

# DUQUESNE UNIVERSITY

## SAFETY PROGRAM FOR WORKING AT ELEVATED HEIGHTS

*Effective April 1, 2006  
Revised November 2010*

Prepared by: Environmental Health and Safety Department

---

### TABLE OF CONTENTS

	Page
Purpose	1
Responsibilities	1
Scaffolding	2
Ladders	3
Open Roofs or Platforms/ Mezzanines	4
Safety Harnesses	5
Floor Openings	6
Aerial Lifts	6
Training	6
Appendix A: Record of Review/ Changes	7

### **Purpose**

Falls from elevated surfaces may occur at any time, but construction related activities historically have demonstrated the highest number of injuries. This program outlines the controls to be utilized by Duquesne University to ensure the safety of on-site personnel during their work at elevated levels. Any work at levels elevated above a defined base such that a fall there from may result in bodily injury, shall be regarded as a type of high risk work. This includes/ but is not limited to: work on scaffolding, ladders, platforms and open roofs, and areas around floor openings.

### **Responsibilities**

Administration - Duquesne University has the overall responsibility for providing a place of employment free of recognized hazards and unsafe conditions, as well as complying with federal, state, and local standards and regulations.

The Deans, Directors or Department Heads - Have the overall responsibility of ensuring that all pertinent personnel are provided with the required equipment and resources to conduct safe work operations. They must also ensure that proper safety equipment and training are made available to each worker involved in elevated work operations.

Environmental, Health and Safety - Has the responsibility of ensuring local, state, federal and insurance company compliance and the responsibility for guidance and technical expertise needed to oversee the program. Responsibilities also include providing training for affected personnel.

Department Supervisor (whose employee(s) engage in elevated work) - Ensure that all aspects of this Program are implemented and hazards are controlled so not to present a hazardous exposure to University employees,

students and visitors. It is also the responsibility of Department Supervisors to insure the employee(s) designated to perform elevated work utilizes the necessary procedures and equipment to minimize that employee's own exposure to the hazards generated. Responsibility also includes ensuring that all equipment is maintained in a safe operational manner.

University Employee(s) (engaged in elevated work) -Are responsible for following this Program and implementing controls that will eliminate or greatly reduce the hazards generated by their work for the protection of themselves, University employees, students and visitors. Personnel using tools or equipment for elevated work are also responsible for ensuring that equipment is in proper working order.

Project Supervisor(s) for Outside Contractor(s) - Are responsible for ensuring outside contractors and sub-contractors involved in elevated work have and follow a Fall Protection Program or comply with the provisions of this Program.

## **SCAFFOLDING**

Scaffolds shall meet or exceed the requirements of the Occupational Safety Health Act (OSHA), 29 CFR 1926 Subpart L.

Scaffolds shall be erected in accordance with the manufacturers' designs and instructions and with OSHA standards for persons engaged in work that cannot be done safely from the ground, from solid construction, or from ladders.

Materials used in scaffolds shall be of standard manufacture, conform to standard specifications for strength, dimensions, and weights; they shall be able to support at least 4 times the maximum intended load.

Safety harnesses shall be considered for use at all times when using scaffolding. Fall protection is not required on scaffolds above 10 feet so long as the scaffolds are equipped with standard toprails, midrails, and toeboards and the work performed is such that the workers are not exposed to a fall.

Scaffolds shall be maintained in a safe condition, and shall never be altered. Any damaged or weakened scaffold shall be immediately and properly disposed of. It should not be used under any circumstances. Scaffolding should be protected from corrosion or deterioration.

The maximum work level height shall not exceed four times the shortest base dimension of scaffolding. If this is not possible, suitable outrigger frames must be used to increase the shortest base dimension.

Scaffold footing or anchorage shall be provided that is sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Barrels, boxes, loose brick, concrete blocks, or other unstable objects shall not be used to support scaffolds. Use mud sills, if necessary.

Work on scaffolds shall not be done during storms or high winds, or when covered with ice or snow, unless all ice and snow are removed and the planning sanded to prevent slipping.

Tools, materials, or debris shall not be permitted to accumulate enough to become a hazard.

Scaffolding shall never be moved while in use or occupied. Wheels or casters shall have positive wheel and/or swivel locks to prevent movement.

Scaffold poles, legs, or uprights shall be plumb and braced securely to prevent swaying or displacement.

Guardrails, midrails, and toeboards shall be installed on all open sides and ends of platforms of fixed scaffolding over 10 feet high and movable scaffolding over 6 feet high. Guardrails shall be approximately 42 inches high, midrails 21 inches, and toeboards shall be, at minimum, 4 inches high.

Areas around the bases shall be roped off 5 feet from the scaffolding to alert other personnel of an overhead hazard. This area shall be posted "CAUTION," "OVERHEAD HAZARD," "HARDHAT REQUIRED" for entry.

Overhead protection shall be provided for workers on scaffolding exposed to overhead bump hazards. Personnel working at or near the base of scaffolding shall wear overhead protection when the scaffold is in use or occupied.

Scaffolding over 10 feet high shall be secured (tied off) to permanent structures using a minimum No. 9 soft drawn wire. Sprinkler, water, or other utility lines shall not be used as tie-off areas.

Scaffold planks shall extend over end supports at least six inches but not more than 12 inches.

When scaffolding is erected, manufacturer's construction instruction and drawings shall be followed to ensure a proper and safe set-up.

Scaffolding which has been identified as being unsafe, defective, bent, or excessively rusted, shall be tagged or posted as being unsafe. It shall be immediately removed from service.

## **LADDERS**

All ladders to be used at Duquesne University shall meet or exceed the requirements of Occupational Safety Health Administration (OSHA) 29 CFR 1910.25-27 and 1926 Subpart X.

Ladders shall be designed so there are no structural defects or accident hazards such as sharp edges, burrs, etc. Metal ladders selected shall be strong enough to meet the test requirements and shall be protected against corrosion unless inherently corrosion resistant (i.e., aluminum). All wood ladders shall be free of splinters; sound and visually inspected to be free of shake, wane, compression failures, decay, or other irregularities.

Ladders shall not be used: with broken, loose, or missing rungs; loose nails, bolts, metal parts; cracked, split, worn or broken siderails, braces, or steps; damaged, worn, or missing safety feet. Unsafe ladders shall be tagged not for use and removed from service.

Workers shall inspect any ladder for defects before its use each day, and after any occurrence that could damage the ladder, such as a fall.

Wooden ladders may be coated with transparent, nonconductive finish such as varnish, shellac, or a clear preservative. Ladders shall not be coated with any opaque covering except for a minimum amount needed for identification or warning, and then only on one face of the siderails.

Portable, straight, and extension ladders shall be equipped with non-slip safety feet. Step ladders shall have safety feet on the front legs.

Metal ladders shall be equipped with rubber feet or a rubber base insulation to ensure the ladder is insulated from the ground.

Step ladders must have spreaders or locking devices which will hold them securely in the open position. The spreaders must have any sharp points or edges covered or removed. Some step ladders do have the pail shelf and spreader combined as one unit.

Ladders, when not in use, shall be stored at a location where they will not be exposed to the outside atmosphere, but where it is dry and there is good ventilation. Ladders stored in a horizontal position shall be supported at several points to avoid sagging and permanent set.

Ladders shall be placed on a substantial base and the area around the top and bottom of the ladder kept clear.

Ladders shall not be placed in front of doors opening toward the ladder unless the door has been blocked open, locked, or guarded.

Ladders shall not be placed in passageways, doorways, driveways, or anywhere they may be displaced by activities unless protected by barricades or guards.

Ladders shall not be used horizontally as platforms, runways, or scaffolds.

Portable ladders shall be tied, blocked, or otherwise secured while in use.

Portable ladders shall be used at such a pitch that the horizontal ground distance from directly below the top support to the foot of the ladder is one quarter of the working length of the ladder.

When a portable ladder is used to gain access to a roof, mezzanine, etc., the ladder shall extend a minimum of 3 feet above the point of top support.

Only one person shall be permitted on any ladder at any time.

Anyone ascending or descending a ladder shall face the ladder.

When working from a ladder involves pushing, pulling, or any action that may dislodge a person from the ladder, fall protection shall be used.

Ladders shall be placed so that climbing workers are not exposed to hazards from project objects.

Ladders shall not be used for any purpose other than those originally intended or recommended by the manufacturer.

## **OPEN ROOFS OR PLATFORMS/ MEZZANINES**

During work on open roofs, platforms, and mezzanines without guardrails, personnel shall be protected from falling. Warning lines shall be erected not less than 6 feet from the edges near the working area.

The warning line shall consist of a rope, wire, or chain and supporting stanchions erected as follows: The warning line shall be flagged at not more than 6 foot intervals with high visibility material. The warning line shall be rigged so that its lowest point (including sag) is no less than 34 inches from the roof surface and its highest point is no more than 39 inches from the roof surface. After warning line is erected, the stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion. The warning line shall have a minimum tensile strength of 500 pounds. The line shall be attached at

each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

Workers shall wear safety harnesses should it be required to perform work between the warning line and roof edge, on platforms, or mezzanines less than 6 feet wide. Safety harness systems shall be rigged to allow movement only as far as the roof/platform edge.

Lifelines shall be secured to an anchorage or structure member capable of supporting a dead weight of at least 5400 pounds. Lifelines shall be at least one-half-inch nylon or equivalent with a nominal breaking strength of 5400 pounds.

EH&S will designate a competent person (safety monitor) to monitor the safety of other employees when a basic fall protection systems are not feasible.

The safety monitor shall:

- Be competent to recognize fall hazards.
- Warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner.
- Be on the same working/walking surface within visual sighting distance of the employee being monitored.
- Be close enough to communicate orally with the employee.
- Not have other responsibilities that could take the monitor's attention from the monitoring function.

Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used.

No employee, other than the employee engaged in roof work or an employee covered by a fall protection plan, shall be permitted in an area where an employee is being protected by a safety monitoring system.

Each employee working in a controlled access zone shall be directed to comply with fall hazards warnings from the safety monitors.

## **SAFETY HARNESSSES**

Safety harnesses shall be constructed of nylon and polyester webbings with a lanyard (rope) attached to the safety harness D-rings.

The lanyard shall be at least ½ inch diameter nylon rope or stronger. The lanyard shall be positioned to allow as little slack as possible, to limit the free fall distance to which a worker is exposed. Maximum length to provide for a fall will be no greater than 6 feet.

The lanyard shall be hooked to a secure anchorage point. A safe fixture point above head height shall be utilized.

A lifeline shall be required when no fixture point can be found. A lifeline is an anchoring cable rigged between two fixed anchorage points. This may serve as a mobile fixture point. EH&S shall be consulted prior to any construction of lifelines.

Sprinkler, water, or other utility lines shall not be used as anchorage points.

Each safety harness and lanyard assemble shall bear the manufacturer's identification, date of manufacture, and the product number.

University personnel knowledgeable and experienced in safety harness inspections shall inspect each harness and lanyard to the manufacturer's inspection recommendations every 6 months. The date of inspection shall be recorded on an inspection tag permanently attached to the harness.

Each harness and lanyard assemble shall be visually inspected by the user for defects and to ensure the harness has been inspected before each use.

## **FLOOR OPENINGS**

Where open pits and floor openings exist in out work area, workers shall be protected from falling hazards.

A floor opening shall be guarded by either a hinged cover of standard strength and construction, or a removable railing with toeboard on not more than two sides of the opening and fixed standard railings with toeboards on all other exposed sides.

When a floor hole is uncovered, the hole shall be constantly attended or protected by the removable and fixed railings.

When a floor opening is not guarded by a cover, protective railings shall be constructed. A standard railing consists of a top rail, intermediate rail and posts, and shall have nominal height of 42 inches. The top rail shall be smooth-surfaced. The intermediate rail shall be about halfway up. Ends of rails shall not overhand the terminal posts except where such overhand does not constitute a projection hazard.

Railing shall be anchored to withstand at least a load of 200 pounds applied in any direction at any point on the top rail.

## **AERIAL LIFTS**

All aerial lifts to be used shall meet or exceed the applicable requirements of the American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-2001.

Only authorized personnel familiar with the use and operation of aerial lifts shall utilize aerial lifts.

Personnel shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket.

Personnel shall not attempt to increase the working height using boxes, ladders, or other means.

The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

## **TRAINING**

Duquesne University's Manager, EH&S shall ensure that initial safety training for working at elevated levels is conducted to qualify personnel. Annual refresher courses will be given to maintain competence.