

Northwestern

Fall Protection

Environmental Health and Safety

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I. Purpose

This program establishes a process to protect individuals from the hazards associated with falls to lower levels on Northwestern property. This program provides guidance for the assessment, determination, and selection of fall protection equipment to perform tasks safely.

II. Scope

This program applies to contractors and Northwestern staff, faculty, and students whose work exposes them to fall hazards of 4 feet or more above a lower level on existing buildings. For the purposes of this program, 'work' includes, but is not limited to, maintenance and repairs, inspections, installations, theater productions, and access methods and routes to and from work areas. This program does not apply to contractor controlled worksites.

The fall protection requirements of this program are exempt during inspecting, investigating, or assessing workplace conditions, or work to be performed prior to the start of work or after all work has been completed. This exemption does not apply when acceptable/certified fall protection systems or equipment are installed and available for workers to use for pre-work and post-work inspections, investigations, or assessments.

III. Responsibilities

A. Environmental Health and Safety (EHS)

- i. Review, audit, and revise this program as needed.
- ii. Conduct fall hazard assessments in response to reported or observed concerns, with assistance from Northwestern departments and units (e.g., providing work area access, drawings and scope of work).
- iii. Review and approve [Fall Hazard Assessment Forms](#) completed by Northwestern departments and units.
- iv. Provide consultation and guidance to Northwestern departments and units in the selection of appropriate personal fall arrest and protection equipment.
- v. Perform or facilitate annual inspections of personal fall protection equipment (e.g., body harnesses, lanyards).
- vi. Provide consultation and guidance to Northwestern project managers and design teams for the installation of temporary and permanent fall protection systems on existing buildings, new construction, renovation, and re-roofing projects.
- vii. Identify training needs, and coordinate external or internal fall protection training.

B. Northwestern Departments and Units

- i. Adhere to the requirements of this program.
- ii. Conduct [fall hazard assessments](#) for all work within 15 feet of unprotected edges with fall hazards of 4 feet or more.
- iii. Ensure required staff, faculty, and students are trained as authorized persons in the use and care of fall protection equipment.
- iv. Must have a trained, competent person who can identify hazards and has the authority to take prompt, corrective measures.
- v. Provide fall protection equipment and financial resources to replace fall protection equipment as needed.

- vi. Designate individual(s) to inventory, inspect, and maintain fall protection equipment in accordance with maintenance and inspection schedules, recommendations, and procedures provided by the manufacturer or certifying engineer.
- vii. Monitor and ensure contractor compliance with this program.
- viii. Contact EHS to evaluate any safety concerns, or as specified in this program.

C. Contractors

Where fall hazards exist on existing buildings and renovation projects, contractors must:

- i. Conduct fall hazard assessments,
- ii. Develop and implement a site-specific fall protection program to protect contractor employees from fall hazards,
- iii. Provide the fall protection program for inspection upon request,
- iv. Ensure contractor employees are trained and meet the requirements of **Authorized Persons**,
- v. Designate a competent person who meets the requirements of a **Competent Person** on all jobsites that have fall hazards, and
- vi. Supply and maintain fall protection equipment, as required.

IV. Fall Hazard Assessment

A fall hazard assessment is required for all work at heights of 4 feet or more within 15 feet from an unprotected edge.

- A. Every effort must be made to avoid work at heights, such as using [unmanned aircraft systems](#) (i.e., ‘UAS’ or ‘drones’) for visual inspections, when feasible.
- B. Northwestern departments and units must designate a competent person to evaluate all work utilizing the [Fall Hazard Assessment Form](#).
- C. EHS will review the fall hazard assessment form, provide recommendations and guidance, and grant final approval for work to commence by signing the form.

V. Fall Hazard Requirements

There are many fall hazards at Northwestern that require fall protection and have specific requirements, such as, but not limited to:

- A. **Dangerous Equipment**
Regardless of the potential fall distance, individuals must be protected from falling into or onto dangerous equipment by a guardrail system or fall restraint system, unless it is covered or guarded to eliminate the hazard.
- B. **Fixed Ladders that Extend More than 24 Feet above a Lower Level**
 - i. Fixed ladders installed prior to November 19, 2018 must be equipped with a personal fall arrest system, ladder safety system, cage, or well.
 - ii. Fixed ladders installed, modified, or repaired after November 19, 2018 must be equipped with a personal fall arrest system or a ladder safety system.
 - iii. A cage or well in combination with a personal fall arrest system or ladder safety system may be used, provided the cage or well does not interfere with the operation of the system.
 - iv. On and after November 18, 2036, all fixed ladders must be equipped with a personal fall arrest system or a ladder safety system.
- C. **Floor Openings, Holes, and Wall Openings**
 - i. Individuals must be protected from tripping or stepping into or through holes or

floor openings (including skylights) greater than 2-inches in its least dimension with covers or guardrails.

- ii. Individuals must be protected from gaps or open spaces in walls, partitions, vertical surfaces, or similar surface that are at least 30-inches high and at least 18-inches wide.

D. Mobile Elevated Work Platforms (MEWPs)

Refer to Northwestern's [Mobile Elevated Work Platforms](#) Program.

E. Rooftops

- i. When work is less than 15 feet from an unprotected edge on a low-slope roof, users must use a guardrail system, fall restraint system, or personal fall arrest system.
- ii. When work is more than 15 feet from an unprotected edge on a low-slope roof, users:
 - a. Must use a guardrail, fall restraint, or personal fall arrest system, or
 - b. May use a work rule, authorized by a competent person and supervisor, prohibiting individuals from going within 15 feet of the unprotected roof edge if the work is both infrequent and temporary. The work rule may be established in a written work procedure, [Fall Hazard Assessment Form](#), or pre-job briefing for the supervisor to review with all individuals performing the work. The work rule is not a substitute for fall protection and may only be used after evaluating the hazards.
- iii. Fall Protection System Drawings
All rooftops that contain permanent fall protection systems (e.g., anchor posts, horizontal lifelines) or ballasted fall protection systems intended for permanent use (e.g., ballasted guardrails, ballasted anchor posts) must have copies of the annual inspections and licensed engineer-approved system drawings posted in a conspicuous manner at the roof access point (e.g., hatch, window, door). Drawings must include a detailed layout of all fall protection equipment, limitations, number of users, and any other relevant information pertaining to the fall protection systems.
- iv. Contact EHS for all anticipated work on high-slope roofs (slope greater than 4-inches of vertical rise for every 12-inches of horizontal length).

F. Scaffolds

- i. Scaffolds must meet the requirements of 29 CFR 1926, Subpart L (Scaffolds).
- ii. Self-contained, adjustable scaffold must have a guardrail system if the platform is support by the frame; if supported by a rope system, a personal fall arrest system and guardrail system must be used.
- iii. When guardrails are not feasible, personal fall protection systems must be used and attached by a lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member.
- iv. Under no circumstances may personal fall protection systems be attached to a handrail.
- v. No scaffold may be erected, moved, dismantled, or altered, except under the supervision of a competent person.
- vi. Scaffolds may not be altered or moved horizontally while they are in use.
- vii. Scaffolds and scaffold components must be inspected by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.

G. Stairways

- i. Stairway floor holes must be protected by guardrails on all exposed sides, except at the stairway entrance.
- ii. Each flight of stairs with at least 3 treads and 4 risers must be equipped with stair rail systems and handrails.
- iii. Handrails must be 30- to 38-inches in height as measured from the leading edge of the stair tread.
- iv. Stair rail systems installed before January 17, 2017 must be at least 30-inches in height as measured from the leading edge of the stair tread.
- v. Stair rail systems installed after January 17, 2017 must be at least 42-inches in height as measured from the leading edge of the stair tread.

H. Weather Considerations

Weather forecasts should be examined prior to the commencement of outdoor work. Consideration should be given to suspend work if wet or icy conditions may create additional hazards. Employees are prohibited from working outdoors during storms, visible lightning, audible thunder, and/or high winds when using personal fall protection systems.

VI. Standard Fall Protection Systems

Fall protection system selection must be based on a [fall hazard assessment](#) that includes the type of work performed, location, environment, and fall distance. Below are the standard fall protection systems to protect individuals from falls to lower levels.

A. Covers

Each cover must be capable of supporting, without failure, at least twice the maximum intended load that may be imposed on it at any one time and be secured to prevent displacement.

B. Designated Areas

Designated areas are not conventional fall protection systems or engineering controls, but an alternative fall protection method utilizing a warning line system that is only effective when set up and used correctly and safely.

- i. EHS must approve all uses of Designated Areas through the use of a [Fall Hazard Assessment Form](#).
- ii. Warning line systems must be installed and inspected by a competent person upon erection and before each use.

C. Guardrail Systems

- i. Provide a barrier to prevent individuals from falling to lower levels, and designate an area in which work may take place without the use of additional fall protection equipment. Guardrails are typically the most effective type of fall protection.
- ii. Guardrail systems must consist of a toprail 42-inches (+/- 3-inches) above the walking-working surface and midrail, installed midway between the walking-working surface and the top rail (e.g., 21-inches). Intermediate vertical members may be used in lieu of midrails, if installed no more than 19-inches apart.
- iii. Temporary guardrail systems must be visually inspected by a competent person prior to any work; any deterioration or deficiencies which may cause the guardrail system to fail must be documented and corrected prior to work

commencing.

D. Ladder Safety Systems

- i. Allows the user to climb up and down using both hands and does not require the individual continuously hold, push, or pull any part of the system while climbing.
- ii. Requires the use of a body harness that is connected to the rigid or flexible carrier or lifeline along the length of the ladder.
- iii. Must be certified and annually inspected.

E. Personal Fall Protection Systems

- i. Use guardrails and covers when feasible before using personal fall arrest or fall restraint systems.
- ii. Personal fall protection systems must:
 - a. Limit the maximum arresting force on the individual to 1,800 pounds and bring the individual to a complete stop within 3.5 feet;
 - b. Be stored in a well-ventilated, clean, dry area free from temperature and humidity extremes, corrosive materials, or other contaminants.
 - c. Be inspected by a competent person prior to each use for wear, damage, and other deterioration, and be inspected and certified by a qualified person annually.
 - d. Be ANSI-approved and not be used for any other purpose (e.g., hoisting equipment or materials).
- iii. Ropes, lanyards, and harnesses must be compatible with all connectors, anchors, and lifelines used and protected from damage (e.g., cuts, abrasions, melting).
- iv. Lanyards and lifelines must have a minimum breaking strength of 5,000 pounds, and D-rings, snaphooks, and carabiners must be capable of sustaining a minimum tensile load of 5,000 pounds.
- v. Snaphooks and carabiners must be the automatic-locking type that require at least two separate, consecutive movements to open.
- vi. Body harness D-rings must be located in the center of the user's back near shoulder level; body belts are not permitted at Northwestern.
- vii. Anchorages must be capable of supporting at least 5,000 pounds for each individual attached, or be designed, installed, and used under the supervision of qualified person as part of a complete personal fall protection system that maintains a safety factor of at least two. Anchorages must be annually inspected by a qualified person.
- viii. Horizontal lifelines must be designed, installed, and used under the supervision of a qualified person, and part of a complete personal fall arrest system that maintains a safety factor of at least two. Lifelines must be annually inspected by a qualified person.

F. Rope Descent Systems

Rope descent systems require annual inspection and must be re-certified by a qualified person who is certified through the manufacturer:

- i. At least every 10 years, or sooner as needed,
- ii. As required by the manufacturer, and
- iii. If the system has been placed under tension as a result of a fall.

VII. Protection from Falling Objects

Individuals must wear ANSI Z89.1 head protection when exposed to falling objects. In addition, protect individuals from falling objects by implementing one or more of the following:

- A. Erect toeboards along all exposed edges of overhead walking-working surfaces to prevent objects from falling to a lower level.
- B. Where tools, equipment, or materials are piled higher than the top of the toeboard, install paneling or screening from the toeboard to the midrail for a length that is sufficient to protect individuals below, or to the toprail if the items are piled higher than the midrail. Guardrail openings must be small enough to prevent objects from falling through.
- C. Erect canopy structures that are strong enough to prevent collapse and penetrations by falling objects, and keep potential falling objects far enough from edges, holes, and openings to prevent them from falling to a lower level.
- D. Barricade the area into which objects could fall, prohibit individuals from entering the barricaded area, and keep objects far enough from an edge or opening to prevent them from falling to a lower level.

VIII. Emergency Procedures

- A. Any work involving fall hazards greater than 4 feet requires the development of rescue procedures based on the tasks performed, surrounding environment, and availability of resources to ensure the safest and quickest method of rescue is employed. Rescue procedures must be documented in the [Fall Hazard Assessment Form](#).
- B. Sufficient means for communication in the event of a fall must always be in place.
- C. In the event of a fall requiring rescue, call 911 immediately.
- D. In the event of a fall:
 - i. Permanent fall protection equipment (e.g., anchors, lifelines) must be inspected, repaired, or replaced if necessary, and re-certified by a qualified person prior to it returning to service.
 - ii. Temporary fall protection systems (e.g., warning lines, portable anchors) must be inspected prior to returning to service.
 - iii. All other fall protection equipment (i.e., body harnesses, lanyards, and self-retracting lifelines) must be inspected by a competent person and repaired or replaced if found to be damaged prior to it returning to service.

IX. Signage

- A. Post fall hazard danger signage in a conspicuous manner at the roof access point (e.g., hatch, window, door) where individuals have potential exposure to rooftop fall hazards, regardless of the distance to the fall hazards.
- B. Post fall hazard danger signage in a conspicuous manner in elevated work areas (e.g., platforms, pits) with fall hazards.
- C. See **Appendix 1** for an example fall hazard danger sign.

X. New Construction and Renovation Projects

- A. Permanent fall prevention and protection measures must be included as an integral part of the design phase for all construction and renovation/repair projects.
- B. All walking-working surfaces where individuals are exposed to fall hazards (e.g., roof

systems, ladders, skylights, floor openings) must be permanently guarded or have qualified anchorages or lifelines for personal fall protection systems.

- C. All safe access and fall hazards associated with operations and maintenance must be identified, and design measures must be instituted to mitigate these hazards. It is essential to solicit comments from Facilities Operations and EHS concerning specific needs for safe access.
- D. Refer to Northwestern [Design Guidelines](#) for Safe Access and Fall Protection.

XI. Training

Individuals who are exposed to fall hazards, utilize fall protection equipment and systems, and supervise work involving fall hazards, must be trained. Training must be delivered to each individual in a manner that the individual understands. Different types of training include:

A. Authorized Person Training

- i. Recognizing and evaluating fall hazards and control methods.
- ii. Proper use, inspection, maintenance, and storage of fall protection equipment or systems.
- iii. Understanding fall protection system limitations and proper hook-up, anchoring, and tie-off techniques.
- iv. Following the work rules and guidelines set forth by the competent person, and consult with the competent person when in doubt.
- v. Training is required when any of the following scenarios occur:
 - a. New employee on-boarding,
 - b. Job-transfer that results in the potential for an employee to be exposed to fall hazards, or
 - c. Whenever a competent person deems training to be necessary.
- vi. EHS will deliver authorized person training.

B. Competent Person Training

- i. All of the responsibilities and requirements of authorized persons.
- ii. Supervising authorized persons performing work at heights and using fall protection systems.
- iii. Taking prompt, corrective measures to eliminate fall hazards.
- iv. Completing fall hazard assessments, fall protection plans, and rescue procedures.
- v. EHS will deliver competent person training.

C. Refresher Training

- i. Competent and authorized persons must receive refresher training every three years, at a minimum.
- ii. EHS will deliver competent and authorized person refresher training.

D. Retraining

Retraining will be provided to any competent or authorized person if and when any of the following scenarios occurs:

- i. Changes in the workplace or types of fall protection systems/equipment render previous training obsolete or inadequate.
- ii. When inadequacies in an individual's knowledge or use of fall protection systems or equipment indicate the individual no longer has the requisite understanding or skill necessary to use the equipment or perform the job safely.
- iii. Post-incident.

XII. Recordkeeping

A. Facilities:

- i. Provide departments, units, and contractors with the permanent fall protection system documentation associated with buildings, upon request.
- ii. Maintain applicable records for permanently-installed fall protection systems, including:
 - a. Building name and number,
 - b. Type of fall protection system installed,
 - c. Certificate of inspection,
 - d. Equipment manufacturer,
 - e. Date of installation,
 - f. Company that installed the system,
 - g. Name and contact information of certifying engineer who certified the equipment, and
 - h. Date of last certification/recertification.

B. Northwestern Departments and units:

- i. Maintain employee training records,
- ii. Maintain fall protection equipment records (i.e., certifications, inventories, and inspection reports), and
- iii. Maintain Fall Hazard Assessment Form records.

XIII. Regulatory Authority and Related Information

Northwestern and contractors will comply with the Occupational Safety and Health Administration's (OSHA) standards and any other applicable codes and standards, including:

[OSHA 29 CFR 1910 Subpart D – Walking-Working Surfaces](#)

[OSHA 29 CFR 1926 Subpart M – Fall Protection](#)

[OSHA 29 CFR 1926 Subpart L - Scaffolds](#)

[ANSI Z359.2 – Minimum Requirements for a Comprehensive Managed Fall Protection Program](#)

[Northwestern Mobile Elevated Work Platform \(MEWP\) Program](#)

XIV. Contact

For questions, contact Environmental Health and Safety at ehs@northwestern.edu.

Appendix 1 – Example Fall Hazard Signage

