Toronto Metropolitan University

Department of Civil Engineering
Faculty of Engineering & Architectural Science

SAFETY MANUAL

Department of Civil Engineering

Toronto Metropolitan University

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PREFACE

How to Use This Manual

The purpose of this safety manual is to establish guidelines, rules and standard operating procedures (S.O.P.'s) for the academic-research-specific safety program for the Toronto Metropolitan University (also referred as TMU throughout this manual) Civil Engineering Department establishment in accordance with the *Ontario Occupational Health & Safety Act and Regulations*[1] – The Green Book, *Workplace Safety and Insurance Act*[2][3], as well as other applicable codes and standards. In addition, this manual is intended to complement the Toronto Metropolitan University (TMU) Integrated Risk Management policies and rules and Toronto Metropolitan Environmental Health and Safety Department. This safety program has been developed by the Department of Civil Engineering with input from TMU faculty members, staff, and its research students. Should the manual lack information and or not contain items required to follow safe work practices then any Safety Data Sheets (MSDS) and Risk Assessments associated with the work performed and or "The Act" shall be considered and prevail. This manual is intended to serve as the basis for the departmental integrated safety and health management program. Implementation of this safety program satisfies the requirements of the Department of Environmental Health & Safety (EHS), (formerly Integrated Risk Management (IRM) as of June 01, 2017). The essential elements of this program include: **faculty**, **technical staff,** **research students** and **visiting scholars** commitment and involvement; the establishment and operation of safety committees; provisions for safety and health training; first aid procedures; accident investigations; recordkeeping of injuries, training; and workplace safety rules, lab policies, and procedures. It is intended that this manual be enhanced and continuously improved by the Department of Civil Engineering. Any section of this manual may be modified by the employer to accommodate actual operations and lab work practices, provided that the original intent of that section is not lost. Should accidents occur, new or revised safety rules shall be developed and incorporated into this manual to prevent any recurrence.

[1] The university research labs are not considered to be industrial establishments nor construction sites but for the purposes of following the Act all labs offices and areas within Civil Engineering domain shall be considered Industrial Establishments

[2] Supervisor in academic setting is defined as the research faculty member

[3] Worker in academic setting is defined as technical staff, research students, learners and visitor scholars undergraduate students

DISCLAIMER

As applicable codes and standards, policies and procedures including those by "the Act" and Toronto Metropolitan Environmental Health & Safety (EHS), change and evolve, the manual may not be up to date at such time (s) to reflect those changes. Every effort will be made to keep this manual updated.

Refer to EHS website should this manual contain references to documents, forms, links which are no longer accessible:

https://www.torontomu.ca/facilities-management-development/environmental-health-safety/

Note 1: *Sometime in October, 2017 any references to IRM websites may not be accessible as the web address has changed to EHS under the umbrella of FMD (Facilities Management and Development) the final web address is* https://www.torontomu.ca/facilities-management-development/environmental-health-safety/

Note 2: *In late April, 2022 Toronto Metropolitan University (TMU) announced its name change from Ryerson University. The new name was unanimously approved by the institution's board of governors and put into effect immediately. The change includes e-domain address from @ryerson.ca to @torontomu.ca This manual may reference either Ryerson or @ryerson.ca Every effort will be made to keep the manual updated to reflect the University's new name*

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List of Abbreviations

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CSA	Canadian Standards Association
CUPE	Canadian Union of Public Employees
DOS	Division of Safety
DSO	Department Safety Officer
EHS	Environmental Health and Safety
FMD	Facilities Management and Development aka Operations aka Campus Facilities
H&S	Health and Safety
IRM	Integrated Risk Management
MSDS	Material Safety Data Sheet
OHSA	Occupational Health and Safety Act
OPSEU	Ontario Public Service Employees Union
SOP	Standard Operating Procedures
PPE	Personal Protective Equipment
TFA	Toronto Metropolitan Faculty Association
TMU	Toronto Metropolitan University
WSIB	Workplace Safety Insurance Board

Section I – Management Commitment and Involvement

1.1 General

Toronto Metropolitan University is committed to the prevention of illness and injury through the provision and maintenance of a healthy and safe campus. The University endeavours to meet its responsibilities for the health and safety of the members of its community by complying with relevant health and safety standards and legislative requirements, and by assigning general and specific responsibilities for workplace health and safety.

The University takes all reasonable steps to acquaint its employees with their rights and duties in the workplace and applicable regulations and procedures for protecting their health and safety. Where appropriate, the University establishes policies and programs to assist in maintaining safe conditions and work practices and facilitating employee participation in health and safety activities, including health and safety committees.

All individuals shall protect their own health and safety by complying with prevailing regulations and standards and with safe practices and procedures established by the University. Employees must report any health hazards and unsafe conditions or practices to supervisory staff for corrective action.

It is a primary duty of all faculty and staff who are supervisors, as defined under the Occupational Health and Safety Act, to ensure that any persons under their direction are made aware of and comply with all applicable health and safety policies and procedures. They are responsible for ensuring that all aspects of the workplace, including teaching and research sites, are safe and that any risks, hazards, and safety violations drawn to their attention are investigated and corrected promptly.

Employers and employees work together to make safety and health a priority. Employer and employee communication is essential with understanding of their different responsivities and the health & policy statement.
Some ways to achieve employer commitment and employee involvement include:

- Post the department's written safety and health policy for all to see.
- Involve employees / workers in policy making on safety and health issues.
- Take an active part in safety activities.
- Hold meetings that focus on employee / worker safety and health.

- Abide by all safety and health rules.
- Invest time, effort, and money in the safety and health program.

Management leadership and employee / worker involvement are complementary. Management leadership provides the motivating force and the resources for organizing and controlling activities within the organization. In an effective program, management regards worker safety and health as a fundamental value. Employer involvement provides the means through which workers express their own commitment to safety and health, for themselves and their fellow workers. The four main points covered into this section are:

- Management leadership
- Employee / Worker involvement
- Responsibility, authority and accountability
- Review of program operations

1.1.2 Policy Statement

The Toronto Metropolitan University Department of Civil Engineering commits to providing both its employees and students with a safe and healthy workplace. Employees shall report unsafe conditions and do not perform work tasks if the work is considered unsafe. Employees must report all accidents, injuries, and unsafe conditions or practices their supervisors for corrective action. No such report will result in retaliation, penalty, or other disincentive.

Employee recommendations to improve safety and health conditions will be given thorough consideration by the Health and safety committee. Management will give top priority to and provide the financial resources for the correction of unsafe conditions. Similarly, management will take disciplinary action against an employee who willfully or repeatedly violates workplace safety rules. This action may include verbal or written reprimands and may ultimately result in termination.

Senior management will be actively involved with employees in establishing and maintaining an effective safety program, this may be in collaboration in whole or in part with the Environmental Health and Safety – EHS (formerly IRM). A Health and Safety Representative from EHS along with the Department Safety Officer – DSO or other members of a management team will participate in ongoing safety and health program activities, which include:

- Promoting safety committee participation;
- Providing safety and health education and training;

- Reviewing and updating workplace safety rules; and
- Inclusion into this manual

This policy statement serves to express management's commitment to and involvement in providing our employees a safe and healthful workplace. This workplace safety program will be incorporated as the standard of practice for this organization. Compliance with the safety rules will be required of all employees as a condition of employment.

1.1.3 Policy Statement on Environmental Management

The Toronto Metropolitan University is committed to the protection of the environment through the implementation of an effective environmental management program. At a minimum, the University will comply with all applicable environmental legislation and will make every reasonable effort to exceed its formal obligations for protecting the environment, out of a sense of responsibility for the safety of the environment as a shared resource. Members of the University community shall be aware of the manner in which their activities must be conducted in order to have the least possible impact on the environment.

All departments and persons utilizing University premises shall comply with, and if reasonably possible, exceed all environmental statutes and regulations as well as Ministry of Environment policies and guidelines and internal University policies and procedures. Furthermore, it is the duty of all employees or students who are defined as a person responsible under the Environmental Protection Act to ensure that any person under their direction are made aware of and comply with all applicable environmental statutes and legislation. They shall be responsible for ensuring that all aspects of Toronto Metropolitan's premises, including teaching and research sites, pose minimal environmental impact and that any environmental risks and/or hazards are investigated and corrected promptly.

The University shall take all reasonable steps to acquaint its employees with their duties and obligations to prevent, contain and clean up the release of pollutants generated at Toronto Metropolitan or as the result of activities and with the applicable regulations and procedures for protecting the environment. Where appropriate, the University shall establish special procedures and programs to assist in preventing releases of pollutants, the containment of pollutants, cleaning up spills, recycling materials and reusing them. The University shall facilitate and encourage participation in activities to protect and preserve the environment.

Section II Responsibilities within the Department of Civil Engineering

2.1.1 Faculty Members

Both the faculty members from the Toronto Metropolitan Faculty Association (TFA) [1] and the CUPE Local 3904, Unit 1 - Part-Time & Sessional Instructors [2] who are involved into physical labs whether Research or undergraduate work are considered to be Research Engineer / Scientist – Principal.. They are Supervisors in terms of the Act for the persons working in the lab whether students, student researchers or Technical Staff. This may and will require the need to delegate safety to the Technical Staff but ultimately responsibility is with Faculty members.

- Creates a climate of Health and Safety awareness
- Advise staff of existence of any potential hazards to the health and safety of a worker within their respective labs and for their Research
- Provide staff with proper training and written instructions on proper safety procedures
- Assures safety guards and other related safety needs are installed and operational with laboratory equipment; may be in collaboration with Technical Staff and/or researchers
- Demonstrates use of equipment and in a safe manner
- Ensure communication of and use of the appropriate personal protective equipment
- Ensure Researchers and students work in accordance with the set rules, policies and procedures
- Introduction and maintenance of systems and measures to identify, monitor and control risks
- Maintain appropriate records to demonstrate compliance with required regulations
- Provide proper supervision of all staff and students
- Complete and provide signature (sign-off of approval) of Risk Assessments assuring all the necessary training and documents are provided (reference Lab Access Policy) and forwards to the appropriate personnel
- Delegates aspects of safety to Technical staff with the knowledge that safety is ultimately the Faculty responsibility
- Plans, organizes, Supervises controls and directs safety aspects of the work of a staff, engineers, and Technical Staff
- Advises of changes to the Health and Safety Manual including support for on-going development and maintenance

- Be part of the Health and Safety Committee as required by the Chair

2.1.2 Research students and Visiting Scholars (Post-Doctoral Fellows)

Both the Visiting Scholars, Post Doc's Research students and unpaid graduate students taking courses or unpaid working in labs shall be considered employees (workers) under the Act. It is the policy of the Department of Civil Engineering that the Act shall be adhered to, thus they shall be considered workers.

Should they be enumerated (paid) they shall be considered Professors or Instructors for undergraduate courses. As well, they shall be Research Directors of Graduate students. Thus they shall act as direct Supervisors of these students, and shall assume the same responsibilities towards the students doing laboratory work under their direction as if the students where employees, AND the students shall act as workers and follow the duties of a worker.

They are Supervisors in terms of the Act for the persons working in the lab whether students, student researchers or Technical Staff. This may and will require the need to delegate safety to the Technical Staff but ultimately their responsibility. *Reference* 2.1.1 *Faculty Members*

These persons are also part of the health and safety mandate thus may contribute to the H&S manual with support ideas and implementation if called upon.

2.1.3 Technical Support staff (Laboratory Technicians)

The Technical Support Staff have a critical role in keeping the Health and safety within the workplace. They are in the forefront of day-to-day activities in their respective laboratories. These persons shall be considered workers as defined by "The Act". Given that Faculty members are not as present and available as are Technical Staff within the labs, thus, these Technical Support Staff become authoritative in nature over the workers (students and researchers either paid or unpaid) and as such have authority as Supervisors on behalf of Faculty members as defined by "The Act" however ultimate responsibilities lie with the immediate Supervisor and/or Professor.

- Main communication link between DSO and EHS and the Chair
- Support duties of Faculty members as delegated upon
- Ensure WHMIS Safety Data Sheets are readily available and current
- Maintain equipment owner's manuals and/or instruction manuals of respective equipment and available upon request
- Ensure Standard Operating Procedures as required are readily available upon request
- Ensure First Aid and Spill Kits are available and stocked

- Inspect the work place through regular informal Workplace Inspections
- Inspect safety related equipment and record such inspections
- Respond to unsafe conditions
- Provide guidance and/or demonstrations to students and Researchers
- Advise and Provide Personal Protective Equipment and or Safety Apparel including facial fit-test
- Circulate material received from EHS and DSO
- Ensure deficiencies are corrected in collaboration with the Department Chair EHS, DSO Faculty member and/or other Laboratory Technical Staff
- Ensure that the laboratories are free of slips, trips and fall hazards
- Investigate accidents, unsafe conditions or work refusals and communicate with the Chair and or DSO of such conditions
- Complete accident Forms and submit including Workers Compensation Accident Information - to EHS and DSO
- Accompany staff from EHS during their site visits as required
- Accompany inspectors from outside agencies as required
- Inform Department Head of all issues
- Ensure all Safety Related Signs and Laboratory Rules are posted current and visible
- Ensure aspects of information received from DSO and/or EHS are adhered and maintained with respect to:
    - Fire Safety
    - Chemical Safety
    - Mandatory Training; maintain Records of Training
    - Biohazard Safety
    - Radiation Safety
- Administers mandatory training of workers/students including licenses for use of equipment; may request support from DSO and EHS as required with respect to but limited to:
    - Ladder/Working at Heights Safety

- Overhead Cranes Safety
- Heavy Material Lifting and Moving (Fork Lift , Walkie)
- Chemical Safety
- Biohazard Safety
- Radiation Safety

- Advises of changes to the Health and Safety Manual including support for its on-going development and maintenance
- Be part of the Health and Safety Committee as required by the Chair

2.1.4 Administrative Support Staff Duties and Responsibilities

The Administrative Support Staff do have role in keeping the Health and safety within the workplace as do all of us that support Toronto Metropolitan students and the University initiatives. They are one of the first person's all students and researchers see and talk to. These persons shall be considered workers as defined by "The Act". Given that Faculty members are not as present and available as are Administrative Staff thus, they may as required by the Chair to become authoritative in nature over the workers (work study students in offices setting either paid or unpaid) and as such have authority as Supervisors on behalf of the Chair or Faculty members as defined by "The Act". The following shall be inclusive but not limited to:

- Perform duties and responsibilities in a safe manner, *reference section 9.9*
- Provide communication between DSO and the Chair
- The Administrative Assistant shall provide laboratory access to Undergraduate or Post-Doctoral Fellows or Visitors once e-mail confirmation received by the DSO detailing the laboratories room numbers, whether key or Toronto Metropolitan One-Card Access (or both), end date, Supervisor Name, relevant Student identification – this is part of Lab Access Procedure; offices are not affected by this requirement; this shall include supporting the Graduate Program Administrator for Graduate Studies during times of absences.
- The Graduate Program Administrator for Graduate Studies, shall provide laboratory access to Graduate students either Masters of PhD programs once e-mail confirmation received by the DSO detailing the laboratories room numbers, whether key or Toronto Metropolitan One-Card Access (or both), end date, Supervisor Name, relevant Student identification – this is part of Lab Access

Procedure; offices are not affected by this requirement; this shall include supporting the Administrative Assistant during times of absences

- Supports duties of Faculty members as delegated upon
- Inspect the work place through regular informal Workplace Inspections
- Respond to unsafe emergency conditions
- Provide guidance and/or demonstrations to students and Researchers
- Ensure that respective offices are free of slips, trips and fall hazards
- Communicate with the Chair and or DSO of unsafe H&S conditions
- Support as required investigations of unsafe conditions or work refusals and Complete accident Forms and submit including Workers Compensation Accident Information - to EHS and DSO
- Ensure all Safety Related Signs are posted and visible
- Administers mandatory training of workers/students; may request support from DSO as required with respect to:
    - Office safety
    - Fire Safety
    - Ergonomic safety
    - Heavy Material Lifting and Moving
- Requests changes to the Health and Safety Manual including support for on-going development and maintenance
- Be part of the Health and Safety Committee as required by the Chair

2.1.5 Safety Officer Duties and Responsibilities

- Main communication link between Civil department and EHS
- Inspect the work place through yearly Workplace Inspection if required by EHS
- Circulate material received from EHS
- Respond to reports of unsafe conditions
- Ensure deficiencies are corrected in collaboration with the Department Chair and/or Laboratory Technical Staff

- Ensure that the Joint H & S committee at Toronto Metropolitan University members are informed, if needed, to investigate accidents, unsafe conditions or work refusals
- Accompany staff from EHS during their site visits
- Accompany inspectors from outside agencies
- Keep Department Head informed of all issues
- Workers Compensation Accident Information - forward to EHS
- Advises of changes to the Health and Safety Manual including support for on-going development and maintenance
- Sit as member of the Health and Safety Committee
- Ensure staff in the department receive the needed information with respect to:
    - Fire Safety
    - Chemical Safety
    - Mandatory Training
    - Biohazard Safety
    - Radiation Safety

See Appendix II – Departmental Safety Officers

2.1.6 Department Head Duties and Responsibilities

- Establishes the Health and Safety Committee as well as member of the Health and Safety Committee
- Decides on Frequency of Committee meetings
- Advise staff of existence of any potential hazards to the health and safety of a worker
- Provide staff with proper training and written instructions on proper safety procedures
- Ensure communication of and use of the appropriate personal protective equipment
- Ensure staff work in accordance with the set rules, policies and procedures
- Introduction and maintenance of systems and measures to identify, monitor and control risks
- Maintain appropriate records to demonstrate compliance with required regulations
- Provide proper supervision of all staff and students

- Advises of changes to the Health and Safety Manual including support for on-going development and maintenance
- Provides signature (sign-off of approval) of Risk Assessments by Faculty Members and/or Student Events assuring all the necessary training and documents are provided (reference Lab Access Policy) and forwards to the DSO for implementation

2.2 Summary of Duties

2.2.1 General

Everyone in the workplace in responsible for Safety, whether their own personal safety or the safety of others in the workplace. Safety does not fall under one persons nor one department responsibility it is for all to contribute and be a part of. From the employer to the newest worker, each has different but important duties to keep the workplace safe within the 4 steps of awareness per OHSA [3].

Step 1: Get on Board

Step 2: Get in the know – the right to know

Step 3: Get involved – the right to participate

Step 4: Get more help – the right to refuse unsafe work and where to go for help

2.2.2 Table of Summary of Duties

Duties of employer	Duties of supervisor	Duties of worker
1. Make sure workers know about hazards and dangers in the workplace and how to work safely. 2. Make sure every supervisor knows how to take care of health and safety on the job. 3. Create health and safety policies and procedures for the workplace. 4. Make sure everyone knows and follows the	1. Tell workers about hazards and dangers in the workplace and show them how to work safely. 2. Make sure workers follow the law and the workplace health and safety policies and procedures. 3. Make sure workers wear and use the right protective equipment. 4. Do everything reasonable to keep	1. Follow the law and the workplace health and safety policies and procedures. 2. Always wear or use the protective equipment that the employer requires. 3. Work and act in a way that won't hurt them or any other worker. 4. Report any hazard they find in the workplace to their supervisor.

health and safety procedures. 5. Make sure workers wear and use the right protective equipment. 6. Do everything reasonable to keep workers from getting hurt or sick on the job.	workers from getting hurt or sick on the job.	

2.3 Occupational Health and Safety Act

The Occupational Health and Safety Act came into effect in Ontario in 1979. The purpose of this Act is to protect workers from health and safety hazards on the job. Both workers and supervisors have responsibilities under the terms of the Act.

2.3.1 Supervisors and their Duties

Definition of a Supervisor:

A "supervisor" is defined in the Act as a *person who has charge of a workplace or authority over a worker. A supervisor: is qualified because of knowledge, training, and experience to organize work and its performance, is familiar with the Act and the regulations that apply to the work, and has knowledge of any potential or actual danger to health or safety in the workplace.*

A worker is an employee of the supervisor or their institution or firm. A professor who directs the research of a graduate student, postdoctoral fellow or other research associate is the direct supervisor of that individual if that individual is paid a salary for the research. A graduate student, postdoctoral fellow, or other research associate who does not receive a salary, being supported through other funds, is considered to be under the supervision of the professor who directs the individual's research.

Duties of a Supervisor:

(1) A supervisor shall ensure that a worker,

- *works in a manner and with the protective devices, measures and procedures required by this Act and the regulations; and*
- *uses or wears the equipment, protective devices or clothing that their employer requires to be used or worn*

(2) Without limiting the duty imposed by subsection (1), a supervisor shall

- *advise a worker of the existence of any potential or actual danger to the health or safety of the worker of which the supervisor is aware;*
- *where so prescribed, provide a worker with written instructions as to the measures and procedures to be taken for protection of the worker; and*
- *takes every precaution reasonable in the circumstances for the protection of a worker.*

A supervisor also has special responsibilities in dealing with accidents involving personal injury or death; see ACCIDENT INVESTIGATION PROCEDURES.

2.3.2 Workers and their Duties

Definition of a Worker:

A "worker" means *a person who performs work or supplies services for monetary compensation,* which includes faculty, staff, teaching assistants, lab demonstrators, post-doctoral fellows, research associates, technicians, technologists, graduate students. Undergraduate students taking courses and visitors to the Department, shall be considered workers.

Duties of a Worker:

(1) A worker shall,

- *work in compliance with provisions of this Act and the regulations,*
- *use or wear the equipment, protective devices or clothing that their employer requires to be used or worn;*
- *report to their employer or supervisor the absence of or defect in any equipment or protective device of which they are aware and which may endanger themselves or another worker; and*
- *report to their employer or supervisor any contravention of this Act or the regulations or the existence of any hazard of which they know.*

(2) No worker shall,

- *remove or make ineffective any protective device required by the regulations or by their employer, without providing an adequate temporary protective device and when the need for removing or making ineffective the protective device has ceased, the protective device shall be replaced immediately;*

- *use or operate any equipment, machine, device or thing or work in a manner that may endanger himself/herself or any other worker; or*
- *engage in any prank, contest, feat of strength, unnecessary running or rough or boisterous conduct.*

2.3.3 Right to Refuse Unsafe Work and Duties

Right to Refuse or to Stop Work Where Health or Safety are in Danger:

(1) A worker may refuse to work or do particular work where he or she has reason to believe that,

- *any equipment, machine, device, or thing the worker is to use or operate is likely to endanger himself, herself or another worker;*
- *the physical condition of the workplace or the part thereof in which he or she works or is to work is likely to endanger himself, or herself; or*
- *any equipment, machine, device or thing he or she is to use or operate or the physical condition of the workplace or the part thereof in which he or she works or is to work is in contravention of this Act or the regulations and such contravention is likely to endanger himself, herself or another worker.*

(2) Upon refusing to work or do particular work, the worker shall promptly report the circumstances of the refusal to the worker's employer or supervisor who shall forthwith investigate the report in the presence of the worker and, if there is such, in the presence of one of;

- *a committee member who represents workers, if any;*
- *a health and safety representative, if any; or*
- *a worker who because of knowledge, experience and training is selected by a trade union that represents the worker, or if there is no trade union, is selected by the workers to represent them, who shall be made available and who shall attend without delay.*

2.3.4 Students Professors, Instructors and their Duties

Students

Undergraduate students taking courses and unpaid graduate students shall be considered employees (workers) under the Act.

Professor, Instructors

It is however the policy of the Department of Civil Engineering that the Professors, instructors in undergraduate courses and research directors of graduate students shall act as the direct supervisors of these students, and shall assume the same responsibilities towards the students doing laboratory work under their direction as if the students are employees, AND the students shall act as workers and follow the duties of a worker.

Section III – Safety Committee

3.1 General

The Toronto Metropolitan University Joint health and safety committee (JHSC) is composed of workers and employer representatives. Together they shall be mutually committed to improving health and safety conditions in the workplace. Committees identify potential health and safety issues and bring them to employer's attention and must be kept informed of health and safety developments in the workplace by the employer. As well, a designated worker member of the committee inspects the workplace as required [4].

3.2 Safety Committee Organization

The Civil Engineering Department safety committee establishes and recommend improvements to the workplace safety program safety Manual and its on-going development to identify corrective measures needed to eliminate or control recognized safety and health hazards. The safety committee employer representatives will not exceed the amount of employee / workers representatives (i.e. one unit includes: Professor, technical staff, Chair, DSO and may include research student).

3.3 Responsibilities

The safety committee will be responsible for assisting management in communicating procedures for evaluating the effectiveness of control measures used to protect employees / workers from safety and health hazards in the workplace. The Toronto Metropolitan University EHS representative may be called upon for guidance and support in the committee endeavours.

For assisting management in reviewing and updating workplace safety rules based on accident investigation findings, any inspection findings, and employee reports of unsafe conditions or work practices; and accepting and addressing anonymous complaints and suggestions from employees / workers / researchers / students.

For assisting management in updating the workplace safety program by evaluating employee / worker injury and accident records, identifying trends and patterns, and formulating corrective measures to prevent recurrence.

For assisting management in evaluating employee / worker accident and illness prevention programs, and promoting safety and health awareness and co-worker participation through continuous improvements to the workplace safety program.

Safety committee members, partial or in whole, shall participate in safety training and be responsible for assisting management in monitoring workplace safety education and training to ensure that it is in place, that it is effective, and that it is documented.

Management will provide written responses to safety committee written recommendations.

3.4 Meetings

Safety committee meetings shall be held ideally quarterly or less as needed (more often if needed) and each committee member will be compensated as applicable when engaged in safety committee activities. Management shall post the minutes of each meeting in a conspicuous place and the minutes will be available to all employees / workers.

3.5 Minutes of Committee Meetings

All safety committee records will be maintained for not less than three calendar years. Those minutes shall be filed by the DSO or appointed person.

Section IV – Safety and Health Training

4.1 General

The occupational health and safety awareness training provides a basic understanding of the Occupational Health and Safety Act (OHSA) [5], and does not replace any sector specific, hazard specific, or competency specific training. Workplace health and safety promotes health and safety through partnerships, educations

> *Health and safety awareness training for every worker and supervisor under Ontario's Occupational Health and Safety Act (OHSA).*

4.2 Health and Safety Orientation

Workplace safety and health orientation begins on the first day of initial employment or job transfer. Each employee has access to a copy of this safety manual, through his or her supervisor, for review and future reference, and will be given a personal copy or access to the safety rules, policies, and procedures pertaining to his or her job as required. Supervisors will ask questions of employees and answer employees' questions to ensure knowledge and understanding of safety rules, policies, and job-specific procedures described in our workplace safety program manual. All employees will be instructed by their supervisors that compliance with the safety rules described in the workplace safety manual is required.

The EHS department shall conduct yearly Graduate student Orientation (generally in the Fall Semester) or as needed. This shall include but not limited to OHSA fire routes and drills workplace violence security. The Civil department shall provide additional orientation to WHMIS and EHS Young Workers where on-line certificates are produced through the EHS department (see Lab Access Procedures). Additionally, considering each research lab and general lab and facilities are unique safety awareness further training for work and research activities shall be included and specific to.

See Appendix II – Safety Orientation Details and Attendance Form for GA TA

4.3 Job-Specific Training

Supervisors (Professor's for example) will initially train employees / workers on how to perform assigned work safely. Supervisors (such as Professors) may delegate responsibly to Technical Staff as required but ultimately responsibility lies with the Supervisor. The following shall be inclusive but not limited to:

- Carefully review with each employee the specific safety rules, policies, and procedures that are applicable and that are described in the workplace safety manual and SOP's.
- Provide employees / workers verbal instructions and specific directions on how to do the work safely.

- Observe employees / workers performing the work. If necessary, shall provide a demonstration using safe work practices, or remedial instruction to correct training deficiencies before an employee is permitted to do the work without supervision.
- All employees / workers will receive safe operating instructions on seldom-used or new equipment before using the equipment.
- Shall review safe work practices with employees / workers before permitting the performance of new, non-routine, or specialized procedures.

  Shall document training on Forms and maintain said records of training for a period of no less than three (3) calendar years

See Appendix II – Record of Training

See Appendix II – Safety Form Waiver Mach. Shop MON107

4.4 Periodic Retraining of Employees

All employees / workers will be retrained periodically on safety rules, policies and procedures, and when changes are made to the workplace safety manual. Individual employees will be retrained after the occurrence of a work-related injury caused by an unsafe act or work practice, and when a supervisor observes employees / workers displaying unsafe acts, practices, or behaviors.

Training shall be provided as well so they are able to:

- Recognize the health and safety hazards of their work
- Use established work practices and procedures to protect their health and safety and that of their co-workers
- Take special care when working with new materials

Specifically, instruct laboratory workers in:

- Hazards of the materials, machinery and equipment used
- Ergonomic hazards
- Use of ventilation systems and PPE

4.5 Lab Access Procedures with Training and Minimum Requirements

Note: Refer to lab access policy for complete details see appendix II as follows

See Appendix II – Lab Access Policy

4.6 Lifting Devices Training and Minimum Requirements

All operators of lifting devices of fork lifts overhead cranes scissor lift electric pallet movers shall have training performed by an outside company. With this training a licence shall be acquired. Companies for example are Ryder and Wajax however any accredited company or agency shall be acceptable.

Training for lifting devices of this nature may be performed internal to the Department of Civil Engineering by persons within the University. They must have been trained and licenced to perform training to others. Such agencies that provide this must be accredited by the Ontario government or it's affiliates.

4.7 Working at Heights Training Requirements

Workers, Researchers and students shall attend one of the sessions for those who:

- carries out construction-type work (e.g. painting, repair, dismantling, drilling, installation of machinery etc.);
- requires the use of fall protection (travel restraint systems, fall restricting systems, fall arrest systems, safety nets and work belts or safety belts) in the course of your work; or
- supervises or assigns work at heights.
- Requires the use of scissor lift

Although the Ontario Ministry of Labour requires that employees working on construction projects that use fall protection receive Working at Heights Training, the University shall recognize its requirements. The training must be approved by Ontario's chief prevention officer and delivered by an approved training provider - EHS shall administer such training.

Workers, Researchers and students shall understand the theory module:

1. through discussion of working at heights hazards
2. controls,
3. basics of fall protection and ladder safety.

Additionally Workers, Researchers and students shall understand the Practical equipment module. This focuses on the application and use of the different fall protection systems, their components, as well as their limitations. They shall successfully meet the performance outcomes, including demonstrating how to inspect the equipment, how to don and take off the harness, and maintaining 100% tie-off.

By the end of the program, they shall be able to:

- recognize working at heights hazards

- explain the hierarchy of controls
- discuss safe work plans
- identify and assess when ladders are appropriate as well as learn about proper inspection, care and use of ladders
- describe types of warning methods and physical barriers, and identify when they are required discuss limitations, application and storage of different fall protection systems calculate fall distances
- demonstrate how to inspect equipment, don and doff a harness, and maintain 100% tie-off discuss the differences between permanent, temporary and structural anchors
- select the appropriate fall protection equipment when working on a platform explain the roles and responsibilities of workplace parties with respect to a rescue plan

For complete training requirements and information refer *see appendix II EHS*

See Appendix II – Safety Tip Sheet Ladder Safety

4.8 Compressed Gas Cylinders Training Requirements

Workers, Researchers and students who wish to handle store gas cylinders shall attend EHS training sessions. Contact EHS department 416-979-5000 ext.553770 or at ehs@torontomu.ca

See Appendix II – IRM Compressed Gas Cylinder Procedure

4.9 Mandatory Training for Student Interns

Mandatory safety training for all paid and unpaid student interns

To: All Employees

Toronto Metropolitan is a recognized leader in smart risk-taking, having achieved one of the best rankings in injury prevention performance in the university sector. Despite this impressive standing and ongoing prevention efforts, our goal is to achieve zero accidents. Young workers, like Toronto Metropolitan students starting internships over the summer, are the most vulnerable group at risk of harm in the workplace.

Training is mandatory for all interns

The law requires mandatory environmental health and safety awareness training for both paid and unpaid workers. This includes students interns in research placements, practicums, exchanges, zones and thesis-related activity both on and off campus.

Environmental Health and Safety (EHS) is pleased to share the following requirements for both **supervisors who will be retaining interns at Toronto Metropolitan, and those coordinating opportunities with external placement employers.**

Interns working at Toronto Metropolitan University

TMU faculty and staff who will be retaining and supervising interns are required to ensure interns complete the online EHS Awareness eLearning module (instructions below).

As a TMU employee, this training will prepare interns to be safe and informed in the workplace. This training was created in compliance with Ontario Ministry of Labour (MOL) Regulation 297/13.

Interns working with external placement employers

TMU supervisors or advising organizers must take the following steps to ensure interns are entering safe external placements and that the risks are fully understood by all parties.

Placement agreements

For unpaid practicum placements that are required as a component of the student's academic curriculum, supervisors and advising organizers (including but not limited to placement coordinators, managers, or program administrators) must ensure that there is an active practicum agreement between TMU and each external placement employer before students start their placement at the external site. In the absence of a formal agreement in writing, a new agreement is required and must be reviewed and processed by the office of General Counsel prior to the student's placement start date. Supervisors and advising organizers shall refer to Ryerson's standard placement agreement.

Insurance

WSIB coverage is available for paid interns through their placement employer. For unpaid, curriculum-required internships, WSIB coverage is provided through the Ontario Ministry of Advanced Education and Skills Development. For any other internships, please contact the insurance officer at 416-979-5000 ext. 553772.

Site-specific training

As a legal requirement under the Ontario Occupational Health and Safety Act, it is mandatory that external placement employers provide site-specific safety training to their interns. In addition,

employers also need to complete the *See Appendix II – Placement Employer Safety Orientation Checklist* with the intern on the first day of placement. The intern will need to sign the checklist to confirm that they have received the training. Once completed, please send it to the TMU supervisors or advising organizers.

EHS Awareness eLearning Module

TMU students placed as interns with external employers are required to complete basic online training to stay safe and informed in the workplace. The EHS Awareness eLearning module will prepare interns to be safe and informed in the workplace, providing students with the tools they need to understand their rights and responsibilities as an employee in Ontario. Please note that this course is not a replacement for the placement employer's mandatory, site-specific training. This training was created in compliance with Ontario MOL Regulation 297/13.

How can interns access the mandatory eLearning module?

To access the EHS Awareness eLearning module, students should follow these instructions.

Training is mandatory for all interns

For technical questions or assistance with troubleshooting D2L, please contact the Computing and Communications Services (CCS) Faculty and Staff Help Desk at help@torontomu.ca or 416-979-5000, ext. 556806.

Section V – First Aid Procedures

5.1 General

First aid stations, kits and training are mandated by Regulation 1101: *First Aid Regulation* and the Workplace Safety Insurance Board (WSIB). Technical Staff shall have such training and continue with re-training as expiration occurs. This is to be performed by an accredited association such as St. John's Ambulance or equivalent.

The WSIB's "In Case of Injury" poster (Form 82) must be prominently displayed in every workplace covered by the WSIB.



5.2 Minor First Aid Treatment

First aid kits are kept in the front office, and each laboratory. If you sustain an injury or are involved in an accident requiring minor first aid treatment:

- Administer first aid treatment to the injury or wound.
- Inform your supervisor, or Technical Staff.

- Should a first aid kit be used, indicate usage on the accident investigation report.
- Access to a first aid kit is not intended to be a substitute for medical attention.
- Provide details for the completion of the accident investigation report.
- dial “80” should a Technical staff not be available

5.3 Non-Emergency Medical Treatment

For non-emergency work-related injuries requiring professional medical assistance, management must first authorize treatment. If you sustain an injury requiring treatment other than first aid:

- Inform your supervisor.
- Proceed to the nearest medical facility. Your supervisor will assist with transportation, if necessary.
- Provide details for the completion of the accident investigation report.

5.4 Emergency Medical Treatment

If you sustain a severe injury requiring emergency treatment:

- Call for help and seek assistance from a co-worker.
- Use the emergency telephone numbers and instructions posted next to the telephone in your work area to request assistance and transportation to the local hospital emergency room; dial “80”.
- Provide details for the completion of the accident investigation report.

5.5 First Aid Training

Each employee / worker will receive training and instructions from his or her supervisor on the first aid procedures. This may be allocated to a third party agency such as St. John’s Ambulance. At minimum each laboratory Technical staff shall have first aid training.

5.6 First Aid Instruction

In all cases requiring emergency medical treatment, immediately call, or have a co-worker call, to request emergency medical assistance.

WOUNDS:

Minor: Cuts, lacerations, abrasions, or punctures

- Wash the wound using soap and water; rinse it well.
- Cover the wound using clean dressing.

Major: Large, deep and bleeding

- Stop the bleeding by pressing directly on the wound, using a bandage or cloth.
- Keep pressure on the wound until medical help arrives.

BROKEN BONES:

- Do not move the victim unless it is absolutely necessary.
- If the victim must be moved, "splint" the injured area. Use a board, cardboard, or rolled newspaper as a splint.

BURNS:

Thermal (Heat)

- Rinse the burned area, without scrubbing it, and immerse it in cold water; do not use ice water.
- Blot dry the area and cover it using sterile gauze or a clean cloth.

Chemical

- Flush the exposed area with cool water immediately for 15 to 20 minutes.

EYE INJURY:

Small particles

- Do not rub your eyes.
- Use the corner of a soft clean cloth to draw particles out, or hold the eyelids open and flush the eyes continuously with water.

Large or stuck particles

- If a particle is stuck in the eye, do not attempt to remove it.
- Cover both eyes with bandage.

Chemical

- Immediately irrigate the eyes and under the eyelids, with water, for 30 minutes. Each lab will have an eye wash station

NECK AND SPINE INJURY:

- If the victim appears to have injured his or her neck or spine, or is unable to move his or her arm or leg, do not attempt to move the victim unless it is absolutely necessary.

HEAT EXHAUSTION:

- Loosen the victim's tight clothing.
- Give the victim "sips" of cool water.
- Make the victim lie down in a cooler place with the feet raised.

Section VI – Accident Investigation and Procedures

6.1 General

The prime objective of **accident[4] investigation** is prevention. Finding the causes of an accident and taking steps to control or eliminate it can help prevent similar from happening in the future. Accidents can rarely be attributed to a single cause. Work environment, job constraints, and supervisory or worker experience can all play a part. These factors shall be examined to determine what role each had in causing the accident.

In order for an investigation to be a valuable tool in accident prevention, three things must take place:

1. the information gathered must be analyzed;
2. corrective action must be taken; and
3. the action must be monitored for effectiveness.

Above all DO NOT PANIC

6.2 Accident Investigation, Procedures, Reporting

All accidents whether near misses to major to fatalities shall have and internal accident and/or WSIB form completed

See EHS website: https://www.torontomu.ca/facilities-management-development/environmental-health-safety/emergencies-reporting/report-incident-injury/

Note: *Sometime in October, 2017 any references to IRM websites may not be accessible as the web address will be changing to EHS under the umbrella of FMD (Facilities Management and Development) the final web address will be unknown until such time.*

6.2.1 Minor Accidents Procedures

Minor accidents involving hazardous chemicals or the malfunction and/or breakdown of equipment must be reported to the immediate supervisor. More serious accidents shall be considered Major in nature (see 6.2.2) and must be reported to the Department Safety Officer and the Head of the Department as well as to the immediate supervisor.

[4] The term "accident" can be defined as an unplanned event that interrupts the completion of an activity, and that may (or may not) include injury or property damage.
An incident usually refers to an unexpected event that did not cause injury or damage this time but had the potential. "Near miss" or "dangerous occurrence" are also terms for an event that could have caused harm but did not.
For Detailed Definition refer to *http://www.ryerson.ca/irm/report_hazard_accident/definitions/*

- Apply first aid (first aid kits available on all floors); first aid shall be given by someone who has had appropriate training
- In the case of minor injuries that cannot be satisfactorily treated by first aid alone, or if there is any doubt, this shall be considered major in nature.

6.2.2 Major Accident Procedures

All accidents involving personal injury must be reported promptly to your supervisor who is responsible for ensuring that the procedures below are followed. If your supervisor is not immediately available, contact the Department Safety Officer or the Head of the Department. Should they not be available inform security ext. 5040 and explain the nature of the situation

- Apply first aid (first aid kits available on all floors); first aid shall be given by someone who has had appropriate training
- Report promptly to your supervisor who is responsible for ensuring that the procedures are followed.
- If your supervisor is not immediately available, contact the Department Safety Officer or the Head of the Department.
- Should they not be available inform security ext. 5040 and explain the nature of the situation
- The injured person shall be sent or taken to the hospital emergency unit, or doctor of his/her choice. TMU employee's should take along a completed copy of the Worker's Compensation Board and any additional forms available from the Departmental Manager. If this form does not accompany the injured employee to the treatment centre then it must be filled out and sent to the treatment centre as soon as possible.

6.2.3 Severe Accident Procedures

- In the case of injuries that are more severe, or there is doubt about the severity of the injury, and emergency assistance is required, call ext. 80 from an internal phone (or 911 from an external phone however 911 operators may not be aware of Campus Rooms so better to call 416 979-5040 for Security).
- If it is necessary to call an ambulance, indicate the location of the injured person and the location of the nearest appropriate entrance to the building. If possible send someone to that entrance to lead the ambulance personnel to the injured person.
- A SEVERELY INJURED PERSON MUST NOT BE MOVED without the advice of medical or ambulance personnel.

6.2.4 Critical or Fatality Accident Response Procedures

For all accidents involving critical injury or fatality:

- Immediately call ext. 80 for assistance from an internal phone (or 911 from an external phone however 911 operators may not be aware of Campus Rooms so better to call 416 979-5040 for Security).
- If it is necessary to call an ambulance, indicate the location of the injured person and the location of the nearest appropriate entrance to the building. If possible, send someone to that entrance to lead the ambulance personnel to the injured person.
- As soon as possible, notify your supervisor, the Head of the Department (or Safety Officer), and the Department of Environmental Health and Safety. The latter will notify the appropriate government agencies.
- Do not touch anything associated with the accident, except for the purpose of saving life, relieving suffering or preventing unnecessary damage to equipment or property. The scene of an accident must be examined by the appropriate authorities.

6.2.5 Who Performs the Accident Investigating

An accident investigation will be performed by the supervisor at the location where the accident occurred. The TMU EHS safety coordinator is responsible for seeing that the accident investigation reports are being filled out completely, and that the recommendations are being addressed.

Supervisors will investigate - at the option of collaboration with DSO and /or Technical Staff- all accidents, injuries, and occupational diseases using the following investigation procedures:

- Implement temporary control measures to prevent any further injuries to employees.
- Review the equipment, operations, and processes to gain an understanding of the accident situation.
- Identify and interview each witness and any other person who might provide clues to the accident's causes.
- Investigate causal conditions and unsafe acts; make conclusions based on existing facts.
- Complete the accident investigation report.
- Provide recommendations for corrective actions.
- Indicate the need for additional or remedial safety training.

Accident investigation reports must be submitted to the EHS safety coordinator within 24 hours of the accident.

Other members of the Investigation team can include:

- employees with knowledge of the work, ie Technical Staff
- safety officer
- health and safety committee
- union representative, if applicable
- employees with experience in investigations

- "outside" expert
- representative from government

Section VII – Recordkeeping Procedures

7.1 General

Compliance to Record keeping shall be in accordance to Toronto Metropolitan University Policies: Refer to website: …… UNDER DEVELOPMENT

The purpose of this section of the recordkeeping procedures is for workplace injuries use of equipment yearly Workplace Inspections and any equipment listed in the "The Act" unless described elsewhere within the manual. It provide proof for registry staff, government official union various officers in the event of accidents malfunction and the like.

7.2 First Notice of Injury; First Aid Training

The EHS safety coordinator will control and maintain all employee / worker accident and injury records. Records are maintained for a minimum of one year or at least the two most recent reports as per O. Reg. 851 section 6 and include:

- Accident Investigation Reports;
- WSIB's Employer's Report of Injury/Illness Form 7; and
- Log & Summary of Occupational Injuries and Illnesses.

Each person that obtains first aid training shall keep their own personal record, generally provided in wallet size certificate. Training is typically co-ordinated through the EHS department with records of such in their possession.

7.3 Training Records of Personnel Using Equipment, Material Handling, Processes

Training records as described in the manual shall be filed with the person that performed the training. These shall be maintained in good order and readily available upon request.

7.4 Training Records of Lifting Equipment, Material Handling, Processes

Training records shall be filed with the person that performed the training. These shall be maintained is good order and readily available upon request.

7.5 Operating Instructions, Owner's Manual of Tools and Equipment Procedures

Each piece of equipment and/or tool, whether for laboratory use or office use shall be accompanied with manufacturer instruction or owner's manuals. Non-motorized equipment and general purpose hand tools (screwdrivers pliers hammers for example) generally do not.

Procedure:

1. Obtain manual from manufacturer (these are generally in hard copy form)
2. Photocopy the original and maintain this photocopy in proximity of the equipment or tool
3. File/store original in a safe place (filing cabinet for example)
4. Assure original is available upon request
5. Should these be only available on the internet, provide copy of web-site and post its location in proximity of equipment

7.6 Standard Operating Procedures (SOP's)

SOP's are UNDER DEVELOPMENT through EHS. When complete, SOP's shall be made readily available upon request.

Procedure:

1. Obtain SOP's from EHS (these are generally in hard copy form)
2. Photocopy the original and maintain this photocopy in proximity of the equipment or tool
3. File/store original in a safe place (filing cabinet for example)
4. Assure original is available upon request
5. Should these be only available on the internet or electronically, provide copy of web-site and post its location in proximity of equipment

7.7 Inspection of Safety Equipment

Safety Equipment whether fixed or portable shall be inspected regularly. These regular inspections shall be conducted as required by the manufacturer and/or as standards require. Records of such shall be readily visible as required and/or readily available upon request.

Section VIII - Safety Rules, Policies and Procedures

The safety rules contained on these pages have been prepared to protect you in your daily work. Employees are to follow these rules, review them often and use good common sense in carrying out assigned duties. Remember safety is everyone's responsibility, not just one individual nor department – it belongs to all of us.

8.1 General Laboratory Safety

8.1.2 General

- Know and follow safety rules, procedures and protocols
- Be aware of hazards, and the procedures for dealing with those hazards, before you start your work
- Fire doors must be kept closed at all times
- Familiarize yourself with all safety equipment and procedures in your work area (telephone, exits, fire extinguishers, fire alarms, fire blankets, safety shower, eyewash fountain, first aid and spill kits, evacuation routes)
- Never block emergency exits, emergency equipment or electrical panels
- Post suitable warning signs if a specific hazardous situation exists; include the name and phone number of individual(s) responsible
- Maintain a tidy workplace
- Research labs must keep lab doors closed to effect proper ventilation of the lab
- Keep your work area locked when unoccupied to avoid unauthorized entry
- No bicycles, roller blades or pets in buildings

8.1.3 Student/Worker Safety Orientation Checklist

See Appendix II – Safety Orientation Details and Attendance Form for GA TA

8.1.4 Release of Liability for Visitors and Volunteers

Form UNDER DEVELOPMENT

8.1.5 Working Alone

Undergraduate students must not work alone in a laboratory at any time. A second person must be present and must assume responsibility of the undergraduate. The work carried out must be authorized by a faculty member. For other members of the Department, working alone is usually defined as working in a laboratory outside of normal working hours (8 a.m. to 6 p.m., Monday through Friday) in the absence of any other co-workers faculty or staff. Individuals may work alone if their laboratory work is of a non-hazardous nature and if there is someone else working on the same floor and wing of the building and is aware of their presence.

If, for some reason, hazardous work must be performed outside normal working hours then the following procedure must be followed:

1. The work must have your Supervisor's or Professor's written approval,
2. A second co-worker must be available in case of emergency, or
3. Inform Campus Security (ext. 5040) to set up a check-in routine with you; they must be contacted again once your work is completed.

If you are working late at night, both the Campus Security provides and Escort Service

8.1.6 Safety Rules within the Department of Civil Engineering

- All accidents must be reported to the nearest Laboratory Technical Staff, and your supervisor and to the Department Safety Officer.
- Anyone wishing to use any power tools must have the approval of a qualified technician and must have received appropriate training on that equipment prior to any use.
- Faculty, staff and students must not work alone when using power tools, hazardous substances, or dangerous equipment.
- Undergraduates must not work alone in a laboratory at any time. No unauthorized work shall be performed in the testing laboratories and shops after normal operating hours.
- The student/workers must notify their supervisor if they will be working after normal operating hours in any testing laboratories or shops and must abide by the university's policy on working alone.
- All laboratory and shop doors will be locked after normal operating hours (i.e. 8:30am to 5:00pm). If a later lockup time is needed, responsibility for ensuring a particular laboratory is locked may be transferred to a responsible person.
- An undergraduate student may work in testing laboratory areas only if a faculty member or staff member is notified, and there is a responsible person present (any exceptions to this policy will be made by the Department Head).
- All supervisors are responsible for ensuring that proper personal protective equipment is worn by their student/worker (e.g. safety shoes, safety glasses, etc.).
- All electrical panels to be obstruction free at least one metre away; there shall be no leaning of tools nor materials onto the door of the electrical panel
- The initial use of any unproven testing system must be supervised by the principal investigator responsible for the project. This includes all testing systems which employ any hazardous substance. The health and safety of all persons who may come in contact with a testing system must be considered. Also see Pre-Start Health and Safety Review

- For testing systems which use regulated hazardous substances, a written plan specifying all control measures to be taken to ensure the safe handling of the substance(s) must be developed. This plan shall include details of the procedures to be used in case of accidental spill or exposure of workers/students, and the method of disposal shall be outlined. It is recommended the plan have the approval of the EHS Environmental Health and Safety and the Department Safety Officer.
- All hazardous substances purchased or received in the Department must be done via the appropriate Laboratory Technical Staff, so proper handling and storage procedures are met. All shipments of hazardous substances must meet the Transport of Dangerous Goods legislation and the University's standard operating procedures.
- All supervisors are responsible for ensuring that their student/worker completes a WHMIS EHS and Young Workers on-line training course.
- All students/workers and supervisors must complete and sign the student/worker safety orientation checklist.

  See Appendix II – Safety Orientation Details and Attendance Form for GA TA

8.1.7 Pre-Start Health and Safety Review of Equipment

All equipment entering the lab for the first time whether purchased as new or as used or as custom fabrication, shall have a pre-start health and safety review. This shall be conducted by a competent person knowledgeable of such equipment and its safety features. This shall include but not limited to:

- electrically approved for use in Canada (CSA ETL, ULc as examples)
- dents, tears, damage free
- all safety guards secured and in its proper location
- emergency button to applicable standards (red with distinctive yellow border)
- flying objects free
- owner's manual with operating instructions provided
- Engineer stamp if required

Health and safety reviews shall be conducted by a third party organization for equipment valued at over $25,000.00 Canadian dollars. Such organization shall provide its findings and approval to proceed. No equipment shall be operated until modifications, if any, are required.

8.1.8 Undergraduate and Research Laboratories – Safety Rules

Due to Laboratories commonly utilized by others such as students and researchers, be aware that as the person entering the lab at each session, for the day, after break(s) etc. etc. that the lab may be in a different condition the its previous state. Always enter with caution.

Each laboratory shall have general lab rules posted on a wall near the entrance door (s) or on the entrance door. Read and understand these rules.

See Appendix V – Laboratories Posted Rules

Here are some common laboratory rules:

SAFETY GOGGLES/GLASSES must be worn at all times in the lab. Prescription glasses can be worn under the safety goggles.

FIRE: Use drench showers or blankets (Drop and Roll) for clothing fires. Immediately **report it to the supervisor or lab demonstrator** or other responsible individual, and then exit the laboratory and building quickly via proper exit route (Make sure you know where the exits are). Use fire extinguishers for bench-top fires or other fires only if very small fire.

CHEMICAL SPILLS: must be cleaned up immediately. Use plenty of water to rinse chemicals from eyes or skin. Remove chemical-soaked clothing if caustic. Know where showers and eye-wash fountains are and how to use them.

FOOD AND DRINK are not allowed in any laboratory.

ACCIDENTS AND INJURIES must be reported to the demonstrator or other responsible person. There are emergency first aid supplies available and most technicians and others are trained in basic first-aid, but any injury of consequence will be handled by the medical services.

FUME HOODS must be used for any experiment involving irritating or hazardous vapours.

UNSUPERVISED WORK: No undergraduate student is permitted in the laboratories unless there is a supervisor present (see working alone 8.1.5).

- Be aware of the specific hazards associated with each lab exercise.
- Wear appropriate clothing and foot wear (NO OPEN_TOED SHOES).
- Familiarize yourself with all emergency safety equipment (eyewash, fire alarm, fire extinguishers, telephone).
- Label all containers in use (bottles, beakers)
- Do not leave hazardous experiments unattended
- Clean your work area and wash before leaving the laboratory

THE BEST SAFETY PRECAUTIONS include **ADVANCED PREPARATION** for each laboratory and a **CLEAN ORGANIZED WORK SPACE.**

VIOLATION OF ANY SAFETY REGULATION IS GROUNDS FOR SUSPENSION FROM THE LABORATORY

Emergency Contacts: Security ext. 5040 OR "80"

8.1.9 Clean-Up Machine Shop Safety Rules

UNDER DEVELPOMENT

8.1.10 Clean-Up Concrete Laboratory Safety Rules

UNDER DEVELPOMENT

8.1.11 Clean-Up T.A.R.B.A. (Asphalt) Laboratory Safety Rules

UNDER DEVELPOMENT

8.1.12 Clean-Up Environmental Laboratory Safety Rules

See Appendix V – Lab Clean-up (Env Lab)

8.1.13 Clean-Up GeoTechnical Laboratory Safety Rules

See Appendix V – Lab Clean-up (Soil Lab)

8.1.14 Clean-Up Sustainable Construction Laboratory Safety Rules

UNDER DEVELPOMENT

8.1.15 Clean-Up Structures Laboratory Safety Rules

UNDER DEVELPOMENT

8.1.16 Clean-Up Hydraulics and Hydrology Laboratory Safety Rules

See Appendix V – Lab Clean-up (Hydraulics & Hydrology Lab)

8.1.17 Working at Heights – Safety Information and Requirements

There are instances where research activities require work to be performed at high elevations. Laboratories such as the Civil Structures lab is an example. In most cases ladders and step ladders may be utilized (see section 4.7) for their requirements.

Higher elevations in accordance with the Act of 10 feet or more requires working at heights training and must be completed prior to such work.

For complete training requirements refer *see appendix II EHS*

See Appendix II – Safety Tip Sheet Ladder Safety

8.2 Off-Campus Activity Safety Policy

8.2.1 Off-Campus Activities within the Department of Civil Engineering

The fundamental premise of this Off-Campus Activity Safety Policy is that from the initial stages of planning, off-campus activities must be evaluated from a safety perspective. The Policy recognizes that most off-campus activities entail risks that are no greater than the participants would face in everyday life and can be safely carried out with minimal planning and preparation. However, in the case of a an activity that entails risks higher than this, appropriate advance planning, preparation, and training must be carried out so that the foreseeable risks are appropriately managed, and an activity safety plan must be approved before the activity takes place. In circumstances where it is concluded that the risks are unmanageable, the activity shall not be carried out.

The Policy recognizes that planning and preparation, including risk assessment, for an off-campus activity shall be carried out by the organizer(s) - normally at the Unit/Department level - who, it is understood, will have specific relevant knowledge. When hazards falling outside local expertise are identified, the Policy requires that planners/organizers consult appropriate experts for advice. As part of the preparations for an activity, participants must be provided with appropriate training and briefing delivered by persons with the requisite expertise.

UNDER DEVELOPMENT AS FOLLOWS *The Policy defines the responsibilities of participants and those in the chain of responsibility with respect to safety in off-campus activities. Additional information about resources that will assist planners in meeting the requirements of the Policy is provided in the Supporting Information.*

8.2.2 Field Trip and Release of -Campus Activities within the Department of Civil Engineering

There are conditions on each type of travel activity for undergrad students:

If the travel is local (Toronto and Surrounding Cities) to meet with their industry client then they can do this without any official approval.

If the field trip is deemed low to risk free (as deemed by the EHS department extension 553772) then a liability form is not necessary. If the Field trip is deemed medium to high risk then a Release of Liability Form is required titled Release Of Liability, Waiver Of Claims, Assumption Of Risks And Indemnity Agreement. Here is a sample of the Form

See Appendix II – Waiver_Form_Field trip SAMPLE

- If the local visit includes a trip to an active field site or construction site and there are safety hazards other than those encountered in everyday life and they are attending with a knowledgeable person (TA, instructor, Client) then the attached form is required to document the activity and the official approval.

- If they are NOT traveling with a client or TA or Instructor then a full (high risk) Risk Assessment plan must be completed and approved prior to leaving. The plans must be submitted at least a week in advance of the trip departure date to the Department of Civil Engineering Administrative staff. along with the Release of Liability, Waiver of Claims, Assumption of Risks And Indemnity Agreement.

8.2.3 Student Off- Campus Events, Field Trip and Activities

There are conditions on each type of activity for undergrad and/or graduate students. The initiator of such activities/event shall provide the DSO and the Department Chair a Student Event Risk Assessment found within the EHS website: *https://www.torontomu.ca/student-life-and-learning/programs/exploretmu/event-risk-management/*

Within reasonable time, the Chair shall review this Risk Assessment after the DSO provides the approval (whether by e-mail confirmation or signature). The Chair shall accept or reject the request and inform both the DSO and initiator of the decision. Only with acceptance shall the event proceed.

If the travel is for social events not related to Civil Department activities nor work, no Risk Assessment shall be deemed necessary.

8.2.4 Student Interns, Internship Activities either Internal within the Department of Civil Engineering OR External with Outside Companies and/or Government(s)

Interns either working at TMU or working outside TMU as part of the TMU program/Curriculum shall have specialized training: Refer to Section 4.9 for training details and forms required

PROCEDURE FOR MANUAL UNDER DEVELOPMENT

8.3 Personal Protective Equipment (PPE)

The basic PPE described into this sub-section is to be worn by all individuals (supervisors, staff, researchers, students, and visitors, etc.) during and in the vicinity of all lab-related activities, in warehouse yards, during loading and unloading of trucks and trailers (anywhere).

8.3.1 Basic PPE Requirements

1. ***Protective Safety Footwear***
2. ***Industrial Head Protection "Hard hat "***
3. Eye and Face Protection
4. Hand protection (i.e gloves)
5. Long pants and shirts with sleeves extending over the shoulders.
6. Hearing Protection
7. Respiratory Protection

8. Fall Protection
9. High Visibility Apparel

Note: do not wear sleeveless shirts, tank tops; loose hair or jewellery; clothing made of highly flammable and static producing materials

8.3.2 Common personal physical hazards

- Struck by falling objects
- Eyes endangered by sharp objects, particles, chemicals
- Skin damaged by sharp objects, chemicals
- Limbs or body crushed by heavy objects
- Struck by moving parts and equipment
- Hearing damaged by excessive noise
- Respiration impaired by poor air supply, particles, chemicals
- Physical damage caused by heat, cold, weather
- Physical damage caused by falls, trips, slips

8.3.3 Rules for PPE.'s Eye/Face, Clothing, Gloves, Hearing

Eye and Face Protection

The minimum requirement for eye protection is that safety glasses (or prescription glasses) fitted with side shields must be worn in labs where hazardous chemicals are in use; contact lenses are not to be worn. Safety glasses do not provide complete protection to the eyes from spills and splashes. Where more protection is required, such as when working with corrosive substances, either safety goggles or a full face shield may be recommended.

Clothing:

Appropriate clothing and shoes are part of your protective equipment. Short pants and open-toed shoes or sandals offer no protection from spills of hazardous chemicals. Shoes which cover the feet completely and long pants or a lab coat shall be worn.

Gloves:

Gloves are available in a variety of materials including natural rubber, neoprene, nitrile and vinyl. Each type of material is resistant to only a limited range of chemicals therefore no single type of glove is suitable for all situations. Wearing the wrong type of glove can cause more damage by keeping chemicals in contact with your skin. Consult manufacturer's data before selecting the appropriate type of gloves.

NOTE: Disposable latex rubber gloves are permeable or reactive to a variety of chemicals including benzene, carbon tetrachloride, chloroform, chromic acid, ethyl ether, hexane, methylene chloride, naphtha, nitric acid, styrene, sulphuric acid, tetrahydrofuran, toluene, and xylene. They are not recommended for use with these chemicals.

Hearing Protection:

Routine exposure to noise in excess of 85dB requires the use of hearing protection (i.e. ear plugs, ear muffs); for extended exposure to noise in excess of 80 dB, hearing protection is advised. Sections of designated hearing protection areas are within the Civil Engineering department - signs shall be posted to indicate such areas.

Additional Rules as follows:

1. Do not paint or drill holes in hard hats.
2. Do not wear hard hats that are dented or cracked.
3. Do not were anything under a hard hat, such as baseball cap and shower cap, except for manufacturer approved liners.
4. Wear safety glasses, goggles or face shields when operating chippers or grinders.
5. Wear face shields over goggles or safety glasses during open gas cutting or welding operations.
6. Wear chemical goggles when using, applying or handling chemical liquids or powders from containers labeled "CAUSTIC" or "CORROSIVE."
7. Do not continue to work if your safety glasses become fogged. Stop work and clean the glasses until the lenses are clear and defogged.
8. Wear a welding helmet or welding goggles during welding operations.
9. Wear dielectric gloves when working on electric current.
10. Wear ear plugs or ear muffs in areas posted "Hearing Protection Required."

8.3.4 References

Regulations refer to Canadian Standards Association (CSA) or other equipment standards as a convenient way to identify PPE which meets requirements and is acceptable. CSA-certified PPE can be identified by the CSA logo for the following standards

- Head protection – CSA Z94.1-052, Industrial Protective Headwear and ANSI Z89.1
- Eye Protection – CSA Z94.3-M92, Eye and Face Protectors and ANSI Z87.1
- Foot Protection – CSA Z195-M-M1992, Protective Footwear, CSA Z195-09, Protective Footwear, and ASTM F2412-05, ASTM F2413-05.

For respiratory protection, National Institute for Occupational Safety and Health (NIOSH) standards and approvals are usually referenced throughout North America.

8.4 Confined Space

8.4.1 General

The University Maintenance Department lists Campus Wide areas deemed to be confined spaces. Within the Civil Engineering Department there are areas of such. No worker visitor Supervisor student, nobody, shall enter a confined space unless properly trained, see 8.4.3

8.4.2 Confined Space Locations with Civil Engineering Department

Within the Civil Engineering Department the areas are all washdown pits:

1. ENG LG 23 Concrete Lab
2. MON106 Hydraulics Lab

8.4.3 Confined Space General Rules

1. Do not perform confined space operations until you have received initial indoctrination and training, regarding your duties and responsibilities.
2. If respirators are required, do not perform any operations until trained in the specifics of the respirator protection program.
3. Obtain a confined space entry permit from your supervisor before entering the space.
4. Do not enter a confined space more than five feet deep without a full body harness and lifeline attached to a man-rated winch for retrieval.
5. Lock and tag "OUT OF SERVICE" all impellers, agitators, pumps or any other equipment in the tank before entering the confined space.
6. Open all manholes of the space for ventilation.
7. If involved in confined space operations, follow all provisions of this written confined space program.

8.5 Hazardous Materials

8.5.1 General

Each lab shall contain Material Safety Data Sheet (MSDS) for each chemical product used in your workplace. No the hazards in the laboratories.

1. Follow the instructions on the label and in the corresponding Material Safety Data Sheet (MSDS) for each chemical product used in your workplace.
2. Do not use protective clothing or equipment that has split seams, pin holes, cuts, tears, or other signs of visible damage.

3. Each time you use your gloves, wash your gloves before removing them using cold tap water and normal hand washing motion. Always wash your hands after removing the gloves.
4. Do not use chemicals from unlabeled containers and unmarked cylinders.
5. Do not perform "hot work", such as welding, metal grinding or other spark producing operations, within 50 feet of containers labeled "Flammable" or "Combustible."
6. Do not drag containers labeled "Flammable."
7. Do not store chemical containers labeled "Oxidizer" with containers labeled "Corrosive" or "Caustic."
8. Always use chemical goggles and a face shield before handling chemicals labeled "Corrosive" or "Caustic."

8.6 Respirator Safety

8.6.1 General

Respirators are designed to protect the wearer from hazardous vapours or dust. Wide varieties of respirators are available and are designed to deal with different substances in various situations. The use of respirators requires proper selection, fitting and training. The Department does not provide respirators consequently any use of respirators must have prior authorization and approval by your supervisor.

The Technical Staff is available to advise on selection, fitting and training on respirators “Fit Test” may be requested and/or required. Contact the Department of Environmental Health and Safety (EHS) for initial “Fit Testing”.

8.6.2 Additional Rules Respirators

1. Do not perform operations requiring respirators, unless you have been approved for use of respirators, trained, and fitted.
2. Inspect respirators for cracked or worn parts before and after each use and after cleaning. Do not use the respirator if any of the conditions (cracked or worn parts) are present.
3. Do not work in an area that requires the use of respiratory protective equipment if you fail to obtain a tight seal between the respirator and your face.
4. Do not wear a respirator if facial hair prevents a tight seal between the respirator and your face.
5. Clean and sanitize respiratory equipment according to manufacturer's recommendations after each use.
6. Store respiratory equipment in a clean and sanitary location.

8.7 Housekeeping

8.7.1 General

1. Do not place material such as boxes or trash in walkways and passageways.
2. Do not block or obstruct stairwells, exits or accesses to safety and emergency equipment such as fire extinguishers or fire alarms.
3. Keep walking surfaces of elevated working platforms clear of tools that are not being used, and clear of other materials such as aggregate.
4. Return tools to their storage places after use.
5. Do not use gasoline for cleaning purposes.
6. All electrical panels to be obstruction free at least one metre away; there shall be no leaning of tools nor materials onto the door of the electrical panel

8.7.2 Preventing Slips, Trips, Falls

To reduce the risk of suffering from a slip, trip and/or fall, follow these safety tips:

- Pay attention to where you are going and walk at a pace that is appropriate for the walking surface and the task you are carrying out.
- Don't carry or push loads that obstruct your vision.
- Use handrails whenever possible.
- Don't run on stairways or through working areas.
- Remove items that may be tripping hazards such as wires, cords and boxes.
- Regularly check for defects in the flooring condition (i.e. broken floorboards and/or loose carpeting).
- Wear shoes that are appropriate for the task with good support and slip-resistant soles.
- Be careful when entering from wet or snowy weather: wipe shoes and watch out for wet spots on the floor.
- Ensure working areas and hallways are adequately lit.
- If you notice a wet floor or spill, cover the spill with paper towel/napkins to alert people of the hazard. Contact the Facilities Help Desk at 416-979-5091 or fixit@torontomu.ca so that staff can clean it up as soon as possible.

  See Appendix II – Safety-tip-sheet-slips-trips-falls

8.8 Safety Equipment Procedures

8.8.1 General

A variety of protective measures are available for dealing with the hazards present in the chemical laboratory. One of the simplest measures to reduce or eliminate a hazard is to substitute a less hazardous or non-hazardous material for one which presents the lowest level of risk. For example many older procedures may use solvents such as benzene or carbon tetrachloride for routine applications; it is now known that benzene is a potent carcinogen and that carbon tetrachloride can cause serious liver damage. Substitution of these solvents with toluene or dichloromethane may pose less risk if compatible with the procedure.

A second measure is to reduce the scale of an operation to reduce the level of risk. Smaller reactions are less likely to cause serious accidents if something goes wrong; they also produce less waste.

8.8.2 Fume Hoods

The most common method to prevent exposure to hazardous chemicals by inhalation is to work in a ventilated work space provided by a fume hood. Protection is provided by air flow through the fume hood.

An annual calibration and inspection shall be conducted on fume hoods to ensure proper operation – this shall be coordinated with TMU Facilities/Operations. It is important to note that the protection offered by a fume hood can be compromised if the sash is opened too high or if the airflow is obstructed by equipment or chemicals stored in the fume hood.

General Rules “Basics for Safe and Effective Fume Hood Use” shall be posted at each fume hood readily visible.

See Appendix V – Basic for Safety and Effective Hood Use

Keep the following awareness when using a fume hood:

- keep all apparatus at least six inches from the front of the hood; airflow is less likely to be impeded and vapors are less likely to escape
- don't use the hood to store chemicals and equipment; they restrict airflow
- hang thin paper strips from the sash to detect proper airflow
- proper fume hood ventilation of labs requires that doors to the lab be kept closed
- flammable liquids must only be used in fume hoods designated for this purpose

8.8.4 Local Ventilation

Flexible ventilation ducts with flared openings can also be used to provide ventilation in local areas, particularly with equipment which, because of size or function, cannot be placed in a fume hood. Areas that produce particulate (dust) shall have such ducts. Any equipment which releases hazardous fumes during operation must have local ventilation.

8.8.5 Eyewash Fountains and Deluge Showers Eyewash Bottles

Access to this equipment must not be obstructed in any way. Eyewash fountains/showers/bottles shall be tested regularly to ensure adequate water flow and to remove any rusty water. Emergency Eyewashes shall be checked by activating it on a weekly basis. Emergency Showers shall be inspected weekly to ensure that access is not obstructed plus examine for any abnormalities and visible signs of wear. These shall be considered as regular inspections.

Eyewash Inspection form shall be posted in proximity to each station; records of each inspection shall be recorded and initialed on the “Eyewash Weekly Inspection Form”.

See Appendix II – Eyewash Weekly Inspection Form

If it is necessary to use any eyewash fountain, hold your eyelids open with your fingers and roll your eyes back and forth while washing them. Flush your eyes for at least 15 minutes to ensure removal of the chemical.

If it is necessary to use an emergency shower, activate the shower then remove contaminated clothing as rapidly as possible.

8.8.6 Fire extinguishers:

All laboratories are equipped with "C" class fire extinguishers (CO2) which are suitable for most fires except metal fires; those labs with significant quantities of pyrophoric metals are also equipped with "D" class extinguishers. These extinguishers are only designed to fight small local fires. Do not attempt to fight large fires; evacuate the building and call for professional fire fighters Dial “80” and advise the Emergency.

All fire extinguishers shall be inspected. These shall be conducted by Facilities Management and Development (FMD) formerly Campus Facilities and Sustainability. Record of each shall be on a tag with the extinguisher.

8.9 Emergency Procedures

8.9.1 Emergency Procedures

IN CASE OF EMERGENCY:

DIAL 80	FROM WITHIN THE UNIVERSITY
DIAL 911	FROM OUTSIDE THE UNIVERSITY then call 416-979-5040 for TMU Security

8.9.3 Responsibilities

Safety is the responsibility of everyone who works in the Department of Civil Engineering. This includes all faculty, staff, graduate AND undergraduate students, researchers and visitors to the Department. These pages are intended to cover many of the common or general hazards associated with work in the Department and must be read and adhered to by everyone working in the Department. It cannot be assumed that the warnings or rules laid out in these pages are necessarily complete for dealing with specific chemical hazards; additional information or measures may be required and the appropriate information sources shall be consulted. It is the responsibility of individual supervisors to ensure the necessary procedures and protocols are both established and followed in their respective work areas.

8.9.4 Personal Safety

Personal safety depends upon a positive attitude towards safety as well as good, informed judgment on the part of each individual working in the department. Most health and safety problems in the laboratory can be avoided by practicing good housekeeping and common sense based upon informed knowledge of the hazards.

8.9.5 Workplace Inspections

At minimum, monthly inspections of emergency safety equipment shall be conducted, as required. Any items deemed not safe shall be tagged and removed from service until such times as repairs, if required are completed.

Formal Workplace inspections for the Civil Department shall be conducted in co-ordination with EHS requirements. Such workplace inspections shall be performed by the DSO and shall include at least one member of the Faculty (a Professor Supervisor) – this inspection shall consist of the entire Civil

Department within their control but does not include base building. Such workplace inspections shall be performed at least once a year.

The inspections may also be conducted by members of the Joint Occupational Health and Safety Committee; Civil Department Safety Committee; EHS or Facilities Management. Inspection reports are filed with the Department Safety Officer and at the discretion of the department head, posted on all safety bulletin boards. Individual supervisors or the Departmental Manager will be contacted by the Safety Committee to deal with any problems that may arise as a consequence of these inspections.

Some samples of hazards found in the workplace:

http://www.ryerson.ca/content/dam/irm/pdfs/WIP/2011_WIP_PPT_Oct2011_HazPics.pdf

Note: *Sometime in October, 2017 any references to IRM websites may not be accessible as the web address will be changing to EHS under the umbrella of FMD (Facilities Management and Development) the final web address will be unknown until such time.*

8.9.6 Medical emergency

Minor accidents involving hazardous chemicals or the malfunction and/or breakdown of equipment must be reported to your supervisor. More serious accidents must be reported to the Head of the Department and/or the Department Safety Officer as well as to your supervisor.

All accidents involving personal injury must be reported promptly to your supervisor who is responsible for ensuring that the procedures below are followed. If your supervisor is not immediately available, contact the Department Safety Officer or the Head of the Department.

Apply first aid (first aid kits shall be available in all labs); first aid shall be given by someone who has had appropriate training

Reference Sections V (First Aid Procedures) and VI (Accident Investigations)

8.9.7 Fire Emergency

In the event of a fire emergency, you should be aware of the location and/or use of all fire extinguishers, fire alarms and fire exits in your area. If the fire cannot safely be controlled with a fire extinguisher, then the following actions shall be taken:

- alert all persons in the area of the fire emergency
- leave the area while closing doors and windows (where this can be done safely)
- pull the nearest fire alarm

- check to ensure that the area has been evacuated then leave the building to the nearest safe location
- phone security Dial “80” and report the emergency
- be available to guide the Fire Department to the location of the fire

8.9.8 Chemical Spills

All spills shall be cleaned up promptly, efficiently and properly. All individuals at risk due to the spill shall be warned immediately. Spill kits are available within each laboratory.

If the spill involves non-volatile, non-flammable and non-toxic material then it shall be cleaned up as directed by your supervisor or Laboratory Technical Staff. Most cleanups of liquid spills are facilitated by the use of an absorbent material that will neutralize the liquid where appropriate. Cleanup can then be carried out using a dustpan, brush and appropriate protective equipment. The spill area shall be washed following the cleanup.

If a hazardous chemical such as a flammable, toxic or highly reactive substance is spilled, immediately warn everyone in the area. Shut down all equipment and leave the area. Your supervisor and/or Technical Staff shall be notified immediately and assume responsibility for the proper cleanup of the contaminated area. Any clothing that has been contaminated shall be removed as quickly as possible and decontaminated where possible.

Waste from chemical spills must be disposed of in an appropriate manner. Contact the appropriate Supervisor, Technical Staff. The Department Safety Officer may be able to offer guidance.

8.10 Safe Laboratory Procedures and Techniques

8.10.1 Glassware

- check glassware for cracks, chips and other flaws; these flaws shall be repaired before the glassware is used
- select the right glassware for the job; vacuum applications required thick-walled glass while operations carried out under pressure require specially designed glassware
- glassware under pressure or vacuum shall be shielded
- if it is necessary to apply pressure to glassware, wear thick leather gloves
- never heat or apply pressure/vacuum to a chemical in a stock bottle; these bottles are made of a soft glass which breaks readily

8.10.2 Electrical Equipment

All equipment plugged into an electrical source of nominal 120V or more shall be electrically certified and approved for use in Canada examples are: CSA ETL, ULc. In addition to the hazards posed by electrical shock, electrical equipment also presents a source of fire hazard when used in conjunction with flammable substances (see section on Flammability 8.10). Electrical hazards can be minimized by the following:

- only trained or qualified individuals shall repair or modify electrical equipment electric wires shall never be used as supports
- unplug equipment by pulling on the plug not the cord
- equipment should be regularly inspected and frayed cords or broken plugs shall be repaired
- any equipment failure or overheating shall be remedied immediately
- use "C" class fire extinguishers for electrical fires

8.10.3 Static Electricity and Spark Hazards

Protection from static discharge must be addressed in particular when handling flammable solvents; this risk is increased during periods of low humidity. Proper grounding of containers and equipment will significantly reduce this risk. Common potential sources of sparks and static discharges are:

- ungrounded metal tanks and containers
- clothing or containers made of plastic or synthetic materials
- high pressure gas cylinders upon discharge
- control systems on hotplates
- brush motors and forced air dryers

8.10.4 UV Lamps

Radiation of wavelengths below 250 nm poses a considerable risk to both eyes and exposed skin. Wear UV-absorbing safety glasses and avoid direct eye contact with the UV source; wear protective clothing to prevent burns from UV exposure. Work involving UV irradiation shall be carried out in an enclosed work area to prevent exposure of workers to the UV source.

It is recommended that Mercury arc lamps not be used, however if so, shall be cleaned thoroughly before use. Handling with bare hands leaves oil deposits on the surface of the outer glass which forms residues

that will burn into the glass causing build-up of heat during the operation of the lamp. The lamp may overheat and crack, releasing mercury vapour as a consequence.

8.10.4 Lasers

The type and intensity of radiation available from a laser varies greatly from one instrument to another. The following general rules shall be followed:

- always wear goggles that offer protection against the specific wavelength(s) of the laser in use; no available goggles protect against all laser wavelengths
- never look directly at the beam or pump source
- never view the beam pattern directly; use an image converter or other safe, indirect means
- do not allow objects that cause reflections to be present in or along the beam
- keep a high general illumination level in areas where lasers are in operation; low levels of light cause dilation of the pupils, thereby increasing the danger to the eyes
- display warning signs

8.10.5 X-ray Generators

X-rays are a hazardous physical agent under the Occupational Health and Safety Act. Any equipment generating X-rays must be operated in accordance with government regulations and appropriate warning signs must be posted.

8.10.6 Magnetic Fields

NMR spectrometers have superconducting magnets which generate static magnetic fields with high flux densities. Hazards exist from the mechanical forces exerted by these magnetic fields on ferromagnetic tools and equipment and on medical implant devices. Individuals with implanted cardiac pacemakers and similar medical devices shall not be exposed to these magnetic fields. Other implanted medical devices such as suture staples, aneurysm clips, prostheses, etc. may also be subjected to adverse effects.

8.10.7 Radioactive Material

All work involving the use of radioactive materials must be carried out under the supervision of a faculty member who is licensed by the Atomic Energy Control Board to work with radioisotopes.

Radiation badges are to be worn while using any radioactive instrument. All work must be approved by the specialist representative of EHS before it is carried out. All radioactive materials must be handled, stored and disposed of in accordance with the appropriate government regulations and in accordance with

procedures set out by the Integrated Risk Management including Waste Disposal procedures for Radioisotope Disposal.

8.10.8 Cryogenics and Cold Traps (Nitrogen Dewar)

Liquid nitrogen is the most common cryogenic coolant and must be handled with caution, as it depletes oxygen from the air we breathe. The following points must be taken into account when using liquid nitrogen

- never ride in an elevator with a Nitrogen Dewar
- use only a properly vented container
- extreme cold can rapidly cause tissue damage; use appropriate protective equipment
- spills in confined spaces can cause asphyxiation due to rapid evaporation of the nitrogen
- glass Dewars used as cold traps shall be encased to contain glass fragments in the event of implosion
- do not leave liquid nitrogen cold traps open to the air; oxygen may condense from the air and can react explosively with combustible materials

Dry ice is frequently used in conjunction with a cooling liquid. These cooling systems can also cause tissue damage due to extreme cold. The proper choice of a cooling liquid presents problems since a non-toxic, non-flammable, low viscosity, low volatility liquid does not exist. In general isopropanol (flash point 11°C) is preferable to acetone (flash point -18°C) due to a higher flash point but still represents a fire hazard. A 3:2 mixture of ethylene glycol to water which is thinned with isopropanol is an alternative cooling liquid with reduced flammability.

8.10.9 Reduced Pressure Operations and Vacuum Pumps

- vacuum desiccators shall be taped or encased due to the risk of implosion
- glass vacuum lines shall be shielded when in use
- cold traps shall be placed between apparatus and vacuum pumps to prevent volatiles from entering the pump oil; traps shall be cleaned after use
- exhaust from the pump shall be vented into a fume hood or to the exterior of the building; exhaust must be vented in a manner that prevents contact of the emissions with the public (i.e. must not be vented at ground level)

- pump belt drives must have a guard over the belt to prevent anything from getting caught in the belt

8.10.10 Distillations and Reflux Operations

Distillations and reflux operations are common laboratory procedures which present several potential dangers: pressure build-up leading to explosions if closed systems are used, and fire hazards associated with heating flammable substances are two of the most common. A variety of apparatus designs are available to accomplish reflux/distillation operations at atmospheric pressure, under inert atmospheres, under reduced pressure and by the addition of steam. The following general points shall be noted when carrying out these operations:

- check the integrity of the system; leaks of flammable materials can lead to fires
- ensure smooth boiling through stirring or the addition of boiling stones (do not add boiling stones to hot liquid)
- choose an appropriate heat source - electric heating mantle, ceramic cavity heater, steam bath or silicone oil bath
- do not heat the heat source above their auto-ignition temperature of the liquid being distilled/refluxed
- do not distill organic liquids to dryness

8.11 Chemical Hazards Procedures and Techniques

8.11.1 General Corrosivity

Corrosive chemicals cause visible destruction or irreversible alteration to living tissue. Common acids and bases are the most usual corrosives encountered, but other chemicals such as Br2 are also extremely corrosive.

- concentrated acids and bases shall always be diluted by addition to water due to the large heat of solution for these compounds
- use appropriate personal protective equipment and fume hood ventilation when working with strong acids and bases, and other corrosive substances
- safety glasses do not provide complete eye protection from chemical splashes; wear appropriate safety goggles or splash shields when working with corrosive substances

NOTE: some specific acids such as HF (extremely toxic) and HClO4 (powerful oxidizer of organics) require special handling procedures. Consult the appropriate references and your supervisor before working with these chemicals.

8.11.2 Flammability

The risk of fire in the chemical laboratory is most often associated with two classes of compounds - common organic solvents, and certain metals, metal hydrides and organometallics. For common organic solvents the following shall be noted:

- the minimum temperature at which vapours from a substance will ignite when exposed to an ignition source (flame, spark, static discharge, etc.) is called the flash point
- a flammable substance has a flash point below 40°C
- a combustible substance must be heated above 40°C to ignite

8.11.3 Storage Chemicals, Flammability

- up to 1L glass bottles of flammable liquids can be stored anywhere in laboratories; larger quantities must be stored in flammable storage cabinets (e.g. 4L glass bottles) or in approved safety containers
- the maximum volume of flammable liquids that may be stored in a laboratory is 225 litres
- always use ventilation (e.g. fume hoods) which is adequate for the quantity of flammable liquid in use; only use fume hoods which have been designated and labelled for use with flammable liquids
- always connect (or bond) containers when transferring flammable liquids from metal containers
- NEVER store flammable liquids in a conventional domestic refrigerator; only refrigerators/freezers that are approved for flammable storage can be used

Alkali and alkaline earth metals, certain other metals such as aluminum, metals in a finely divided form, metal hydrides and many organometallic compounds can ignite on exposure to air and/or water. The following shall be noted when working with this class of compounds:

- store these chemicals in a location separate from other chemicals in the laboratory and in containers appropriate for the purpose
- use equipment appropriate for the hazards associated with these substances including inert atmosphere techniques

- class "D" fire extinguishers (metal fires) must be present in laboratories where these substances are in use; do not use "C" class fire extinguishers (CO2) on metal fires

8.11.4 Noxious Chemicals

Certain classes of compounds such as thiols (mercaptans) and related sulfur-containing compounds are characterized by a particularly noxious odour

- these compounds must be used with adequate ventilation (fume hoods)
- whenever compounds of this type are used they will be released through the ventilation system into the local atmosphere, consequently both the Department Safety Officer and the Emergency Report Centre must be notified in advance of the use of these chemicals

8.11.5 Reactive Chemicals

Air/Water Reactive

chemicals which can ignite on exposure to air or water, e.g. certain metallic and organometallic substances, phosphorous

special handling, storage and disposal procedures must be established in laboratories where these substances are in use (see section on Flammability and Appendix II - Incompatible Chemicals)

Self-Reactive Chemicals

may be heat, shock or friction sensitive and can react violently as a consequence, e.g. acetylene and acetylides, azides, diazonium salts, nitro compounds, chlorates and perchlorates, peroxides

special handling, storage and disposal procedures must be established in laboratories where these substances are in use

Lachrymators

substances which react with moisture in the eyes and mucous membranes to cause tear formation, e.g. halogenated aldehydes, ketones and esters

must be used with adequate ventilation (fume hood) and stored in well sealed containers

Incompatible Chemicals

Accidental contact of incompatible chemicals can lead to fire, explosion and/or the release of highly toxic substances. The magnitude of the problem usually increases with the quantity of chemicals being stored. Prudent practice requires that incompatible chemicals be stored in separate locations to minimize the risk of accidental mixing.

Appendix XXXX **(UNDER CONSTRUCTION)** - *Incompatible Chemicals lists some general groups of incompatible chemicals; further information on specific chemicals may be obtained from references such as Hazards in the Chemical Laboratory, by L. Bretherick or Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Research Council, National Academy Press, 1995.*

8.11.6 Toxicity

A wide range of substances are present in the chemical laboratory which present a risk due to either chronic or acute toxicity; this includes the presence of carcinogens, mutagens and teratogens:

- toxic substances may enter the body by inhalation, absorption, ingestion and/or injection
- appropriate protective measures must be taken to prevent exposure and which are consistent with permissible exposure limits for a specific substance
- where available, antidotes for poisons must be present during usage of these poisons

NO FOOD OR DRINKS ARE TO BE CONSUMED IN LABORATORIES WHERE HAZARDOUS SUBSTANCES ARE IN USE.

CONTAINERS/UTENSILS USED FOR THE PREPARATION OR CONSUMPTION OF FOOD OR BEVERAGES MUST NOT BE STORED IN LABORATORIES WHERE HAZARDOUS SUBSTANCES ARE IN USE.

ANY WOMAN WHO WORKS IN A LABORATORY WHERE HAZARDOUS SUBSTANCES ARE IN USE AND WHO IS, OR BELIEVES THAT SHE MAY BE, PREGNANT MUST INFORM HER SUPERVISOR.

8.11.7 Designated Substances

The Occupational Health and Safety Act allows a biological, chemical or physical agent, or combination thereof, to be "designated" and its use in the workplace may be either prohibited or strictly regulated.

In Ontario there is a government website containing laws/regulations that is available to reference:

https://www.ontario.ca/laws/regulation/090490?_ga=2.57485418.1900798152.1500572371-964615251.1464964140

The following are designated substances:

- ACRYLONITRILE
- ARSENIC
- ASBESTOS

- BENZENE
- COKE OVEN EMMISSIONS
- ETHYLENE OXIDE
- ISOCYANATES
- LEAD
- MERCURY
- SILICA
- VINYL CHLORIDE O. Reg. 490/09, s. 2.

Acrylonitrile, benzene, (as well as carbon disulfide, carbon tetrachloride), isocyanates, styrene, and vinyl chloride monomer are all volatile organic materials and must be used with adequate ventilation (fume hood) to prevent exposure through inhalation and with appropriate protective equipment to prevent exposure through skin absorption. These materials can be disposed of in the normal liquid organic waste stream (halogenated or non-halogenated as appropriate).

Substances containing arsenic, lead or mercury must be handled in an appropriate manner to prevent exposure through inhalation or absorption. All chemical waste containing arsenic, lead or mercury must be collected and properly labeled for disposal as required by the Department of Integrated Risk Management.

Elemental mercury is used in many types of apparatus, in particular mercury-filled thermometers. Mercury spills from broken equipment shall be cleaned up immediately (mercury spill kits are available by chemical handling vendors or requests to the EHS department). Broken thermometers are collected by the Environmental Technologist who will recover the mercury from the thermometers before disposal.

Silica powder, including chromatography grade silica, is a respiratory hazard and shall be handled in a fume hood when dry. Any fine silica sand (normally found at the Coastal Laboratory) would have a certain amount of powder and shall be handled wet and otherwise be covered. Used silica shall be stored in sealed and labelled containers then suitably disposal of or requested to the EHS department.

8.12 Nuclear and Isotopes Procedures and Techniques

8.12.1 General

The Civil Engineering Department does not possess, store, utilize such equipment.

Section IX – Standard Operating Procedures of Tools and Equipment Rules, Policies and Procedures

Standard operating procedures (SOP's) provide comprehensive guidance to users in its safe operation. They are intended to compliment yet enhance any existing manual or instructions. In most cases, equipment and tool manufacturers provide written instructions "Owner's manuals" and are available either in their respective labs or through the Technical Staff.

SOP's ARE UNDER DEVELOPMENT through the EHS department.

The following compliment manufacturer instructions and manuals and are no way intended as replacement. As such, the safety rules contained on these pages have been prepared to protect those in daily work activities. Employees shall follow these rules, review them often and use good common sense in carrying out assigned duties.

Remember safety is everyone's responsibility, not just one individual nor department – it belongs to all of us.

9.1 General Use Tools and Equipment

This category is for those common use items regularly found in hardware stores and large box stores, not from speciality commercial use. Tools and equipment of this nature are generally utilized by everyday public found in dwellings and tool boxes. In every case simple rules are:

- Know and follow safety rules, procedures and protocols
- Be aware of hazards, and the procedures for dealing with those hazards, before you start your work

9.1.1 Electrical Powered Tools Suitable with Convenience Receptacles

A good general practice is to assure that prior to usage all equipment plugged into an electrical source of nominal 120V (example is convenience receptacles) or more shall be electrically certified and approved for use in Canada examples are: CSA ETL, ULc. Look for the tag(s), if missing contact the nearest Laboratory Staff or Supervisor/Professor.

1. Do not use power equipment or tools on which you have not been trained.
2. Keep power cords away from the path of drills, saws, vacuum cleaners, floor polishers, mowers, knives and grinders.
3. Do not carry plugged-in equipment or tools with your finger on the switch.
4. Do not carry equipment or tools by the cord.
5. Disconnect the tool from the outlet by pulling on the plug, not the cord.
6. Turn the tool off before plugging or unplugging it.

7. Do not leave tools that are "On" unattended.
8. Do not handle or operate electrical tools when you are standing on wet floors.
9. Do not operate spark inducing tools such as grinders, drills or saws near containers labeled "Flammable" or in an explosive atmosphere.
10. Turn off electrical tools and disconnect the power source from the outlet before attempting repairs or service work. Tag the tool "Out of Service."
11. Do not connect multiple electrical tools into a single outlet.
12. Do not run extension cords through doorways, through holes in ceilings, stairways, walls or floors.
13. Do not drive over, drag, step on or place objects on a cord.
14. Do not operate a power hand tool with a two-pronged adapter or a two-conductor extension cord.
15. Never operate electrical equipment barefooted. Wear rubber-soled or insulated work boots.
16. Do not operate a power hand tool while holding a part of the metal casing or holding the extension cord in your hand. Hold all portable power tools by the plastic hand grips or other nonconductive areas designed for gripping purposes.
17. Do not operate a power hand tool that has frayed, worn, cut, improperly spliced or damaged power cord.
18. Do not a operate power hand tool if the ground pin from the three-pronged power plug is missing or has been removed.

9.1.2 Pneumatic Tools

1. Do not point a compressed air hose at bystanders or use it to clean your clothing.
2. Do not use tools that have handles with burrs or cracks.
3. Do not use compressors if their belt guards are missing. Replace belt guards before use.
4. Turn the tool "off" and let it come to a complete stop before leaving it unattended.
5. Disconnect the tool from the air line before making any adjustments or repairs to the tool.
6. Engage positive locks on hoses and attachments before use.
7. Shut off pressure valve and disconnect air line when not in use.
8. Tag damaged or defective pneumatic tools "Out of Service" to prevent usage of the tool by other employees.

9.1.3 Hand Held Tools

General

1. Do not continue to work if your safety glasses become fogged. Stop work and clean the glasses until the lenses are clear and defogged.
2. Use tied-off containers to keep tools from falling off of elevated work platforms.

3. Keep the blade of all cutting tools sharp.
4. Carry all sharp tools in a sheath or holster.
5. Tag worn, damaged or defective tools "Out of Service" and do not use them.
6. Do not use a tool if its handle has splinters, burrs, cracks, splits or if the head of the tool is loose.
7. Do not use impact tools such as hammers, chisels, punches or steel stakes that have mushroomed heads.
8. When handing a tool to another person, direct sharp points and cutting edges away from yourself and the other person.
9. Do not carry sharp or pointed hand tools such as screwdrivers, scribes, snips, scrapers, chisels or files in your pocket unless the tool or pocket is sheathed.
10. Do not perform "make-shift" repairs to tools.
11. Do not use "cheaters" on load binders.
12. Do not carry tools in your hand when climbing. Carry tools in tool belts or hoist the tools to the work area with a hand line.
13. Do not throw tools from one location to another, from one employee to another, from scaffolds or other elevated platforms.

9.1.4 Ladders and Step Ladders

1. Read and follow the manufacturer's instructions label affixed to the ladder if you are unsure how to use the ladder.
2. Do not use ladders that have loose rungs, cracked or split side rails, missing rubber foot pads, or are otherwise visibly damaged.
3. Keep ladder rungs clean and free of grease. Remove buildup of material such as dirt or mud.
4. Allow only one person on the ladder at a time.
5. Face the ladder when climbing up or down.
6. Maintain a three-point contact by keeping both hands and one foot or both feet and one hand on the ladder at all times when climbing up or down.
7. When performing work from a ladder, face the ladder and do not lean backward or sideways from the ladder.
8. Do not stand on the top two rungs of any ladder.
9. Do not stand on a ladder that wobbles, or that leans to the left or right.
10. When using a straight ladder, extend the top of the ladder at least 3 feet above the edge of the landing.
11. Do not move a rolling ladder while someone is on it.
12. Do not place ladders on barrels, boxes, loose bricks, pails, concrete blocks or other unstable bases.
13. Do not carry items in your hands while climbing up or down a ladder.

14. Do not try to "walk" a ladder by rocking it. Climb down the ladder, and then move it.
15. Do not use a ladder as a horizontal platform.

More information about Standard for ladders – Fixed – Safety Requirements can be found in ANS A14.3-2008 [6].

See Appendix II – Safety Tip Sheet Ladder Safety

9.2 Speciality Tools and Equipment

This category is for those items not commonly nor regularly available in hardware stores and large box stores. They generally are for speciality and commercial use. Tools and equipment of this nature are generally utilized by tradesmen found in industrial complexes and/or construction sites. In every case simple rules are:

- Know and follow safety rules, procedures and protocols
- Be aware of hazards, and the procedures for dealing with those hazards, before you start your work

9.2.1 Machine Shop Equipment Engine Lathe Upright drill Press Milling Machine

UNDER DEVELPOMENT

9.2.2 Concrete Laboratory Equipment

UNDER DEVELPOMENT

9.2.3 T.A.R.B.A. (Asphalt) Laboratory Equipment

UNDER DEVELPOMENT

9.2.4 Environmental Laboratory Equipment

UNDER DEVELPOMENT

9.2.5 GeoTechnical Laboratory Equipment

UNDER DEVELPOMENT

9.2.6 Sustainable Construction Laboratory Equipment

UNDER DEVELPOMENT

9.2.8 Structures Laboratory Equipment

UNDER DEVELPOMENT

9.2.9 Hydraulics and Hydrology Equipment

UNDER DEVELPOMENT

9.3 Procedures for Manual Material Handling/Lifting Without Use Of Equipment

9.3.1 General

Proper lifting helps to eliminate potential risks of personal injury. Injuries to the back arms and shoulders are generally caused by poor lifting techniques. The following provides an instructional aid and shall be adhered to.

9.3.2 List of Techniques for proper Lifting

Proper lifting helps to eliminate potential risks of personal injury:

1. Plan the move before lifting; remove obstructions from your chosen pathway; assure the landing is obstruction free and sized properly for the footprint and can withstand the anticipated load
2. Test the weight of the load before lifting by pushing the load along its resting surface should the load weight be unknown.
3. If the load is too heavy or bulky, use lifting and carrying aids such as hand trucks, dollies, pallet jacks and carts, or get assistance from a co-worker.
4. If assistance is required to perform a lift, coordinate and communicate your movements with those of your co-worker's.
5. Position your feet 6 to 12 inches apart with one foot slightly in front of the other.
6. Face the load.
7. Bend at the knees, not at the back.
8. Keep your back straight.
9. Get a firm grip on the object with your hands and fingers. Use handles when present.
10. Never lift anything if your hands are greasy or wet.
11. Wear protective gloves and eyewear when lifting objects with sharp corners or jagged edges.
12. Hold objects as close to your body as possible.
13. Perform lifting movements smoothly and gradually; do not jerk the load.
14. If you must change direction while lifting or carrying the load, pivot your feet and turn your entire body. Do not twist at the waist.
15. Set down objects in the same manner as you picked them up, except in reverse.
16. Do not lift an object from the floor to a level above your waist in one motion. Set the load down on a table or bench and then adjust your grip before lifting it higher.

9.3.3 Technique for Lifting and Off-Loading Trucks

1. Slide materials to the end of the tailgate before attempting to lift them off of a pick-up truck. Do not lift over the walls or tailgate of the truck bed.

9.4 Lock-Out/Tag-Out Program

The purpose for a lock-out tag-out procedure is to take every reasonable precaution to protect workers from an energized electrical conductor or equipment that can be locked and tagged out of service, without unnecessarily endangering other workers who may potentially work with live electricity hydraulics mechanical and pneumatics so as to provide isolation.

Use of lockouts and safety tags as required by the Ministry of Labour shall be used when working on equipment, electrical panels and valves that will be shut off whenever practical. These tags must be maintained until such time that notification is received from the Contractor, Laboratory Technical staff, (that is any person authorized to perform the work), that work has been completed.

If Department Technical staff or Toronto Metropolitan University Maintenance and Operations isolates system(s), only those staff shall reactivate systems and remove their own locks and hasps. Systems isolated by Contractors with Maintenance and Operations approval are to be restored to service by the individual who isolated it.

Devices such as padlocks shall be provided for locking out the source of power at the main disconnect switch. Before any maintenance, inspection, cleaning, adjusting or servicing of equipment (hydraulic, electrical, mechanical or pneumatics) that requires entrance into or close contact with the machinery or equipment, the main power disconnect switch or valve, or both, controlling its source of power or flow of material, shall be locked-out or blocked off with a padlock, blank flange, hasp or similar device. These devices and appropriate tags are available and shall be procured from a reputable supplier familiar with the program.

9.4.1 Lock-Out Procedure

1. Do not perform any maintenance, inspection, cleaning, adjusting or servicing of any equipment without following the lockout / tag-out program.
2. If required to work on powered equipment, you must have your personal padlock with your name on it and a personal key at all times.
3. Disconnect and padlock all machine power disconnects in the off position before removing guards for the purpose of working "ON" or "IN" the machinery or its approaching unguarded parts. (NOTE: When more than one employee / worker is working on a single piece of equipment, each employee / worker must use his own padlock along with lock-out tongs to lock out the equipment. When the work is completed, they shall remove only their own personal lock and not the lock of others)

4. Do not commence equipment repair or maintenance work until you have verified that the tagged/locked out switch or control cannot be overridden or bypassed.
5. Replace all guards before removing personal padlocks from the control.
6. Do not use or remove another employee's / worker's protective lock. Do not remove a lock from equipment unless you placed it there.
7. Before machinery is put back into use after LOCKOUT/TAGOUT, give a verbal announcement/sound warning to fellow employees.
8. Lock out is not required if there is no lock out device and the voltage is less than 300 Volts then a worker must be stationed at the tagged device to ensure the device is not operated while wok is taking place

9.4.2 Tag-Out Procedure

1. Do not perform any maintenance, inspection, cleaning, adjusting or servicing of any equipment without following the lock-out/tag-out program.
2. Follow the Lock-Out procedure as per 9.4.1
3. After the lock-out device is applied a label known and the Tag-Out shall be attached and made readily visible in a conspicuous location (usually with/on the lock)
4. All disconnecting points shall be tagged. A tag is as important as the lock but is not a replacement for the lock itself.
5. The tag shall be made from non-conducting material AND secured to prevent inadvertent removal
6. Only the person who locked out shall apply the tag
7. The tag shall state their name and date as per the label/tag of the person who is performing the lock-out tag-out AND if required state the reasoning for the lock-out.
8. Assure the disconnect and padlock are applied and in the off position before removing guards for the purpose of working "ON" or "IN" the machinery or its approaching unguarded parts.
9. When more than one contractor / employee / worker is working on a single piece of equipment, each employee / worker must use their own tag to the equipment. When the work is completed, they shall remove only their own personal tag and not the tag of others
10. Do not commence equipment repair or maintenance work until you have verified (see 9.4.4) that the tagged/locked out switch or control cannot be overridden or bypassed AND performed electrical verification (see 9.4.4).
11. Replace all guards before removing personal tags.
12. Do not use or remove another employee's / worker's protective tag. Do not remove a tag from equipment unless you placed it there. However if who placed the tag is not available a direct

Supervisor or Manager may order the tag removed and will take responsibility of informing the worker/person that the tag has been removed. It is the responsibility in this case that the person who applied the tag in the beginning should they be absent then they shall verify the tag is present upon their return.

13. Before machinery is put back into use after LOCKOUT/TAGOUT, give a verbal announcement/sound warning to fellow employees.
14. Lock-out is not required if there is no lock out device and the voltage is less than 300 Volts then a worker must be stationed at the tagged device to ensure the device is not operated while wok is taking place

9.4.3 Alternatives to the Lock-Out Procedure

The lock out tag out is not required if:

1. there is no lock out device and the voltage is less than 300 Volts then a worker must be stationed at the tagged device to ensure the device is not operated while wok is taking place
2. conductors are adequately grounded with a visible grounding mechanism
3. it is not practical to isolate the device (example trouble shooting live line work), then rubber gloves, cover-ups, safety glasses, Fire retardant clothing and suitable safety shoes for electrical work AND a job planning program

9.4.4 Verifying Procedure

Even though the device is open, locked and tagged it shall be verified as being isolated from the electrical energy source with an appropriate electrical measuring device (example multi-meter) at the work location each day of following an absence.

9.5 Machine/Equipment Safety

9.5.1 General

Machine and equipment safety are vital in activities within the Civil Engineering department. Throughout this manual many elements have been identified which pertain to safety not only to avoid personal injury but also for safety in around and on machinery and equipment.

Manufacturers' owner's manuals or instructions provide the essential elements for its safe use and shall be adhered to. Standard Operating Procedures (SOP's) if available shall be followed which provide further information/details.

All operators/workers must ensure that machinery and equipment are properly guarded and shielded so that moving parts, equipment or material do not endanger workers

- Ensure that electrical equipment is suitable for its use, and certified by the Canadian Standards Association or the Electrical Safety Authority as defined in the Ontario Electrical Safety Code or electrically approved for use in Canada
- Provide ground fault circuit interrupters where electrical equipment or the person using it may come in contact with moisture
- On-going development of standard operating procedures for machinery and equipment based on manufacturers' recommendations
- On-going development of an inspection, cleaning, and maintenance program for all machinery and equipment used in the laboratory

9.6 Hoists – Over Head Crane

9.6.1 General

The following are for persons who request the use of cranes or hoists. Any permission is limited to the crane(s) and/or hoist(s) listed in the description section of a 'Record of Training' (**not everyone requesting the use of cranes and hoists will be granted this permission**). A request for permission to use any lifting equipment shall be directed towards the Supervisor and/or Professor and shall be identified on the Risk Assessment(s). If approved, he/she will arrange for training with support from Technical Lab Staff. A 'Record of Training' shall be provided.

A competent certified crane operator will be assigned to provide limited training and guidance. Only those persons who will be operating a crane or hoist shall be trained and this training will be tailored to the lift operation(s) needed and no other lift may be attempted. The Departmental Chair must grant the final permission by signing-off on the 'Record of Training' before any lifting equipment is used.

In order to provide Due Diligence and allow flexible time and usage of overhead crane, alternate training may be conducted by 3rd. party M.O.L. accredited licensed trainers such as Ryder or Wajax. A license, shall be provided to the operator which identifies the operator name, training length of time the license is valid (expiry date) and the 3rd. party vendor that provided such training/license.

Licensing may also be provided within the Civil Department "in house". The program shall be performed and administered by an accredited trainer, licensed competent person dubbed "train the trainer" agreement which is generally a Technical support staff person. They shall have the Minister of Labour authority to provide in-house overhead crane licenses.

9.6.2 Rules for use of Cranes and Hoists

The following are for persons who request the use of cranes or hoists. Any permission is limited to:

- Only persons who are trained and certified as crane operators and have a completed Record of Training may operate lifting equipment
- Operators must be tested on each lift operation by a certified competent crane operator and this training must be documented on their Record of Training
- Only approved lift operations will be performed (some lifts will not be approved)
- **NO LIFTS MAY BE PERFORMED WHERE THE LOAD PASSES OVER ANOTHER PERSON!**
- **NO LIFTS MAY BE PERFORMED WHILE WORKING ALONE!**
- **HARD HATS MUST BE WORN FOR ALL LIFT OPERATIONS!**
- In general, the equipment will only be used during normal operating hours and be locked-out when not in use
- Persons in care and control of any hoisting equipment are responsible for the safety of all personnel in the near vicinity
- Any lift operations after normal operating hours must have the prior approval of the operator's Supervisor and/or Professor and the Departmental Chair

9.6.3 Cranes and Hoists Pre-Operational Inspection

The following are for persons who request and operate the use of cranes or hoists:

1. Visually inspect cables, rope drum, hook (hook should turn freely), and safety latches ensuring they are in good working conditions.
2. Test limit switches by raising the hook block without load (Hook block should stop when there is 3 cable loops on drum) and then lowering the hook block (Hook should not touch the floor).
3. **DO NOT** operate crane if limit switches are not operating properly.
4. Ensure the hoist trolley and brakes work properly by moving crane in all directions and performing the stop/braking operations.
5. Complete and sign the Overhead Crane Pre-Operational Inspection Checklist

See Appendix II – Overhead Crane Pre-Operational Inspection Checklist

9.6.4 General Operating Instructions of Cranes and Hoists

General

1. Only qualified persons may operate this unit.
2. Ensure the load to be lifted is within the crane, chains or slings load capacity.
3. Before picking-up a load, check for hook to be directly above load and load is balanced; **AVOID OFF-CENTER LOADING OF ANY KIND.**
4. Never lift or transport a load until all persons are clear.
5. Avoid shock and jerking of hoist load chain; best to avoid sudden acceleration or deceleration.
6. If there is any evidence of overloading, immediately lower load.
7. **DO NOT** allow load to bear against the hook latch nor contact any obstruction.
8. Take up a slack load chain carefully and start load slowly to avoid shock and jerking of hoist load chain. If there is any evidence of overloading, immediately lower load.

9.6.5 DO's and DON'Ts for Safety Procedures of Cranes and Hoists

For your safety

1. **DO NOT** operate unless trained and authorized
2. **DO NOT** use crane for lifting persons.
3. **DO NOT** use damaged chains or slings.
4. **DO NOT** load hoist, chains or slings if there are kinks and/or twists
5. **DO NOT** load hoist, chains or slings beyond the rated capacity.
6. **DO NOT** allow load to swing or twist while hoisting.
7. **DO NOT** leave suspended load unattended.
8. **DO NOT** allow load to bear against the hook latch nor contact any obstruction
9. **DO NOT** move load over the head of any person. Warn all persons of your intentions to move load into their area.
10. **DO NOT** position yourself between the load and wall nor any other movable object.
11. **DO NOT** wrap load chain around load or choke the chain around load.
12. **DO** ensure attachments to the hook are firmly seated in hook saddle.

13. **DO NOT** load the point of hook; avoid off-center loading of any kind.
14. **DO NOT** operate hoist if reeved hoist chains are twisted.
15. **DO NOT** allow load to bear against the hook latch.
16. **NEVER** operate the hoist when flammable materials or vapours are present. Electrical devices produce arcs or sparks that may cause a fire or explosion.
17. **DO NOT** use hoist when tired, distracted or under the influence of drugs, alcohol or medication which cause diminished control.
18. **DO STAY ALERT**, watch what you are doing and use common sense.

9.6.6 Annual Inspections by 3rd. Party

Each overhead cranes and hoist shall undergo at minimum yearly. This shall be conducted by a 3rd. party company for example are Ryder and Wajax however any accredited company or agency shall be acceptable. This shall satisfy the requirements "The Act" O.Reg.851, Sec.51. It is recommended during this time that complete preventative maintenance be performed

Records of inspections and preventative maintenance shall be duly filed and available upon request.

9.7 Material Elevators_Lifts

1. Only trained employee / worker may operate elevators.
2. Do not operate elevator unless all gates and guards are in place or the door is closed.
3. Clean the elevator ground after each operation.

9.8 Mixers

1. Always wear your PPE's at minimum eye and foot protection for the work and mixer be conducted
2. Do not operate the mixer unless a safety grid is over the mixer and guards are over the belt and gears.
3. When cleaning or performing maintenance inside the mixer, pull the motor starter and "LOCK" in the "OFF" position. (Follow LOCKOUT/TAGOUT and Confined Space Entry Procedures.)

4. Do not use an iron or steel hammer on hardened metal parts, such as molds or mixer parts. Use lead or brass hammers.
5. Do not reach into the mixer while it is in motion.
6. Before starting a mixing machine, remove all tools, bars, etc., on the machine or in the mixer. *See Appendix I – Commentary*

9.9 Office Safety

NOTE: Includes administration and office personnel including work study students either paid or unpaid.

1. Close drawers and doors immediately after use.
2. Open one file cabinet drawer at a time.
3. Put heavy files in the bottom drawers of file cabinets.
4. Use the handle when closing doors, drawers and files.
5. Use the ladder or step stool to retrieve or store items that are located above your head *see section 9.1.4.*
6. Do not stand on furniture to reach high places.
7. Do not kick objects out of your pathway; pick them up or push them out of the way.
8. Do not block your view by carrying large or bulky items; use dolly or hand truck or seek assistance.
9. Store sharp objects, such as pens, pencils, letter openers or scissors in drawers or with the points down in a container.
10. Keep floors clear of items such as paper clips, pencils, tacks or staples.
11. Do not tilt the chair you are sitting in on its back two legs.
12. Carry pencils, scissors and other sharp objects with the points down.
13. Position hands and fingers onto the handle of the paper cutter before pressing down on the blade.
14. Keep the paper cutter handle in the closed/locked position when it is not in use.
16. Keep fingers away from the ejector slot when loading or testing stapling devices.
17. Point the ejector slot away from yourself and bystanders when refilling staplers.
18. Do not use extension or power cords that have the ground prong removed or broken off.
19. Use a cord cover or tape the cord down when running electrical or other cords across aisles, between desks or across entrances/exits;
20. Do not place fingers or loose clothing in or near the feed of a paper shredder.
21. Do not connect multiple electrical devices into a single outlet.
22. Do not throw matches, cigarettes or other smoking materials into trash baskets.
23. Keep doors in hallways fully open or fully closed that are not occupied by persons working alone in offices or labs.
24. Use a staple remover, not your fingers, for removing staples.

25. Turn off and unplug office machines before adjusting, lubricating or cleaning them.
26. Do not use fans that have excessive vibration, frayed cords or missing guards.
27. Do not place floor type fans in walkways, aisles or doorways.
28. Use handrails when ascending or descending stairs or ramps.
29. Obey all posted safety and danger signs.
30. Do not use frayed, cut or cracked electrical cords.
31. Do not store or leave items on stairways or walkways.
32. Do not run on stairs or take more than one step at a time.
33. Do not jump from ramps, platforms, ladders or step stools.
34. Clean up spills or leaks immediately by using a paper towel, rag or a mop and bucket.
35. Electrical power bars are allowed but do not plug in one power bar to another.

9.10 Forklifts

9.10.1 General

The following are for persons who request the use of fork lifts and is limited to the fork lift licensing agency. N**ot everyone requesting the use of fork lift will be granted this permission**. A request for permission to use any lifting equipment shall be directed towards the Supervisor and/or Professor and shall be identified on the Risk Assessment(s). If approved, he/she will arrange for training with support from Technical Lab Staff. A 'Record of Training' shall be provided.

Only competent and licensed fork lift operator shall operate any fork lift truck.

The Departmental Chair must grant the final permission by signing-off on the 'Record of Training' before any fork lift device/equipment is used. This may be delegated to an appropriate Technical staff.

Licensing may also be provided within the Civil Department “in house”. The program shall be performed and administered by an accredited trainer, licensed competent person dubbed “train the trainer” agreement which is generally a Technical support staff person. They shall have the Minister of Labour authority to provide in-house fork lift/truck licenses.

9.10.2 Rules for use of Fork Truck

The following are for persons who request the use of fork truck/lift. Any permission is limited to:

- Only persons who are trained and certified as operators and have a completed Record of Training may operate the fork lift/truck
- Operators must demonstrate competency by a certified competent Technical staff
- Only approved lift operations will be performed (some lifts will not be approved)
- **NO LIFTS MAY BE PERFORMED WHERE THE LOAD PASSES OVER ANOTHER PERSON!**
- **NO LIFTS MAY BE PERFORMED WHILE WORKING ALONE!**
- **HARD HATS MUST BE WORN FOR ALL LIFT OPERATIONS while in designated hard hat areas!**
- In general, the equipment will only be used during normal operating hours and the key be locked-out when not in use
- Persons in care and control of any fork lifting equipment are responsible for the safety of all personnel in the near vicinity
- Any lift operations after normal operating hours must have the prior approval of the operator's Supervisor and/or Professor and the Departmental Chair

9.10.3 Pre-Use Inspection

Prior to use for the first time during a shift or day, perform a general walk around the forklift and perform a thorough observation. Do not use forklift if any of the following conditions exist:

1. The mast has broken or cracked weld-points.
2. The roller tracks are not greased or the chains are not free to travel.
3. Forks are unequally spaced or cracks exists along the blade or at the heels.
4. Hydraulic fluid levels are low.
5. Hydraulic line and fitting have excessive wear or are crimped.
6. Fluid is leaking from the lift or the tilt cylinders.
7. The hardware on the cylinders is loose.
8. Tires are excessively worn, split or have missing tire material.
9. Air filled tires are not filled to the operating pressure indicated on the tire.
10. Batteries have cracks or holes, uncapped cells, frayed cables, broken cable insulation, loose connections or clogged vent caps.
11. Seat belt is latching and not frayed

9.10.4 Starting the Forklift

1. Assure emergency brake is engaged.
2. Engage brake by applying foot to brake
3. Shift gears to neutral before turning the key.
4. Turn truck starter key then release emergency brake

9.10.5 Picking Up a Load

1. Square up on the center of the load and approach it straight on with the forks in the travel position.
2. Stop when the tips of your forks are about a foot from the load.
3. Level the forks and slowly drive forward until the load is resting against the backrest of the mast then tilt the mast slightly so the load is more than 2 degrees of horizontal.
4. Lift the load an inch or two to test for stability: If the rear wheels are not in firm contact with the floor, take a lighter load or use a forklift with a higher lift capacity.
5. Lift the load high enough to clear whatever is under it.
6. Back up about one foot, then slowly and evenly tilt the mast backwards to stabilize the load.

9.10.6 Putting a Load Down

1. Square up and stop about one foot from desired location.
2. Level the forks and drive to the loading spot.
3. Slowly lower the load to the floor.
4. Tilt the forks slightly forward so that you do not hook the load.
5. When the path behind you is clear of obstructions, back straight out until the forks have cleared the pallet.

9.10.7 Stacking One Load on Top of Another

1. Stop about one foot away from the loading area and lift the mast high enough to clear the top of the stack.
2. Slowly move forward until the load is squarely over the top of the stack.
3. Level the forks and lower the mast until the load is no longer supported by the forks.
4. Look over both shoulders for obstructions and back straight out if the path is clear.

9.10.8 Forklift Safety Rules

1. Do not exceed the lift capacity of the forklift. Read the lift capacity plate on the forklift if you are unsure.

2. Follow the manufacturer's guidelines concerning changes in the lift capacity before adding an attachment to a forklift.
3. Drive with the load at a ground clearance height of 4-6 inches at the tips and 2 inches at the heels in order to clear most uneven surfaces and debris.
4. Drive at a walking pace and apply brakes slowly to stop when driving on slippery surfaces such as icy or wet floors.
5. Approach railroad tracks curbs or other similar uneven surfaces at a 45° angle.
6. Do not drive over objects in your pathway.
7. Do not drive into an area with a ceiling height that is lower than the height of the mast or overhead guard.
8. Steer wide when making turns.
9. Do not drive up to anyone standing or working in front of a fixed object such as a wall.
10. Do not drive along the edge of an unguarded elevated surface such as a loading dock or staging platform.
11. Obey all traffic rules and signs.
12. Sound horn when approaching blind corners, doorways or aisles to alert other operators and pedestrians.
13. Do not exceed a safe working speed of five miles per hour and slow down in congested areas.
14. Drive in reverse and use a signal person when your vision is blocked by the load.
15. Look in the direction that you are driving; proceed when you have a clear path.
16. Do not use bare forks as a man-lift platform.
17. Do not drive the forklift while people are on an attached man-lift platform.
18. Do not use "Reverse" to brake.
19. Lower the mast completely, turn off the engine and set the parking brake before leaving your forklift.

9.10.9 Annual Inspections by 3rd. Party

Each forklift shall undergo at minimum yearly a safety inspection. This shall be conducted by a 3rd. party company for example are Ryder and Wajax however any accredited company or agency shall be acceptable. This shall satisfy the requirements “The Act” O.Reg.851, Sec.51. It is recommended during this time that complete preventative maintenance be performed

Records of inspections and preventative maintenance shall be duly filed and available upon request.

9.11 Scissor Lift

The following are for persons who request the use of scissor lifts and is limited to the licensing agency. N**ot everyone requesting the use of scissor lift will be granted this permission**. A request for permission of use shall be directed towards the Supervisor and/or Professor and shall be identified on the Risk Assessment(s). If approved, he/she will arrange for training with support from Technical Lab Staff.

Each operator of a scissor lift shall satisfy the requirement of working at heights and its training (refer to section 4.7).

Each 'Record of Training' shall be provided.

Only competent and licensed scissor lift operator shall operate any scissor lift.

The Departmental Chair must grant the final permission by signing-off on the 'Record of Training' before any the equipment is used. This may be delegated to an appropriate Technical staff.

9.11.2 Rules for use of Scissor Lift

The following are for persons who request the use of the Scissor Lift. Any permission is limited to:

- Only persons who are trained and have a completed Record of Training may operate the scissor lift
- Operators must demonstrate competency by a certified competent Technical staff
- Only approved lift operations will be performed (some lifts will not be approved)
- **NO LIFTS MAY BE PERFORMED WHILE WORKING ALONE!**
- **HARD HATS MUST BE WORN FOR ALL LIFT OPERATIONS!**
- In general, the equipment will only be used during normal operating hours and the key be locked-out when not in use
- Persons in care and control of any lifting equipment are responsible for the safety of all personnel in the near vicinity
- Any lift operations after normal operating hours must have the prior approval of the operator's Supervisor and/or Professor and the Departmental Chair

9.11.3 Additional DO NOT's Rules for use of Scissor Lift

In addition, the following Scissor DO NOT's Rules shall apply:

1. Do not drive near drop-offs, holes, or loading docks.
2. Do not raise platform on slope or drive onto slope when elevated.
3. Do not raise platform on uneven or soft surfaces.
4. Do not drive onto uneven or soft surfaces when elevated.
5. Do not use without guardrails, mid rails, chain, or bar in place.
6. Do not raise platform in windy or gusty conditions.
7. Do not exceed rated load.
8. Do not use if working platform is not working properly or if any part is damaged, worn or missing.
9. Do not use near moving vehicles or cranes.
10. Do not stand or sit on guardrails.
11. Do not use under the influence of alcohol or drugs.
12. Do not override safety devices.
13. Do not raise platform while machine is on a truck, forklift, or other device or vehicle.
14. Do not use ladders, scaffolding, or other devices to increase size or working height of platform.
15. Do not use with damaged tires.
16. Do not attach ropes or chains to guardrails or use as a crane.
17. Do not use with tires that are not per manufacturers, specifications.
18. When using the Scissor Lift above or near an overhead hoist travel way, the overhead hoist must be locked out. If you are working near the orange duct-o-bars by the hoist travel rail, the main switch for the duct-o-bars must be locked out and checked for power by an electrician.
19. Do Not use unless body harness approved type is dawned and safety-tied/linked to the guard rail

FAILURE TO AVOID THE ABOVE HAZARDS MAY RESULT IN DEATH OR SERIOUS INJURY!

9.11.4 Pre-Start Checks

1. Check for obstacles around the work platform and in the path of travel such as holes, drop offs, debris, ditches and soft fill.
2. Check for overhead clearances.
3. Make sure the batteries are fully charged. Disconnect battery-charging system from external power source.

9.11.5 Start and Operation

1. Pull out the emergency stop button on the control panel.
2. Select “platform” with off/platform/base select key switch.
3. Enter the platform.
4. Pull out the emergency stop button on the platform control panel.

5. Proceed with job using the required buttons, levers and controller located on the operator console.
6. The Scissor Lift is equipped with a high and low range for travel. It can be used in high range in open travel ways, but shall be used in low range in tight areas.
7. If painting is being done while on the Scissor Lift, cover up the platform, handrails and controls to minimize overspray or splashing on the Scissor Lift.

9.11.6 Shutdown Procedure

1. Fully lower the platform.
2. Push the emergency stop buttons.

- On the operator console.
- On the base control.

3. Turn the base key switch to the off position.
4. If you are finished with the Scissor Lift, clear all tools, debris, etc., from the platform and plug the Scissor Lift in to recharge the battery.

9.11.7 Annual Inspections by 3rd. Party

Each scissorlift shall undergo at minimum yearly a safety inspection. This shall be conducted by a 3rd. party company for example are Ryder and Wajax however any accredited company or agency shall be acceptable. This shall satisfy the requirements "The Act" O.Reg.851, Sec.51. It is recommended during this time that complete preventative maintenance be performed

Records of inspections and preventative maintenance shall be duly filed and available upon request.

9.12 Warehouse Safety

1. Visually inspect for sharp objects or other hazards before putting hands, legs or other body parts into containers such as garbage cans, boxes, bags or sinks.
2. Remove or bend nails and staples from crates before unpacking.
3. When cutting shrink wrap with a blade, always cut away from you and your co-workers.
4. Do not try to kick objects out of pathways. Push or carry them out of the way.
5. Do not let items overhang from shelves into walkways.
6. Move slowly when approaching blind corners.
7. Place heavier loads on the lower and middle shelves; lightest at the top.
8. Remove one object at a time from shelves.
9. Place items on shelves so that they lie flat and do not lean against each other.

10. Keep floors clean and aisles unobstructed to allow easy access to exits.
11. Use only approved equipment (mobile stairs, ladders) to retrieve materials from high shelves.
12. Secure materials that cannot be laid flat.
13. Report inadequate lighting (burned out bulbs or blocked lights) to the Technical Lab Staff or your Professor / Supervisor.
14. Store all hazardous or potentially hazardous products in area designated; if not sure contact the Technical Lab Staff or your Professor / Supervisor. immediately upon receipt.

9.13 Hand Truck

1. Tip the load slightly forward so that the tongue of the hand truck goes under the load.
2. Push the tongue of the hand truck all the way under the load to be moved.
3. Keep the center of gravity of the load as low as possible by placing heavier objects below the lighter objects.
4. When loading hand trucks, keep your feet clear of the wheels.
5. Push the load so that the weight will be carried by the axle and not the handles. The operator should only balance and push.
6. Place the load so that it will not slip, shift or fall. Use straps, if provided, to secure the load.
7. If your view is obstructed, use a spotter to assist in guiding the load.
8. For extremely bulky or pressurized items such as gas cylinders, strap or chain the items to the hand truck.
9. Do not walk backward with the hand truck, unless going up stairs or ramps.
10. When going down an incline, keep the hand truck in front of you so that it can be controlled at all times.
11. Move hand trucks at a walking pace.
12. Store hand trucks with the tongue under a pallet, shelf, or table.
13. Do not exceed the manufacturer's load rated capacity. Read the capacity plate on the hand truck if you are unsure.

9.14 Pallet Jack

9.14.1 General

The following are for persons who request the use of electric powered pallet jack. N**ot everyone requesting the use of pallet truck will be granted this permission**. A request for permission to use any lifting equipment shall be directed towards the Supervisor and/or Professor and shall be identified on the

Risk Assessment(s). If approved, he/she will arrange for training with support from Technical Lab Staff. A 'Record of Training' shall be provided.

Only competent operators shall operate any electrical powered pallet jack.

The Departmental Chair must grant the final permission by signing-off on the 'Record of Training' before any equipment is used. This may be delegated to an appropriate Technical staff.

Licensing may also be provided within the Civil Department “in house”. The program shall be performed and administered by an accredited trainer, licensed competent person dubbed “train the trainer” agreement which is generally a Technical support staff person. They shall have the Minister of Labour authority to provide in-house licenses.

9.14.2 Rules for use of Electrical Powered Pallet Jack

The following are for persons who request the use of pallet jack:

- Only persons who are trained and certified as operators and have a completed Record of Training may operate the fork lift/truck
- Operators must demonstrate competency by a certified competent Technical staff
- Only approved lift and move operations will be performed (some will not be approved)
- **HARD HATS MUST BE WORN FOR ALL LIFT OPERATIONS while in designated hard hat areas!**
- In general, the equipment will only be used during normal operating hours and the key be locked-out when not in use
- Persons in care and control of any lifting/moving equipment are responsible for the safety of all personnel in the near vicinity
- Any operations after normal operating hours must have the prior approval of the operator's Supervisor and/or Professor and the Departmental Chair

9.14.3 Pre-Use Inspection

Prior to use for the first time during a shift or day, perform a general walk around the forklift and perform a thorough observation. Do not use forklift if any of the following conditions exist:

1. Check for broken or cracked weld-points.
2. check for obstruction free travel.
3. Forks are unequally spaced or cracks exists along the blade or at the heels.
4. fluid levels.

5. lines and fitting have excessive wear or are crimped.
6. Fluid is not leaking from the lift or the tilt cylinders.
7. The hardware on the cylinders is not loose.
8. Tires are excessively worn, split or have missing tire material.
9. Batteries have cracks or holes, uncapped cells, frayed cables, broken cable insulation, loose connections or clogged vent caps.

9.14.4 Operating the Pallet Jack

1. Only employer authorized personnel may operate pallet jacks.
2. Do not exceed the manufacturer's load rated capacity. Read the lift capacity plate on the pallet jack if you are unsure.
3. Do not ride on pallet jacks.
4. Turn key and engage code number
5. Start and stop gradually to prevent the load from slipping.
6. Pull manual pallet jacks; push when going down an incline or passing close to walls or obstacles.
7. If your view is obstructed, use a spotter to assist in guiding the load.
8. Stop the pallet jack if anyone gets in your way.
9. Do not place your feet under the pallet jack when it is moving.
10. Keep your feet and other body parts clear of pallet when releasing the load.

9.14.5 Annual Inspections by 3rd. Party

Each electric pallet truck shall undergo at minimum yearly as safety inspection. This shall be conducted by a 3rd. party company for example are Ryder and Wajax however any accredited company or agency shall be acceptable. This shall satisfy the requirements “The Act” O.Reg.851, Sec.51. It is recommended during this time that complete preventative maintenance be performed.

Records of inspections and preventative maintenance shall be duly filed and available upon request.

9.15 Welding Safety

Any welding shall be performed in a designated approved welding bay or area. Other welding may be performed only with a Hot Work Permit issued by Campus Facilitiies and Operations. In any case the following shall apply:

1. Do not attempt to perform any welding until you have been trained and approved to do so by your Supervisor Professor.

2. Obey all warning and precaution signs that are posted designating welding areas.
3. When arc welding and arc cutting, use helmets or handshields with filter lenses and cover plates to view the arc.
4. When operating resistance welding or brazing equipment, use face shields or goggles.
5. Wear welding gloves when welding or cutting.
6. Open windows, doors and turn on local exhaust fans to reduce air contaminants.
7. Use respiratory protective equipment provided.
8. Do not transfer gases from one cylinder to another or mix gases in a cylinder.
9. Do not use oxygen from a cylinder or cylinder manifold unless a pressure regulating device intended for use with oxygen is provided.
10. Check all cylinders and equipment (hoses, regulators and etc.) for leaks before and after use. Do not use if leaking.
11. Use flash guard shields to isolate welding area.
12. When not in use, turn off gas supply and bleed off cylinders.
13. Place oxygen and fuel gas cylinders and acetylene generators away from the welding position so that they will not be unduly heated by radiation from heated materials, by sparks or slag, or by misdirection of the torch flame.
14. Keep one or more approved Class B or Class C fire extinguishers at the location where welding or cutting is being performed.
15. When welding, wear a welding helmet with filter plates and lenses, welding gloves, a long sleeve shirt, long pants, and an apron.
16. Do not perform welding tasks while wearing wet cotton gloves or wet leather gloves.
17. Do not use welding apparatus if power plug cord is cut, frayed, split or otherwise visibly damaged or modified.
18. Upon completion of welding do not leave area until 30 minutes have passed to assure not sparks are lingering and no fire has occurred.

9.15.1 Cutting/Brazing

1. Obey all signs posted in the welding area and / or instruction.
2. Do not leave oily rags, paper or other combustible materials in the welding, cutting or brazing area.
3. Use the red hose for gas fuel and the green hose for oxygen.
4. Do not use worn or cracked hoses.
5. Do not use oil, grease or other lubricants on the regulator.
6. "Blow Out" hoses before attaching the torch.

7. Ignite torches with friction lighters only. Do not use a cigarette lighter or match.
8. Do not wear contact lenses when cutting/brazing in a contaminated atmosphere.
9. Bleed oxygen and fuel lines at the end of each job or shift.

9.16 Compressed Gas Cylinders

9.16.1 General Rules Compressed Gases

Unless trained on storage and handling only Technical staff shall handle compressed gases. Gases used in laboratories are supplied in cylinders at high pressure. In addition to any potential chemical hazards, compressed gases are a high-energy source and therefore hazardous.

See Appendix II – IRM Compressed Gas Cylinder Procedure

In addition, and to complement EHS the following rules shall be followed:

- cylinders of all sizes must be restrained from falling by restraining devices
- during storage or transport, the cylinder cap must be in place
- cylinders must only be transported when strapped to a wheeled cart
- no lubricant shall be used when connecting the regulator to the cylinder
- new connections shall be checked for gas leakage
- the cylinder delivery pressure shall be set to zero after the main cylinder valve is closed to prevent a rapid release of compressed gas the next time the cylinder is opened
- empty cylinders shall have the regulators removed, be marked MT, the shipping cap replaced and returned to main storage room in Kerr Hall
- unused or partially used cylinders that are of no further use shall be returned to gas company or stored in Kerr Hall
- in the event of a fire, the supply of a combustible gas shall be shut off before any attempt is made to extinguish the flame
- a trap shall be used to prevent the back siphoning of solution when a soluble gas is being employed
- do not expose cylinders to temperatures higher than 50°C
- use toxic, flammable or reactive gases in a fume hood
- use the appropriate regulator for the type of gas

- be aware that special handling procedures as required for certain gases

9.16.2 Storage and Handling

1. Do not handle oxygen cylinders if your gloves are greasy or oily.
2. Store all cylinders in the upright position.
3. Keep all cylinders not in use capped and secured with safety chain.
4. Do not lift cylinders by the valve protection cap.
5. Do not store compressed gas cylinders in areas where they can come in contact with chemicals labeled "Corrosive."
6. Place cylinders on a cradle, slingboard, pallet or cylinder basket to hoist them.
7. Do not place cylinders against electrical panels or live electrical cords where the cylinder can become part of the circuit.
8. Do not store oxygen cylinders near fuel gas cylinders such as propane or acetylene, or near combustible material such as oil or grease.
9. Do not transport cylinders without first removing regulators and replacing the valve protection caps.
10. Do not hoist or transport cylinders by means of magnets or choker slings.

9.16.3 Use of Cylinders

1. Do not use dented, cracked or other visually damaged cylinders.
2. Use only an open ended or adjustable wrench when connecting or disconnecting regulators and fittings.
3. Close the cylinder valve when work is finished, when the cylinder is empty, or at any time the cylinder is moved.
4. Stand to the side of the regulator when opening the valve.
5. If a cylinder is leaking around a valve or a fuse plug, move it to an outside area away from where work is performed and tag it to indicate the defect.
6. Do not use compressed gas to clean the work area, equipment or yourself.
7. Do not remove the valve wrench from acetylene cylinders while the cylinder is in use.
8. Open compressed gas cylinder valves slowly. Open fully when in use to eliminate possible leakage around the cylinder valve stem.
9. Purge oxygen valves, regulators and lines before use.

9.17 Hot / Cold Stress Prevention Program

Employers have a duty under section 25(2)(h) and supervisors under section 27(2)(c) of the *Occupational Health and Safety Act (OHSA)* to take every precaution reasonable in the circumstances for the protection of a worker. This

includes developing hot and cold environment policies and procedures to protect workers in hot and cold environments – UNDER FURTHER DEVELOPMENT.

Indoor working space

7. Keep all doors closed
8. Inform workers about the door opening if the opening time will exceed 2 minute.

Section X – Disposal Procedures Rules, Policies

UNDER DEVELOPMENT through the EHS department and VERTERE Chemical Inventory System

10.1 General Chemical and Hazardous Waste Disposal

All chemical waste disposal is carried out by the Department of Civil Engineering with guidance and support from EHS. Sinks and garbage cans are not to be used for hazardous waste disposal.

All hazardous waste must be segregated according to the procedures outlined below in **Packaging and Identification of Hazardous Waste.** The general procedure for disposing of waste chemicals is outlined below in Disposal Procedures Hazardous Chemicals. All chemicals and hazardous materials shall be identified and suitably packaged. TMU EHS department administers regular waste pick up, thus shall be coordinated with EHS department where a third party company knowledgeable in this type of work is coordinated with.

See Appendix II – Filling out Chemical Waste Disposal Request Form

https://ccs.cf.ryerson.ca/cehssmforms/chemical.disposal/

10.1.1Flammable Liquids

Flammable liquids such as common organic solvents must be placed in solvent disposal cans (red with wide mouths and flame arrestor) which are identified as to point of origin. This waste shall be collected in separate containers for Halogenated and Non-halogenated waste (<3% halogen content).

Containers which have been used to store chemicals, such as stock bottles, but which are empty may be disposed of with the normal garbage; these bottles shall be washed and the labels defaced before they are placed in the garbage.

10.1.2 Packaging and Identification of Hazardous Waste

The purpose of the following instructions is to prevent dangerous chemical reactions if there is an accident during transit.

1. All chemicals must be packed in sturdy containers, using an inert packing material such as vermiculite.
2. Chemicals must be taken from the laboratory by the user to the pick-up point. Disposal companies require that chemical wastes be identified as members of one of the following Chemical Code Groups:

Group A

- Inorganic Acids
- Elements and inorganic salts that do not liberate gaseous products when acidified.

Group B

- Inorganic alkaline chemicals
- Organic bases
- Elements and inorganic salts which liberate gaseous products when acidified.

Group C

- Solid organic compounds (excluding bases)

Group D

- Organic liquids (excluding organic bases) NOTE: Separate containers must be used for halogenated and non- halogenated Group D liquids.

Group E

- Inorganic oxidizing agents NOTE: Group E chemicals cannot be stored or transported with any other chemicals in a common container.

Group F

- Pesticides

Group G

- Shock sensitive materials
- Organic oxidizing agents
- Pressurized containers, gas cylinders
- Materials that react violently with water

10.1.3 Disposal Procedure Hazardous Chemicals

DEFACE all containers that have hazardous material warnings if they no longer contain hazardous materials.

SEGREGATE incompatible materials (see back of pink form).

SEPARATE unopened, unused chemicals from other material to be disposed.

LABEL the chemical name, contaminants (including levels when known), concentration (molarity, dilution factor, etc.), must appear on each individual bottle, bag, box or container of chemicals or by-product. To comply with transport regulations, an inventory must be attached to external packaging (pink forms are provided for your convenience).

COMPLETE and ACCURATE IDENTIFICATION of all materials is the single most important factor in providing safe, environmentally sound and cost- effective hazardous waste management.

Complete EHS Chemical Waste Form *See Appendix II*

10.1.4 UNKNOWNS

Unknowns cannot be transported. Contact your EHS representative for guidance and support. Departments shall bear all costs for analysis/identification when the identity of a material cannot be determined (with certainty) by the originating department.

10.1.5 PACKAGING

1. Solid Chemicals must be packed in cardboard boxes with an acceptable absorbent material such as vermiculite surrounding the individual containers (styrofoam chips are not acceptable as they are reactive and non-absorbent).
2. Liquid Chemicals must be packaged as above, in their original shipping containers, or (if they are non-corrosive) in suitable non-breakable containers approved by EHS
3. Flammable Liquids must be placed in Solvent Disposal cans (the red ones with the wide mouth). Cans must be clean, with an intact flame arrestor and labelled according to point of pickup. Non-flammable, non-corrosive liquid material may be mixed with flammable material provided that the materials are compatible.

10.2 Equipment Disposal

10.2.1 General

All equipment disposal is carried out by the Department of Civil Engineering with guidance and support from EHS as required.

Equipment that is sent out to be disposed of either by destruction or by recycling must be labelled and tagged identifying that the equipment has had all hazardous materials removed (e.g. mercury-filled thermometers, PCB-filled transformers, and radioactive sources). UNDER DEVELOPMENT….. *these tags are fixed by the appropriate safety representative from EHS*

10.2.2 Computers

Computers including mainframe desktops laptops etc. etc. shall be stored in MON building at the receiving doors or suitable space. A work order to Facilities Management shall be placed as the quantity dictates; prior to a work order CCS (Computer Services) shall be contacted to remove any confidential hard drives to be suitably destroyed. A third party disposal company shall remove and recycle as appropriate.

10.2.3 Metals

All metals for disposal can be stored where appropriate. There are many local metal recyclers that will pick-up and remove metal debris. A phone call to any recycler is appropriate otherwise create a work order through Facilities Management as the quantity dictates.

10.3 Laboratory Debris and Waste Disposal

10.3.1 General

Laboratories that produce waste other than general garbage and recyclable materials that Facilities Management administers shall be administered and conducted by the Department of Civil Engineering. These may include but not limited to the Structures and Concrete Labs which contain concrete wood framing as examples.

10.3.2 Large Bins

Large bins such as 10 12 14 yards for example may be ordered and arrived empty. The location shall be within the laboratory. Locations outside the laboratories and within the general public shall be approved by the Facilities Management department. E-mail approval shall be deemed adequate.

Section XI – Contractors and External Vendors Procedures

UNDER DEVELOPMENT ……..

11.1 Contractors Altering Base Building Facilities

UNDER DEVELOPMENT ……..

11.2 External Vendors Performing Equipment Installations

UNDER DEVELOPMENT……..

References

[1] TMU Faculty Association, "Collective Agreement between the Board of Governors TMU University and the TMU Faculty Association," Toronto Metropolitan University, Toronto, ON, 2015.

[2] CUPE Local 3904, Unit 1, "Collective Agreement between the Board of Governors of Toronto Metropolitan University and The Canadian Union of Public Employees Local 3904, Unit 1 Part-Time and Sessional Instructors," Toronto Metropolitan University, Toronto, ON, 2014.

[3] Ontario Ministry of Labour, "Worker Health and Safety Awareness in 4 Steps," Ontario Ministry of Labour, November 2013. [Online]. Available: http://www.labour.gov.on.ca/english/hs/training/workers.php. [Accessed 2 2015].

[4] Ministry of Labour, "A Guide for Joint Health and Safety Committees and Health and Safety Representatives in the Workplace," Ministry of Labour, Ontario, October 2012.

[5] MINISTRY OF ATTORNEY GENERAL, "Occupational Health and Safety Act," Service Ontario, [Online]. Available: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm. [Accessed 2 2015].

[6] ANSI-ASC A14.3-2008, "American National Standard for Ladders - Fixed - Safety Requirements," American Ladders Institute, Chicago, IL, 2008.

[7] OPSEU, "Collective Agreement between Ontario Public Service Employees Union and Its Local 596 and Toronto Metropolitan University," The Board of Governors of Toronto Metropolitan University, Toronto, ON, 2014.

[8] Toronto Metropolitan University, "Human Resource: OPSEU Job Description," [Online]. Available: http://www.ryerson.ca/content/dam/hr/management/job_eval/docs/jd_technical_gr14.pdf. [Accessed 22 01 2015].

Appendix I – Commentary

Cement Dust

Hazard: Exposure to cement dust can irritate eyes, nose, throat and the upper respiratory system. Skin contact may result in moderate irritation to thickening/cracking of skin to severe skin damage from chemical burns. Silica exposure can lead to lung injuries including silicosis and lung cancer.

Solutions:

- Rinse eyes with water if they come into contact with cement dust and consult a physician.
- Use soap and water to wash off dust to avoid skin damage.
- Wear a P-, N- or R-95 respirator to minimize inhalation of cement dust.
- Eat and drink only in dust-free areas to avoid ingesting cement dust.

Wet Concrete

Hazard: Exposure to wet concrete can result in skin irritation or even first-, second- or third-degree chemical burns. Compounds such as hexavalent chromium may also be harmful.

Solutions:

- Wear alkali-resistant gloves, coveralls with long sleeves and full-length pants, waterproof boots and eye protection.
- Wash contaminated skin areas with cold, running water as soon as possible.
- Rinse eyes splashed with wet concrete with water for at least 15 minutes and then go to the hospital for further treatment.

Appendix II – Forms Department of Civil Engineering Forms



Departmental Safety Officers

Environment, Health, Safety and Risk Mgmt.

Geeta Sharma, MPH, CRSP, CRM
Associate Director, EHS and Risk Mgmt.

February, 2017

Ryerson University

Integrated Risk Management

Current DSO

roles and responsibilities

Ryerson University Integrated Risk Management



What is a Departmental Safety Officer (DSO)?

1. A DSO is a **representative** of the School, Department or Centre who is knowledgeable about the operation of the area, the related hazards and required controls.

2. This individual is **appointed** by the Manager, Chair, Dean, Academic/Non-Academic Director or Senior Officer to represent the department.

Ryerson University Integrated Risk Management

Responsibilities of DSO's

1. Assist the department head in fulfilling the intent of the University EHS System
2. Forward EHS concerns to the relevant party
3. Coordinate routine, documented inspections of all areas within the department
4. Assist supervisors in investigating and documenting accidents and incidents
5. Respond to reports of unsafe conditions by investigating and reporting to the department head.
6. Advise the department head and EHS of critical injuries, dangerous unsafe condition or refusal to work.
7. Ensure that there are adequate number of trained first aiders for the department.
8. Act as primary EHS resource for EHS and the JHSC.

New DSO

Program and Support

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YEAR 1 July 2016 - June 2017	YEAR 2 July 2017 - June 2018	YEAR 3 July 2018 - June 2019
Departmental Safety Officer (DSO) Program	Noise Safety Program	Electrical Safety
Chemical Safety Program	Risk Assessment Database	Hot Work
Machine/Equipment Safety Program	Working From Heights Program	Confined Spaces
Safety Training (student focused)	Lab Safety Program	Medical Surveillance Program
Office Ergonomics Program		Designated Substances

Ryerson University Integrated Risk Management

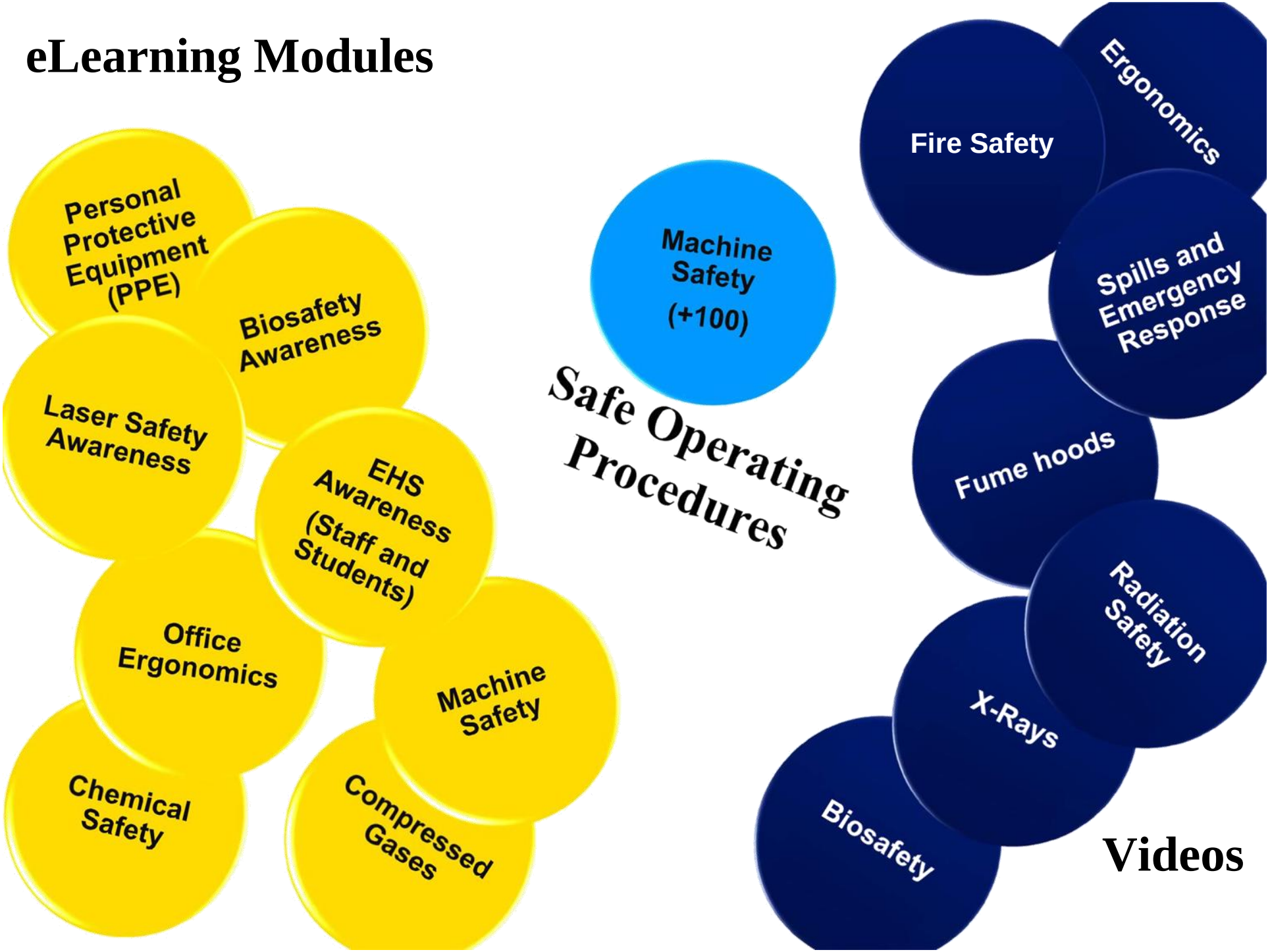
Three -Year Action Plan


Lab Safety
Fume Hoods
Spill Kits
Emergency Equipment
Lab Signage
Hazardous Waste Room
Lab Safety Videos
Senior EHS Officer



Ryerson University
Integrated Risk Management

eLearning Modules





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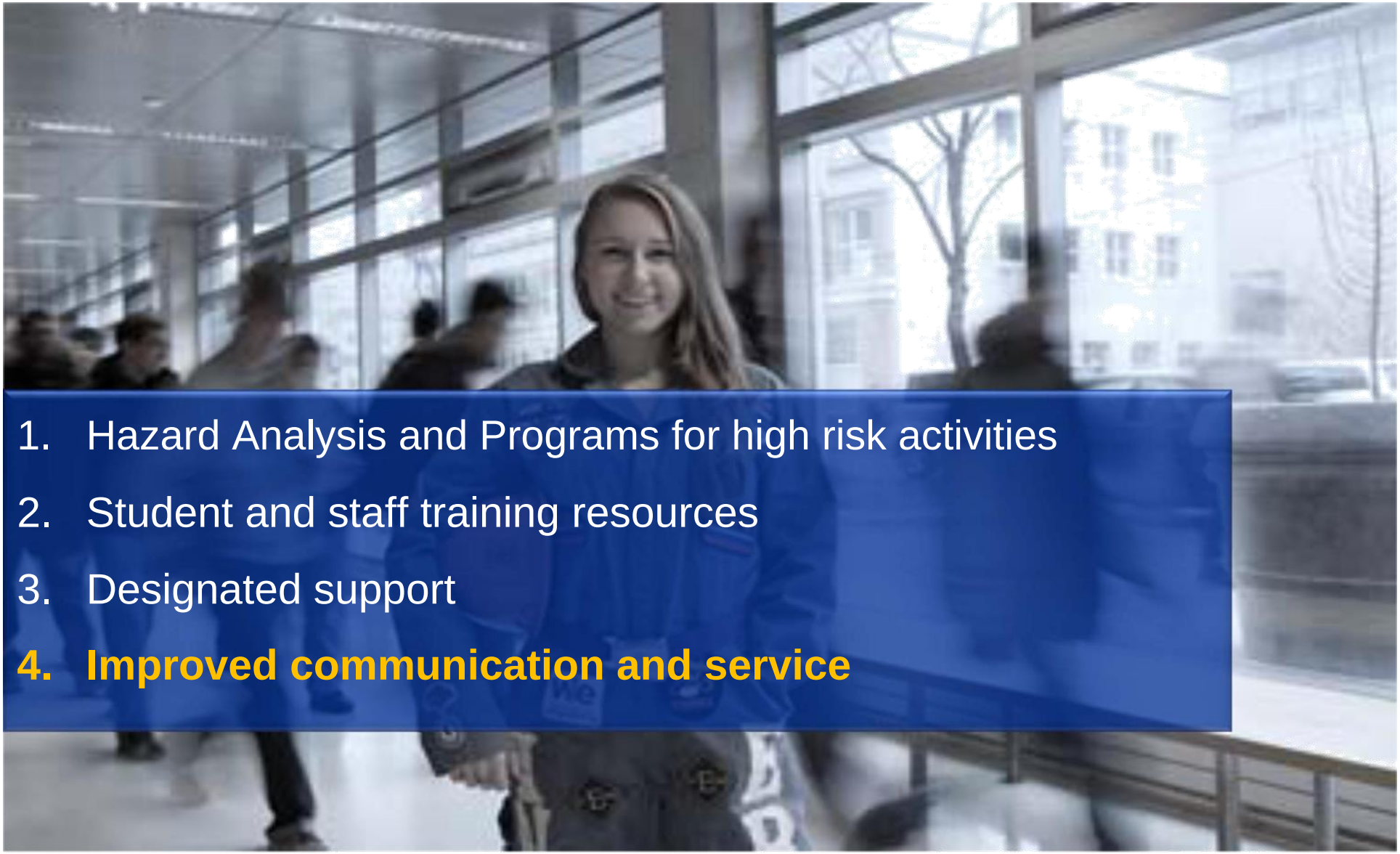
Integrated Risk Management

Designated EHS Manager

1. Designated EHS Manager
2. One point of contact
3. Will help integrate the programs through the DSO Committee

Ryerson University Integrated Risk Management



1. Hazard Analysis and Programs for high risk activities
2. Student and staff training resources
3. Designated support
4. **Improved communication and service**

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What does it mean

for me?

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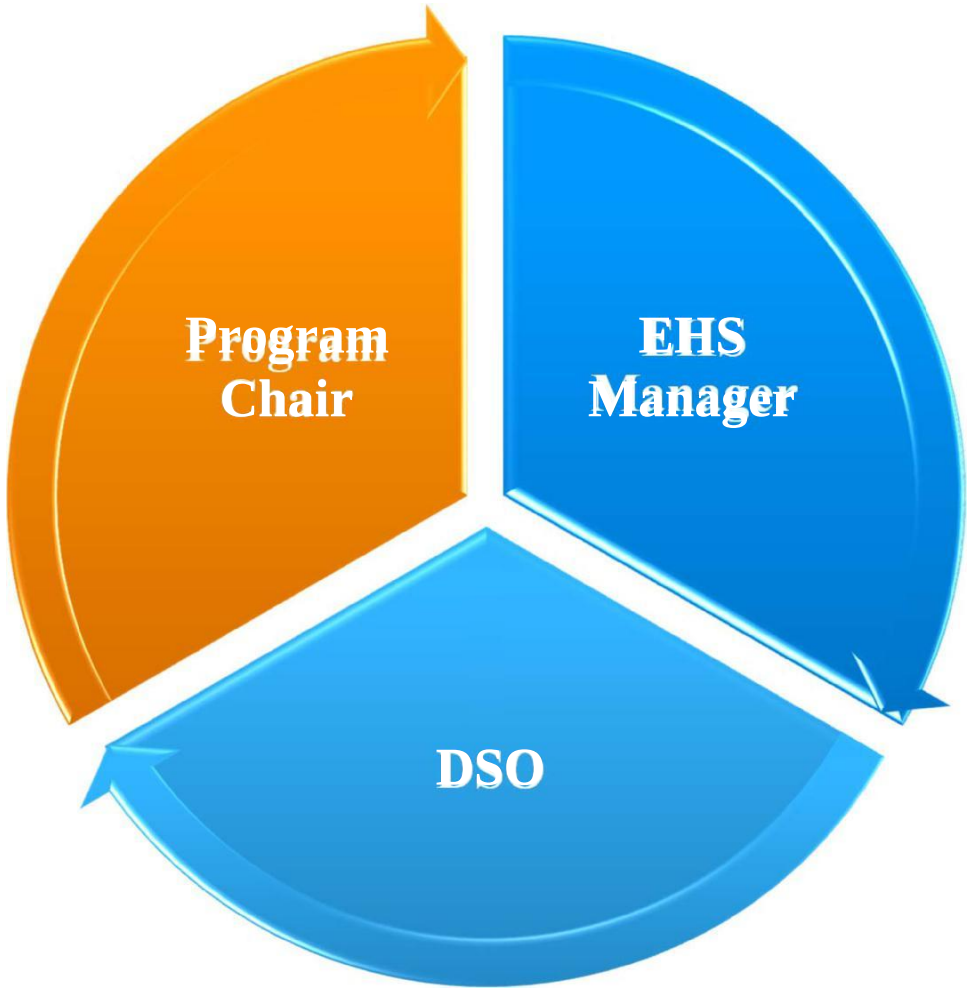
Departmental Safety Committee



Accountability	Deliverables	Meeting Frequency
Departmental Safety Committee (EHS, Chair, DSO)	▪ Hazard Assessments ▪ Prioritize safety risk ▪ Develop action plan ▪ Implementation ▪ Review incidents and injuries	▪ Every 3-4 months? ▪ Based on department's risk?
Dean and Associate Deans (EHS Manager)	▪ Update on safety issues ▪ Consultation and authorization ▪ Progress report	Quarterly
Dean's Council (AD, EHS and Risk)	▪ Review draft safety action plan ▪ Progress report	First and Last meetings of the year

DSO Training Plan

Tier 1 – General OHS

- For ALL DSO's

Tier 2 – High Risk Hazards

- For DSO's working in high risk areas e.g. laboratories, workshops, and studios

Designated personalized EHS support

Training (Tier 1 and 2)

Access (and accountability) to the leadership team

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What hazards could

I have to deal with?

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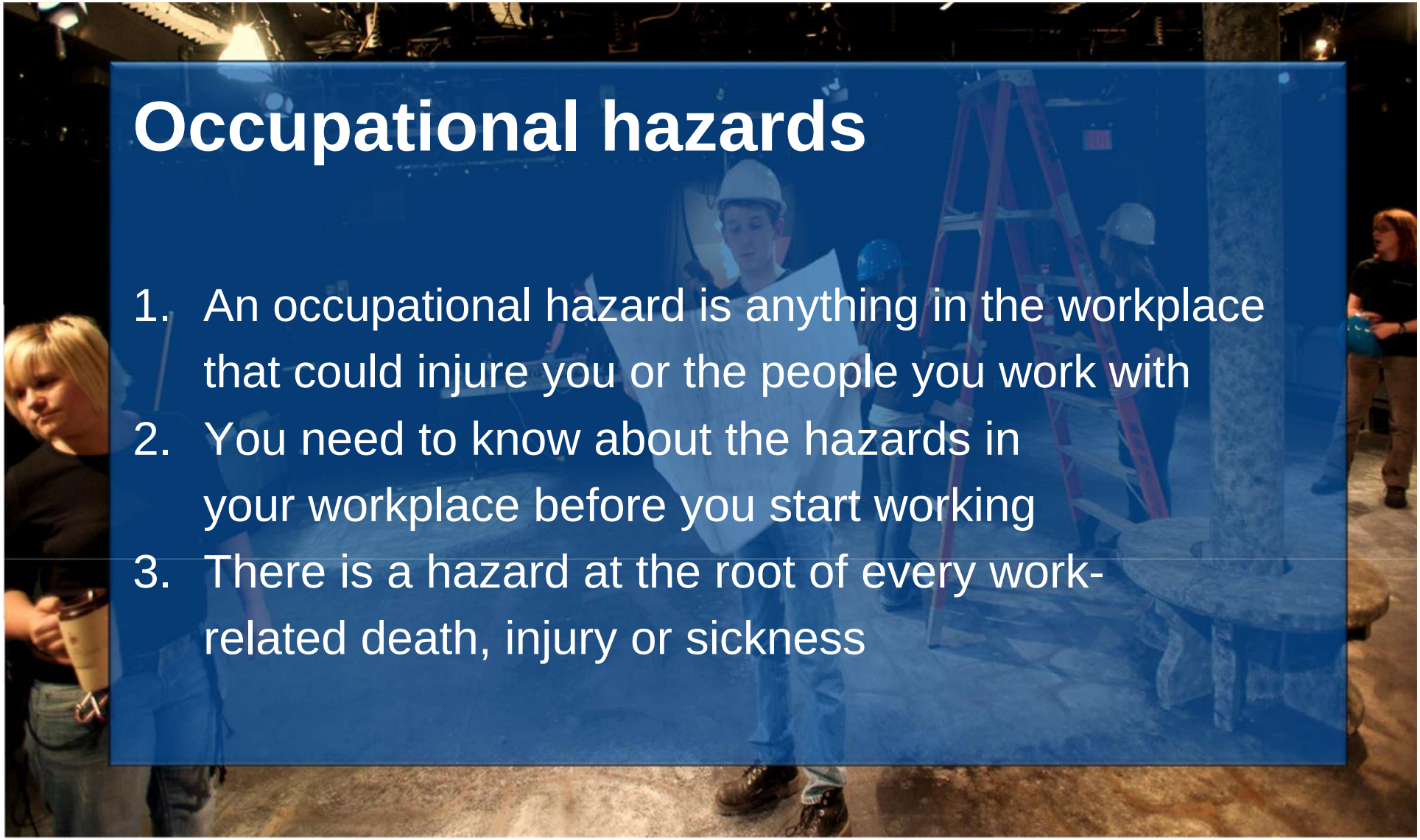

Occupational hazards

1. An occupational hazard is anything in the workplace that could injure you or the people you work with
2. You need to know about the hazards in your workplace before you start working
3. There is a hazard at the root of every work-related death, injury or sickness

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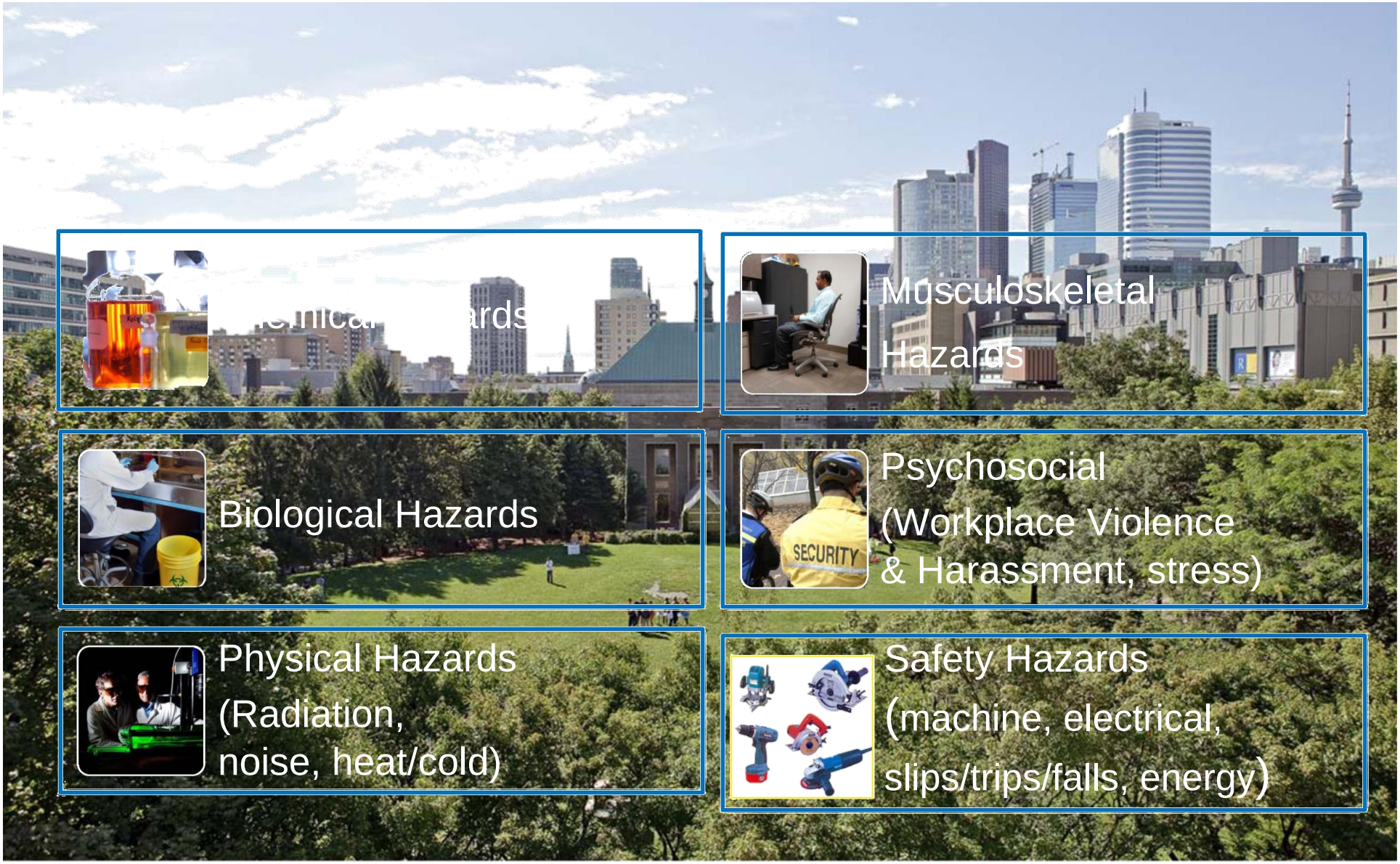

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Key Hazards at Ryerson

Please help us

create the perfect program for you?

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1. Departmental Safety Committee

- Strengths?
- Weaknesses?

2. DSO Training Modules:

- Tier 1?
- Tier 2?

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Attendance Sheet
Safety Awareness and Hazard Awareness
Orientation for GA TA

Dated: _____

The following persons attended a short orientation conducted by the Department of Civil Engineering Department at Toronto Metropolitan University.

Orientation included:

- **Acknowledgment and presentation of the Green coloured Occupational Health and Safety Act and Regulations for Ontario.**
- **WHMIS and EHS on-line training website and process**
- **Risk Assessment review for projects**
- **Laboratory Access via one-card procedure**
- **Conduct of undergrad students during physical laboratory sessions**
- **Need for safety apparel (differs depending on lab requirement)**
- **Laboratory Technician support; need for understanding and training on equipment required**
- **Professor Consultation Safety Review**
- **Common sense approach to hazards and safety**
- **Safety Manual**
- **Workplace Violence and Harassment**

Your Name (Print)	Signature	Your Name (Print)	Signature

I have been made aware that I must be governed within the rules and regulations of both Toronto Metropolitan University and the Occupational Health and Safety Act of Ontario.

Should any unforeseen hazard and/or safety concern arise I will notify the appropriate personnel in the Civil Engineering Dept. at Toronto Metropolitan University.

I will conduct myself in a safe manner at all times while in the laboratories.

Orientation Presenter _____
(Print and Sign)

RYERSON UNIVERSITY

DEPARTMENT OF CIVIL ENGINEERING

RECORD OF TRAINING

Name of equipment: _____

Location of equipment: _____

Name of technical staff/trainer: _____

Signature of technical staff/trainer: _____

I (name of student/worker) _____ **certify that I have received training on using the equipment listed above as per the following itemized list.**

	Item	**Please Check** where applicable
1.	Use of Personal Protection Equipment (e.g. goggles)	
2.	Sample preparation and positioning	
3.	Electrical Safety (e.g., some equipment are for dry use only)	
4.	Connecting to power outlet	
5.	Equipment on/off	
6.	Use of equipment guards	
7.	Review of equipment safety and operational procedures/**manual**	
8.	Use of water	
9.	Emergency procedure (e.g., dial 80)	

Student/worker signature: _____Date:_____

Student/worker Email: _____ Supervisor's name: _____

Safety Awareness and Hazard Awareness
Training & Waiver, Machine Shop

Dated: _____

1. _____ understand the hazards and safety requirements and any associated risks if any, when using any and/or all machines tools equipment and devices in the Civil Engineering Machine Shop lab #MON107

2A. I _____ have been suitably trained in the operation and use of any and all machines tools equipment and devices in the Civil Engineering Machine Shop lab #MON107

OR

2B. I _____ have been suitably trained in the operation and use of the Machine Equipment (list 1 or more) _____ specific to the Work and/or Project associated with my studies at TMU including any and all machines tools and/or devices specifically needed to perform and utilize this Machine equipment(s) located in the Civil Engineering Machine Shop lab #MON107

Also, I have been made aware that I must be governed within the rules and regulations of both Toronto Metropolitan University and the Occupational Health and Safety Act of Ontario.

Also, should any unforeseen hazard and/or safety concern arise I will notify the appropriate personnel in the Civil Engineering Dept. at Toronto Metropolitan University.

Also, I will work in a safe manner at all times while in the lab MON107. I am aware should any injury, dismemberment, death occur as a result of my own negligence, I will not hold Toronto Metropolitan University liable in any matter.

Yours Truly, **Witnessed**

_____

Printed and Signed

DEPARTMENT OF CIVIL ENGINEERING

FACULTY OF ENGINEERING and ARCHITECTURAL SCIENCE

LAB ACCESS POLICY

If you are working with a faculty member / supervisor on research and/or other work that requires access to any physical labs of the Department of Civil Engineering, please follow the procedures listed below:

LAB ACCESS PROCEDURES: First and foremost is to discuss with your Professor and/or Supervisor the work/project/research for what are the access needs required. Then, refer to safety needs by visiting:

https://www.TorontoMU.ca/facilities-management-development/environmental-health-safety/

2. Professor and/or Supervisor shall complete the suitable Risk Assessment form:

https://www.torontomu.ca/facilities-management-development/environmental-health-safety/risk-assessments/

Risk Assessment(s) shall also include a list of labs required and/or facilities along with an anticipated lab access expiration date; start date; name of workers.

3. Researchers/Students/Workers shall complete e-training on-line quizzes required in Step 3A. Upon successful completion an electronic certificate will be awarded. For instructions to access this e-training refer to: D2L ELearning Instructions

3A It is **MANDATORY** to successfully complete the following Toronto Metropolitan University Orientation Quizzes found at: https://www.torontomu.ca/facilities-management-development/environmental-health-safety/mandatory-safety-training/

I. *Workplace Hazardous Materials Information System* (WHMIS) AND,
II. *Environmental Health and Safety e-Learning* (EHS) AND,
III. *Chemical Safety* (see “Lab-Specific Training” on same web page)

4. Upon receipt of the electronic copies of the safety certificates they shall be forwarded electronically and/or printed to your Professor and/or Supervisor.

IMPORTANT: The above mandatory certificates in steps 3, 3A are minimum requirement(s). Your Professor/Supervisor shall require further training requirements based on the Research or work anticipated to be performed or as indicated on the Risk Assessment.

Further Reference: All Health and Safety information & trainings can be found in Environmental Health and Safety section under Toronto Metropolitan University's Facilities Management and Development (FMD) website: https://www.TorontoMU.ca/facilities-management-development/environmental-health-safety/mandatory-safety-training/environmental-health-safety-elearning/

5. Once the Professor / Supervisor has received the forwarded safety certificates as per items #3, 3A, they shall both sign and forward as well the Risk Assessment to D. Peneff, the Department Safety Officer (DSO) who shall complete an overview of completion.

6. The DSO shall forward to the Department Chair items in #5 for final authorization. Upon the Chairs’ signature, the DSO shall process information into CivilLabAccess shared google drive AND shall request said access by notifying the Administrative Assistant for undergraduate students and Post Doc/Visiting Scholars; to the Graduate Administrator for graduate student(s).

Thank you.

Civil Office, Department of Civil Engineering

Portable Ladder Safety



Ladders and step stools are useful tools, but when used incorrectly they can result in serious injury from falling. Follow these requirements and safety tips when using a ladder or step stool:

- Choose the right ladder for the job: look for the Canadian Standards Association (CSA) approval when choosing a ladder.
- Inspect ladder before each use for defects (e.g. loose parts). Do not use defective ladders! Get them repaired or throw them out right away.
- Ensure the ladder is placed on a firm, level, non-slippery surface that is clear of obstacles.
- Ensure legs of a step ladder are fully extended and the braces are locked into place.
- Make sure footwear is non-slip and flat.
- Always maintain 3 point contact (two hands and one foot, or one hand and two feet) when climbing a ladder. Face ladder when descending.
- Read and follow the labels/markings on the ladder.
- Never stand on or above the top two rungs of a stepladder and do not overreach beyond the side rails.
- For electrical work, use a ladder made of material that is non-conductive of heat and electricity (e.g. fiberglass).



When using a ladder or step stool, wear flat and non-slip footwear

Ryerson University

Integrated Risk Management

Related Legislation: Section 73 of O. Reg. 851 made under the Occupational Health and Safety Act. Source: Canadian Centre for Occupational Health and Safety (CCOHS)

Slips, Trips and Falls



Slips, trips and falls are one of the leading causes of unintentional injuries in the workplace. Common reasons for slips, trips and falls are wet or oily surfaces; accidental spills; loose or unanchored rugs or mats; change of floor traction from one area to another; and dark and/or obstructed pathways.

Safety tips to reduce the risk of suffering from a slip, trip and/or fall includes (but are not limited to):

- Pay attention to where you are going and walk at a pace that is appropriate for the walking surface and the task you are carrying out.
- Don't carry or push loads that obstruct your vision.
- Use handrails whenever possible.
- Don't run on stairways or through working areas.
- Remove items that may be tripping hazards such as wires, cords and boxes.
- Regularly check for defects in the flooring condition (i.e. broken floorboards and/or loose carpeting).
- Wear shoes that are appropriate for the task with good support and slip resistant soles.
- Be careful when entering from wet or snowy weather: wipe shoes and watch out for wet spots on the floor.
- Ensure working areas and hallways are adequately lit.
- If you notice a wet floor or spill, cover the spill with paper towel/napkins to alert people of the hazard. Contact the Facilities Help Desk at 416-979-5091 or fixit@ryerson.ca so that staff can clean it up as soon as possible.



Take extra care around wet and/or slippery surfaces



Close drawers to prevent from bumping into them

Ryerson University

Facilities Management & Development

Related Legislation: Occupational Health and Safety Act -Industrial Establishments O.Reg. 851 s. 11, 13-15, 18, 73, 85.

Compressed Gas Cylinder Transfer Room

Document Type: Guideline
Control Number: UIRM- GL_006
File Code: UIRM-001
Last Reviewed: March 2014

Scope

A. This procedure covers the handling of compressed gas cylinders and cryogenic fluid dewars with respect to ordering, receiving, delivery and storage.

Ordering of Compressed Gases and Cryogenic Fluids

A. A purchase order for compressed gases must be accompanied by the name and telephone number of the person who ordered the cylinder (requisitioned).

B. It is the responsibility of Purchasing to ensure that the requisition's name and telephone number accompany the purchase order sent to the supplier. Purchasing will also ensure that the supplier is informed of the procedure for calling Receiving prior to making a shipment (Section III.B.).

Delivery of Compressed Gases and Cryogenic Fluids to the Gas Cylinder Room

3. Cylinders and dewars will be delivered to the gas cylinder room.

4. The supplier will call Receiving *en route* to delivery to inform Receiving of the impending shipment. Receiving will meet the driver at the loading dock at S. Kerr Hall to receive shipment.

5. Cylinders will be secured within the appropriate bay by the supplier. Dewars will be left freestanding in the designated area.

Receiving of Compressed Gases and Cryogenic Fluids

5. Receiving will meet the supplier's driver at the loading dock at S. Kerr Hall to receive shipment.

6. Receiving will contact the requisitioner on the day that the gases arrive.

7. In instances in which the requisitioner's name does not appear on the delivery ticket, it is the responsibility of Receiving to match the purchase order number to the name of the requisitioner, using the on-line ordering information available from Purchasing.

8. The Faculty of Engineering (EHS Advisor) is responsible for maintaining the gas cylinder room in proper order. This includes, but is not limited to:

Inspecting the area daily to
ensure that cylinders are stored properly,
ensure that storage equipment (e.g. cage, chains) is in good working order,
ensure that the area is not obstructed in such a way as to make delivery or return of cylinders unsafe or difficult,
collect delivery tickets of cylinders and dewars recently delivered to ensure that end users are informed of their delivery in a timely manner,
attach a tag to each cylinder or dewar with the name of the requisitioner, the delivery date, and a tracking number assigned by Receiving, and
note down in a log book the tracking number, PO number, name of the supplier, type of gas, and name of the requisitioner for each cylinder received, so that the cylinders can be tracked.

Securing all cylinders that are not properly secured.

Informing the Department of Environmental Health and Safety (EHS) of safety infractions by users (users can be identified by the cylinder tags, or if the tag is missing, by other information contained in the log book.), and

Informing Environmental Health and Safety (EHS) whenever the area in front of the gas cylinder room, or the path from the loading dock lift outside the building to the elevator inside S. Kerr Hall is unreasonably constricted or cluttered.

Pick-up of Compressed Gases and Cryogenic Fluids from S-37A

9. The S. Kerr Hall loading dock and gas cylinder room will be accessible to all regular requisitioners of compressed gases and cryogenic fluids. Keys for the room will be supplied to all regular requisitioners. A key for the loading dock lift will be stored in the gas cylinder room for all users.

10. Pick-up of compressed gases and cryogenic fluids from the gas cylinder room is the responsibility of the requisitioner.

11. If a requisitioner/user picks up a delivery before Receiving has tagged the cylinders, it is the responsibility of the requisitioner to supply Receiving with each cylinder number, the P.O.

number and the requisitioner's name. It is the responsibility of the requisitioner in all such cases to ensure that each cylinder has an official cylinder tag identifying the requisitioner and date of delivery.

Storage of Compressed Gases and Cryogenic Fluids

5. The gas cylinder room is not to be used for long-term storage of gas cylinders or cryogenic liquids.

6. It is the responsibility of the requisitioner to store compressed gases and cryogenic liquids in a safe manner within the requisitioner's department.

7. Cylinders kept in the area for longer than 14 days will be returned to the supplier.

8. Requisitioners will be contacted 48 hours prior to removal of unclaimed cylinders and informed that the cylinders must be removed from the room or they will be returned.

9. The requisitioner must make prior arrangements for pick-up of cylinders or dewars if the requistioner is to be absent from the University for an extended period (and therefore not easily contacted by Receiving).

Returning Empty Compressed Gas Cylinders

5. It is the responsibility of the requisitioner to return all empty cylinders and to secure them properly within the gas cylinder room.

6. Empty cylinders are to be returned with requisitioner identification labels intact and the return date indicated.

7. In addition, empty cylinders must be clearly labelled in a non-permanent way by the requisitioner (e.g. with the word "EMPTY" written clearly on the side of the cylinder in chalk or with marker on masking tape).

8. It is the responsibility of Receiving to inform the supplier when empty cylinders are available for pick-up.

Training

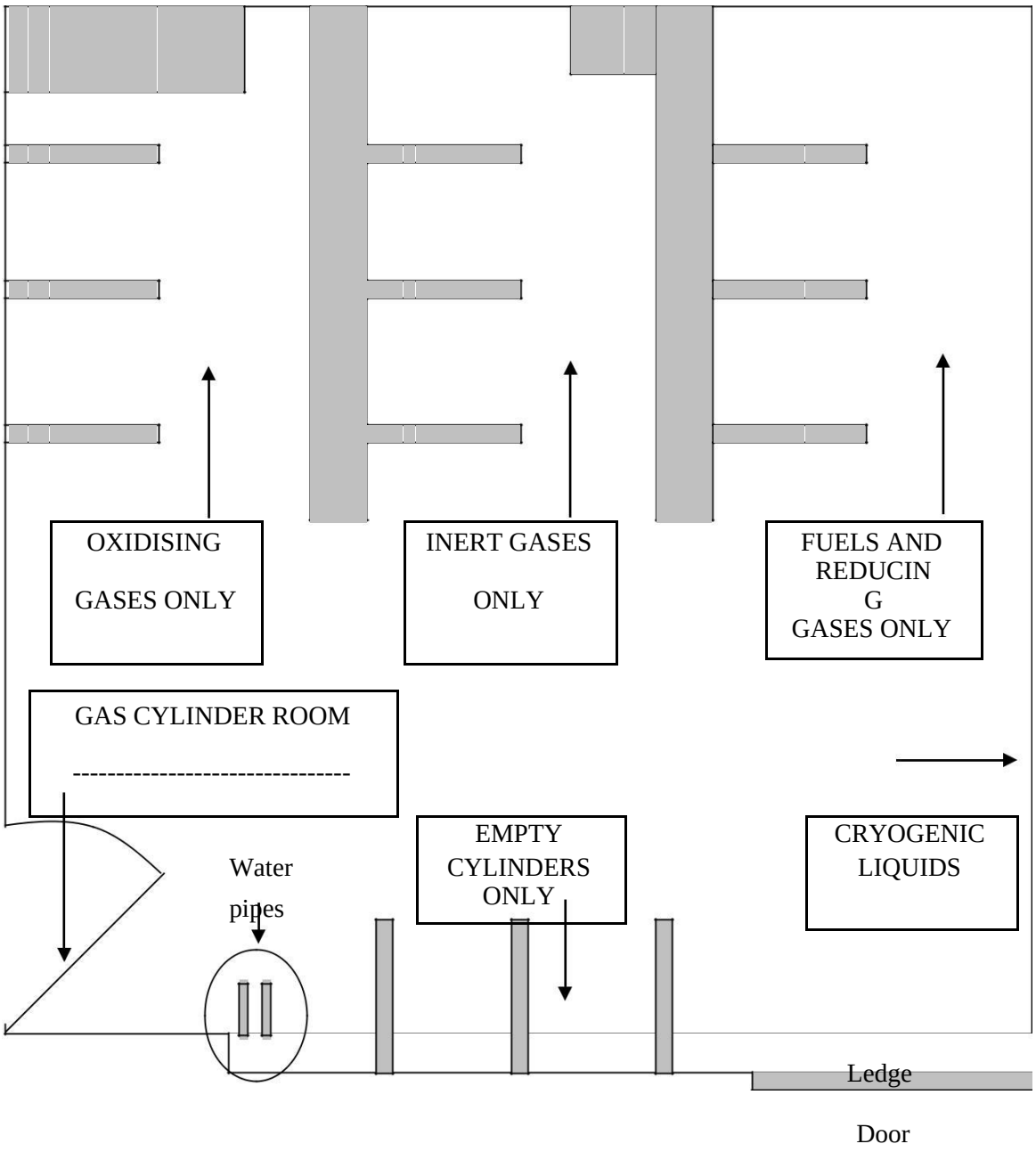
5. All personnel who use, will use, or may use compressed gas cylinders or cryogenic liquids in their work at Toronto Metropolitan University must be trained in WHMIS and have specific training on the hazards, controls and safe handling for the particular product that is being used.

6. Training is required whether the worker is a paid employee, a volunteer, or a student.

7. The Department of Integrated Risk Management will provide Generic WHMIS training to staff, faculty, students or volunteers at the request of the supervisor.

4. It is the responsibility of the Supervisor to ensure that specific on-site training be provided to staff, faculty, students or volunteers.

Signage for Gas Cylinder Room



Questions?

Contact Integrated Risk Management at 416-979-5000, ext. 557096 or ehs@torontomu.ca

Placement Employer Safety Orientation Checklist

Instructions: External placement employers are required to complete this on the student's first day of employment.

Student information

Name:
Student ID:

Placement Information

Organization Name/Address:
Supervisor's Name/Contact Information:

Safety Checklist	Check as each topic is covered
Name of immediate supervisor and Joint Health and Safety Committee representative (JHSC) or Safety Representative	
Worker/supervisor rights and responsibilities	
Safe work procedures and operation of equipment	
Use of Personal Protective Equipment (PPE)	
Identification of restricted or prohibited areas, tools, equipment and machinery	
Hazards in the workplace that may affect the student, how they're controlled and how to deal with them	
What to do and who to see if the student has a safety concern	
What to do when there is a fire or other emergency (e.g., evacuation procedures)	
Location of fire exits and fire extinguishers	
Location of the first aid supplies, equipment, facilities: • Names of staff responsible for first aid • How to record first aid treatment	
Procedures for reporting accidents and injuries	
Workplace Hazardous Materials Information System (WHMIS)	
Workplace policies and procedures on: • Workplace Harassment • Violence prevention • Working in isolation • Smoking/Drinking/Substance abuse	
Location of other important information • Safety Data Sheets • Joint Health & Safety Committee Minutes • Instructions for safe operation of each piece of equipment (if applicable) • Important telephone numbers	

I have completed the Safety Orientation with my Placement Partner and/or Placement Supervisor.

Student Signature **Date**

SAMPLE ONLY

RELEASE OF LIABILITY, WAIVER OF CLAIMS, ASSUMPTION OF RISKS AND INDEMNITY AGREEMENT

WARNING: BY SIGNING THIS DOCUMENT YOU WILL WAIVE CERTAIN LEGAL RIGHTS, INCLUDING THE RIGHT TO SUE.

PLEASE READ CAREFULLY!

TO: Board of Governors of Toronto Metropolitan University

NAME OF PARTICIPANT:_____

ADDRESS OF PARTICIPANT:_____

PREAMBLE

Participation at ***CVL901 field trip to Peel Integrated Waste Management Facility at 7795 Torbram Road in Brampton, Ontario*** is an exceptional educational opportunity, but it is not without certain risks, dangers, hazards and liabilities to all participants. These include, but are not limited to, personal injury, death, property damage, expense and other loss, delay or inconvenience, and course cancellations or curtailment. All persons taking part in the ***CVL901 filed trip to Peel Integrated Waste Management Facility*** are required to accept these and other risks as a condition of their participation in this course. Toronto Metropolitan University will not accept any liability for injury, loss, damage or expense sustained as a result of any person's participation in the ***CVL901 field trip to Peel Integrated Waste Management Facility*** . All applicants will be required to sign the Release of Liability, Waiver of Claims, Assumption of Risks and Indemnity Agreement set forth below, which will release Toronto Metropolitan University, and its representatives, from any future claims which might arise as a result of the applicant's participation in the ***CVL901 field trip to Peel Integrated Waste Management Facility.***

STATEMENT OF RISKS

The ***CVL901 field trip to Peel Integrated Waste Management Facility*** involves the risks inherent in travel. There are significant risks, dangers and hazards to which all participants including , but not limited to, personal injury, death, property damage, expense and other loss, delay or inconvenience, poor road and transportation systems, injury or illness resulting from exposure to cold, wet or windy weather, or the effects of heat and strong sunlight, any injury or deaths resulting from falls on steep, icy, slippery or uneven terrain and/or cliffs, unsafe areas, weather, illness, motor vehicle accidents (either as a pedestrian or a passenger), any muscular skeletal injury such as sprains, the inability to access immediate medical help in an emergency, transportation problems, and loss of personal belongings.

CONTINUED ON NEXT PAGE.....
(BACK-SIDE OF THIS PAGE)

.....CONTINUED FROM PREVIOUS PAGE (FRONT SIDE OF THIS PAGE)

It is the responsibility of each participant in the ***CVL901 field trip to Peel Integrated Waste Management Facility*** to learn as much as possible about the risks of the venture, to weigh those risks against the advantages, and to decide whether or not to participate. Toronto Metropolitan University and the professors, instructors and support personnel for the ***CVL901 field trip to Peel Integrated Waste Management Facility*** cannot, and will not, assume liability in respect to any of these risks, dangers, hazards, liabilities, and any violations of law (e.g. underage drinking). Bus will be departing Toronto Metropolitan University (87 Gerrard St. E., South East Corner of Gerrard and Church) on March 25, 2015, 11:45 am. Bus will be departing Peel Integrated Waste Management Facility (7795 Torbram Road, Brampton) at 1:30 pm. Toronto Metropolitan University accepts no responsibility and assumes no liability with respect to any academic, vocational, medical, or financial advice received by a participant considering the ***CVL901 field trip to Peel Integrated Waste Management Facility***.

RELEASE OF LIABILITY, WAIVER OF CLAIMS AND INDEMNITY AGREEMENT

In consideration of the Board of Governors of Toronto Metropolitan University allowing my participation in the ***CVL901 field trip to Peel Integrated Waste Management Facility***, I agree as follows:

1. TO WAIVE ANY AND ALL CLAIMS that I have or may have in the future against the Board of Governors of Toronto Metropolitan University, and its members, officers, employees, students, agents, volunteers and independent contractors (all of whom are hereinafter collectively referred to as the Releasees);

2. TO RELEASE THE RELEASEES from any and all liability for any loss, damage, injury or expense that I may suffer, or that my next of kin may suffer as a result of my participation in the ***CVL901 field trip to Peel Integrated Waste Management Facility*** due to any cause whatsoever INCLUDING NEGLIGENCE, BREACH OF CONTRACT, OR BREACH OF ANY STATUTORY OR OTHER DUTY OF CARE;

3. TO HOLD HARMLESS AND INDEMNIFY THE RELEASEES from any and all liability for any damage to the property of, or personal injury to, any third party, resulting from my participation in the ***CVL901 field trip to Peel Integrated Waste Management Facility***; and

4. This agreement shall be effective and binding upon my heirs, next of kin, executors, administrators, assigns and representatives in the event of the death or incapacity.

In entering into this Agreement, I am not relying upon any oral or written representations or statements made by the Releasees other than what is set forth in this Agreement.

I HAVE READ AND UNDERSTOOD THIS AGREEMENT AND I AM AWARE THAT BY SIGNING THIS AGREEMENT I AM WAIVING CERTAIN LEGAL RIGHTS WHICH I OR MY HEIRS, NEXT OF KIN, EXECUTORS, ADMINISTERS AND ASSIGNS MAY HAVE AGAINST THE RELEASEES.

Signed this _____ day of _____, 20_____ _____
SIGNATURE OF PARTICIPANT

_____ _____
WITNESS PRINT PARTICIPANTS NAME

This agreement must be completed in full, signed, dated, witnessed and paragraph 2 must be initialled before the participant may begin the course.

RYERSON UNIVERSITY

DEPARTMENT OF CIVIL ENGINEERING

Eyewash Weekly Inspection Form

An emergency eyewash station is provided to flush tepid water to the eye, diluting any hazardous materials that may have come into contact with the eyes.

Building: _____ Lab Room #: _____

General Requirements:

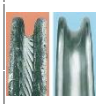
Initial and date in the corresponding box verifying the eyewash station is checked weekly for the following:

- The pathway to the eyewash station is clear of obstructions.
- Are the nozzles equipped with protective covers and removed automatically when activated?
- To test the eyewash station, flush water until clear water flows continually through eyewash head without any leaks, rust, dirt, etc. for approximately 3 minutes. (If problems are evident, contact department safety officer)

Year 2015	Week 1	Week 2	Week 3	Week 4	Week 5	Comments
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Overhead Crane Pre-Operational Inspection Checklist

Location: Toronto Metropolitan University, Civil Engineering Department, 245 Church Street / Room ENG LG26
Make: DEMAG**, Capacity:** 20 TON**, Serial** #03283

Condition Code: ✓=Acceptable, ✘=Defective IF any item was coded Defective then REPORT to Supervisor immediately, Shut Down, and Lock & Tag the Crane. **Inspection Checklist**	**A)**	**B)**	**C)**	**D)**	**E)**	**F)**	**G)**	**Operator's Initials**	**Date & Time**	**Comments**
A) Check upper limit with no load. **B)** Check for excessive wear, cracks or components - hook block, sheaves, hook   **C)** Check Hoist Rope: - crushing, kinking, broken wires  **D)** Examine load hooks for wear, cracks, or damage-saddle wear: - free swivel, working latch - twist < 10° - throat opening < 5%  **E)** Test run unit, observe operation for malfunctions: - safety, emergency stop - correct direction of motions - brakes of all motions    **F)** Check all running ropes for correct reeving (proper spooling)  **G)** Check load attachments - capacity ratings - end connections - crushing, kinking, broken wires, tears 	✓	✓	✓	✓	✓	✓	✓	N.J.	1 Jan 2017 9 AM	"Example"

IMPORTANT NOTES:

* Slings / Straps shall be inspected before every use.
* NO DAMAGED sling / strap shall be used to lift any Load

Toronto Metropolitan University Internal Report

Accidents – Incidents – Exposures

Updated: January 2017

SECTION A: Information About the Event

TYPE OF EVENT	WAS THIS A *CRITICAL INJURY OR EVENT*?
☐ INJURY ☐ NO INJURY ☐ Exposure to Hazardous Materials ☐ Property Damage ☐ Release of Hazardous Materials ☐ Occupational Illness ☐ Hazardous Condition/Situation ☐ Serious Near Miss	Review last page of this document for definitions and immediate actions that must be taken ☐ YES ☐ NO

Date of Event (dd/mm/yyyy)	Time of event (am/pm)
Date Reported to Supervisor (dd/mm/yyyy)	Time Reported to Supervisor (am/pm)

Expected Day(s) Lost? UNSURE ☐ NO ☐ YES ☐

Health Care Required? UNSURE ☐ NO ☐ YES ☐

Building/Room Location: Click here to enter text.

SECTION B: Information About Injured Person or Person Involved with Event

Last Name:	
First Name:	
Job Title:	
Email:	
Department:	
Phone:	

# of Years in Position:	
Status at Time of Event:	
	Examples: Employee, Student, Visitor, Guest, Volunteer, Contractor
Affiliation (Union)	

SECTION C: Part(s) of Body Injured

	LEFT SIDE		RIGHT SIDE	
☐ DOES NOT APPLY				
☐ Head				
☐ Face	☐ Ear	☐ Eye	☐ Ear	☐ Eye
☐ Teeth	☐ Shoulder	☐ Hip	☐ Shoulder	☐ Hip
☐ Neck	☐ Upper Arm	☐ Upper Leg	☐ Upper Arm	☐ Upper Leg
☐ Chest	☐ Elbow	☐ Knee	☐ Elbow	☐ Knee
☐ Pelvis	☐ Lower Arm	☐ Lower Leg	☐ Lower Arm	☐ Lower Leg
☐ Abdomen	☐ Wrist	☐ Ankle	☐ Wrist	☐ Ankle
☐ Upper Back	☐ Hand	☐ Foot	☐ Hand	☐ Foot
☐ Lower Back	☐ Fingers(s)	☐ Toe(s)	☐ Fingers(s)	☐ Toe(s)

Other (Describe):

SECTION D: Contributing Factors (Review All Six Categories)

Task Factors:

☐ Does NOT Apply	☐ Unknown
☐ No Task Factors	☐ Incorrect Tool
☐ Awkward Load to Handle	☐ Lifting Above Shoulders
☐ Bending Forward at Waist	☐ Procedure Not Followed
☐ Extended Reach	☐ Repetitive Motion
☐ Heavy Load – Lift	☐ Rushing
☐ Heavy Load – Pull	☐ Twisting the Trunk
☐ Hot Load – Pull	

S.O.P. - Standard Operating Procedure

Organizational Factors:

☐ Does NOT Apply	☐ Unknown
☐ No Organizational Factors	☐ Skill Training
☐ Communication	☐ Staffing
☐ Excessive Workload	☐ S.O.P. (Missing)
☐ Job Design	☐ S.O.P. (Not Up To Date)
☐ Job Training	☐ Other
☐ Planning	

Equipment Factors:

☐ Does NOT Apply	☐ Unknown
☐ No Equipment Factors	☐ Equipment Noise > 85 dBA
☐ Defective Equipment	☐ Equipment Recently Installed
☐ Inappropriate Equipment	☐ Equipment Vibration Excessive
☐ Incorrect Equipment	☐ Equipment Failure
☐ Missing Equipment	☐ Materials Failure
☐ New Equipment	☐ Safety Device(s) Failure
☐ New Equipment Location	☐ High Force Requirement
☐ Missing Maintenance	☐ Labels Missing
☐ Defective Safety Device	☐ Labels Unreadable
☐ Ineffective Safety Device	☐ Inadequate Maintenance
☐ Safety Devices Missing	☐ Inadequate Signage
☐ Missing Signage	

Human Factors:

☐ Does NOT Apply	☐ Unknown
☐ No Human Factors	☐ Language Difficulties
☐ Inadequate Experience	☐ Physical Limitations
☐ Inadequate Knowledge	☐ Pre Existing Condition
☐ Inadequate Skill	☐ Distracted
☐ Illness	☐ Talking/Texting on Phone
☐ Fatigue	☐ S.O.P. Not Followed

Environmental Factors:

☐ Does NOT Apply	☐ Unknown
☐ No Environmental Factors	☐ P.P.E. Restrictions
☐ Floor Surface Inappropriate	☐ Limited Light
☐ Floor Surface Slippery	☐ Limited Space
☐ Floor Surface Uneven	☐ Temperature (Too Hot)
☐ Floor Surface Wet	☐ Temperature (Too Cold)
☐ Floor Surface Inadequate	☐ Vision Obstructed

P.P.E. – Personal Protective Equipment

Other Factors:

☐ Does NOT Apply	☐ Unknown
☐ No Other Factors	☐ New/Unfamiliar Equipment
☐ Returning from Extended Leave	☐ New/Unfamiliar Hazardous Substance
☐ Returning from Long Vacation	☐ New/Unfamiliar Procedure
☐ Hazardous Behaviour	☐ New/Unfamiliar Process
☐ Hazardous Condition	☐ New/Unfamiliar Task
☐ Hazardous Situation	☐ New/Unfamiliar Tools
☐ New Worker (< 6 months)	☐ New/Unfamiliar Working Conditions
☐ Inadequate P.P.E.	☐ Sudden/Unexpected Weather Change
☐ Missing P.P.E.	☐ Change in Normal Shift for New Shift
☐ P.P.E. Not Worn/ Disregarded	

P.P.E. – Personal Protective Equipment

SECTION E: Details of the AIE

The TASK BEING PERFORMED when the event occurred was: ☐ URGENT | ☐ ROUTINE

In Your Opinion, the EVENT was ☐ PREVENTABLE | ☐ NOT PREVENTABLE

WHO?	Who was involved? Were there witnesses? Was there anyone else in the area that the incident happened?
WHAT?	Describe what happened. Include in your description details of any equipment, tools and substances involved. Include the exact names of any chemicals involved. Check equipment for defects.
WHERE?	Describe the exact location of the incident. Use a camera to take photographs from several different angles. Make a drawing (if appropriate) of the scene which would include exits, ventilation vehicle paths and lighting.
WHEN?	Note anything significant about the time.
HOW?	Describe the sequence of events that led to the incident and its “presumed cause(s).
WHY?	This is the hardest part of the investigation, but it is the reason for it. Start with the initial impressions, but do not stop asking questions until you are satisfied that you know all the causes, direct and indirect.

In the box below, describe the DETAILS OF THE EVENT (keep in mind the questions above).

SECTION F: Corrective Action

WHAT MAKES GOOD CORRECTIVE ACTION?

☑ It is cost effective | ☑ It is reasonable | ☑ It is doable | ☑ It is specific
☑ It is focused on systems and processes, not on individual performance
☑ It does not create another hazard | ☑It addresses the why or root cause

Provide specific action(s) to prevent this event or a similar event from happening again. Review and check all those that apply. Provide the details in the corrective actions box.

☐ Communication	☐ Job Hazard Analysis	☐ P.P.E. Program
☐ Emergency Preparedness	☐ Knowledge Training	☐ Safety Device(s)
☐ Equipment Program	☐ Leadership Training	☐ Skill Training
☐ Hazard Inventory	☐ Maintenance Program	☐ Task Analysis
☐ Housekeeping Program	☐ Manufacturer	☐ Task Observation
☐ Hygiene Control Program	☐ Materials Management	☐ Work Permit System
☐ Inspection Program	☐ Medical Surveillance Program	☐ Work Procedure(s)
	☐ Noise Control Program	☐ Working Alone Program

P.P.E. – Personal Protection Equipment

Specify Corrective Action (s)

SECTION G: Investigator and Key Stakeholders

Investigated By: Name & Contact Information	
Report Filled In By: Name & Contact Information	
Name of Department/School:	
Departmental Safety Officer:	
Supervisor (TMU Employee): (of person, activity or event)	
Department Head:	
JHSC Worker Member: (if applicable)	
JHSC Management Member: (if applicable)	
Witness (1): Name & Contact Information	
Witness (2): Name & Contact Information	

Joint Health & Safety Committee (JHSC) http://www.ryerson.ca/irm/rights_responsibilities/jhsc/

SECTION H: Signatures

I declare that all of the information provided is complete and true to the best of my knowledge.

Print or Type Full Name, Sign and Date

Investigator (print or type name)	Signature	Date (dd/mm/yyyy)

Injured Person (print or type name)	Signature	Date (dd/mm/yyyy)

SECTION I: Checklist

REVIEW AND SELECT ALL THAT APPLY:

- ☐ Site Visited
- ☐ Photos taken and attached
- ☐ Sketch attached
- ☐ Additional documentation attached
- ☐ Appropriate persons/ departments notified
- ☐ Signatures Obtained
- ☐ Copy of signed report provided to worker
- ☐ Signed scanned report sent to irm@ryerson.ca
- ☐ Original signed report kept in department
- ☐ Signed scanned report provided to local union if applicable

Injury to a Non-TMU Employee – Additional Steps Required

1. An electronic copy of this form (Internal AIE form) is sent to the University Insurance Officer (cscanlan@ryerson.ca).
2. Pictures must be taken and sent with this form.

Injury to a TMU Employee – Additional Steps Required

1. Supervisor fills out the online WSIB Employer's Report Form 7

http://www.ryerson.ca/content/dam/ehss/pdfs/forms/WSIB_EmployerReport_Form7.pdf

The Form 7 must be filled out online (no hand written copies)

A. Print three copies one for employee, one kept in the department, and one for HR
B. Signed by Injured Worker and Supervisor
C. Signed form must be dropped off to HR within 3 calendar days of the event or a penalty of $250 will be levied to the department

INSTRUCTIONS FOR FILLING OUT THE ACCIDENT – INCIDENT – EXPOSURE (AIE) FORM

WHAT TYPES OF EVENTS GET INVESTIGATED

Accidents, Incidents, Exposures, Significant Property Damage, Serious Near Misses, Critical Injuries, Critical Events

WHO INVESTIGATES

The Supervisor of the person, event or activity (or their designate)

WHO FILLS OUT THE FORM

The Supervisor of the person, event or activity (or their designate)

WHEN DOES THE FORM GET FILLED OUT

Within 24 hours of the event occurring or reported.

THE INTERNAL AIE REPORT IS FILLED OUT – WHAT NEXT

☑ SAVE as PDF
☑ SUBMIT electronic report to irm@ryerson.ca
☑ OBTAIN signatures
☑ SCAN signed copy and send it electronically to irm@ryerson.ca
☑ SCANNED signed copy is sent electronically to Key Stakeholders (Section G, Investigator and Key Stakeholders).

CRITICAL INJURIES AND CRITICAL EVENTS MUST BE REPORTED IMMEDIATELY

There are legal requirements to report these specific types of injuries or events to various government agencies within strict time lines. Become familiar with this list and the actions in the unlikely event that this should happen. Everyone who reports to you should also be familiar with this list and the actions.

CRITICAL INJURIES	CRITICAL EVENTS
a death	a fire in a room where people work
a substantial loss of blood	a major structure failure
burns to a major portion of the body	an explosion
The AMPUTATION of a leg, arm, hand, or foot (including if more than one finger or toe is amputated)	the collapse or failure of lifting equipment
The FRACTURE of a leg or arm (including if wrist, hand, ankle, foot, multiple fingers or multiple toes are broken)	the major release of a hazardous substance
the loss of eye sight in an eye	flooding (a substantial amount)
placing life in jeopardy	
producing unconsciousness	

IN THE EVENT OF A CRITICAL INJURY
IMMEDIATE ACTIONS ARE REQUIRED – SEE INSTRUCTIONS BELOW:

Unsure? Follow the directions below.

STEP 1	Assist the Injured Person
STEP 2	Call Security (Internal Phone Dial 80) – Outside Phone Dial 416-979-5040
STEP 3	Prevent further injuries or damage to property
STEP 4	Secure the scene and DO NOT DISTURB IT – authorities may need to investigate
STEP 5	Call Integrated Risk Management at 416-979-5000 x 7096

Filling out Chemical Waste Disposal Request Form

1 Locating the link

Go to "All Forms" page on TMU EHS website and click on "Waste Pick-up Request (Chemical Waste Disposal Request Form)" link. You will be requested to log on with your matrix ID.



After logging on, you will notice a screen similar to seen in the figure below. Near the bottom of the page, you will notice a link to chemical waste disposal request form (as highlighted below). Click on the link to proceed to submission page.



2 Filling out the form

On the next screen, you will be prompted to fill out the form that has three important sections

- Your contact information,
- Pick up location
- and Chemical waste information

Note: The system will save your progress automatically in case you log-out.

2.1 Contact Information

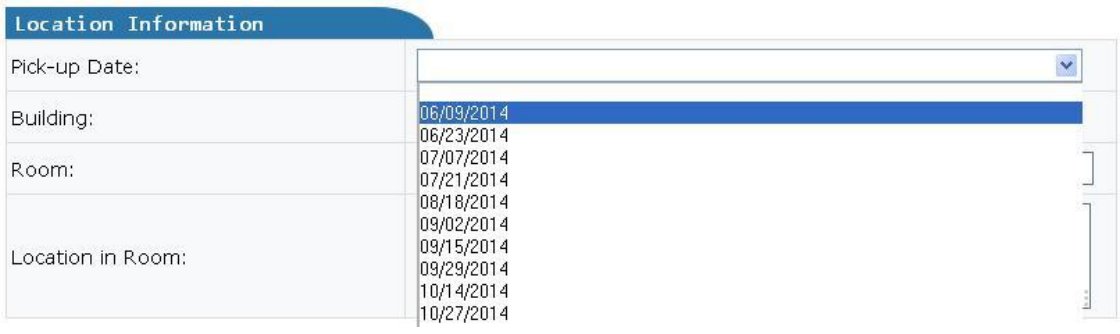
- Under Submitter field, you will need to enter your first and last name (if not automatically pulled from your TMU matrix id).



- Under Phone ext. or no field, you will be required to enter your 6-digit TMU phone extension e.g. 551234 or other phone number.
- Under Department field, enter your department's full name (please avoid using acronyms)
- Under Supervisor name and email field, enter his/her information.
- Additional field can be used to enter more than one email addresses of your supervisor

2.2 Location Information

- The Pick-up date field requires you to select a date from the dropdown list. Chemical waste is usually picked up every two weeks. Select the earliest available date to ensure waste is picked up soon (as seen in figure below).



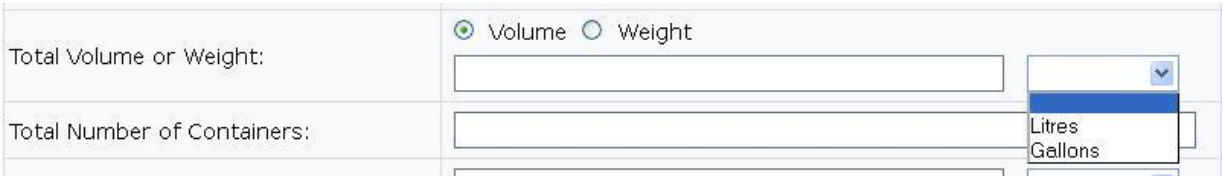
- Under Building field, choose your building from the dropdown menu.
- Next field will require you to enter your room number e.g. 1234
- Location in Room field will require you to provide the location of the chemical waste in the room. Please include as many details as possible to ensure your waste is picked up on time.

2.3 Entering Chemical Information

- If you have not been assigned a tag number, leave this field empty. If you have been assigned one, enter your tag number. If there is more than one tag number, you can add multiple tag numbers by clicking on "Add" button on the right side.
- Under Chemical Composition field, please enter the composition of the chemical.

This information will be helpful in determining the properties of the substance.

- Next field will require you to choose the Physical form of the chemical from gas/aerosol can, solid and liquid.
- Depending on the property, you will need to select from "Total Volume" or "Weight" option for the chemical. Once you select an appropriate option, you will notice that another field will appear below.



- If you selected Volume, you will need to enter the volume in either liters/gallons and weight in kilograms/pounds.
- Under Total Number of Containers field, you will be asked to enter the number of containers (if there is just one container, enter one)
- The next field will ask you to enter container size in litres/gallons
- Under Container material field, select the material of the container from the dropdown.
- The last field will ask you whether any sharps are included in the waste. There should be no biological sharps in the chemical waste.
    - To ensure safe and proper disposal, please use an approved sharps container

2.4 Multiple Chemicals ready to be picked up

If there is more than one chemical waste ready to be picked up, click on "Add" button to enter the information for next chemical (as seen in figure below)



3 Submit

Please verify that information entered on the submission form is correct before submitting the form by click on "submit" button.

Did you know that you can securely file Form 7 online with our eServices?

eForm7 offers a fast, effective solution for managing your Form 7 reports with the WSIB.

To submit an eForm 7, visit our eServices site. It only takes a few minutes to subscribe and you can start filing your reports right away.

If you have any questions, you can call our eServices Support Centre, Monday to Friday from 8:30am – 4:30pm, at 1-866-542-9742 to speak to an eForms Representative.

...go to fillable PDF

…go to Form7 Guide

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR MACHINE SHOP ROOM NO. MON107
OCCUPATIONAL HEALTH AND SAFETY

1. The purpose of these rules and regulations is to ensure that all persons in this area are protected and the working conditions are safe.

2. The Civil Engineering Department will provide some protective equipment to all persons working in the lab.

2.1 PROTECTIVE EQUIPMENT REQUIRED

The users of this lab should follow procedure when working with equipment herein by using appropriate protective equipment similar to that listed below:

- **A. Heat Protection**
- **B. Eye Protection**
- **C. Gloves**
- **D. Aprons**
- **E. Welding Shields**
- **F. Respirators or Dust Masks.**

2.2 Laboratory coats and safety footwear are NOT provided by the Department. Any person found in this lab not wearing protective equipment will be asked to leave.

2.3 The Civil Engineering Department shall maintain a reasonable amount of protective equipment for each area. If not enough equipment is available; do not proceed with work until the proper protective measures have been taken.

3. ISSUING OF PROTECTIVE CLOTHING

3.1 When protective clothing is issued the user will have to sign a confirmation slip and shall be responsible for items until returned.

4. WEARING OF PROTECTIVE CLOTHING

4.1 All persons engaged in activities where the risk of bumping and/or injuring the head is possible shall wear the appropriate protective head equipment.

4.2 All persons must wear eye protection when engaged in any activity where particles or liquid can become air borne and any risk of eye injury is possible, some activities that require eye protection are listed below:

A. Dusting
B. Sanding
C. Spray Painting
D. Grinding
E. Chipping
F. Wire Brushing
G. All Forms of Metal Cutting
H. As Prescribed by the Professor

4.3 All persons shall wear CSA approved safety shoes or boots (with steel toe and non-skid sole) when working in this area.

4.4 All persons shall wear gloves or mitts when exposed to the risk inherent in work activities such as:

A. Welding
B. Material Handling
C. General Oven or Kiln Use

4.5 All persons shall wear aprons and welding masks, as well as respirators when engaged in welding activities.

4.6 All persons shall wear a respirator and/or dust mask when exposed to the risk inherent in work activities such as:

A. Spray Painting
B. Sanding
C. Grinding
D. Welding
E. Handling of fine powders or respiratory irritants

4.7 All persons with loose clothing or long hair shall wear hairnets or pin their hair back when working on machinery such as:

A. Universal Milling Machine
B. Precision lathe
C. Table saw
D. Band saw
E. Grinder
F. Up-right drill press
G. Asphalt or Concrete Mixers
H. Any piece of equipment with moving parts

4.8 Smoking is prohibited in all TMU labs and is punishable by law in Ontario.

4.9 No persons shall work alone or without supervision, except for Departmental Lab Technicians.

5. **In the interest of each and every person within this Department, it is important to take precautions reasonable in the circumstances. Also it is imperative that everyone in the lab space abides by these rules and regulations to maintain a safe working environment.**

6. **It is the duty and obligation of the safety officer to ensure that these rules and**
   Regulations are accurate and current in all civil laboratories.

BASICS FOR SAFE AND EFFECTIVE HOOD USE

Fume hoods are installed in laboratories to protect workers from hazardous vapors generated by laboratory experiments. However, simply conducting these experiments in the fume hood does not guarantee adequate protection. The fume hood must be used properly. These guidelines will help you optimize the safety and effectiveness of your fume hood.

- **Operate the hood at the proper sash height at 12 inches or less** from the working surface while working in the hood to ensure maximum flow rate and to protect yourself from potential chemical splashes or explosions. The sash should be closed when you are not working in the hood.
- **Know the physical, chemical and toxicological properties** of the chemicals you are working with.
- **Always work with hazardous chemicals in a fume hood**, do not use hazardous chemicals on the bench top.
- **Check the airflow indicator** prior to starting an experiment to ensure the fume hood is drawing air. If you are not sure there is a proper air draw, test the hood airflow with a piece of light material (such as a tissue).
- **Do not turns off velocity control alarms** (beep indicated fume hood velocity problem).
- **Reduce pedestrian traffic in front of hoods**. Also minimize nearby disturbances, such as doors opening or closing, and any quick motion in order to prevent cross drafts.
- **Do not position fans so as to direct airflow across the face of the hood**. This can interfere with airflow and containment of hazardous chemicals.
- **Do not block airfoil:** The airfoil provides airflow across the floor of the hood. If you use absorbent paper in the hood, do not block the airfoil.
- **Work as far inside the hood as possible**, at least 4 to 6 inches from the front edge with the sash face between you and task at hand. All equipment should be a minimum of 9 to 12 inches away from the hood face.
- **Keep sash face clean and clear**. To encourage use of sash as added protection against splashes, sprays, etc., keep sash face clean. If sash face must be blocked with paper for certain experiments, please take it down after the experiment is complete.
- **Do not use hood as a storage cabinet** for chemicals or equipment. Materials stored in fume hoods should be kept to a minimum and stored in a manner that will not interfere with airflow. Keep at least 50% of the working surface clear, if possible.
- **Prepare a plan of action in case of an emergency**, such as a power failure, especially when using extremely hazardous chemicals or acids.
- **Fume hoods are not to be used for the disposal of materials**. The cap of the waste bottle must seal the bottle immediately after pouring waste into it.
- Set the baffles according to the nature of the work being performed:
    - For hot work, position the baffle so most of the air is exhausted from the top of the hood.
    - For normal operations, locate the baffles in the center position so air is exhausted from all three positons.
    - For work with chemicals which have a very high vapor density, position the baffles so most of the air is exhausted from the bottom of the hood.
- **Do not use a hood for any function it was not designed for**, such as perchloric acid, radioisotopes, etc. The generation of perchloric acid vapors requires specially designed fume hoods with wash-down systems.
- **Wear protective equipment!** Fume hoods do not prevent accidents or chemical splashes.
- **Close sash when finished** with hood work or **when leaving experiments or chemicals unattended!** This simple procedure has contained many fires and explosions within a hood.
- **If fume hood airflow stops**; shut off experiments, turn off heat, and seal containers. Immediately advise supervisor or staff.

Forms Environmental Health and Safety and Web Site References

Note: *Sometime in October, 2017 any references to IRM websites may not be accessible as the web address will be changing to EHS under the umbrella of FMD (Facilities Management and Development) the final web address will be unknown until such time.*

http://www.ryerson.ca/irm/forms/

Accidents and Reporting

http://www.ryerson.ca/irm/report_hazard_accident/definitions/

Chemical Waste

https://ccs.cf.ryerson.ca/cehssmforms/chemical.disposal/

Working at Heights

http://www.ryerson.ca/irm/training/working-at-heights-training/

Appendix III – Think Safety Checklists

The following checklists may help you take steps to avoid hazards that cause injuries, illnesses and fatalities. As always, be cautious and seek help if you are concerned about a potential hazard.

General Safety

□ Implement a comprehensive safety and health management system to find and fix all hazards at the worksite.

□ Establish a written hazard communication program to inform all employees about chemical hazards and hazardous substances, reporting of hazards, appropriate personal protective equipment and what to do in emergency situations.

□ Train workers in safe work practices and methods for all work activities, procedures and equipment as well as how to recognize and respond to potential workplace hazards, including rendering first aid.

□ Put in place personal protective equipment programs. Train workers in selecting, cleaning and maintaining equipment such as respirators, protective clothing and goggles.

p Use safe work practices and appropriate personal protective equipment for all welding, cutting and burning; handling of chemicals (e.g., moist concrete, epoxies, form release agents); and during grinding, chipping, wire brushing, scraping and cleaning.

□ Ensure that all tools and equipment -- including forklifts, cranes, hoists and rigging -- are maintained in good working condition, are inspected regularly and are operated by thoroughly trained, tested and competent workers.

Physical Hazards

□ Set up a noise control program to reduce noise sources. Include sound-level measurements, audiometric testing, training and/or hearing protection equipment.

□ Implement machine guarding and lockout/tagout procedures for all equipment and machinery servicing and/or maintenance work to prevent workers from being injured.

□ Establish a confined-space entry program to protect workers cleaning the inside of mixer drums, storage bins, hoppers and other confined spaces.

Health Hazards

□ Avoid exposure to cement dust to prevent bronchitis and silicosis.

□ Prevent burns and skin and eye irritation by avoiding skin contact and eye contact with cement dust or wet cement.

□ Wear the appropriate personal protective equipment, such as gloves, boots, goggles or HEPA-filter respirators.

□ Avoid dusty areas and wet down work areas, as appropriate, to reduce or eliminate dust.

□ Use special HEPA vacuums to clean up dust instead of dry sweeping.

□ Reduce silica exposures during chipping, drilling and sawing of concrete materials with engineering controls, such as wet methods and local exhaust ventilation.

Fall Hazards

□ Identify and fix fall hazards, such as slippery surfaces, damaged ladders and walkways, and any loose or unsteady hand- or footholds used to climb up and down on trucks and other equipment.

□ Make sure all portable ladders have safety feet and are the proper length for the specific task. Secure them or tie them off to prevent movement.

□ Ensure scaffolding and walking/working surfaces have adequate guardrails, safe accessibility and no tripping hazards or holes.

Ergonomics

□ Implement appropriate work practices and/or controls to help reduce or eliminate potential back injuries from twisting, turning, lifting, awkward postures and whole body vibration.

□ Train workers in appropriate mechanical and manual materials handling techniques and safety procedures to help reduce or eliminate musculoskeletal injuries.

□ Provide dollies, hand-trucks and conveyors to help minimize, reduce or eliminate the need to bend and lift.

Appendix IV – Useful Links

Concrete Safety & Health Resources

Most resource materials can be found on the OSHA website at www.osha.gov

Physical Hazards

Confined Space

Downloadable electronic advisor software (1997), 2MB.

This software guides the user in identifying confined spaces and protecting workers who enter them.

http://www.osha.gov/dts/osta/oshasoft/csa.html

Control of Hazardous Energy (Lockout/Tagout)

OSHA Publication 3120 (2002), 174KB PDF,

45 pages.

This booklet provides guidance on protecting workers against unexpected energy releases from mechanical and electrical equipment.

http://www.osha.gov/Publications/osha3120.pdf

Lockout/Tagout e-Tool Interactive online training program (1999).

This e-Tool offers an overview of OSHA's Lockout/Tagout standard, including interactive case studies.

http://www.osha.gov/dts/osta/lototraining/index.html

Materials Handling and Storage

OSHA Publication 2226 (2002), 559KB PDF, 41 pages.

This booklet outlines OSHA requirements covering handling and storing materials, focusing on forklift safety and ergonomics.

http://www.osha.gov/Publications/osha2236.pdf

Permit-Required Confined Spaces

OSHA Publication 3138 (2004), 486KB PDF, 22 pages.

This booklet covers highlights of the OSHA standard for confined spaces.

http://www.osha.gov/Publications/osha3138.html

Safeguarding Equipment and Protecting Workers from Amputations

OSHA Publication 3071 (2001), 1.2MB PDF, 78 pages.

This booklet offers guidance on machine guarding and other safe practices to reduce the risk of amputations.

http://www.osha.gov/Publications/osha3170.pdf

Sling Safety

OSHA Publication 3072 (1996), 866KB PDF, 28 pages.

This booklet covers all aspects of sling safety.

http://www.osha.gov/Publications/osha3072.pdf

Stairways and Ladders

OSHA Publication 3124 (2003), 155KB PDF, 15 pages.

This booklet covers safety issues related to both fixed and movable stairs and ladders.

http://www.osha.gov/Publications/osha3124.pdf

Health Hazards

Designated Substances in Ontario

https://www.ontario.ca/laws/regulation/090490?_ga=2.57485418.1900798152.1500572371-964615251.1464964140

Crystalline Silica Exposure Card for General Industry

OSHA Publication 3176 (2003), 37KB PDF; OSHA Publication 3178 (Spanish) (2003), 42KB PDF.

This laminated pocket card offers workers a concise summary of silica health hazards and lists precautions to take to limit exposure.

http://www.osha.gov/Publications/osha3176.pdf

http://www.osha.gov/Publications/osha3178.pdf

Crystalline Silica

OSHA Fact Sheet (2002), 52KB PDF, 2 pages, also in Spanish (2003).

This Fact Sheet highlights the hazards of silica and provides guidance on preventing exposures.

http://www.osha.gov/OshDoc/data_General_Facts/crystalline-factsheet.pdf

http://www.osha.gov/OshDoc/data_General_Facts/crystalline-spanish.pdf

Silica e-Tool

Downloadable electronic software (1998).

This e-Tool describes the hazards of silica and offers guidance on protecting workers.

http://www.osha.gov/dsg/etools/silica/index.html

Hazard Communication Guidelines for Compliance

OSHA Publication 3111 (2000), 112KB PDF, 33 pages.

This booklet provides an overview of OSHA's Hazard Communication standard and gives specific guidance on compliance.

http://www.osha.gov/Publications/osha3111.pdf

Hearing Conservation

OSHA Publication 3074 (2002), 157KB PDF, 32 pages.

The booklet explains how to establish an effective hearing conservation program that meets OSHA requirements.

http://www.osha.gov/Publications/osha3074.pdf

Personal Protective Equipment

OSHA Publication 3151 (2004), 629KB PDF, 46 pages.

This booklet offers guidance on when and how to use personal protective equipment to guard against occupational injuries and illnesses.

http://www.osha.gov/Publications/osha3151.pdf

Respiratory Protection

OSHA Publication 3079 (2002), 273KB PDF, 42 pages.

This booklet outlines OSHA requirements on respiratory protection and offers guidance on establishing an effective respiratory protection program.

http://www.osha.gov/Publications/osha3079.pdf

Respiratory Protection e-Tool

Downloadable electronic software (1998).

This e-Tool enables users to determine whether they need to establish a respiratory protection program and what type of respirators to use.

http://www.osha.gov/SLTC/etools/respiratory/index.html

Small Entity Compliance Guide for OSHA's Respiratory Protection Standard

OSHA (1999), 706KB PDF, 149 pages.

This booklet provides help for small businesses seeking to meet OSHA requirements for respiratory protection programs.

http://www.osha.gov/Publications/secgrev-current.pdf

The 2014 Ontario Occupational Health & Safety Act (OH&S) and Regulations, "The Green Book", has been designed to provide the working space with safe working environment.

- Occupational Health and Safety Act
- Regulation 851 – Industrial Establishments
- Regulations 213/91 – Construction Projects
- Regulation 860 – Workplace Hazardous Materials Information System
- Regulation 1101 – First Aid Requirements
- Regulation 833 – Control of Exposure to Biological or Chemical Agents
- Regulation 632/05 – Confined Spaces
- Regulation 67/93 – Health Care and Residential Facilities

Other Regulations

- O.Reg. 474/07 Needle Safety
- O.Reg. 629/94 Diving Operations
- O.Reg. 414/05 Farming Operations
- O.Reg. 714/94 Firefighters – Protective Equipment
- R.R.O. 1990, Regulation 857 Teachers
- O.Reg. 297/13 Occupational Health and Safety Awareness and Training
- O.Reg. 87/13 Training Requirements for Certain Compulsory Trade
- R.R.O. 1990, Regulation 855 Oil and Gas – Offshore
- R.R.O. 1990, Regulation 859 Window Cleaning
- R.R.O. 1990, Regulation 856 Roll-Over Protective Structures
- O.Reg. 490/09 Designated Substances
- O.Reg. 278/05 Designated Substances – Asbestos on Construction Projects and Buildings and Repair Operations
- R.R.O. 1990, Regulation 834, Critical Injury – Defined

- O.Reg. 243/95 Criteria to be used and other matters to be considered by the board under subsection 46(6) of Act
- O.Reg. 385/96 Joint Health and Safety Committees – Exemption From Requirements
- R.R.O. 1990, Regulations 852 Inventory of agents or combinations of agents for the purpose of section 34 of the Act
- R.R.O. 1990, Regulation 858, University Academic and Teaching Assistants
    - Last amendment O.Reg. 353/91
- O.Reg. 33/12 Offices of the worker and employer advisors

Hazards in the Chemical Laboratory, by L. Bretherick or Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Research Council, National Academy Press, 1995.

Appendix V – Clean-Up and Posted Laboratory Safety Rules

IMPORTANT NOTICE

For All MON412 Environmental Lab Users

- A clean and tidy lab is essential for a safe working environment. **Please clean up at the end of each day (and put everything back in its place even if you need to use it again the next day)** by doing the following:

  - Thoroughly wash all tools and glassware as soon as possible. Use soap and scrub with a brush. Then rinse with warm water 4 times followed by DDW if desired. Air-dry or wipe-dry (blue cloth only) and put them back in their original locations. **Do not leave dirty tools and glassware in or by the sinks** because they will get harder to clean over time.
  - Wipe clean (tap water and blue cloth only) all instruments that you've used, i.e. the inside of incubator, oven, fume hood and the surfaces of DO meter, PH meter, shaker, etc. Wipe off any spills immediately, especially on instruments such as scales, pH meters, etc. to prevent stains.
  - Spray the surface of your workspace (lab bench) with disinfectant and wipe it off with a blue cloth.
  - Trash should be picked up and disposed in designated bins. Please note **our cleaners do not clean the lab**. They only pick up the garbage from the bins.
  - Do not pour slurry (semi-liquid mixture) or chemicals down the drain. This will clog the drain or harm the sewage system. Ask the Lab Technician if you are not sure how to dispose of your samples. We do have a procedure for hazardous chemicals disposal.
  - For safety reasons, do not leave chemicals on the benches even though you will use them again the next day. They must be stored in their original locations.
  - All prepared reagents, samples, wastewater collected must be labelled with your name, description and date. Unlabelled items will be discarded. Do clean and dispose of all items at the end of your experiments.

- Please ask for assistance from the Lab Technician if you are unsure how to use any of the instruments and equipment in the lab. Do not attempt to figure it out yourself as this may cause personal injury or damage to instruments and equipment.

- Please first ask the lab technician if you need to use or borrow any of the items, including chemicals in the lab. Do not remove any items from the lab without informing the Lab Technician. It is important to keep track of the inventory because our first priority is to always ensure smooth operation of the undergraduate lab. Also, store your materials only in designated cabinets/Areas.

- You can find MSDS at: https://jr.chemwatch.net/chemwatch.web/account/autologinbyip

IMPORTANT NOTICE

For All KHN101 Geotechnical Lab Users

- A clean and tidy lab is essential for a safe working environment. **Please clean up at the end of each day (and put everything back in its place even if you need to use it again the next day)** by doing the following:

  - Return all hand tools (screwdrivers, pliers, wrenches, hammers, knives, saws, etc.) to their original locations.
  - Wash all dirty tools and glassware (tongs, spatulas, bowls, spoons, glass plates, mixing dishes, water content dishes, beakers, etc.) with clean water. Then dry them with paper towels or a clean cloth before putting them back in their original locations. **Do not leave dirty tools and glassware in or by the sinks** because they will get harder to clean over time.
  - Clean all instruments and equipment (scales, unconfined compression machines, direct shear machines, permeameter/compaction moulds, liquid limit devices, etc.) that you've used by using brush/dustpan or vacuum, then use a **damp cloth*** to wipe off the fine dirt. Use paper towels to dry if necessary.
  - Sweep your work area including the benchtop, the countertops by the sinks and scales by using brush/dustpan or vacuum. Then use a **damp cloth*** to wipe off the fine dirt on the benchtop and countertops.
  - ***(Ensure the damp cloth is first rinsed with clean water. Otherwise, you will only be smudging the surface. Then re-rinse with clean water and hang it up to dry).**
  - Trash should be picked up and disposed in designated bins. Please note **our cleaners do not clean the lab**. They only pick up the garbage from the bins.
  - The white bucket (sedimentation trap) in every sink will be filled up with soil over time. Please do clean them out occasionally.
  - Return all gloves to their original locations.
  - All samples must be labelled with your name, description and date. Unlabelled items will be discarded. Do clean and dispose of all items at the end of your experiments.

- Please ask for assistance from the Lab Technician if you are unsure about how to use any of the instruments and equipment in the lab. Do not attempt to figure it out yourself as this may cause personal injury or damage to the instruments and equipment.

- Please first ask the lab technician if you need to use or borrow any of the items in the lab. Do not remove any items from the lab without informing the Lab Technician. It is important to keep track of the inventory because our first priority is to always ensure smooth operation of the undergraduate lab.

IMPORTANT NOTICE

For All MON102/ MON106
Hydraulics and Hydrology lab Users

- A clean and tidy lab is essential for a safe working environment. **Please clean up at the end of each day (and put everything back in its place even if you need to use it again the next day)** by doing the following:

  - Return all hand tools and accessories (screwdrivers, pliers, wrenches, hammers, knives, drills, bits, screws, etc.) to their original locations.
  - Wash all dirty tools and glassware (spatulas, bowls, spoons, beakers, graduated cylinder, etc.) with clean water. Then dry them with paper towels or a clean cloth before putting them back in their original locations. **Do not leave dirty tools and glassware in or by the sinks** because they will get harder to clean over time.
  - Clean all instruments and equipment (scales, miter saw, circular saw, power hand tools, etc.) that you've used by using brush/dustpan or vacuum.
  - Sweep your work area including the floor and the benchtop by using brush/dustpan or vacuum.
  - Empty the Vacuum when it is full.
  - For wet vacuuming, remove the cartridge filter and install a foam filter. After use, empty the collection tank by unscrewing the drain cap. **Do not use the cartridge filter for wet vacuuming**.
  - Trash should be picked up and disposed in designated bins. Please note **our cleaners do not clean the lab**. They only pick up the garbage from the bins.

- Please ask for assistance from the Lab Technician if you are unsure about how to use any of the instruments and equipment in the lab. Do not attempt to figure it out yourself as this may cause personal injury or damage to the instruments and equipment.

- Please first ask the lab technician if you need to use or borrow any of the items in the lab. Do not remove any items from the lab without informing the Lab Technician. It is important to keep track of the inventory because our first priority is to always ensure smooth operation of the undergraduate lab.

Computer Labs

General Information:

Computer lab accounts are for labs located in EPH-230, MON-207,MON-314 and in the Graduate Studies Offices of the Monetary Times Building only.
Valid until 30 days after graduation and then all account information and data WILL BE erased.

Printing for undergraduate students is as follows:

- 1st Year, 200 pages per semester
- 2nd Year, 200 pages per semester
- 3rd Year, 300 pages per semester
- 4th Year, 400 pages per semester

Printing for graduate students is 600 pages per semester
Balance will be carried over to the following semester.
Passwords will be changed each semester.

Lab Rules:

The civil engineering staff monitors the activity on any workstation in the civil domain. No food/beverages are permitted in the labs. Violation of this rule will result in the student being asked to leave the lab.

The following actions may subject the student to the Student Code of Academic or Non-academic Conduct (see reference to the Codes in this Student Handbook):

1. Giving your account's name and password to someone else.
2. Attempting to hack into the server or the workstations.
3. Moving, tampering, or damaging the workstations.
4. Loading illegal software, data, or any other material on the server or the workstations.
5. Taking data and software is theft. Anyone found downloading software, data, or any other material from the server or the workstations without proper authority.
6. Using the Civil Engineering Department computer facilities for tasks other than those assigned during a civil engineering program course.
7. Using the lab for word-processing, recreational computer games use, and web surfing except on assigned sites and topics, printing personal material, or executing non-civil engineering program work.
8. Failing to obey requests of faculty members, staff, or lab assistants on matters pertaining to lab operation.
9. Boisterous behavior, excessive noise, or using obscene/profane file names.
10. Using the WWW browsers for the purposes of surfing unauthorized sites, sending e-mail from the workstations, or attempting in any way to hack into sites on or off campus.

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR ROOM _____MONETARY TIMES
OCCUPATIONAL HEALTH AND SAFETY

ENSURING LABORATORY SAFETY IS NOT JUST THE RESPONSIBILITY OF THE INSTRUCTOR, IT IS THE RESPONSIBILITY OF EVERYONE WORKING IN THE LABORATORY. YOU ARE EXPECTED TO BE FAMILLIAR WITH THE SAFETY RULES AND TO CONDUCT YOUR LABORATORY WORK IN A SAFE MANNER AT ALL TIMES.

- **SAFETY GOGGLES AND LAB COATS MUST BE WORN AT ALL TIME.**

- **NO SMOKING, CHEWING, EATING, DRINKING OR PLAY ALLOWED IN THE LABORATORY.**

- **ACQUAINT YOURSELF WITH THE EYEWASH STATION, FIRE-FIGHTING EQUIPMENT. YOU ARE RESPONSIBLE FOR KNOWING THEIR LOCATION AND USE.**

- **ALL CHEMICALS IN THE LABORATORY ARE TO BE CONSIDERED DANGEROUS.** Remember that most chemicals are flammable, toxic, carcinogenic or all three. Treat them accordingly.

- **DO NOT LEAVE FLAMES UNATTENDED.** Never leave anything that is being heated or is visibly reacting unattended. Turn burners/ hot plates off when not in use.

- **REPORT ALL ACCIDENTS OR INJURIES TO THE INSTRUCTOR/ TECHNICIAN IMMEDIATELY. CALL 80 FOR EMERGENCY.**

- **FAMILLIARIZE YOURSELF WITH THE EXPERIMENTAL PROCEDURE BEFORE BEGINNING WORK IN THE LABORATORY.** Take special note of any procedure that might pose a safety problem.

- **IF YOU DO NOT UNDERSTAND A PROCEDURE OR YOU CANNOT READ A LABEL, CONTACT THE INSTRUCTOR.** Do not gamble with your (and others) safety when there is a question. What you don't know can hurt you.

- **CLEAN-UP.** No experiment is complete until the laboratory has been cleaned up. All glassware must be cleaned, drained, and stored. All work counters should be cleaned and dried. Trash should be picked up and disposed in designated bins.

- **NO PERSONS SHALL WORK ALONE OR WITHOUT SUPERVISION, EXCEPT FOR DEPARTMENTAL LAB TECHNICIANS.**

BASICS FOR SAFE AND EFFECTIVE HOOD USE

Fume hoods are installed in laboratories to protect workers from hazardous vapors generated by laboratory experiments. However, simply conducting these experiments in the fume hood does not guarantee adequate protection. The fume hood must be used properly. These guidelines will help you optimize the safety and effectiveness of your fume hood.

- **Operate the hood at the proper sash height at 12 inches or less** from the working surface while working in the hood to ensure maximum flow rate and to protect yourself from potential chemical splashes or explosions. The sash should be closed when you are not working in the hood.
- **Know the physical, chemical and toxicological properties** of the chemicals you are working with.
- **Always work with hazardous chemicals in a fume hood**, do not use hazardous chemicals on the bench top.
- **Check the airflow indicator** prior to starting an experiment to ensure the fume hood is drawing air. If you are not sure there is a proper air draw, test the hood airflow with a piece of light material (such as a tissue).
- **Do not turns off velocity control alarms** (beep indicated fume hood velocity problem).
- **Reduce pedestrian traffic in front of hoods**. Also minimize nearby disturbances, such as doors opening or closing, and any quick motion in order to prevent cross drafts.
- **Do not position fans so as to direct airflow across the face of the hood**. This can interfere with airflow and containment of hazardous chemicals.
- **Do not block airfoil:** The airfoil provides airflow across the floor of the hood. If you use absorbent paper in the hood, do not block the airfoil.
- **Work as far inside the hood as possible**, at least 4 to 6 inches from the front edge with the sash face between you and task at hand. All equipment should be a minimum of 9 to 12 inches away from the hood face.
- **Keep sash face clean and clear**. To encourage use of sash as added protection against splashes, sprays, etc., keep sash face clean. If sash face must be blocked with paper for certain experiments, please take it down after the experiment is complete.
- **Do not use hood as a storage cabinet** for chemicals or equipment. Materials stored in fume hoods should be kept to a minimum and stored in a manner that will not interfere with airflow. Keep at least 50% of the working surface clear, if possible.
- **Prepare a plan of action in case of an emergency**, such as a power failure, especially when using extremely hazardous chemicals or acids.
- **Fume hoods are not to be used for the disposal of materials**. The cap of the waste bottle must seal the bottle immediately after pouring waste into it.
- Set the baffles according to the nature of the work being performed:
    - For hot work, position the baffle so most of the air is exhausted from the top of the hood.
    - For normal operations, locate the baffles in the center position so air is exhausted from all three positons.
    - For work with chemicals which have a very high vapor density, position the baffles so most of the air is exhausted from the bottom of the hood.
- **Do not use a hood for any function it was not designed for**, such as perchloric acid, radioisotopes, etc. The generation of perchloric acid vapors requires specially designed fume hoods with wash-down systems.
- **Wear protective equipment!** Fume hoods do not prevent accidents or chemical splashes.
- **Close sash when finished** with hood work or **when leaving experiments or chemicals unattended!** This simple procedure has contained many fires and explosions within a hood.
- **If fume hood airflow stops**; shut off experiments, turn off heat, and seal containers. Immediately advise supervisor or staff.

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR ROOM KHN101 KERR HALL NORTH
OCCUPATIONAL HEALTH AND SAFETY

Ensuring laboratory safety is not just the responsibility of the instructor; it is the responsibility of everyone working in the laboratory. You are expected to be familiar with the safety rules and to conduct your laboratory work in a safe manner at all times.

1. **Safety shoes must be worn at all time** (No safety shoes = No lab).

2. **No eating, drinking or play allowed in the laboratory** (No tempering with equipment not in use).

3. **Acquaint yourself with locations of first aid kit, eyewash station, fire extinguisher and emergency exits. You are responsible for knowing their location and use.**

4. **All chemicals in the laboratory are to be considered dangerous** (Remember that most chemicals are flammable, toxic, carcinogenic or all three. Treat them accordingly).

5. **Do not leave flames unattended** (Never leave anything that is being heated or is visibly reacting unattended. Turn burners/ hot plates off when not in use).

6. **Report all accidents or injuries to the instructor/ technician immediately. Call 80 for emergency.**

7. **Familiarize yourself with the experimental procedure before beginning work in the laboratory** (Take special note of any procedure that might pose a safety problem).

8. **If you do not understand a procedure or operation of equipment, contact the instructor** (Do not gamble with your and others' safety when there is a question. What you don't know can hurt you and/or damage equipment).

9. **Clean up** – Cleaning utensils provided (No experiment is complete until laboratory has been cleaned up. All equipment used must be cleaned, dried and stored. All work counters must be wiped clean. Trash must be picked up and disposed in designated bins. Do not dump soil into the sink).

10. **No person shall work alone or without supervision, except for departmental lab technicians.**

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR TARBA LAB ROOM ENG22 AND ROOMES THEREIN
OCCUPATIONAL HEALTH AND SAFETY

1. **The purpose of these rules and regulations is to ensure that all persons in this area are protected and the working conditions are safe.**

2. **The Civil Engineering Department will provide some protective equipment to all persons working in the lab.**

2.4 **PROTECTIVE EQUIPMENT REQUIRED**

The users of this lab should follow procedure when working with equipment herein by using appropriate protective equipment similar to that listed below:

- **G. Heat Protection**
- **H. Eye Protection**
- **I. Gloves**
- **J. Aprons**
- **K. Welding Shields**
- **L. Respirators or Dust Masks.**

2.5 **Laboratory coats and safety footwear are NOT provided by the Department. Any person found in this lab not wearing protective equipment will be asked to leave.**

2.6 **The Civil Engineering Department shall maintain a reasonable amount of protective equipment for each area. If not enough equipment is available, do not proceed with work until the proper protective measures have been taken.**

3. **ISSUING OF PROTECTIVE CLOTHING**

3.2 **When protective clothing is issued the user will have to sign a confirmation slip and shall be responsible for items until returned.**

4. **WEARING OF PROTECTIVE CLOTHING**

4.2 **All persons engaged in activities where the risk of bumping and/or injuring the head is possible shall wear the appropriate protective head equipment.**

4.2 All persons must wear eye protection when engaged in any activity where particles or liquid can become air borne and any risk of eye injury is possible, some activities which require eye protection are listed below:

A. Dusting
B. Sanding
C. Spray Painting
D. Grinding
E. Chipping
F. Wire Brushing
G. All Forms of Metal Cutting
H. As Prescribed by the Professor

4.3 All persons shall wear CSA approved safety shoes or boots (with steel toe and non-skid sole) when working in this area.

4.4 All persons shall wear gloves or mitts when exposed to the risk inherent in work activities such as:

D. Welding
E. Material Handling
F. General Oven or Kiln Use

4.10 All persons shall wear aprons and welding masks, as well as respirators when engaged in welding activities.

4.11 All persons shall wear a respirator and/or dust mask when exposed to the risk inherent in work activities such as:

F. Spray Painting
G. Sanding
H. Grinding
I. Welding
J. Handling of fine powders or respiratory irritants

4.12 All persons with loose clothing or long hair shall wear hairnets or pin their hair back when working on machinery such as:

I. Universal Milling Machine
J. Precision lathe
K. Table saw
L. Band saw
M. Grinder
N. Up-right drill press
O. Asphalt or Concrete Mixers
P. Any piece of equipment with moving parts

4.13 Smoking is prohibited in all TMU labs and is punishable by law in Ontario.

4.14 No persons shall work alone or without supervision, except for Departmental Lab Technicians.

7. In the interest of each and every person within this Department, it is important to take precautions reasonable in the circumstances. Also it is imperative that everyone in the lab space abide by these rules and regulations to maintain a safe working environment.

8. It is the duty and obligation of the safety officer to ensure that these rules and regulations are accurate and current in all civil laboratories.

July. 13, 2006

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR STRENGTHS OF MATERIALS LAB ROOM NO. MON412
OCCUPATIONAL HEALTH AND SAFETY

1. The purpose of these rules and regulations is to ensure that all persons in this area are protected and the working conditions are safe.

2. The Civil Engineering Department will provide some protective equipment to all persons working in the lab.

2.1 PROTECTIVE EQUIPMENT REQUIRED

The users of this lab should follow procedure when working with equipment herein by using appropriate protective equipment similar to that listed below:

- **M. Heat Protection**
- **N. Eye Protection**
- **O. Gloves**
- **P. Aprons**
- **Q. Welding Shields**
- **R. Respirators or Dust Masks.**

2.2 Laboratory coats and safety footwear are NOT provided by the Department. Any person found in this lab not wearing protective equipment will be asked to leave.

2.3 The Civil Engineering Department shall maintain a reasonable amount of protective equipment for each area. If not enough equipment is available; do not proceed with work until the proper protective measures have been taken.

3. ISSUING OF PROTECTIVE CLOTHING

3.1 When protective clothing is issued the user will have to sign a confirmation slip and shall be responsible for items until returned.

4. WEARING OF PROTECTIVE CLOTHING

4.1 All persons engaged in activities where the risk of bumping and/or injuring the head is possible shall wear the appropriate protective head equipment.

4.2 All persons must wear eye protection when engaged in any activity where particles or liquid can become air borne and any risk of eye injury is possible, some activities that require eye protection are listed below:

A. Dusting
B. Sanding
C. Spray Painting
D. Grinding
E. Chipping
F. Wire Brushing
G. All Forms of Metal Cutting
H. As Prescribed by the Professor

4.3 All persons shall wear CSA approved safety shoes or boots (with steel toe and non-skid sole) when working in this area.

4.4 All persons shall wear gloves or mitts when exposed to the risk inherent in work activities such as:

G. Welding
H. Material Handling
I. General Oven or Kiln Use

4.5 All persons shall wear aprons and welding masks, as well as respirators when engaged in welding activities.

4.6 All persons shall wear a respirator and/or dust mask when exposed to the risk inherent in work activities such as:

K. Spray Painting
L. Sanding
M. Grinding
N. Welding
O. Handling of fine powders or respiratory irritants

4.7 All persons with loose clothing or long hair shall wear hairnets or pin their hair back when working on machinery such as:

Q. Universal Milling Machine
R. Precision lathe
S. Table saw
T. Band saw
U. Grinder
V. Up-right drill press
W. Asphalt or Concrete Mixers
X. Any piece of equipment with moving parts

4.8 Smoking is prohibited in all TMU labs and is punishable by law in Ontario.

4.9 No persons shall work alone or without supervision, except for Departmental Lab Technicians.

5. In the interest of each and every person within this Department, it is important to take precautions reasonable in the circumstances. Also it is imperative that everyone in the lab space abides by these rules and regulations to maintain a safe working environment.

6. It is the duty and obligation of the safety officer to ensure that these rules and Regulations are accurate and current in all civil laboratories.

Revised: 2012 January 12

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR ROOM MON106 CIVIL ENGINEERING BUILDING
OCCUPATIONAL HEALTH AND SAFETY

Ensuring laboratory safety is not just the responsibility of the instructor; it is the responsibility of everyone working in the laboratory. You are expected to be familiar with the safety rules and to conduct your laboratory work in a safe manner at all times.

1. **Lab coat is not mandatory.**

2. **No eating, drinking or play allowed in the laboratory** (No tempering with equipment not in use).

3. **Acquaint yourself with locations of first aid kit, eyewash station, fire extinguisher, emergency exits and phone. You are responsible for knowing their location and use.**

4. **Report all accidents or injuries to the instructor/ technician immediately. Call 80 for emergency.**

5. **Familiarize yourself with the experimental procedure before beginning work in the laboratory** (Take special note of any procedure that might pose a safety problem).

6. **If you do not understand a procedure or operation of equipment, contact the instructor** (Do not gamble with your and others' safety when there is a question. What you don't know can hurt you and/or damage equipment).

7. **Clean up** (No experiment is complete until laboratory has been cleaned up. All equipment used must be cleaned, dried and stored in their original location. All work counters must be wiped clean. Trash must be picked up and disposed in designated bins).

8. **No person shall work alone or without supervision, except for departmental lab technicians.**

DEPARTMENT OF CIVIL ENGINEERING

RULES AND REGULATIONS
FOR MACHINE SHOP ROOM NO. MON107
OCCUPATIONAL HEALTH AND SAFETY

1. The purpose of these rules and regulations is to ensure that all persons in this area are protected and the working conditions are safe.

2. The Civil Engineering Department will provide some protective equipment to all persons working in the lab.

2.1 PROTECTIVE EQUIPMENT REQUIRED

The users of this lab should follow procedure when working with equipment herein by using appropriate protective equipment similar to that listed below:

- **S. Heat Protection**
- **T. Eye Protection**
- **U. Gloves**
- **V. Aprons**
- **W. Welding Shields**
- **X. Respirators or Dust Masks.**

2.2 Laboratory coats and safety footwear are NOT provided by the Department. Any person found in this lab not wearing protective equipment will be asked to leave.

2.3 The Civil Engineering Department shall maintain a reasonable amount of protective equipment for each area. If not enough equipment is available; do not proceed with work until the proper protective measures have been taken.

3. ISSUING OF PROTECTIVE CLOTHING

3.1 When protective clothing is issued the user will have to sign a confirmation slip and shall be responsible for items until returned.

4. WEARING OF PROTECTIVE CLOTHING

4.1 All persons engaged in activities where the risk of bumping and/or injuring the head is possible shall wear the appropriate protective head equipment.

4.2 All persons must wear eye protection when engaged in any activity where particles or liquid can become air borne and any risk of eye injury is possible, some activities that require eye protection are listed below:

A. Dusting
B. Sanding
C. Spray Painting
D. Grinding
E. Chipping
F. Wire Brushing
G. All Forms of Metal Cutting
H. As Prescribed by the Professor

4.3 All persons shall wear CSA approved safety shoes or boots (with steel toe and non-skid sole) when working in this area.

4.4 All persons shall wear gloves or mitts when exposed to the risk inherent in work activities such as:

J. Welding
K. Material Handling
L. General Oven or Kiln Use

4.5 All persons shall wear aprons and welding masks, as well as respirators when engaged in welding activities.

4.6 All persons shall wear a respirator and/or dust mask when exposed to the risk inherent in work activities such as:

P. Spray Painting
Q. Sanding
R. Grinding
S. Welding
T. Handling of fine powders or respiratory irritants

4.7 All persons with loose clothing or long hair shall wear hairnets or pin their hair back when working on machinery such as:

Y. Universal Milling Machine
Z. Precision lathe
AA. Table saw
BB. Band saw
CC. Grinder
DD. Up-right drill press
EE. Asphalt or Concrete Mixers
FF. Any piece of equipment with moving parts

4.8 Smoking is prohibited in all TMU labs and is punishable by law in Ontario.

4.9 No persons shall work alone or without supervision, except for Departmental Lab Technicians.

5. In the interest of each and every person within this Department, it is important to take precautions reasonable in the circumstances. Also it is imperative that everyone in the lab space abides by these rules and regulations to maintain a safe working environment.

6. It is the duty and obligation of the safety officer to ensure that these rules and Regulations are accurate and current in all civil laboratories.

Revised: 2012 January 12