/Emergency Response**

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ATTACHMENT F: TRAINING DOCUMENTATION

## OSHA's Employee Responsibilities

- Read the OSHA Poster at the workplace.
- Comply with all applicable OSHA standards.
- Follow all lawful employer safety and health rules and regulations and wear or use prescribed protective equipment while working.
- Report hazardous conditions to the supervisor.
- Report any work-related injury or illness to the employer, and seek treatment promptly.
- Exercise rights under the Act in a responsible manner.

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ATTACHMENT G: NEW HIRE TRAINING  
DOCUMENTATION

## OSHA's Employee Responsibilities

- Read the OSHA Poster at the workplace.
- Comply with all applicable OSHA standards.
- Follow all lawful employer safety and health rules and regulations and wear or use prescribed protective equipment while working.
- Report hazardous conditions to the supervisor.
- Report any work-related injury or illness to the employer, and seek treatment promptly.
- Exercise rights under the Act in a responsible manner.

## New Hire Training Summary:

*The following items must be reviewed with employees upon initial assignment:*

- Discuss employee roles in this fall protection plan
- Convey company-specific fall safety rules
- The nature of fall hazards in the work area
  - Slips, Trips, & Falls
  - Elevated work surfaces in the workplace (Discuss: Platforms, Wall and Floor Openings, Roofs, Scaffold, Ladders, Man lifts, Other)
- Address appropriate & safe use of ladders
- The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones and other protection to be used
  - Fall protection and/or prevention is required when working 4-feet (if General Industry) or 6-feet (if Construction) above a lower surface.
- The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
  - Toeboards, when used as falling object protection, must be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.
  - Guardrail systems, when used as falling object protection, must have all openings small enough to prevent passage of potential falling objects.
  - While performing roof work, materials and equipment must not be stored within 6 feet of a roof edge unless guardrails are erected at the edge.

*Upon completing the review of the above information, have new employees sign the new hire training log on the following page.*

