

Department of Civil Engineering

Health & Safety & Environment Policies & Procedures Manual

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1. First Aid and Emergency Services/Contacts

In case of EMERGENCY: Police/ Fire/ Ambulance call 9-1-1

1st Aid Faculty/Staff:	Call 911 for Emergency or Non-emergency call 604-822-4444
1st Aid Students:	Call 911 for Emergency or Non-emergency call 604-822-2222
Police:	In case of emergency Call 911. Or for Non-emergency call (604) 717-3321
Lab Managers/Supervisors	
Scott Jackson	604-655-4911
Doug Hudniuk	604-822-4851

The purposes of the first aid and emergency services are to:

- Ensure prompt and effective emergency response
- Minimize the effects of injuries/exposures and promote speedy recovery
- Provide workers with assistance when required

Students and visitors should call 604-822-2222 (dial 2-2222 on UBC landline) or locate an Emergency Blue Phone to contact Campus Security for first aid. In the event of a medical emergency or if the first aid situation was caused by a crime being committed, first call 9-1-1 and then call first aid at 604.822. 2222

Campus Security patrol officers are Occupational First Aid Level 2 (OFA2) certified and provide emergency support and first aid response 24/7, as well as guide emergency responders (fire, ambulance, police) to the right place on campus quickly.

Campus Security and the First Aid program is not a replacement for the emergency services, but will likely arrive on scene before fire, ambulance, and police services. In the unlikely event that Campus Security is unavailable, the program will automatically be supported by [Vancouver Fire Rescue Services](#)

The UBC Campus First Aid attendants will:

- Provide treatment
- Record each injury in the treatment books
- Complete necessary forms to initiate a WorkSafeBC claim if required.

In any emergency situation, or in situations where serious illness or injury is suspected, **calling 911** is always appropriate. Workers will not be reprimanded for using 911.

1.1 Dept. First Aid Supplies

The Department has safety stations that are regularly stocked with first aid supplies. Some staff have had first aid training but it would be offered on a volunteer basis only. Please enquire with staff that are near the stations and they will be able to assist. All campus security patrol personnel are also APSC level 2 first aid attendants that can be reached at 604-822-2222 . For serious injuries please call 911.

1.2 Location of First Aid Safety Station(s):

CEME 2002 - in the First Aid cupboard behind the front counter in the Main Office
CEME 1301J - Signs indicate the location of the First Aid Station in the SE corner of the lab
RH 146 – Shop (main first aid station for Rusty Hut) - Middle of machine shop next to shop supervisors office.

Automated External Defibrillator (AED)

The university has installed an AED in CEME. It is located in the ground floor lobby on the wall near the elevator. The AED is a portable, safe and easy-to-use device which restores normal rhythm to the heart. The AED reads the heart rhythm and only delivers a shock if needed. Everybody, not only first aid attendants, should feel confident to use it in case of an emergency as it will only deliver an electric shock if the person's heart rhythm is not normal, and it will not do any harm.

Please follow the steps below in the event of a sudden cardiac arrest :

- **First call 911** to ensure the fire department and/or paramedics are dispatched immediately.
- Take the AED and follow the instructions step by step. The device will instruct you on how to use the device.
- Keep following the instructions of the AED until the ambulance arrives.

1.3 Building Emergency Response Plans and Procedures

The Department has established and implemented plans and procedures for situations that have been identified where emergencies could arise. These plans and procedures deal with workplace accidents/injuries, fire prevention, emergency evacuation, personal security, earthquake and bomb threats. The Civil Departments building emergency response plans are located on the Civil Department website at <http://www.civil.ubc.ca/our-department/health-safety-environment-hse>

Emergency Directors and floor wardens are spread throughout the Department and are appointed by the Department Head and LST members. The Department Safety Director coordinates the floor wardens, first aid attendants, Dept. Local Health and Safety Team and supervisors to implement and regularly review these plans and procedures.

The Emergency Directors in CEME are as in the following table :

NAME		AREA	TELEPHONE
Jennifer Pelletier	Director	MECH - CEME	604-827-4090
Freda Moraes	Director	CIVIL - CEME	604-822-1212
Scott Jackson	Director	CIVIL – RUSTY HUT/EERF	604-655-4911
Josy Austin	Co-Director	MECH - CEME	604-822-4784
Doug Hudniuk	Co-Director	CIVIL – RUSTY HUT/EERF	604-822-4851
This table last updated Mar. 28, 2023			

For the complete list of Floor Wardens, refer to the Building Emergency Response Plan housed on the Department website at <http://www.civil.ubc.ca/our-department/health-safety-environment-hse>

2. Department Safety Governance

2.1 Purpose

To establish the Department of Civil Engineering's policies that will provide a safe, healthy and secure environment for all members of faculty and staff, students and visitors, by developing and enforcing preventive specific rule measures. Compliance with the Workers Compensation Act, WHMIS and related legislation is the minimum standard acceptable. All students and members of faculty and staff are encouraged to strive to exceed these minimum legal standards and to eliminate unnecessary risks.

This document outlines some specific safety measures to govern the work within the department. It is expected that all personnel working in these facilities will follow the policies in this document.

2.2 Scope

This document outlines the Health, Safety and Environment (HSE) policy for the Department of Civil Engineering at the University of British Columbia.

2.3 UBC Health and Safety Responsibilities

It is the responsibility of the University acting through administrative heads of unit to:

- Provide a safe, healthy and secure working environment.
- Ensure regular inspections are made and take action as required to improve unsafe conditions.
- Ensure that health, safety, and personal security considerations form an integral part of the design, construction, purchase and maintenance of all buildings, equipment and work processes;
- Provide first aid facilities where appropriate.
- Support supervisors and safety teams in the implementation of an effective health, safety and security program.
- Ensure compliance with WCB and other applicable legislation.
- Establish department or building HSE teams.
- Communicate with the university community or affected groups about events or situations when potentially harmful conditions arise or are discovered.
- Ensure adequate resources are available to implement appropriate procedures.

It is the responsibility of supervisors (staff and researchers) to:

- Formulate specific safety rules and safe work procedures for their area of supervision.
- Ensure that all employees under their supervision are aware of safety practices and follow safety procedures.
- Provide training in the safe operation of equipment.
- Inspect regularly their areas for hazardous conditions.
- Correct promptly unsafe work practices or hazardous conditions.
- Be responsive to concerns expressed about personal security and investigate any accidents, incidents or personal security concerns which have occurred in their area of responsibility.
- Report any accidents or incidents involving personal security to the appropriate University authority.
- Participate, if requested, on department or building HSE teams.
- Ensure health and safety rules are posted in the work areas and specific work procedures are to be made accessible to all employees in the areas where they apply.

- Ensure Health and safety rules and safe work procedures are communicated initially to workers during orientation and on-the-job training.
- Ensure Workers are aware of the hazards associated with their work and understand how safe work procedures will prevent or minimize injury.
- Researchers are required to list hazards involved with their work as part of their Project Proposal Forms and Plans.
- For projects with higher safety risks involved, researchers are required to develop comprehensive safety plans.
- Ensure rules and procedures are enforced by immediately correcting unsafe acts or conditions.

It is the responsibility of individual students and members of faculty and staff to:

- Observe safety rules and procedures established by supervisory staff, administrative heads of unit and the University.
- Be safety-conscious in all activities, be they work, study or recreation.
- Report as soon as possible any accident, injury, unsafe condition, insecure condition or threats to personal security to a supervisor or administrative head of unit.
- Use properly and care for adequately personal protective equipment provided by the University.
- Participate, if elected or appointed, on departmental or building HSE teams.
- Complete all required Department safety training.

2.4 Dept. Health and Safety Team

The Dept. HSE Team is a joint team made up of worker and employer representatives working together to identify and resolve health and safety problems in the various areas of the Department. It is an organizational unit that coordinates health and safety activities, and monitors the status of the health and safety program.

The role of the HSE Team is to:

- Assist in creating a safe and healthy workplace.
- Recommend actions that will improve the effectiveness of the HSE Program .
- Promote compliance with WorkSafeBC and internal requirements.
- Recommend changes to senior management, the department head and/or the Applied Science Joint Occupational Health & Safety Committee (JOHSC).
- Department Health and Safety Team members review accident and injury reports to ensure that established rules and procedures are providing the Unit with the safest work practices.
- Review recommendations from the Applied Science JOHSC, faculty, staff or students concerning health and safety issues and endorse/carry them out where warranted.

Dept. management provides all necessary resources to ensure that the HSE Team is able to function effectively. These include:

- Training for team members.
- Administrative support.
- Adequate time for team members to carry out responsibilities.
- Open two-way communication channels.
- Makes decisions based on recommendations from the HSE Team.

2.5 Dept. Health and Safety Team Membership

Name	Telephone	Area of Representation
Felix Shuen	604-822-4397	Civil Environmental Lab Supervisor
Richard Colwell	604-822-2273	UBC APSC Safety Officer
Freda Moraes, Co-Chair	604-822-1212	Front Office, Office Manager
Doug Hudniuk	604-822-4414	Shop Supervisor, CUPE 116
Scott Jackson, Chair	604-655-4911	Lab Manager/ Dept. Safety Director
Dharma Wijewickreme	604-822-5112	Faculty Representative
Adriani Tambunan	604-822-2267	CUPE 2050 Lab Manager
Ana Valverde	studentsafetyrep@civil.ubc.ca	Student Representative
This table last updated Feb. 28, 2023		

Mechanics /

2.6 Dept. Health and Safety Team Meetings

The HSE Team meets on the first Wednesday of the month. All meeting discussions and decisions are recorded in the Safety Team Meeting Minutes which are available as described in Section 3.1.

3. Documentation

3.1 Dept. Safety Team Minutes

Safety Team Meeting Minutes are distributed to the Applied Science JOHSC sharepoint site, the Department Head, the Department Safety Director, the local HSE Team, the APSC Safety Officer, and are posted in hard copy on the HSE bulletin boards (in the main hallway outside the Rusty Hut Structures Lab and also the main hallway in the CEME building (outside the Materials Lab), and are available to all Civil faculty and staff on SharePoint at <https://apsc.share.ubc.ca/civil/safety/>

3.2 Dept. Safety Documentation

The Health and Safety records maintained by the department are as follows:

- **Dept. General Safety Documentation**
 - Department Safety Plan - Available on department website and stored on department servers.
 - BERP's The Building Emergency Response Plans (for CEME, RHut, EERF, SERC) are available on department website and stored on department servers.
 - HSE Local Safety Team (LST) listing is available on department website and stored on department servers.
- **Employee Mandatory Training Records**
 - Most mandatory training is kept on the SRS training servers and also on departmental servers.
 - Mandatory site specific training checklists (for each work area/laboratory) are kept in a training log stored on a department server and hardcopies of such training are kept with the Department Safety Director.
 - Onboarding checklist sheets used when an employee is hired, and are housed in the main Civil administrative office with the employee's personnel file.
- **Records of meetings and crew talks** where health and safety issues were discussed
 - Safety issues discussed with the lab managers are documented in meeting minutes with the department head and with the department safety director.
- **Inspection reports and records of actions** taken to solve problems
 - General Lab inspections (annual) are compiled and stored electronically on SharePoint at <https://apsc.share.ubc.ca/civil/safety/> , on the lab managers server, and on the Applied Science JOHSC sharepoint site.
 - Some issues/actions also discussed/documented in Department Safety Team Meeting Minutes which are posted on the department safety bulletin boards, sent to the JOHSC sharepoint site, the department sharepoint site (<https://apsc.share.ubc.ca/civil/safety/>) and on department servers.
- **Accident investigations reports**
 - These are UBC CAIRS reports (<https://www.cairs.ubc.ca>) are discussed by both the local safety team and the APSC JOHSC committee and housed electronically on the universities SRS servers, the department safety servers and hardcopies in the department safety director's office.
- **Emergency contact information**
 - Contact information for faculty, staff, graduate student, Postdoctoral Fellows, Research Associates, and visitors can be found in their personnel files or on the university directory.
- **Subcontractor pre-qualification documents**

- Subcontractors receive site-specific training; records of this are stored in Dept. Lab Manager's office.
- **Local Health and Safety Team meeting minutes**
 - Showing what steps have been taken to address health and safety issues.
 - Housed electronically at <https://apsc.share.ubc.ca/civil/safety/> and on lab managers server.
- **Equipment log books and maintenance records**
 - Log books are stored with/near the equipment. Archived logs are stored in the lab managers office.
 - Maintenance records are stored in the Shop Supervisors office and/or Lab Manager's office.
- **Health and safety forms and checklists**
 - The HSE forms and procedures/checklists can be found on the department's lab managers office and on the lab managers server.
- **Personal health records**
 - Medical certificates, hearing tests, and first aid records - are stored in the personnel files in the Civil main office.
- **First aid log books**
 - Located at the first aid stations in the labs and front office.
- **Lab manuals, including lab safety regulations**
 - Lab manuals are available in the Lab Info section on SharePoint and posted on the lab information boards in each lab.
 - Lab safety regulations are posted on the lab info boards as well as each lab entrance area.

4. Orientations, Training and Supervision

4.1 Dept. Requirements

WorkSafeBC requires each Department to provide proper direction and instruction to workers in the safe performance of their duties. Through training and supervision, employees and students are made aware of hazards and safe work procedures to follow in order to protect themselves.

To meet this requirement, the Department of Civil Engineering provides:

1. Worker employee orientations
2. HSE orientations
3. On-the-job training
4. Worker supervision
5. Orientation and training records
6. Bullying and harassment prevention training

4.2 Department New Employee Orientation

The Department provides orientation for all new or transferred employees. Supervisors conduct Department orientation sessions for their areas in accordance with Unit Orientation and Training Guidelines. An employee receives orientation training within 10 working days of his/her start date.

4.3 HSE Orientation

The civil department uses the UBC New Worker Safety Orientation which provides a general HSE orientation for all employees and /or anyone assigned a working space within the department facilities. This training is found in two parts: a generic online Part 1, and part 2 site specific training which is a documented checklist training dependant on working locations. <https://civil.ubc.ca/departement/workplace-training/>

Undergraduate students receive an online HSE orientation and an online HSE quiz suitable for each year. They are also receive additional safety orientations/information in various lab courses /classes (CIVL210, Civil 235, CIVL311, CIVL315, CIVL316 and CIVL430).

4.4 On-the-Job Training

On-the-job, site-specific training is provided by supervisors to new staff and when new procedures are introduced. On-the-job, site-specific training includes:

- Using written work procedures and health and safety instructions to demonstrate the job
- Explaining health and safety aspects of performing the job
- Explaining who to contact for help
- Completing the Site Specific Safety Checklist appropriate for the area they are working in.

On-the-job training is initiated **immediately** when a new employee commences work, and prior to implementing a new work process.

4.5 Worker Supervision

Supervisors ensure that work is carried out as expected by maintaining supervision over the work activities in the Department. Workers are kept up-to-date on management decisions and action plans through periodic staff meetings, Department memos and internal e-mail. All employees are expected to work according to established safe work procedures. Supervisors immediately rectify any unsafe actions in accordance with proper corrective procedures. To effectively meet their responsibilities, supervisors take the “Safety Supervision at UBC” online training course (<http://wpl.ubc.ca>) and are trained in the following areas:

- Techniques of effective supervision and instruction, including motivation and communication, on an ongoing basis
- Incident/Accident Reporting and Investigations and how to take corrective and preventive action
- Workplace health and safety inspections of their area

4.6 Orientation and Training Records

The Department maintains records of orientation and training to verify that employees have received adequate instruction to work safely. The laboratory managers/supervisors signs each site specific lab training record (upon completion of the employee’s training). The records of training completed are stored on the department lab manager server and on hardcopy in the Safety Directors office.

5. Accident/Incident - Reporting and Investigations

The purpose of accident reporting and investigating is to identify deficiencies in the management of health and safety, take steps to correct these deficiencies, and prevent similar incidents from occurring in the future. These reports are of utmost importance in improving our safety environment and are not used as tools of persecution. An employee must report all incidents/accidents to their supervisor as soon as possible following the incident and by using the universities online “CAIRS” reporting system (www.cairs.ubc.ca)

To meet WorkSafeBC and University requirements, UBC Departments must report and investigate any incident or accident that resulted in:

- a death or critical condition with a serious risk of death
- a work related injury requiring treatment by a medical practitioner
- a time loss injury
- an occupational disease or allegations of an occupational disease
- a major structural failure or collapse
- major release of a toxic or hazardous substance; or
- a near miss (did not result in an injury but had the potential for causing serious injury and/or property loss)

5.1 Reporting Procedures

If an accident, incident or near miss occurs in the Department:

- It is reported to a manager/supervisor/student supervisor immediately.
- Manager/supervisor notifies the department head and department safety director by email.
- In the case of a serious injury, the department head and safety director will be notified by telephone.
- The worker’s supervisor/manager will report the incident to SRS by filling an online report on the “CAIRS” system (www.cairs.ubc.ca). The preliminary report must be completed within 48 hours.
-

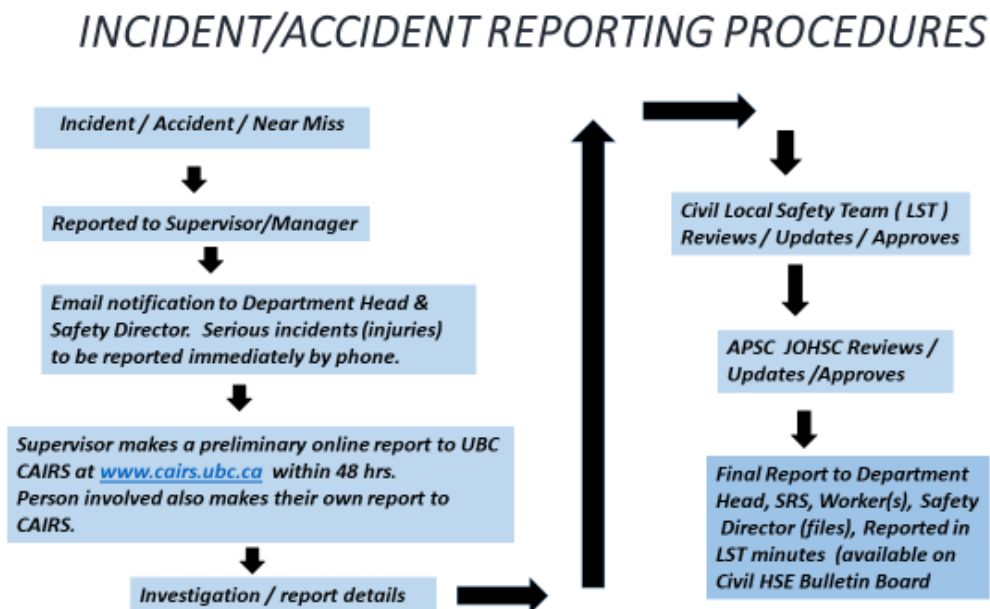


Figure 1 - Incident, Accident, and Near Miss Procedures Flow Chart

5.2 Accident Investigation

Incident and accidents are reported and investigated in order to prevent similar situations from recurring. Investigations should never seek to assign blame.

Management will provide all tools and resources necessary for investigations to be effective. These include:

- Accident investigation training for investigators
- Time made available to allow investigators to complete their duties
- Quick action on recommended corrective actions to prevent recurrence of similar situations.

An accident investigation report is completed online (see CAIRS at www.srs.ubc.ca) by the supervisor and by the employee (if one is involved). For assistance filing the supervisor reports, please contact either the office manager or the department safety director. The local safety team co-chairs, department safety director and department head will automatically receive email notifications of the reports. The reports will be discussed at the monthly local safety team meetings and the APSC JOHSC meetings with suggested changes and recommendations made. The final reports will be reviewed by the Department Head, the APSC JOHSC, a copy posted on the departments SharePoint site, and a hardcopy kept on file in the Safety Directors office. The Safety Team and Safety Director will monitor the progress on any actionable items resulting from the investigation and comments on the incident reported in the safety team minutes.

Note: The initial accident investigation report (online CAIRS report) must be submitted within 48 hours of the incident.

Details on accident investigation procedures can be found at https://www.cairs.ubc.ca/public_page.php .

6. Research Facilities and Laboratories

6.1 Lab Emergency Contacts

In case of EMERGENCY: Police/ Fire/ Ambulance **call 9-1-1**

Please see the Emergency Contact List in Section 1

6.2 Research Facilities and Laboratories At A Glance

The Department of Civil Engineering has several facilities used for teaching and research. These are:

Earthquake Engineering Research Facility

- Location: 2235 Eastmall
- Type: Research
- Area: 490 m²
- Principal Investigators: C. Ventura

Structures Laboratory

- Location: Rusty Hut, Room 100
- Type: Research and Teaching - CIVL430
- Area: 663 m²
- Principal Investigators: P. Adebar, , C. Ventura, T. Yang

Geotechnical Laboratories - Undergraduate

- Location: CEME building, Rooms 1006 and 1008
- Type: Teaching – CIVL210 and CIVL311
- Principal Investigators: J. Fannin, J. Howie, D. Wijewickreme, M. Taiebat, T. Carey
-

Geotechnical Laboratories - Graduate

- Location: Rusty Hut Rooms 130-136
- Type: Research and teaching – CIVL574
- Principal Investigators: J. Fannin, J. Howie, D. Wijewickreme, M. Taiebat

Environmental Laboratories

- Locations: CEME building, Rooms 1301 to 1306 and MacMillan Building, Rooms 90 and 94
- Type: Research and teaching – CIVL407 (CEME1301 only)
- Principal Investigators: P. Berube, L. Li, R. Ziels, J. Lee, S. Beck, R. Scholes

Hydraulics Laboratory

- Location: Rusty Hut, Room 139
- Type: Research and teaching – CIVL315 and CIVL316
- Principal Investigators: G. Lawrence, N. Yonemitsu

Materials Laboratory

- Location: CEME building, Room 1012
- Type: Research and teaching – CIVL422

- Principal Investigators: N. Banthia, C. Zanotti

Field Staging Labs

Locations: SRC (Staging Research Center—South Campus) , MacMillan (rooms 80, 90, 94)

Type: Research

Principle Investigators: V. Lo, D. Mavinic, D. Wijewickreme , A. Bigazzi, S. Weijs

Pilot Plant on Annacis Island

- Location: Annacis Island (off campus), Operated by Metro Vancouver
- Type: Research
- Principal Investigators: V. Lo

6.3 General Lab Safety Guidelines

Before beginning to work in any area, you need to do the Site Specific training for that area. Please contact the Safety Director to arrange your training. This will involve learning the location of the following key items:

- Locations of Fire extinguishers, Phones, Exits, First Aid Supplies
- Eye wash stations and/or safety showers
- Emergency procedures and emergency contacts

When working in the research facilities of the Civil Engineering Department, specific safety rules must be followed. These include:

- Access to some of our research facilities is restricted and the rooms have punch code locks, card access and/or security alarms. If you are required to work in these areas and need access, please contact the Director of Safety + Research Facilities.
- Safety glasses and closed-toed shoes is the minimum PPE to be worn in labs at all times.
- No food or drink is allowed in any of the labs (exception water bottles).
- Equipment is to be operated only by trained personnel.
- There is no access to labs after hours and weekend without written permission from the Safety Director and the Principal Investigator.
- Before starting any task within a lab, check with the supervisory technician to determine what PPE is necessary for the work planned.
- For all work in labs lasting more than one day, a Work-in-Progress sign must be posted in the work area.
- Procurement, use, storage and disposal of chemicals must be done in consultation with the department Environmental Lab Supervisor.
- Once a task has been completed, all tools and equipment are to be returned in working order, all samples are to be disposed of in an appropriate manner and the working area is to be cleaned up.

6.4 Personal Protective Equipment

The Department provides some personal protective equipment (PPE) for loan during course work including: safety glasses, hand protection, ear protection, safety boots, hardhats, and high-visibility vests. Some PPE must be provided by the user such as safety shoes. The Department strongly encourages students to purchase their own personal protective equipment. As well as being mandatory in some labs, PPE equipment is also required at construction sites and many field sites that may be visited during the term.

6.4.1 Gloves

There are two types of gloves. The first type protects against cuts and abrasions and are usually made of leather or canvas. The second type protects against chemicals. These can be made of several kinds of plastic, rubber or latex materials.

- Choose the glove that is appropriate to the type of hazard that you are handling.
- Gloves are only to be worn in the laboratory.
- Gloves of the correct material are to be worn when handling hazardous materials. They are not to be worn for other tasks.



Please consult with the Environmental Lab Supervisor to assess your specific needs.

6.4.2 Eye Protection

Safety glasses are to be worn in all labs at all times.

Additional eye protection will need to be worn whenever there is a potential for splashing of chemicals or biological substances or for impact from projectiles or dusts. Selection of eye protection should be made after careful hazard analysis. Safety Goggles or Face Shields are available in many of the laboratories.

6.4.3 Goggles or Goggles with a Face Shield

Goggles or goggles with a face shield are recommended for the following situations:

- The substance being handled is a serious eye hazard and/or the operation involves a high risk that an eye-hazardous material will splash,
- The substance being handled is a liquid hotter than 60 °C. Hot materials are much more injurious than the same materials at room temperature and they are more likely to splash or spatter.
- If there is need for protection of the entire face, such as where there is the potential for flying particles and/or acids.
- When the eye hazard is unknown

The wearing of safety glasses does not excuse personnel from the requirement of wearing safety goggles if deemed more suitable.

6.4.4 Footwear

Protective footwear is designed to protect the foot from physical hazards such as falling objects, stepping on sharp objects or exposure to corrosive chemicals. In many areas of the Department faculty, staff and students are exposed to these hazards.

Chemical Laboratories Footwear (Environmental, All Geotechnical, Hydraulics and, Undergrad Structures Lab)

All faculty, staff and students working in laboratories shall wear closed-toed footwear to protect against the hazards commonly encountered in laboratories. These hazards include chemical and **biological** as well as physical hazards associated with sharps, broken glassware, material handling and electricity.

Closed-toed footwear is made of a solid material which completely encloses the foot (for example, an oxford or athletic style leather shoe). Open toe or open heel sandals or shoes with a ventilated construction are not acceptable.

Machine Shop, Wood Shop, Graduate Structures, Earthquake and Materials Labs Footwear

All faculty and staff who are working in these areas shall wear closed-toed footwear equipped with steel toes. Boots or shoes must be CSA rated. Students whose studies require the use of machine shop facilities shall abide by the same rules. "Loaner" boots are available. Certain activities may require footwear which will also protect the soles of the feet from punctures.

Those personnel whose duties may require them to enter these areas must have similar protection. Supervisors may authorize exceptions to these requirements after ensuring that hazards will be avoided by other means. Hazardous areas shall be cordoned off so that faculty, staff and students who are not equipped with safety footwear will not enter these areas. When personnel must enter such areas, dedicated walkways shall be provided to ensure equivalent protection.

6.4.5 Respiratory Protection

Workers should use respirators for protection from contaminants in the air only if other hazard control methods are not practical or possible. Respirators should only be used:

- When engineering or administrative controls are not technically feasible
- While engineering controls are being installed or repaired
- When emergencies or other temporary situations arise (e.g., maintenance operations).

Respiratory hazards can include airborne contaminants such as dusts, mists, fumes, and gases or oxygen-deficient atmospheres. Well designed and maintained engineering controls are the preferred methods of controlling worker exposure to hazardous contaminants in the air. These control methods include:

- Mechanical ventilation
- Enclosure or isolation of the process or work equipment
- Proper control and use of process equipment, and
- Process modifications including substitution of less hazardous materials where possible.



The Dept. Safety Director is the respirator coordinator. In order to select the correct respirator and to arrange a fit test, please see the Dept. Safety Director.

6.5 Electrical Safety

Almost every workplace has a source of electrical power. If this electrical energy is used improperly, electrical shock and injury may result. The following basic guidelines will help reduce electrical hazards. Always check with an experienced technician if you have any concerns about electrical elements.

- All electrical equipment shall be properly grounded. Contact a department technician if unsure.
- Learn where the disconnect switches or circuit breakers are for the electrical equipment and receptacles in your area.

- All circuit breakers and switches shall be labelled to clearly indicate the "on" and "off" position, and what equipment they serve.
- The design, construction and modifications of all research electrical apparatus shall be either done or approved by a department electronic technician. All previously built research apparatus must be inspected by a department technician before being put into service.
- **Any equipment purchased to be used in the department must be inspected prior to use by a lab manager and must have an electrical certification recognized by the BC Safety Authority.**
- All equipment, appliance and extension cords shall be inspected regularly and be kept in good working condition. Any problems should be reported to a department technician immediately.
- Exercise caution when it is necessary to work on electrical equipment in damp conditions. Use a ground-fault circuit interrupter (GFCI) in all areas (inside and out) that may pose a potential water hazard. A GFCI protection device or outlet must be used for all portable equipment being operated outdoors.
- Power bars (multi-outlet plugs) shall not be used unless they have a built-in circuit breaker and are CSA approved. Surge protected power bars are recommended. The following conditions shall be met when using power bars:
 - Users must verify that the total amperage of all equipment plugged into the power bar does not exceed the rated current for the power bars (typically 15 A). The amperage of electrical equipment is usually stamped on the manufacturer's plate - if in doubt, consult a department electronic technician.
 - Power bars must be plugged directly into mounted electrical receptacles. They must not be daisy chained.
- Extension cords shall be CSA approved with three separate insulated wires and three pronged connectors all in good condition. In addition the following apply to their use:
 - Extension cords can only be used for temporary work and should not be used through walls, ceilings, doorways, floors, etc.
 - Extension cords should only service a single piece of electrical apparatus which does not exceed the current rating of the cord (see manufacturer's rating on equipment).
 - All cords must be placed such that they do not present a tripping hazard. If such placement cannot rule out a hazard completely, appropriate warning signs must be displayed.
 - Do not route cords over metal objects such as emergency showers, overhead pipes or frames, metal racks, etc.
 - Do not place under carpet, rugs, or heavy objects.
 - Do not place cords on pathways or other areas where repeated abuse can cause deterioration of insulation.
- Never override fuses, circuit breakers or interlock switches. Blown fuses should be replaced by qualified personnel and only with the properly rated substitute.
- All building electrical repairs, splices, and wiring shall be performed by the Physical Plant Electrical Department.

7. Hazard Assessment and Worksite Inspections

7.1 Unit Requirements

WorkSafeBC requires that Units ensure that hazards to the health and safety of workers are identified and brought to management's attention. It is management's responsibility to ensure that the identified hazards are eliminated or, where this is not practical, controlled, and that workers are protected from the hazards.

Worksite hazard assessments and inspections are key activities in the prevention of accidents. Their purposes are to:

- Identify existing and potential hazards.
- Increase awareness leading to the prevention of workplace accidents and illnesses.
- Ensure compliance with standards and regulations.

To meet this requirement, The Department of Civil Engineering:

- Conducts a Preliminary Hazard Analysis prior to all new projects, jobs, processes, equipment or hazardous materials
- Conducts regular Worksite Inspections.
- Provides all necessary resources to ensure that hazard assessments and workplace inspections are effective.

These include:

- a. Hazard recognition and inspection training for those conducting inspections.
 - b. Time for inspectors to complete their duties.
 - c. Established communication channels between inspectors, the local Health and Safety Team and senior management.
 - d. Quick action on recommended corrections.
- Documents all assessments and inspections.

7.2 Hazard Assessments/Task Analyses

For all work carried out in the labs in Civil Engineering, a Project Proposal form (available on Civil Website) must be completed and submitted before the work may proceed.

A Preliminary Hazard Analysis (PHA) is conducted as part of the Project Proposal Form. A PHA is an exercise in identifying all of the potential hazards or risks in proposed tasks so that mitigating elements can be put in place before the work begins. The process is as follows:

- Researcher completes Project Proposal Form (PPF) and submits by email to lab-tech@civil.ubc.ca.
- Lab supervisors and managers review the PPF and determine if the safety measures proposed are sufficient with relation to the risks involved.
- If the lab managers determine that additional safety precautions are required given the level of risk involved, then the researcher will be required to develop a written Project Safety Plan (or a Field Safety Plan if the work being proposed is to be conducted in the field - see section 10.3 of this document).
- The Project Safety Plan/Fieldwork Safety Plan is developed with the assistance of the researcher, the safety director and the supervising faculty member.

- The completed Project Safety Plan/Field Safety Plan is submitted to the safety director for final review and is subsequently discussed with the department's local safety team.
- Approval for the plan is granted by the supervising faculty member.

Hazard assessment does not cease with the approval for the Project Safety Plan/Field Safety Plan. The lab manager may request additional Hazard Assessments at any stage of a project or for a given procedure within a project.

For further hazard assessment information, please contact the civil safety director.

7.3 Workplace Inspections

In compliance with the UBC HSE program and in keeping with best practices implementation, regular inspections of the research facilities and office areas are carried out to identify safety and housekeeping issues. These are compiled into reports that are reviewed by the LST and JOHSC to determine appropriate actions. If you are asked to help rectify an issue, please cooperate with the local safety team representative. Following are the four types of workplace inspections to be conducted:

Informal Workplace Inspections

- This is accomplished by supervisors conducting regular walk-throughs of their areas of responsibility and by workers checking their work areas prior to commencing work.
- All employees are expected to maintain continual awareness of hazards in their work areas.
- No formal inspection report is required; however, any detected hazards must be corrected immediately if the task is within the employee's capabilities. If not, the hazard should be reported to the area supervisor or management for correction.

Regular Workplace Inspections

- Work areas will be inspected on a regular basis by the area supervisor or a designate. For most environments, these inspections should be conducted semi-annually. In high risk environments, these inspections will be conducted more frequently.
- The inspection checklists will be completed for each inspection and each supervisor must regularly review and update his/her checklist as required.
- The completed reports shall be forwarded to the department safety director for review and response.
- The Local Safety Team is responsible for ensuring inspections completed regularly, reviewing inspection reports and providing recommendations.
- The area supervisor must ensure that corrective action is taken so that the hazard is eliminated or controlled.

Local Health and Safety Team Inspections

- General Inspections are formal workplace inspections that are conducted by Local Safety Team members and/or other employees *at least annually*.
- A General Inspection Report is completed and copies sent to the APSC JOHSC, and the Local Safety Team for review.
- The area supervisor must ensure that corrective action is taken to eliminate or control identified hazards.

Special Inspections

- Special inspections take place immediately after a malfunction/accident, when new machinery or processes are introduced, or as required by manufacture instructions.
- The area supervisor and a worker representative conduct this type of inspection, along with a specialist when necessary.
- The area supervisor must report all findings to the local safety team for review.
- The area supervisor must ensure that any existing unsafe conditions are effectively controlled before commencing an inspection or investigation.

7.4 Unattended Operation

If an experiment must run overnight, emergency contact information and/or procedures must be on the posted “FRM000008 Work in Progress Sign” which should be posted in a prominent location next to the experiment.

7.5 Hazardous Materials - Chemicals

To order chemicals or for information and advice, contact the Department Environmental Lab Supervisor. You must have plans on how to store and dispose of any leftover chemical (or by-products of reaction) and you must have a copy of the SDS handy when working with the chemical.

Ordering chemicals is only done by the environmental lab supervisor (Felix Shuen). Once obtained, you are to follow the procedures given by the lab supervisor and are required to read the SDS and understand all the safety requirements for its proper use, handling, storage and disposal.

When working in a lab with chemicals, you must have previously taken the Chemical Safety Course found at www.wpl.ubc.ca.

7.6 Workplace Hazardous Materials Information System (WHMIS)

WHMIS (Workplace Hazardous Material Information System) uses classifications to group chemicals with similar properties or hazards. The Controlled Products Regulations specifies the criteria used to place materials within each classification. There are six (6) classes although several classes have divisions or subdivisions. Each class has a specific symbol to help people identify the hazard quickly.

The classes are listed below. Click on each link for more information from Health Canada.

[Class A – Compressed Gases](#)

[Class B – Flammable and Combustible Materials](#)

[Class C – Oxidizing Materials](#)

[Class D – Poisonous and Infectious Materials](#)

[Class E – Corrosive Materials](#)

Class F – Dangerously Reactive Materials

8. Environmental Protection

8.1 Unit Requirements

The University is committed to protecting the environment through ensuring compliance with legislation, demonstrating due diligence, and establishing a process of continuous improvement resulting in environmental stewardship.

8.2 UBC Policy #6 (Environmental Protection Compliance)

UBC Policy #6 states that:

“UBC will act responsibly and demonstrate accountable management of the property and affairs of UBC in protecting the environment. All individuals in the University community share the responsibility for protecting the environment. Administrative heads of unit are responsible for ensuring compliance with legislation and UBC procedures both on and off campus.”

All individuals in the Department are made aware of UBC Policy #6 - Environmental Protection Compliance and other relevant policies (e.g. UBC Policy #5 – Sustainability).

8.3 Activities

The principle investigator assesses the environmental impact of all new projects or activities. Where possible, efforts are taken to minimize any adverse impacts.

- project proposals are required to address the disposal of materials

All individuals are trained prior to conducting activities that could impact the environment. Examples include:

- all employees working in the environmental lab are trained regarding hazardous waste disposal
- acid and caustic wastes are neutralized before disposal
- the workshop follows UBC procedures for disposing of waste oils, etc.
- liquid waste from the Materials lab is treated before discharge to the sewer

Disposal of hazardous wastes is conducted in accordance with all applicable legislation and UBC procedures. For hazardous waste disposal procedures, contact the UBC Environmental Services Manager. All individuals handling hazardous materials shall refer to the UBC Spill Reporting Procedures located in the *Laboratory Chemical Safety Reference Manual*.

The Department participates in the following programs:

- Solvent recovery (contact 822-1285)
- Chemical Exchange (contact 822-6306)
- Waste Reduction (contact 822-9280), including:
 - battery recycling
 - e-waste pickup

- paper recycling
- plastic recycling
- concrete recycling
- oil recycling

8.4 Management Review and Reporting

Environmental issues are reviewed at the Lab Management Meetings with the department head. Serious issues are reported immediately to the UBC Environmental Services Manager.

9. Personal Security and Public Safety

All members of the University Community including Unit, staff and students shall be provided with an environment safe from violence or the threat of violence.

9.1 Bullying and Harassment

The Dept. strives to provide a safe, respectful and productive work environment for our faculty, staff and student employees. All employees in the Department of Civil Engineering are trained in recognizing and preventing bullying and harassment. This training shall be obtained online at <http://bullyingandharassment.ubc.ca/training-events/>.

9.2 Working Alone

Working on your own in the research facilities is only allowed if a proper plan is developed. The Department has a form ("FRM000017 Working Alone Form" available on the SharePoint site under Safety Plans) based on Work Safe BC regulations to help workers develop a safe working alone procedure. Once this procedure has been written out it must be submitted for approval to the department safety director and by the supervising faculty member before work can begin. The completed working alone forms are housed on the SharePoint site under Safety Plans.

9.3 Field Work

Course work, research and work requirements may result in faculty, staff and students leaving the Department and working off campus or farther afield.

It is the responsibility of the faculty supervisor to assess the level of risk involved (as defined in "FRM000013 Field Safety Plan Template" available on SharePoint at <https://apsc.share.ubc.ca/civil/safety/>) with the field operation. If the level of risk is determined to be medium or high, then the researcher must prepare a Field Safety Plan. The Field Safety Plan is assessed by the faculty supervisor, and forwarded for approval to the department safety director. The director will evaluate and discuss plan with the researchers and the department safety team. After making any amendments, the completed plan is authorized and stored on the department sharepoint site and a hardcopy in the safety director's office.

9.4 Ergonomics

Ergonomics is the study of the interaction between people, equipment, and systems in their (work) environment. It includes the physical, psychological and environmental aspects of the interaction. The goal of ergonomics is to find a balance between the capabilities of the human and the demands required by the work environment to prevent musculoskeletal injuries (MSI).

The UBC website has a tutorial with instructions for

- setting up your office work site:

<https://hr.ubc.ca/health-and-wellbeing/ergonomics>

More information can be obtained from:

- ☞ WorksafeBC
- ☞ <http://www2.worksafebc.com/Topics/Ergonomics/Home.asp>

Employees are encouraged to review your own work practices to see if there are any of these risk factors present in your work environment and take steps to eliminate them.

9.5 Student Safety Abroad

UBC's Safety Abroad Program is designed for students traveling outside of Canada for university activity – this includes conferences, field work related to research, volunteering, service learning, varsity sports, and studying abroad.

Students travelling outside Canada for a university activity are required to register with the [Student Safety Abroad Registry](#)

More information can be found at <http://safetyabroad.ubc.ca/>