ILLINOIS STATE UNIVERSITY
EXHIBIT DG-5: SAFETY GUIDELINES
Effective October 23, 2024

I. Fall Protection Hierarchy of Controls

A. Hazard Elimination

1. The best solution is to eliminate fall hazards by having a design where no fall hazard is present.

B. Engineering Controls

1. These are physical barriers, like guardrails or walls, around unprotected edges, roof openings and other fall hazards. These systems require minimal, if any, user interaction and training.

C. Personal Fall Protection Systems

1. Fall Restraint Systems

a) These systems use personal protective equipment (e.g. anchoring device, harness, and lanyard) to restrict the range of a worker's movement so they cannot fall. Requires user to have equipment and system specific training.

2. Fall Arrest Systems

a) These systems use personal protective equipment (e.g. anchoring device, harness, and lanyard) to arrest a fall within acceptable force and clearance limits. Since this exposes the worker to the possibility of a fall and arrest situation, user equipment and system specific training, along with a rescue plan, are required.

D. Administrative Controls

1. These are work practices or procedures that increase a worker's knowledge and awareness of a fall hazard and designed to limit exposure to fall hazards. Administrative controls can't be used in lieu of engineering controls and fall protection systems. Examples include standard operating procedures, training, and signage

II. Fall Protection and Roof Safety

A. Fall protection and roof safety design plans must be reviewed and approved by representatives from Facilities Planning, Design and Construction (FPDC) and Environmental Health and Safety (EHS).

B. If a design has any unprotected fall hazard(s) with an elevation change of 30" or greater, it must be reviewed by EHS.

C. Installation of personal fall protection systems (anchor points, horizontal lifelines, etc.) must be selected from one of three manufacturers. These manufactures are Guardian Fall Protection, Miller Fall Protection, or 3M-DBI/Sala. This allows for compatibility and consistency of fall protection systems and equipment across campus and assists with meeting regulatory equipment training requirements for end users.

D. Contractor shall provide on-site training of personal fall protection systems. Training to include ISU Project Manager, ISU EHS, and ISU FM.

E. All new construction projects, renovations, and alterations to roof mounted equipment that would subject personnel to a fall hazard must incorporate an OSHA compliant fall protection solution approved by a licensed P.E. and installed by a qualified person.

F. All new construction, renovations, and alterations for shingled roof systems shall incorporate fall protection solution(s) that allow for roof maintenance and repair.

G. Follow the fall protection hierarchy of controls in Section IV of this document.

H. Provide fixed stairs or ladders where roof sections have different elevations.

I. Ship stairs/ladders may be used only when it is not feasible to provide standard stairs. Alternating tread stairs are not allowed.

J. Fixed exterior ladders from the ground or first level to the roof of a one-story building should be avoided. Every effort shall be made to locate said ladder indoors where it is readily accessible (preferably in a locked mechanical room). Access to a roof shall not be through a private office, hallway, lab, or classroom.

    1. Any roof access that is accessible to the public shall incorporate a lockable/securable barrier at least 8 feet in height.

K. Provide sufficient clearance for working space around all equipment for safe operation and maintenance.

L. All roof mounted equipment closer than 15 feet from the edge of the building must have a fall protection system unless the placement of the equipment does not present a fall hazard.

M. Guardrail systems shall consist of a top rail with a height of 42 inches, an intermediate rail halfway between the top rail and the roof surface, vertical posts, and withstand the minimum required forces applied in the horizontal and vertical direction.

N. If a parapet wall is to be utilized for fall protection, it must have a consistent minimum height of 42 inches from the roof surface and withstand the minimum required forces.

O. All anchoring systems, including anchor points and horizontal lifelines designed for fall restraint, must be designed to meet fall arrest requirements. This allows the system to be used for either fall restraint or fall arrest depending on the specific application and task.

P. All personal fall protection systems must be designed by a licensed P.E. and installed by a qualified person with the appropriate documentation sent to FPDC and EHS.

Q. Any personal fall protection system installed on a roof or equipment requires signage posted in a conspicuous area notifying individuals of requirements for fall protection and restrictions.

III. Roof Access Criteria

A. The roof access must be placed in a safe location at least 15 feet away from any fall hazard, when possible.

B. Provide a top landing that is large enough for employees to set down tools and supplies when opening the door or hatchway.

C. Portable extension ladders can be used to access one-story buildings and must be provided with a permanent extension ladder "catch" at a location agreed upon by FPDC and EHS.

D. Doorways

1. Access through a doorway is preferred. If a doorway is not feasible, a roof hatch may be used.

E. Roof Hatch

1. Roof hatch access via a stairway is preferred.

2. Roof hatch access via a fixed ladder must be secured at the base with a security door or access guard.
3. Roof hatch openings must be enclosed by guardrail system with a self-closing gate.

F. Fixed Ladders

1. Fixed ladders that extend more than 24 feet above a lower surface should be avoided, when possible.
2. Fixed ladders that extend more than 24 feet above a lower surface must be equipped with a personal fall arrest system or ladder safety system.
   a) A ladder cage does not constitute a personal fall arrest system or ladder safety system.
3. The personal fall arrest system or ladder safety system must provide protection throughout the entire vertical distance of the ladder, including all ladder sections.
   a) At least two fall arrestors for the fall arrest/ladder safety system must be supplied by the contractor.
4. If a fixed ladder has adjacent sections offset by landing platforms, each landing platform must be protected by guardrails, a toe board, and a self-closing gate.

IV. Equipment and Walkway Placement

A. The building should be designed in such a way that all fall hazards are minimized and the placing of equipment and walkways on roofs be strategic to reduce employee exposure to fall hazards.

B. Placement of equipment, walkways, and roof drains should be at least 15 feet away from any unprotected fall hazard, including the roof edge, or be protected by a fall protection system.

V. Regulatory Standards

A. This section summarizes the regulations that apply to fall protection and roof safety; however, it is not all-inclusive and other regulations may apply.

B. General Industry OSHA Standards

1. OSHA 29 CFR 1910 Subpart D – Walking Working Surfaces
   a) Scope and Definitions – 1910.21
   b) General Requirements – 1910.22
   c) Ladders – 1910.23

d) Duty to Have Fall Protection and Fall Object Protection – 1910.28
e) Fall Protection Systems and Falling Object Protection: Criteria and Practices – 1910.29
f) Training Requirements – 1910.30

2. OSHA 29 CFR 1910 Subpart I – Personal Protective Equipment (PPE)

a) Personal Fall Protection Systems – 1910.140

C. ANSI Standards

1. ANSI/ASSE Z359

a) Z359.1 – The Fall Protection Code
b) Z359.2 – Minimum Requirements for a Comprehensive Managed Fall Protection Program
c) Z359.3 – Safety Requirements for Positioning and Travel Restraint Systems
d) Z359.4 – Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
e) Z369.6 – Specifications and Design Requirements for Active Fall Protection Systems
f) Z359.7 – Qualification and Verification Testing of Fall Protection Products
g) Z359.11 – Safety Requirements for Full Body Harnesses

D. International Building Code (IBC)

VI. Conclusion

A. If fall hazards are present, solutions limiting the amount of user involvement is preferred. This will eliminate the possibility for user error with specialized fall protection equipment. While there are many different solutions available, the hierarchy of controls must be followed to eliminate and mitigate fall hazards to lower the risk for employees working at heights.