



FALL PROTECTION GUIDELINES



Office of Risk Management

FOR THE UNIVERSITY COMMUNITY

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TABLE OF CONTENTS

1. SCOPE	1
2. INTENT	1
3. LEGISLATION AND REQUIREMENTS	1
4. RESPONSABILITIES	2
5. SAFETY MEASURES AND HAZARD CONTROL	3
6. FALL PREVENTION	3
7. FALL PROTECTION	4
8. EDUCATION AND TRAINING	5
9. PROCEDURES FOR HIGH ELEVATION RESCUES	6
FALL ARREST EQUIPMENT	7
LADDERS AND STEPLADDERS	9

1. SCOPE

To all University of Ottawa employees, professors, students, volunteers, and visitors who **regularly or occasionally work at heights** and are exposed to a hazard of falling.

Everyone who carries out work at a height or who is exposed to the risk of falling from a height of more than 3 meters must receive training.

The work at a height includes work on sloped roofs or flat roofs in circumstances when adequate railings are not provided.

2. INTENT

To provide an overview of legislation and prevention strategies to eliminate accident or reduce the number and severity of fall-related accidents.

3. LEGISLATION AND REQUIREMENTS

The Ontario Regulation, Industrial Establishments (851), Section 85, under the Occupational Health and Safety Act specifies that a worker who is exposed to a risk of falling from a height of more than 3 meters must wear full body harness and lifeline adequately secured to a fixed support so that the worker cannot fall freely for a vertical distance of more than 1.5 meters. (The type of system and anti-fall protection must be adequate and CSA recognized.)

For example, a worker who is working on a ladder or a step-ladder and who is situated at a height of more than 3 meters from the ground must use an adequate anti-fall protection measures; especially, if the worker does not have 3 points of contact with the ladder, he or she must wear full-body harness and lifeline secured to a fixed support.

In addition, section 207, Construction Regulation (Ontario regulation 213/91) indicates that when a built-up roof is being constructed, repaired or resurfaced, a barrier shall be placed in the immediate work area at least two meters from the perimeter of the roof.

In accordance with the Ontario Regulations 213/91 and 851, the University of Ottawa requires that employees exposed to:

- ◆ a potential free-fall greater than 3 meters/10 feet, or
- ◆ more than 1.2 meters/4 feet if the work area is used as a path for a wheelbarrow or similar equipment, or
- ◆ if work at a height includes the work on roofs at an angle, or
- ◆ flat roof in circumstances when adequate railings are not provided,

must receive fall protection training and implement proper fall prevention methods.

Employees should never be required nor allowed to perform any duties, which require the employee to get closer than 2 meters to an unprotected edge, platform or walkway of any building, nor to utilize elevated equipment unless the employee is properly trained and secured from falling. Special considerations must be implemented if employees are exposed to falling through any openings in a surface or into operating machinery, water or another liquid.

Everyone, even those who don't usually work at heights have to have fall protection training and wear protective equipment if they are to perform activities described previously.

For detailed information consult the Industrial Establishments and the Construction Regulations under the Ontario Occupational Health and Safety Act.

In circumstances when a worker cannot be secured to a fixed support, the other work method must be used, for example, use a lifting device ("off-slab powered platforms"). *REMINDER: the use of a lifting device also requires mandatory, specialized training.*

All health and safety regulations applying to construction, industrial establishments, etc. have the same basic requirement for fall protection, i.e., a worker exposed to a hazard of falling of 3 meters or more must wear protective equipment and must be trained to use it properly.

4. RESPONSABILITIES

In accordance with the Policy 77 and with the Ontario Occupational Health and Safety Act and its regulations,

Supervisors must:

- 1) Select the most appropriate method of fall prevention and fall protection to protect the employee,
- 2) Acquire the necessary equipment,
- 3) Train the employee in proper equipment use and keep records of training,
- 4) Develop a rescue plan, and
- 5) Ensure that the program is followed and employees accept their obligation to follow the rules to protect themselves.

Workers must:

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- 1) Follow the rules to protect themselves
 - 2) Use proper equipment and personal protective equipment, as required, and
 - 3) Take all training provided and implement it.

5. SAFETY MEASURES AND HAZARD CONTROL

There are two ways to ensure the safety of the worker who might be exposed to the hazard of falling. It is:

- fall prevention and,
- fall protection

Fall preventative measures always have to be considered first. In both cases a worker has to be adequately trained.

6. FALL PREVENTION

The best protection is to prevent falls from happening in the first place. Fall prevention uses physical means to keep workers away from situations where they might fall. Fall prevention includes:

- 1) Proper use of worksite access such as ladders and scaffolds. Please refer to Safety Sheet #2 (Ladders and Stepladders, see Appendix 2)
- 2) Protective covers over floor and roof openings. Protective covers must be:
 - secured in place, and
 - constructed to meet the structural requirements for loads due to the use of floors and roofs as set out in the Building Code
- 3) Visual Warnings: signs or tape, cones or boulders, paint or chalk
- 4) Physical Barriers: warning barriers and bump lines, handrails, fencing, guardrail systems*, travel restraints
- 5) Pre-assembly on the ground

**Guardrails must be installed in following areas:*

- a) Around the perimeter of an uncovered opening in a floor, roof or other surface to which a worker has access;
- b) At an open side of,
 - i. A raised floor, mezzanines, balcony, gallery, landing, platform, walkway, stile, ramp or other surface, or

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- ii. A vat, bin or tank, the top of which is less than 107 centimeters above the surrounding floor, ground, platform or other surface; and
 - c) Around a machine, electrical installation, place or thing that is likely to endanger the safety of any worker.

A guardrail shall:

- a) Have a top rail located not less than 91 and not more than 107 centimeters above the surface to be guarded;
- b) Have a mid rail;
- c) If tools or other objects may fall on a worker, have a toe board that extends from the surface to be guarded to a height of at least 125 millimeters, and
- d) Be free of splinters and protruding nails.
- e) A guardrail shall be constructed to meet the structural requirements for guards as set out in the Building Code.

When preventative measures are not feasible, such as when work places are a rooftop or mobile scaffold, an adequate fall protection must be provided for each exposed worker.

7. FALL PROTECTION

Fall protection includes:

- 1) Fall restriction.

A fall-restricting system is designed to limit a worker's free fall distance to 0.6 meters (2 feet). One type uses a harness that attaches to a safety rail on a fixed ladder.

- 2) *Travel-restraint systems.* Where work must be done within 2 meters (6 feet) of an open, unprotected edge that presents a fall hazard, a travel-restraint system must be provided.
 - A travel restraint system shall consist of a full body harness with adequate attachment points.
 - The full body harness shall be attached by a lifeline or lanyard to a fixed support that meets the requirements of the Building Code.
 - The travel restraint system shall be inspected by a competent worker before each use.
 - If a component of the travel restraint system is found to be defective on inspection, the defective component shall immediately be taken out of service.

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- 3) Fall arrest system prevents a falling worker from hitting the ground or any object or level below the work. Please refer to Safety Sheet #5 (See Appendix 1) and to the Personal Protective Equipment Standard of the University of Ottawa.
 - 4) Anchor points. The location of fixed anchor points generally can be found on the building plan located in the mechanical room at the top of the roof. If not please contact Physical Resources Service.
 - 5) Safety nets. A safety net system must be designed by a professional engineer. The system is installed below a work surface to protect any location where a fall hazard exists. This system is rarely used in the Ontario Construction, but it is regulated.

Please note: Changes in the Regulation requires that body harness systems are now required rather than body belts as part of the fall arrest system. Also, non-locking type snap hooks are no longer allowed as part of the fall arrest system.

8. EDUCATION AND TRAINING

A training program for fall protection must be established for every employee exposed to fall hazards, even if it happens very rarely or only occasionally.

One form of adequate training is the ***Basics of Fall Protection*** program produced by the Construction Safety Association of Ontario (CSAO).

Basics of Fall Protection enables participants to:

- 1) recognize common fall hazards, and
- 2) identify and apply basic fall protection controls.

A list of qualified trainers is maintained by ORM and can be obtained upon request.

Training Records

Supervisors must ensure that:

- 1) a worker who may use a fall protection system is adequately trained in its use and given adequate oral and written instructions by a competent person.
- 2) the person who provides the training and instruction prepares a written training and instruction record for each worker and signs the record.

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- 3) The training and instruction record shall include the worker's name and the dates on which training and instruction took place.
 - 4) The employer shall make the training and instruction record for each worker available to an inspector on request.

If you have questions or concerns about whether you should have training please contact the Manager of Occupational Health and Safety at the Office of Risk Management, Environmental Health and Safety.

9. PROCEDURES FOR HIGH ELEVATION RESCUES

General Information

These procedures are meant to inform members of the University community of the proper action to take in situations involving high-elevation and confined-space rescues on University premises. The Technical Rope Rescue Team (TRRT) of the Ottawa Fire Department is trained to carry out rescues anywhere on campus. This team will take charge of the situation and direct the rescue. The type of response and rescue procedure will depend on the nature of the accident/incident.

Please note that the Technical Rope Rescue Team will take a minimum of 5-10 minutes to arrive on site. It is critical that the actions outlined be followed to ensure a safe rescue and prevent further injury or worsening of the situation.

Steps:

- 1) Call Protection Services immediately at extension **5411** or PRESS the emergency button on the telephone.
- 2) Provide as much information as possible about the situation. Here are examples of information that may be requested:
 - The nature of the emergency/incident/accident (high elevation rescue, confined space, building structure collapse, etc.)
 - What the person requiring rescue was doing or working on when the incident/accident occurred
 - Exact location of the person requiring rescue:
 - Name/location of the building
 - Building's address
 - Is the person inside or outside the building or on the roof?
 - If the person is outside the building, on which side of the building at what height?
 - The person's condition: conscious or unconscious, visibly injured or not, position relative to the building

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- How long this person has been in the situation?
 - What kind of equipment is the person wearing (if any)
- 4) If possible, describe the risks for the person requiring assistance and for the rescuer:
- Approximate elevation (how many floors up)
 - Could there be an oxygen deficiency?
 - Other risks such as electrical, mechanical or thermal (hot/cold)

Location of Roof Anchor Points

Physical Resources Service maintains a binder called “Roof Anchor Point Location by Building”, showing the location of roof anchor points on each building. A copy of this binder is available in the Protection Services Communication Centre (Room 110) and in the office of the Environmental Health and Safety Officer at Physical Resources Service (Room 225, 141 Louis Pasteur).

In addition, in most mechanical rooms/penthouses located at the top of University buildings, a plan is posted showing the location of roof anchor points.

Responsibilities

Physical Resources Service must ensure the proper and regular certification of all anchor points located on the University of Ottawa premises. It must also provide Protection Services with an updated version of the binder called “Roof Anchor Point Location by Building”.

Physical Resources Services & Office of Risk Management

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FALL ARREST EQUIPMENT

Consult the Ontario Occupational Health and Safety Act and its regulations for detailed information.

1. Any worker required to use fall protection must be trained in its safe use and proper maintenance. Refer to Fall Protection Training Guidelines for further details.
2. Equipment must be properly suited for the task.
3. Equipment must be in good working condition. Inspect all parts of the equipment for damage, wear, and obvious defects before each use if equipment is not used regularly.
4. Replace defective equipment. If there is any doubt about the safety of the equipment, do not use it.
5. Replace any equipment, including ropes, involved in a fall. A trained inspector must confirm the equipment can be used safely if a potential defect is found.
6. Always refer to manufacturer's instructions regarding the use and care of the equipment.
7. A trained inspector should examine equipment at least yearly.
8. Equipment must include a CSA-approved full body harness.
9. Equipment must include a lanyard equipped with a shock absorber unless the shock absorber could cause a falling worker to hit the ground or an object or level below the work.
10. Equipment must be attached to a CSA approved lifeline or by the lanyard to an adequate fixed support (Anchor).
11. Fall arrest equipment shall bear manufacturer identification marks.
12. Equipment must prevent a falling worker from hitting the ground or any object or next level below the work area.
13. Must not subject a falling worker to a peak fall-arrest force greater than 8 kilonewtons (1800 pounds).
14. The minimum strength of all components including lifeline and lifeline anchorage (in systems **without** shock absorber) must be able to support a static load of 8 kilonewtons (1800 pounds) without exceeding the allowable unit stress of the materials used for each component.
15. The minimum strength of all components including lifeline and lifeline anchorage (in systems **with** shock absorber), must be able to support a static load of 6 kilonewtons (1350 pounds) without exceeding the allowable unit stress of the materials used for each component.
16. Anchor points must be inspected yearly and must be identified with a seal of approval by a professional engineer.
17. The location of fixed anchor points generally can be found on the building plan located in the mechanical room at the top of the roof. If not please contact Physical Resources Service.
18. For additional information, consult the following documents: The User's Guide for Basics of Fall Protection, Ladders, and Construction Health & Safety Manual produced by the Construction Safety Association of Ontario.
19. For additional information on personal protective equipment, please refer to the University of Ottawa Personal Protective Equipment standard and the Fall Protection Guidelines.

LADDERS AND STEPLADDERS

Consult the Ontario Occupational Health and Safety Act and its regulations for detailed information.

1. Must be properly suited for the task.
2. Must be in good working condition. Check all parts before each use.
3. Shall be CSA approved, especially for construction purposes.
4. Should use the heavy duty or grade 1 type.
5. Verify the rating load and respect limitations.
6. Must have non-slip feet.
7. Must be on a firm footing and secure against slipping.
8. Avoid twisting or turning.
9. Never step on the top rung.
10. Face the ladder and use both hands to climb up or down and maintain three-point contact at all times. To keep your hand free, use a tool belt, or hoist tools and materials up after you reach the top.
11. Don't overreach. Keep your centre of gravity between the side rails. A general rule is that if your buckle is in line with the uprights you are leaning too far.
12. Never paint or coat with an opaque material a wooden ladder.
13. Never use aluminium ladders or conductive materials where electrical contact is possible.
14. Ensure areas surrounding the base and top are clear of obstructions.
15. Never use horizontally.
16. If work is conducted at more than 3 metres with a hazard of falling, must wear safety harness and tie the lanyard to the structure or to a lifeline before beginning work and have proper training
17. Ensure you are wearing slip-resistant footwear.

Additional requirements if using an extension ladder:

18. Follow the 4 to 1 rule. Ladders should be inclined such there is one rung length out from the wall for every four rungs height to the point the ladder touches the wall (not less than 1/4 and no greater than 1/3).
19. Should extend at least a metre above the edge of the working surface.
20. Have someone hold the bottom of a tall ladder until it can be tied off to a firm anchoring point.
21. Don't use in high winds.
22. If exceeds 6 metres in length and is not securely fastened or is likely to be endangered by traffic, must be held in place by one or more workers while being used.
23. Never erect ladders near power lines unless you are a competent electrician and follow restricted rules.

Additional requirements if using a stepladder:

24. Ensure to lock the stepladder in place by spreading the legs to their limit and locking the spreader.
25. Never stand on the top or use the pail shelf as a step.
26. Verify the age of the ladder (should be imprinted into the ladder)
27. Maintain 3 points of contact with the ladder

