Simon Fraser University
Fall Protection Program

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# Table of Contents

1.0 Introduction .................................................................................................................. 1

2.0 Definitions ..................................................................................................................... 1

3.0 Roles and Responsibilities .......................................................................................... 2

4.0 WorkSafeBC Fall Protection Requirements ............................................................... 3

5.0 Education and Training ............................................................................................... 3

6.0 Fall Hazards at SFU ..................................................................................................... 3
   6.1 Work Conducted on Building Roofs ......................................................................... 4
   6.2 Short Duration Work .............................................................................................. 5

7.0 Risk Assessment ......................................................................................................... 5

8.0 Fall Protection Systems .............................................................................................. 5
   8.1 Guard Rails ............................................................................................................... 6
   8.2 Fall Restraint System .............................................................................................. 6
   8.3 Fall Arrest System .................................................................................................. 7
   8.4 Work Procedures .................................................................................................... 7

9.0 Fall Protection Equipment .......................................................................................... 9
   9.1 Equipment Available and Storage Locations ......................................................... 9
   9.2 Inspection and Maintenance .................................................................................. 9

10.0 Ladders, Scaffolds and Work Platforms ................................................................... 9

11.0 Rescue Operations .................................................................................................. 10
Appendices

Appendix A: Forms, Sign-out Sheets and Check Lists ................................................................. 10
  Personal Fall Protection Equipment Sign-out Sheet
  Log Sheet for Using Roof Anchor System
  Fall Protection Work Plan

Appendix C: Fall Protection Equipment Inspection ........................................................................... 18

Appendix D: WorkSafeBC Requirements for Ladders, Scaffolds and Temporary Work Platforms........ 20

Appendix E: Man-Lift Operating Instructions and Inspection Records .............................................. 26
  Up-right Lift Instruction Manual
  Up-right Lift UL24/30 Inspection Records
  Up-right Lift UL38/44 Inspection Records
  Boom Lift Inspection Records
  New Up-right Lift Outrigger

Appendix F: Building Specific Instructions and Locations of Anchoring Systems ............................... 28
  Academic Quadrangle(#002)
  Alcan Aquatic Research Centre(#035)
  Animal Care Facility(#034)
  Applied Science Building(#038)
  ASSC1-Saywell Hall(#022)
  ASSC2-Blusson Hall(#017)
  Bee Research Building(#024)
  Bennett Library(#004)
  Childcare Centre(#033)
  Convocation Mall(#003)
  Diamond Alumni Centre(#037)
  Discovery 1(#202)
  Discovery 2(#201)
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  Lorne Davies Complex (East Part)(#007)
  Lorne Davies Complex (West Part)(#007)
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  Residence C: Barbara Rea House(#098)
  Residence D: Pauline Jewett House(#099)
  Residence: Dining Hall(#096)
  Residence: Hamilton Hall(#095)
  Residence: Louis Riel(#093)
  Residence: Madge Hogarth House(#091)
  Residence: McTaggart- Cowan Hall(#094)
  Residence: Shell House(#092)
  Robert C. Brown(#009)
  Shrum Science Biology(#026)
  Shrum Science Chemistry(#027)
  Shrum Science Kinesiology(#028)
  Shrum Science Physics(#029)
  South Sciences Building(#041)
  Strand Hall(#011)
  TASC1(#046)
  TASC2(#047)
  University Theatre(#006)
  Water Tower Building(#021)
  Water Tower Reservoir(#020)
  West Mall Centre(#040)
1.0 Introduction

Simon Fraser University has developed a Fall Protection Program in accordance with the requirements outlined by WorkSafe BC in the Occupational Health and Safety Regulation. The purpose of this Program is to establish guidelines to protect all employees engaged in work activities that expose them to potential falls from elevations. The Fall Protection Program addresses the following:

- Roles and responsibilities,
- Regulatory requirements,
- Education and training,
- Fall hazards at SFU,
- Work conducted on building roofs,
- Risk assessment,
- Fall protection systems,
- Storage, inspection and maintenance of fall protection equipment,
- Rescue operations.

2.0 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>“anchor”</td>
<td>means a secure point of attachment for a lifeline or lanyard;</td>
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<tr>
<td>“control zone”</td>
<td>means the area between an unguarded edge of a building or structure and a line which is set back a safe distance of at least 2 meters.</td>
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<tr>
<td>“fall arrest system”</td>
<td>means a system that will stop a worker's fall before the worker hits the surface below;</td>
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<tr>
<td>“fall protection system”</td>
<td>means (a) a fall restraint system, (b) a fall arrest system, or (c) work procedures that are acceptable to the Board and minimize the risk of injury to a worker from a fall;</td>
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<td>“fall restraint system”</td>
<td>means 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;</td>
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<tr>
<td>“full body harness”</td>
<td>means a body support device consisting of connected straps designed to distribute the force resulting from a fall over at least the thigh, shoulders and pelvis, with provision for attaching a lanyard, lifeline or other components;</td>
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<tr>
<td>“horizontal lifeline system”</td>
<td>means a system composed of a synthetic or wire rope, installed horizontally between 2 anchors, to which a worker attaches a personal fall protection system;</td>
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<tr>
<td>“lanyard”</td>
<td>means a flexible line of webbing, or synthetic or wire rope, that is used to secure a full body harness to a lifeline or anchor;</td>
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<tr>
<td>“lifeline”</td>
<td>means a synthetic or wire rope, rigged from one or more anchors, to which a worker's lanyard or other part of a personal fall protection system is attached;</td>
</tr>
<tr>
<td>“personal fall protection system”</td>
<td>means a worker’s fall restraint system or fall arrest system composed of (a) a full body harness, and (b) a lanyard, lifeline and any other connecting equipment individual to the worker that is used to secure the worker to an individual point of anchorage or to a horizontal lifeline system;</td>
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<tr>
<td>“safety monitor system”</td>
<td>means a system in which a trained worker is designated to monitor work activities in a control zone to ensure that work is done in a manner that minimizes the potential for a worker to fall.</td>
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</table>

Section 11.1, Occupational Health and Safety Regulation
3.0 Roles and Responsibilities

Environmental Health & Safety (EHS)

The Environmental Health and Safety Department (EHS) is responsible for the following:
- Review and update the Fall Protection Plan and Roof Access Manual on an annual basis.
- Arrange annual training for supervisors and employees in the use of fall protection systems.
- Inform and advise contractors of their responsibilities, SFU's Fall Protection Plan, Roof Access Manual and associated hazards when working at heights at SFU.

Facilities Services

Facilities Services is responsible for the following:
- Ensure anchor points and fall protection equipment are inspected by a qualified person and subsequently documented prior to use and as required on an annual schedule.
- Ensure the anchor point log books, which are located near the roof access points of every building, are kept up to date.
- Maintain lifts (man-lifts, scissor lifts, etc.) as per manufacturer's instructions.
- Ensure contractors working at height submit their fall protection plan to EHS for review, prior to commencing work.

Supervisors

Supervisors, including Foreman and Lead Hands, are responsible for the following:
- Assess the risk of all work conducted at heights greater than 3 meters and advise workers of the appropriate fall protection system to be used.
- Make the appropriate fall protection equipment available to employees and ensure that this equipment is used when required.
- Ensure that only authorized workers, adequately instructed and trained in the use of fall protection, work at heights.
- Ensure that workers follow safe work procedures when working at heights.
- Ensure fall protection equipment is removed from service after it has arrested the fall of a worker.

Employees

Employees are responsible for the following:
- Understand and be familiar with the policies, procedures and other safety protocols as outlined in this Fall Protection Program.
- Follow and perform safe work and rescue procedures, as well as other required fall protection protocols.
- Inspect fall protection equipment before use on each shift.
- Properly wear and use fall protection equipment.
- Participate in fall protection training as directed by their Supervisor.
- Alert their Supervisors to potential fall hazards that are not already identified and controlled.
Contractors

Contractors are responsible for the following:

- Understand and be familiar with the policies, procedures and other safety protocols as outlined in SFU’s Fall Protection Program, the contractor’s own program requirements and the applicable legislative requirements.
- Follow and perform safe work and rescue procedures, where warranted, as well as other required fall protection protocols.
- Complete their own Fall Protection Plan for the work being conducted and submit a copy to EHS, prior to commencement of work.
- Ensure their employees are properly instructed and trained in:
  - The fall hazards associated with the work; and
  - The required precautions identified in the safe work procedures to properly perform their duties.
- Verify that all potential fall hazards have been eliminated or minimized.
- Properly wear and use their own assigned fall protection equipment.
- Report all incidents/accidents immediately to their Supervisor, as well as the SFU Project Manager; and
- Provide, at the request of SFU, copies of all relevant fall protection documentation including, but not limited to:
  - Fall Protection Program,
  - Applicable Safe Work Procedures,
  - Rescue Plan,
  - Proof of adequate training for all workers, and
  - Other relevant information and documentation.

4.0 WorkSafe BC Fall Protection Requirements

According to the Occupational Health and Safety Regulation, a fall protection system must be used when work is being done at a place from which a fall of 3 m (10 ft) or more may occur, or where a fall from a lesser height may result in serious injury.

A written fall protection plan is required when:

(i) work is being done at a location which does not have permanent guardrails, and from which a fall of 7.5 m (25 ft) or more may occur, or

(ii) work procedures are used as a means of fall protection

The fall protection plan must be available at the workplace before work with a risk of falling begins.

5.0 Education and Training

Before a worker is allowed into an area where a risk of falling exists, the Supervisor must ensure that the worker is instructed in the fall protection system for the area and the procedures to be followed.

EHS will arrange annual fall protection training for supervisors and employees. All records of training will be maintained by EHS.

6.0 Fall Hazards at SFU

There are a number of routine (and some less common) activities that require SFU maintenance personnel, from all departments, to work at heights greater than 3 meters (10 feet), or heights greater than 7 meters (25 feet). These include:

- painting (interior and exterior),
- pressure washing,
- roof inspections and maintenance,
- roof fan and fume hood maintenance,
- repair of roof drains,
- changing light bulbs and fixtures in high ceilings (e.g., gymnasium),
- maintaining mechanical and electrical equipment in mechanical and boiler rooms (off the catwalks).

The list above is not complete and there are undoubtedly other work-related activities that take place at heights. In addition, some tasks are contracted to specialists outside the University maintenance department, including:

- Major painting projects,
- Large roof repairs or replacements,
- Window cleaning,
- Power washing,
- Installation of anchoring systems for fall protection,
- Roof repairs (flushing),
- Antenna installations (e.g., library roof),
- Stack extensions (e.g., Shrum Science Centre),
- Repair of heat traces (for ice and snow removal) and glass replacement on glass roof of Convocation Mall,
- Glass replacement (windows and skylights),
- Landscaping and planting on building ledges.

Prior to commencing work at SFU, contractors who will be working at heights must submit their Fall Protection Plan to EHS for review. EHS will not approve the plan but will review the plan to ensure that it is complete and has been tailored to the work being conducted at SFU. A Fall Protection Work Plan form is provided in Appendix A and may be used by EHS to determine whether a contractor's Fall Protection Plan meets the necessary requirements.

6.1 Work Conducted on Building Roofs

Many of the roofs at SFU are flat roofs with minimal railing systems in place. Access points to most of the roofs are located at least 2 meters from the edge of the building. Provided that a distance of 2 meters (6.5 ft) from the edge of the flat roof can be maintained or a railing is in place, workers are permitted to carry out their work without the use of fall protection or fall restraint equipment.

When the required work is located within 2 meters of the roof edge, either a temporary railing or fall restraint equipment will be used on a site specific basis. All workers required to work within this area will be trained in the use of fall restraint equipment and fall protection. Anchor systems have been installed on many of the buildings. If workers need to use these anchor systems, a log book system is in place at the roof entrance points to document their use by trained personnel.

Building-specific instructions and roof anchor points are provided in Appendix F for the following 40 buildings on Burnaby Campus:

1. Academic Quadrangle(#002)  
2. Alcan Aquatic Research Centre(#035)  
3. Animal Care Facility(#034)  
4. Applied Science Building(#038)  
5. ASSC1-Saywell Hall(#022)  
6. ASSC2-Blusson Hall(#017)  
7. Bee Research Building(#024)  
8. Bennett Library(#004)  
9. Childcare Centre(#033)  
10. Convocation Mall(#003)  
11. Diamond Alumni Centre(#037)  
12. Discovery 1(#202)  
13. Discovery 2(#201)  
14. Education Building(#036)  
15. Facilities Services(#013)  
16. Lorne Davies Complex (East Part)(#007)  
17. Lorne Davies Complex (West Part)(#007)  
18. Maggie Benston Centre(#032)  
19. Residence B: Shadbolt House(#097)  
20. Residence C: Barbara Rea House(#098)  
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23. Residence: Hamilton Hall(#095)  
24. Residence: Louis Riel(#093)  
25. Residence: Madge Hogarth House(#091)  
26. Residence: McTaggart- Cowan Hall(#094)  
27. Residence: Shell House(#092)  
28. Robert C. Brown(#009)  
29. Shrum Science Biology(#026)  
30. Shrum Science Chemistry(#027)
6.2 Short Duration Work

WorkSafe BC recognizes that it may not be possible to provide suitable fall protection under all conditions where work is conducted at heights greater than 3 meters (10 feet). This would include the installation of fall protection equipment, climbing a ladder to a work platform, climbing a scaffold, etc. However, fall protection devices must be utilized if work is performed at heights, for any length of time.

7.0 Risk Assessment

Prior to conducting any work at heights, the risk of falling and the requirement for fall protection must be assessed. The following factors must be considered:

- Will work be conducted at heights in excess of 3 meters or where a fall from a lesser height may result in serious injury? If not, fall protection is not required.
- Have the workers received the required fall protection training?
- Are guardrails present? Would it be advantageous to install guardrails (i.e., will work repeatedly be conducted in this area)? If so, the Superintendent of Buildings & Grounds should be contacted regarding the installation of guardrails.
- If there are no guardrails, are there anchor points or horizontal lifelines to attach personal fall protection systems to? Would it be advantageous to install anchors or horizontal lifelines (i.e., will work repeatedly be conducted in this area)? If so, the Superintendent of Buildings & Grounds should be contacted regarding the installation of this equipment.
- Are there any other hazards in the area that would affect the use of fall protection equipment (e.g., operating machinery)?
- What personal fall protection equipment (lifelines, lanyards, harnesses, etc.) is required to perform the work? Where is the equipment located?
- If a fall arrest system is used, provision for the possible rescue of workers must be made (elevating work platforms, notification of Campus Security, etc.)

8.0 Fall Protection Systems

A fall protection system must be used when work is being done at a place from which a fall of 3 meters (10 ft) or more may occur, or where a fall from a lesser height may result in serious injury. There are several different types of fall protection systems, each with varying degrees of effectiveness. Guardrails are considered the best option for fall protection, followed by a fall restraint system, a fall arrest system, and finally, the implementation of work procedures, which is considered the least desirable option. A control zone with a safety monitor is an example of an acceptable work procedure. Equipment used for a fall protection system must be sufficient to support the fall restraint or arrest forces. It must also consist of compatible and suitable components, and be used in accordance with applicable standards.

Before a worker is allowed into an area where a risk of falling exists, they must be instructed in the fall protection system for the area and the procedures to be followed.

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1 The applicable CSA or ANSI standard in effect when the equipment was manufactured, subject to any modification or upgrading considered necessary by WorkSafeBC.
8.1 Guard Rails

Guard rails and guarded catwalks have been installed on the flat roofs of some buildings on campus (e.g., Shrum Science Centre). In unguarded areas where work must be conducted within 2 meters (6.5 feet) of the edge of the roof, a fall restraint system shall be used providing a suitable anchor point is available:

In the event that guard rails or proper anchor points are not located near the place of work, the Supervisor should be notified regarding their installation. A control zone system must be used if no anchoring points are available.

8.2 Fall Restraint System

A fall restraint system prevents a worker from falling from a work position, or from travelling to an unguarded edge from which the worker could fall.

A series of permanent anchor points have been installed on the roofs of some buildings (including the library and South Sciences Building) for the attachment of swing stages and lifelines. They have been installed on the inside of the roof edges. These anchors can also be used for fall restraint.

Each personal fall protection system that is connected to an anchor must be secured to an independent point of anchorage. Anchors for personal fall protection systems must meet specific load capacities identified by WorkSafe BC. Permanent anchors and anchors with multiple attachment points must be certified by a professional engineer.

The log book, which is located just inside the roof access door, must be filled out prior to using the anchor system.

A fall restraint system, consisting of the following elements, must be used where a suitable anchor point is available opposite the work area:

- Lifeline
- Full body harness
- 4 foot lanyard (no shock absorber). The lanyard must be attached to the dorsal “D” ring, on the back of the harness.
- Rope positioning device (rope grab)

Permanent horizontal lifeline systems must be certified by a professional engineer.

A temporary horizontal lifeline system may be used if it is installed and used in accordance with the written instructions provided by the manufacturer. Alternatively, it can be used if it is installed and used in accordance with written instructions that have been certified by a professional engineer. In both cases, the instructions must be readily available in the workplace.

In the event that a proper anchor point cannot be located near the place of work, the Supervisor should be notified regarding the installation of a suitable anchor. A control zone system must be used if no anchoring points are available.

Temporary anchoring devices, such as anchor straps or slings (or lifelines), capable of supporting 800 pounds could be wrapped around appropriate supporting structures, in order to anchor a fall restraint system. Such structures could include:

- Permanent railings (on catwalks)
- Permanent ladders
- Support struts or beams
8.3 Fall Arrest System

A fall arrest system will stop a worker's fall before the worker hits the surface below. Permanent anchors, adjacent to the roof edge (i.e., those normally used with swing stages) can be used for fall arrest, provided no other attachment points, further away from the roof edge, are available. The log book, which is located just inside the roof access door, must be filled out prior to using the anchor system.

For fall arrest protection on a roof, the following system must be used:
- Full body harness
- 4 foot lanyard with a shock absorber
- Protection against abrasion (e.g., folded canvas tarpaulin) should be draped over the edge of the roof on top of the anchor to prevent the edge of the building from severing the lanyard in the event of a fall.

The lanyard must be attached to the dorsal “D” ring on the back of the harness. The other end of the lanyard must be attached to the roof anchor, nearest the work area.

If a worker falls from the roof, the shock absorber will deploy and the worker will be hanging from the building, approximately 8 feet from the roof edge. This must be taken into account when preparing for potential rescue operations.

8.4 Work Procedures

WorkSafe BC allows the use of a control zone with or without a safety monitor as a fall protection system provided there is no provision for fall restraint or fall arrest or where the use of a fall arrest system would result in greater hazards to the worker.

8.4.1 Control Zone

A control zone is the area between an unguarded edge of a building or structure and a line which is set back a safe distance of at least 2 meters. A safety monitor system is a system in which a trained worker is designated to monitor work activities in a control zone to ensure that work is done in a manner that minimizes the potential for a worker to fall. Only workers directly required for the work at hand should be inside the control zone.

A control zone is intended for level or low-sloped work surfaces. A control zone is not permitted as the fall protection system for the following:
- on a working surface where the slope of that surface exceeds 4 vertical in 12 horizontal,
- skeletal structure work, or
- scaffold erection and removal.

If workers will at all times remain further from the unguarded edge than the width of the control zone, no safety monitor or other fall protection system need be used.

The width of a control zone is to be at least 2 meters (6.5 feet), and additional distance must be added if any of the following conditions exists:
- The working surface is slippery or sloped,
- The work is carried out at an elevation relative to the unguarded edge, or
- The risk is increased by the use of equipment near the control zone.
8.4.2 Raised Warning Line

If a worker will be working within a control zone” (less than 2 meters (6.5 ft) away from a fall hazard), a raised warning line defining the control zone is required along the internal edge of the control zone. An acceptable raised warning line includes the following:

- A high-visibility material, or a line flagged or clearly marked with high-visibility materials at intervals not exceeding 2 meters (6.5 ft).
- Rigged and maintained to be between 0.85 meters and 1.15 meters above the work surface.

If workers will be further than the boundary of a control zone, a raised warning line is not required. On a narrow roof, such as one less than 12 meters (40 ft) wide, an employer may proceed with a safety monitor and a control zone system without using a raised warning line by declaring the entire work surface the control zone.

A diagram outlining a control zone is provided in Appendix B.

8.4.3 Safety Monitors

The role of the safety monitor is to ensure that the work activity in the control zone is performed in accordance with the fall protection plan and in a manner that minimizes the potential for a worker to fall. A safety monitor must meet the following requirements:

- Be experienced in the work overseen and trained in the role of safety monitor.
- Be present at all times when a worker is in the control zone.
- Have complete authority over the work as it relates to the prevention of falls.
- Engage in no other duties while acting as the safety monitor.
- Be located so as to have a clear and continuous view of the work.
- Be able to have normal voice communication with the workers being protected.
- Monitor no more than 8 workers.
- Be instantly distinguishable from other workers (e.g., wear a safety vest).
9.0 Fall Protection Equipment

9.1 Equipment Available and Storage Locations

Each Department has its own fall protection equipment and storage areas. The Supervisor must be contacted regarding the administration or sign out of this equipment. Fall protection devices or related equipment on campus include:

- Harnesses
- Lanyards (with and without shock absorbers)
- Lifelines
- Man lifts
- Confined space rescue system (tripod and retractable lifeline)
- Ladders
- Scaffolds

Permanent anchor systems have been installed on a number of buildings on campus and are identified in Appendix F. Log books are available at these sites and must be filled in before the anchors are used.

9.2 Inspection and Maintenance

According to the WorkSafe BC regulation, equipment used in a fall protection system must be inspected by a qualified person before use on each shift. It should be stored in a clean and dry location to prevent its deterioration and should be maintained in good working order. Please refer to Appendix C for a Fall Protection Equipment Inspection Guide.

In addition, equipment should be inspected by a qualified person on an annual basis, in accordance with the Manufacturer's instructions. The inspection of fall protection equipment will be conducted annually by the Contractor hired to conduct the anchor system inspections. If a device is identified as defective in condition or function, it must be removed from service and the Supervisor must be informed immediately.

After a fall arrest system has been used to stop the fall of a worker, it must be removed from service. It cannot be used again until it has been inspected and recertified as safe for use by the manufacturer or by a professional engineer.

10.0 Ladders, Scaffolds and Work Platforms

WorkSafe BC specifies detailed requirements for the use of ladders, scaffolds and work platforms in the workplace. These requirements are outlined in Appendix D.

With regards to fall protection, a person on an elevating work platform (e.g., the Up-Right man lifts stored in the Gymnasium and Academic Quadrangle) must wear a personal fall arrest system secured to an anchorage point. A Group “L” ladder climbing harness with a 1 foot lanyard should be worn and clipped to the front of the harness and the lift guard rail. A 4 foot lanyard and shock absorber should not be used, as the guard rail will not support the arresting impact.

In the event of an emergency, the platform may be manually lowered from the ground by means of a valve located on the power unit (see instructions in Appendix E). Only a qualified mechanic should operate this valve.

A fall arrest system is not required on a scissor lift if it is on a firm level surface with no irregularities to cause platform instability and all manufacturer's guardrails and chains are in place. Most scaffolds are built with guardrails and therefore, the use of a fall arrest system is also not required.

Please note that a fall arrest system should never be used with (i.e., attached to) a step ladder. However, fall protection equipment shall be used on an extension ladder, at heights greater than 3 meters. This
would include a Group “L” ladder climbing harness with a 1 foot lanyard attached to the front of the harness and the ladder rung.

### 11.0 Rescue Operations

#### Fall Arrest

A rescue plan for the rescue of a worker who has fallen and is suspended by a personal fall protection system is a mandatory supplementary component of a fall protection plan.

Whenever a fall arrest system is in use, a minimum of two workers must be present and rescue equipment must be immediately available in the area (e.g., ladder, elevating work platform, tripods). The worker who is not using the fall arrest system must be equipped with a radio and must remain in the vicinity of the work at all times. In the event that rescue is required, the second worker will contact 911 and then immediately to Campus Security by calling 778-782-4500.

If a ladder or elevating work platform can be used to reach the suspended worker, then the second worker can initiate rescue. If additional assistance is required, the second worker should contact the Superintendent, Buildings and Grounds and request assistance from additional employees trained in fall protection rescue. It may be possible to haul the suspended worker back to the level from which they fell or pull him/her in through a nearby window or other opening.

It is important that the time it takes to rescue a worker suspended after a fall is reduced as much as possible. The comfortable suspension time after a fall, even in a full body harness, is limited.

#### Fall Restraint

Where a fall restraint system is used the worker can likely regain their footing or otherwise self-rescue immediately after the fall has occurred.

#### Elevating Work Platform

If the suspended worker has fallen from an elevating work platform (e.g., Up-Right man-lift), the second worker will lower the platform to the ground using the controls at the base of the equipment.
Appendix A

Forms, Sign-out Sheets and Check Lists
## Personal Fall Protection Equipment – Sign Out Sheet

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Department</th>
<th>Equipment Used</th>
<th>Work Area</th>
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Purpose of Using Roof Anchors:

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Purpose of Using Roof Anchors:
Fall Protection Work Plan

Company Name: _______________________________________________________________

Jobsite name & Address: _________________________________________________________

Job Task: ___________________________________________________________________

Supervisors Ensure: Workers must review and sign this fall protection work plan prior to starting work in an area where a hazard of falling exists. Workers must understand this plan and be trained in fall protection and the systems and equipment that will be used. This plan must be posted at the worksite for the duration of the work activities. This plan must be used in conjunction with a comprehensive and effective Fall Protection Program. Add additional pages as necessary.

Effective period for plan (From) ➢ (To) ➢ (dd/mm/yy) ➢ (dd/mm/yy)

Job Location/Description: _________________________________________________________

1. Identify Potential Fall Hazards

☐ Elevating work platforms (boom operated) ☐ Scaffold erection/ dismantling
☐ Excavations ☐ Stairways
☐ Floor openings/ skylights ☐ Swing Fall
☐ Skeletal framing ☐ Wall opening
☐ Hazardous processes/ equipment ☐ Reinforcing steel installation
☐ Ladders (fixed or portable) ☐ Other (Identify)

2. Describe the hazard(s) including specific dimensions, locations, levels, etc.

3. Identify Fall Protection Systems to be used

☐ Guard rails ☐ Fall arrest
☐ Fall restraint ☐ Control zone with monitor
☐ Procedures ☐ Safety net
☐ Work Platform ☐ Catch platform
☐ Self-propelled elevated work platform ☐ Other (Identify)
☐ Scaffold ☐ Other (Identify)

4. Describe the procedures for handling, storing and securing tools and materials
5. Identify the method of providing protection for workers who may be in or pass through the area below the overhead work activity

- Barricading
- Hard hats required
- Catch net
- Warning signs
- Toe boards/ screens on scaffolds
- Toe boards/ covers on floor openings
- Other (identify)
- Other (identify)

6. Identify the method for prompt, safe removal of injured workers

- Written agreement with:
  - Self-rescue (Training Documentation)
  - Identify Fire Department and attach agreement
- Site First Aid
  - Other employees of employer (Training Documentation)
- Elevators/ stairs
  - Other (Identify)

7. Identify the method used to determine the adequacy of anchorage points

- Evaluation by a professional engineer
- Existing engineering/ design documents
- Manufacturers data
- Other (identify)

8. Describe and identify locations of anchorage points


9. Name of project site safety and health representative: ________________________________

10. Name of Safety Monitor if control zone used: _______________________________________

11. Name of person(s) trained to work under this plan: ________________________________

12. Select System Components

- Full body harness
- Vertical lifeline
- Horizontal lifeline
- Lanyard
- Boatswains chair
- Connecting Devices (identify)
- Choker
- Karabiner
- Rope Grab
- Personal shock absorber
- Beamer
- Anchorage points (identify)

13. Identify maximum free fall distance* : _____________________________________________

14. Identify total fall distance** : ____________________________________________________

*Free-Fall Distance. The vertical displacement of the fall arrest attachment point on the employee's body harness between the onset of the fall and just before the system begins to apply force to arrest the fall. (The distance that a worker falls before engaging the fall arrest system.) Free-fall distance must not exceed 6 feet.

**Total Fall Distance. The maximum vertical change in distance from the bottom of an individual's feet at the onset of a fall, to the position of the feet after the fall is arrested. This includes the free-fall and deceleration distances.
15. Describe the procedures for the assembly, maintenance, inspection and disassembly of the fall protection system to be used

16. Inspection checklist
- Identification tags
- Horizontal lifeline tension is correct
- Integrity of stitching in shock absorber
- Integrity of stitching in harness/ belt/ lanyard
- Manufacturer’s assembly/ disassembly instructions
- Locking capability of retractable lanyards assured
- Locking capability of karabiners assured
- Locking capability of snap hooks assured
- Knots and other connection methods do not weaken lifeline
- Lifelines installed and used under supervision of competent person and protected from cuts or abrasions
- Rope (wear, fraying, damage, mildew)
- Lanyard (wear, fraying, damage, mildew)
- D rings have adequate strength, are not cracked or deformed
- Guardrails are sound and of adequate strength
- Devices are used to connect to horizontal lifelines lock in both directions
- Anchorage points provide adequate strength and are capable of meeting regulated strength requirements
- Safety monitor is competent, can see all workers, is close enough to communicate, and has no other duties
- Warning lines are adequately marked and are at appropriate distance from fall hazard
- Hole covers are secured, marked and capable of withstanding anticipated weight loads
- Other (identify)
Appendix C

Fall Protection Equipment Inspection
Fall Protection Equipment Inspection
(Adapted from the CCOHS document entitled Safety Belts, Harnesses, and Lanyards)
http://www.ccohs.ca/oshanswers/prevention/ppe/belts.html

How to inspect the webbing (body of belt, harness or lanyard):
- Inspect the entire surface of webbing for damage. Beginning at one end, bend the webbing in an inverted "U." Holding the body side of the belt toward you, grasp the belt with your hands six to eight inches apart.
- Watch for frayed edges, broken fibers, pulled stitches, cuts or chemical damage. Broken webbing strands generally appear as tufts on the webbing surface.
- Replace according to manufacturers' guidelines.

How to inspect the buckle:
- Inspect for loose, distorted or broken grommets. Do not cut or punch additional holes in waist strap or strength members.
- Check belt without grommets for torn or elongated holes that could cause the buckle tongue to slip.
- Inspect the buckle for distortion and sharp edges. The outer and center bars must be straight. Carefully check corners and attachment points of the center bar. They should overlap the buckle frame and move freely back and forth in their sockets. The roller should turn freely on the frame.
- Check that rivets are tight and cannot be moved. The body side of the rivet base and outside rivet burr should be flat against the material. Make sure the rivets are not bent.
- Inspect for pitted or cracked rivets that show signs of chemical corrosion.

How to inspect the rope:
- Rotate the rope lanyard and inspect from end to end for fuzzy, worn, broken or cut fibers. Weakened areas have noticeable changes in the original rope diameter.
- Replace when the rope diameter is not uniform throughout, following a short break-in period.
- The older a rope is and the more use it gets, the more important testing and inspection become.

How to inspect the hardware (forged steel snaps, "D" rings):
- Inspect hardware for cracks or other defects. Replace the belt if the "D" ring is not at a 90° angle and does not move vertically independent of the body pad or "D" saddle.
- Inspect tool loops and belt sewing for broken or stretched loops.
- Check bag rings and knife snaps to see that they are secure and working properly. Check tool loop rivets. Check for thread separation or rotting, both inside and outside the body pad belt.
- Inspect snaps for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should be seated into the snap nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to close the keeper firmly.

How to inspect the safety strap:
- Inspect for cut fibers or damaged stitches inch by inch by flexing the strap in an inverted "U." Note cuts, frayed areas or corrosion damage.
- Check friction buckle for slippage and sharp buckle edges.
- Replace when tongue buckle holes are excessively worn or elongated.

How to clean the equipment:
Basic care prolongs the life of the unit and contributes to its performance.
- Wipe off all surface dirt with a sponge dampened in plain water. Rinse the sponge and squeeze it dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion.
- Rinse the webbing in clean water.
- Wipe the belt dry with a clean cloth. Hang freely to dry.
- Dry the belt and other equipment away from direct heat, and out of long periods of sunlight.
- Store in a clean, dry area, free of fumes, sunlight or corrosive materials and in such a way that it does not warp or distort the belt.
Appendix D

WorkSafe BC Requirements for Ladders, Scaffolds & Temporary Work Platforms
Ladders, Scaffolds and Temporary Work Platforms

WorkSafe BC specifies that a ladder, window cleaner's belt or work platform must meet and be used in accordance with the applicable standards and/or the requirements of a professional engineer. The ladder, window cleaner's belt, work platform and associated components must be inspected before use on each shift, and after any modification. Any condition that might endanger workers must be remedied before the equipment is used.

1.0 Ladders

The following safety practices must be followed whenever a ladder is used at SFU:

- Ensure the ladder is marked for the grade of material used to construct the ladder and the use for which the ladder is constructed.
- Ensure the ladder is:
  1. placed on a firm and level base,
  2. positioned so that the horizontal distance from the base to vertical plane of support is approximately ¼ of the ladder length,
  3. has sufficient length to project approximately 1 m (3 ft) above the upper landing to which it provides access, and
  4. if necessary, is secured to ensure stability during use.

If work cannot be done from a ladder without hazard to a worker, a work platform must be provided. A worker must not carry up or down a ladder, heavy or bulky objects or any other objects which may make ascent or descent unsafe.

2.0 Work Platforms

All work platforms must have sufficient strength to bear the load to be placed on it, and must be secured against separation from the supporting equipment, structure or surface to which it is attached.

Types of Work Platforms:
2.1 Lines Supporting Work Platforms

Rigging and lines used to suspend or support work platforms must
(a) have sufficient breaking strength to withstand the loads likely to be imposed with the required factor of safety,
(b) be free of knots or splices except for terminal eye-splices,
(c) be suitable for the purpose for which they are used,
(d) be protected from abrasion or other damage from the work environment,
(e) be secured to the platform and to an anchorage able to withstand the loads likely to be imposed on them,
(f) be of sufficient length to lower the work platform to a safe lower landing, and
(g) except for load lines, be used exclusively for suspending the work platform.

2.2 Hooks and Clamps

(1) Cornice hooks, parapet clamps and thrust-out beams must be secured by tiebacks to a solid anchor on the building or structure.
(2) Tiebacks for cornice hooks, parapet clamps and thrust-out beams must be rigged at right angles to the building face.
(3) Each cornice hook, parapet clamp, hanger or stirrup used to support a swing stage must be manufactured of mild steel or other material having similar ductile properties.
(4) Counterweights must be
   (a) made of solid material not subject to loss of weight through attrition, and
   (b) secured to the thrust-out beam.

2.3 Engineering Required

A scaffold must be constructed, installed and used in accordance with the instructions of a professional engineer with respect to
(a) bracing, if the scaffold is enclosed by a tarpaulin or any other cover,
(b) a scaffold exceeding 38 m (125 ft) in height,
(c) a scaffold exceeding 25 m (80 ft) in height if stairways are included as part of the scaffold,
(d) a scaffold used to support a temporary floor,
(e) a scaffold suspended or cantilevered from a structure,
(f) a scaffold system supported by a catenary line,
(g) a needle beam scaffold, and
(h) an outrigger scaffold.

Permanent powered platforms must be constructed, installed and used in accordance with the instructions of a professional engineer.
A signed copy of the engineer's instructions or certification referred to above must be available at the workplace during installation, disassembly and use of the system.

2.4 Removal from service

A work platform must be removed from service until certified safe for use by the manufacturer or a professional engineer if it has
(a) been subjected to a sudden drop,
(b) been in contact with exposed energized electrical equipment or conductors, or
(c) shows signs of any kind of structural or mechanical damage or substantial wear.

3.0 Scaffolds

All scaffolds that are used by workers at SFU must be in a safe condition and must be able to withstand the load, regardless of who erected it.
WorkSafeBC specifies the following requirements for scaffold platforms:
(i) the platform must be a minimum nominal width of 50 cm (20 in)²,
(ii) the platform must not leave more than one opening in the work platform, which must be no greater than 25 cm (10 in) in width, and
(iii) if not level, the platform must be designed to ensure adequate footing for workers using the platform.

Guardrails are not required on the edge of a work platform if the platform is adjacent to a structure that provides protection equivalent to guardrails, and the open space between the platform and the structure is equal to or less than 30 cm (12 in).

### 3.1 Manufactured components

Major components of scaffolds must be used in accordance with technical data provided by the manufacturer, or in writing by a professional engineer. The rated load, erection procedures and compliance with an applicable standard must be given. The documents must be available at the workplace for reference.

All lumber used to construct a scaffold must be graded and marked to the National Lumber Grades Authority *Standard Grading Rules for Canadian Lumber*.

### 3.2 Scaffold stability

A scaffold must be erected with the vertical members plumb, and with the ledgers and bearers level. The base of a scaffold must have bearing plates or sills that rest on a solid surface and are sufficient to support the weight of the scaffold. The poles, legs and uprights of a scaffold must be securely and rigidly braced to prevent movement.

A scaffold must be effectively guyed or secured to a building or structure:

(a) if the height of the scaffold exceeds 3 times its minimum base dimension, or
(b) in any other circumstances if required for stability.

Unless otherwise specified by the manufacturer, height adjustment devices must not extend more than 2/3 of their total length or 60 cm (24 in), whichever is less.

All connections between the parts of a scaffold must be secure.

### 3.3 Electrical hazards

A scaffold must be effectively grounded if

(a) it is a metal scaffold and is located close to a high voltage energized electrical conductor or equipment, and
(b) a hazardous level of electrical charge is likely to be induced in the scaffold.

### 4.0 Movable Work Platforms

A person on an elevating work platform must wear a personal fall arrest system secured to a suitable and substantial anchorage point. A person on a scissor lift, or on an elevating work platform with similar characteristics to a scissor lift, that is on a firm level surface, is exempt from wearing a personal fall arrest system, provided that all manufacturer's guardrails and chains are in place.

### 4.1 Marking of the equipment

(1) The following equipment must be clearly marked with a rated capacity:

(a) a platform that is suspended from or attached to a crane or hoist,
(b) an elevating work platform,
(c) a work platform that is supported by a lift truck,
(d) a swing stage, and
(e) interchangeable load bearing components of a suspended work platform system.

² Except that a nominal 30 cm (12 in) wide work platform may be used with ladder jacks, pump jack or similar systems.
4.2 Manuals

(1) For each elevating work platform in use at a workplace,
   (a) the equipment manufacturer's operation manual must be available at the workplace, and
   (b) the equipment manufacturer's maintenance manual, containing maintenance instructions and
      replacement part information, must be reasonably available to workers at the workplace.
(2) If either of the manuals required by subsection (1) is not available, the equipment must not be used
   until
   (a) the manual is obtained, or
   (b) written instructions for the safe operation and maintenance of the equipment are supplied by a
      professional engineer.

4.3 Maintenance of records

(1) The employer must keep records of inspection, maintenance, repair or modification for each
   (a) elevating work platform,
   (b) swing stage, and
   (c) permanent powered platform.
(2) If the inspection and maintenance records, other than pre-shift inspections, are not available, the
    equipment must not be used until it has been inspected and certified safe for use by the manufacturer or
    a professional engineer.

4.4 Testing

(1) A vehicle-mounted elevating work platform and a self-propelled boom-supported elevating work
   platform must be
   (a) inspected in accordance with good engineering practice at least every 12 months, and
   (b) certified in writing by the equipment manufacturer or a professional engineer as complying with
      this Part and safe for use.
(2) An insulated elevating work platform must be dielectrically tested at least annually in accordance with
    the edition of CSA Standard CAN/CSA-C225 Vehicle-Mounted Aerial Devices that the device was
    designed to meet, or the most recent edition, as the circumstances require.
(3) The insulating capability of an insulated elevating work platform must be certified by the testing
    agency.
(4) If an insulated elevating work platform does not pass the testing method required by subsection (2)
    and subsection (3),
   (a) the platform must be considered non-insulated,
   (b) any markings or identification on the device indicating insulated capability must be removed or
      effectively covered over, and
   (c) the user must be informed of the non-insulated status of the device.

4.5 Work platforms on wheels

(1) If a moveable work platform on wheels is not designed for or intended to be moved along the floor or
    other supporting surface while a person is occupying the platform, the platform must be secured to
    prevent that movement before a person accesses or occupies the platform.
(2) If a moveable work platform is designed for and intended to be moved along the floor or other
    supporting surface while a person is occupying the platform, the platform must be moved only in the
    manner and under the conditions specified by the platform's manufacturer.
Despite subsection (2), if the height of the work platform of a rolling scaffold that is occupied by a person is
(a) not more than one and one half times the least base dimension of the scaffold, the scaffold may be moved by the effort of the person occupying the platform or by the effort of a person on the floor or other supporting surface,
(b) more than one and one half times the least base dimension of the scaffold, the scaffold must be moved only by the effort of a person on the floor or other supporting surface, and
(c) more than two times the least base dimension of the scaffold, the scaffold must not be moved while the person is occupying the platform.

**4.6 Warning devices on elevating work platforms**

(1) An elevating work platform, except a vehicle-mounted work platform, must have a warning system consisting of an intermittent horn or flashing light that
(a) is automatically activated during any motion of the work platform, and
(b) can be seen or heard by other workers in proximity to the work platform.

(2) If the safe operation of an elevating work platform requires its carrier vehicle to be on a level surface or level within specified degrees, the platform must be fitted, as the carrier requires, with a device to warn the operator that
(a) the carrier is not level, or
(b) the carrier is outside the permitted degrees from level.

**4.7 Controls on elevating work platforms**

The controls for an elevating work platform must
(a) be clearly identified to indicate their functions,
(b) be “hold-to-run” (continuous pressure) type that return to the neutral or the stop position when released,
(c) be protected against inadvertent operation,
(d) for each set of controls, be provided with an emergency stop device that is
(i) within easy reach of the operator,
(ii) clearly labeled STOP, and
(iii) colored red, and
(e) include a clearly marked overriding lowering control that will enable a worker at the lower controls to stop and lower the platform in an emergency.