

IOWA STATE UNIVERSITY
Environmental Health and Safety

Fall Protection Manual



IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Protecting the Safety, Health, and Environment of the Iowa State Community

Iowa State University strives to be a model for safety, health, and environmental excellence in teaching, research, extension, and the management of its facilities. In pursuit of this goal, appropriate policies and procedures have been developed and must be followed to ensure the Iowa State community operates in an environment free from recognized hazards. Faculty, staff, and students are responsible for following established policies and are encouraged to adopt practices that ensure safety, protect health, and minimize the institutions' impact on the environment.

As an institution of higher learning, Iowa State University

- fosters an understanding of and a responsibility for the environment,
- encourages individuals to be knowledgeable about safety, health and environmental issues that affect their discipline, and
- shares examples of superior safety, health and environmental performance with peer institutions, the State of Iowa and the local community.

As a responsible steward of facilities and the environment, Iowa State University

- strives to provide and maintain safe working environments that minimize the risk of injury or illness to faculty, staff, students, and the public,
- continuously improves the operations, with the goal of meeting or exceeding safety, health and environmental regulations, rules, policies, or consensus standards, and
- employs innovative strategies of waste minimization and pollution prevention to reduce the use of toxic substances, promote reuse, and encourage the purchase of renewable, recyclable and recycled materials.

The intent of this statement is to promote environmental stewardship, protect health, and encourage safe work practices within the Iowa State University community. The cooperative efforts of the campus community will ensure that Iowa State University continues to be a great place to live, work, and learn.



Wendy Wintersteen
President

Service and Emergency Providers

Environmental Health and Safety

2408 Wanda Daley Drive | (515) 294-5359

Iowa State University Occupational Medicine Department

G11 Technical and Administrative Services Facility (TASF), 2408 Pammel Drive | (515) 294-2056

McFarland Clinic PC, Occupational Medicine

1018 Duff Avenue | (515) 239-4496

Thielen Student Health Center

2647 Union Drive | (515) 294-5801

Emergency

Emergency - Ambulance, Fire, Police

911

Department of Public Safety/ Iowa State University Police

Armory, 2519 Osborn Drive | (515) 294-4428

Mary Greeley Medical Center

1111 Duff Avenue | (515) 239-2011

Non-discrimination Statement

"Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3350 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. (515) 294-7612, email eooffice@iastate.edu"

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A. Introduction

Each year many people are injured or die due to the lack of adequate fall protection. Many of these injuries and deaths could have been prevented if people were properly trained on how to recognize and protect themselves from fall hazards. Iowa State University recognizes that preventing falls from heights or from the same level is key to protecting employees from injury. To comply with the Occupational Safety and Health Administration's (OSHA) Subpart D – Walking Working Surfaces, the Department of Environmental Health and Safety (EH&S) has developed the Iowa State University Fall Protection Program. These regulations require that fall protection be provided for fall hazards with a height of four feet for general industry and at six feet in construction. This program does not apply to the use of portable ladders.

B. Responsibilities

Iowa State University

Iowa State University is responsible for both ensuring the safety of its employees and compliance with all related requirements of state and federal regulations. The administration encourages employees at all levels to promote positive attitudes regarding safety, incorporate safety into their work practices, and cooperate fully in the implementation of safety-related programs.

Departments

Each university department is responsible for evaluating areas under its administrative control to determine whether there are locations where this fall protection program would apply. Departments that identify such areas are responsible for implementing the Iowa State University Fall Protection Program. Implementation of the program includes designating competent person(s) and authorized employees, providing the necessary equipment, developing, and delivering department-specific training, and maintaining related documentation.

Managers and Supervisors

Managers and supervisors are responsible for ensuring that:

- Employees have the necessary fall protection equipment.
- Equipment is being properly maintained and utilized.
- Employees are properly trained.
- Annual equipment inspections or certifications are completed.
- Records are generated, retained, and maintained.

Employees

Employees are responsible for observing all practices and procedures contained in the Iowa State University Fall Protection Program, following departmental fall protection standard operating procedures, completing required training, and reporting hazardous or unsafe conditions to their supervisors or EH&S.

Authorized Employees

Authorized employees are responsible for:

- Attending fall protection training from EH&S.
- Receiving equipment and/or location specific fall protection training from a competent person.
- Properly use, inspect, maintain, store, and care for fall protection equipment.
- Inspecting fall protection equipment before each use.

- Complying with departmental fall protection procedures.
- Notifying the competent person of any damaged equipment or unsafe situations.

Competent Person

Competent persons are responsible for:

- Recognizing fall hazards.
- Assessing workplaces to ensure the proper implementation of fall protection.
- Correcting any unsafe conditions.
- Conducting departmental specific fall protection training.
- Being knowledgeable on, but not limited to, these topics:
 - The nature of fall hazards in the work area.
 - Fall hazard elimination and control methods.
 - Applicable fall protection regulations.
 - Fall hazard surveys and fall protection procedures.
 - The responsibilities and roles of employees.
 - Detailed inspections of equipment components and systems.
 - Procedures for removal of fall protection systems and equipment from service.
 - Fall protection system assessments and determining when a system is unsafe.
 - Fall protection rescue procedures.
 - The selection and use of non-certified anchorages.

Environmental Health and Safety

EH&S has created the Iowa State University Fall Protection Program and will assist individual departments in the implementation of the requirements. EH&S will conduct initial and refresher fall protection training for authorized employees.

C. Scope

This fall protection program is designed to assist departments with establishing the minimum requirements that are to be implemented and followed in order to prevent falls to lower levels and through openings in walking and working surfaces.

D. Employee Training

All employees working at heights greater than four feet with unprotected fall hazards in their work area should complete EH&S's Fall Protection Authorized User - Initial training course before being exposed to fall hazards. This requirement does not apply to employees only using portable ladders. Employees should be trained upon initial assignment and receive refresher training every three years, or if one or more of the following events occur:

- changes in the employee's work environment render previous training obsolete,
- fall protection systems or equipment changes render previous training obsolete, or
- there is a reason to believe the employee does not have the understanding and required skills.

If authorized employees are expected to utilize department-specific active fall protection systems, they must receive additional equipment-specific training from a competent person at the department level. Examples of active fall protection systems that would require departmental specific training include fixed ladder safety systems, fixed anchor points, vertical, and horizontal lifeline systems. Authorized employees must be trained on these topics by a competent person:

- The nature of fall hazards in the work environment and how to recognize them.
- The task and environment-specific procedures to be followed to minimize those hazards.

In addition to completing EH&S's Fall Protection Authorized User - Initial course, competent persons must be knowledgeable on fall protection and have additional training that covers the responsibilities of being a competent person, as outlined in this program.

E. Fall Hazards



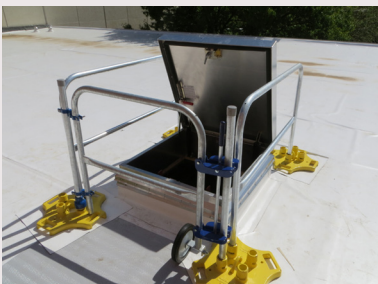
Boom Lift



Skylight with Guard Rails and
Roof Access Hatch



Leading Edge



Roof Access Hatch

A fall hazard is anything in the workplace that could cause an unintended loss of balance or bodily support and result in a fall. Any time a person is working at a height of four feet or more, they may be at risk. However, regardless of the fall distance, fall protection must be provided when working on or around dangerous equipment, machines, or conditions. Examples of machines that require the use of fall protection are bucket trucks and articulated boom lifts. A scissor lift may not require the use of personal fall protection equipment if it has a complete railing system that meets the fall protection requirements. Examples of additional fall hazards include, but are not limited to:

- Floor openings
- Elevated work platforms
- Skylights
- Leading edges
- Roof access hatches

This fall protection program does not apply to the use portable ladders. However, employees utilizing portable ladders should be trained on them before use.

F. Hierarchy of Controls for Fall Protection



Guard Rails

Elimination

When possible, fall hazards should be eliminated from the workplace.

Passive Fall Protection

When fall hazards cannot be eliminated, the first control method should be passive fall protection systems such as guard rails and parapet walls that meet local, state, and federal requirements. These systems typically place a barrier between employees and the fall hazards. These systems require little, if any, user involvement or training.

Active Fall Protection

Active fall protection, either fall restraint or fall arrest, should only be utilized if it is determined that hazard elimination or passive fall protection cannot be implemented to control the hazard. These systems are designed to restrain a person or arrest a person in the event of a fall. These systems may consist of an anchorage point, body harness, and a lanyard or self-retracting device. Active systems require system specific training, in addition to the EH&S fall protection training.



Parapet Walls



Fixed Anchor

G. General Personal Fall Protection System Requirements



Self-retracting Device Label



Temporary Horizontal Lifeline System

- Anchorages used to attach personal fall protection equipment must be independent of any anchorage used to suspend employees for the purpose of accessing a work area or platforms on which employees work.
- Personal fall protection systems and their components must be used exclusively for employee fall protection and not for any other purpose, such as hoisting equipment or materials.
- A personal fall protection system or its components subjected to impact loading (i.e., a fall) must be removed from service immediately and not used again. Anchor points must be inspected, re-certified, and load tested (if applicable) before being placed back into service.
- Personal fall protection systems must be inspected before each use for a legible label, mildew, wear, damage, corrosion, deterioration, frays, kinks, and an intact shock load indicator. Defective equipment must be removed from service immediately.
- Lifelines, self-retracting devices, lanyards, and harnesses used for fall protection must be compatible with all components used.
- Personal fall protection systems must be worn with the attachment point of the body harness located in the center of the employee's back near shoulder level. The attachment point may be located in the pre-sternal position if the free fall distance is limited to two feet or less.
- Personal fall arrest systems must be designed in such a manner that the employee cannot free fall more than six feet or contact a lower level.
- Snap hooks and carabineers must be the automatic locking type that require at least two separate, consecutive actions to open.

Low-Slope Roofs

Providing fall protection on roofs can be difficult and challenging. When designing or implementing fall protection on roofs, please refer to Environmental Health and Safety's Roof Safety Design document found in the Facilities Planning and Management's Design Manual. Training specific to roof safety is available from EH&S.

Roofs are considered low-sloped if they are pitched at a 4/12 ratio or less. Low-sloped roof fall protection guidance is categorized by the distance of the work area from a fall hazard:



Body Harness with a Self-retracting Device and Self-rescue Pack



Anchor Point Inspection Tag

6 Feet or Less

When working within six feet of an unprotected edge or other fall hazard with a drop of four feet or greater, fall protection is required. Employees must be protected by a passive fall protection system, travel restraint system, or a personal fall arrest system.

6-15 Feet

When working between 6 and 15 feet from the roof edge or fall hazard, designated areas are permitted by OSHA when the following criteria are met:

- The work is being performed on a low-sloped or flat roof,
- The work is greater than six feet from the unprotected edge or fall hazard; and
- The work is both infrequent and temporary.

If the work meets these criteria, work in designated areas is allowed without the use of a guardrail system, travel restraint system, or a personal fall arrest system. If the work does not meet these requirements, fall protection may still be required. Designated areas may only be established and used by trained personnel who have completed required training. Examples of temporary and infrequent work tasks are quarterly HVAC filter changes, clearing a roof drain, repairing roof leak, and emergency service to a piece of equipment.

15 Feet or More

When work is performed 15 feet or more from the roof edge or fall hazard, and the work is both infrequent and temporary, fall protection may not be required provided that a work procedure has been implemented and is enforced. The work procedure must prohibit personnel from going within fifteen feet of a fall hazard without the use of a fall protection system (i.e. guardrail system, safety net system, travel restraint system, or a personal fall arrest system).

Inspection

All fall protection equipment must be inspected by the user prior to each use. Each component of a fall protection system must be inspected annually by a competent person. Annual inspection records must be maintained during the lifespan of the equipment. Inspection and replacement requirements must be completed in accordance with manufacturer specifications.

Rescue

A rescue plan must be developed if using a fall arrest system. On campus, if a fallen worker cannot perform self-rescue, call emergency services. ISU will rely on rescue personnel from the Ames Fire Department in such an event unless the rescue plan identifies an alternative rescue process.

H. Definitions

Anchorage: A secure point of attachment for lifelines, lanyards, or deceleration devices.

Authorized person: A trained employee that is designated by the department to use fall protection equipment and has a working understanding of the fall protection program and standard operating procedures. Authorized employees must follow instructions from the competent person regarding the use of the fall protection systems.

Body harness: A body harness (or full body harness) is a body support device used to protect a worker from falls by distributing the force of the fall over a large area of the body and is designed to minimize the risk of injuries caused by suspension. It also provides a means for attaching the harness to other components of a personal fall protection system. Body belts are prohibited from use in personal fall arrest systems.

Competent person: A person who is capable of identifying existing and predictable fall hazards or conditions and has authorization to take prompt corrective measures to eliminate them. Additionally, they are a person who is capable of training employees to identify such conditions.

Connector: A device used to connect components of a fall protection system together.

Deceleration device: Any device that serves to dissipate energy during a fall.

Fall arrest lanyard: Lanyard designed to absorb and dissipate the stopping energy generated from a fall.

Lanyard: A flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.

Leading edge: Any unprotected edge of a platform, floor, or other opening where the elevation between the next level or the ground is greater than four feet.

Lifeline: A component of a personal fall protection system consisting of a flexible line for connection to an anchorage at one end so as to hang vertically (vertical lifeline), or for connection to anchorages at both ends so as to stretch horizontally (horizontal lifeline) and serves as a means for connecting other components of the system to the anchorage.

Personal fall arrest system: A type of personal fall protection system that decelerates and stops an employee in the event of a fall from a walking-working surface. As such, a person using this system must anticipate the possibility of a fall. The system consists of anchorage, a body harness, and connector. The connector may include a lanyard,



Adjusting a Full Body Harness

deceleration device, lifeline, or a suitable combination of these.

Personal fall protection system: A system (including all components) an employer uses to provide protection from falling, or to safely arrest an employee's fall, if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

Positioning system (work-positioning system): A system of equipment and connectors that, when used with a body harness, allows an employee to be supported on an elevated vertical surface and work with both hands free.

Qualified person: A person who is in possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems related to fall protection.

Self-retracting device: A deceleration device containing a drum-wound line that can be slowly extracted from, or retracted into, the drum under slight tension during normal movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.

Travel restraint system: A type of personal fall protection system that restrains a person from being exposed to a fall hazard. This system usually includes an anchor point, a body support harness, and a lanyard or lifeline designed to eliminate the possibility of an employee falling off a walking-working surface but is long enough to complete the required task.