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Fall Protection Program		
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SAFETY PROGRAM: FALL PROTECTION PROGRAM

PREAMBLE

Fall protection is mandated in Alberta when workers are performing tasks in a temporary or permanent work area when there is a risk of falling:

- A vertical distance of 3 m (10 ft) or more,
- A vertical distance of less than 3 m if there is an unusual possibility of injury (i.e. onto something other than a flat, solid surface), or
- Into or onto a hazardous substance or object, or through an opening in a work surface.

Fall protection is also required at permanent work areas where there is a risk of falling over 1.2 m but less than 3 m.

Fall protection at MRU will be achieved through a hierarchy of controls (engineering, administrative, and personal protective equipment).

SCOPE

This program outlines the requirements for fall protection for employees of Mount Royal University when performing work at height as part of their MRU directed activities and applies to all faculty, staff, and volunteers of MRU when performing work at heights on behalf of the University, whether on or off campus. Working at heights may encompass working on platforms and other permanent work spaces, as well as temporary structures, such as scaffolding, and on mobile elevated work platforms (MEWPs). Additional information applicable to MEWPs can be found in the [Mobile Elevated Work Platform Safe Work Guidelines](#).

This program does not apply to work performed by Recreation staff on the MRU climbing wall. Safety requirements for this location and task are outlined in the Climbing Gym Instructor TechManual, published by the Association of Canadian Mountain Guides. Contact Recreation for more information.

LEGISLATION

Legislated requirements for fall protection are outlined in the Alberta Occupational Health & Safety Code, Part 9, Sections 138 to 161. Additional requirements for equipment are outlined in Canadian Standards Association (CSA) standards; see References for a listing of applicable standards.

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RESPONSIBILITIES

MRU Executive (President, Vice-Presidents)

- Provide management support and leadership necessary to provide a safe and healthy working environment for employees and students, in compliance with the Mount Royal Health and Safety Policy.
- Ensure that adequate resources are available to implement appropriate measures.

Associate Vice-Presidents / Deans / Directors / Department Managers

- Ensure that safety procedures are communicated to the employees.
- Require compliance with the procedures.
- Identify areas or work processes that have hazardous conditions that warrant the need for fall protection.
- Provide a budget for fall protection equipment and training within their department.
- Ensure that workers within their area are trained and competent with working at height and fall protection requirements (when applicable to their job scope) and that associated records are maintained.
- Ensure that engineered fall protection controls are inspected as mandated by regulations.

Supervisors / Chairs

- Provide approved fall protection equipment that protects against identified hazards.
- Ensure that worker completing tasks at heights over 3 m / 10 ft are adequately trained and competent in the use, maintenance, limitations, and cleaning of required fall protection equipment.
- Ensure that fall protection equipment is inspected at least annually by a competent and certified inspector.
- Require compliance with these procedures and fall protection equipment manufacturer instructions.
- Maintain applicable training and usage records.
- Ensure that Fall Protection Plans are drafted for all working at heights situations.
- Consult with the Environmental, Health & Safety (EH&S) Department if there are any concerns or questions regarding working at heights or fall protection.

MRU Employees (Staff, Faculty, or Volunteers)

- Comply with the procedures regarding the use of fall protection controls and equipment for heights over 3 m / 10 ft.
- Perform tasks at height and use fall protection equipment in accordance with their training, competence, and experience.
- Clean, disinfect and store equipment appropriately.
- Report any falls, impacts, or fall protection equipment malfunction or deficiencies to their supervisor.

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Contractors

- Prime Contractors are required to have their own fall protection program or procedure that meets or exceeds applicable legislation, which will apply to their employees and subcontractors when performing work on MRU property.
- Prime Contractors must have a Fall Protection Plan for work scopes that include tasks at heights over 3 m / 10 ft and make available this plan available for review by the MRU Project Manager or EH&S, on request.
- Where a Contractor will be working under MRU (i.e. the Contractor is not Prime), the Contractor employees will follow the MRU fall protection program.
- Contractors may use guardrails and anchors belonging to the University but must provide their own personal fall protection equipment (e.g. harnesses, lanyards, energy absorbers, connectors and vertical lifelines). All equipment shall be inspected before use and if University equipment is found to be damaged or defective, Contractors must mark the equipment out of service and report it to their MRU Project Manager.

Environmental, Health & Safety (EH&S)

- Provide expertise and advice on fall protection requirements and general training information to all levels of management and employees.
- Perform annual inspections of personal fall protection equipment, excluding specialized or engineered systems.
- Receive, review and investigate all incidents related to fall protection and working at heights and provide recommendations for corrective action.
- Ensure this procedure and other documentation related to working at heights and fall protection equipment are kept current.

Building Operations

- Coordinate annual inspections of specialized and engineered fall protection systems (e.g. anchors) and installation of new, permanent anchors.

MRU Project Managers

- Ensure that contractors hired to perform work at heights on MRU property have and follow a fall protection program or procedure that meets or exceeds applicable legislation.
- Ensure that contractors performing work over 3 m / 10 ft use engineered fall protection controls in place where reasonable, such as railings, permanent or temporary lifelines, and engineered anchor points.

HAZARD ASSESSMENT

Identifying fall hazards involves recognizing any work process, activity or situation with the potential to cause injury or harm to a person due to a risk of falling when working at heights. The hazards must be identified, the risks assessed, and the proper controls put into place prior to starting work. Reassessment

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of fall hazards and determination of appropriate controls should be repeated whenever work scopes change, with or without advance notice.

Once a fall hazard is identified, a work procedure shall be developed to ensure that the risk of working at height is eliminated or reduced to as low as reasonably achievable. For all tasks where a fall hazard exists, a Fall Protection Plan shall be used to assess the hazard and detail procedures to reduce that hazard.

HIERARCHY OF FALL PROTECTION CONTROLS

The levels in the hierarchy of fall protection controls are outlined below. Employees must use the assigned fall protection controls whenever working at heights is identified as a hazard.

1. HAZARD ELIMINATION

Determine if the task design can be altered to allow an employee to complete it without working at height. ***Elimination is the first and best control to protect employees from fall hazards.***

2. ENGINEERED FALL PROTECTION

Where elimination is not feasible, the use of passive, engineered controls such as guardrails should be installed. These controls provide fall protection without requiring employees to don fall protection or perform other actions.

Regularly accessed work areas over 3 m shall have guardrails installed wherever possible. If a work area is identified during the hazard assessment that would benefit from the installation of a guardrail, submit a request to Frontline to initiate discussions with Facilities Management.

When guardrails are in place:

- **Do not** climb or lean against a guardrail;
- **Do not** stand on the toe board or mid-rail to extend your reach;
- **Do not** reach past the plane of the railings – keep your centre of gravity firmly behind them
- **Do not** climb above the surface protected by the guardrails without an alternate means of fall protection

3. TRAVEL RESTRAINT

Where engineered fall protection is not feasible, a travel restraint system that prevents an employee from reaching the fall hazard shall be used.

Where guardrails are not available, the expectation is that MRU employees will use travel restraint devices any time they are working at height. Employees using travel restraint devices will ensure they are the correct length to prevent themselves from reaching the fall hazard; this includes shortening adjustable lanyards to the appropriate length.

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4. PERSONAL FALL PROTECTION

If the use of a travel restraint system is not reasonably practicable, then a personal fall protection system must be used. Personal fall protection allows users to fall but stops the fall before the user strikes the ground or an obstruction below. If a fall arrest system is used, it's critical that the Total Fall Distance is calculated to ensure adequate Clearance Distance is available.

At MRU, personal fall protection is only to be used as a last resort. If required, contact your Supervisor as an on-site rescue plan will need to be developed as part of the Fall Protection Plan.

5. PROCEDURES

Used in place of fall protection equipment only if it is not reasonably practicable to use one of the above noted systems. Examples include the use of warning lines and safety monitors. Procedures require management and EH&S approval and should only be considered as a last resort for the following tasks:

- Installation or removal of fall protection equipment (e.g. anchors)
- Roof inspection
- Emergency repairs
- At-height transfers between equipment and structures if allowed by the manufacturer's specifications
- Situations where a worker must work on top of a vehicle or load and the requirements of this safety program have been met

The department manager must ensure that the following requirements are met for a procedural fall protection system to be approved:

- A hazard assessment is completed before work begins
- The procedures to be followed are written and reviewed with all workers before work begins
- Work is carried out in such a way as to minimize the number of employees exposed to a fall hazard while work is performed
- Work is limited to light duty tasks of limited duration
- Assigned workers are competent to complete the task
- The procedures do not expose employees to additional hazards
- When used for inspection, investigation or assessment activities, these activities take place prior to the start of work or after the work has been completed

EXAMPLES OF WORKPLACE ACTIVITIES WITH FALL HAZARDS

The following are examples of activities that involve working at heights and will require controls to address the hazards, including a Fall Protection Plan. Note that this is not a complete list. Additional comments on some items are noted in the sections below.

- Roof top repairs and maintenance
- Gutter cleaning
- Working around skylights, pits and sumps

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- Working from a ladder
- Working from mobile elevated work platforms (i.e. scissor or boom lift)
- Erecting and working from scaffolding
- Working around pool while empty
- Working around excavations deeper than 3 m

MOBILE ELEVATED WORK PLATFORMS

The Alberta OHS Code explicitly requires that workers use travel restraint or personal fall protection when working on a Mobile Elevated Work Platform (MEWP). The system must be connected to an engineered anchor point on the equipment and the lanyard must be short enough to prevent the worker from being ejected, yet long enough to allow the worker to perform work.

Where a boom-supported elevated work platform does not have a manufacturer-installed anchor point, an anchor certified by a professional engineer to meet the OHS requirements must be identified.

For scissor lifts and vertical lifts, if the manufacturer's specifications allow a worker to work from the platform using only the guardrails for fall protection and the platform is operating on a firm, level surface, the travel restraint system is not required.

A self-retracting lanyard should be used on platforms where possible, to both limit the length of the lanyard and allow a worker to perform work unimpeded while working around the entire platform.

A personal fall arrest system with a shock absorber can function as a travel restraint system preventing the worker from being ejected. If the lanyard is too long to prevent ejection, then the shock absorber will help limit arrest forces on both the worker and the platform's anchor point in the event of an ejection and fall.

LADDERS

An employee performing work from a fixed ladder 3 m (10 ft) or more in height must have fall protection in the form of a guardrail or an integral fall protection system (e.g. fixed rail system). A ladder cage is not a means of fall protection.

An employee may work from a portable ladder without using a personal fall arrest system when it is not reasonably practicable to use one (e.g. when there is no available anchor of sufficient strength), provided the following conditions are met:

- The work is light duty and short duration (on the ladder no more than 30 minutes at a time)
- The employee must keep their center of gravity (belly button) between the side rails of the ladder
- The employee must maintain 3 points of contact whenever they extend an arm beyond a side rail

Personal fall arrest systems are not required when an employee is travelling up or down a portable ladder.

Ladderway floor openings and platforms are normally guarded by a standard guardrail and toe board on all exposed sides, except at the entrance to the opening. A self-closing double bar safety gate or equally

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effective means must be provided at the opening to prevent persons from walking directly into the opening and falling.

CLIMBING ONTO VEHICLES OR LOADS

If an employee must climb onto a vehicle or its load where it is not practical to provide a fall protection system, steps must be taken to eliminate or reduce the need to climb on the vehicle / load and management-approved procedures shall be developed to minimize risk to the employee.

Employees must not climb onto a load if the load is not secured against movement.

PROTECTION FROM FALLING OBJECTS

Falling objects can result in serious injuries, especially when dropped from higher elevations. Ensure that one or more of the following controls are put in place to reduce the risk of injury and property damage – note that the list is not exhaustive and other options may be more effective for the work scope:

- Secure tools and materials
 - Tools can be secured using lanyards, belts, holsters, wristbands or other similar equipment
 - Move large or heavy objects away from the edge and secure to the working surface
- Use toeboards, screens or mesh on guardrails and scaffolds
- For larger projects, use debris nets, catch platforms or canopies to catch or deflect falling objects
- Barricade a work zone below work at heights and post warning signs to prevent people entering the area
 - If someone must enter the work zone below employees working at heights, they must notify the workers above before entering and be equipped with hard hats for protection.

FALL PROTECTION PLAN

As outlined in the Alberta OHS Code, a Fall Protection Plan must be developed for a work site if an employee could fall 3 m (10 ft) or more and is not protected by guardrails that meet legislated specifications.

The Fall Protection Plan template is available on the [EHS website](#), with a sample available in [Appendix A](#). As plans are developed for standard, regularly occurring tasks, task and area-specific templates may become available; these will outline typical controls used for that task or location, but must still be updated or amended each time they are used. A new Fall Protection Plan is required anytime a unique work situation arises, as identified during the hazard assessment.

The Fall Protection Plan must specify:

- The fall hazards at the work site
- The fall protection system to be used at the work site
- The anchors to be used during the work
- Confirmation that clearance distances below the work area are sufficient to prevent a worker from striking the ground or an obstacle below the work area (see diagram 1, below)

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- The procedures used to assemble, maintain, inspect, use and disassemble the fall protection system, where applicable
- The rescue procedures to be used if a worker falls and is suspended by a personal fall arrest system or safety net and needs to be rescued.

The Fall Protection Plan must be available at the work site and reviewed with workers before work with a risk of falling begins.

Anytime conditions affecting fall hazards or protection change, the Fall Protection Plan must be updated.

FALL PROTECTION EQUIPMENT

All fall protection equipment must meet the requirements outlined in the Alberta OHS Code and the standards referenced therein.

Assembly and disassembly of all equipment must be done according to manufacturers' recommended procedures. This includes donning the harness according to the manufacturer's directions, attaching the lanyard to the identified anchor point and only using approved anchor points.

- Store fall protection equipment in a secure, dry environment, free of exposure to fumes or corrosive environments that can damage the equipment.
- Visually inspect all personal fall protection equipment before each use. See [Appendix B](#) for fall protection equipment inspection guidelines.
- An annual documented inspection must be performed by a trained member of EH&S or an alternate provider. See [Appendix C](#) for sample inspection checklist templates; current inspection checklist templates are available on the [EH&S website](#).
- Any defective equipment must be tagged and removed from use immediately.
- Clean equipment per manufacturer's instructions. Avoid the use of solvents or harsh detergents.
- Remove from service any element of a personal fall protection system that was subjected to impact loading (high force or shock applied over a short time period). This includes anchors, harnesses, lanyards, connecting components, among others. Report the equipment to your supervisor or EH&S; equipment will be sent for inspection and repair or disposal.
- Body belts are not permitted at MRU.

ANCHORS

Permanent anchor points, also known as engineered or certified anchor points, are designed for long term use in locations where personal fall protection systems will repeatedly be required. At MRU, these can be found on Mobile Elevated Work Platforms and some rooftop locations.

Permanent anchors are recertified annually and must be visibly inspected by the employee before each use. If an anchor is damaged, it must be tagged out of service and cannot be used until it is repaired, replaced or re-certified by the manufacturer or a professional engineer.

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Temporary anchors are only in place for a short time and must be removed either on the date when the project they were used for is completed, or as specified by the manufacturer or professional engineer. They may be connected by a temporary lifeline or a rail system to provide more movement to workers around a space (e.g. across a roof). Consult the manufacturer’s specifications for installation instructions and limitations on use.

All anchors must meet the strength requirements outlined in Part 9 of the OHS Code and must be designed, installed, and used in accordance with the manufacturer’s specifications or specifications certified by a professional engineer.

If unsure of the strength of an anchor to be used for fall arrest, contact EH&S or Building Operations for additional information.

When attaching to any anchor, select one that is directly above the worker whenever possible. This will reduce the risk of swing fall and reduce the clearance distance required (see below).

Employees using a travel restraint or personal fall arrest system must ensure that:

- The fall protection system is safely secured to an anchor that meets OHS requirements
- Anchors are visually inspected and determined to be free of damage before using
- Damaged anchors are not used until they are repaired, replaced or re-certified by the manufacturer or a professional engineer
- Anchor connectors are appropriate to the work being performed
- The anchor used is not part of an anchor used to support or suspend a platform

SELECTION/CARE/USE

Fall protection system equipment must be selected and used as outlined in the Alberta OHS Code and any referenced standards (CSA, ANSI or CEN). All components of a fall protection system must be compatible with one another and with the environment in which they are used.

Ensure the harness selected fits the user snugly, and that materials used in the harness and lanyard are appropriate for the task (e.g. use fire retardant materials in a welding environment or a nonconductive lanyard near an energized conductor).

Snaphooks and carabiners must be auto-locking (2-stage) components to reduce the risk they could open accidentally. Only connect snaphooks and carabiners to compatible connections, as outlined in the manufacturer’s specifications.

Equipment must be inspected as per manufacturer’s recommendations and legislated requirements, including a pre-use inspection by the user and an annual inspection by a certified inspector. Any equipment found to have damage or abnormalities must be disposed of or tagged out of service and submitted for repair. For additional information on equipment inspections, see the section below.

When using a work positioning system, the user’s center of gravity must not extend beyond an edge from which the user could fall. If there remains a risk that the user could fall (e.g. working off of a MEWP), then the user must also use a personal fall arrest system.

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A personal fall arrest system must ensure:

- The user cannot hit the ground or an object below the work area (see Clearance Distance calculation below)
- The maximum arresting force on a worker is limited to 6 kilonewtons (kN) for systems without an energy absorber or with an E4 energy absorber, or 8 kN if the worker is using an E6 energy absorber
- The vertical distance of a fall is limited by selecting the shortest length lanyard that will still permit the user to perform their tasks, and securing the lanyard to an anchorage connector at the user's shoulder height or higher
 - Where a shoulder-height anchor is not available, the lanyard must be secured as high as possible and ensure that the clearance and maximum arresting force requirements are met (see Clearance Distance calculation below)
- That a life safety rope is installed and used in a manner that minimizes the hazards of swinging and limits the swing drop distance to 1.2 m
- That Self Retracting Lifelines (SLR) cannot come into contact with an unprotected sharp edge
 - Where this hazard cannot be eliminated, an energy absorber should be used instead of an energy absorbing lanyard to reduce the risk of failure by the SLR over the sharp edge

CLEARANCE DISTANCE

Calculating the clearance distance is critical to confirm that the selected personal fall arrest system will prevent the user from contacting the ground (or other object below the work area) in the event of a fall.

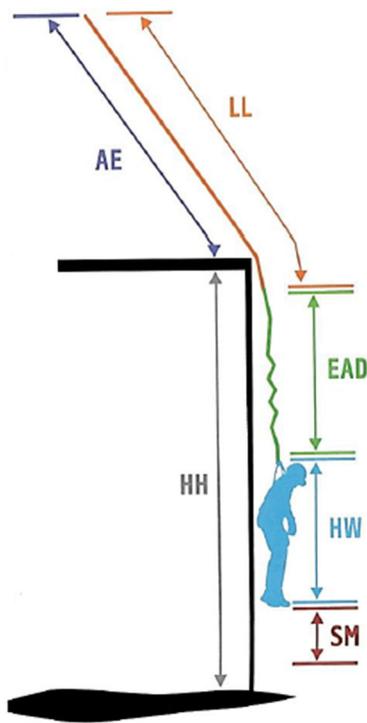
To calculate the clearance distance:

- Determine the clearance available (CA) by adding the height of the hazard (HH – distance from the ground or obstruction to the work area) and the distance between the anchor and the edge (AE)

$$CA = HH + AE$$
- Determine the clearance required (CR) by adding the lanyard length (LL – from the lanyard label), the energy absorber deployment distance (EAD – from the label), the height of the worker (HW) and a safety margin (at least 0.5 m or 2 ft) to account for stretch of the any items, such as the harness or connector.

$$CR = LL + EAD + HW + SM$$
- If the CA is larger than the CR, the selected protection is adequate.

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**Example:**

HH = 5.5 m (18 ft)

AE = 0.9 m (3 ft)

$$CA = HH + AE = 6.4 \text{ m (21 ft)}$$

LL = 1.8 m (6 ft)

HW = 1.8 m (6 ft) – rounded up

EAD = 1.2 m (4 ft) – such as E4 energy absorber

SM = 0.5 m (2 ft)

$$CR = LL + EAD + HW + SM = 5.3 \text{ m (18 ft)}$$

CA is larger than the CR, so the protection is appropriate.

From Fall Protection Group, <https://fallprogroup.com/>

EQUIPMENT INSPECTIONS

All elements of the fall protection system, including personal fall protection equipment, anchors, and guardrails, **must be visibly inspected by the employee before each use**. Any equipment showing signs of damage must be tagged out of service and shall be disposed of or returned to the manufacturer for recertification before being returned to service. Inspection guidelines for personal fall protection equipment are provided in [Appendix B](#).

Formal inspections conducted by a trained, competent person are required annually for the following:

- Personal fall protection equipment, including body harnesses, lanyards, and connecting hardware – to be completed by trained members of EHS using the inspection checklists provided in [Appendix C](#).
- Anchors – to be completed by a certified third party, organized by Building Operations

Equipment will be removed from service if:

- Equipment is found to be defective as part of a pre-use or formal inspection
- Equipment has come in contact with excessive heat, or any chemical or other substance that may corrode or damage the fall protection system
- Equipment has stopped a fall
- Equipment is missing or has unreadable safety labels or markings

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EMERGENCY RESPONSE

An on-site rescue plan must be developed as part of the Fall Protection Plan any time there is a risk that a worker could fall and be suspended by a personal fall arrest system. The on-site rescue plan is critical as suspension trauma, significant injuries or medical emergencies require immediate response. Calling 911 may be part of a rescue response, but does not replace or supersede the on-site response.

Employees at MRU are not trained in high-angle rescue.

All incidents related to working at heights, including close calls (also known as near misses), must be reported to the employee's supervisor and submitted to Intalex (MRU's incident tracking software) or the Workplace Incident Report Form available on the [EHS website](#).

SUSPENSION TRAUMA

Suspension trauma occurs when a worker is held in an upright position with the harness straps restricting circulation in the legs. Workers can be rendered unconscious in a short amount of time, and prolonged suspension can be fatal.

To reduce the risk of suspension trauma, employees should be equipped with leg loop extensions on their full body harnesses when they are using a personal fall arrest system. Leg loops attach to the harness to provide foot loops that a worker can stand in to support their legs and relieve the pressure of the harness straps on the legs while awaiting rescue.

If leg loop extensions are not available, a rescuer can also lower a loop of rope down to a suspended worker that they can put their feet into and use like an attached leg loop extension.

SELF-RESCUE

If possible, employees should attempt a self-rescue following a fall. This may include climbing back to the level they were working from or using a specialized descent device to continue the descent to the lower level. Some self-retracting lanyards include an integral hand winch that allows the fallen worker to be raised or lowered to a safe location and can be operated by another employee if the fallen worker is not conscious.

Any self-rescue approach chosen must not pose a risk to the employee's health or safety.

LIFTS AND LADDERS

Where self-rescue is not available, rescuers may access a suspended worker using a MEWP or a ladder capable of adequate height.

MEWPs can only be operated by trained and competent employees, and must be inspected and ready to place into service immediately in the event of an incident. When developing an emergency response plan, ensure that the equipment and personnel are available in the event of an emergency.

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If an employee is working from a MEWP when they fall or become incapacitated, they may be lowered to the ground by another trained employee, using the emergency lowering devices accessible at ground level.

Ladders must be secured against movement prior to using for rescue. Ensure that the suspended worker has a secure grip on the ladder and able to safely descend before disconnecting their fall protection lanyard.

EXTERNAL RESCUE

In the event of a fall and/or a suspended worker who cannot perform an extraction unassisted, the second employee identified on the Fall Protection Plan shall call 911 and Campus Security at 403-440-5900 immediately, before beginning any rescue attempt. In the call, it's critical to specify that it is a **rescue from height, the approximate height of the worker, and the exact location on campus.**

Once 911 has been contacted, internal rescue should be attempted, if it is safe to do so. The suspended worker shall deploy the leg loop extensions, or another employee will lower a line with a loop for the worker to stand in to reduce the effects of suspension trauma while waiting for rescue.

TRAINING

All employees required to use fall protection equipment must be trained in its use by a competent person. At MRU, training and certification is provided by approved third party vendors.

The training will include the following, as a minimum (as outlined in CSA Z1001):

- A review of current Alberta OHS legislation and CSA Standards as pertaining to fall protection
- Hazard identification
- Fall safety systems and emergency planning
- Information on the effect of falling on the human body
- Anchor points – strength requirement and types
- Types of body holding devices (fall restraint, fall protection) and how to perform pre-use inspections, how to fit correctly, and how to use correctly, including hands-on training
- Fall protection equipment connectors, including carabiners and snap hooks, lanyards and self-retracting lanyards (SLRs), and energy absorbers
- Care and maintenance of equipment
- Emergency response

Employees or contractors expected to conduct site rescue of suspended workers require additional training. Discuss with EH&S if this applies to your project.

DEFINITIONS

Anchor Point: A secure point of attachment for lifelines, lanyards, or deceleration devices. An anchor point must be capable of supporting at least 5000 pounds/ 22.2 kN (3600 pounds/ 16 kN if engineered/certified by a qualified person) per person and must be independent of any anchorage being used to support or suspend platforms.

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Body Belt: A belt that circles the waist and is used for worker positioning and fall prevention. Because a body belt must NEVER be used for personal fall arrest, they are not permitted at MRU.

Clearance Distance: the distance from a specified reference point, such as the working platform or anchorage of a fall-arrest system, to the highest obstruction that a worker might encounter during a fall

Connector: A device which is used to couple (connect) parts of the personal fall arrest system together

Contractor: An independent legal entity that is engaged in the business of providing work in exchange for payment. An independent legal entity includes an individual, sole proprietorship, partnership or a corporation.

Employee: Volunteers or individuals who are engaged to work for the University under an employment or apprenticeship contract, including Faculty, Staff, exempt Employees, Management Employees, and Undergraduate, Graduate or Postgraduate students carrying out work for the University.

Energy absorber: any device that dissipates kinetic energy and does not return it to the system or into the human body.

Fall Restraint: A system to prevent a worker from falling from a work position or from travelling to an unguarded edge from which the worker could fall.

Fall Arrest System: An assembly of components joined together so that when the assembly is connected to a fixed support, it is capable of arresting a worker's fall before the worker hits the surface below; consists of a full-body harness with back-mounted D-ring, an energy absorbing lanyard, a lifeline, connecting hardware and anchorage point(s). A potential for injury will exist if the worker falls.

Fall Protection: Specialized personal protective equipment designed to prevent falls from height or to bring a worker to a safe and controlled stop after falling.

Fall Protection Plan: A safety plan for workers who will be working at heights over 3 m (10 ft).

Free Fall: The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Full Body Harness: Webbing/straps which are secured about an employee's body in a manner that will distribute the fall arrest forces over the thighs, pelvis, waist, chest and shoulders. Having means for attaching it to other components of a personal fall arrest system, preferably at the shoulders and/or middle of the back.

Guardrail: A guard consisting of a top rail 102 cm to 112 cm (40 in. to 44 in.) above the work surface, and an intermediate rail located approximately midway between the underside of the top rail and the top of the toeboard, if one is provided, or the work surface if no toeboard is provided.

Hazard: A situation, condition or thing that may be dangerous to the safety or health of workers or the presence of an agent or environmental condition that could cause harm to people, property or the environment.

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Hazard Controls: Procedures and/or processes and/or mechanized equipment intentionally used to protect the worker from hazards in the workplace. Common hazard controls fall under engineering controls (i.e ventilation), administrative controls (i.e training), and personal protective equipment (i.e safety glasses).

Horizontal lifeline (HLL): a component of an HLL system that extends horizontally from one end anchorage to another and consists of a flexible line made from wire, fibre rope, wire rope, or rod, complete with end terminations.

Lanyard: A flexible line of rope or strap that has self-locking snaphook connectors at each end for connecting to body harnesses, deceleration devices, and anchor points.

Lifeline: A component consisting of:

- A flexible line for connection to an anchorage or anchorage connector at one end to enable the line to hang vertically (a VLL); or
- A flexible line for connection to anchorages or anchorage connectors at both ends to enable the line to span horizontally (an HLL).

Permanent Work Area: A work zone that is intended to be used indefinitely, with no fixed end date.

Personal Fall Arrest System: A system used to arrest (catch) an employee in a fall from a working level. It consists of an anchorage location, connectors, a body harness, and may include a lanyard, deceleration device, lifeline, or any combination of the before-mentioned items.

Prime Contractor: A contractor that has been assigned health and safety responsibility for a defined work zone, as outlined in the Alberta Occupational Health and Safety Code.

Project Manager: An MRU employee responsible for overseeing contractors hired to perform work on behalf of MRU.

Self-retracting lanyard (SRL): a connecting means that automatically adjusts its length under light tension as the worker moves toward or away from the anchorage. It stops a fall.

Self-Rescue: A situation in which a worker can make their way back to a safe location after a fall arrest without needing the assistance of another person.

Snaphook: A connector comprised of a hook-shaped member with a closed keeper which may be opened to permit the hook to receive an object and when released, automatically closes to retain the object. Snaphooks must be self-closing with a self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection, thus preventing the opportunity for the object to —rolloutll of the snaphook.

Supervisor: A person who has charge of a workplace, or authority over a worker. Depending on the particular reporting relationship, a Supervisor includes, but is not limited to any of the following: Manager, Associate Dean, Director, Vice President or President.

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Suspension Trauma: Loss of consciousness due to a person being held upright with limited movement for a period of time, with the harness straps restricting circulation in the legs. Workers can be rendered unconscious in a short amount of time, and prolonged suspension can be fatal.

Temporary Work Area: A work zone that is not expected to be used indefinitely, but has a fixed work end date.

Travel Restraint System: 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 he or she could fall; equipment designed to keep a person away from the location of the fall hazard; a mechanism which restricts the movement of a worker on a work surface; consists of a full-body harness, a lifeline or retractable lanyard, and an anchorage point; also referred to as fall restraint.

Vertical Lifeline (VLL): A length of rope with a manufactured termination at the top end. It may or may not include a means to tension the line, such as a small weight at the bottom end.

Vertical Lifeline System: A fall-arrest system that uses a VLL, fall arrester, connecting means, and body-holding device.

Volunteer: Unpaid individual working under the direction of an Employee of the University. Volunteers do not receive course credits or grades, and the work is not a requirement of graduation.

Warning Line System: A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, which designates an area in which work can be conducted without the use of guardrails, personal fall arrest systems, or safety nets to protect employees in the area. This may be utilized on any roof greater than 6 m / 20 ft wide and must be placed no closer than 4 m / 13 ft to the edge.

Work Zone: An area where work is occurring, including overhead work. Work zones shall be signed to warn people to stay out of the area and must be defined with barriers such as cones, flagging tape or other barricades. The type of barrier used shall reflect the degree of risk to people entering the area; when the risk is high, it is more critical to keep people out of the work zone and more substantial barriers must be used.

REFERENCES

Alberta Occupational Health and Safety Act, Regulations, and Code

Canadian Standards Association (CSA) Standards:

- Z259.10-18 Full Body Harnesses
- Z11-18 Portable Ladders
- Z29.1-05 Body Belts and Saddles for Work Positioning and Travel Restraint
- Z259.13-16 Manufactured Horizontal Lifeline Systems
- Z259.11-17 Personal Energy Absorbers and Lanyards
- Z259.16-15 Design of Active Fall-Protection Systems
- Z1001-18 Occupational Health and Safety Training

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REVISION HISTORY

Date	Revision	Notes
February 2020	01	Creation of Safety Program

APPENDICES

[Appendix A: Blank Fall Protection Plan](#)

[Appendix B: Equipment Inspection Guidelines](#)

[Appendix C: Fall Protection Equipment Inspection Checklists](#)

APPENDIX A: FALL PROTECTION PLAN TEMPLATE

Below is a sample – most current template is available on the [EHS website](#).

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="3">Mount Royal University - Environmental Health & Safety</td> </tr> <tr> <td colspan="3">Fall Protection Plan</td> </tr> <tr> <td style="width: 33%;">Rev: 01</td> <td style="width: 33%;">Date: September 2019</td> <td style="width: 33%;">Page: 1 of 3</td> </tr> </table>	Mount Royal University - Environmental Health & Safety			Fall Protection Plan			Rev: 01	Date: September 2019	Page: 1 of 3				
Mount Royal University - Environmental Health & Safety														
Fall Protection Plan														
Rev: 01	Date: September 2019	Page: 1 of 3												
<u>FALL PROTECTION PLAN</u>														
<p>This Fall Protection Plan must be completed anytime a hazard assessment identifies work at height over 3 m / 10 ft will be conducted on MRU property without a guardrail or comparable barrier that is at least 1 m / 3 ft in height.</p> <ul style="list-style-type: none"> ➤ Submit the completed copy of this plan to the Environmental Health & Safety department for approval at least 2 working days before the task start. ➤ Work at height shall not commence until EH&S has approved the plan and the area is properly signed and flagged. ➤ EH&S may inspect any work area on campus and has the authority to stop unsafe work. <p style="text-align: center;">EMERGENCY: CALL 911 OR SECURITY AT 403-440-5900</p> <p>No roof maintenance or exterior work using Mobile Elevated Work Platforms or scaffolds shall be conducted in wind conditions over 50 km/h, or when other environmental conditions lead to unsafe working conditions</p> <p style="text-align: center;">POST THIS PERMIT AT THE WORK SITE, WITH SUPPORTING DOCUMENTATION <i>A copy shall be kept in the EH&S office</i></p>														
Work Location:	Date:	Start / End Times:												
Scope of Work:														
Potential Fall Hazards:														
<p>Fall Protection to be Used:</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Move work to safe area</td> <td><input type="checkbox"/> Personal Fall Arrest System</td> </tr> <tr> <td><input type="checkbox"/> Guardrails</td> <td><input type="checkbox"/> Procedure-based system (light duty and limited duration work only)</td> </tr> <tr> <td><input type="checkbox"/> Travel Restraint</td> <td></td> </tr> </table> <p>Anchors to be Used:</p>			<input type="checkbox"/> Move work to safe area	<input type="checkbox"/> Personal Fall Arrest System	<input type="checkbox"/> Guardrails	<input type="checkbox"/> Procedure-based system (light duty and limited duration work only)	<input type="checkbox"/> Travel Restraint							
<input type="checkbox"/> Move work to safe area	<input type="checkbox"/> Personal Fall Arrest System													
<input type="checkbox"/> Guardrails	<input type="checkbox"/> Procedure-based system (light duty and limited duration work only)													
<input type="checkbox"/> Travel Restraint														
<p>Clearance Distance Calculation (for Personal Fall Arrest System):</p> <table style="width: 100%;"> <tr> <td>Fall Distance:</td> <td></td> <td style="text-align: right;"><i>*Use same unit (metres or feet) throughout calculation</i></td> </tr> <tr> <td>Potential Fall Distance (platform to next lower level)</td> <td style="text-align: right;">_____ m or _____ ft</td> <td></td> </tr> <tr> <td>Anchor to Edge Distance</td> <td style="text-align: right;">+ _____ m or _____ ft</td> <td></td> </tr> <tr> <td>Total Fall Distance</td> <td style="text-align: right;">= _____ m or _____ ft</td> <td></td> </tr> </table>			Fall Distance:		<i>*Use same unit (metres or feet) throughout calculation</i>	Potential Fall Distance (platform to next lower level)	_____ m or _____ ft		Anchor to Edge Distance	+ _____ m or _____ ft		Total Fall Distance	= _____ m or _____ ft	
Fall Distance:		<i>*Use same unit (metres or feet) throughout calculation</i>												
Potential Fall Distance (platform to next lower level)	_____ m or _____ ft													
Anchor to Edge Distance	+ _____ m or _____ ft													
Total Fall Distance	= _____ m or _____ ft													

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Clearance Required:			
Lanyard Length	_____ m or _____ ft	(see label)	
Energy Absorber Deployment Distance	+ _____ m or _____ ft	(see label)	
Worker Height	+ _____ m or _____ ft	(round up)	
Minimum Safety Margin (may be increased)	+ 1 m or 3 ft		
Total Clearance Required	= _____ m or _____ ft		
Fall Distance _____ – Clearance Required _____ = _____ Clearance Distance			
CLEARANCE DISTANCE MUST BE POSITIVE NUMBER			
Equipment Procedures (assembly/disassembly, maintenance, use):			
Manufacturer's Instructions attached? <input type="checkbox"/> Yes <input type="checkbox"/> No – enter below:			
Rescue Plan – procedures and required equipment:			
<i>*Calling 911 is not a complete rescue plan</i>			
ENSURE ALL REQUIRED RESCUE EQUIPMENT IS ON-SITE, INSPECTED, AND READY TO USE			
The undersigned personnel know, understand, and will follow the outlined fall protection plan:			
Role	Print Name	Signature	Phone
Supervisor			
Authorization:			
Department	Print Name	Signature	Phone
EH&S			

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APPENDIX B: EQUIPMENT INSPECTION GUIDELINES

The information below applies provides typical requirements for most equipment, but the manufacturer’s manual must be consulted to confirm equipment specifications, limitations, and use instructions.

GUARDRAILS

Although guardrails are a passive restraint that don’t require actions by users to be effective, they must still be inspected before work begins. Inspection requirements include:

- Inspect all guardrails, including top, mid and toe boards for any damage such as bends, corrosion or deformation.
- Inspect connecting components, such as bolts, nuts, welds and other fixings.
- Inspect the integrity of any supporting structures and base plates.

ANCHORS

Anchors must be designed and installed under the supervision of a qualified engineer. A formal inspection is performed on an annual basis.

When inspecting anchors before use:

- Check the label, stamp or engraving to ensure all components are properly marked or legible.
- Check for signs of damage such as cracks, corrosion, deformation, dents, or discolouration.

FULL BODY HARNESSSES

Full body harnesses are the only allowed body holding device allowed at MRU. They are designed to distribute arrest forces evenly throughout the body and prevent an employee from falling out of the harness in the event of a fall.

Harnesses used on MRU campus must be CSA or ANSI approved. The harness must fit snugly and be correctly fastened when working at heights.

Harnesses must be thoroughly inspected by the user before each use. Look for labels – if they are missing or illegible, the equipment must be put out of service. Check that impact indicator to ensure the harness hasn’t been involved in a fall.

Look at webbing, connectors, buckles, and stitching; check for signs of damage, such as:

- | | |
|---------------------------------------|------------------------------|
| • Cracks | • Deformations |
| • Discolouration or rust | • Heavy staining or abrasion |
| • Broken stitches | • Melting or burns |
| • Malfunctioning snaphooks or buckles | • Cuts, tears or rips |

If any of the above are noted, mark the equipment out of service until it can be formally inspected and destroyed or recertified.

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CONNECTORS

Connectors are defined as any device linking a body holding device (e.g. harness) to an anchor point. They include:

- Snaphook
- Carabiners
- Lanyards
- Energy absorbers
- Self-retracting lifelines

They can be subject to immense stress in the event of a fall, so only CSA or ANSI approved devices must be used, and manufacturer's instructions must be followed.

Snaphooks and carabiners must have gates rated for 16kN (3600lbf). Single-action (non-locking) or manual locking devices are not permitted due to a risk of roll-out or gate failure. During the inspection:

- Confirm the functionality of the gate – it should automatically close and lock every time
- Check the device is free of cracks, corrosion and deformation, and is not missing hardware
- Confirm that the connections between the device and the harness and anchor points are compatible (refer to manufacturer's operating manual)

Lanyards are connecting devices typically made of a length of strong material with snaphooks or carabiners on each end. Ensure that the material of the lanyard is suitable for the task (e.g. fire or chemical resistant when needed) and review the manufacturer's label for information on purpose, length, maximum weight of the user, maximum freefall distance. Similar to a harness, the inspection should look for:

- Cracks
- Discolouration or rust
- Broken stitches
- Malfunctioning snaphooks or buckles
- Deformations
- Heavy staining or abrasion
- Melting or burns
- Cuts, tears or rips

If a lanyard is made of steel cable, look for:

- Broken strands
- Kinks or deformations
- Bent or stretched eyelets
- Corrosion or burn marks

Self-retracting lifelines are a type of lanyard that is designed so that the device will lock if the lifeline pulls out from the case at a speed determined by the manufacturer. When inspecting these, inspect the entire length of the lifeline for damage and check the locking mechanism by pulling fast on the lifeline to engage the locking mechanism.

Energy absorbers are connecting components that reduce the arrest forces generated during a fall. As with other connectors, look for signs of damage along the exposed webbing. Also check the casing for tears, rips or soft spots and inspect the energy absorber and load indicator for signs of deployment.

APPENDIX C: FORMAL FALL PROTECTION EQUIPMENT INSPECTION CHECKLISTS

Below is a sample of the inspection checklist document. The most current version can be found on the [EH&S website](#).



MRU EH&S: Fall Protection Equipment Inspection Checklist

Equipment Type: _____ Model: _____
 Manufacturer: _____ S/N: _____
 Manuf. Date: _____ Expiry Date: _____

Inspection Factors	P / F / NA	Comments
Manufacturer Manuals available, bulletins reviewed?		
Labels & Markings Present & Legible?		
CSA or ANSI Approved?		
Impact Indicator Intact?		
Webbing / Rope		
Stitches / Splices		
Energy Absorber		
SLR Casing, Locking Action		
Snaphook / Carabiner		
D-Rings / O-Rings		
Buckles / Adjusters		
Steel Cable		
Other:		
Other:		
Other:		

Pass Fail Action Taken: _____

Inspected by: _____ Date Inspected: _____