

## Fall Protection Program

### I. Purpose

The intent of the Fall Protection Program is to minimize the possibility of injury or death from the improper use or lack of use of appropriate fall protection. The program defines the requirements for fall protection as required by OSHA 29 CFR 1926.500-503 Subpart M.

### II. Responsibilities

**The Physical Facilities Director** has ultimate responsibility for the Fall Protection Program for Physical Facilities Employees, and faculty members who utilize fall protection have responsibility for ensuring the program is followed. The Director/Faculty member must:

- Identify those work situations that have the potential to produce injuries due to falls.
- Provide for appropriate training for employees who have the potential to fall more than six feet.
- Provide adequate fall prevention & arrest equipment that meets or exceeds the American National Standards Institute (ANSI) standards and ensure its use in appropriate situations as defined in the OSHA standard.
- Ensure that all personnel requiring the use of fall protection equipment employ the "buddy system" or have an observer to render assistance when and if required.

**Employees or students** who participate in the Fall Protection Program must:

- Understand the procedures and safe use of fall protection systems.
- Use appropriate fall protection systems when required.
- Attend all required training.

### III. General

Employees and students of Montana Tech who are exposed to a fall hazard of 4 feet or more must be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems. See Appendix A for definitions, Appendix B for standard operating procedures, and Appendix C for specific requirements for fall protection systems.

### IV. Training

Training for employees who may be exposed to fall hazards must be done by a competent person. Training should take place at the time of hire, when changes in the workplace or equipment occur, or when the supervisor has reason to believe that an employee who has already been trained does not have the understanding and skill required to perform his duties. The Environmental Health and Safety Director will maintain the training records.

Fall Protection training will include:

- The nature of the fall hazards in the work area;
- Correct procedures for erecting maintaining, disassembling and inspecting fall protection systems;
- Use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
- The role of employees in Montana Tech's fall protection plan; and
- The requirements of the fall protection standard

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# Appendix A

## Definitions

**Competent Person**- One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. 29CFR 1926.32 (f).

**Controlled Access Zone** – an area in which certain work (e.g., overhand 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.

**Equivalent**- 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.

**Free Fall**- (FF) - The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

**Full-body harness** (FBH)-A component of a personal fall arrest system with straps which fasten about the person in a manner to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest and shoulders with means for attaching it to other components or subsystems.

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

**Lanyard** (L)-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** - The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork 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** (LL) - A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertically 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.

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

**Qualified Person**- A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems relating to the subject matter, the work, or the project.

**Safety Monitoring System** – A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

**Vertical Lifeline** (VLL) - A component, element or constituent of a lifeline subsystem which consists of a vertically suspended flexible line with a connector at the upper end for fastening it to an overhead anchorage or anchorage connector and along which a fall arrester travels.

**Warning Line System** - 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 guardrail, or safety net systems to protect employees in the area.

# Appendix B

## Standard Operating Procedures

1. Only employees who have the skill and training will be authorized to use the following fall protection systems.
  - Safety monitoring systems;
  - Guardrail systems;
  - Full body harness systems;
  - Controlled access zones; and
  - Safety net systems
  - Positioning/restraint systems
2. Employees who are constructing a leading edge four feet or more above lower levels must be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems. When Montana Tech can demonstrate that it is infeasible or creates a greater hazard to use these systems, Montana Tech must develop and implement a fall protection plan.
3. Safety approved aerial lifts may be used for working at heights; however, all operators must wear approved fall protection and be secured by a lanyard when the working height is four feet or higher.
4. Employees engaged in roofing activities on low-slope roofs with unprotected sides and edges four feet or more above lower levels must be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system.
5. On roofs 50 feet or less in width, the use of a safety monitoring system alone is permitted.
6. Employees working on a steep roof with unprotected sides and edges four feet or more above lower levels must be protected from falling by guardrail systems with toeboards, safety net systems, or personal fall arrest systems.
7. Lanyards must be attached to prevent a free fall of four feet. Approved attachment points must be established and marked in areas where lifelines and lanyards are used regularly. Lifeline attachment points must be capable of supporting a load of 5,400 pounds.
8. All fall protection equipment must be visually inspected for defects prior to each use. If there is evidence of excessive equipment wear or deterioration or if mechanical malfunction is detected, the item must be removed from service.
9. Safety harnesses and lanyards that have been subjected to an impact load must be destroyed.
10. Any personnel using fall protection equipment must have an observer to render assistance when and if required.

# Appendix C

## Specific Requirements for Fall Protection Systems

**A safety monitoring system** refers to a fall protection system in which a competent person is responsible for recognizing and warning employees of fall hazards. The duties of the safety monitor are to:

- Recognize fall hazards;
- Warn workers by voice when approaching the open edge in an unsafe manner;
- Warn workers by voice if there is a dangerous situation developing which cannot be seen by another person involved with product placement, such as a member getting out of control;
- Make the designated workers aware they are in a dangerous area;
- Warn employees when they appear to be unaware of a fall hazard or are acting in an unsafe manner;
- Be on the same walking/working surface as the monitored employees and within visual sighting distance of the monitored employees;
- Be close enough to communicate orally with the employees; and
- Not allow other responsibilities to encumber monitoring.

**A controlled access zone** refers to an area designated and clearly marked, in which leading edge work may take place without the use of guardrail or personal fall arrest systems to protect the employees in the area. Control zone systems must follow these provisions:

- When used to control access to areas where leading edge and other operations are taking place, the controlled access zone should be defined by a control line or by any other means that restricts access.
- When control lines are used, they will be erected not less than 6 feet nor more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge.
- The control line will extend along the entire length of the unprotected or leading edge and should be approximately parallel to the unprotected or leading edge.
- The control line will be connected on each side to a guardrail system or wall.
  - The control lines will consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
    - ◇ Each line should be flagged or otherwise clearly marked at not more than 6 foot intervals with high visibility material.
    - ◇ Each line should be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches from the walking/working surface and its highest point is not more than 45 inches from the walking/working surface.
    - ◇ Each line will have a minimum breaking strength of 200 pounds.

**Guardrail Systems** consisting of a top rail, midrail, and screens or mesh should meet the following requirements:

- The height of the top rail must be between 39 inches and 45 inches above the walking/working surface;
- Midrails will be installed at a height midway between the top rail and the walking/working surface;
- Screens and mesh, when used, will extend from the top rail to the walking/working surface and along the entire opening;

- The top rail of the guardrail systems should be capable of withstanding without failure a force of at least 200 pounds without deflecting to a height of less than 39 inches;
- Midrails, screens or mesh should be capable of withstanding a force of at least 150 pounds;
- Steel and plastic banding cannot be used as top rails or midrails;
- Top and midrails must be at least ¼ inch in diameter or thickness to prevent injuries;
- Guardrail systems used on ramps and runways should be erected along each unprotected side;
- If manila, plastic or synthetic rope is being used as a top rail or midrail, it must be inspected as frequently as necessary to ensure that it continues to meet the strength requirements;

**A Personal Fall Arrest system** is used to arrest an employee in a fall from a working level. The components are individually designed for a specific system and may not be compatible with other systems. The components consist of 1) connectors, 2) D-rings, 3) full-body harness, 4) snaphooks, 5) lanyards, and 6) lifelines. Inspect each component prior to each use for wear, damage or other deterioration if a defect is found remove from service.

**Safety net systems** must meet the following requirements:

- Safety nets should be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet below the level.
- Safety nets should have sufficient clearance under them to prevent contact with the surface below when subjected to an impact force.
- Safety nets must be drop-tested after installation before being used as a fall protection system.

**Positioning/Restraint System** A positioning/restraint system is used to hold a worker in place while allowing a hands-free work environment at elevated heights and/or restrict the worker's movement to prevent reaching a location where a fall hazard exists. A typical positioning/restraint system consists of:

- anchorage/anchorage connector
- body wear (full-body harness)
- connecting device (positioning lanyard)

*\*The positioning and suspension systems are not designed for fall arrest, and therefore a back-up fall arrest system must be used.*