

<b>The University of British Columbia Land and Building Services</b>		<b>Fumehood Mechanical Room and Rooftop Access</b>	
<b>Work Procedure</b>		<b>I-B-06</b>	
<b>Prepared by:</b> Dan Leslie	<b>Approved by:</b> David Barnes	<b>Issue Date:</b> May, 2009	
		<b>Replaces:</b> January, 2004	

## 1. Application

This procedure applies to all persons who may be required to work in or require access to mechanical rooms or roofs where there are fumehoods and fumehood exhausts. It is mandatory that all work carried out in these areas be done in compliance with this and other relevant work procedures.

Workers and others who require access must be fully trained and knowledgeable of the issues and work procedures that apply to work and other activities in these areas.

**It is important to note that not all fumehood mechanical rooms have been cleared for entry.**

Each room will have a placard on the door giving instructions on how to proceed to enter that room. A list of rooms and roofs that have been cleared is provided on the shared drive @ Policies and Procedures/I-B-6 attachment A and B.

A standing committee, the **Fumehood Mechanical Room and Rooftop Access Committee** has been established to monitor these rooms and roofs and provide ongoing direction for this process. (see attachment F)

## 2. Hazards

- Falls from unguarded roof edges.
- Potential exposures to substances exhausting from fumehood systems that may be in excess of exposure levels, if identified and known, as set by the WCB.

## 3. References

I-B-16      Fumehood System, Maintenance & Repair  
I-B-24      Fall Protection  
I-B-28      Hazard Identification and Risk Assessment

WCB Regs    Part 11, Fall Protection  
                  Part 5, Chemical and Biological Substances  
                  Table 5-4, Exposure Limits and Designations

## 4. Access Issues and Quality Assurance

Most of these areas are entered on a relatively regular basis and some of them have been cleared for work activities without the use of respiratory protection. Criteria has been established that the areas must meet to be added to the 'cleared' list. It then becomes critical that the areas are maintained in that condition to assure workers that the areas remain safe for entry and work activities.

### 4.1 Mechanical Room Criteria

- a) Integrity of the fumehood system, no leaks at the fan or the positive side of the system
- b) Integrity of the mechanical room envelope, no major leaks for exhaust re-entry

- c) Confidence in the quality of the air being introduced to the mechanical room
- d) General room ventilation system, exhaust fans and make-up air
- e) Mechanical room internal pressure, positive pressure where practicable
- f) Location of fumehood exhausts – louvered or through stacks

Some of these criteria are interdependent, for example:

- The mechanical room envelope is critical if the fumehood exhaust is louvered
- Positive room internal pressure is dependent upon the HVAC system in the building

**ONCE THE DETAILED CRITERIA AS SET OUT BY THE FUMEHOOD COMMITTEE IS MET THE MECHANICAL ROOM CAN BE WORKED ON WITHOUT RESPIRATORY EQUIPMENT. WORKERS ENTERING CLEARED AREAS MUST CARRY RESPIRATORY EQUIPMENT.**

#### **4.2 Rooftop Criteria**

- a) Fume hood exhaust type, louvered or through stacks
- b) Fume hood exhaust location
- c) Fume hood stack height or air induction fans.
- d) Roof profile and anticipated exhaust plume
- e) Integrity of the fumehood system, no leaks at the fan or the positive side of the system
- f) Adequate discharge velocity

**ONCE THE DETAILED CRITERIA SET OUT BY THE FUMEHOOD COMMITTEE IS MET THE ROOFTOP CAN BE WORKED ON WITHOUT RESPIRATORY EQUIPMENT. WORKERS ENTERING CLEARED AREAS MUST CARRY RESPIRATORY EQUIPMENT.**

#### **4.3 Quality Assurance**

Each of the areas that have been cleared have been thoroughly inspected, repaired and a clearance inspection performed. The committee has determined that these areas meet the established criteria and are safe for work activities without respiratory protection.

However, there must be a procedure for ensuring the area meets the criteria prior to entry and work without respiratory protection, and for periodically subjecting the areas to a regularly scheduled inspections to ensure conditions continue to meet the established clearance criteria.

There will be a pre-work inspection required to ensure that there are no obvious deficiencies and to ensure that conditions are in accordance with the posted list for that area. After the worker is satisfied that the conditions in the area meet the requirements for that room, work can then be carried out without respiratory protection.

There will be a periodic thorough inspection of each area to ensure that the area meets all of the criteria established for that area. Designated workers will carry out this inspection.

### **5. Cleared Areas and Placards**

Those mechanical rooms and rooftops cleared for work activities without respiratory protection are listed and are an addendum to this work procedure. (see attachment A and B) These lists will be updated periodically and will be attached to the work procedure, posted on bulletin boards and communicated to the work crews. In addition, all doors leading to all areas that have fumehood exhaust systems will be posted with appropriate signs and these will be changed as required.

- 5.1 Placard for areas cleared for work activities without respiratory protection**  
For placement on all doors leading to those areas cleared for work activities without respiratory protection. (see attachment D)
- 5.2 Placard for areas NOT cleared for work activities without respiratory protection**  
For placement on all doors leading to all areas **not** cleared for work activities without respiratory protection. (see attachment C)

## **6. Rooftop Access and Entry Procedures**

- 6.1** Persons requesting access to building roofs must be authorized and have the approval of their department head. Application must be made to Plant Operations Building Trades Supervisor for access. Access is restricted to those who require access for business or academic purposes.
- 6.2** On roofs where there is a recognized hazard such as fumehoods or unguarded edges, those granted access must be fully trained in the hazards and control measures.
- fall protection
  - use of respiratory protection
  - I-B-06, Fumehood Mechanical Room and Rooftop Access
- 6.3** Rooftop access doors and hatches will be keyed to exclude passage by building master keys. Access will be possible only to authorized persons with a specific key for that door.
- 6.4** Access routes to roofs is via several different means
- a) via stairways to a door leading to the roof
  - b) through a rooftop mechanical room that may or may not involve fumehoods
  - c) exterior ladder or stairs
- In all instances, where there are fumehood exhausts on the roof, attention must be given to the requirements for respiratory equipment if that roof area has not been cleared for access without respiratory protection. Placards will be posted at all routes.

## **7. Mechanical Room Access and Procedures**

- 7.1** Rooftop access doors and hatches will be keyed to exclude passage by building master keys. Access will be possible only to authorized persons with a specific key for that door.
- 7.2** Check the placard on the door. If the room has not been cleared for work activities without the use of respiratory protection, proceed in accordance with the instructions and training given.
- 7.3** If the room has been cleared for work activities without respiratory protection, the following requirements must be met before work without respiratory protection is permitted
- a) the Quality Assurance documentation, including inspection and due dates (see attachment E) posted inside the room, in a document pouch, shows that the room was inspected, conditions meet the required criteria, and the room is not past the next inspection due date.
- 7.4** Upon confirmation by a visual inspection that conditions meet the requirements indicated on the posted checklist, work activities without respiratory protection are permitted.
- 7.5** It must be assured that the work being carried out will not compromise the integrity of any of the criteria listed in 4.1 above. If so, then respiratory protection will be required until conditions are restored to the required condition.

## **8. Quality Assurance**

- 8.1** There will be a formal preventative maintenance inspection and assurance program established to ensure that all areas cleared for work activities without the use of respiratory protection are maintained in the required condition.
- 8.2** These inspections will be carried out by qualified persons, in accordance to an established schedule, and records will be maintained by the Operations Supervisor in a central file.
- 8.3** The inspections will be customized for each area, listing the items to be inspected and the conditions to be met.
- 8.4** The inspection forms will be dated and initialed by the persons doing the inspections, and posted at each area in a manner that will preserve the documentation and allow for easy reference as required.
- 8.5** Any deficiencies found during the course of these inspections that compromise the room integrity will be corrected without delay and the room status will be noted until repairs and confirmation of conditions.

## **9. Respiratory Protection and Work Restrictions**

### **9.1 General Respirator and Work Restrictions**

- a) cartridges used on cartridges type respirators will be the combination acid gas and organic vapour cartridge.(yellow or olive)
- b) persons using respirators must be fit-tested on an annual basis and a record of the test maintained
- c) Entry time restricted to 20 minutes per room per day.
- d) The permitted time and number of entries is unrestricted when using supplied air respirator.

### **9.2 ½ Mask Respirator with yellow or olive Cartridge**

- a) permitted for periods of 20 minutes per room per day. Activities are restricted to light duty activities such as light hand work while seated or standing, inspection and survey, and minor adjustments and repairs that can be completed within the 20 minutes time period.

### **9.3 Powered Air-Purifying Respirator (PAPR) with yellow or olive Cartridge**

- a) permitted for periods up to a cumulative total of 2 hours per room per day.
- b) activities restricted to moderate duty activities, such as hand and arm work, arm and leg work, and similar activities that can be completed within the 2 hour time period

### **9.4 Self Contained (SCBA) or Supplied Air Respirators**

- a) permitted for periods of any duration, any work activities, and any number of entries, in emergency situations or where a fumehood system shut down is not an option

## 10. Responsibilities

WCB Definition	UBC Organization	Responsibilities
<b>Employer</b>	<b>Associate Vice President and Directors</b>	<ul style="list-style-type: none"> <li>• Ensure that the Fumehood Mechanical Room and Rooftop Access work procedure is implemented, including training, quality assurance system and requirements, monitoring and review of the procedure</li> <li>• Assign responsibilities for implementation and monitoring to ensure the program runs effectively.</li> </ul>
<b>Supervisor</b>	<b>Associate Director</b>	<ul style="list-style-type: none"> <li>• Implement the program and ensure that the necessary systems are put in place and training is provided</li> <li>• Assign responsibilities to ensure the program is implemented</li> <li>• Monitor for effectiveness and ensure that the program is operating effectively.</li> </ul>
	<b>Managers and Heads</b>	<ul style="list-style-type: none"> <li>• Ensure that the program requirements are implemented as required</li> <li>• Ensure that all workers are trained in all aspects of the requirements</li> <li>• Give adequate directions to workers so that work can be carried out safely</li> <li>• Monitor for compliance and effectiveness</li> <li>• Make recommendations as may be appropriate for improvement to the procedures</li> </ul>
<b>Worker</b>	<b>All Workers</b>	<ul style="list-style-type: none"> <li>• Carry out their work in a safe manner and in compliance with the established procedures</li> <li>• Report any observed hazards or problems to their supervisor</li> </ul>
<b>Others</b>	<b>Operations Manager</b>	<ul style="list-style-type: none"> <li>• Schedule periodic quality inspections maintain inspection records</li> </ul>
	<b>Fumehood Mechanical Room And Rooftop Access Committee</b>	<ul style="list-style-type: none"> <li>• Monitor fumehood mechanical room and rooftop access issues.</li> <li>• Liaise with the maintenance staff on all related issues</li> <li>• Meet at least quarterly and as often as is required to ensure the effective operation and management of the procedures</li> <li>• Make recommendations to management for improvements to the program</li> <li>• Review and make decisions on applications for variances</li> <li>• See attachment F for terms of reference and Committee organization and representation</li> </ul>
	<b>Land and Building Services Safety Group</b>	<ul style="list-style-type: none"> <li>• Provide resources to the Committee as required</li> <li>• Receive and carry out an initial evaluation of all applications for variances to this established procedure</li> <li>• Ensure that applications meet the established criteria prior to submission to the Committee for their consideration.</li> </ul>
<b>Note: The term manager refers to all management supervisors</b>		

<b>The University of British Columbia Land and Building Services</b>		<b>ATTACHMENT A I-B-06</b>
<b>Work Procedure</b>		<b>List of Rooms Cleared for Work Without Respirator Protection</b>
<b>Prepared by:</b>  Originally approved by Fumehood Mechanical Room and Rooftop Committee	<b>Approved by:</b>  Originally approved by David Barnes	<b>Issue Date:</b> January 3, 2007  <b>Replaces:</b> September 1, 2005

This is the list of fumehood mechanical rooms that have been evaluated, repaired and inspected to ensure that they meet the documented criteria detailed in policy I-B-06, Fumehood Mechanical Room and Rooftop Access.

This list will be updated from time to time and communicated to the work crews and posted in appropriate locations.

<b>Building</b>	<b>Floor</b>	<b>Room</b>
<b>Advanced Material &amp; Process Lab (AMPEL)</b>	<b>Penthouse</b>	<b>600</b>
<b>Bio Science South</b>	<b>5<sup>th</sup></b>	<b>5321</b>
<b>Bio Science South</b>	<b>5<sup>th</sup></b>	<b>5356</b>
<b>Bio Science North</b>	<b>4<sup>th</sup></b>	<b>4505</b>
<b>Bio Science West</b>	<b>4<sup>th</sup></b>	<b>4400</b>
<b>Chemistry South</b>	<b>Penthouse (West)</b>	
<b>Chemistry-Physics</b>	<b>5<sup>th</sup></b>	<b>501</b>
<b>Coal and Mineral</b>	<b>4<sup>th</sup></b>	<b>400</b>
<b>Forward</b>	<b>6<sup>th</sup></b>	<b>601</b>
<b>Forward</b>	<b>6<sup>th</sup></b>	<b>605</b>
<b>Forward</b>	<b>6<sup>th</sup></b>	<b>606</b>
<b>Forward</b>	<b>6<sup>th</sup></b>	<b>608</b>
<b>Forward</b>	<b>6<sup>th</sup></b>	<b>619</b>
<b>MacDonald</b>	<b>3<sup>rd</sup></b>	<b>359, 383</b>
<b>Pulp &amp; Paper</b>	<b>4<sup>th</sup></b>	<b>404</b>
<b>Wesbrook</b>	<b>4<sup>th</sup></b>	<b>412</b>
<b>Chemistry/Physics</b>	<b>4<sup>th</sup></b>	<b>433</b>
<b>Lower Mall Research Stn.</b>	<b>Penthouse</b>	

List issued by:	Signature:
Title:	Date:

<b>The University of British Columbia Land and Building Services</b>		<b>ATTACHMENT B I-B-06</b>	
<b>Work Procedure</b>		<b>List of Roof Tops Cleared for Work Without Respirator Protection</b>	
<b>Prepared by:</b>  Originally approved by Fumehood Mechanical Room and Rooftop Committee	<b>Approved by:</b>  Originally approved by David Barnes	<b>Issue Date:</b> May, 2009  <b>Replaces:</b> December 9, 2008	

This is the list of roofs that have been evaluated, repaired and inspected to ensure that they meet the documented criteria detailed in policy I-B-06, Fumehood Mechanical Room and Rooftop Access.

This list will be updated from time to time and communicated to the work crews and posted in appropriate locations.

<b>Building</b>	<b>Building</b>
<b>Advanced Material &amp; Process Lab (AMPEL)</b>	<b>Forestry FSC</b>
<b>AERL</b>	<b>Hennings Building</b>
<b>Biological Sciences North</b>	<b>Kenny Building</b>
<b>Biological Sciences South</b>	<b>Library Processing Centre</b>
<b>Biological Sciences Centre</b>	<b>Life Sciences Centre</b>
<b>Civil &amp; Mechanical Eng. SW Wing</b>	<b>Michael Smith</b>
<b>Chemical Biological Engineering Building</b>	<b>Network of Centres of Excellence</b>
<b>Chemistry-Physics</b>	<b>Pulp &amp; Paper Centre</b>
<b>EOS</b>	<b>Wesbrook Building</b>

List issued by:	Signature:
Title:	Date:

<b>The University of British Columbia Land and Building Services</b>		<b>ATTACHMENT C I-B-06</b>	
<b>Work Procedure</b>		<b>List of Roof Tops Permanently Cleared for Work Without Respirator Protection</b>	
<b>Prepared by:</b>  Originally approved by Fumehood Mechanical Room and Rooftop Committee	<b>Approved by:</b>	<b>Issue Date:</b> May, 2009	<b>Replaces:</b> New

This is the list of roofs that have induction air systems (Strobic), solid discharge connectors or other equivalent systems that meet the criteria detailed in policy I-B-06, fumehood mechanical room and roof top access.

This list will be updated from time to time and communicated to the work crews and posted in appropriate locations.

<b>Building</b>	<b>Building</b>
AERL	Chemistry North
Chemistry Centre D	EOS Main
Life Sciences Centre	

List issued by:	Signature:
Title:	Date:

The University of British Columbia Land and Building Services		ATTACHMENT D
Work Procedure		Placard for Areas <u>Not</u> Cleared for Work Activities Without Respiratory Equipment
Prepared by: Dan Leslie	Approved by:	Issue Date: May, 2009  Replaces: January, 2004

This is a danger sign, red with black or white lettering.

To be posted on the doors of all fumehood mechanical rooms that have **NOT** been cleared for work activities without respiratory equipment.

Fumehood Mechanical Room or Rooftop Access  
**AUTHORIZED PERSONNEL ONLY**



**RESPIRATORY PROTECTION IS  
REQUIRED FOR ALL ENTRY  
AND WORK ACTIVITIES**

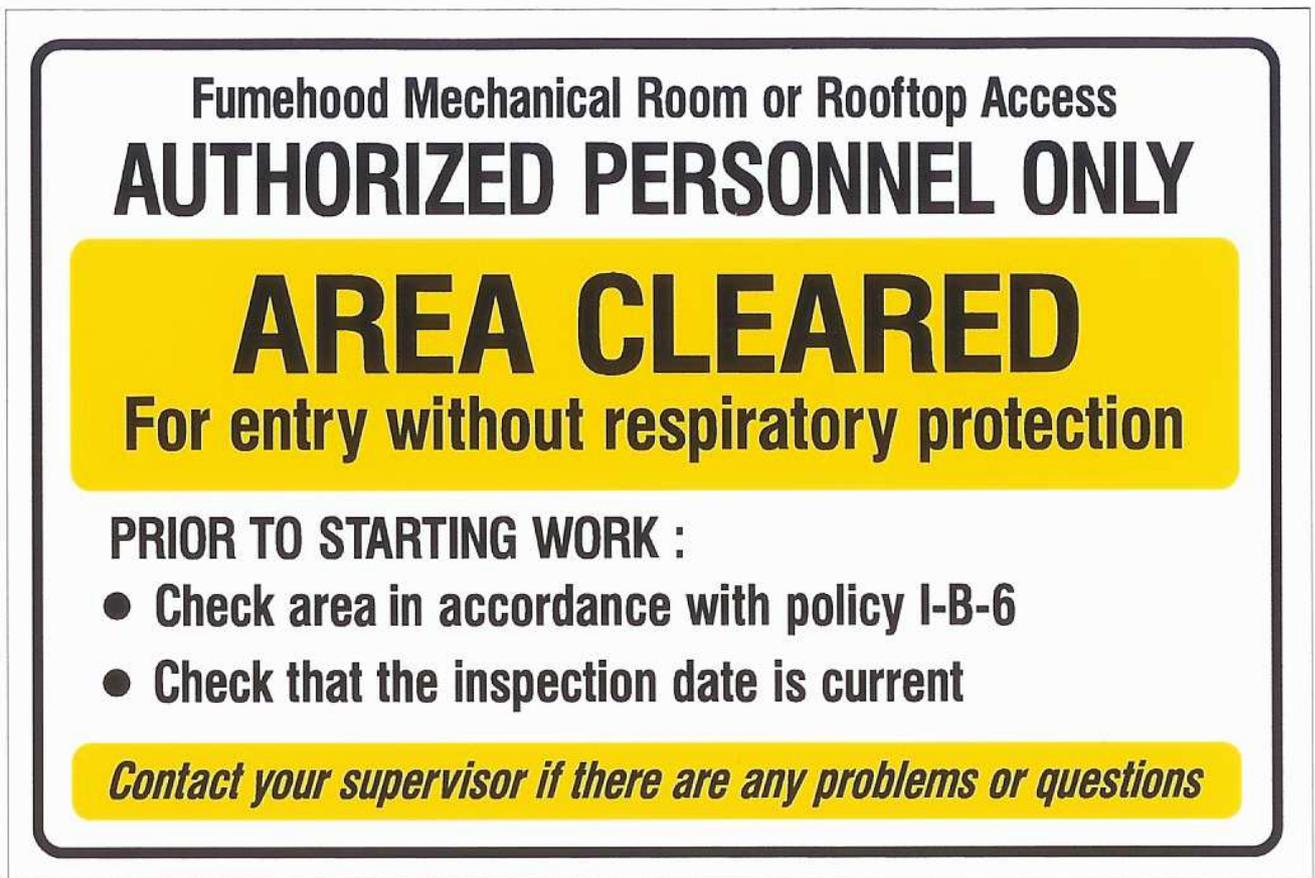
Respirator Type	Maximum working time
Half-face respirator with yellow or olive cartridges _____	20 minutes Per Room per Day
Powered air purifying respirator with yellow or olive cartridges _____	2 hours Per Room Per Day
Air Line Respirator _____	No Time Restrictions

*Contact your supervisor if there are any problems or questions*

The University of British Columbia Land and Building Services		ATTACHMENT E
Work Procedure		Placard for Areas Cleared for Work Activities Without Respiratory Equipment
Prepared by: Dan Leslie	Approved by:	Issue Date: May, 2009  Replaces: January, 2004

**This is a cautionary sign, yellow with black lettering,**

To be posted on the doors of all mechanical rooms which have been cleared for work activities without respiratory equipment.



<b>The University of British Columbia Land and Building Services</b>		<b>ATTACHMENT F</b>	
<b>Work Procedure</b>		<b>Quality Assurance Documentation and Pre-Work Inspection Requirements</b>	
<b>Prepared by:</b> Dan Leslie	<b>Approved by:</b>	<b>Issue Date:</b> May, 2009	
		<b>Replaces:</b> June 21, 1999	

<b>This Fumehood Mechanical Room or Rooftop has been cleared for work activities without the use of respiratory equipment.</b>
<b>Prior to starting work:</b>
• <b>Check area in accordance with Policy I-B-06</b>
• <b>Check that the inspection date is current</b>
• <b>Determine that atmosphere is odour free</b>
• <b>Check air supply to room is operational</b>

<b>Building:</b>		<b>Room #:</b>		
<b>Quality Assurance Inspection Confirmation</b>				
<b>Inspected By</b>				
<b>Date Inspected</b>	<b>Print Name</b>	<b>Signature</b>	<b>Trade/Department</b>	<b>Next Inspection</b>

<b>The University of British Columbia Land and Building Services</b>	<b>ATTACHMENT G</b>
<b>Issue Date:</b> May, 2009  <b>Replaces:</b> December 17, 1999	<b>Fumehood Mechanical Room and Rooftop Access Committee Terms of Reference</b>

**1. Introduction**

In accordance with Work Procedure I-B-06, Fumehood Mechanical Room and Rooftop Access, a standing committee is required to monitor and make recommendations for the continued operation and expansion of this procedure.

This Committee will report and make recommendations to the Associate Director of Building Operations.

**2. Representation**

The Committee representation will be as follows:

CUPE 116	2 members appointed by the Union
Operating Engineers 882	2 members appointed by the Union
Management	2 members appointed by management
Land & Building Services Safety Group	1 member

Each member will serve a minimum of two years.

The Superintendent of Mechanical and Electrical Operations, or his designate, will be a mandatory member of the Committee as 1 of the 2 management representatives.

The Committee will elect a Chair from the committee membership. This method of Committee leadership will be reviewed after a period of 8 months to ensure that the single chair concept is working effectively and is acceptable to all parties.

**3. Meetings**

- 3.1 The Committee will meet at least quarterly on a scheduled basis, and more often if necessary.
- 3.2 A meeting quorum will be the Chair and one member from each of the unions and management.

**4. Committee Resources**

The Committee will utilize other resources as may be necessary to carry out their responsibilities. Some of the available resources are:

- Facility Managers
- Technical Services
- Health, Safety & Environment
- Faculties
- Consultants

## 5. Duties and Responsibilities

<b>Position</b>	<b>Responsibilities</b>
<b>Committee</b>	<ul style="list-style-type: none"> <li>• The Committee will concern itself with all roofs, mechanical rooms and other areas that are affected by the presence of fumehood exhaust systems</li> <li>• Review and interpret WCB regulations as well as industry and design standards that are accepted as being safe standards for the purposes of determining work procedures</li> <li>• Review and recommend changes to the UBC design guidelines</li> <li>• Review new building designs that incorporate fumehood systems</li> <li>• Monitor the results of quality assurance inspections and make recommendations for improvement. These recommendations may include the hazard classification of work areas and the application of appropriate safe work procedures</li> <li>• This Committee will establish the procedure to be followed for variances or any deviation from the established procedures. All requests must be submitted to the Land and Building Services Safety Group for initial evaluation to ensure that the application includes all of the required documentation, as follows:               <ul style="list-style-type: none"> <li>• Location affected by the variance</li> <li>• Anticipated start and completion dates of the project</li> <li>• A detailed description of the proposed work activities</li> <li>• Reason for the variance request</li> <li>• A written work procedure that would be implemented and followed for work activities under the variance</li> <li>• The procedure must provide for the safety of the workers, building occupants or others that may be affected by the work activities</li> </ul> </li> <li>• The Committee will approve or deny applications based on their review and Safety Group recommendations</li> </ul>
<b>Chair</b>	<ul style="list-style-type: none"> <li>• Schedule meetings, arrange for the recording of meeting business, preparation of agendas and other materials for distribution to the members prior to the meeting, and perform or arrange for other requirements for the effective operation of the Committee</li> </ul>
<b>Land and Building Services Safety Group</b>	<ul style="list-style-type: none"> <li>• Receive all applications for variances to the established procedures</li> <li>• Ensure that the applications include all required documentation</li> <li>• Evaluate to ensure that the application is valid and for acceptable reasons</li> <li>• Based on the initial evaluation, the Safety Group representative will consult with any resources deemed necessary to evaluate the request, and either deny the application, or submit valid applications to the Committee for their consideration and approval.</li> <li>• The Safety Group will maintain a log book of all applications to record the details of each request or application</li> <li>• The Safety Group does not approve variances. The Committee does this based on recommendations from the Safety Group</li> </ul>

<b>THE UNIVERSITY OF BRITISH COLUMBIA</b> <b>DEPARTMENT OF PLANT OPERATIONS</b>	<b>ROOF TOP ACCESS</b> <b>APPLICATION FORM</b>
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Name:	
Department:	
Building:	
Roof Area:	
Requirement (Justification) For Roof Access:	
Description of Roof Top Activities:	
Do Departmental Procedures for Roof Top Activities Exist? Please attach a copy	
Date Access Required:	
Access Required Until (Date):	
I understand that building roof tops are inherently dangerous. I agree to limit my activities to that as described above and I will follow all the applicable procedures and safety requirements.	
Signature:	Date:
Department Head's Signature:	Date:
H.S.& E Signature:	Date:
Plant Operations Signature:	Date: