

# **HEALTH & SAFETY MANUAL**

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**BCIT**

**CIVIL ENGINEERING**

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## INTRODUCTION

British Columbia Institute of Technology (BCIT) is committed to conducting all activities in a manner that protects the health and safety of students. The Institute endeavors to provide safe tools, materials, equipment, and processes for work and study by meeting or exceeding regulatory requirements for occupational health and safety.

BCIT'S strives towards providing an accident free and healthy environment in which to work and learn. This Safety Manual outlines a safety management program describing safety procedures and policies for issues encountered in offices and laboratories. The program is a guide. It is intended to supplement the Institute, municipal, provincial, and federal legislation, and regulations and other policies or regulations that may apply to the workplace and is not designed to replace them. This document must be reviewed on an annual basis and updated as required by regulations.

The School is committed to providing and maintaining a safe and healthy environment for all students through the implementation of a comprehensive health and safety program. The School recognizes it has a responsibility to establish and uphold proper standards for the maintenance of its facilities and equipment. It also accepts responsibility for providing protection, training, and other resources to promote student safety and maintain a healthy learning environment.

It is our policy to take all necessary steps to prevent injuries to students at our facilities. To achieve this objective, we will comply with all applicable laws and regulations to ensure a safe workplace. All management, supervisors, instructors, workers, contractors, and students must ensure compliance with all Institute policies, procedures, regulations, and codes governing our operations and curriculum. In support of these objectives, students are expected to follow established safe work procedures and are encouraged to actively participate in making their own work environment safe and productive.

No safety program can be successful without the equal commitment of management, employees, and students. New conditions are constantly arising, and it is impossible to devise or list rules covering every situation that might occur. It is necessary therefore, that each person accepts individual responsibility to know their job, be alert, exercise good judgment and use common sense to perform their work in a safe manner.

## WORKPLACE SAFETY

### OVERVIEW

BCIT's Civil Engineering Program aims to provide a safe, healthy, and secure environment in which to work and learn. Appropriate preventative measures will be taken to eliminate hazardous conditions, accidents, injuries, occupational diseases and unnecessary or undue risks to personal security. Compliance with the Workers' Compensation Act of B.C., WHMIS, Institute Safety Program and related legislation is the minimal standard acceptable. As indicated, this manual is a guide and is intended to supplement Institute policy and procedures. References are noted where applicable and shall be included in all review and orientation. The following sections are provided as a summary of Institute policy. BCIT Occupational Health and Safety is governed by BCIT Policy 7150 (Occupational Health and Safety) and BCIT Policy 5102 (Student Code of Conduct). These policies can be accessed online at:

<http://www.bcit.ca/files/pdf/policies/7150.pdf>

<http://www.bcit.ca/files/pdf/policies/5102.pdf>

This policy applies to activities in the following laboratories:

- SW3 – 1650 Construction Materials Lab
- SW3 – 1690 Geotechnical Lab
- SW3 – 1655/1695 Environmental Lab
- SW3 – 1640 Hydraulics Lab
- SW1 – 1068/1070 Structures Lab

Hereafter, these laboratories will collectively be referred to as “Civil Labs”.

### RESPONSIBILITIES

#### Directors', Deans', Registrars' & Managers' Responsibilities

- Identify Occupational Health and Safety (OHS) management delegation in area of responsibility
- Ensure OHS programs are implemented and functional (including OHS committees)
- Support OHS through allocation of appropriate resources
- Ensure risk identification, assessment and control strategy is in place
- Ensure that OHS education and training is available to employees and students
- Provide injury management program for employee/students
- Review OHS performance in area of responsibility

### Program Heads', Program Coordinators', Supervisors', & Instructors' Responsibilities

- Maintain sufficient supervision for the health and safety of employees and students
- Develop safe work procedures and ensure that they are followed
- Identify and assess hazards
- Provide risk control
- Ensure employees and students are trained and educated to perform their work safely
- Report OHS risks or deficiencies to senior management

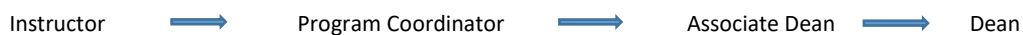
### Employees', Students', Contractors', Visitors' Responsibilities

- Take reasonable care of themselves and others
- Comply with OHS policies, programs, and procedures
- Attend OHS training and education provided
- Cooperate with management and staff nominated to elected OHS functions
- Use personal protective equipment provided
- Report unsafe conditions
- Report work related injuries/illnesses
- Refuse unsafe work

### Reporting Unsafe Conditions

When a student has reasonable cause to believe that the activity they are about to do would create undue hazard to the health or safety of any person, including themselves, they have the right and responsibility to report the circumstances of the unsafe condition to their instructor, as well as, Safety, Security and Emergency Management if required. The instructor will investigate the matter and ensure that any unsafe condition is remedied without delay or if in their opinion the report is not valid, they shall inform the person who made the report.

It is expected that students and instructors will resolve most matters. If a matter cannot be solved by students or instructors, seek a resolution by following the path below:



## INSPECTIONS

Inspections must be done in accordance with industry standards and include, but are not limited to, worksite, laboratory, and equipment inspections. Safety inspections are used to identify and control hazards in the workplace before incidents occur. During an inspection, both activities and conditions in the workplace are examined. Situations that have the potential to cause injury or damage (sometimes referred to as unsafe acts and unsafe conditions) are identified and corrective action is initiated. Inspections focus on identifying both unsafe conditions and unsafe actions. The following ranking system is used to describe the hazard level, based on risk of injury and hazard type:

- A: imminent danger (requiring immediate attention)
- B: hazardous condition (should be addressed as soon as possible)
- C: low hazard (mitigate)

Critical tasks are reviewed, and risk is assessed for every situation. Documentation is mandatory and a Hazard Assessment should be created. This will ensure due diligence is conducted three fold by making sure that students and employees are working safely as instructed, that the training program is sufficient to allow students and employees to work safely and to allow for feedback on safe work procedures and their effectiveness.

The School must ensure that formal and informal inspections are completed. Instructors encourage students to bring forward their observations of unsafe conditions on an ongoing basis. The School should always initiate prompt corrective action in response to valid concerns of students.

Inspections shall include, at a minimum, the following:

- Monthly Joint Committee Inspections.
- Weekly Instructor Inspections.
- Equipment pre-use Inspections.

Students will be trained in recognizing hazards during the laboratory safety training and orientation. A copy of the inspection form will be available from the supervisor.

## ACCIDENT AND INCIDENT INVESTIGATIONS

Every accident and occupational disease that results in injury requiring medical treatment or did not involve injury but had a potential for causing serious injury, must be investigated. The goal of the investigation is to determine the cause or causes of the accident, or occupational disease and to identify any unsafe conditions, acts or procedures that contributed or may contribute in any manner to the accident or occupational disease. Corrective action will be initiated without undue delay. Investigations vary depending on circumstances such as: accident type, severity, and number of people involved.

Full details of BCIT's Incident Investigation Procedures are available at:

[http://www.bcit.ca/files/safetyandsecurity/pdf/incident\\_investigations.pdf](http://www.bcit.ca/files/safetyandsecurity/pdf/incident_investigations.pdf)

### FORMS

The following are brief descriptions of the report forms that are required for accident reporting or for compensation.

#### Worker's Compensation Board Forms

To receive compensation, workers injured at work must ensure that the proper forms are completed.

**Form 6A** "Employee/student's Report of Injury" -to be completed by the injured person if fit to do so. Another individual can complete the form for signature by the injured worker.

**Form 6** "Application for Compensation and Report of Injury or Industrial Disease" -this form is sent to the injured worker's home address by the Workers' Compensation Board. It should be completed by the injured worker and returned to the Workers' Compensation Board.

### REPORTABLE OCCURRENCES

The following occurrences must be reported immediately to Safety, Security and Emergency Management, and WorkSafe BC:

- serious injury or death of a worker
- major structural failure or collapse of a building
- major release of a hazardous substance
- an incident required by regulation to be reported.



## STUDENT EDUCATION AND ORIENTATION

### Employers' Responsibilities

Under section 21(2) of the Worker's Compensation Act, an employer has the responsibility to ensure workers and students are made aware of all known or reasonably foreseeable hazards, as well as their rights and duties under the OHS provisions and regulations, and are provided with the information, instruction, training, and supervision to ensure their health and safety. The School must establish orientation and training programs for workers under the WSBC OHSR 3.23. The objective of the programs is to ensure that workers can apply the information to protect their own health and safety.

Orientation and training programs will include:

- name and contact information for the student's supervisor
- Civil laboratory health and safety rules
- hazards to which the student may be exposed
- working alone or in isolation
- personal protective equipment
- location of first aid facilities and means of summoning first aid and reporting illnesses and injuries
- emergency procedures
- instruction and demonstration of the student's work task or work process
- Globally Harmonized System (GHS) information requirements

Additional training in fall protection, respirator care and use and confined space may be required dependent on hazard assessment.

### Basic Rules for Students

All persons will conduct themselves in a safe and responsible manner and will adhere to all applicable safety and WorkSafe BC OHS regulations, policies, standards, and guidelines but are not limited to the following:

1. A student has a maximum of 3 noncompliance reports which may result in dismissal from the program.
2. Students are not permitted to work in laboratory areas unsupervised. Students must perform laboratory duties while supervised by an instructor or AI.
3. Students are responsible for the cleanliness of their own work area.
4. No alcoholic beverages or drugs are to be consumed during class hours. If someone is suspected of consuming these at any time, either prior to commencing class or during class hours, laboratory access will not be permitted, and they will be assigned to a self-study area for the remainder of the day.

5. Student's personal belongings must be stored in lockers, not left in laboratories or classrooms.
6. No offensive language.
7. NO FOOD OR BEVERAGES PERMITTED IN THE LAB AREAS.
8. No smoking in any BCIT buildings, including smokeless tobacco, chew, electronic cigarettes, or vaping.

## WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (WHMIS)

WorkSafe BC requires everyone to receive Workplace Hazardous Material Information System education (Regulation 5.6 and 5.7). This applies to all students working with controlled products. WHMIS legislation provides employers, employees, students, and suppliers nationwide with specific vital information about hazardous materials (called controlled products in the legislation).

BCIT's WHMIS Program includes the following:

- Student rights and responsibilities
- Controlled product labeling - alerts workers to the identity, dangers, and basic safety precautions of products
- Safety Data Sheets (SDS) - technical bulletins which provide detailed hazard and precautionary information
- Education and training programs

All students that handle or work near controlled products must be instructed in:

- The content required on Safety Data Sheets (SDS) and workplace labels
- The purpose and significance of the information contained on the label
- Procedures for the safe use, storage, handling, and disposal of the controlled product
- The safe use, storage, handling, and disposal of a controlled product contained or transferred in a pipe or a piping system including valves, a process or reaction vessel, or a tank car, tank truck, ore car, conveyor belt, or similar conveyance
- Procedures to be followed if the controlled product escapes from equipment, or from another product
- Procedures to be followed in case of an emergency involving a controlled product. Instruction must be specific to the workplace and cover the safe work procedures and emergency response procedures to be used in the workplace
- The proper use of personal protective equipment (e.g., air purifying respirators and SCBA) or other protective means to minimize or eliminate exposures to within the legal exposure limits
- Reading and following information provided on labels and in the Safety Data Sheet (SDS), before using or handling the WHMIS controlled product

BCIT will acquire all safety data sheets from suppliers. Copies of the SDS for any controlled product found in Civil laboratories can be obtained,

- At the locations where students may be exposed to the controlled product.
- By request, to the supervisor by students or employees.

### Additional Notes and Guidelines

Follow any additional procedures or instructions provided by your instructor or OHS for the safe use and handling of hazardous materials.

The amount of a hazardous substance in a work area should not exceed the amount reasonably required for the work in progress in one work shift.

Never store incompatible substances (consult SDS) in a manner that would allow them to mix in the case of container leakage or breakage.

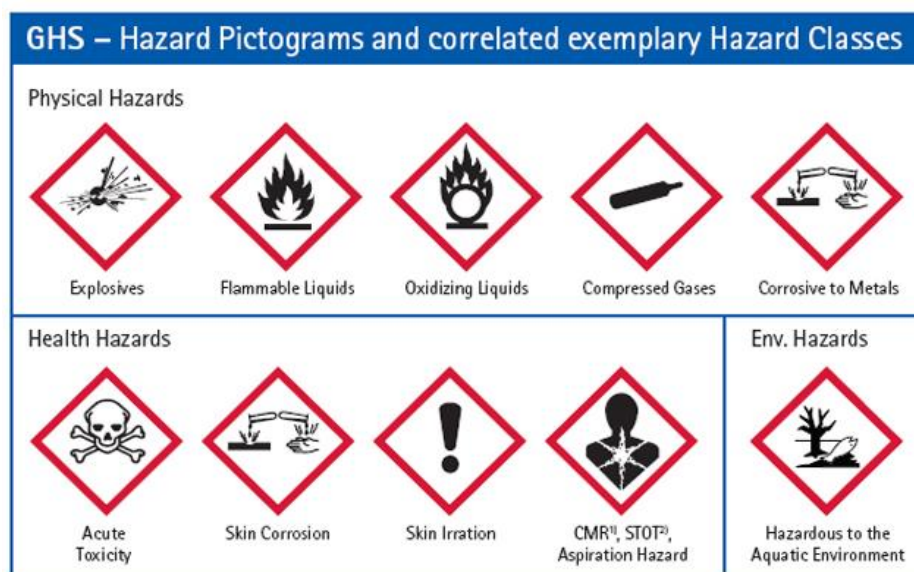
Report any containers that are un-labeled or improperly labeled.

Supplier labels must be affixed to the original containers of controlled products. Labels cannot be removed, defaced, modified, or altered. If labels are modified, missing or illegible, they should be replaced with workplace labels.

Workplace labels must be affixed to controlled products that have been transferred from the original container into another container.

### GLOBALLY HARMONIZED SYSTEM

The Canadian developed WHMIS 2015 (modified in February 2015) incorporates the internationally agreed-upon United Nations-managed Globally Harmonized System (GHS) that classifies the hazards of chemical products and communicates health and safety information on labels and safety data sheets.



1) carcinogenic, germ cell mutagenic, toxic to reproduction / 2) specific target organ toxicity

## LABORATORY SAFETY

**Students must always work under the supervision of an instructor or assistant instructor (AI) when in the lab.** Students may be required to perform light duties, such as instrument readings or mass measurements, when conducting longer term experiments. In these situations, students may be unsupervised, but safety protocols remain in place and students must remain vigilant with following regulations.

Research projects with a lab component require students to perform additional duties in laboratory environments. Students, in this situation, will operate in the lab unsupervised and are required to prepare a **working alone safety plan** for approval and meet with representatives from BCIT OHS and the department before lab access is granted. The **working alone safety plan** includes the following:

- Date and time for unsupervised lab work.
- Check-in and check-out procedures.
- Detailed list of tasks performed, and equipment used.
- Risk assessment and mitigation strategy for each task.
- Additional information as required.

### SIGNAGE

Signage shall be posted near each major piece of equipment in the laboratory which lists:

- The PPE required when using the equipment.
- Instructions for using the equipment.

All cabinets and drawers in a lab should be appropriately labeled. Safety signage will be posted throughout each laboratory and these guidelines will be enforced without exception.

### EMERGENCIES

Report all emergencies to the following:

- Immediate supervisor.
- Safety, Security and Emergency Management.
- OHS.

## Fire

**Small fire in the lab:** In the case of a manageable fire, not larger than 300mm in diameter, the fire may be extinguished using a fire extinguisher. The incident must be reported to Safety, Security and Emergency Management immediately.

**Large fire in the lab:** In the event of an unmanageable fire or when it is larger than 300mm in diameter, activate the fire alarm, instruct all occupants of the lab to exit quickly and calmly, and report the incident to Safety, Security and Emergency Management immediately via the security stations on campus (the blue stations). Check in with your supervisor at the designated Assembly Area for the building.

**Fire in other areas of the building:** In the event of a fire alarm, exit quickly and calmly, move away from the building, and check in with your supervisor at the designated Assembly Area for the building.

### **Use of Portable Fire Extinguishers**

Portable fire extinguishers are useful only if you know how to use them, if they are right for the type of fire you are fighting, and if the fire is discovered immediately. You shall not attempt to fight even a small fire until people have been evacuated from the area and the Fire Department has been called. Never attempt to fight a fire if any of the following is true:

- You are uncertain about how to use the fire extinguisher
- The fire is spreading beyond the immediate area where it started
- The fire could block your escape route
- You are alone

Refer to the BCIT Burnaby Campus Emergency Preparedness and Response Guide (Page 26) for further information on what to do in case of a fire on campus.

## Earthquake

In the event of an earthquake, take cover under sturdy furniture and hold on, if it is safe stay where you are. After the earthquake, go to the designated assembly area. Watch for aftershocks. Emergency Response Personnel will advise you further.

Refer to the BCIT Burnaby Campus Emergency Preparedness and Response Guide (Page 17) for further information on what to do in case of an earthquake on campus.

## SAFE WORK AND HAZARDS

Hazards present in laboratory testing and construction lab areas include toxic or flammable chemicals, electrical equipment, tools, working at heights and soldering. By identifying sources of hazards and following appropriate procedures, even activities of high potential risk can be engaged in safely.

## GENERAL GUIDELINES FOR LABORATORY SAFETY

### Rules for Personal Safety

- Always wear personal protective equipment (PPE) specific to each laboratory.
- Always wear task-appropriate PPE.
- Do not eat, drink, or smoke in the lab.
- Do not chew gum or apply cosmetics in the lab.
- Wear a lab coat and gloves when handling corrosive, toxic, or flammable materials.
- If you see a colleague doing something dangerous, point it out to them.
- Know where safety equipment (eyewash, shower, extinguishers) is located and how to use it.
- Know how to clean up spills of the chemicals that you use, or who to contact for assistance.
- Wash your hands after handling chemicals and before leaving the area.
- Act in a professional manner at all times.
- No horseplay and practical jokes.
- Visitors must be escorted.
- Operators must be alert to unsafe conditions. It is the responsibility of everyone to assure a safe working environment for themselves and other workers in the laboratories.
- Lab workers must be familiar with the hazards of the materials with which they are working. Consult the SDS sheets before working with any hazardous materials.
- Work should not be conducted if the student is feeling tired or otherwise impaired.
- Do not carry out any work process that would create an undue hazard.
- Report all laboratory work related illnesses and injuries, no matter how minor to Safety, Security and Emergency Management.
- Report all laboratory work related illnesses and injuries, no matter how minor to your supervisor.
- Report all laboratory work accidents or near-misses to your supervisor immediately.
- Report any hazardous conditions encountered in the lab to your supervisor immediately.
- Acts of violence, threatening, or abusive behavior is strictly prohibited. Anyone witnessing such acts are expected to report the incident to the supervisor immediately.
- Students must attend health and safety training programs and orientations as instructed.

- Failure to comply with safety protocol listed in this document, or any related BCIT safety protocol may result in a student's final grade being withheld for a course or failure in a course.

## EQUIPMENT

Do not use equipment you have not been trained to use. After training, refer to the Safe Operating Procedure (SOP) worksheet located near each piece of equipment for instructions on how to operate the equipment and what additional PPE may be required.

### Clothing

The minimum dress in laboratories is long pants and sleeves with sturdy shoes covering the entire foot, including toes. Bare legs (e.g. shorts, skirts, or dresses) or arms are not acceptable. In certain labs, additional PPE such as hardhats, gloves, glasses, CSA-approved safety footwear and high visibility clothing may be required.

Job Hazard Assessments will determine the appropriate Personal Protective Equipment (PPE) required.

Students will adhere to all posted SOP PPE requirements.

### Footwear

While in lab areas students must wear substantial footwear to protect against hazards, such as chemical, mechanical (e.g., slipping) and physical hazards associated with material handling.

"Substantial footwear" should be made of a solid material that 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.

### General Electrical Safety Principals

Electrical currents of low amperage and voltage under certain circumstances may result in fatal shock. It is not voltage that kills but amperage. Voltages as low as 24-V AC can be a lethal threat. Low voltage DC circuits do not normally present a hazard to human life, although severe burns are possible. The time of contact with a live circuit affects the degree of damage, especially as far as burns are concerned.

Only persons qualified by training or experience should maintain electric or electronic equipment.

When handling electric wires, never use them as supports and never pull on live wires.

Any electrical failure or any evidence of undue heating of equipment should be reported immediately to the persons responsible for the area or equipment.



## SPILL PROCEDURES

Spills or other accidental releases of hazardous materials can be large or small and may be liquid or dried. Spills may involve other hazards such as electrical equipment. The type of spill and the hazards involved must be considered when planning spill response procedures. The spill control procedures that are followed in the work area must reflect the materials, equipment and procedures being used. The procedures must also consider the safety of all personnel involved and reflect what is in the SDS. Consult BCIT Safety and Environment Manuals and Policies for more information

### *Spills Involving Personal Injury*

In the event of personal injury, the treatment of the injury must take precedence over spill clean-up. First aid procedures should be followed, consult the SDS.

### Decontamination of Personnel

Minimize contamination by confining all contaminated persons to a restricted area. In the case of injured personnel, isolation should only be part of their decontamination if doing so does not add to the extent of their injuries, or their treatment. Remove all contaminated clothing. If a worker is contaminated by skin contact in a manner that does not require first aid, the contaminated skin should be washed well before returning to work.

### Spill Reporting

Report the following types of incidents to your supervisor and OHS:

- Personal injuries involving chemical exposure
- Personal contamination
- Spills of 500 mL or greater
- Spills requiring spill cart equipment for clean-up.

Students witnessing or involved in a spill should also notify other students in the area so that the area can be isolated, and a spill response initiated.

The supervisor of the area should also be notified immediately.

Incident and accident reports will be completed by the supervisor, if required, and the report forwarded to OHS.

### General Spill Cleanup

Class I spills are categorized as any spill less than one liter. A Class II, large spill, is greater than one liter. A checklist for spill procedures is as follows:

- Personal safety check
- Advise other personnel
- Obtain spill kit
- Contain spill
- Decontaminate
- Dispose

In the event of a spill, the safety of all people is the prime concern. If someone is injured, try to deal with them first. Remember the victim is often confused and may not be able to help themselves. You may have to help them get to a safer location or a decontamination area for showering or eye-washing.

If there are any injuries take appropriate action:

1. If there is a chemical spill that is causing burns, shower and remove clothes, if necessary, pay attention to the face and eyes. Refer to the SDS for information and call for First Aid.
2. Clear the immediate area. Inform others of what has happened so that, if necessary, they will be ready to help or to evacuate. If a strong smell spreads, or if there is potential danger beyond the immediate area, evacuate the neighboring areas. If necessary, evacuate all areas.
3. Wearing appropriate protective equipment - lab coat, apron, goggles, respirator, gloves, etc., ascertain the identity and volume of the chemical spilled.
4. Check whether the spill involves any material that is biohazardous and, if so, follow the clean-up procedure for biohazardous material.
5. Review the SDS to check for any special precautions e: clean up.
6. Get the Spill Clean Up kit.
7. Inform your supervisor.

If the spill is large (Class II) or you are unable to contain the spill, call 9-1-1 and advise them of the situation. They will deploy the fire department and HAZMAT if necessary.

## WRITTEN SAFE WORK PROCEDURES AND SAFE OPERATING PROCEDURES

Written and practical instructions reduce and control the hazards that are likely to be encountered in the workplace. Safe work procedures ensure work is planned and carried out safely and in accordance with regulations. The focus is the incorporation of safety into the day-to-day activities. Instructions will encompass the rules and procedures as well as the minimum legislative requirements.


Safe work procedures with respect to laboratories and specific equipment, such as the example shown below, are listed in Appendix C.



**SW1-1068: STRUCTURES LAB**

**Civil Engineering– Safe Work Procedure  
Universal Testing Machine  
Tinus Olsen Super L-200,225 kip**

**DO NOT use this machine unless you have been instructed in its safe use and operation and have been given permission**

**PERSONAL PROTECTIVE EQUIPMENT**

 Safety Glasses must be worn while operating this equipment

 CSA approved steel-toed footwear **must be worn at all times** in work areas.  Hearing protection must be worn.

**PRE-OPERATIONAL SAFETY CHECKS**

Locate and ensure you are familiar with all machine operations and controls

- ✓ Ensure all bending parts components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.

Ensure all safety guards are correctly fitted and secured.  
Ensure that the unit is mechanically sound.

**Never operate a faulty Power Tool –Report it to your Supervisor**

**OPERATIONAL SAFETY CHECKS**

Ensure that the piece of metal that is being tested is secured to the testing bench  
Ensure that the area does not contain any hazards that may impact on the safe operation of the Universal Testing Machine.  
Never insert your hands when the machine is performing its bend test.  
Regularly inspect the machinery for leaking hydraulic hoses.  
Ensure to be standing behind marked off floor barrier while test is being run.

**HOUSEKEEPING**

- ✓ Remove test piece from the machine after test is complete, or make sure it is secured and cannot shift or fall off testing table.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the machine to pre use condition after use.

**Never allow arms or hands near the Universal Testing Machine during test**

**POTENTIAL HAZARDS AND RISKS**

■ Moving ■ Electricity ■ Eye injuries ■ Manual handling ■ Pinch Points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to compliment training and as a reminder to users prior to equipment use.

## ERGONOMICS, BODY MECHANICS AND MUSCULOSKELETAL INJURY PREVENTION

The purpose of ergonomics is to promote physical comfort, productivity, and efficiency, resulting in a reduction in the risk of physical injury, stress, and fatigue. Ergonomics includes the entire work environment, in all settings including manufacturing and office environments.

Musculoskeletal injuries happen as a result of working under conditions with repetitive or forceful use, improper ergonomics and/or improper body mechanics. These conditions cause injurious inflammation of muscles, tendons or bursa of the limbs and body of the person doing the work.

Following general work practices will help prevent musculoskeletal injuries.

1. Practice good housekeeping.
2. Pre-plan procedures to ensure the proper tools, equipment and number of personnel are available.
3. Minimize the distance materials must be moved. Plan storage and movements properly.
4. Store materials at or above hip height to minimize unnecessary bending.
5. Break or divide heavy or large loads into smaller loads for easier transport.
6. Use personal protective equipment such as kneepads, and gloves.
7. Talk with your manager about alternating activities if you have been assigned repetitive work.
8. Where practicable, use dollies, hoists, forklifts, or other equipment to do a job more efficiently.
9. Take a minute to stretch/warm up before any repetitive or heavy lifting jobs.
10. Do not attempt to lift objects that are obviously too heavy or bulky for one or which require getting into an awkward position. Get help.
11. Be ready to lend a hand to fellow employees with lifting tasks.
12. Ensure you have a firm grip on the object before lifting it, and ensure your hands and body are in the clear.
13. Ensure that you have a clear view of your route, and the route does not present any hazards when carrying materials.
14. When lifting:
  - a. Keep your back as upright as possible
  - b. Use leg muscles instead of back or stomach muscles
  - c. Avoid twisting motions - turn with your feet.

## PERSONAL PROTECTIVE EQUIPMENT

All personal protective equipment (PPE) must meet applicable standards acceptable to Provincial regulations.

Students shall be instructed on the selection, use, and maintenance of all PPE used.

Students shall be educated on the reasoning for each piece of PPE and its limitations.

Supervisors will ensure PPE and its use adheres to the following:

- Available to students.
- Properly worn.
- Properly cleaned and stored.
- Maintained and repaired.
- Inspected and tested.

Students using PPE shall perform the following:

- Use the equipment in accordance with training and instruction.
- Inspect the equipment before use.
- Refrain from wearing PPE outside of the lab area where it is required, if to do so would constitute a hazard.
- Immediately report any damage or defective PPE to their supervisor.

### Specific PPE Requirements

**Hearing protection** (e.g., muffs and plugs) is required in any lab location where there is noise of 85 dBA or greater and where your instructor determines hearing protection is necessary. All hearing protection must be selected, maintained, and used in accordance with CSA Standard Z94.2-94 "Hearing Protectors". Under most circumstances hearing protection will be required when working in the vicinity of operating power equipment or tools. (To assist in determining noise levels, a "rule of thumb" is: to clearly hear someone speaking where there is a background noise of 85 decibels, they could speak normally at 30 cm (1 ft) distance but would have to yell at 1.2 m (4 ft).

**Eye protection** (e.g., goggles, face shields) must be worn when:

- Handling any material that is likely to injure or irritate the eyes.
- Exposed to any material that is likely to injure or irritate the eyes.
- Engaged in any work in which there is a risk of eye injury.
- A student has 20/200 vision or is blind in either eye.

- Working or passing through an area that the instructor or OHS have designated as requiring such protection.

Wear safety goggles over non-safety prescription glasses where an eye hazard exists. All eye protection equipment must meet CSA Standard CAN/CSA-Z94.3-20.

**Hard hats** may be required to be available in the laboratories. Hard hats must be CSA Standard CAN/CSA-Z94.1-92 approved and have a properly adjusted suspension. Non-conductive safety headgear is required when exposed to electrical hazards. Hard hats shall come equipped with a device to prevent the hat from being dislodged during a fall.

**Respiratory protection** that has been fit-tested must be worn or carried on your person in those locations identified by your supervisor. Fit tests must be performed in accordance with procedures in CSA Standard CAN/CSA-Z94.4-02, "Selection, Use, and Care of Respirators". If any of this equipment is not available or is in poor condition, alert your supervisor and it will be provided or replaced.

## HEARING PROTECTION

Hearing protection will be made available to all students. The following guidelines apply to the use of hearing protection:

- Hearing protection must be worn where excessive noise (greater than 85 dB at any time in an 8-hour period) is present.
- All noise levels that may exceed 80 dB will be tested and recorded.
- Permanent areas, whose noise level exceeds 82 dB, will be clearly posted as a noise hazard.
- Hearing protection must be worn in any area with a posted noise hazard.
- All hearing protection must meet the requirements of CSA Standard Z94.2-02.

## RESPIRATORS

Respirators protect against different hazards, at varying levels and with assorted limitations.

In most circumstances the nature of the work performed will require only one type of respirator: the air purifying half mask respirator. These respirators filter the air but do not supply it - ensure the oxygen level in the work area is greater than 19.5%.

Select the required filters designed for the hazard and check its protection capabilities. Certain substances lack adequate warning properties or cannot be filtered from the air with this type of respirator.

If a student is or might be exposed in a workplace to an air contaminant that exceeds an 8-hour time weighted average (TWA) limit, ceiling limit or short-term exposure limit set by ACGIH for the air contamination, the student must wear the appropriate respirator which will be provided.

If a student is required to enter or work in an area immediately dangerous to life or health (IDLH) or deficient in oxygen, the student must wear a full face piece positive pressure respirator which is either a self-contained breathing apparatus (SCBA), or an airline respirator with an auxiliary self-contained air cylinder of sufficient capacity to permit the student to escape unassisted from the contaminated area if the air supply fails.

### Fit Checks & Tests

1. Prior to wearing a respirator, students will be trained on:
  - a. Selection, use and care of respirators
  - b. Hazard Identification
  - c. Respirator limitations
2. Fit tests must be performed in accordance with procedures in CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators
3. Medical Evaluation (fit for wear) will be completed for each student required to wear a respirator.
4. Each time a respirator (Air Purifying Half Mask Respirator) is placed in position on the face (donned), the wearer shall conduct a negative and positive pressure fit check to ensure a proper fit. This ensures the respirator is adjusted properly and sealed against the face. The advantages are that the wearer can do this alone in the field and the check can be repeated any time the seal is in question.
5. A negative pressure check is accomplished when the wearer closes off the respirator inlets and inhales. A vacuum and partial inward collapse of the mask should result.
6. If a vacuum cannot be maintained, readjust the face piece and try again.
7. A positive pressure check is accomplished when the wearer closes off the exhalation valve and breathes out gently. An outward expansion of the respirator should result. Air will escape through any gaps in the seal. If this should happen, readjust the face piece and try again.

8. A respirator, which requires an effective seal with the face for proper functioning, must not be issued to a student unless a fit test demonstrates that the face piece forms an effective seal with the wearer's face.
9. A fit test must be carried out:
  - a. Before initial use of a respirator.
  - b. At least once a year.
  - c. Whenever there is a change in respirator face piece, including the brand, model, and size.
  - d. Whenever changes to the user's physical condition could affect the respirator fit.
10. Other personal protective equipment that is to be worn at the same time as a respirator and which could interfere with the respirator fit must be worn during a fit test.
11. The School must maintain a record of fit test results.

### Inspection and Maintenance

1. Instructors shall ensure respirators are used and worn correctly.
2. If problems are observed corrective measures shall be taken immediately.
3. If the respirator is not appropriate for the hazard, the wearer shall leave the area, cease work or take other action to eliminate further exposure.
4. Each person issued a respirator shall inspect the respirator prior to each use to ensure that it is in good condition. This inspection shall include a check of the tightness of the connections and the condition of the face piece, headbands, valves, and cartridges.
5. The mask itself shall be inspected for signs of deterioration. If any defects are noted, the wearer shall repair the respirator.
6. Replacement parts shall be approved for the specific respirator being repaired. If the repair cannot be made immediately, a replacement respirator of the same model and size shall be provided until such time as the repair can be made.

### Cleaning and Sanitizing

All tight-fitting respirators shall be cleaned and sanitized after each use by the respirator wearer. This shall be done in accordance with the manufacturer's recommendations.



### Guidelines for Respirator Use

- Ensure that the face is clean-shaven where the face-piece seals to the skin.
- Ensure that respirators, which require an effective face seal to perform effectively, are not worn if this seal cannot be achieved and maintained.
- Conduct a negative and positive pressure fit check to ensure a proper fit.
- Ensure that safety eyewear does not interfere with the face-piece seal.
- Ensure that no covering passes between the sealing surface of the respirator face-piece and the face.
- Ensure that other Personal Protective Equipment does not interfere with the face-piece seal.
- Inspect the respirator for proper operating condition prior to each use.
- Check the face-piece seal immediately after donning a respirator.
- Monitor the use of respirators to ensure that:
  - The correct type is being used,
  - They are being worn properly,
  - They are in good working order, and
  - Problems are documented.

## HAND TOOLS

Hand tools may only be used by authorized persons. A person must not be authorized to operate a hand tool until the person has been adequately instructed and trained and has demonstrated an ability to safely operate it.

### General Guidelines for Hand Tool Use

1. Don't use tools for jobs they are not intended for - there is an appropriate tool for every job.
2. Don't apply excessive pressure on tools.
3. Hand tools create exposure too many hazards including falling, flying and abrasive objects, and harmful dusts, fumes, mists, vapors and gases. Wear appropriate personal protective equipment (e.g., safety glasses, gloves, and respirator) for all applicable exposures.
4. Maintain tools carefully, keep them clean and dry, and store them properly after use. Inspect tools for defects prior to use.
5. At no time shall any hand tool be operated if that tools guard has been manipulated in such a way that it will compromise its integrity or the protection in which it was intended.
6. Any damaged tool shall be identified as unsafe and removed from service until which time the tool has been replaced or refurbished to appropriate working condition.
7. Exercise extreme caution when using tools near live electrical circuits. Does not use cushion grip handles as a replacement for insulated handles.
8. Pull on wrenches and pliers. Never push unless you are using an open hand. Face adjustable wrenches forward, and turn wrench so pressure is against the permanent jaw.
9. Don't increase leverage by adding sleeves to increase tool length - there is an appropriate tool for every job.
10. Don't cut or chip towards yourself when using cutting tools or chisels.
11. Do not use one hammer to strike another.

Note: Please refer to Safe Work Procedure/Safe Operating Procedures for full details on operating, maintaining and using equipment.

## POWER TOOLS

Power tools may only be used by authorized persons. A person must not be authorized to operate a hand tool until the person has been adequately instructed and trained and has demonstrated an ability to safely operate it.

All rules that apply to the hand tools section apply in addition to this section. Power hand tools must meet standards (CSA, etc.) acceptable to the WCB.

### General Guidelines for Power Tool Use

1. Inspect tools, power cords and electrical fittings for damage prior to each use. Repair or remove from service and replace damaged equipment.
2. Ensure all belt and pinch point guards are in place and functioning.
3. Do not wear gloves, loose clothing or jewelry while using revolving/rotating power tools.
4. Switch tools off before connecting them to a power supply.
5. Do not use electric tools in wet or damp locations without a Ground Fault Circuit Interrupter (GFCI).
6. Ensure tools are properly grounded (3-prong plug) or are double insulated.
7. Keep power cords clear of tools during use.
8. Do not carry electrical tools by the power cord.
9. Avoid octopus (overloaded) connections.
10. Wear approved safety glasses or goggles when using power tools for grinding, cutting and sanding operations.
11. If a guard on machinery is impracticable for a specific operation it may be removed, but an appropriate device must be used to prevent hands entering the cutting area. Guards must be replaced upon completion of the operation.
12. Ensure all guards and shields are in good working order and in place prior to any equipment operation.

## HOUSEKEEPING

Lab areas must always be kept clean and free from obstructions. Tools, loose objects, oil, grease, and other materials left lying about are hazards.

Tidy your lab area at the end of the day, immediately after finishing a job, or as necessary.

Any sizeable spills of toxic, flammable, or corrosive materials must be cleaned up immediately using the method described in the appropriate SDS or on the container label. Large spills of such materials must be reported to your supervisor/instructor.

All students must help to keep work sites clean and free of tripping/slipping hazards by depositing refuse in designated containers.

Materials, tools, and equipment must not be stored in stairways, corridors, catwalks, ramps, passageways, and exits. Materials stored overhead must be protected against falling into work areas.

Broken glass and other "sharps" must be disposed of in designated trash containers.

All material must be properly stacked and secured to prevent sliding, falling or collapse.

All materials must be stacked or stored in a manner that permits safe access to and egress from a work area.

To ensure housekeeping is maintained, site inspections include housekeeping components.

## SAMPLES

Samples stored in the lab must be properly identified with a sample description, student name, course number, and date.

Samples not properly identified may be discarded.

Samples must be stored in a location specified by the supervisor.

Disposal of samples must be carried out according to appropriate sample specific guidelines.

## APPENDICES

APPENDIX A – LIST OF LABORATORY EQUIPMENT AND SAFE WORK PROCEDURES

SW1-1068: STRUCTURES LAB

## Civil Engineering– Safe Work Procedure Structures Frame

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Head protection must be worn.



Safety glasses must be worn while operating this equipment.



Hearing protection must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Confirm that there is no power to the Frame when loading the test metal.
- ✓ Locate and ensure you are familiar with all machine operations and controls
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure that all students are behind the cordoned off area.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ If using the crane to move material, ensure all lifting chains and straps are in good working condition and have been inspected.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use Crane with people under or near the load.
- ✓ Never use the Structures Frame if the test piece is not secured.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Structures Frame.
- ✓ Never place your hands on the test piece when the test is being conducted.
- ✓ Be conscious of your manual handling techniques.

### HOUSEKEEPING

- ✓ Shut off the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the machine to pre-used condition after use.
- ✓ Remove test piece from the machine after test is complete, or make sure it is secured and cannot shift or fall of testing table.

**Never allow arms or hands onto the test piece when it is under load**

### POTENTIAL HAZARDS AND RISKS

- Moving, rotating parts
- Manual handling
- Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.



SW1-1068: STRUCTURES LAB

## Civil Engineering– Safe Work Procedure Universal Testing Machine Baldwin-Weidemann

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Hearing protection must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Universal Testing Machine.
- ✓ Never insert your hands when the machine is performing its test.
- ✓ Regularly inspect the machinery for leaking hydraulic hoses.
- ✓ Ensure to be standing behind marked off floor barrier while test is being run.

### HOUSEKEEPING

- ✓ Remove the test piece from the machine after the test is complete.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the machine to pre-used condition after use.

**Never allow arms or hands near the Universal Testing Machine during test**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Eye injuries ■ Manual handling ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1068: STRUCTURES LAB

## Civil Engineering– Safe Work Procedure Universal Testing Machine Tinus Olsen Electro-Matic ETM-20, 30 kip

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Hearing protection must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls
- ✓ Ensure all bending parts components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine –Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the piece of metal that is being tested is secured to the testing bench
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Universal Testing Machine.
- ✓ Never insert your hands when the machine is performing its test.
- ✓ Regularly inspect the machinery for leaking hydraulic hoses.
- ✓ Ensure to be standing behind marked off floor barrier while test is being run.

### HOUSEKEEPING

- ✓ Remove test piece from the machine after test is complete, or make sure it is secured and cannot shift or fall off testing table.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the machine to pre-used condition after use.

**Never allow arms or hands near the Universal Testing Machine during test**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Manual handling ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1068: STRUCTURES LAB

## Civil Engineering– Safe Work Procedure Universal Testing Machine Tinus Olsen Super L-200,225 kip

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Hearing protection must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls
- ✓ Ensure all bending parts components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Power Tool –Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the piece of metal that is being tested is secured to the testing bench
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Universal Testing Machine.
- ✓ Never insert your hands when the machine is performing its test.
- ✓ Regularly inspect the machinery for leaking hydraulic hoses.
- ✓ Ensure to be standing behind marked off floor barrier while test is being run.

### HOUSEKEEPING

- ✓ Remove test piece from the machine after test is complete, or make sure it is secured and cannot shift or fall of testing table.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the machine to pre-used condition after use.

**Never allow arms or hands near the Universal Testing Machine during test**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Eye injuries ■ Manual handling ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

SW1-1068: STRUCTURES LAB

## Civil Engineering– Safe Work Procedure Universal Testing Machine Tinus Olsen Super L-60-60 kip

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Hearing protection must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all bending parts components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine –Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the specimen being tested is secured to the testing bench.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Universal Testing Machine.
- ✓ Never insert your hands when the machine is performing its bend test.
- ✓ Regularly inspect the machinery for leaking hydraulic hoses.
- ✓ Ensure to be standing behind marked off floor barrier while test is being run.

### HOUSEKEEPING

- ✓ Remove test piece from the machine after test is complete, or make sure it is secured and cannot shift or fall of testing table.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the machine to pre-used condition after use.

**Never allow arms or hands near the Universal Testing Machine during test**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Manual handling ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1640: HYDRAULICS LAB

## Civil Engineering– Safe Work Procedure Hydraulic Flume

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required.



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Inspect water lines for small holes or distress marks
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces to ensure no slip/trip hazards are present.
- ✓ Ensure that the water hose is in the closed position.

**Never operate a faulty Machine –Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the flume.
- ✓ Ensure that the water hose is in good working condition.

### HOUSEKEEPING

- ✓ Drain all water from the flume.
- ✓ Clean up the work area.
- ✓ Return the testing machine to pretest default.
- ✓ Close the water hose.

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Water lines ■ Pinch points ■ Slips/Trips

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1640: HYDRAULICS LAB

## Civil Engineering– Safe Work Procedure Pelton Wheel/Turbine Demonstration Unit

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required.



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure that the power lead can be kept dry, off the ground and connected through a GFCI.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Power Tool – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the Pelton wheel/Turbine without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the mixer.
- ✓ Never insert your hands into a rotating Pelton Wheel.
- ✓ Never leave the mixer running unattended.
- ✓ Ensure that the water hose is in the closed position.

### HOUSEKEEPING

- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Drain all water from the unit.
- ✓ Clean up the work area.
- ✓ Return the testing machine to pretest default.
- ✓ Close the water hose.

**Never allow arms or hands into a wheel**

### POTENTIAL HAZARDS AND RISKS

- Moving, rotating parts ■ Entrapment ■ Electricity ■ Eye injuries ■ Water lines

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1690: GEOTECHNICAL LAB

## Civil Engineering– Safe Work Procedure Tri-axial Tester

**DO NOT use this machine unless you have been instructed  
in its safe use and operation and have been given permission**

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.



CSA approved steel-toed footwear must be worn at all times in work areas.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Inspect air lines for cuts or weak points.
- ✓ Inspect water lines for small holes or distress marks.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ Ensure Valves are in closed position after each step is completed.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Triaxial Tester.
- ✓ Ensure that the O-rings are not cracked or broken.
- ✓ Ensure that the pressure cell is on base correctly to be able to deal with the pressure generated during the test.
- ✓ Ensure after each step that all the valves are put back into the closed position.

### HOUSEKEEPING

- ✓ Wash out the specimen with clean water.
- ✓ Clean up the work area.
- ✓ Drain all water from the reservoir.
- ✓ Return the testing machine to pretest default.
- ✓ Close all air valves.

### POTENTIAL HAZARDS AND RISKS

- Water Lines ■ Air Lines ■ Pinch Points ■ Slips/Trips

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

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SW1-1690: GEOTECHNICAL LAB

## Civil Engineering– Safe Work Procedure Direct Shear Machine

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.



CSA approved steel-toed footwear must be worn at all times in work areas.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure that the Gear box is in neutral.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure that the power lead can be kept dry, off the ground and connected through a GFCI.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ Ensure that the weight hanger is secure and is able to hold the desired weight.

**Never operate a faulty machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Direct Shear.
- ✓ Make sure gear box is in neutral.

### HOUSEKEEPING

- ✓ Wash out the specimen with clean water.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return weight back to their shelves

### POTENTIAL HAZARDS AND RISKS

- Electricity ■ Manual handling of weights ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.



SW1-1690: GEOTECHNICAL LAB

## Civil Engineering– Safe Work Procedure Consolidometers

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.



CSA approved steel-toed footwear must be worn at all times in work areas.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Inspect air lines for cuts or weak points.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ Ensure Valves are in closed position.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the Direct Consolidometer.
- ✓ Never insert your hands near the contact block when the test is being run.
- ✓ Ensure all air lines are in the closed position to start the test

### HOUSEKEEPING

- ✓ Wash out the specimen with clean water.
- ✓ Clean up the work area.
- ✓ Close all air valves

### POTENTIAL HAZARDS AND RISKS

- Electricity ■ Pressurized air lines ■ Manual handling of weights ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Fume Hood Sulphur Capping

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Safety glasses must be worn while operating this equipment.



Dust mask, or NIOSH/MSHA approved respirator must be worn.



CSA approved steel-toed footwear must be worn at all times in work areas.



Heat resistant gloves must be worn.



Long and loose hair must be contained.



Close fitting/protective clothing must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are working properly. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Make sure that the pot heater is in a secure and level spot to ensure no spills of the liquid sulfur.
- ✓ Ensure heat resistant gloves are available and ready to use.

**Never operate a faulty Power Tool – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never melt the sulfur capping or start the capping process without the hood fan running.
- ✓ Ensure the mold for the capping is prepared.
- ✓ Never use bare hands when transferring the liquid Sulphur to the mold.
- ✓ Ensure long sleeves are worn during the process.
- ✓ Regularly inspect the melting pot and the Fume hood to make sure they are fully operational.

### HOUSEKEEPING

- ✓ Clean bench of any excess harden Sulphur.
- ✓ Turn the melting pot off and store away from the edge of the bench.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow heat or pour Sulphur without the Fume hood operational and glove on.**

### POTENTIAL HAZARDS AND RISKS

- Eye injuries ■ Manual handling ■ Burns ■ Toxic Fumes

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Compression Testing Machine Forney

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Safety glasses must be worn while operating this equipment.



CSA approved steel-toed footwear must be worn at all times in work areas.



Hearing protection must be worn.



No Loose clothing.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the Compression tester without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the tester.
- ✓ Never insert your hands into the compression area of the tester.
- ✓ Never leave the tester running unattended.
- ✓ Ensure guards are in place to catch any debris that may be caused by the compression test
- ✓ Watch fingers when loading test sample into the tester.

### HOUSEKEEPING

- ✓ Empty the Compression Tester of all contents.
- ✓ Turn off the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the Compression tester to its pretest state after use.

**Never allow arms or hands near the Compression Tester when a test is being run.**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Pitch points ■ Fly debris ■ Eye injuries ■ Manual handling

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Compression Testing Machine Testmark

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.



CSA approved steel-toed footwear must be worn at all times in work areas.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the Compression tester without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the tester.
- ✓ Never insert your hands into the compression area of the tester.
- ✓ Never leave the tester running unattended.
- ✓ Ensure guards are in place to catch any debris that may be caused by the compression test
- ✓ Watch fingers when loading test sample into the tester.

### HOUSEKEEPING

- ✓ Empty the Compression Tester of all contents.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.
- ✓ Return the Compression tester to its pretest state after use.

**Never allow arms or hands near the Compression Tester when a test is being run.**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Pitch points ■ Fly debris ■ Eye injuries ■ Manual handling

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Concrete Mixer

**DO NOT use this machine unless you have been instructed  
in its safe use and operation and have been given permission**

### PERSONAL PROTECTIVE EQUIPMENT



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.



CSA approved steel-toed footwear must be worn at all times in work areas.



Close fitting/protective clothing must be worn.



Hearing protection must be worn.



Floor can be slippery if water is spilled, good footwear required.



A mask shall be worn when excessive airborne dusts or fumes are created.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure the mixer is in a suitable safe work area and select a firm, level and stable ground surface.
- ✓ Confirm the mixer has a current electrical safety tag.
- ✓ Ensure that the power lead can be kept dry, off the ground and connected through a GFCI.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the mixer.
- ✓ Never insert your hands into a rotating mixer pan.
- ✓ Be conscious of your manual handling techniques when adding cement powder, gravel or sand to the mixer bowl using a shovel (or similar).
- ✓ Regularly inspect the mixer bowl for consistency and suitability for the concrete mix.
- ✓ Never leave the mixer running unattended.

### HOUSEKEEPING

- ✓ While still wet, wash out with clean water.
- ✓ Allow the mixer to revolve to wash the interior and carefully clean off the exterior.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow arms or hands into a moving pan.**

### POTENTIAL HAZARDS AND RISKS

- Moving, rotating parts ■ Entrapment ■ Electricity ■ Eye injuries ■ Manual handling ■ Skin irritation ■ Dust

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Concrete Cylinder Grinder

**DO NOT use this machine unless you have been instructed in its safe use and operation and have been given permission**

### PERSONAL PROTECTIVE EQUIPMENT



Floor can be slippery if water is spilled, good footwear required



Safety Glasses must be worn while operating this equipment



Long and loose hair must be contained



CSA approved steel-toed footwear must be worn at all times in work areas.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure the grinder is in a suitable safe work and that there is water available.
- ✓ Ensure that the power lead can be kept dry, off the ground and connected through a GFCI.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ Ensure the water hose connection is secure and that there is a flow of water.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Make sure that the water is not leaking onto the floor.
- ✓ Never use the mixer without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the grinder.
- ✓ Never insert your hands near the grinder when it is spinning.
- ✓ Regularly inspect the grinder and the guards for damage.
- ✓ Ensure that there is enough water flow to ensure no dust is being put in to the air.

### HOUSEKEEPING

- ✓ Empty the grinder of all contents.
- ✓ While still wet, wash out the concrete slurry with clean water.
- ✓ Sweep up any dust with a wet rag or mop to ensure no silica dust becomes airborne
- ✓ Clean up the work area.

**Never allow arms or hands near the grinder when operational**

### POTENTIAL HAZARDS AND RISKS

- Moving, rotating parts ■ Entrapment ■ Electricity ■ Eye injuries ■ Manual handling

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

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Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

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SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Coarse Aggregate Sieve Shaker

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Hearing protection must be worn.



Safety glasses must be worn while operating this equipment.



Dust mask, or NIOSH/MSHA approved respirator must be worn.



Long and loose hair must be contained.



Close fitting/protective clothing must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Must be adequately mounted to a substantial, rigid foundation, preferably a poured concrete floor. Otherwise, the machine will vibrate excessively and move around.
- ✓ Make sure to disconnect and lock out electric power supply before performing loading shaker.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the shaker without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the shaker.
- ✓ Keep all parts of your body away from moving parts of the machine while it is operating.
- ✓ Stop the Testing Screen immediately if excessive vibration or machine movement occurs.
- ✓ Watch hands when loading coarse aggregate into the shaker.
- ✓ Ensure that guards and screens are not cracked and installed properly.

### HOUSEKEEPING

- ✓ Empty the shaker of all contents.
- ✓ Allow the shaker to finish washing the interior and carefully cleaning off the exterior.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow hands into the shaker when it is operating**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Eye injuries ■ Manual handling ■ Dust

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to compliment training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Fine Aggregate Sieve Shaker **(Decommissioned until further notice)**

**DO NOT** use this machine unless you have been instructed in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Hearing protection must be worn.



Safety glasses must be worn while operating this equipment.



Dust mask, or NIOSH/MSHA approved respirator must be worn.



Long and loose hair must be contained.



Close fitting/protective clothing must be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Make sure to disconnect and lock out electric power supply before performing loading shaker.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the shaker without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the shaker.
- ✓ Keep all parts of your body away from moving parts of the machine while it is operating.
- ✓ Stop the Testing Screen immediately if excessive vibration or machine movement occurs.
- ✓ Watch hands when loading coarse aggregate into the shaker.
- ✓ Ensure that guards are not cracked and installed properly.

### HOUSEKEEPING

- ✓ Empty the Shaker of all contents.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow hands into the shaker when it is operating**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Eye injuries ■ Manual handling ■ Dust

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25



SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Marshall Hammer

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Hearing protection must be worn.



Safety Glasses must be worn while operating this equipment



Heat resistant gloves must be worn.



Long and loose hair must be contained



Close fitting/protective clothing must be worn

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure the Marshall Hammer does not have power when loading the sample that is to be used.
- ✓ Ensure the hammer is in a locked position when loading the sample to prevent crushing injury.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the hammer without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the hammer.
- ✓ Never put your hands near the sample when it is being hammered.
- ✓ Regularly inspect the Marshall Hammer rod and the hammer end for cracks and defects.
- ✓ Ensure that the sample is seated properly to ensure safe contact with the sample.

### HOUSEKEEPING

- ✓ Empty the hammer sample of all contents.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow arms or hands near the hammer when the test is being run.**

### POTENTIAL HAZARDS AND RISKS

- Moving, rotating parts ■ Entrapment ■ Eye injuries ■ Manual handling ■ Burns ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

Version: 6.4

Date: 2021-09

Prepared by: Lighthouse Safety Services

Reviewed by the Civil Engineering Department: 2024-25

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Marshall Stability Tester

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Heat resistant gloves must be worn.



Safety glasses must be worn while operating this equipment.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Never use the mixer without all guarding in place.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the mixer.
- ✓ Regularly inspect the Stability Tester for cracks or defects.
- ✓ Never leave the mixer running unattended.

### HOUSEKEEPING

- ✓ Empty the Stability Tester of all contents.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow hands into the tester**

### POTENTIAL HAZARDS AND RISKS

- Moving parts

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Superpave Gyrotory Compactor

**DO NOT use this machine unless you have been instructed  
in its safe use and operation and have been given permission**

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ Ensure no guards are cracked or compacting head.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Use proper lifting techniques when inserting and removing specimen molds to prevent back injury.
- ✓ Keep hands and arms away from moving parts and pinch points.
- ✓ Keep hands and arms away from the top of the compactor when extruding the specimen.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the compactor.
- ✓ Do not operate the compactor with any of the access panels or guards removed.
- ✓ Always wear heat resistant gloves when handling hot molds

### HOUSEKEEPING

- ✓ Empty the Compactor of all contents.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow hands into the pinch point of the Compactor.**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Manual handling ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

SW1-1650: CONSTRUCTION MATERIALS LAB

## Civil Engineering– Safe Work Procedure Mechanical Soil Compactor

**DO NOT** use this machine unless you have been instructed  
in its safe use and operation and have been given permission

### PERSONAL PROTECTIVE EQUIPMENT



CSA approved steel-toed footwear must be worn at all times in work areas.



Safety glasses must be worn while operating this equipment.



Long and loose hair must be contained.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all components are fitted, secure and functional. Do not operate if components are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure all safety guards are correctly fitted and secured.
- ✓ Ensure that the unit is mechanically sound.
- ✓ Ensure no guards are cracked or compacting head.

**Never operate a faulty Machine – Report it to your Supervisor**

### OPERATIONAL SAFETY CHECKS

- ✓ Use proper lifting techniques when inserting and removing specimen molds to prevent back injury.
- ✓ Keep hands and arms away from moving parts and pinch points.
- ✓ Keep hands and arms away from the top of the compactor when extruding the specimen.
- ✓ Ensure that the area does not contain any hazards that may impact on the safe operation of the compactor.
- ✓ Do not operate the compactor with any of the access panels or guards removed.

### HOUSEKEEPING

- ✓ Empty the Compactor of all contents.
- ✓ Disconnect the electrical AC power source.
- ✓ Clean up the work area.

**Never allow hands into the pinch point of the Compactor.**

### POTENTIAL HAZARDS AND RISKS

- Moving parts ■ Electricity ■ Manual handling ■ Pinch points

This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to complement training and as a reminder to users prior to equipment use.

APPENDIX B – WORKING ALONE FORM

**Date of Meeting:** \_\_\_\_\_

**Student Name:** \_\_\_\_\_

**Faculty Advisor Name(s):** \_\_\_\_\_

**Civil Labs Students will be working in:**

| LAB NAME                         | Y/N? |
|----------------------------------|------|
| SW3-1640: Hydraulics             |      |
| SW3-1650: Construction Materials |      |
| SW3-1655: Environmental          |      |
| SW3-1690: Geotechnical           |      |
| SW1-1068: Structures             |      |

**Approximate Start Date:** \_\_\_\_\_

**Approximate End Date:** \_\_\_\_\_

**Time of day student will have lab access:** \_\_\_\_\_

**Are you aware of the lab specific safety rules and PPE requirements? (Y/N)** \_\_\_\_\_

**Have you read and reviewed the BCIT Civil Engineering lab safety? (Y/N)** \_\_\_\_\_

**Who is your daily check-in/check-out contact?** \_\_\_\_\_

**Identify specific equipment you will be using and dates you have been trained on its safe operation**

| EQUIPMENT NAME | CAN YOU SAFELY USE THIS EQUIPMENT? (Y/N) | TRAINING DATE |
|----------------|--|---------------|
|                |  |               |
|                |  |               |
|                |  |               |
|                |  |               |
|                |  |               |

**Identify and prioritize the tasks and hazards below, then identify the plans to eliminate/control the hazards.**

| TASKS | HAZARDS | PRIORITY | PLANS TO ELIMINATE/CONTROL |
|-------|---------|----------|----------------------------|
|       |         |          |                            |
|       |         |          |                            |
|       |         |          |                            |
|       |         |          |                            |
|       |         |          |                            |
|       |         |          |                            |

**Additional sheets may be required as needed.**

## APPENDIX C – FIELD TRIP FORM

The following form will need to be filled out and submitted to BCIT OHS (Jasper Tam or Rebecca Chen) for their inputs.

|                             |   |
|-----------------------------|---|
| YEAR                        | <i>Calendar year the trip was or will be taken</i>  |
| MONTH                       | <i>Calendar month the trip was or will be taken</i>   |
| DATE(S)                     | <i>Calendar date(s) the trip was or will be taken</i>   |
| COURSE                      | <i>Course associated with the trip</i>  |
| INSTRUCTOR                  | <i>Instructor(s) associated with the course</i>   |
| NUMBER OF SUPERVISORS       | <i>Total number of faculty and BCIT staff used to supervise the group.<br/>Will there be supervisor(s) from the host?</i>   |
| FIRST AID TRAINING?         | <i>Do any of the supervisors have first aid training? (Y/N)</i>   |
| NUMBER OF STUDENTS          | <i>Total number of students expected to participate</i>   |
| MODE OF TRAVEL              | <i>Self directed or transportation provided by BCIT (SD/BCIT)</i>   |
| SITE NAME                   | <i>Name of the site</i>   |
| SITE LOCATION/ADDRESS       | <i>Site address or location if address is not applicable</i>  |
| DESCRIPTION                 | <i>Ex.: construction site, power plant or bridge</i>  |
| ACTIVITIES                  | <i>Ex.: site investigation or facility tour</i>   |
| DISTANCE TO HEALTH FACILITY | <i>How many minutes will it take to reach the facility</i>  |
| EMERGENCY RESPONSE PLAN     | <i>Is an emergency response plan in place?</i>  |
| SAFETY/FIRST AID ON SITE?   | <i>Does the site employ safety and first aid practices? (Y/N)<br/>Is BCIT or host providing PPE or students bring their own?<br/>Is there going to be a safety orientation on site?</i> |
| OTHER ITEMS                 | <i>Other relevant information</i>   |



