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| UT Health Science Center: GS5117 - Fall Protection | |
| Version 1 | Publication Date: 06/14/2022 |

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| No./Title: GS5117 – Fall Protection | Resp. Office: Campus Safety and Emergency Management | Effective Date: 6/1/2021 |
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| Related Policies: GS5107 – Slips, Trips and Fall Safety | | |
| Forms: | | |

PURPOSE

The purpose of this program is to outline the fall protection requirements to minimize or eliminate fall related injuries. This Fall Protection Program prescribes the duty to provide fall protection; sets the criteria and practices for fall protection; and outlines required training and recordkeeping. This program is developed in accordance with the Occupational Safety and Health Administration (OSHA) regulations.

SCOPE AND APPLICABILITY

This plan shall apply to students, staff, and faculty whose work duties require them to work at unprotected heights greater than four (4) feet. Individuals engaged in construction activities must use fall protection for work at unprotected heights greater than six (6) feet. The scope of this procedure includes on campus facilities as well as situations where students, staff or faculty could be exposed to a fall hazard while engaged in offsite university-sponsored activities. The use of ladders, scaffolds, and aerial lifts are not covered within the scope of this program.

This program does not apply to the following situations:

- Recreational or athletic events including rock climbing and similar activities.
- Where climbing gear is used.
- Stairs or fall hazards on the same level (covered in the UT Slips, Trips and Falls Guidance document GS-5107)

ABBREVIATIONS AND DEFINITIONS

Abbreviations

ANSI – American National Standards Institute

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CFR – Code of Federal

GFCI- ground fault circuit interrupter

NFPA – National Fire Protection Association

OSHA - Occupational Safety and Health Administration

Definitions

Elevated walking surface: is a location where an individual could stand and is more than four feet above an adjoining surface.

Employee: Any UTHSC staff, student or faculty member.

Extreme fall hazard: these are locations and situations where a fall is likely and the resulting injuries could be fatal.

Fixed ladders: ladder that are permanently attached (e.g. bolted, anchored) to a building or structure.

Holes: include HVAC floor openings, trap doors, temporary openings in the walking surface for construction or maintenance, skylights, man hole covers, and alike. The minimum area defining a hole is one square foot. Note that a smaller limit may be necessary for locations where children are present.

Personal Fall Arrest System: consists of a full body harness, D-ring connector, lanyard and a suitable anchor point. Other components may include horizontal lifeline, self-retracting lift line, positioning belt, and shock absorbing lanyard.

ROLES AND RESPONSIBILITIES

Campus Safety will:

- Maintain this written plan and periodically update it as necessary
- Assist with plan interpretation
- Conduct site reviews, including complaint follow up, upon request
- Assist departments or individuals to the extent feasible with compliance
- Maintain records as required
- Provide awareness-level training about fall protection requirements
- Provide or arrange task-specific fall protection training upon request
- Investigate accidents involving falls

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- Disseminate information related to fall hazard prevention as necessary

Supervisors with employees potentially exposed to a fall hazard:

- Review, implement and enforce this Fall Protection procedure.
- Provide appropriate fall protection equipment (e.g. scaffolding, personal fall arrest system, etc.) as required by the task being performed.
- Ensure that appropriate fall protection is used by employees in accordance with manufacturer instructions.
- Provide or arrange for fall protection training appropriate for the task (e.g. use of scaffolding) or equipment (e.g. personal fall arrest system) being used.
- Ensure site-specific fall prevention plans and rescue plans are developed if necessary.
- Ensure specific fall hazards are identified and adequately controlled through engineering and/or administrative controls.
- Ensure that contractors or vendors working on campus comply with the requirements of this fall protection procedure and applicable regulations.
- Report concerns to Campus Safety and Emergency Management

Individuals who may be exposed to a fall hazard shall:

- Comply with the requirements of this procedure and applicable regulations
- Use appropriate fall protection equipment in accordance with manufacture instructions
- Participate in fall protection training
- Report concerns or unsafe conditions to Campus Safety and Emergency Management

PROCEDURES

Campus Safety shall conduct safety inspections to identify fall hazards on campus and make recommendations as necessary. Extreme fall hazards shall be considered imminent danger. Any staff or faculty member is authorized to stop work when these situations are encountered.

Signs may be used to warn of a fall hazard, but shall not be the sole means of protection.

OSHA has identified fifteen areas or activities where some type of fall protection is needed. These situations are listed below with additional information about each [available online](#). Please keep in mind there may be other situations where a fall of 6 feet or more is possible.

- Unprotected Sides and Edges
- Leading Edges

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- Hoist Areas
- Openings/Holes
- Formwork and Reinforcing Steel
- Ramps, Runways, Platforms, and Other Walkways
- Excavations
- Dangerous Equipment
- Overhand Bricklaying and Related Work
- Low Slope Roofs
- Steep Roofs
- Precast Concrete Erection
- Wall Openings
- Protection from Falling Objects
- Walking/Working Surfaces Not Addressed

All fall protection systems used at UTHSC shall meet the requirements of 29 CFR 1926.502 - Fall Protection Systems Criteria and Practices.

FALL PROTECTION REQUIREMENTS

Note: A specific Fall Protection Standard does not exist for general industry. Some Fall Protection Program requirements are contained in industrial specific standards and are addressed below.

Floor Openings

Stairway floor openings shall be guarded by a standard railing and toe-board. Ladder way floor openings or platforms shall be guarded by a standard railing and toe-board on all exposed sides.

Hatchway and chute floor openings shall be guarded by either a hinged floor cover of standard strength and construction with standard railing or a removable railing with toe-board on not more than two sides and fixed standard railings with toe-boards on all other exposed sides.

Skylight floor openings and holes shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.

Pit and trap door floor openings, infrequently used, shall be guarded by a cover of standard strength and construction. While the cover is not in place, the pit or trap door openings shall be constantly attended by someone or shall be protected on all sides by removable standard railings.

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Manhole floor openings shall be guarded by a standard manhole cover. While the cover is not in place, the manhole shall be constantly attended by someone or shall be protected by removable standard railings.

Temporary floor openings shall have standard railing or be constantly attended by someone.

Floor holes in which persons can accidentally walk into shall be guarded by standard railing with toe-boards on all exposed sides or shall be guarded by a cover of standard strength and construction. While the cover is not in place, the hole shall be constantly attended by someone

Floor holes in which persons cannot accidentally walk into (because of fixed machinery or equipment) shall be protected by a cover that leaves no openings more than 1 inch wide. The cover shall be held securely in place to prevent tools or materials from falling through.

Wall Openings and Holes Wall

Wall openings from which there is a drop of more than 4 feet shall be guarded by a rail, picket fence, half door or equivalent barrier. Removable toe-boards shall be used when there is an exposure below to falling material.

Chute wall openings where there is a drop of more than 4 feet shall be guarded by a rail, picket fence, half door or equivalent barrier.

Window wall openings at a stairway landing, floor, platforms, or balcony from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, shall be guarded by standard slats, standard grill work or standard railing. If the window opening is below the landing or platform, a standard toe-board shall be provided.

Temporary wall openings shall have adequate guards but these do not need to be made of standard construction.

Where there is a hazard of materials falling through a wall hole, standard toe-boards or an enclosing screen shall be installed.

Protection of Open Sided Floors, Platforms and Runways

Open sided floors, platforms, or runways 4 feet or more above the adjacent floor or ground level shall be guarded by a standard railing on all open sides except when there is an entrance to a ramp, stairway, or fixed ladder. Toe-boards are required where persons can pass below, there is moving machinery, or there is equipment, which could create a hazard.

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Regardless of height, floors, walkways, platforms or runways located above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units and similar hazards shall be guarded with standard railing and toe-boards.

Fixed Industrial Stairs

Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails. Standard railings shall be installed on the open sides of all stairways and stair platforms, which are located four or more feet above a lower level even if there are less than four risers in the flight of stairs

Fixed Ladders

Ladder safety devices (life belts, friction brakes, sliding attachments) are required on tower, water tanks and chimney ladders that are over 20 feet, unless cage protection is provided. Fixed ladders 20 or more feet in height shall have a personal fall arrest system. Note that existing ladders more than 20 feet in height may use a cage as defined by the 29 CFR 1910.27(d).

Portable Ladders

Users must be able to recognize and avoid ladder hazards and be aware of safe practices in setting up, storing, and working with ladders. See UTHSC Ladder Safety Program (GS 5102)

Scaffolds

Guardrails, mid-rails, and toe-boards shall be installed on open sides of scaffolds which are 10 feet or greater in height. Full body harnesses and lifelines are required for suspension scaffolds and boatswains chairs.

1. Scaffolding shall be in accordance with the OSHA construction standard (29 CFR 1926 Subpart L) or General Industry (29 CFR 1910.28) and the manufacturer's specifications. Note there are many different types of scaffolding.
2. Shall be installed by trained individuals and inspected periodically.
3. May require the use of personal fall arrest system based on the nature of the work.

Aerial Lifts

Employees working in a bucket truck or boom lift are required to wear a full body harnesses and lanyards.

Elevated Walking or Working Surfaces

Fall hazards from these locations shall be controlled by one of the following:

1. Guardrail constructed in accordance with NFPA standards or the building code with respect to strength (200 lbs.), rail height (42 inches minimum), and mid-rail or baluster

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spacing (maximum 4 inch clear width). Note that OSHA guardrails, detailed in 29 CFR 1910.23 may be used for limited situations or for existing situations where children under the age of 12 are unlikely to be present. Work on a ladder adjacent to a guardrail may negate the protective feature of the rail and should be addressed before work starts.

- a. Guardrail systems shall meet the following criteria:
- b. Top-rails and mid-rails of guardrail systems shall be at least one quarter inch in diameter;
- c. If wire rope is used for top-rails, it shall be marked every six feet with highly visible material;
- d. Steel or plastic banding material shall not be used as top-rails or mid-rails;
- e. Manila, plastic or synthetic rope used for top-rails or mid-rails shall be inspected frequently to ensure strength and stability;
- f. The top edge height of top-rails or guardrails shall be 42 inches plus or minus three inches above the walking level;
- g. When workers are using stilts, the top edge height of the top rail or equivalent shall be increased equal to the height of the stilts;
- h. 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 are no walls or parapet walls at least 21 inches high;
- i. When mid-rails are used, they shall be installed at a height midway between the top edge of the guardrail system and the walking/working level;
- j. When screens and mesh are used they shall extend from the top-rail to the walking/working level and along the entire opening between top-rail supports;
- k. Intermediate members, such as balusters, when used between posts, shall not be more than 19 inches apart;
- l. Other structural members, such as additional mid-rails and panels, shall be installed so that there are no openings larger than 19 inches;
- m. The guardrail system shall be capable of withstanding a force of at least 200 pounds;
- n. Mid-rails, screens, mesh, intermediate vertical members, solid panels and equivalent structural members shall be capable of withstanding a force of at least 150 pounds;
- o. Guardrail systems shall have smooth surfaces to protect employees from punctures or lacerations and prevent clothing from snagging;
- p. The ends of top-rails and mid-rails shall not overhang terminal posts, except where such overhang does not constitute a projection hazard;

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- q. A chain gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place;
 - r. At holes, six feet or more in depth, guardrail systems shall be set up on all unprotected sides or edges and all holes shall be covered when not in use;
 - s. Guardrail systems with a gate shall be used around holes that are access points to prevent employees from falling into these holes; and
 - t. If guardrail systems are used at the sides or edges of ramps and runways, they shall be erected on each side or edge.
2. Personal Fall Arrest Systems – must be installed and used in accordance with the manufacturer’s specifications.
 3. Nets – in accordance with the OSHA construction standard (29 CFR 1926.105) or applicable ANSI standards.
 4. Warning Line – generally available only on construction sites with various limitations. See the OSHA construction Standard (29 CFR 1926.502(f)).
 5. Controlled Access Zones - generally available only on construction sites with various limitations. See the OSHA construction standards (29 CFR 1926.502(g)).
 6. Safety Monitoring System- generally available only on construction sites with various imitations. See the OSHA construction standards (29 CFR 1926.502(h))

Boatswain Chair

- Shall be used in accordance with the manufacturer’s specifications.
- Open Pits and Excavations
- Fall hazard shall be guarded with a fence or barriers when unattended
- Signs shall be posted warning of the hazard at intervals not to exceed 50 feet around the perimeter of the fence or barrier.

Holes in the Walking Surface

Holes shall be guarded with any of the following:

- Floor grate, screen or temporary cover of sufficient strength to carry twice the anticipated load.
- Where a cover or grade is not feasible, other methods (guardrails, barriers, warning lines) shall be used.
- Covers shall be secured to prevent movement and require marking if located on a construction site.

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Towers, Light Poles and Alike

- A mechanical lift is the preferred method to access to the upper level of towers, light poles, and similar structures.
- Towers, light poles and alike that are metallic may be conductive. It may be necessary to use electrical equipment that is low voltage, double insulated or protected by a GFCI in these situations.
- Personal fall arresting systems must be used where present.

Trees

- A mechanical lift is the preferred method to access the upper portions of a tree.
- Where a mechanical lift can't be used, climbing gear must be considered. Training is required for climbing gear.

Lifts, Powered Platforms

- A personal fall arrest system is typically necessary with a mechanical lift.

TRAINING AND INFORMATION

Task-specific training is required for the following equipment and situations for individuals using:

- Personal fall arresting systems
- Installing and using scaffolding
- Positioning devices
- Boatswain chairs
- Powered Platforms as defined by 29 CFR 1910.66 and other mechanical lifts
- Nets

The employer shall provide a training program for each employee who may be exposed to fall hazards. The training program shall enable employees to recognize and eliminate falling hazards. Task-specific fall protection training shall be provided by a competent person and shall cover the following items:

- The nature of fall hazards in the workplace.
- The correct procedures for erecting, maintaining, inspecting, disassembling, use and operation of those fall protection systems covered under the FALL PROTECTION SYSTEMS section of this program.
- The limitations of use of mechanical equipment during the performance of roofing work on low-sloped roofs.
- The correct procedures for handling and storing equipment and material used.

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- The regulatory standards covered by this program.

The work area supervisor shall verify that training has been provided by written certification containing all of the following information:

- Name/identity of employees trained; and
- The date(s) training was provided; and
- The signature of the person providing the training. The most current training certification records shall be maintained by the department. Re-training shall be provided under the following conditions:

The employer has reason to believe retraining is needed; or

- Changes in the workplace render previous training obsolete; or
- Changes in the type(s) of fall protection used render previous training obsolete; or
- Inadequacies in the affected employees knowledge of fall protection systems or equipment indicate that the employee has not retained the necessary understanding or skill.

RECORDKEEPING

Supervisors shall maintain a records of the completion of awareness-level and work-area specific training for all employees potentially exposed to falls from heights of four feet or greater.

REFERENCES

29 CFR 1910 Subpart D, "Walking-Working Surfaces"

29 CFR 1910 Subpart F, "Powered Platforms, Man lifts, and Vehicle-Mounted Work Platforms"

29 CFR 1910.132 "Personal Protective Equipment"

29 CFR 1926 Subpart M, "Fall Protection"

ANSI/ASSE Z359 Fall Protection