

ENVIRONMENTAL HEALTH & SAFETY
THE UNIVERSITY OF TEXAS AT TYLER



PROGRAM FOR FALL
PROTECTION

2023

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Introduction:

The University of Texas at Tyler Environmental Health and Safety department has developed this Fall Protection Safety Program to ensure a safe work environment and to protect the health and safety of University Staff and any contractors or vendors working on University property. This program was written with guidance from OSHA guidelines, the University of Texas System Construction Safety Program, and on-site Job Hazards Analyses.

Purpose:

The purpose of the University Fall Protection Plan, herein referred to as the Plan is to ensure that University employees and students who perform activities at heights have the knowledge and tools to work safely. This program applies to elevated work surfaces at 6 feet or greater above the lower level. Protection must be provided for all personnel who are exposed to potential hazards at heights.

Application:

This program applies to work performed by any UT Tyler employee, student, or contractor performing work that is above 6 feet or greater. Extension and A-frame ladders are not subject to this program. Fall protection must be provided whenever the length of a fixed ladder equals or exceeds 24 feet. This Plan does not include stairwell guardrails or handrails. This Plan does not apply to Landscape Services' arborists who are performing tree climbing with rope and saddle. They must comply with the arborist tree-specific plan. Arborists must comply with the University Fall Protection Plan when performing work at heights, when not in trees.

Notice:

An unprotected edge, also called a leading edge, is any wall or parapet that is less than 39 inches or a wall opening that is at least 30 inches high and at least 18 inches wide. Leading edges, for the purposes of the University, occur at 6 or more feet above a lower level. No one should access areas where leading edges exist without the authorization, training, and proper personal protective equipment to do so safely.

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. Noncertified 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.)

Corrosive Environment: An area that is located in a maritime environment (Marine Science Institute) or close to where corrosive chemicals or salts are being handled or discharged (CPE, WEL, NHB, MBB, Chilling Stations, etc.).

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.

Leading edge: The unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as deck) which changes location as additional floor, roof, decking or formwork sections are placed, formed or constructed.

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.

Rip-Stitch Impact Indicator: A rip-stitch impact indicator reveals an inner warning label when the lanyard has been subjected to a fall.

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 of rescue component and a self-closing gate to retain the component within the opening.

Student: Anyone enrolled at the University for undergraduate, graduate, or part-time studies who is not paid a salary.

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.

Tongue Buckle: The tongue buckle works by inserting the loose strap of webbing through the buckle placing the tongue through the appropriate grommet hole. Push remaining webbing through the keeper.

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.

Vertical Lifeline Subsystem: An assembly, including the necessary connectors, comprised of a vertical lifeline component and, optionally, an energy absorber and a lifeline tensioner component.

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.

Roles and Responsibilities:

Environmental Health & Safety (EHS) has overall responsibility for the program administration including the training, evaluation, inspections, and audits. EHS conducts periodic audits of the workplace to ensure that this program is being effectively implemented. EHS has the final authority over all safety issues and may halt operations or practices it considers an imminent danger at any time.

1. Environmental Health & Safety (EHS) will:
 - Ensure that the operation and maintenance manuals of personal fall protection equipment and components are made available to each user.
 - Conduct hands-on training.
 - Identify 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.
 - Provide all users with the necessary training, tools, and equipment to perform working at heights safely.
 - Ensure the personal fall arrest or restraint systems they own or borrow, are maintained in accordance with the manufacturer's specifications.
 - Have the authority to halt work at heights any time unsafe operations or conditions exist to either the participants or personnel below the affected area.
 - Understand hazards specific to their areas and communicate these to potentially affected individuals.
 - Ensure modifications are not made to anchorage component systems or personal fall protection systems without manufacturer's prior approval.
 - Ensure that personnel attend and complete all required training.
2. Project Managers (Supervisors) will:
 - Ensure that personnel are trained and appropriately use all fall protection equipment as needed.
 - 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 inspection records are maintained for fall protection equipment for their area.
 - Immediately take out of service any defective or damaged equipment. Ensure that equipment is either serviced or replaced.
 - Notify EHS if a fall occurs.
 - Ensure that prompt rescue, typically this is thirty minutes or less, of employees and students 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 rescues (refer to the rescue section for further details).
3. Employees, contractors, and students will:
- Maintain all PPE required to work safely at heights.
 - Ensure that while working at heights, hazards are not created for personnel below.
 - Inspect all the components of fall protection systems and personal fall protection equipment prior to use.
 - Complete the University online training, hands-on training, and review manufacturer's specifications every two years.
 - Adhere to manufacturer specifications for the safe operation of all equipment.
 - Report any defective building structures such as anchor points or guardrails to Facilities Operations Maintenance (FOM).
 - Immediately report damaged or defective personal fall arrest or restraint systems components to the supervisor or Environmental Health & Safety.
 - Report any unsafe or hazardous conditions to their supervisor.
 - Report all falls immediately to their supervisor.

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:

- Restricting access
- Housekeeping
- 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:

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

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 or students 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.

Sky Lights:

Each employee and student 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 guardrail 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 workers 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, etc.). 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. All 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.

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 the manufacturer specifications. System weight limits must not be exceeded without written permission from a Texas 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.
- The typical length of a fall arrest lanyard is 6 feet, provided that the user will not contact objects or a lower level.
- The typical deceleration distance, or distance it takes to bring a user, to a complete stop, is 3.5 feet.
- Personal fall arrest systems shall have sufficient strength to withstand twice the potential impact energy of the falling user.

- 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.
- Limit free fall to 2 feet or less.
- Lifelines shall be protected against cutting and abrasion.

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 leg strap. 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:

- Hot objects, sparks, flames, or heat producing operations
- Sharp objects or abrasive surfaces
- Moving equipment
- Electrical hazards
- Chemicals used either by the wearer or near the wearer
- 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.

Restraint Systems:

A restraint lanyard is a device that 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:*

- It should only be long enough to get to the edge of the walking surface and not over it;
- It can withstand a force of 3,000 lbs. applied to the device when the lifeline or lanyard is fully extended; and
- It does not have a deceleration device on it.

All components of personal fall arrest/restraint systems must be appropriate for the workplace conditions and environment.

1. Fall Arrest Lanyards and Life Lines:

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.

2. Ropes and Straps (webbing):

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

3. 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.

4. 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.

5. Self-retracting Lifeline 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.

6. 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, 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.

7. 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.

8. D-rings and Snap Hooks:

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;
- To each other;
- 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; or
- On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines.

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.

9. 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.

Prohibited Conditions:

1. Using or providing damaged or defective equipment.
2. Use of a body belt for anything other than a positioning device.
3. 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.

4. Using equipment for activities other than its intended, specified purpose.
5. Putting a load on any component that is greater than it has been rated for.
6. Not notifying supervisors of activation through a fall of anchor points, lanyards harnesses or any component of fall protection device or system.
7. Warning lines on steep slope surfaces exceeding a 4/12 roof pitch (must use personal fall protection equipment instead).
8. 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.
9. Attaching personal fall protection systems to guardrails or hoists that have not been certified by a qualified person.
10. Tying a knot in lanyards, lifelines or anchorage connectors. The use of knots decreases the efficacy of the load rating.
11. Tying off to fire protection piping, conduit, ductwork piping or other structures that are not intended nor designed for fall protection and haven't been approved for such application by a qualified person *They are not designed to withstand the load required for anchorage systems.*
12. Tying around "H" or "I" beams unless a webbing lanyard or wire core lifeline, or other equivalent connector is used (beam-straps or cross arm straps). *Avoid tying off around rough or sharp edges.*

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 webbing for cuts, tears, holes, mildew, enlarged eyeholes, and any other signs of wear that may affect the integrity of the equipment.
- Examine the stitching for damage or signs of weakening.
- 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 lifelines and lanyards for fraying, broken strands, cuts, abrasions, chemical damage, discoloration, or deterioration that may affect the effectiveness of the equipment.
- Examine anchor points to ensure it has not become unseated, that there no cracks, deformities, or other damage.

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. Most harnesses come with indicators that signify the harness has seen impact. It might be plastic designed to break, loose D-rings with an exposed alert color, or popped stitches on the back strap. Contact Environmental Health and Safety by calling 903-565-5663 to have the anchor point inspected and certified.

Quarterly Inspection:

Personal fall protection systems must be inspected quarterly by a properly trained employee. Quarterly 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 or illegibility of marking;
- Absence of any elements affecting the equipment form, fit, or function;
- 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;
- Alteration or the absence of parts or evidence of defects in, damage to, or improper function of mechanical devices and connectors;
- 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; and
- Stitching for breaks, ragged strands, loose or rotted threads, and for other signs of weakening;
- Any other condition that calls in to question the suitability of the equipment for its intended purpose.

Self-retracting lifeline should be inspected for

- Damage to external casing
- Functionality of locking mechanism
- Other signs of damage, deterioration, and defects
- Check webbing/wire rope for cuts, burns, abrasions, discoloration, mold, broken wires, stitching and load indicators
- Hardware components, such as snap hooks and carabineers should be inspected for damage, corrosion, sharp edges, burrs, cracks, deformation (Gates should operate smoothly and close completely)

The quarterly equipment inspection must be documented on an inspection form. When an 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.

Inspection of Guardrails & Railing:

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 Environmental Health and Safety by calling 903- 566-7011, who will be responsible for evaluation of the issue and repairs, if needed. An example of some common issues with guardrails are:

- Loose connections, components, deformation, cracks, or damage.
- 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.
- 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.

Inspections of Anchor Points by 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. 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 an Environmental Health and Safety designated vendor 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:

- Verify with Environmental Health and Safety that anchor is in good working order. If anchor does not have EQID or is tagged out contact Environmental Health and Safety to have inspection performed.
- 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

Should any of the above conditions be noted, Notify Environmental Health and Safety by calling 903-565-5663 and provide the location 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 an Environmental Health and Safety designated vendor performs an inspection and verifies that it is in good working condition and safe to use.

Care & Storage 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.

- 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.
- Keep in clean dry areas and away from direct sunlight, which can degrade the synthetic webbing.
- Harnesses should be hung up, when feasible, by their D-rings.
- Fall protection equipment must be kept away from solvents, acids, corrosives, oils, or any materials that could damage or degrade them.
- 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.
- 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, by radio, etc.
- The attendant must be able to immediately contact rescue personnel. In the City of Tyler this can be accomplished by calling 9-1-1. 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, such as the theatrical arts, if the student or employee who has fallen can be reached safely using an aerial lift, then rescue can be performed by placing the lift underneath

the fallen individual. The suspended individual must not be detached from their lanyard until they are completely inside the lift.

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 6 feet from a leading edge/walking-working surface with an unprotected side or edge that is 4 feet or more above a lower level or a low sloped roof.

- At 6 feet from the edge: conventional fall protection (guardrail, fall restraint or fall arrest system) is required.
- Between 6 feet and 15 feet from the edge: conventional fall protection (guardrail, fall restraint or fall arrest system) is required. A secured designated area in lieu of conventional fall protection is acceptable as long as the work is both "infrequent and temporary"
- 15' and greater from the edge: conventional fall protection (guardrail, fall restraint or fall arrest system) is required. The employer is not required to provide any fall protection, provided the work is both infrequent and temporary.

Lift Safety:

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

<https://www.utt Tyler.edu/safety/construction-safety/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:

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

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:

Review Ladder Safety <https://www.utt Tyler.edu/safety/construction-safety/ladder-safety-program/> for portable ladder safety. Fall protection must be provided whenever the length of a fixed ladder equals or exceeds 24 feet. This can be accomplished by using the buddy system (one employee will hold the ladder in place while the other is working) or other fall arrest methods.

Confined Space:

A harness with a 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, wristlets, also referred to as wrist harness, may be used for the purpose of rescue.

Training:

No student, staff, or faculty shall work at heights without the proper training. All student, staff, or faculty who work at heights must successfully complete both the online training and hands-on site-specific training initially and every two years thereafter.

Retraining:

When with Environmental Health and Safety, or the supervisor has reason to believe that any employee or student, 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 workplace render previous training obsolete.
- Changes in the types of fall protection systems or equipment to be used 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 Retention:

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 3 years. Training records for all users must be kept at a minimum of 3 years.

Annual Compliance Review

The Safety Organization will review the program annually to determine how the program can be improved. EH&S will strive to keep all programs up to date, with accurate information that employees, and outside contractors can rely on.

Revisions

Date	Author/Reviewer	Description/Reason for Change
5/4/2021	T Bay/ P Tate	Reviewed for latest revision/updated year/added revision section
7/5/2021	T Bay/ P Tate	Added info for inspections & leading edge requirements
6/13/2022	T Bay/ P Tate	Reviewed and updated date
7/7/2023	T Bay/ K Stapp	Reviewed, updated logo & date