

# NAU Environmental Health and Safety

## Fall Protection Program

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# Table of Contents

## Northern Arizona University Environmental Health and Safety Fall Protection Program

<u>Purpose</u> .....	1
<u>Scope and application</u> .....	1
<u>Roles and responsibilities</u> .....	1
<u>Fall prevention</u> .....	5
<u>Passive fall protection systems</u> .....	6
<u>Active fall protection systems</u> .....	6
<u>Prohibited conditions</u> .....	12
<u>Inspection</u> .....	13
<u>Care and maintenance of equipment</u> .....	16
<u>Rescue</u> .....	16
<u>Roof safety</u> .....	17
<u>Aerial lifts</u> .....	18
<u>Working at heights – pedestrian protection</u> .....	18
<u>Ladders</u> .....	18
<u>Confined space</u> .....	18
<u>Training</u> .....	18
<u>Record keeping</u> .....	19
<u>Program evaluation</u> .....	19

### **Appendices**

Appendix I: Definitions

Appendix II: Annual Visual Inspection Form for Guardrails and Anchor Points

Appendix III: Fall Assessment Evaluation Form

Appendix IV: Cleaning of Fall Protection Equipment

Appendix V: Inspection of Personal Fall Protection Equipment

Appendix VI: Rescue Plan

Appendix VII: Roof Access Rules

Appendix VIII: Rules for Working Safely on a Roof

Appendix IX: Load Requirements for Fall Protection Components

Appendix X: Annual Inspection Forms

## **Purpose**

Falls are among the most common causes of serious work-related injuries and deaths. Northern Arizona University (NAU), through the NAU Fall Protection Program Manual, is committed to protecting employees and others from fall hazards through safe design, hazard elimination, engineering controls, safe work practices, training, and personal protective equipment when necessary. If a fall hazard cannot be eliminated, effective fall protection must be planned, implemented, and monitored to control the risks of injury due to falling. The Northern Arizona University Fall Protection Plan ensures identification and evaluation of fall hazards to which employees will be exposed, and to provide specific training as required by the Occupational Safety and Health Administration (OSHA) Fall Protection Standard, 29 CFR 1926, Subpart M and NAU EHS Policy 120. This program applies to elevated work surfaces at 4 feet or greater above the lower level.

## **Scope and application**

The NAU Fall Protection Program Manual applies to all departments on NAU campuses, off-campus NAU work locations and leased properties where any type of activity, indoors or outdoors, could result in injuries from falls. All employees and others engaged in work-related activities where there is a risk of falling from an elevation are required to follow the requirements outlined in this document. Specifically, this document covers identification and assessment of fall hazards, prevention measures and safe work practices to reduce the risk of falling when working at heights. This plan applies to faculty, and staff at Northern Arizona University. This plan is developed to ensure that University employees who perform activities at heights have the knowledge and tools to work safely. Contractors are expected to follow American National Standards Institute (ANSI) and/or Occupational Safety and Health Administration (OSHA) guidelines and to not create a hazard for the NAU Community.

## **Roles and responsibilities**

### **University**

Northern Arizona University is classified as a non-manufacturing employer where a select number of employees are exposed to hazardous conditions, such as physical hazards during the course of their employment. It is the responsibility of NAU to maintain a Fall Protection Program for university employees who might be exposed to fall hazards during the performance of their duties. In addition, the university must design the Fall Protection Program to achieve regulatory compliance and provide a means for employees to be better informed about and protected from the hazards.

### **Environmental Health and Safety**

The overall responsibility to develop and implement occupational health and safety programs for the university falls with the Department of Environmental Health and Safety (EHS). Although it is the overall responsibility of EHS to develop these programs, it is ultimately up to each department or unit supervisor to ensure that employees are provided the vital support and means to adequately carry out the provisions of each program and achieve regulatory compliance with all OSHA requirements. Responsibilities of EHS related to the NAU Fall Protection Program:

- Investigating and documenting all incidents that result in employee injury.
- Maintaining records of employee training. equipment issue, and fall protection systems used at Northern Arizona University jobsites.
- Periodically auditing compliance with this program and notifying affected management of any findings or opportunities for improvement related to this program.
- Providing policies, programs, and guidelines designed to ensure that safe work practices are developed, employed, and revised as necessary.
- Providing training to NAU employees and evaluating fall protection plans upon request.

EHS has final authority over all safety issues and may halt operations or practices it considers an imminent danger at any time.

### **Facility Services Management Group**

The [Planning, Design and Construction](#) Department is responsible for ensuring that:

- All general contractors are notified that they are responsible for ensuring compliance with all applicable federal, OSHA, state, and local regulations related to fall protection and other EHS-related regulations.
- Applicable systems are incorporated into all new construction and any renovation affecting roofing systems.
- Specifications for fall protection anchorage systems meet applicable regulatory requirements.

## **Facilities management**

Facilities Management is responsible for:

- Developing and implementing a system to ensure recertification as required by applicable regulations.
- Maintaining records of certification and testing of each anchor point related to fall protection.

## **Departments**

Departments are responsible for administering the Fall Protection Program and are responsible for:

- Ensuring that the operation and maintenance manuals of personal fall protection equipment and components are made available to each user.
- Arranging for/or conduct training on mandatory elements of the NAU Fall Protection Program.
- Identifying all fall hazards and activities in their workplace and implement preventative measures for these hazards.
- Resolve any safety issues that arise, during inspections or audits.
- Providing all users with the necessary training, tools, and equipment to perform work at heights safely.
- Ensuring the personal fall arrest or restraint systems they own or borrow are maintained in accordance with the manufacturer's specifications.
- Contacting NAU Environmental Health and Safety when new procedures are implemented or new equipment is utilized that may affect an employee's safety.

## **Supervisors**

Supervisors are responsible for ensuring that the Fall Protection Program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the employees under their charge. Duties include:

- Address any unsafe or hazardous conditions.
- Ensure that inspection of fall protection equipment in their area occurs in the timeframe specified in this document.
- Ensure that prompt rescue, typically this is thirty minutes or less, of employees can occur by calling emergency services. Some remote locations may not have timely access to emergency services, so it may be necessary to purchase self-rescue equipment or train personnel to perform rescue.
- Immediately take out of service any defective or damaged equipment. Ensure that equipment is either serviced or replaced.
- Notify EHS if a fall occurs.
- Responsible for employees working at an elevated surface at heights of six feet or more are required to develop a fall protection plan based on requirements identified in EH&S guidelines and training.
- Responsible for identifying personnel required to work on elevated surfaces and for complying with all training and safety measures identified by this policy.
- Supervisors will maintain surveillance of work conditions in all places where employees for whom they are directly responsible work, as well as employee exposures and stress.

### **NAU employees**

Employees are responsible for ensuring that:

- Adhere to manufacturer specifications for the safe operation of all equipment.
- Complete Fall Protection Training.
- Complying with all applicable rules and regulations.
- Ensure that while working at heights, hazards are not created for personnel below.
- Immediately report damaged or defective personal fall arrest or restraint systems components to the supervisor.
- Inspect all the components of fall protection systems and personal fall

protection equipment prior to use.

- Maintain all PPE required to work safely at heights.
- Report any defective building structures such as anchor points or guardrails to Facilities Management.
- Report any unsafe or hazardous conditions to their supervisor and report all falls immediately to their supervisors.
- Responsible for the safety and health of employees and co-workers and must adhere to the requirements of this program.
- Wearing all required personal protective equipment (PPE).

## **Fall prevention**

It is always preferable to engineer out the hazard, e.g. the use of guardrails, designing walls with a height of at least 42 inches, plus or minus 3 inches, or ensuring maintenance activities can be performed inside the building and not on the roof edge. In the event that engineering controls cannot be implemented, the use of active fall protection systems must be used.

Passive fall protection systems, such as guardrails, are always preferred over active fall protection systems. Active fall protection systems require personnel to be actively engaged in the system. They wear a personal fall protection device, such as a full body harness. If any components of an active fall protection system fail, the user could come in direct contact with the hazard, which may result in injury or death.

### **Engineering controls**

Engineering controls are designed to eliminate hazards and are the preferred method for protecting from or controlling exposure to fall hazards. Examples of engineering controls used to eliminate or reduce exposure are listed below:

- Changing equipment or processes to control the hazard (e.g. designing equipment to be maintained, operated, or inspected from the ground level).

### **Administrative controls**

Administrative controls serve to reduce a hazard by changing work practices or procedures. Examples of administrative controls used to reduce exposure are listed below:

- Housekeeping

- Restricting access
- Signage

## **Passive fall protection systems**

Passive fall protection systems do not require operational involvement from the user in order to be protected while performing work at heights. Examples of passive systems are listed below:

- Construction of parapet walls meeting the height criteria for guardrails
- Installation of guardrail systems

Whenever possible guardrails, aerial lifts, and platforms should be installed/used in lieu of active fall protection systems.

Personal fall arrest or restraint systems shall not be attached to guardrail systems, unless they have been certified as permitted by a qualified person.

### **Guardrails and parapets**

The top edge height of the top rails, or equivalent guardrail system members, shall be 42 inches plus or minus 3 inches above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45 inches, provided the guardrail system meets all other criteria.

Mid-rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall of at least 21 inches high. Mid-rails shall be installed at a height midway between the top edge of the guardrail system and the walking/working level. (Example: If the top edge of the guardrail is 42 inches, then the mid-rail must be 21 inches.). If employees perform an action, such as working on a planter, that puts them above the roof surface and reduces the protection of the top rail of the guardrail or parapet, additional fall protection measures must be employed.

### **Skylights**

Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by placing covers over the holes. Unless the skylight has been designed to be walked on, every skylight shall be guarded by a standard skylight screen or a fixed standard guardrails on all exposed sides or personnel must use personal fall protection when working around them.

## **Active fall protection systems**

Active fall protection systems require that employees understand when they are exposed to fall hazards and have a working knowledge of the fall protection system available for their protection. Active systems begin with a certified anchorage point and have components connected to the worker (body harness, lanyard, self-retracting lifeline, rope grab). Proper training in the use of active systems is essential for an effective fall protection system.

## **Personal fall protection systems**

Personal protective equipment shall be used to minimize fall hazards where engineering or administrative controls do not eliminate the hazard or in conjunction with either engineering or administrative controls. Before using personal fall protection systems, the employee/ supervisor must assess the potential fall area and select a system that will prevent the user from contacting the ground or other objects, such as the side of a building. Personal fall protection systems are comprised of several components: anchorage point, lanyard, and full body harness. They may also include a deceleration device and a positioning belt.

All fall protection equipment shall meet or exceed appropriate ANSI standards. NAU personnel shall use only commercially manufactured equipment specifically designed for fall protection and certified by a nationally recognized testing laboratory. All fall protection equipment must bear the marking of the manufacturer and approvals for specified use. The design capacity includes the user's full weight plus the weight of any tools and materials that are carried and could be part of the load for fall protection equipment during a fall.

## **Anchorage**

Anchorage used for personal fall protection systems shall be independent of any anchorage being used to support or suspend platforms. There are two types of anchorage points: noncertified and certified. Non-certified anchor points must be capable of supporting 5,000 pounds static per user for fall arrest, 3,000 lbs for work positioning & rescue, and 1,000 lbs for fall restraint. These are under the supervision of a competent person. A competent person can identify existing fall hazards and has the authority to take prompt corrective measures to eliminate these hazards. Examples of non-certified anchorage points are: beams, girders, columns, other building steel, or designated anchor points.

Certified anchorage points must be capable of withstanding two times the foreseeable force for fall arrest, restraint, and work positioning. Certified anchor points must be capable of withstanding five times the applied load for rescue. All certified anchor points must be certified by a qualified person. A qualified person is someone with a recognized degree or professional certificate, an engineer typically structural or

mechanical, and extensive knowledge and experience capable of designing, analyzing, and evaluating fall protection system specifications. Qualified persons may also work under the supervision of an engineer.

Anchor points should, generally be directly above the user's head, and used as part of a complete fall arrest system. Anchor points in aerial lifts are typically located in the cage, which is below the user's head. Personal fall arrest systems shall not be attached to guardrail systems, unless they have been certified as permitted by a qualified person. Tying off around rough or sharp edges should be avoided.

## **Body wear**

The full body harness is a piece of personal protective equipment used to protect the wearer from injuries resulting from a fall. A full body harness is comprised of straps which may be secured about the user in a manner that will distribute the fall arrest forces over the thighs, shoulders, chest, and pelvis. It has a way to attach it to the other components of a personal fall protection system. Only full-body harnesses shall be used. Select the harness based on the activities that it will be used for. The use of a body belt is prohibited for fall protection. The attachment point for full body harnesses is usually located in the center of the user's back, around shoulder level.

Body belts may only be used as part of a positioning system to allow hands-free work environment. Positioning devices shall be secured to an anchorage point capable of supporting at least twice the potential impact load of the user's fall or 3,000 lbs, whichever is greater. All personnel that employ body belts must use them in conjunction with a full body harness. Where a positioning device is used, it shall comply with the following:

- A body belt must be worn in conjunction with a full body harness.
- Body belts shall be at least one and five-eighths (1 5/8) inches wide.
- Positioning devices shall be rigged such that a free fall cannot be more than 2 feet.

## **Restraint systems**

A restraint lanyard is a device, which is attached between the user and an anchorage point to prevent the user from walking or falling off an elevated surface. It does not support a person at an elevated surface, it prevents them from leaving the elevated surface or work position. Restraint systems are not designed for fall arrest. Restraint systems should be used when an arrest would create the hazard of the user hitting an object during the deceleration. An example of this is using a fall arrest system on a roof edge. If the user falls from the edge they will hit the side of the building. In this example, fall restraint – not arrest – is the fall protection system that should be used. When selecting fall restraint ensure that the lanyard meets the following:

- All components of personal fall arrest/restraint systems must be appropriate for the work place conditions and environment.
- It can withstand a force of 3,000 pounds applied to the device when the lifeline or lanyard is fully extended.
- It does not have a deceleration device on it.
- It should only be long enough to get to the edge of the walking surface and not over it.

### **Fall arrest lanyards and lifelines**

Fall arrest lanyards and lifelines shall have a minimum breaking strength of 5,000 pounds. Lanyards shall not exceed six feet in length. Lanyards used on aerial lift devices should not exceed 4 feet in length to reduce the possibility of leaving the safety of the basket.

### **Ropes and straps**

Also known as webbing. Ropes and straps used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers.

### **Connecting assemblies**

Connecting assemblies shall have a minimum tensile strength of 5,000 pounds. Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.

### **Tie off adapter**

Tie off adapters must provide a secure point of attachment for a complete personal fall arrest system, and must be capable of supporting a load of 5,000 lbs.

### **Self-retracting lifelines and lanyards**

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

## **Horizontal lifelines**

Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person as part of a complete personal fall protection system that maintains a safety factor of at least two. On suspended scaffolds or similar work platforms with horizontal lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline. In this instance, each user shall be attached to a separate lifeline.

## **Vertical lifelines**

Vertical lifelines shall have a minimum breaking strength of 5,000 pounds and shall be protected against being cut or abraded. Each user shall be attached to a separate lifeline when vertical lifelines are used.

## **D-rings and snap hooks**

D-rings and snap hooks shall have a minimum tensile strength of 5,000 points. D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or being permanently deformed. Unless the snap hook is a locking type and designed for the following connections, snap hooks shall not be engaged:

- Directly to webbing, rope or wire rope.
- On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines.
- To a D-ring to which another snap hook or other connector is attached.
- To a horizontal lifeline.
- To any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object depressing the snap hook keeper and releasing itself.
- To each other.

To prevent unintentional disengagement, snap hooks shall be sized to be compatible with the member to which they are connected and shall have the locking-type closure. This is to prevent unintentional disengagement of the snap hook. The devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline. Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

## **Warning lines**

Warning lines all consist of ropes, wires, or chains, and supporting stanchions erected as follows: the rope, wire, or chain shall be flagged at not more than 6-foot intervals with high visibility material and no more than 15 feet from a leading edge:

The rope, wire, or chain shall be rigged and supported in such a way that its 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.

## **Personal fall arrest systems**

Most personal fall arrest systems are designed to protect a combined person and tool weight of less than 310 lbs. Check with manufacturer specifications. System weight limits must not be exceeded without written permission from an Arizona licensed structural engineer or the manufacturer of that system.

- A personal fall arrest system shall limit the maximum arresting forces to 1,800 pounds with a full body harness.
- Have sufficient strength to withstand twice the potential impact energy of a user free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.
- Lifelines shall be protected against cutting and abrasion.
- Limit free fall to 2 feet or less.
- Personal fall arrest systems shall have sufficient strength to withstand twice the potential impact energy of the falling user.
- The typical deceleration distance, or distance it takes to bring a user, to a complete stop, is 3.5 feet.
- The typical length of a fall arrest lanyard is 6 feet, provided that the user will not contact objects or a lower level.

## **Size and harness selection**

Departments are required to have harnesses sized for all individuals who are required to wear them. This may mean having a variety of harness sizes. When the harness is adjusted the wearer should be able to get only two fingers underneath the legstrap. Wearing improperly sized or adjusted harnesses could result in serious injury or even death.

Departments shall assess conditions to ensure that appropriate fall protection equipment is selected based on the workplace and activity. At a minimum, assessments should identify the presence of the following, prior to selecting personal fall protection equipment:

1. Hot objects, sparks, flames, or heat producing operations
2. Sharp objects or abrasive surfaces
3. Moving equipment
4. Electrical hazards
5. Chemicals used either by the wearer or near the wearer
6. Anything else that could affect the strength or integrity of personal fall protection devices or components

Harnesses are made of a variety of materials based on their function. As an example welders should use a welder's harness that is made of flame-retardant material. Painters should wear a harness that is made of material resistant to grease, oil, and paint.

## **Prohibited conditions**

- Attaching personal fall protection systems to guardrails or hoists that have not been certified by a qualified person.
- Improper dimensions of the D-ring, rebar, or other connection point in relation to the snap hook keeper to be depressed by a turning motion of the snap hook.
- Not notifying supervisors of activation through a fall of anchor points, lanyards, harnesses or any component of fall protection device or system.
- Putting a load on any component that is greater than it has been rated for.
- Tying a knot in lanyards, lifelines or anchorage connectors. The use of knots decreases the efficacy of the load rating.
- Tying off to fire protection piping, conduit, ductwork piping or other structures that are not intended nor designed for fall protection and have not been approved for such application by a qualified person.
- Tying off to an anchorage below the dorsal D-ring, unless when using an aerial lift

platform that places the anchorage below the dorsal D-ring.

- Use of a body belt for anything other than a positioning device.
- Using equipment for activities other than its intended, specified purpose.
- Using or providing damaged or defective equipment.
- Warning lines on steep slope surfaces exceeding a 4/12 roof pitch (must use personal fall protection equipment instead).

## **Inspection**

Active fall protection equipment including anchor points, lifelines, lanyards, full body harnesses, snap hooks, and connectors shall be inspected before each use by the user. At a minimum, users shall comply with manufacturer instructions regarding inspection. Departments will retain instructions, manuals, and inspection information for all equipment they possess and make them readily available to all users.

Defective equipment shall be taken out of service and rendered not useable. The following should be noted on the inspection prior to each use:

- Examine all metal hardware for cracks, fractures, deformation, loosening of anchorage, or other signs of wear or deterioration which may affect the equipment or its ability to fasten/close.
- Examine anchor points to ensure it has not become unseated, that there no cracks, deformities, or other damage.
- Examine lifelines and lanyards for fraying, broken strands, cuts, abrasions, chemical damage, discoloration, or deterioration that may affect the effectiveness of the equipment.
- Examine the stitching for damage or signs of weakening.
- Examine webbing for cuts, tears, holes, mildew, enlarged eyeholes, and any other signs of wear that may affect the integrity of the equipment.

Any personal fall protection equipment that is damaged or shows signs of being altered must be placed out of service until a competent or qualified person or the manufacturer verifies that it is in good working order. If a user is involved in an incident where a fall from an elevated work surface occurs, the fall protection equipment must be inspected by a competent person to determine if it is suitable for reuse or must be discarded.

## Annual inspection

Personal fall protection systems must be inspected at least once a year, or as often as directed by the manufacturer, by a designated competent person. Annual inspections should address all components of a fall protection system including, but not limited to, lifelines, structural components, and personal protective equipment. Follow all manufacturers' recommendations or instructions when performing annual inspections. Be sure the equipment meets all manufacturers' specifications. Any deficiencies identified during the inspection or certification process must be addressed before the fall protection system is used. Additional inspection may be required by the equipment manufacturer. A designated competent person shall inspect full body harnesses, shock absorbing lanyards, anchorage connector straps, and lifelines for the following annually:

- Absence of any elements affecting the equipment form, fit, or function.
- Absence or illegibility of marking.
- Alteration or the absence of parts or evidence of defects in, damage to, or improper function of mechanical devices and connectors.
- Evidence of defects in or damage to hardware elements, including cracks, sharp edges, deformation, corrosion, alteration, excessive wear, and any other defects.
- Evidence of defects in or damage to straps or ropes including fraying, un-splicing, kinking, knotting, broken or pulled stitches, excessive elongation, excessive soiling, abrasion, alteration, mildew, excessive wear, or aging.
- Metal hardware for breaks, cracks, fractures, loose anchorage, or other signs of wear or deterioration which might affect the strength of the equipment or the action of the fastening devices.
- Stitching for breaks, ragged strands, loose or rotted threads, and for other signs of weakening.
- Will also include any other condition that calls in to question the suitability of the equipment for its intended purpose.

The annual equipment inspection must be documented on an inspection form, see Appendix X. When inspection reveals defects in, damage to, or inadequate maintenance of equipment, the equipment shall be permanently removed from service and destroyed. The annual inspection must include all the elements of the daily or prior-to-use inspection, if applicable. Retractable lifelines shall be sent to the manufacturer for inspection at intervals as required by the specific manufacturer of the equipment.

## **Inspection of guardrails & railings**

Prior to using a guardrail as passive fall protection the user will perform a visual inspection. The visual inspection will note deformation or wear that could reduce the guardrails designed capacity or effectiveness. If the visual inspection notes potential problems, the user should immediately stop and notify FACMAN. An example of some common issues with guardrails are:

- Corrosion.
- Gates at ladders and similar unprotected edges should operate smoothly with one hand. Spring closures should be able to fully close and secure the gates.
- Loose connections, components, deformation, cracks, or damage.
- Regular guardrails and removable railings should not show excessive play at the connections. Pins and removable components should be in place. Removable components like pins should be tethered to the railing or socket to prevent them from being lost.

## **Inspection of anchor points by a qualified person**

Anchor points must be load tested upon installation. Anchorage – points must be inspected by a qualified person after a fall, following any major alteration to existing equipment, or annually if they are in a corrosive environment, as defined in Appendix I. Load Testing is required initially when design documents are not available. Follow all manufacturers' recommendations for care and inspection.

Anchor points that are used on a regular basis as determined by the departments that use them will be inspected by FACMAN designated vendor will inspect them every two years in a typical environment and every year in a corrosive environment. The vendor will be a qualified person.

All users should perform a visual inspection prior to clipping in and should look for the following items:

- If the anchor point has become unseated or moved.
- If the anchor point shows signs of wear or corrosion.
- If the area around the anchor point has cracks, deformation, or other signs of damage.
- Verify that anchor is in good working order.

Should any of the above conditions be noted, notify Facilities Management so that the anchor point can be tagged. It must not be used until it can be tested by a qualified person. If the anchor point is removed from service the tag must state the name of the individual and contact number who tagged it.

Anchor points that are tagged out must not be used until Facilities Management designated vendor performs an inspection and verifies that it is in good working condition and safe to use.

## **Care and maintenance of equipment**

Refer to the manufacturer's instructions for the care and storage of all personal fall protection equipment. These instructions must be made available to users of fall protection equipment. Equipment in need of maintenance or repair must be tagged 'Out of Service' or with similar phrasing and removed from service. Equipment that is damaged or in need of repair should be separated from equipment in good working order.

In general, fabric webbing harnesses, lanyards, and anchorage connecting straps can be washed using a mild detergent, then rinsed, and dried.

1. Fall protection equipment should be stored in a clean, dry area at normal temperature so as not be damaged by environmental factors such as heat, light, excessive moisture, temperature extremes, and other degrading elements.
2. Keep in clean dry areas and away from direct sunlight, which can degrade the synthetic webbing.
3. Harnesses should be hung up, when feasible, by their D-rings.
4. Fall protection equipment must be kept away from solvents, acids, corrosives, oils, or any materials that could damage or degrade them.
5. Ensure fall protection equipment is kept away from sharp objects or conditions such as hot surfaces, sparks, or flames that could damage it. Take fall protection equipment out of service if burn marks or stiffening of material is noted.
6. Equipment should be dried thoroughly before to putting away.

## **Rescue**

Before the use of any personal fall protection equipment, an assessment of the area must be made. A key piece of this assessment includes the rescue plan. Rescue plans must include the following:

- An attendant or coworker who remains in contact with the person using personal fall protection, this can be visual contact or by radio.
- The attendant must be able to immediately contact rescue personnel. This can be accomplished by calling 911. No work shall be performed where it is not possible to identify an emergency and summon and promptly ensure rescue can occur.

In some cases, it may become necessary for personnel to work alone at heights. If their duties require the use of active fall protection equipment and they are working alone, a formal rescue plan must be created before commencing work. Review Appendix VI to assist in ensuring that prompt rescue can occur. For departments who have employees who have to work alone at heights, the departments must have a system in place to periodically communicate with these employees to ensure their safety while working at heights.

### **Suspension trauma**

Suspension trauma also known as harness hang syndrome (HHS), or orthostatic intolerance may be experienced by users using fall arrest systems. Following a fall, a user may remain suspended in a harness. The sustained immobility may lead to a state of unconsciousness. Depending on the length of time the suspended user is unconscious/immobile and the level of venous pooling, the resulting orthostatic intolerance may lead to death.

According to the Journal of Emergency Medical Services, critical circulatory collapse is one of the injuries that can occur with suspension trauma in as little as 30 minutes. The time it takes for suspension trauma to occur is largely contingent on the individual's physical condition.

One of the ways to slow the progression of suspension trauma is to stand up. Under normal circumstances, when a user is standing, the leg muscles must contract to provide support and maintain balance, which puts pressure on the veins. Too often, a user is saved by their personal fall arrest system, only to succumb to suspension trauma while waiting for rescue. Everyone who works at heights should be fully trained in fall prevention and protection procedures. Adding suspension trauma relief straps to harnesses can make a difference. After a fall event, the user can deploy the suspension trauma relief straps - creating a loop that the user can put their feet into and press against to simulate standing up. This allows the leg muscles to contract and can relieve pressure from the leg straps to help improve circulation.

## **Roof safety**

Personal fall protection or engineering controls must be used when going within 15 feet from a leading edge. Any deviation from this requires written authorization in accordance with the rules for working safely on roof found in Appendix VII.

Employees are forbidden from accessing roofs with a leading edge or a guardrail or wall less than 39 inches without completing Fall Protection Training. Roof safety access and rules can be found in Appendices VII and VIII.

## **Aerial lifts**

Some aerial lifts require fall protection. Refer to the manufacturer's specifications. When employees have to leave the safety of the lift, fall protection is required, more details can be found in the University Lift Safety Program:

## **Working at heights – pedestrian protection**

Whenever work at heights must be performed, hazards from falling objects must be controlled. This can be accomplished in a variety of ways:

- Barricading the area below to protect pedestrians from falling objects
- Using toe boards for scaffolding
- Wearing tool belts or securing tools

Toe boards should be used whenever overhead work may present the possibility for tools to be kicked over the side. Toe boards shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toe board.

## **Ladders**

Fall protection must be provided whenever the length of a fixed ladder equals or exceeds 24 feet. Review Ladder Safety for portable ladder safety.

## **Confined space**

A harness with tripod retrieval system may be used to enter/exit or for rescue in a confined space. Some confined spaces are very narrow and the use of normal fall protection such as a harness and lanyard may create a hazard by causing the entrant to become entangled or stuck on equipment or the interior structure of the confined space. In this case, fall protection may be deemed as infeasible, in which case wrist harness may be used for the purpose of rescue.

## **Training**

No employees shall work at heights without the proper training. All employees FTE who work at heights must successfully complete an initial fall protection training. All non FTE employees who access roofs shall complete EHS Roof Access training.

When there is a reason to believe that any employee, who has already been trained does not have the sufficient understanding and skills, retraining will occur.

Circumstances where retraining is required include, but are not limited to, situations where:

- An incident in the workplace has occurred that is associated with fall protection.
- Changes in the types of fall protection systems or equipment to be used render previous training obsolete.
- Changes in the workplace render previous training obsolete.
- Inadequacies in an affected user's knowledge or use of fall protection systems or equipment indicate that the user has not retained the requisite understanding or skill.

## **Record keeping**

Manufacturer's instructions, inspection, and maintenance records must be kept for as long as the equipment is in use. This includes qualification records for the design and installation for anchorage points and systems. The annual inspection records for personal fall protection and anchorage systems must be kept a minimum of 5 years. Training records for all users must be kept for the duration of employment.

## **Program evaluation**

EHS may perform departmental audits at any time. The University Fall Protection Program will be evaluated by EHS at a period not to exceed five years. Additionally, the program and departments will be evaluated when deficiencies are noted, after incidents involving injuries, or near misses occur. In the event of a fall, an incident investigation will be conducted by EHS.

# **Appendix I**

## **Definitions**

## Definitions

**Anchorage** - A secure point to attach a lifeline, lanyard, deceleration device or any other fall arrest, restraint, or rescue system.

There are two types of anchorages: **certified** (engineered) and **non-certified** (improvised). Certified anchorages must be designed by a professional engineer. Non-certified anchorages are attached to suitably strong structures (beams, trusses, etc.) and approved by a competent person.

**Anchorage Connector** - A component of subsystem that functions as an interface between the anchorages and fall protection, work positioning, rope access or rescue system for the purpose of coupling the system to the anchorage.

**Body Belt** - Body belts are not permitted for fall arrest. Body belts are only to be used for work positioning (when accompanied by a full body harness).

**Competent Person** - An individual designated by the employer to be responsible for the immediate supervision, implementation, and monitoring of the employer's managed fall protection program who, through training and knowledge, is capable of identifying, evaluating, and addressing existing and potential fall hazards, and who has the employer's authority to take prompt corrective action with regard to such hazards.

**Connector** - A device which is used to couple (connect) parts of the system together. It may be an independent component of the system (such as a carabineer), or an integral component of part of the system (such as a buckle or D- ring sewn into a full body harness, or a snap hook spliced or sewn to a lanyard or self- retracting lanyard).

**Deceleration device** - Any mechanism, such as rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyard, or automatic self-retracting-lifeline/lanyard, 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.

**Deceleration distance** - The additional vertical distance a falling user travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of a user's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the user comes to a full stop.

**D-ring** - An integral "D" shaped connector typically used in harnesses, lanyards, energy absorbers, lifelines and anchorages connectors as an integral connector as an attachment point.

**Energy (Shock) Absorber** - A component whose primary is to dissipate energy and limit deceleration forces which the system imposes on the body during fall arrest.

**Fall Arrest** - The action or event of stopping a free fall or the instant where the downward free fall has been stopped.

**Fall Arrest System** - The collection of equipment components that are configured to arrest a free fall.

**Fall Protection** - Any equipment, device or system that prevents an accidental fall from elevation or that mitigates the effect of such a fall.

**Fall Protection System** - Any secondary system that prevents workers from falling or, if a fall occurs, stops the fall.

**Free Fall** - The act of falling before the personal fall arrest system begins to apply force to stop the fall.

**Friction Belt** – A buckle that uses friction or pressure to hold the webbing in position, these friction type / slip buckles do not separate into two pieces.

**Guardrail System**- A passive system of horizontal rails and vertical posts that prevent a person from reaching an unprotected edge.

**Harness, Full Body** - A body support designed to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest and shoulders.

**Horizontal Lifeline** - A component of a horizontal lifeline subsystem, consisting of a flexible line with connectors or other coupling means at both ends for securing it horizontally between two anchorages or anchorage connectors.

**Inspection** - An examination of equipment or systems to assess conformance to a particular standard.

**Lanyard** - A component consisting of flexible rope, wire rope or strap, which typically has a connector at each end for connecting to the body support and to a fall arrester, energy absorber, anchorage connector or anchorage.

**Lifeline** - A component of a fall protection system consisting of a flexible line designed to hang either vertically (vertical lifeline), or for connection to anchorages or anchorages connectors at both ends to span horizontally (horizontal lifeline).

**Passive Fall Protection System** - Fall protection that does not require the wearing or use of personal fall protection equipment.

**Personal Fall Arrest System** - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

**Personal Fall Restraint System** - A fall restraint system consists of the equipment used to keep an employee from reaching a fall point, such as the edge of a roof or the edge of an elevated working surface.

**Qualified Person** - A person with a recognized degree or professional certificate and with extensive knowledge, training, and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems to the extent required by these standards.

**Rescue Plan** - A written process that describes in a general manner how retrieval or personnel recovery is to be approached under the specified parameters, such as location or circumstances.

**Rope Grab (Fall Arrester)** - A device that travels on a lifeline and will automatically engage or lock to arrest a free fall.

**Self-Retracting lifeline (SRL)** - A self-retracting device suitable for applications where during use the device is mounted or anchored such that possible free fall is limited to 2 feet (.6m) or less.

**Snap hook** - A connector with a hook-shaped body that has an opening for attachment to a fall protection or rescue component and a self-closing gate to retain the component within the opening.

**Suspension Trauma** - Also known as harness hang syndrome (HHS), or orthostatic intolerance, is an effect which occurs when the human body is held upright without any movement for a period of time. If the person is strapped into a harness or tied to an upright object they will eventually suffer the central ischemic response (commonly known as

fainting). If one faints but remains vertical, one risks death due to the brain not receiving the oxygen it requires.

**Swing Fall** - A pendulum-like motion that occurs during and/or after a vertical fall. A swing fall results when trained user begins a fall from a position that is located horizontally away from a fixed anchorage.

**Unprotected Edge** - Sometimes referred to leading edge. A wall less than 42, plus or minus 3 inches, or an opening in a wall greater than 30 inches tall and 18 inches wide.

**Vertical Lifeline** - A component, element or constituent of a lifeline subsystem consisting of a vertically suspended flexible line and along which a fall arrester travels.

**Webbing** - A narrow woven fabric with selvedge edges and continuous filament yarns made from light and heat resistant fibers that may be incorporated in a harness, lanyard, or other component or subsystem.

**Wrist Harness (Wristlets)** – Designed for work inside of a confined space, where a full body harness would be restrictive for work purposes.

# **Appendix II**

## **Visual Inspection Form for Guardrails and Anchor Points**

## Visual Inspection Form for Guardrails and Anchor Points

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

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

### Guardrails

Prior to using a guardrail as passive fall protection the user will perform a visual inspection. The visual inspection will note deformation or wear that could reduce the guardrails designed capacity or effectiveness.

YES NO Connections and components are free of corrosion, damage, or excessive play.

YES NO Connections and components are free of deformation, cracks, or damage.

YES NO Gates at ladders or similar unprotected edges operate smoothly with one hand.

YES NO Spring closures fully close and secure the gates.

YES NO Removable railings are free of excessive play at the connections.

YES NO Pins and removable components are in place.

YES NO Removable components like pins are tethered to prevent them from being lost.

If the visual inspection notes potential problems, the user should immediately stop and notify FACMAN.

### Anchor Points

Anchor points must be load tested upon installation. Anchorage systems must be inspected by a qualified person after a fall, following any major alteration to existing equipment, or annually if they are in a corrosive environment, as defined in Appendix I. Load testing is required initially when design documents are not available. Follow all manufacturers' recommendations for care and inspection. Anchor points that are used on a regular basis will be inspected by FACMAN designated vendor every two years, a qualified person, if they are used on a frequent basis. All users should perform a visual inspection prior to clipping in and should look for the following items:

YES NO The anchor point is securely in place.

YES NO The anchor point is free of corrosion or other signs of wear.

YES NO The anchor point is free of cracks, deformation, or other signs of damage.

Should any deficiencies be noted, the anchor point must be tagged as 'Out of Service'. It must not be used until it can be tested by a qualified person. If the anchor point is removed from service the tag must state the name of the individual and contact number who tagged it. Anchor points that are not used regularly may be tagged out and must not be used until FACMAN designated vendor performs an inspection.

# **Appendix III**

## **Fall Assessment Evaluation Form**

## Fall Assessment Evaluation Form

Each department is responsible for assessing the potential fall hazards in their area. Below is a list of questions that will help you perform a hazard assessment for your area. Contact your supervisor if deficiencies are noted. This assessment must be completed for each area initially and then annually or when conditions change.

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

Assessment Area: \_\_\_\_\_

YES NO Can I work safely from the ground by bringing the work down?

YES NO Can I work safely using a ladder?

YES NO Provided that I have received the proper training, can I use an aerial lift?

YES NO Are there guardrails in place?

YES NO Can I use portable guardrails?

YES NO Will my activities present a hazard for those below?

YES NO Are there any unstable, uneven, slippery walking/working surfaces?

YES NO Are there any unguarded wall openings?

YES NO Will I be performing work that will make the use of guardrails ineffective?

If personal fall protection equipment is necessary and you have received the proper training, address all the questions below before beginning work:

YES NO Are there existing anchor points that can be used?

YES NO Is the anchor point in service?

YES NO Does anchor point have an EQID?

YES NO If not, can pre-fabricated or engineered anchor points be installed?

YES NO Do I have all the right equipment for the job at hand (such as full body harness, connecting hardware, lanyard, etc.)?

YES NO Are all the pieces of my personal fall protection equipment in good working order?

YES NO Will I exceed manufacturer's specifications once I have added the weight of all tools?

YES NO If a fall arrest system is used, do I have clearance for the entire distance I may fall?

YES NO If using fall restraint, is my lanyard a length so I cannot go over the edge?

# **Appendix IV**

## **Cleaning of Fall Protection Equipment**

## **Cleaning of Fall Protection Equipment**

Basic care of all safety equipment will prolong the durable life of the unit and will contribute toward the performance of its vital safety function. Proper storage and maintenance after use are as important as cleansing the equipment of dirt, corrosives, or contaminants. Storage areas should be clean, dry, and free of exposure to dust, fumes, or corrosive elements.

Nylon or Polyester – Remove 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 with a clean cloth. Hang freely to dry, but away from excessive heat and direct prolonged sunlight.

Equipment Housings – Periodically clean the unit using a damp cloth and mild detergent; towel dry.

Drying – Equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight.

# **Appendix V**

## **Inspection of Personal Fall Protection Equipment**

## **Inspection of Personal Fall Protection Equipment**

Visual inspection before each use must occur of all components in a fall protection system. In addition, an annual inspection by a competent person, or their designee, must occur. To maintain their service life and high performance, all full body harnesses should be inspected frequently. If any of the conditions listed below are found the equipment should be replaced before being used.

### **Harness Inspection**

1. Webbing and Rings: For harness inspections begin at one end, hold the body side of the webbing toward you, grasping the webbing with your hands six to eight inches apart. Bend the webbing 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 webbing 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 not 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.

2. 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.

3. 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.

#### **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 allowed.

Web Lanyard: While bending webbing in an inverted "U", 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 allowed.

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 (Deceleration Device)**

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, webbing 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 webbing is bent over tight. This causes a loss of elasticity in the webbing.

#### **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.

**Rescue Plan**

A rescue plan must be completed for every time that personal fall protection, fall arrest, is used. Include the name(s) of all user(s) who will be performing work while wearing fall arrest equipment. An attendant is required at all times. The attendant must remain in direct contact with the user(s). The attendant must be familiar with the dangers of suspension trauma and have immediate access to medical emergency services. Any deviation must obtain prior approval from their supervisor.

Date: \_\_\_\_\_ Building Name and Room Number: \_\_\_\_\_

Name of User(s): \_\_\_\_\_

Name of Attendant(s):

\_\_\_\_\_

Will the attendant use a cell phone or land line to contact emergency services, and where is it located?

\_\_\_\_\_

What rescue equipment is immediately available in the event of a fall?

\_\_\_\_\_

Describe obstacles and obstructions that would hinder rescue operations in the event of a fall.

\_\_\_\_\_

How will prompt rescue occur?

\_\_\_\_\_

Are trauma straps present on the personal fall protection equipment being used?



## **Roof Access Rules**

1. Do not access the roof unless you have legitimate maintenance, service, or academic reasons.
2. Only authorized personnel are allowed roof access.
3. Employees must obtain authorization from their supervisor or the building manager.
4. Contractors must obtain authorization from their NAU contact.
5. Follow all signage and roof-specific rules prior to and during roof access.
6. Use designated pathways, if present.
7. Notify NAU PD when conducting work outside normal business hours.
8. Only authorized employees performing emergency maintenance may access roof during severe weather conditions.

# **Appendix VIII**

## **Rules for Working Safely on a Roof**

### **Rules for Working Safely on a Roof**

- Do not go within 15 feet of the edge of a roof (leading edge) or a wall opening (at least 18" wide by 30" tall), unless you have the authorization, training, and personal protective equipment to do so.
- Do not throw any object off roofs.
- Employees are prohibited from accessing roofs with a wall or guard rail less than 39 inches high (leading edge), without completing Fall Protection Training.
- Employees must leave the roof if dangerous conditions arise.
- Follow all instructions from authorized faculty/staff or you may be subject to removal from roof and/or disciplinary action.
- Follow all posted instructions, policies, and roof-specific rules.
- For staff and faculty only: if severe weather threatens, exit roof unless authorized to remain. Employees are never authorized on roofs during severe weather.
- No horseplay or running on the roof, only legitimate University activities are permitted.
- Notify NAU PD of unauthorized people on roofs.
- Secure unused tools on the roof and remove them when job is completed.

# **Appendix IX**

## **Load Requirements for Fall Protection Components**

## **Load Requirements for Fall Protection Components**

### **Guardrails**

Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within 2 inches of the top edge, in any outward or downward direction, at any point along the top edge. When the 200 pound test load is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level.

Mid-rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds applied in any downward or outward direction at any point along the mid-rail or other member.

Guardrail systems shall be of a smooth surfaced material to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

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

Steel banding and plastic banding shall not be used as top rails or mid-rails.

Top rails and mid-rails shall be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it shall be flagged at no more than 6-foot intervals with a high-visibility material.

For pipe railings: posts, top rails, and intermediate railings shall be at least one and one-half inches nominal diameter (schedule 40 pipe) with posts spaced not more than 8 feet apart on centers.

For structural steel railings: posts, top rails, and intermediate rails shall be at least 2-inch by 2-inch by 3/8-inch angles, with posts spaced not more than 8 feet apart on centers.

For areas where the general public may access the guard rail shall not have openings which allow passage of a sphere 4 inches in diameter from the walking surface to the required guard height as per the International Building Code 2012, section 1013.4 Hoist areas shall be protected by guardrail or personal fall arrest systems. If guardrail systems or portions of guardrail systems are removed to facilitate the hoisting process creating a potential fall hazard for the employee, that employee must be protected by a personal fall arrest system. Loading docks more than 6 feet above a lower level are not required to have a guardrail system on the working side of the dock where it can be demonstrated that the presence of guardrails would prevent the performance of work. All non-working sides of a loading dock must be protected by a guardrail system.

# **Appendix X**

## **Annual Inspection Forms**

## Annual Inspection Form Full Body Harness

The University requires documentation of inspection on all fall protection equipment. All damaged equipment must be taken out of service until it is replaced or repaired. Contact your supervisor with questions or concerns regarding fall protection equipment.

Inspector Name and EID	Inspector Signature
Department	Inspection Date
Manufacturer and Equipment Name	In-Service Date
Manufacturer Model and Serial #	Manufacture Date
<div style="display: flex; justify-content: space-around;"> <span>Y = Yes</span> <span>N = No</span> </div>	<div style="display: flex; justify-content: space-around;"> <span>Y</span> <span>N</span> <span>N/A = Not Applicable</span> </div>
<b>Impact Indicator</b>	
1. Damaged	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
2. Missing	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
3. Deployed	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
4. Reserve lifeline deployed if applicable	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
<b>Buckles</b>	
5. Cracked	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
6. Poor function	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
7. Missing parts	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
8. Corroded	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
9. Burrs / sharp edges	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
10. Bent / distorted	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
11. Damaged	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
<b>Labels</b>	
12. Present and attached	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
13. Legible	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
Plastic Keepers	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
14. Missing	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
15. Damaged	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
<b>D-Rings</b>	
16. Cracked	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
17. Welded	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
18. Bent / distorted	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
19. Corroded	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
20. Sharp edges	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
<b>Connectors</b>	
21. Cracked	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
22. Sharp edges	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
23. Missing parts	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
24. Corroded	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
25. Labelled / marked	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A
26. Bent / distorted	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A

27. Sticky gates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Stays open / won't lock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Excess dirt / grease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Closes but doesn't lock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Single action (no lock on gate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>D-ring plate (back pad)</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
32. Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Damaged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Stitching</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
34. Cut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Broken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Pulled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Missing stitch patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Burned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Webbing</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
39. Cuts / tears / holes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Burns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Frays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Knots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. UV damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Grease / grime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Paint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Discoloration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Mold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Missing / damaged stitch pattern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Heat damage / glazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Permanent marking on load bearing webbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Abrasion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Pass

Fail

Comments:

## Lanyards and self-retracting Lifelines

The University requires documentation of inspection on all fall protection equipment. All damaged equipment must be taken out of service until it is replaced or repaired. Contact your supervisor with questions or concerns regarding fall protection equipment.

Inspector Name and EID	Inspector Signature
Department	Inspection Date
Manufacturer and Equipment Name	In-Service Date
Manufacturer Model and Serial #	Manufacture Date

<b>Housing</b>	Y	N	N/A
1. Cracks / distortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Dents impeding operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Dirty / contaminated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Missing parts / screws / bolts etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Handle</b>	Y	N	N/A
5. Damaged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Bent / loose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Missing parts / screws	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Impact Indicator (where applicable)</b>	Y	N	N/A
8. Damaged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Deployed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Reserve lifeline deployed if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Connectors</b>	Y	N	N/A
12. Cracked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Sharp edges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Missing parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Corroded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Labelled / marked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Bent / distorted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Sticky gates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Stays open / won't lock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Excess dirt / grease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Closes but doesn't lock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Single action (no lock on gate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Labels</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
23. Present and attached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Legible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Webbing</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
25. Cuts / tears / holes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Burns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Frays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Knots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. UV damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Grease / grime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Paint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Discoloration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Mold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Missing or damaged stitch patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Permanent marking load bearing webbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Heat damage / glazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Abrasions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Wire Rope (Self Retracting Lifeline)</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
38. Heat damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Kinked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Missing / damaged thimble	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Loose termination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Corrosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Distortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Broken wires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Separation of strands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Abraded wire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Bird caging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Shock Absorber</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
48. Cuts / tears / abrasions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Deployed / stretched / elongated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Plastic cover missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Holes / burns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. UV damage / fading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Excessive soiling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Rope (Lanyard)</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
54. Splice loose / coming out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Thimble loose / missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Inner core damage – voids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Fraying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Core showing through sheath	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Cuts / pulls in fibers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Burns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Knots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Heat damage / glazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- |                                    |                          |                          |                          |
|------------------------------------|--------------------------|--------------------------|--------------------------|
| 63. Bird caging                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 64. Discoloration                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 65. Dirt / grease                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Stretched / kinked             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 67. Five full tucks on rope splice | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 68. Paint / rust staining          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments:

Pass

Fail

**Annual Inspection Form  
Rope Grabs, Vertical Lifelines, Temporary Horizontal Lifelines**

The University requires documentation of inspection on all fall protection equipment. All damaged equipment must be taken out of service until it is replaced or repaired.

Contact your supervisor with questions or concerns regarding fall protection equipment.

Inspector Name and EID	Inspector Signature
Department	Inspection Date
Manufacturer and Equipment Name	In-Service Date
Manufacturer Model and Serial #	Manufacture Date

	Y = Yes	N = No	N/A = Not Applicable
<b>General</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
1. Vertical lifeline matches rope grab as per manufacturer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. "Up" arrow legible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Springs operating correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Corrosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Burns / cracks / sharp edges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Unusual discoloration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Deformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Connectors functioning properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Manual Device</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
9. Unit is locked onto rope	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Does not move unless opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Unit operates without restriction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Automatic Device</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
12. Damaged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Operates without restriction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Locks onto rope properly and cleanly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Internal wear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Missing parts / screws	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. All moving parts operate without restriction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Rivets, Bolts and Rollers</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
18. Corroded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Loose / bent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Excess dirt / grease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Vertical and Horizontal Lifelines</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
22. Screws, nuts, bolts, secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Thimbles held firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Covers free from cracks, dents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Metal components corroded / rusting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Broken impact indicator pin if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. No substitutions or alterations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Rope</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
28. Splice loose / coming out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Inner core damage - voids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Frayed strands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Core showing through sheath	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Cuts / pulls in fibers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Burns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Knots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Heat damage / glazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Bird caging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Discoloration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

38. Dirt / grease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Stretched / kinked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Five full tucks in rope splice/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Paint / rust staining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Labels</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
42. Legible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Present and attached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Wire Rope</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
44. Heat damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Kinked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Missing / damaged thimble	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Loose termination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Corrosion / distortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Broken wires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Separation of strands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Abraded wires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Bird caging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Shock Absorber</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
53. Cuts / tears / abrasions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Deployed / stretched / elongated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Protective cover missing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Holes / burns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. UV damage / fading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Rust damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Corrosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Distortion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

