

# UNIVERSITY OF TOLEDO

SUBJECT: FALL PROTECTION PROGRAM

Procedure No: S-08-010

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## PURPOSE OF PROGRAM

The purpose of the University of Toledo's Fall Protection Program is to ensure that affected employees can identify and control fall hazards in order to protect themselves against those hazards. This program shall be used in conjunction with UT's policies and procedures involving the protection of workers in the workplace.

## PROGRAM

This program applies to all University of Toledo employees and pertains to any activities being conducted in elevated locations by University personnel where there are potential fall hazards 4 foot or greater. There are two types of fall protection equipment, FPE, primary and secondary. Primary FPE refers to stationary objects that act as engineering controls for the prevention of falls. Secondary FPE refers to devices attached to structures whose sole use is for fall protection anchorages, and devices used for fall protection that a user attaches to them (lanyards harnesses, elbow straps, etc.) This program primarily pertains to secondary FPE worn by the user and attached to structural anchorage points.

The following fall hazards are NOT covered under the scope of this program:

- Stairways and fixed ladders less than 20 feet in height; 29CFR1926 Subpart X
- Construction of electric transmission and distribution lines and equipment; 29CFR 1926 Subpart Y
- Steel erection; 29 CFR 1926 Subpart R
- Cranes, Derricks, Hoists, Elevators and Conveyors; 29 CFR 1926 Subpart N
- Scaffolding; 29 CFR 1926 Subpart L
- Tunneling Operations and Equipment; 29 CFR 1926 Subpart S

Fall protection requirements regarding these situations are found in other parts of the OSHA Construction and General Industry Standards. In addition, this program does NOT cover retrieval equipment used for confined spaces on campus.

The following fall hazard IS covered under the scope of this program:

- Portable ladders.

Appendix A in this program will cover all the necessary measure to be taken when using a portable ladder.

Appendix B in this program is a FPE Inspection checklist

## TYPES AND SELECTION OF FALL PROTECTION EQUIPMENT

A Personal Fall Protection System is comprised of three (3) key components.

1. Anchorage Connector
2. Body Wear such as Lanyard
3. Connecting Device to join them.

FPE is selected and used to meet the design requirements for the following four **(4) categories of fall protection systems:**

1. **Fall Arrest Systems** which are used to slow or stop a person during a fall an elevated location. As a general rule, it is recommended that a fall arrest system be used at working heights of four (4) feet or more; however, regulatory agencies vary the height –use requirements based on tasks or industries. For example, in construction, fall protection is required at six (6) feet or above and with scaffolds fall protection is required at

ten (10) feet or more. Contact Environmental Health and Radiation Safety to assure compliance with codes prior to procuring and using fall arrest equipment. The fall arrest system consists of an anchorage connection, a connecting device such as a shock-absorbing lanyard, a self-retracting life line and body wear such as a full-body harness.

2. **Positioning System** which is used to hold a worker in place while allowing a hands-free work environment at elevated heights. The positioning systems are not designed for fall arrest and, therefore, a back-up fall arrest system must be used.
3. **Restraint System** which is used to restrict the worker's movement to prevent reaching a location where a fall hazard exists. The restraint systems are not designed for fall arrest and, therefore, a back-up fall arrest system must be used. An example is when a Horizontal Fall line is utilized with body wear such as a full-body harness, a connecting device and an anchorage connector.
4. **Suspension System** which is used widely in the window washing and painting industries and are designed to lower and support a worker while allowing a hands-free work environment. An example of a suspension device is a Boatswain chair.

Retrieval Systems are primarily used in confined spaces applications where workers must enter tanks, manholes, etc. and may require retrieval from above should an emergency occur. Retrieval systems may also be used in rescue after a fall has occurred and the victim is hanging by the fall arrest system in suspension

Prior to the selection of any fall protection method, the strength of the walking/working surface shall be determined by a competent person or supervisor. The walking/working surface shall be capable of supporting the expected loads, including a safety factor. Depending on the circumstances or type of work fall protection may be required when workers are exposed to falls of

Zero feet – The use of FPE is required when working above or adjacent to dangerous equipment or hazardous chemicals. In addition employees must be protected from falls through any skylights or roof openings by installing either a standard guardrail system along all exposed sides or a cover that is marked, secured and capable of supporting at least 2 times the maximum load.

4 feet or more (all workplaces)

5 feet (ship building and repair)

6 feet (concrete and masonry work such as construction)

8 feet (longshoring)

10 feet or more for employees engaged in roofing work or leading edge work, steel erection, working on scaffolds and for fire fighters and ski lift workers.

OSHA generally encourages the employer to select engineering controls first when attempting to control a hazard. Examples of engineering controls include guardrails, barriers and covers. Refer to Section 1926.501 of the OSHA Standard.

#### Site Specific Fall Protection Plan

Site Specific Fall Protection Plans (SSFPP) will generally not be used by the University as a means of protecting employees/students from falls. The Environmental Health and Radiation Safety (EHRS) Department will work with supervisors, and outside consultants if needed, to provide a physical means of fall protection for all workers.

#### Guardrail Construction Details

To obtain details on guardrail construction, refer to Section 1926.502(b) of the OSHA Standard. Important points to consider include a toe board, height of the rails, midrails or screens, and strength requirements. When an individual's center of gravity is located outside of the protection offered by the guardrails, alternative fall protection is necessary. Examples of this situation include individuals working on stilts, leaning over, through or under guardrails to perform work, or employees on portable ladders working near the edge of a roof, open-window, or floor opening. Guardrails can be used for many fall protection applications.

### Positioning Devices

Positioning devices such as safety belts are no longer an acceptable means of fall protection. Full-body harnesses must be used for fall hazard protection. Refer to Section 1926.502(e) in the OSHA Standard regarding positioning device requirements. Note the strength for snaphook requirements for positioning devices.

### Warning Line System

Warning lines may be used on low-sloped roofs in combination with other controls such as safety monitors, guardrails and personal fall arresting equipment or nets. Warning lines shall be made of rope, wire, or chains and flagged every six feet with highly visible material. The line shall be supported by stanchions and the line shall be between 34 and 39 inches above the walking/working surface. The stanchions shall be capable of withstanding a horizontal force of 18lbs. without tipping over. The warning line shall have a minimum tensile strength of 500lbs. Additional details regarding warning lines can be found in Section 1926.502(f) of the OSHA Standard.

### Controlled Access Zones (CAZs)

A controlled access zone may be used as an option for overhand bricklaying and related activities or as part of a Site Specific Fall Protection Plan. Only authorized employees may enter this zone. Controlled access zones shall be provided between six and twenty-five feet from an unprotected or leading edge, except for precast concrete work. The controlled access zones will be marked by a line that consists of rope, wire, tape or equivalent materials, supported by stanchions and flagged every six feet. The line must have a minimum breaking strength of 200lbs. and be located between 39 and 45 inches above the walking/working surface. The line must be approximately parallel to the leading edge or exposed edge, and should be fastened to a secure surface such as a guardrail.

### Safety Monitoring

For this section, the term “at risk” individual shall be an individual potentially exposed to a fall hazard.

A safety monitor is a competent individual (able to recognize fall hazards), located on the same working/walking surface as other at-risk individuals, who shall warn the individuals if they are acting in an unsafe manner that could result in a fall or are unaware of a fall hazard. The monitor shall be able to see the employees, not have other immediate work responsibilities, and orally communicate with the at-risk individuals. Safety monitors may be used on low sloped roofs less than 50 feet in width as the sole means of protection. Safety monitors may be used for low-sloped roof work in combination with other controls or in a Site Specific Fall Protection Plan. See section 1926.502(h) in the OSHA Standard for additional details regarding safety monitors.

### Covers

Covers shall be capable of withstanding at least twice the expected maximum load. The load could be any of the following based on the project: axle load, weight of equipment, or weight of person. Consideration should be given to concentrated and impact loads. The covers shall be secured to prevent movement and either color coded or labeled “HOLE” or “COVER”. See section 1926.502(i) of the OSHA Standard for additional details.

### Personal Fall Arresting Equipment

Personal fall arresting equipment should be purchased from a single manufacturer. The equipment is tested as a system and substitution of equipment from another manufacturer of personal fall arrest equipment could result in a component or system failure. It is important to realize that components from a single manufacturer may not be compatible with all types of fall protection equipment. Personal fall arresting equipment shall be used only for this purpose. Personal fall arresting equipment and associated system components are designed for a combined weight (employee plus tools, etc.) of 310lbs. If the combined weight exceeds 310lbs., system modifications may be necessary.

Free-fall distance shall be kept at a minimum. In no cases shall the free-fall distance exceed 6 feet. Free fall in excess of this distance can result in system failure and/or injury. In most situations the anchor point should be located near or above the shoulder level. In selecting fall protection equipment, consideration should be given to the possibility of injuries associated with “swinging” after the fall, retrieval and the location of where the individual will be after the fall.

Consideration should be given to conditions that could affect the performance of the equipment selected. The following is a short list of conditions that could adversely affect the equipment being used: temperature extremes, use of corrosive substances (solids, liquids or gases), welding/torch cutting, abrasive blasting, high moisture, grease/oil, and

chemicals. Wire rope should never be used where an electrical hazard exists, nor should it be used without a shock-absorbing lanyard.

Safety belts are not acceptable for personal fall arrest equipment, but may be used for positioning. Equipment designed for fall protection shall not be used for positioning. Shock absorbing lanyards shall be used where possible. Lanyards, lifelines, full-body harnesses shall be protected against abrasion or cutting. Special beam wraps are available for anchor points that would cause a lanyard to abrade or be cut. See your supervisor for information on using beam wraps.

#### Anchor Points

Anchor points must be capable of supporting 5000lbs. per attached employee. The adequacy of an anchor point must be determined by a competent individual. Where there is doubt about the strength of an anchor point, an engineer must be consulted. Permanently installed anchor points should be provided for fall hazards that are routinely encountered. Anchor points for fall protection and exposed to corrosive conditions (acids, bases, moisture) should be corrosive-resistant.

### **TRAINING AND EDUCATION**

Each employee exposed to a fall hazard shall be trained to recognize the hazards and take action to prevent a fall. Training shall be provided by a competent person and shall cover the following topics:

- The nature of the fall hazard;
- The correct procedures for erecting, maintaining, disassembling and inspecting the fall protection system to be used;
- The use and operation of guardrails, personal fall arrest systems, safety net system, warning line system, safety monitoring systems, controlled access zones and other protection to be used;
- The role of each employee in the safety monitoring system;
- The limitations of the use of mechanical equipment during the performance of roofing work on low-sloped roofs;
- The correct procedure for the handling and storage of equipment and materials and the erection of overhead protection;
- The role of employees in the Fall Protection Program and;
- The OSHA Fall Protection Standard

### **RETRAINING**

Retraining (refresher) shall be provided when any one of the following exists:

- Changes in the workplace or fall protection equipment that render previous training obsolete or;
- If the individual demonstrates a lack of knowledge regarding the basic components of the Fall Protection Program and
- At intervals deemed acceptable by the supervisor.

### **EQUIPMENT INSPECTION**

Personal fall arresting equipment (body harness, lanyard) that has been subjected to a significant fall shall be discarded. Equipment shall be maintained in accordance with the manufacturer's guidelines and inspected prior to each use. The fall protection equipment shall be inspected annually by a competent person. The inspection checklist, Appendix B in this program, can be utilized to document the inspection. If any deficiencies are identified during the inspection the equipment must be taken out of service until the deficiencies are addressed and/or corrected.

The following should be checked:

**D-Rings** - Cracks, distortion, corrosion, pitting, or excessive wear.

**Buckles** - Distortion, sharp edges or cracks.

**Body Harness** - Burns, damage due to chemicals, cuts, abrasion to the material, or broken stitches. One of the best ways to check the material is to hold sections of the material between the hands and bend the material into a U-shape to look for damage.

**Keepers and Snap locks** - Make sure they operate correctly. Do not rely on the sound of the latches, they must be connected.

**Retractable Lines** - They should operate smoothly. The rope or cable should not be damaged. A quick pull of the line should cause the line to lock. The retractable lifeline assemblies shall be returned to the factory for recertification as specified by the manufacturer. In most cases, the manufacturer specifies an annual inspection. Check the date on the unit for the last certification.

**Lanyard (rope, webbed, or cable)** - Look for cuts, frayed parts, damaged fibers, and the condition of connections. There should be no knots in the line. A knot can result in a substantial reduction in strength.

**Shock Absorber** - Check for ripped stitches, signs of impact loading and connections.

### **POSTING OF FALL HAZARDS**

Fixed (non-transient) fall hazards that are routinely encountered should be posted with signs stating "Fall Protection Required". The signs shall be posted at a location where the fall hazard is first encountered. If there are multiple entry points where the fall hazard is encountered, each location should be posted. Signs shall be posted by the department that has control of the fall hazard.

### **HEAD PROTECTON**

The Fall Protection Program is based on individuals working at least six feet above a lower level. It is presumed that the potential for head injuries exists for any person(s) at the lower level. Hardhats should be donned by all individuals, including visitors, on a job where a fall hazard exists.

### **PROVISIONS FOR RESCUE**

Provisions shall be made for the rescue of employees who have fallen into a net or are suspended by their personal fall arresting equipment. Such provisions shall take the form of ladders, lifts, ropes, combined fall arresting/retrieval body harnesses, etc. If the rescue is likely to endanger the individual who has fallen, or the rescuers, call 911 to initiate the rescue process.

### **FALL PROTECTION CONSIDERATIONS FOR NEW CONSTRUCTION AND RENOVATIONS**

All new construction must provide fall protection in accordance with applicable building codes. One factor that may be overlooked is the provision for fall protection during building maintenance (e.g. roofing). Provisions should be incorporated into the building design by the University or contracted engineers for fall protection anchoring devices. Anchor points and cable or rail systems for fixed ladders are two examples of overlooked features.

Source: Safety & Health Committee

References include:

29 CFR 1910.66 Powered Platforms for Building Maintenance  
29 CFR 1910.25-27 Portable and Fixed Ladders  
29 CFR 1926.500 Subpart M Fall Protection in Construction  
29 CFR 1926.501 Duty to Have Fall Protection  
29 CFR 1926.104 Safety Belts, Lifelines and Lanyards  
ANSI A92.5 Boom Supported Elevated Platforms  
ANSI Z359.0 – Z359.4 Fall Protection For General Industry

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## APPENDIX A

### Portable Ladders

#### Ladder Purchasing

- A. All ladders shall be Type I, rated for 300 lb. duty or greater
- B. All Ladders shall be wood or other non-conductive material. There will be no purchase of aluminum ladders.
- C. Self-leveling feet are strongly recommended for all ladders, although not mandatory on wooded folding ladders. All extension ladders shall have anti-skid self-leveling feet.

For the purposes of this policy, a ladder is defined as an appliance, usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in an ascending or descending direction.

It is the responsibility of department managers in those departments where ladders are supplied, to develop a departmental specific program to address the following:

- Only ladders which meet the specifications of the Occupational Safety and Health Administration (OSHA) shall be purchased.
- Ladders shall not be used for purposes other than their designed intent.
- Ladders shall be selected as appropriate for the task at hand. For example, metal ladders should not be used in or around electrical installations.
- Step-ladders shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in an open position.
- Ladders shall be inspected prior to use and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Danger, DO NOT OPERATE" (i.e., splintering, loose construction, missing rubber feet). The inspection should evaluate the conditions of the steps, rough edges or indications of splintering, skid pads or feet of ladder and the condition of spreader bars.

#### Ladder Safety

- A. Perform visual inspection of ladder and look for obvious defects such as broken steps or missing spreader bars
- B. Check area where ladder is to be erected to assure that there is sufficient clearance for the ladder
- C. Set up the ladder and test for stability. Unstable ladders should be adjusted until stable
- D. Do not use the top two steps, as it reduces the stability of the user and increases the likelihood of falling.
- E. Do not leave ladders standing when unattended or not in use. Return the ladder to proper storage when it is no longer needed.

Non self-supporting ladders shall be erected on a sound base with the base of the ladder a distance from the wall or upper support equal to one-quarter the length of the ladder, and placed to prevent slipping (4' to 1' ratio).

The top of a ladder used to gain access to a roof should extend at least three feet above the point of contact.

This policy contains general guidelines and additional information related to Portable Wood Ladders (29CFR1910.25), Portable Metal Ladders (29CFR1910.26) and Fixed Ladders (29CFR1910.27) require the user to consult the listed OSHA standard.