



**WORKING AT ELEVATED PLACES STANDARD
(Including Working on Roofs or At Heights)**

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1.0 INTRODUCTION

Fall protection systems are required where a worker may be exposed to a fall hazard while performing job duties on campus or at off-campus properties owned/operated by the University.

According to Ontario Regulation 213 (Regulation for Construction Projects, as amended), fall protection systems are required where a worker may be exposed to any of the following hazards:

- a) Falling more than 3 metres
- b) Falling more than 1.2 metres, if the work area is used as a path for a wheelbarrow or similar equipment
- c) Falling into operating machinery
- d) Falling into water or another liquid
- e) Falling into or onto a hazardous substance or object
- f) Falling through an opening on a work surface

In addition, Ontario Regulation 851 (Regulation for Industrial Establishment, as amended) specifies that a worker must be equipped with a fall arrest system when exposed to a risk of falling more than three metres.

Each University of Toronto (UofT) department or unit that has workers who perform work at elevated places must also develop procedures for the rescue of a worker in the event of an arrested fall. The fall rescue plan should outline the specific precautions and procedures that are to be taken during a fall from heights emergency.

Note: In this standard, “worker” includes faculty, staff, students, contractors, and visitors.

2.0 APPLICATION

Situations where working at heights training, fall protection systems, and fall rescue procedures are required may include:

- Climbing a ladder or scaffolding
- Erecting and dismantling of scaffolds when guardrails are not in place
- Working on roofs where there may be gaps/holes on the roof, unstable surfaces, slippery conditions, or unprotected edges
- Operating cranes or hoists
- Climbing to and from elevator platforms
- Walking on unstable surfaces at elevated heights (e.g., buildings under construction)

In addition to fall hazards, other hazards that are associated with working at heights may include:

- Slip and trips
- Working alone
- Inclement weather
- Heat/cold stress
- Electrical hazards
- Ergonomics
- Injuries to workers and the public caused by objects falling from above

3.0 HIERARCHY OF CONTROLS

The hierarchy of controls shall be considered and applied to hazards associated with working at heights. The higher the method of control is ranked, the less chance there is for a worker to be injured.

Rank	Control Method	Examples
1	Eliminate the Fall Hazard Change the work process or relocate the work so the fall hazard no longer exists.	<ul style="list-style-type: none"> Building a roof on the ground and hoisting it into place. Moving an air-handling unit from near the edge of a roof to the centre.
2	Guardrails, Protective Covers and Warning Barriers Prevents a fall from unprotected edges or openings at heights.	<ul style="list-style-type: none"> Install permanent safety features (e.g., guardrails, walls, parapets, or other structural features) which prevents workers from falling off an open edge. Cover floor or roof openings so that workers cannot fall through them. Use an elevated work platform (EWP) or scaffold which has permanent guardrails.
3	Travel Restraint System Use personal protective equipment to restrict a worker's movements by allowing them to reach the edge but not fall over it.	<ul style="list-style-type: none"> Worker wears a full body harness with lanyard (fixed length or adjustable) attached to an anchor point. Alternatively, the lanyard may be connected to a lifeline with a rope grab.
4	Fall Restricting System Use personal protective equipment to limit a worker's fall to a specified distance.	<ul style="list-style-type: none"> Fall restrict systems are designed to limit a fall distance to 0.6 m (2 ft).
5	Fall Arrest System* Designed to stop the fall of a worker before they hit the ground or objects below. * Fall rescue planning required	<ul style="list-style-type: none"> Consist of a full body harness connected to a lifeline or lanyard with shock absorber attached to a fixed support.
6	Safety Net* Designed to catch a falling worker before they hit the ground or objects below. * Fall rescue planning required	<ul style="list-style-type: none"> Install a safety net around the perimeter of a building or at floor or roof openings to arrest a worker's fall.
7	Administrative Controls Work practices or procedures that increase a worker's awareness of a fall hazard.	<ul style="list-style-type: none"> Working at heights training Fall rescue training Fall protection and fall rescue work plans (Appendix A)

4.0 DEFINITIONS

<i>Aerial platforms</i>	Includes scissor lifts, boom lifts, or other type of lifts.
<i>Competent person</i>	Defined as someone: <ul style="list-style-type: none">a) Qualified because of knowledge, training, and experience to organize the work and its performance;b) Familiar with the OHSA and the regulations that apply to the work;c) Who has knowledge of any potential or actual danger to health or safety in the workplace.
<i>Fall arrest system</i>	Any fall protection system that permits a limited free fall (stop and suspend). This system comprises an assembly of components joined together such that when the assembly is connected to a fixed support, it can arrest a worker's fall.
<i>Fall protection</i>	Any system that serves to protect a worker from falling or minimizes the travel distance in the event of a fall.
<i>Fall restricting system</i>	Type of fall arrest system that has been designed to limit a worker's fall to a specific distance.
<i>Guardrail system</i>	An assembly that provides a barrier to prevent a worker from falling from an edge of a surface.
<i>Peer rescue kit</i>	Type of fall rescue system which is attached remotely to the fallen worker by a rescuer. Once connected to the system, the fallen worker can either be raised or lowered to safety. All rescue components needed are contained in one pre-assembled kit and requires only an overhead anchorage.
<i>Safety straps (stirrups or suspension trauma safety straps)</i>	Straps attached to a full-body harness that allows a suspended person to stand up in their harness after a fall. This helps to alleviate pressure on the legs while the person is awaiting rescue. It is designed to prolong suspension time for a person who has experienced a fall.
<i>Self-rescue ladder</i>	A portable web ladder designed and intended to rescue a suspended worker after a fall. The ladder is contained within a bag with a carabiner/snap hook that is connected to an anchor point. Once deployed, the ladder allows the fallen worker to climb to safety or allows the rescuer to climb to the victim to administer assistance. Note that this fall rescue system requires a second worker to deploy the ladder for the fallen worker.
<i>Suspension trauma</i>	A condition which occurs after a worker has fallen and is suspended in a hanging position in a fall arrest harness. Gravity and constriction by the harness' leg straps can cause blood to pool in the lower body, depriving the brain of oxygen. This could lead to symptoms of dizziness or feeling faint, sweating, difficulty breathing, nausea, drop in blood pressure, numbness in arms and legs, and loss of consciousness. Can be fatal within 10–30 mins if not rescued.
<i>Travel restraint system</i>	Any fall protection system that limits travel in a manner such that free fall is not possible. This system comprises an assembly of components capable of restricting a worker's movement on a work surface and preventing the worker from reaching a location from which they could fall.
<i>Unprotected sides and edges</i>	Any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, ramp, or runway where there is no wall or guardrail system.
<i>Warning line system</i>	Temporary demarcation which warns workers if they are approaching an unprotected edge. Where no guardrails or safety net systems are available, they must be placed at least 2 m from the unprotected edge.

5.0 ONTARIO LEGISLATION AND REQUIREMENTS

Section 26 of the Regulation for Construction Projects (O. Reg. 213/91), under the Occupational Health and Safety Act of Ontario, outlines the definition of working at heights and the requirements for fall protection (i.e., fall arrest) systems on construction worksites. Section 207 of the Construction Regulation 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.

Under Section 26.1(4) of the Construction Regulation, each department/unit having employees who perform work requiring fall protection is required to develop written procedures for the rescue of a worker whose fall has been arrested before using any fall protection system or safety net on a project.

Section 85 of the Regulation for Industrial Establishments (O. Reg. 851) specifies that a worker who is exposed to a risk of falling from a height of more than 3 meters must wear a full body harness and lifeline adequately secured to a fixed support so the worker cannot fall freely for a vertical distance of more than 1.5 meters.

6.0 UNIVERSITY OF TORONTO REQUIREMENTS

In accordance with the Ontario Regulations 213/91 and 851, the University of Toronto requires that workers must receive Working at Heights training and implement the proper fall prevention methods when exposed to the following:

- A potential free-fall greater than 3 meters (10 feet)
- Working on roofs at an angle
- On a flat roof in circumstances when adequate railings are not provided

Workers should never perform any duties close (2 meters) to an unprotected edge, platform, or walkway of any building, or utilize elevated equipment unless they are properly trained and secured from falling. Special considerations must be implemented if workers are exposed to any openings in a surface (e.g., roof) that they can fall through.

In circumstances when a worker cannot be secured to a fixed support (e.g., on fragile roofs), other work methods must be used such as a lifting device. The use of a lifting device requires specific training for that device.

Please also refer to the [Portable Ladders Standard](#) where applicable. Please note that ladders are not general work platforms. They should be limited to situations where the work is of short duration and where there is no other means to access the work area.

7.0 EDUCATION AND TRAINING REQUIREMENTS

Working at heights training All workers who may use a method of fall protection to protect themselves against a fall hazard must undergo mandatory fall protection training (i.e., Working at Heights (WAH) training) that has been approved by the Chief Prevention Officer (CPO) of the Ministry of Labour, Training, and Skills Development (MLTSD). A WAH refresher course is required every 3 years. This training is available on-site by an external vendor arranged by Environmental Health and Safety (EHS). Departments may also receive this training from a CPO approved vendor. In these cases, please provide EHS with the proof of training to update the worker's EHS training history: <https://ehs.utoronto.ca/training/my-ehs-training/>.

Site-specific training Employers must ensure all supervisors and workers are given site-specific training and proper oral* and written instructions to supplement standardized WAH training. This includes ensuring each supervisor and worker is aware of hazards at the work site and be provided with instruction on all devices or equipment that may be used, including personal protective equipment (PPE). Site-specific training should be specific to working at height situations that will be encountered including how to wear and use fall protection equipment provided by the site/department and site-specific fall rescue procedures.
*Oral training should be documented (content, when or e.g., as meeting minutes).

Fall rescue training Supervisors and workers who perform fall rescue may require additional training. Rescue responders must be properly trained in how to perform rescue operations and how to install, wear, and use fall rescue equipment correctly. Fall rescuers must be familiar with the rescue equipment's operating characteristics, application limits, and consequences of improper use. Fall rescue equipment must also be inspected, maintained, and stored properly. Fall rescue training may be provided by an external vendor or developed internally by each Department/Unit, based on their site-specific fall rescue plan (e.g., type of rescue equipment, physical or environmental factors that may impact the rescue). Supervisors are to document and keep records of all staff who have been trained and instructed on the fall rescue plan.

Note: Never expose a user to a fall during training exercises.

First aid training Supervisors and workers who perform fall rescue may require first aid training to attend to an injured worker after a fall emergency. Fall rescuers must undergo a two-day training course in standard first aid which includes cardiopulmonary resuscitation (Standard First Aid Level C) that has been approved by the Workplace Safety Insurance Board (WSIB). A Standard First Aid and CPR certificate is valid for 3 years. This training is provided on-site by an external vendor arranged by Environmental Health and Safety (EHS) or by the department/unit (if it is a job requirement). EHS can provide assistance if necessary. For more information, please refer to: <https://ehs.utoronto.ca/training/first-aid-training/>.

Aerial platform training Training on the use of aerial platform lifts (e.g., scissor or boom lifts) may be provided by an external organization (e.g., manufacturer, equipment provider) or internally by a competent person. Prior to training on lifts/platforms designed to lift people, the worker must have current WAH training because a fall arrest harness is worn during the lift's operations. For aerial platform training, there is a theory and hands-on component. Depending on which type of lift you use (e.g., boom/scissor lift), you may require hands-on training for both. The theory is typically the same for lifts. Equipment-specific training, where applicable, should cover safe operation, selection of the appropriate PPE and fall protection equipment, and fall rescue plan. Training should be refreshed every 3 years unless specified by the manufacturer.

Other types of lifts For lifts that are outside of the scissor or boom category, equipment-specific training (including, where applicable, safe operation, selection of the appropriate personal protective equipment and harness and fall rescue plan) is required. Training may be provided by an external provider (e.g., manufacturer) or by a competent supervisor/lead hand. Training should be refreshed every 3 years unless specified by the manufacturer.

8.0 ROLES AND RESPONSIBILITIES

Principal investigators/supervisors and all others in authority shall:

- Assess the situation, including the task, conditions, and associated risks (including fall hazards) prior to commencement of work
- Implement the appropriate procedures to protect workers, including a fall rescue plan in the event of a worker falling. Provide an expedient means of rescue for every situation where a fall arrest system is used, not to exceed 10 minutes in any case. Review procedures regularly including the rescue plan.
- Ensure that training provided includes adequate oral and written instructions by a competent person including risks associated with working at heights and on emergency procedures
- Ensure workers are provided with and trained on equipment necessary for the task, including fall protection and fall rescue equipment and other PPE where applicable. Where applicable, ensure that training (e.g., working at heights) is current.
- Provide the fall protection and rescue equipment and resources as needed; where applicable, ensure that equipment is inspected on a regular basis and maintain related records (e.g., certificates of inspection).
- Monitor and ensure that safe work practices are being followed, including the use of appropriate fall protection/rescue equipment and PPE
- Ensure that fragile roofs are sign-posted and special precautions such as crawl-boards are used
- Ensure that the training records are maintained and made available (including training provided by the department, external organization, and manufacturer/equipment provider) and includes the worker's name and the dates of the training/instruction.
- Supervisors must direct workers during the rescue efforts and ensure procedures are followed

Workers shall:

- Have a clear understanding of the University's Working at Elevated Places Standard (this document)
- Conduct a risk assessment of the elevated work/roof required at the site
- Ensure the roof/floor/location is structurally sound and can hold the weight of the worker(s) and the required equipment
- Consider the prevailing weather conditions prior to the commencement of work
- Not work on a pitched roof if it is wet or windy
- If PPE is required, wear the appropriate PPE, including fall protection and suitable footwear (e.g., non-slip)
- Inspect PPE, including fall arrest or restraint systems and harnesses prior to each use
- Always use fall protection in a manner consistent with their training
- Maintain fall protection equipment in good condition
- Defective/damaged PPE or malfunctioning equipment must be reported immediately, taken out of service, and not used until repaired or replaced as applicable and appropriate
- Some PPE may have expiration dates (e.g., N95 respirators or fall protection harnesses) and should not be used past the expiration date. Report to your supervisor and take the PPE out of service
- Use a "buddy system" to ensure persons are not left alone in the event of an emergency
- Must be trained and follow the rescue plan under the direction of the employer and supervisor.
- Notify supervisor of any conditions that may negatively impact the planned work from elevated heights (e.g., changes in site conditions, wind/weather, defective equipment/PPE, etc.).

Fall rescuers shall:

- Be trained in fall rescue response and be familiar with all components of the fall rescue plan and fall rescue equipment specific to the work site
- Perform safe retrieval of a fallen worker and rescue response-related issues

Note: It is recommended that routine drills or reviews of the rescue plan be performed to ensure prompt and effective response to a fall emergency.

9.0 CATEGORIES OF FALL PROTECTION SYSTEMS

Guardrails

Guardrails are preferred over fall protection devices that must be worn by workers. Other forms of fall protection should only be used where guardrail installation is impractical.

A guardrail must be built to the structural specifications outlined in the building code. It consists of three main components: (a) top rail – the upper most horizontal rail, positioned 91-107 cm above the floor level, (b) mid rail – horizontal rail halfway between the top rail and toeboard level, and (c) toeboard – 12.5 cm. high enclosure at floor level required where tools and other objects may fall onto those below.

Typically, guardrails are installed in any location that presents a fall hazard where routine access is required.

Travel Restraint, Fall Restricting, and Fall Arrest Systems

Travel restraint, fall restricting, and fall arrest systems are typically used where the installation of physical barriers for fall prevention is impractical. Important points regarding these two systems follow:

- Workers must visually inspect their equipment prior to use, and on an ongoing basis throughout the day
- All equipment must be inspected yearly or more frequently by a trained and competent person and record of the inspection shall be kept on site
- Extensive training with the type and model of equipment to be used is essential for the proper use of personal fall protection equipment by workers
- Placement of temporary anchors must be done by highly experienced and knowledgeable individuals
- Any piece of equipment that has sustained a fall or is otherwise damaged shall not be reused unless re-certified/reconditioned by the manufacturer. Equipment that cannot be re-certified is to be destroyed in a manner that eliminates potential reuse
- All system components used shall be designed and rated appropriately for their intended use (see **Table 1** below)
- Personnel must be familiar with and guard against any degradation of the system by the work activity. Special precautions must be taken to guard against abrasion of ropes. Activities such as hot work and the use of harsh acids/alkali require the use of wire rope lanyards and lifelines. Wire rope should not be used where there is the risk of electric shock
- All gate style connectors such as snaphooks and carabiners shall be locking. Self-locking styles are preferred. The capacity of gated connectors must be marked on the item.

Table 1 – Acceptable Equipment

Item	Minimum Criteria/Certification
Full Body Harness	CAN/CSA-Z259.10-18, “Full Body Harness”
Lanyard	CAN/CSA-Z259.1-05 (R2020), “Body Belts and Saddles for Work Positioning and Travel Restraint”
Safety Belt (travel restraint only)	CAN/CSA-Z259.1-05 (R2020), “Body Belts and Saddles for Work Positioning and Travel Restraint”
Shock Absorber	CAN/CSA-Z259.11-17), “Personal Energy Absorbers and Lanyards”
Connecting Hardware	CAN/CSA-Z259.1-05 (R2020), “Body Belts and Saddles for Work Positioning and Travel Restraint”, Breaking strength of at least 22 kN
Vertical Lifelines	CAN/CSA-Z259.2.1-98 (R2011), “Fall Arresters, Vertical Lifelines, and Rails”, Breaking strength of at least 27 kN
Horizontal Lifeline	Designed by a Professional Engineer. Certified by a Professional Engineer following erection.

Travel Restraint Systems

- Travel restraint systems must be designed such that a free fall is not possible
- Travel restraint system shall be capable of withstanding the maximum arrest forces generated through fall arrest
- Travel restraint belts are not to be used on aerial platform lifts such as scissor lifts and boom lifts. If the worker is thrown from lift, there is a risk of severe internal injury because travel restraint systems are not designed to sustain or distribute that amount of force.

Fall Restricting Systems

- A full body harness shall be used as the body holding device. A work belt shall not be used for this purpose
- In the event of a fall, the system shall permit a free fall of less than 0.6 metres

Fall Arrest Systems

- A full body harness shall be used as the body holding device. A work belt shall not be used for this purpose
- When working on an aerial platform lift, a fall protection harness shall be worn and connected to anchor points provided in the lift basket
- In the event of a fall, the system shall permit a free fall of less than 1.5 metres and transfer a maximum force of no more than 8 kN to the wearer. Total fall distance shall be restricted such that an impact on lower level or object below is not possible
- The fall arrest system shall have capacity to absorb twice the energy and twice the load to which it is likely to be subjected
- Vertical lifelines shall accommodate one user only
- Lanyards should be positioned as high and directly overhead as possible to minimize pendulum effect and free fall distance

10.0 RISK ASSESSMENT

A written risk assessment should be carried out for all work on roofs or at heights before the work commences. The necessary equipment, appropriate precautions, and systems of work should be provided and implemented, and workers should have received training. All work at elevated heights, including short-duration work (lasting minutes rather than hours), needs careful planning to minimize the risks to workers. Refer to **Appendix A – Part 1: Working on Roofs or at Heights Risk Assessment** for questions that may assist in assessing the situation to determine the risks involved with working at heights.

Additionally, any work that involves the use of fall protection equipment requires a written fall rescue plan to be developed prior to using any fall protection system or safety net on a project. Refer to **Appendix A – Part 2: Fall Rescue Risk Assessment** for developing a rescue plan tailored to the specific work site and operations.

11.0 FALL RESCUE GUIDELINES

This section serves as a general guideline for UofT departments and units to develop a fall rescue procedure. As each worksite is different in environment, size, complexity and availability of equipment, the planning necessary for fall emergencies are likely to differ.

Plan the Rescue Response

1. Each unit must prepare a fall rescue plan. The plan should be developed by someone who is knowledgeable about the work and the hazards present. Refer to **Appendix A: Fall Protection and Rescue Work Plan**. EHS may be contacted for assistance.
2. For each worksite, identify which workers and supervisors will be part of the fall rescue team. Ensure each person has received specific training to ensure they can implement the fall rescue plan successfully.
3. For each worksite, where applicable, identify which workers and supervisors can administer first aid in the event of a fall. Ensure they have appropriate First Aid and CPR training.
4. Plan how to communicate and relay information about an emergency (e.g., buddy system/verbal, walkie-talkie, radio, phone, etc.). Consider the type and location of emergency communication systems (e.g., phones).
5. If applicable, verify that 911 operates in the area. If not, make alternate arrangements. Ensure emergency telephone numbers are up-to-date and locations of nearest hospitals are known. If the worksite is located in a difficult to find location, appoint a worker to meet with emergency services and guide them to the location.
6. Maintain on-site resources such as fire extinguishers, spill kits, and first aid kits to control hazards in the event of an emergency.
7. **Create a fall rescue plan that is specific to your jobsite and that reflects the different types of fall-related rescues that may be necessary.** Plan the rescue system and how it will be used before starting the work. Consider all factors such as:
 - a. Safest method of retrieval to protect fallen worker and fall rescuers. Rescue methods must take into account scenarios where fallen worker may be unconscious or injured and unable to perform self-rescue.
 - b. Identify hazards in the work environment: e.g., electrical, hazardous substances, inclement weather, etc.
 - c. Determine what on-site equipment or resources are available or required to execute the rescue. Examples include:
 - Portable ladders
 - Elevating work platforms (e.g., scissor lift, genie booms, etc.)
 - Safety straps
 - Self-rescue ladders
 - Peer rescue kits
 - d. Location and strength of anchors used for rescue (if applicable).
 - e. Ascent/descent path and landing area clearance.
 - f. Consideration of the personnel who will use the fall rescue equipment (e.g., level of experience).

- g. Safe work procedures for different type of rescues.

Note: A fallen worker suspended in a harness will require immediate rescue. Rescue plan should target a rescue safely and quickly (under 10 minutes). Calling 911 by itself is not a fall rescue plan.

- 8. Communicate the plan with workers, supervisors, contractors, etc. and document the communication (e.g., signed acknowledgements, meeting minutes, emails, memos). Provide and document training and instruction where applicable (e.g., training records, meeting minutes).
- 9. If the work situation changes and the fall rescue plan must be amended, the changes should be communicated to all parties involved.

PREPARING WORK AREA BEFORE WORKING ON ROOFS OR AT HEIGHTS

- 1. **For health and safety reasons, no worker should be alone when performing work at heights.** Should a worker experience a fall from heights, they may need assistance from others to perform fall rescue or to notify emergency services. Some fall rescue systems cannot be self-deployed by the fallen worker and may require the assistance of a fall rescuer.
- 2. Identify location of emergency equipment, such as fire extinguishers, chemical spill kits, first aid kits, etc.
- 3. Emergency phone numbers and the site address/location should be posted beside all site phones.
- 4. Remove any obstructions, debris, material, or other recognized hazards from the work area, ascent/descent path of the suspended worker, or that may interfere with the operation of the fall rescue system.
- 5. If applicable, assemble fall rescue equipment onto worker's PPE (e.g., attach safety straps onto harnesses).
- 6. If applicable, install or assemble fall rescue equipment at the worksite (e.g., attach self-rescue ladders onto anchors).
- 7. If applicable, mobilize fall rescue equipment to the worksite (e.g., portable ladders, scissor lifts, genie booms).
- 8. Conduct walkthrough inspection of all fall rescue equipment and emergency equipment for the specific work location to ensure fast, effective emergency response.

12.0 GUIDELINES FOR WORKING ON ROOFS

Access To and From the Roof

Getting on and off the roof can pose a major risk. A secure means of entry and exit is essential. Where a ladder is used to access or exit a roof, ensure that it is of a suitable type and set up in a safe manner. Refer to the University's [Portable Ladders Standard](#).

Fall Prevention

Suitable preventative measures should be taken where there is a risk of falling from a height greater than 3 metres. Measures to protect workers against the risks of falls should be taken based on the findings of the risk assessment. Fall prevention uses physical means to keep workers away from situations where they might fall. These fall prevention measures include:

- Proper use of worksite access
- Protective covers over roof openings
- Visual warnings: signs or tape, cones or boulders, paint or chalk
- Physical barriers such as warning barriers and bump lines, handrails, fencing, guardrail systems, travel restraints. Any safeguard provided to prevent falls (such as edge protection) should be strong enough to prevent or arrest falls and stop injuries to workers
- During erecting or dismantling of a scaffold, hand and guardrails may not be in place. The use of other fall prevention controls such as fall protection harness must be in place during these activities

Fall prevention measures should be in place when working at heights begin and remain in place until the work is finished.

Weather Conditions

Weather conditions should be taken into account during roof work, as icy, wet, or windy conditions can significantly increase the risk of people or material falling. Excessive exposure to sunlight should be avoided by wearing appropriate clothing and using sunscreen.

Falling Material

Falling material can cause injury. Nothing should be thrown from a roof. The following steps should be taken to minimize the risk of falling material wherever practicable:

- Use barricades/barriers/toe boards to prevent material from falling from above
- Use enclosed rubbish chutes, or lower material to the ground
- Keep worksite tidy and do not allow materials to accumulate
- Prevent access to danger areas underneath or adjacent to roof work or areas where working at heights is occurring
- Use debris netting, covered walkways or similar safeguards to stop falling material from causing injury
- Where possible, avoid carrying large and heavy objects onto roofs. Minimize the need for manual material handling by using mechanical handling devices (e.g., hoists to deliver materials to the roof)
- Ensure that all material is stored correctly, particularly in windy weather
- If there is public access close to the area is required, additional precautions are needed. If possible, try to arrange for work to be carried out when passers-by will not be there (e.g., carry

out repairs during the school holidays or when foot traffic is not as busy). If this cannot be arranged, minimize the public access to danger areas by placing barriers (e.g., cones, caution tape) and/or using a ground-level spotter to direct foot traffic

- If there is risk of head injury to workers (e.g., objects falling from above, handling objects to worker below, overhead objects such as steel beams, etc.) head protection must be worn

Training

Workers who perform roof work need the appropriate knowledge, skills, and experience to work in a safe manner. Workers need training to recognize the risks, understand the appropriate systems of work, and be competent in the skills to carry them out, such as putting up edge protection, operating a mobile access platform, or installing and wearing fall protection equipment.

Procedures for Different Roof Types

Refer to **Appendix B and C** for specific procedures for different roof types.

APPENDIX A: FALL PROTECTION AND RESCUE WORK PLAN

Company name: _____ Project: _____

Work location: _____ Date: _____

Work plan prepared by:

Name: _____ Position: _____

Department/Unit: _____ Phone: _____

Signature: _____ Date prepared: _____

This Fall Protection and Rescue Work Plan must be developed and implemented by a competent person who has adequate knowledge, training, and experience to organize the work, is familiar with legislation that applies to the work, and has knowledge of any potential or actual danger to health or safety in the workplace.

Work plan approved by:

Name: _____ Position: _____

Department/Unit: _____ Phone: _____

Signature: _____ Date approved: _____

Part 1: Working on Roofs or At Heights Risk Assessment

Step 1: Provide a description of the work (identify the fall hazard). Number of workers¹: _____

¹For health and safety reasons, no worker should be alone when performing work at heights. All workers must have appropriate up-to-date training.

Step 2: Fall protection checklist

Can the work be relocated to a place where a fall hazard does not exist?	<input type="checkbox"/> Y <input type="checkbox"/> N
Can the work be delayed until permanent safety features are installed?	<input type="checkbox"/> Y <input type="checkbox"/> N
Are there other alternatives? - E.g., using a tool from ground level or using an aerial platform lift - E.g., for inspections, using a telescoping pole with camera attachment or binoculars from a safe position - E.g., modify duties to be performed in safe area away (>2 meters) from an unprotected edge, platform, or walkway of any building with appropriate warning or physical barrier, bump line, etc. in place.	<input type="checkbox"/> Y <input type="checkbox"/> N
If yes, list the alternative:	
How long will the task take (e.g., few minutes, hours, days)? <i>Note: Generally, the longer and more often someone must work at height, the higher the risk of a fall.</i>	
Guardrails	
Can a guardrail system be used? If yes, consider the following:	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Does it meet the strength requirements of O. Reg. 213/91, s. 26.3? <input type="checkbox"/> Is it no more than 30 cm from the edge being protected? <input type="checkbox"/> Has it been installed according to the manufacturer's recommendations? <input type="checkbox"/> If it is made of wood, can it resist all loads that a worker may subject it to?	<input type="checkbox"/> Y <input type="checkbox"/> N

Floor and Roof Openings	
Can floor or roof openings be covered? If yes, consider the following:	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Does the cover meet the strength requirements of O. Reg. 213/91, s. 26.3 (2)? <input type="checkbox"/> Is it securely fastened? <input type="checkbox"/> Is it adequately identified as a cover?	<input type="checkbox"/> Y <input type="checkbox"/> N
Elevated Work Platforms (EWP)	
Can an EWP be used? If yes, consider the following:	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Is the EWP on a level surface? <input type="checkbox"/> Is the surface capable of supporting its load? <input type="checkbox"/> Has the worker received fall protection training and been trained in the use of this specific EWP?	<input type="checkbox"/> Y <input type="checkbox"/> N
Travel Restraint Systems	
Can a travel-restraint system be used? If yes, consider the following:	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Is the system set up to prevent the worker from reaching the fall hazard? <input type="checkbox"/> Does the system meet the requirements of O. Reg. 213/91, s. 26.4? <input type="checkbox"/> Does the anchor point meet the requirements of O. Reg. 213/91, s. 26.7? <input type="checkbox"/> Have other fall hazards in the work area been considered? If not, you may need to use a fall arrest system. <input type="checkbox"/> Has the equipment been certified by the Canadian Standards Association (CSA)? <input type="checkbox"/> Has the equipment and system been inspected before use, as per the manufacturer's instructions and CSA requirements?	<input type="checkbox"/> Y <input type="checkbox"/> N
Scaffolding and Pump Jacks	
Can scaffolding or pump jacks be used? If yes, consider the following:	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Is the scaffolding/pump jack on a level surface? Is the work platform on a horizontal plane? <input type="checkbox"/> Is the surface capable of supporting its load? All planks making up walking and working surface is sturdy and level? <input type="checkbox"/> Has the scaffolding/pump jack been inspected before use? <input type="checkbox"/> Has the worker received fall protection training and been trained on inspecting and working on a scaffold/pump jack? <input type="checkbox"/> Are there gaps between the scaffolding/pump jack platform and the working wall where a worker can fall in between? <input type="checkbox"/> Toe boards and guard rails installed? <input type="checkbox"/> All areas clear of tripping hazards (e.g., debris, tools, etc.) and electrical hazards? <input type="checkbox"/> Outdoor weather conditions suitable (e.g., no high winds, rain, lightning, etc.)?	<input type="checkbox"/> Y <input type="checkbox"/> N

Fall Arrest Systems	
Can a fall arrest system be used? If yes, consider the following: <i>If you choose this option, you must have a fall rescue plan in place and workers must be trained on it before work begins.</i>	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Is a fall rescue plan in place to rescue a suspended worker? (See Part 2: Fall Rescue Risk Assessment) <input type="checkbox"/> Has the worker been trained in fall protection and the specific fall arrest system being used? <input type="checkbox"/> Is the system set up to prevent the worker from hitting an object below? Have other fall hazards in the work area been considered? <input type="checkbox"/> Does the fall arrest system meet the requirements of O. Reg. 213/91, s. 26.6? <input type="checkbox"/> Does the anchor point meet the requirements of O. Reg. 213/91, s. 26.7? <input type="checkbox"/> Is the anchor point located so that the lifeline is at a 90° angle from the edge? If not and the worker fell, they could swing and hit a wall or column or the lifeline could break as it slid across the edge. <input type="checkbox"/> Have horizontal lifeline systems been engineered? Have they been installed according to the engineer's requirements? <input type="checkbox"/> Has the fall arrest equipment been certified by the CSA? <input type="checkbox"/> Has the equipment or system been inspected before use, as per the manufacturer's instructions and CSA requirements?	<input type="checkbox"/> Y <input type="checkbox"/> N
Safety nets	
Can a safety net be used? If yes, consider the following: <i>If you choose this option, you must have a fall rescue plan in place and workers must be trained on it before work begins.</i>	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Is a fall rescue plan in place to rescue a suspended worker? (See Part 2: Fall Rescue Risk Assessment) <input type="checkbox"/> Do the safety nets meet the requirements of O. Reg. 213/91, s. 26.8? <input type="checkbox"/> Have the safety nets been installed according to the manufacturer's instructions? <input type="checkbox"/> Have the safety nets been inspected according to the manufacturer's instructions?	<input type="checkbox"/> Y <input type="checkbox"/> N

Step 3: Roof work checklist

Does the work involve working on roofs? If yes, provide the following:	<input type="checkbox"/> Y <input type="checkbox"/> N
Does it have to involve accessing or working on a roof?	<input type="checkbox"/> Y <input type="checkbox"/> N
If yes, how frequently is it done?	<input type="checkbox"/> All the time <input type="checkbox"/> Some of the time <input type="checkbox"/> Rarely
What type of roof is it? <i>e.g., corrugated metal, plastic sheeting, glass, asbestos cement sheeting</i>	
Is roof steep, fragile, unstable, or slippery?	<input type="checkbox"/> Y <input type="checkbox"/> N
If yes, describe:	
Is this just in parts or all over?	
Are there fragile parapets, skylights, and vents present?	<input type="checkbox"/> Y <input type="checkbox"/> N
Are these surfaces difficult to see due to weather or aging?	<input type="checkbox"/> Y <input type="checkbox"/> N
Do fragile sections have guard railing installed around them?	<input type="checkbox"/> Y <input type="checkbox"/> N
If there is some doubt regarding the integrity of the roof structure or any safety measures present, has it been checked by an engineer or relevant professional?	<input type="checkbox"/> Y <input type="checkbox"/> N
How high is the roof? <i>Note: Generally, the higher the roof, the higher the risk of a fall and injury or death.</i>	
Do the workers have appropriate training and experience?	<input type="checkbox"/> Y <input type="checkbox"/> N

Is the training valid (e.g., training expiration date has not passed)?	<input type="checkbox"/> Y <input type="checkbox"/> N
Do workers know how to use equipment safely?	<input type="checkbox"/> Y <input type="checkbox"/> N
Do they know how to identify when a task is too dangerous to undertake or continue?	<input type="checkbox"/> Y <input type="checkbox"/> N
How do workers access and descend from the roof or different levels on the roof?	
Are the measures used safe?	<input type="checkbox"/> Y <input type="checkbox"/> N
Do tools, equipment or materials need to be loaded or removed from the roof? Is a hoist system available and used?	<input type="checkbox"/> Y <input type="checkbox"/> N
If so, how is this done (describe)?	
Does the work need to occur in sunny conditions that produce reflective glare and excessive heat making it difficult to see or work?	<input type="checkbox"/> Y <input type="checkbox"/> N
Is the work required in close proximity to electricity or electrical sources where someone could be electrocuted?	<input type="checkbox"/> Y <input type="checkbox"/> N
Is the area below the work being undertaken at height cluttered with equipment, rubble, and impaling hazards that someone could fall on?	<input type="checkbox"/> Y <input type="checkbox"/> N
What safety measures are already in place to prevent a fall? <i>E.g., guardrails, safety mesh, scaffolding, elevated work platform, suitable anchorage points, catch platform, etc.?</i>	
Are these measures in good condition and able to be used safely?	<input type="checkbox"/> Y <input type="checkbox"/> N
What supervision has been provided for employees working at heights?	

Step 4: Make a diagram of the location of the fall hazard and include any relevant details.

Step 5: Describe the system setup or work procedures. Include all relevant prevention measures to address the hazards identified in the above checklist/risk assessment.

Step 6: Calculate the fall clearance.

Part 2: Fall Rescue Risk Assessment

Step 7: Identify the fall rescue team.

Number of fall rescuers required: _____

Name of Fall Rescuer	Duties	Fall Rescue Training Verified?
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N

Step 8: Identify the first aid team.

Number of first aiders required: _____

Name of First Aider	Duties	First Aid & CPR Training Verified?
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N
		<input type="checkbox"/> Y <input type="checkbox"/> N

Step 9: Identify the communication method used to relay information.

Communication Method for Work:

- Verbal (i.e., buddy system)
- Visual
- Portable radio/walkie-talkie
- Phone
- Cell phone
- Other (specify): _____

Communication to Emergency Services:

- Phone
- Cell phone
- Portable radio/walkie-talkie
- Staff to guide Emergency Services into building
- Other (specify): _____

Communication equipment checked by (name): _____ Date: _____

- Emergency telephone numbers posted? Y N
- Site address/location posted? Y N
- 911 operates in area? Y N
- Location of nearest hospital (indicate): _____

Step 10. Identify the personal protective equipment (PPE) required for the task.

- | | |
|---|--|
| <input type="checkbox"/> Safety glasses | <input type="checkbox"/> Protective footwear (specify): _____ |
| <input type="checkbox"/> Safety goggles | <input type="checkbox"/> Protective gloves (specify): _____ |
| <input type="checkbox"/> Hardhat | <input type="checkbox"/> Protective clothing (specify): _____ |
| <input type="checkbox"/> Face shield | <input type="checkbox"/> Respirator (indicate): <input type="checkbox"/> N95 <input type="checkbox"/> Half-face <input type="checkbox"/> Full-face |
| <input type="checkbox"/> Welding helmet | <input type="checkbox"/> Powered air purifying (PAPR) |
| <input type="checkbox"/> Hearing protection | <input type="checkbox"/> Other (specify): _____ |

Step 11. Identify the fall protection equipment required for the task.

- | | |
|---|---|
| <input type="checkbox"/> CSA full body harness with "D" rings | <input type="checkbox"/> Self-retracting device |
| <input type="checkbox"/> Shock absorbing lanyard | <input type="checkbox"/> Anchorage |
| <input type="checkbox"/> Lanyard (fixed length or adjustable) | <input type="checkbox"/> Safety net |
| <input type="checkbox"/> Lifeline (indicate): <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal | <input type="checkbox"/> Other (specify): _____ |
| <input type="checkbox"/> Rope grab to attach lanyard to lifeline | |

Fall protection equipment inspected by each worker: Yes No

Date: _____

Step 12: Identify any additional safety equipment required (number of each).

- | | |
|--|---|
| <input type="checkbox"/> Fire extinguisher () | <input type="checkbox"/> Personal alert/distress device () |
| <input type="checkbox"/> Spill kit () | <input type="checkbox"/> Other (specify): _____ |
| <input type="checkbox"/> First aid kit () | |

Safety equipment inspected by (name): _____ Date: _____

Step 13. Identify the rescue equipment required for the fall rescue (number of each).

- | | |
|--|---|
| <input type="checkbox"/> Safety straps () | <input type="checkbox"/> Peer rescue kit () |
| <input type="checkbox"/> Portable ladder () | <input type="checkbox"/> Anchorage () |
| <input type="checkbox"/> Self-rescue ladder () | |
| <input type="checkbox"/> Elevating work platform (specify type): _____ () | <input type="checkbox"/> Other (specify): _____ |

Fall rescue equipment inspected by (name): _____ Date: _____

Step 14: Describe the fall rescue procedures to be used to rescue a suspended worker.²

Note: Rescue method must consider scenario where fallen worker is unconscious or injured and unable to perform self-rescue.

² Instructions: Departments/units may attach to this fall rescue risk assessment:
- **Appendix D: General Procedures for Fall Rescue**
- One or more of the rescue method-specific procedure(s) described in **Appendix E to I**
- Update or modify the procedures as necessary to reflect your work site and operations

APPENDIX B: PROCEDURES FOR DIFFERENT ROOF TYPES

Flat Roofs

Working on a flat roof can present a high amount of risk because the worker can fall from the edge of a complete roof, from the edge where work is being carried out, or through openings or gaps. Preventative measures are required during work on flat roofs where there is a risk of falling. Protective measures may be required at the roof edge, openings, and access points to and from the roof.

Edge protection

Unless the roof parapet (wall) provides equivalent safety (at least 36 inches in height), temporary edge protection is required during most work on flat roofs. Both the roof edge and any openings in it need to be protected. It is more appropriate to securely cover openings rather than put edge protection around them.

Demarcating safe areas

Full edge protection may not be necessary if limited work on a larger roof involves no one going any closer than 2 meters from an open edge. In such cases, demarcated areas can be set up, outside which no one is allowed. Demarcated areas should be:

- Limited to areas from which nobody can fall
- Indicated by an obvious physical barrier (full edge protection is not necessary, but a painted line is not sufficient). A warning line system can be erected using painted lines in combination with ropes and posts to designate safe areas where roof work may take place without the use of guardrails, personal fall restraint/arrest systems, or safety net systems
- Adequate supervision

Sloped Roofs

On sloped roofs, workers can fall from the eaves, by slipping down the roof and over the eaves, through the roof or from the gables. Edge protection needs to be strong enough to withstand a person falling against it. The longer the slope and the steeper the pitch, the stronger the edge protection needs to be. Powered access platforms can be a safe alternative to working on the roof itself.

Safe access, egress, and working places should be provided. Roof ladders or similar equipment may be required because the surfaces on sloped roofs may not provide a safe footing for the worker, especially when wet. Roof ladders should be long enough to span the supports and be securely placed. Do not use gutters to support any ladder.

Where work is required on a steep roof (slope > 35°), do not stand on the roof. A steep pitched roof is an inappropriate surface to stand on due to the likelihood of sliding. Perimeter guard rails and catch platforms are also insufficient measures to protect workers on such roofs. In these circumstances, roof workers need a system to prevent sliding and to prevent falls from the perimeter. One of the following systems should be used in such circumstances:

- An aerial access equipment
- A work positioning system, such as a travel restraint system
- A scaffold platform located at the roof edge and a roof ladder

Fragile Roofs

A fragile roof is one that does not safely support the weight of a person and any load they are carrying. Many roof assemblies are or can become fragile. Roofs can also have fragile areas which are not easily recognized such as roof lights. Roofs can also be temporarily fragile, particularly during construction. Sometimes the fragility of a roof can be hidden (e.g., old roofs that have been painted over). The fragility of a roof should be confirmed **before** the work starts.

Prevent unauthorized access

Make sure that unauthorized access to the roof is prevented (e.g., locking off the roof access). Make sure appropriate warning signs are displayed, particularly at roof access points.

Working on fragile materials

At no time should anyone work on, from, or pass over fragile material, unless platforms, coverings or other similar means are provided that adequately support them. Properly installed safety netting beneath the roof surface will provide collective fall protection within the protected area. Fall protection can also be used, but they require adequate anchor points (capable of supporting 5000 pounds of force per worker) which may be difficult to locate on fragile roofs.

Support platforms should be wide and long enough to provide adequate support across roof members. Using a platform may spread the load but will not provide enough support if it is only supported by fragile material. Workers should not have to constantly move platforms while on the roof; there should be enough platforms to avoid jumping from board to board. Precautions to prevent a person falling from the platform may be needed such as guardrails.

Working near fragile material

Protection is needed when anyone passes by or works closer than 2 meters to fragile materials. Wherever possible, make sure that all fragile materials, 2 meters or closer to the people at risk, are securely covered. Alternatively, provide full edge protection (i.e., top rail, intermediate guard rail or equivalent, and toe board) around or along the fragile material to prevent access to it. Make sure appropriate precautions are taken when installing such protection (e.g., the use of netting or safety harnesses).

It may not be reasonably practicable to provide such protection if the proximity to fragile material is irregular and for a short duration (i.e., a matter of minutes). For these situations, safety harnesses may be used in conjunction with a warning line system.

Boundaries can be established to identify the safe areas of the workplace and routes to and from these areas. If boundaries are used:

- The boundary should be at least 2 meters from the nearest fragile material
- The boundary does not need to comply with full edge protection standards, but there should be a physical barrier
- Discipline is essential to ensure everyone stays inside the safe area at all times

Short-Duration Work:

Although short-duration work takes place in a matter of minutes rather than hours, appropriate safety measures still need to be implemented. It may not be practicable to provide edge protection for short-duration work. In such cases, any worker working closer than 2 meters to any unguarded edge should use fall protection. Wherever fall protection is required, ensure compliance with the University of Toronto's Working at Elevated Places Standard (this document).

For minor tasks that are short in duration and there is an increased risk of falling due to either weather conditions, a sloping roof or access is required near a potentially fragile section – the following safety measures should be used when reasonably practicable. For such situations, use one or more of the measures below where feasible until the risk of a fall is minimized:

1. If weather is the only factor increasing the risk of a fall, where possible, wait until conditions improve before commencing or finishing a job
2. Do the work from an elevated work platform such as a scissor lift
3. If work is required near a fragile section, install either edge protection around it (e.g., guardrails) or install safety mesh/netting underneath before commencing work.

4. If an elevating work platform cannot be used or is not reasonably practicable, use the appropriate fall protection equipment and implement a fall rescue plan
5. If a non-fragile sloping roof is stable and other measures cannot be used, use a suitable roof ladder in combination with a fall arrest system and implement a fall rescue plan
6. If the risk of a fall is still significant after using these safety measures, consider installing a catch platform or a safety net to catch anyone who may fall and implement a fall rescue plan

Rooftops with Sub-Standard Fume Hood Exhausts

Some rooftops have laboratory fume hood stacks and there is a subset of these stacks that, under certain atmospheric conditions, may exhaust at or close to roof level. Refer to **Appendix C** for more information on these stacks and appropriate safety procedures.

APPENDIX C: ROOFTOPS WITH SUBSTANDARD FUME HOOD EXHAUSTS

Background

At the University of Toronto, many older buildings with research labs contain fume hood exhaust vents at the roof level that do not meet current University design standards. Current and conservative air dispersion modeling demonstrates that all such substandard fume hood exhausts systems achieve compliance with environmental requirements. However, these systems have exhaust stacks that, under certain atmospheric conditions, are unable to adequately propel exhaust emissions beyond the building's envelope, including the air at roof level. This could result in a potential exposure risk to any individuals on a rooftop with an active, substandard fume hood exhaust stack.

Procedure

In the long-term, these substandard exhausts need to be modified to meet current design standards, thereby removing any significant risk of exposure at the roof level. However, rooftop work and access at the University of Toronto is frequent, necessary, and will continue to occur before any mitigation steps can be completed. Therefore, in the near-term, procedures are required to remove the risk of exposure to any individual accessing the rooftop.

1. Refer to the list of buildings and exhaust stacks that have been identified as substandard (end of this Appendix)
2. If the building requiring access is on the list, then contact the building's Property Manager to help facilitate communication with the lab members using the applicable fume hood exhaust systems
3. Scheduling rooftop access:
 - a. If possible, schedule necessary rooftop work or access for hours outside of normal University of Toronto operating hours
 - b. Via the Property Manager, coordinate with the lab manager, or appropriate contact, to:
 - i. Avoid significant or extended disruption to research activities; and
 - ii. Ensure all affected lab users are aware of the work being conducted.
4. During the scheduled period of rooftop access, any affected labs must cease all work in any fume hoods connected to the substandard fume hood exhaust systems:
 - a. The lab users must ensure all hazardous materials are removed from the hood(s) and are properly and safely stored prior to the scheduled shut-down
 - b. Signage, which provides notice of the times/dates of rooftop access, must be affixed to any fume hoods
 - i. If the access is required for more than an hour, then any substandard fume hood exhaust systems should be deactivated and notification of this shut-down should be added to the signage
 - c. When work is completed and the fume hood exhaust system is reactivated/used, the lab manager or appropriate contact should be notified via the Property Manager, to remove the signage and recommence usage of the fume hood
 - d. It is the responsibility of the laboratory manager or appropriate contact to notify all other laboratory users of any pertinent information provided by the Property Manager.

List of Buildings with Substandard Fume Hood Exhaust Systems:

- Gage Building
- Rosebrugh Building
- Haultain Building
- Ramsay Wright Zoological Laboratories
- McLennan Physical Laboratories (when accessing Penthouse Roof only)
- Pratt Building (when accessing Penthouse Roof only)

If it is found that any of the above exhaust systems have been either modified or removed, please contact ehs.office@utoronto.ca with the details.

References

1. European Agency for Safety and Health at Work, Safe Roofwork, 2004.
2. Health and Safety Executive, Working on Roofs, November 2004 and December 2008
3. University of Ottawa, Office of Risk Management, Environment Health and Safety, Fall Protection Guidelines, October 2006.
4. WorkSafe Victoria, Prevention of Falls – Working on Roofs, 1st Edition, June 2005.

APPENDIX D: GENERAL PROCEDURES FOR FALL RESCUE

1. **Stay calm. Do not panic.** Staying calm will help with the emergency response.
2. **Call emergency services.** Call or delegate someone to call 911 immediately and explain the situation (i.e., worker suspended at heights, worker fallen from heights, worker injured or unconscious, etc.). Assign someone to meet and direct the emergency responders to the location and to notify supervisor and Campus Safety to assist.
3. **Assess the situation.** Exercise caution when approaching the scene to avoid being injured yourself. Eliminate or control any hazards which may exist before performing rescue to prevent further danger to the fallen worker and to fall rescuers. Determine if worker is conscious or unconscious.
4. **Deploy self-rescue devices.** If worker is conscious and equipped with self-rescue devices such as safety straps, instruct them to deploy the devices and wait for rescue. Encourage fallen worker to keep legs active (**Appendix E**).
5. **Perform fall rescue.** Once it is safe to do so, safely retrieve the suspended worker and bring them to a safe level. Some examples of rescue procedures for various fall rescue equipment are provided in **Appendix F to I**.
 - a. **Self-rescue ladders** can be deployed by a fall rescuer to allow the suspended worker to climb back to a safe level (**Appendix F**).
 - b. **Peer rescue kits** can be used to raise or lower the suspended worker to safety (**Appendix G**).
 - c. **Elevating work platforms** or **portable ladders** can be used to reach the suspended worker and get them down safely (**Appendix H, I**).
6. **Provide first aid.** Once retrieved from their suspension, on-site medical assistance or first aid may be required depending on the nature of the injuries (if any) and level of medical attention required. Fall rescuers must be ready to provide basic medical treatment to the fallen worker or move the injured worker to a place where they can be attended to by emergency responders.
 - a. Loosen or remove harness.
 - b. Maintain an airway for breathing.
 - c. Assess victim for injuries and manage identified injuries as best as possible. Use first aid equipment and supplies.
 - d. If worker is unconscious, apply CPR. Provide oxygen and secure airway. Once worker is conscious, treat the worker for suspension trauma and other injuries by resting conscious worker in a seated recovery position and raise legs gradually and carefully.
 - e. If worker is conscious, treat the worker for suspension trauma and other injuries by resting conscious worker in a seated recovery position and raise legs gradually and carefully.



Photo: Worker in seated recovery position

IMPORTANT: Workers who have been suspended for 10 minutes or more must stay in a seated position for 30 minutes following the rescue. Laying the worker down can be fatal.

7. **Wait for emergency services to arrive.** Ensure proper access for emergency responders and vehicles. Worker must be safely transported to a hospital and be evaluated by a health care professional after experiencing a fall from heights.

APPENDIX E: SAMPLE PROCEDURES FOR THE USE OF SAFETY STRAPS OR STIRRUPS

PRODUCT EXAMPLE: 3M DBI-SALA® SUSPENSION TRAUMA SAFETY STRAPS

Important Instructions: These procedures are specific to a particular product – see “Product Example”. Departments are responsible for ensuring that their fall rescue procedures reflect rescue equipment that is available at the site and align with manufacturer’s instructions for that specific product.

Installation

The following installation instructions provided are for a two-strap system. Installation instructions for a single-strap system may differ slightly. Always follow the manufacturer’s instructions for installation and use.

1. The safety strap comes in a pair of cases: one marked as “HOOK” and other marked as “LOOP”.
2. Install one of the safety strap cases at the location where the shoulder and leg straps intersect on the harness (i.e., at the hip).
3. Repeat for the other case on the opposite side of the harness.

Note: Safety straps are intended to be used with a CSA-approved full-body harnesses.

Inspection

During daily harness inspections, review the safety strap assembly and harness connecting points.

1. Check for damage, wear, fraying, cuts, abrasion, burns, discolouration, and knots.
2. Verify one case is marked “HOOK” and the other marked “LOOP”.
3. Inspect the labels. All labels must be present and fully legible.
4. If defect(s) are identified during the inspection, tag and remove the unit from service and send for repair or dispose.

Use

1. After a fall and while suspended in the harness, locate and unzip each case to deploy the suspension straps.
2. Raise the ends of the two straps to locate the hook and loops. Connect the straps together by inserting the hook into an appropriate loop and lower the strap. Adjust the hook/loop combination for the most comfortable length.
3. Step onto the connected strap to reduce the pressure of the leg straps on the legs. Wait for rescue.

Note: Never disconnect the harness buckles during suspension. Maintain an upright position following suspension. Do not lay down.

Note: A fallen worker must be conscious to deploy and connect the safety straps.

APPENDIX F: SAMPLE PROCEDURES FOR THE USE OF SELF RESCUE LADDER

PRODUCT EXAMPLE: MILLER AERIAL LIFT RESCUE LADDER, DBI-SALA® RESCUE LADDER SYSTEM

Important Instructions: These procedures are specific to a particular product – see “Product Example”. Departments are responsible for ensuring that their fall rescue procedures reflect rescue equipment that is available at the site and align with manufacturer’s instructions for that specific product.

Installation

1. Self-rescue ladders come in various lengths (e.g., 15 ft., 25 ft., 30 ft.). Ensure a self-rescue ladder of appropriate length for the work involved is chosen.
2. Open the rescue ladder bag and locate the carabiner or self-locking snap hook.
3. Select an anchorage point that is rigid and capable of supporting the recommended load as required by the manufacturer (e.g., DBI-Sala® Rescue Ladder system requires anchorage point capable of sustaining 3000 lbs). Anchorage location should be close to the suspended worker to reduce possible swing fall hazards and to avoid striking an object during a fall.
4. Attach the carabiner to the anchor point.
5. Avoid working where the webbing of the rescue ladder may contact or abrade against sharp edges.

NOTE: Ensure suitable anchorage point that will support the load of the worker. Ensure only connectors compatible with the equipment (e.g., carabiners, self-locking snap hooks) are used. Ensure all connectors are fully closed and locked.

Inspection

1. Inspect the rescue ladder webbing for cuts, frays, and signs of damage from excessive wear or abrasion. Look for excessive dirt, grease, oil, paint or other surface contamination or discoloring. Check all stitch locations. Ensure that each stitch is intact with no loose, frayed, or torn threads.
2. If rescue ladder has a hanging plate bracket, inspect for bent or damaged parts. Ensure frame is not damaged or distorted. Inspect ferrules for cracks or damage. Inspect wire rope for cuts, kinks, broken wires, corrosion, abrasion, chemical contact.
3. Check connectors (e.g., carabiner/snap hooks) and anchor for bent, cracked, or deformities. Look for sharp edges and burrs. Check for corrosion. Ensure all metal hardware is free from excessive dirt, grease, oil, paint, or any other substance or contaminant. Ensure the connectors closes and locks properly.
4. Inspect the labels. All labels must be present and fully legible.
5. If any defect(s) are identified during the inspection, tag and remove the unit from service and send for repair or dispose.
6. Inspect work environment where ladder will be deployed. Do not use the ladder where there is possibility of ladder to come into contact with power lines, live cables, or other materials that can cause ladder to catch fire.

Use

1. Rescuer to deploy the rescue ladder by pulling on the drawstring.
2. Suspended worker to climb back to work surface or rescuer to climb down to the worker to administer assistance.

Note: Fall rescuer must be equipped with a separate fall protection system if descending to aid a suspended worker. Ensure rescue ladder does not unintentionally hit the fallen worker during deployment. A rescue ladder is designed for use by one person. At no time should more than one person be on the ladder.

APPENDIX G: SAMPLE PROCEDURES FOR THE USE OF PEER RESCUE KIT

PRODUCT EXAMPLE: MILLER QUICKPICK RESCUE KIT (STANDARD* AND PREMIUM** VERSION)

Important Instructions: These procedures are specific to a particular product – see “Product Example”. Departments are responsible for ensuring that their fall rescue procedures reflect rescue equipment that is available at the site and align with manufacturer’s instructions for that specific product.

* Standard kit is designed for users more experienced with rescue. Standard kit provides an economical kit configuration for conducting rescue with workers confident in managing rescue situations and systems.

** Premium kit is the ideal choice for users whose job does not normally include rescue. The kit includes a backup braking system that quickly stops the system in case of accidental release of the rope by the rescuer, preventing the fallen worker from accidentally descending.

Note: QuickPick Premium Rescue Kit is rated for up to a 400 lb worker. The QuickPick Standard Kit is rated for up to a 310 lb. worker.

Installation

Please review manufacturer’s instruction manual for detailed instructions on the installation, use, inspection and maintenance of the peer rescue kit.

1. Select an anchorage point that meets all anchorage requirements (e.g., Miller QuickPick Rescue Kit requires anchorage point capable of sustaining 3100 lbs). Anchorage location should be located directly above the suspended person to minimize potential for swing hazard. Ascent/descent path clear of obstacles. Landing area clear of obstructions.
2. If system cannot be directly connected to an anchorage, select and install an anchorage connector suitable for the application.
3. Install the system to the anchorage or anchorage connector using the attached carabiner. Device should be installed at a height that will allow it to be within reach of the rescuer. Ensure carabiner gate is completely closed and locked.
4. Install the captive-eye carabiner with pigtail rope to the carabiner clip on the rescue pole. This will keep the captive-eye carabiner in an “open” position.
5. Connect the pigtail rope to the carabiner on the lower pulley of the system.

Note: the installation of the pigtail will help facilitate the retrieval of the fallen worker.

6. Secure rescue pole to your wrist using the WristBandit Tool lanyard to ensure pole does not fall should you lose your grip.
7. Loosen the threaded collars on the rescue pole and extend pole as needed to be able to reach the suspended person. Tighten threaded collars once required length is achieved.
8. Feed the rope through the backup braking system (premium kit) or upper pulley (standard kit) by applying pressure downward with the rescue pole to reach the suspended worker.
9. Apply downward pressure with the rescue pole to reach the suspended worker. Hook the “open”

captive-eye carabiner into the D-ring of the fallen worker's harness and apply a quick pull to the rescue pole to release the captive-eye carabiner from the carabiner clip on the rescue pole. The suspended worker is now connected to the peer rescue system. Set rescue pole aside.

10. Install the rope control handle to the free end rope extending from the backup braking system (premium kit) or upper pulley (standard kit).
11. Grip the free end rope with one hand and apply enough tension to hold the suspended worker. With the other hand, slide the rope control handle towards the system, establish a grip on the rope with the rope control handle, then pull downward to raise the suspended worker. Readjust position of the hand on the free hand rope to eliminate any rope slack. Repeat procedure as necessary until person is raised to safety.

Note: It is recommended that the Step 11 be performed by two rescuers. One rescuer to hold onto the free end of the rope to hold the suspended worker and the second rescuer to operate the rope control handle which allows the suspended worker to be raised to safety.

Note: Instruction manual for peer rescue kit may also describe procedures for lowering a worker to safety. In order to do this, once the suspended worker has been successfully connected to the peer rescue system, the connecting device attached to their personal fall arrest system, which was used to arrest the fall, must be disconnected in order for the worker to descend. Operationally, this is too challenging to execute and could lead to serious injury or death if not performed correctly.

EHS recommends that the peer rescue kits only be used to raise a worker to safety. Use other forms of fall rescue equipment or methods if lowering a fallen worker to the ground is required.

Inspection

1. Condition of the rescue kit must be carefully maintained and all components inspected prior to any potential use.
2. Inspect all components for misaligned, bent, cracked, distorted, worn, malfunctioning or damaged parts; loose fasteners or missing parts/components; deterioration; corrosion; or any other indications of damage/problems that may affect integrity or operation of the system.
3. Inspect the entire length of the rope lifeline, rope pigtail, and webbing cross-arm strap for cuts, burns, fraying, kinking, broken/pulled stitches, severely abraded areas, visual environmental/chemical effects, excessive wear or any other indications of damage/problems that may affect integrity of the rope and webbing components.
4. Inspect carabiners (and other hardware elements) for damage, distortion/deformation, corrosion, sharp edges, or pitted surfaces. Carabiner gate should snap into the nose without binding and should not be distorted or obstructed. Gate locking mechanism must be operational and must prevent the gate from opening when closed.
5. Inspect the labels. All labels must be present and fully legible.
6. Ensure all components within the system are functioning smoothly, properly, and only as intended by the manufacturer. Test the backup braking system (premium kit) by applying a sharp pull to the lifeline. The brake must engage.

7. If any defect(s) are identified during the inspection, tag and remove the unit from service and send for repair or dispose.

APPENDIX H: SAMPLE PROCEDURES FOR THE USE OF ELEVATING WORK PLATFORM

PRODUCT EXAMPLE: SKYJACK SCISSOR LIFT, GENIE BOOM LIFT

Preparation

1. Mobilize the elevating work platform (EWP) to the worksite to be used in the event of a fall.
2. Ensure rescue workers using the EWP are protected against falling by wearing a fall protection system that is attached properly to the anchor point of the EWP (e.g., travel restraint or fall arrest).
3. Be sure the EWP has the load capacity for both the rescuer(s) and victim.

Use

1. Use the EWP to reach the suspended worker.
2. Position the EWP platform below the worker.
3. Disconnect the suspended worker from their lanyard or lifeline when it is safe to do so. If the worker is unconscious or cannot help with the rescue, two rescuers may be needed to handle the worker safely.

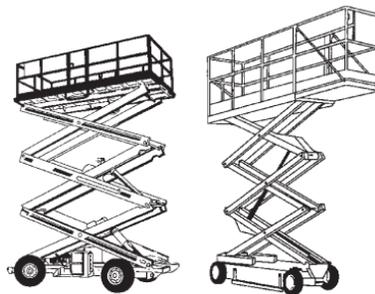


Photo: Examples of elevating work platforms for fall rescue

APPENDIX I: SAMPLE PROCEDURES FOR THE USE OF STEP LADDER

Preparation

1. Mobilize step ladder to the worksite to be used in the event of a fall.
2. If suspended worker is not in an area that rescuers can reach by ladder, move the suspended worker by their lifeline to an area that can be safely reached by ladder (if possible).
3. Ensure rescue workers are protected against falling by wearing a fall protection system (i.e., travel restraint or fall arrest harness with lanyard) that is attached properly to the anchor point or lifeline.

Use

1. Use the step ladder to reach the suspended worker.
2. Position the step ladder so that rescuers can get beneath the suspended worker.
3. Disconnect the suspended worker from their lanyard or lifeline when it is safe to do so. If the worker is unconscious or cannot help with the rescue, two rescuers may be needed to handle the worker safely.



Photo: Example of step ladder for fall rescue

APPENDIX J: INSPECTION AND MAINTENANCE OF FALL RESCUE EQUIPMENT

Before Each Use

1. Review and follow manufacturer's instructions for use, care, and maintenance.
2. Worker shall visually inspect each piece of fall rescue equipment for defects prior to use. Inspection should be done in good lighting. Workers must be trained to perform this duty. Using a checklist is a good idea ([Example: 3M Inspection Checklist](#)).
3. If defects are found, worker should report it to the supervisor or employer. Do not use the equipment. Equipment should be tagged and taken out of service.

Note: Fall protection equipment used must be CSA approved.

Monthly Inspection

1. Formal inspection of the equipment should be done by a competent person other than the worker.

Annual Inspection

1. It is recommended that fall rescue systems be serviced by a factory authorized service centre or the manufacturer on an annual basis. Annual servicing shall include, but not be limited to, an intensive inspection and cleaning of all internal and external components.
2. Ensure to keep records should a Ministry of Labour, Training and Skills Development (MLTSD) inspector request proof of inspection.

Servicing

1. Any additional maintenance and service procedures must be completed by factory authorized service centre or manufacturer. Do not disassemble fall rescue equipment. Alteration or misuse of the product or failure to follow instructions provided by the manufacturer may result in injury or death.
2. A record log of all servicing and inspection dates must be maintained.

Note: Some manufacturers recommend a life span for fall protection equipment of five years. While other manufacturers say that well maintained and inspected equipment may last longer.

After System Has Been Used in an Emergency Rescue Situation

1. Remove from service immediately.
2. When system has been removed from service after being used in an emergency rescue situation, it should be marked as "unusable" until a competent person fully inspects the system and determines that it can be returned to service.

Documentation

1. Manufacturer's instructions should be readily accessible to employees who require this equipment.
2. Records of training (e.g., attendance sheet) or instruction (e.g., affirmation that manufacturer's instruction, SOP, etc., has been reviewed). Employee records of training should be retained for a minimum of 6 months after the worker ends their employment with the University.
3. Records of inspections and maintenance of equipment should be kept and be readily available. Equipment inspection and maintenance records should be kept for a minimum of three years after the equipment has been disposed of.
4. Records of all equipment tagged and taken out of service should also be kept. Records should be kept for a minimum of three years after the equipment has been disposed of.

Note: Extreme working conditions may require increasing frequency of inspections.

Cleaning of Fall Rescue Equipment

1. Fall rescue equipment are typically single-use and do not require daily cleaning.
2. If cleaning is required, equipment may be cleaned with water and a mild soap detergent solution, rinsed, then dried with a clean cloth.
3. Hang equipment to air dry in a place away from heat, steam, or sunlight.
4. Do not use bleach or force dry with heat.

Storage of Fall Rescue Equipment

1. Store fall rescue equipment in a cool, dry, and clean environment away from exposure to:
 - a. Solvents or chemical vapours
 - b. Corrosive chemicals
 - c. Dusts or fumes
 - d. Excessive heat or cold
 - e. Direct sunlight or UV radiation
 - f. Other environmental factors that can damage or deteriorate fall rescue equipment
2. If fall rescue equipment comes in protective bags, they should be used.