

Tarleton State University  
**Fall Protection Program**

Office of Risk Management and Safety  
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# **Tarleton State University**

## **Fall Protection Plan**

Tarleton State University is dedicated to the protection of its employees from workplace injuries. All Tarleton employees have the responsibility to work in a safe and conscientious manner. The following information is provided to assist Tarleton State University departments meet safety requirements for fall protection.

### **I. Scope and Purpose**

The purpose of this plan is to supplement the Tarleton State University Safety Manual and other standard safety procedures by providing guidelines that cover fall protection for employees. Also, this plan is to ensure that employees are trained and aware of the provisions to be implemented by this plan prior to project initialization.

This program applies to all Tarleton State University employees that perform any duties on an elevated work surface where there is a fall hazard of 6 feet or more to a lower level. Employees will not be allowed to perform any duties which require the employee to work closer than 6 feet to an unprotected edge, platform, walkway, or utilize elevated equipment unless the employee is properly secured from falling.

In addition, this program shall apply to all employees in order to minimize slips, trips and falls on the same working elevation. Employees shall control fall hazards in their work area by maintaining good housekeeping and shall report conditions that may lead to slips, trips and falls to their supervisor.

Contractors working on Tarleton State University property are required to comply with all applicable safety regulations and have their own fall protection program. Contractor safety programs shall be available for review upon request by TSU.

### **II. Responsibilities**

Departments affected by this program include, but are not limited to:

- Facilities – including HVAC, Grounds, M/E/P, Building Maintenance, Construction & Planning
- Telecommunications
- Residential Living & Learning
- Environmental Services

A. The Tarleton Department of Risk Management and Safety will:

1. Assist with training as appropriate
2. Monitor program compliance
3. Conduct periodic visits to elevated work locations in order to inspect equipment and observe employee procedures

- B. The applicable director will:
  - 1. Implement this Fall Protection Plan.
  
- C. The Construction Supervisor/Foreman will:
  - 1. Ensure program requirements are met
  - 2. Perform safety checks on work operations and the enforcing of procedures
  - 3. Correct unsafe acts or conditions immediately
  - 4. Assist with training as appropriate for affected employees
  - 5. Provide necessary equipment for the program
  - 6. Conduct periodic inspections to assure program compliance
  
- D. The employee will:
  - 1. Follow guidelines described in this program and other required programs to assure safe working conditions
  - 2. Make known to his/her supervisor any unsafe conditions or acts that might result in injuries to himself or other employees
  - 3. Perform all work safely, in accordance with applicable guidelines, rules and regulations
  - 4. Inspect all personal fall arrest components prior to each use for mildew, wear, damage and other deterioration. Defective components shall be removed from service and reported immediately to the employees' supervisor and RMS

In addition, employees who use fall arresting equipment should be knowledgeable of the following:

- Application limits of the equipment
- Proper hook-up, anchoring and tie-off techniques
- Determination of lifeline/lanyard elongation and deceleration distance
- Methods of use, inspection and storage of equipment

### III. Procedures

- A. Supervisors should conduct pre-construction safety meeting to review equipment and techniques to be used on project. Ensure all employees are aware of their specific tasks.
  
- B. Refer to 29 CFR 1926 Subpart M, the Tarleton Safety Manual, and other guidance documents as needed.
  
- C. Multiple locations on Tarleton State University campus require the use of fall protection equipment and implementation of fall protection safety techniques. In addition, there are areas on campus to which fall protection equipment and anchors have been incorporated.
  - 1. Areas incorporating Miller Sure Track fall protection system include:
    - a. Science building room 102
    - b. Fine arts at the projection room

- c. Central plant cooling towers 1 and 2
  - 2. Areas incorporating fall protection pedestals and anchors include:
    - a. Hunewell complex
    - b. Texan Village complex
    - c. Centennial dormitory
    - d. Traditions roof and vertical pipe chase
    - e. Pressbox roof
  - 3. Other recommended locations include:
    - a. High mast light poles at baseball field, softball field, intramural complex and football stadium
    - b. Fine arts catwalks
    - c. Ladders – fixed, free standing, temporary or roll-away type
    - d. Elevating personal platforms – scaffolds, aerial platforms, scissor lifts, forklift-mounted platforms, etc.
    - e. Elevated Surfaces – roofs (closer than 6 feet to the edge), skylights, scaffolds, boilers/chillers, etc.
    - f. Vertical Openings – ground level entry into excavations, trenches, holes, pits, vessels and other confined spaces
    - g. Vertical Openings – other than ground level access into vessels and other permit required and/or non-permit required confined spaces
- D. Personal fall protection requirements on aerial work platforms (boom lifts, scissor lifts and scaffolding) shall be as determined by the equipment manufacturer and all applicable ANSI standards. Employees should be knowledgeable of the manufacturer’s operating instructions and shall have received classroom and functional operations training on any aerial lift they are assigned to use.

While fall protection devices are required in boom-supported aerial work platforms, they are not required in scissor-lifts. To clarify:

- A boom-supported aerial lift is an elevating work platform that raises and lowers the work platform vertically, and also articulates 360 degrees to allow the platform to move in all directions horizontally.
- A scissor lift is an elevating work platform which can only raise and lower the work platform vertically.

1. Supervisors will ensure that employees:
  - a. Receive initial and periodic training as needed.
  - b. Are competent to operate a work platform, as demonstrated by successfully completing the training program.
  - c. Only operate platforms for which they have been trained.
  - d. Operate work platforms safely.
2. Employees will:
  - a. Inspect and perform safety checks on the work platform before each use.

- b. Report any deficiencies found during pre-use inspections to supervisor.
  - c. Operate work platforms safely to prevent injury and/or damage.
  - d. Not operate a work platform for which they have not been trained.
3. All occupants in boom-supported aerial work platforms must wear personal fall protection with the lanyard attached to the designated anchorage *at all times whenever they are in the platform*.
4. A personal fall protection system used on a boom type aerial lift cannot allow the operator to fall more than 6 feet, exceed 1,800 pounds arresting force, or allow the operator to come into any contact with any lower surface.
5. A body belt used in a fall arrest system or with a self-retracting lifeline/lanyard is NOT allowed on any aerial lift.
6. Approved personal fall protection equipment for boom-supported aerial work platforms include:
  - a. Full body harness with fall restraint system.
  - b. Full body harness with self-retracting lifeline/lanyard system – this system can be used when the platform height is above the lanyard manufacturer’s minimum anchor elevation.
  - c. Full body harness with double lanyard (fall arrest and fall restraint – the fall restraint lanyard shall be used during travel and when platform height is below the calculated total fall distance. The fall arrest lanyard can be used when the platform height is above the calculated total fall distance.
  - d. Body belt with fall restraint arranged so that the employee is not exposed to falling ANY distance outside the platform.
  - e. When calculating the total fall distance take into consideration the following:
    1. Lanyard free fall distance
    2. Maximum allowable deceleration distance
    3. Maximum lock-up length (for self-retracting lifeline/lanyard only)
    4. Any stretch in the lifeline or lanyard outside of the deceleration distance
    5. The height of the operator
    6. Any harness effects
    7. Ensure that the required clearance between the operator and the lower surface is met
    8. Any movement of the platform due to dynamic loading
    9. Any obstruction under the platform
7. During transportation of a man lift or scissor lift - wearing of tool belts and the transportation of freight, packaged goods, toolboxes, lumber or other construction materials is strictly prohibited.
8. Employees should always perform a pre-work inspection of the aerial lift, as well as an inspection of the work area to identify any dangerous conditions such as:
  - Uneven surfaces

- Overhead Obstructions
  - Power lines (always be aware of minimum safe approach distances)
7. Employees working on scaffolding should be knowledgeable of:
- Any electrical hazards, fall hazards and falling object hazards in the work area.
  - Correct procedures for dealing with electrical hazards and for erecting, maintaining and disassembling scaffolding, the fall protection systems and falling object protection systems being used.
  - Proper use of the scaffold and proper handling of materials on the scaffold.
  - Maximum intended load and the load carrying capacities of the scaffold.
8. Scissor lift/boom lift platforms shall not be raised in windy or gusty conditions. (The manufacturer recommends not raising the lift if wind speed is 28 mph or greater.)
- E. Use the following fall protection equipment or techniques when possible and as appropriate (*see Appendix A, definitions*):
1. Safety nets
  2. Guardrail systems
  3. Warning line systems
  4. Controlled access zones
  5. Personal fall arrest systems
  6. Positioning Device Systems
  7. Scaffolding systems
  8. Safety monitoring system
  9. Cross-over straps

Fall Protection Equipment is available for check out through the Maintenance Warehouse and the Office of Risk Management and Safety. Employees must be trained on how to properly use fall protection equipment before the project or work begins.

Fall protection harnesses, lanyards, etc. should be inspected annually by RMS in accordance with manufacturer's recommendations.

- F. Use Safety Monitoring System as described in 29 CFR 1926 as the very minimum in fall protection. When safety monitoring is the only technique/equipment employed, limit employee exposure risk as much as possible and for the shortest periods of time as feasible.
- G. Do not conduct open area construction activities over 6 feet above ground level during adverse weather conditions such as high winds, wet surfaces, lightning, or other hazardous weather situations.
- H. If, in the opinion of the applicable director, the Construction Supervisor, and the Tarleton Office of Risk Management and Safety, exposure risks on a

project are excessive and cannot be mitigated through the use of the 'Fall Protection Plan' recommend through the Director of Facilities completion of the project by outside contractors.

#### IV. Reference

Occupational Safety and Health Administration, 29 CFR Part 1926, Subparts L and M, July 14, 1999.

APPENDIX A  
**DEFINITIONS**

- **Anchorage** is a secure point of attachment for lifelines, lanyards, or deceleration devices.
- **Body Belt** is a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.
- **Body Harness** are straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with means for attaching it to other components of a personal fall arrest system.
- **Buckle** is any device for holding the body belt or body harness closed around the employee's body.
- **Connector** is a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabinier, or it may be an integral component of the system (such as a buckle or "D" ring sown into a body belt or body harness, or a snap-hook spliced or sown to a lanyard or self-retracting lanyard).
- **Controlled Access Zone** (CAZ) is an area in which certain work (e.g. overhead bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.
- **Dangerous Equipment** is equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall into such equipment.
- **Deceleration Device** is any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or limit the energy imposed on an employee during fall arrest.
- **Deceleration Distance** is the additional vertical distance a falling employee 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 an employee'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 employee comes to a full stop.
- **Equivalent** are alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials, or designs specified in the standard.

- **Failure** is load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.
- **Free Fall** is the act of falling before a personal fall arrest system begins to apply force to arrest the fall.
- **Free Fall Distance** is the vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
- **Guardrail System** is a barrier erected to prevent employees from falling to lower levels.
- **Hole** is a gap or void two (2) inches or more in its least dimension, in a floor, roof, or other walking/working surface.
- **Infeasible** means that it is impossible to perform work using a conventional fall protection system (i.e., guardrail system, safety net, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.
- **Lanyard** is a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.
- **Leading Edge** is the edge of a floor, roof, or form-work for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or form-work sections are placed, formed, or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.
- **Lifeline** is a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
- **Low-slope Roof** is a roof having a sloop less or equal to four-to-twelve (4:12) (vertical to horizontal).
- **Lower Levels** are those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms,

ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

- **Mechanical Equipment** is all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcars.
- **Opening** is a gap or void thirty (30) inches or more high and eighteen (18) inches or more wide, in a wall or partition, through which employees can fall to a lower level.
- **Personal Fall Arrest System** is a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connects, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
- **Positioning Device System** is a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.
- **Rope Grab** is a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principal of inertial locking, cam/level locking, or both.
- **Roof** is the exterior surface on the top of a building. This does not include floors or form-work which, because a building has not been completed, temporarily become the top surface of a building.
- **Roofing Work** is the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.
- **Safety-monitoring System** is a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
- **Self-retracting Lifeline/Lanyard** is a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.
- **Snaphook** is a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. The only approved snaphooks are the locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection.

- **Steep Roof** is a roof having a slope greater than Four-in-twelve (4:12) (vertical to horizontal)
- **Toe-board** is a low protective barrier, four (4) inches high minimum that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.
- **Unprotected Sides and Edges** is any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least forty-two (42) inches high.
- **Walking/Working Surface** is any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, form-work and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.
- **Warning Line System** is a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of a guardrail, body harness, or safety net systems to protect employees in the area.
- **Work Area** is that portion of a walking/working surface where job duties are being performed.