UNIVERSITY OF MANITOBA
DEPARTMENT OF CIVIL ENGINEERING

Lab Safety Orientation
OVERVIEW

- Introduce technical support staff
- Faculty Safety Manual and Emergency Quick Reference
- Safe work procedures (SWP)
- Workplace Hazardous Material Information System (WHMIS)
- Description of teaching labs
- Tours of Structures, Hydraulics, Environmental and Geotechnical labs
TECHNICAL STAFF INTRODUCTIONS

- Chad Klowak
  - Lab Manager (W.R McQuade Structures Laboratory H110HSL)
- Samuel Abraha
  - Structures Technologist (W.R McQuade Structures Laboratory H110HSL)
- Grant Whiteside
  - Structures Technician (W.R McQuade Structures Laboratory H110HSL)
- Kerry Lynch
  - Geotechnical Technologist (Geotech Lab E1-317)
TECHNICAL STAFF INTRODUCTIONS

- Scott Sparrow
  - Pavements Technologist (Engineering Mechanics Lab E1-393)
- Virgil Sumaling
  - Information Technologist (Undergraduate Computing Facility E2-368 & E2-365)
- Alexander Wall
  - Hydraulics Technologist (Hydraulics Research & Testing Facility E3-230)
- Victor Wei
  - Environment Engineering Technologist (Environment Engineering Undergraduate Laboratory E1-225)
SAFE WORK PROCEDURES (SWP)

- Step by step instructions on how to carry out a task or operate equipment safely and lists the hazards associated with the task
- May be for a lab apparatus, for an assortment of tools in a workshop, or a specific task in the lab and field
- Documents provided to you in course syllabus and will be found attached to apparatuses where applicable
Geotech SWP 1.0  Safe Work Procedure

Name of Task: Geotechnical Materials and Analysis Labwork – CIVL3730

Position/Job : Indoor Undergrad Lab Work

Department/Area: Dept. of Civil Engineering (Geotechnical)

Hazard(s):
- Physical: Slipping, tripping, drops, pinch/compression, heavy lifting
- Biological: Latex allergies, reactions to other produces in lab such as silicone, hydraulic and mineral oils
- Environmental: 100 psi air lines are present, silica sand, crowding (restricted personal space)

Personal Protective Equipment or other required equipment or other safety considerations:
- First Aid Kit, Full shoe with closed toe required, eyewear available, Eye wash and shower station

Education and training prerequisites:
- Location of Safety Equipment, eye wash and shower station, msds, and emergency phone for campus security

Steps to be taken to complete task safely:

1. General:
   - The lab may be crowded at times so care must be taken to watch for slipping or trip hazards. There is no running in the lab. Movement throughout the lab should be kept to a minimum to avoid tripping, dropping and possible injury. Only those that are required to complete specific tasks related to the lab assignment should be moving throughout the lab.
   - Students and staff should notify UofM staff in charge of the lab of any allergies or conditions that could be aggravated by lab conditions prior to entering the lab. (i.e. Latex allergy)

2. Direct shear:
   - Avoid getting silica sand in eye’s as it is quite abrasive
   - Silica sand should not be agitated in such a way to cause smaller particles to become airborne and possibly inhaled
   - Keep clear of apparatus when the vertical or horizontal motor is running. Announce to others near that device when you are starting the motors.

3. Geodimeter/Compression:
   - Weights provided for this test must remain at their designated stations and not placed higher than the middle shelf of the device.
   - All large weights (i.e. 100 Newtons) must be on lower shelf when not being used
   - Keep knees bent when placing or removing weights to avoid possible injury
   - Keep feet straddled on each side of the loading arm when placing or removing weights
   - Ensure that you have space or be mindful of others space when placing or removing weights to avoid a drop and possible injury.

4. Triaxial:
   - Wear proper enclosed shoes with good traction (i.e. Standard walking or running shoe)
   - Watch carefully when walking to avoid slips and falls.
   - Clean up or have someone clean any water spills immediately and block off area if necessary
   - Be aware of all airline hose attached to the triaxial device so as not to dislodge or pinch them. A dislodged hose can ‘whip’ around and can cause eye or other injury.
   - Only one person at a time should be placing or removing items from the oven to avoid possible drops or burns
   - Use oven mitts for removing items from the oven and allow items to cool before handling or weighing.

Responsibilities, Completion and Review

Management and workers to ensure all duties performed in accordance to training, established health and safety regulations/guidelines, policies and procedures (e.g. utilizing personal, protective equipment as per safe work procedures)

Notify Manager or designates (i.e. supervisors) of all occurrences, injuries illnesses or safety and health concerns which are likely to harm themselves, co-workers, or any others who perform similar tasks.

Completed by and Date: K. Lynch on Sept 05, 2018

Approved by:

Last Reviewed / Revised by and Date: 31/03/2018

Note: This task will be monitored periodically to ensure compliance and effectiveness

HRTF SWP 22.0 Constant head tank

Safe Work Procedure

Name of Task:
Starting and using constant head tank system

Position/Job : Technician or student/ hydraulic testing

Department/Area: Dept. of Civil Engineering (Water Resources)

Hazard(s):
- Noise, slipping, electric shock, flooding

Personal Protective Equipment or other required equipment or other safety considerations:
- Safety glasses (on lower level of HRTF), hearing protection, squeeges for puddles

Education and training prerequisites:
- University of Manitoba’s "New Worker General Orientation" and has had HRTF lab orientation with instructions on how to use system

Steps to be taken to complete task safely:

1. Contact technician in charge to schedule experiment to avoid scheduling conflicts with teaching labs and other experiments

2. Close door to graduate room and alert any people downstairs that you are starting the pumps

3. Ensure sound dampening foam (blue) is over grate before starting pumps

4. Ensure all wires and instrumentation are off floors

5. Check water levels in lower reservoir. This should be within 1.5 meters of ultrasonic water level sensor (read out is on west wall near head tank overflow)

6. Push “start” button for 60 hp pump and wait for overflow of constant head tank to occur. DO NOT TURN ON 60 HP AND 75 HP PUMPS AT SAME TIME WITHOUT HAVING SIGNIFICANT FLOW INTO A FLUME, OTHERWISE LAB WILL FLOOD!!

7. If volumetric calibration is required, ask for a demonstration by the technician in charge and they will give a walkthrough of the procedure

8. Slowly open gate valve to operate desired flume and monitor flow with installed flow meter

9. Continue to increase flow as required by experiment and adjust tail water gates/stop blocks as required

10. Take required measurements and monitor flow throughout experiment and stay near lab for duration of experiment. DO NOT START EXPERIMENT AND LEAVE BUILDING

11. If experiment is to run outside operating hours, a “work alone permit” is required (see technician in charge)

12. When use of system is complete, close gate valve completely

13. Push “stop” button for 60 hp pump

14. Squeegee any remaining water from floors into grates

Responsibilities, Completion and Review

Management and workers to ensure all duties performed in accordance to training, established health and safety regulations/guidelines, policies and procedures (e.g. utilizing personal, protective equipment as per safe work procedures)

Notify Manager or designates (i.e. supervisors) of all occurrences, injuries illnesses or safety and health concerns which are likely to harm themselves, co-workers, or any others who enter the premises.

Completed by and Date: A. Wall 24-Apr-13

Approved by:
WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (WHMIS)

- Required by any person; storing, handling or using hazardous products
- Courses requiring WHMIS training will provide directions in course syllabus with link below to complete training on UMLEARN

http://umanitoba.ca/admin/vp_admin/risk_management/ehso/chemical_safety/6336.html
WHMIS

(WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM)

HAZARD CLASSIFICATION

CLASS A – COMPRRESSSED GAS

CLASS B – FLAMMABLE AND COMBUSTIBLE MATERIAL
1. Flammable Gas
2. Flammable Liquid
3. Combustible Liquid
4. Flammable Solid
5. Flammable Aerosol
6. Reactive Flammable Material

CLASS C – OXIDIZING MATERIAL

CLASS D – POISONOUS AND INFECTIONOUS MATERIAL
1. Materials Causing Immediate and Serious Toxic Effects
2. Materials Causing Other Toxic Effects
3. Biohazardous Infectious Material

CLASS E – CORROSIVE MATERIAL

CLASS F – DANGEROUSLY REACTIVE MATERIAL

SYMBOLS

WORKPLACE LABELS

These labels are applied at the workplace on controlled products or containers of controlled products when

A. The original supplier label is missing or becomes unreadable.
B. The material is decanted or transferred from suppliers’ containers to workplace containers.
C. The material is produced at the workplace for use within the workplace.

Workplace labels will include the following information:

1. Name/Identity of the Product.
2. Safe Handling Information – refers to any precautions that must be followed to minimize the risks of adverse health effect or injury. This also includes any personal protective equipment e.g., type of gloves, eye, or respiratory protection to be worn or other controls to be used through statement or pictogram (symbols).
3. Reference to the MSDS.

SUPPLIER LABELS

Supplier labels on a controlled product must be in English and French and include the following information:

1. Product Identifier
2. Hazard Symbol(s)
3. Risk Phrase(s)
4. Precautionary Measures(s)
5. First Aid Measures(s)
6. Supplier Identifier
7. Reference to the Availability of a Material Safety Data Sheet

This type of border as shown is the indicator that the label identifies a controlled product.

MATERIAL SAFETY DATA SHEET

A Material Safety Data Sheet (valid for three years) will include information relating to each of the following categories:

1. Product Identification and Use
2. Hazardous Ingredients
3. Physical Data
4. Fire and Explosion Data
5. Reactivity Data
6. Toxicological Properties
7. Preventive Measures
8. First Aid Measures
9. Date and Source of MSDS

and any other hazard information of which the Supplier is aware or ought reasonably to be aware.

Fire / Medical Emergencies
555 from 474, 789, 975, 977 exchanges or #555 from a cell phone (MTS or Rogers) or
911 from other exchanges. If 911 is called you must also call Campus Security at: 474-9341

Chemical / Biohazard Emergencies
474-6633
(8:00 am - 4:00 pm Mon. to Fri.) If busy or after hours call: 555

For further information on WHMIS, contact the Environmental Health and Safety Office at 474-6633.
DESCRIPTION OF TEACHING LABS

Labs may have the following, note their location on first visit:

- First Aid Kits
- MSDS
- Eyewash Stations or Showers
- Personal Protective Equipment
- Fire Escape Plan & Fire Extinguisher
- SWP where applicable
- Faculty Safety Manual
- Emergency Quick Reference Guide
- Entrance requirement signage
- Chemical inventory list
ENGINEERING MECHANICS LABORATORY (E2-393)

- Scott Sparrow (scott.sparrow@umanitoba.ca)
- Supported Courses
  - Engineering Statics ENG 1440, Solid Mechanics CIVL 2800, Structural Analysis CIVL 3760, Structural Design 1 CIVL 3770
- Hazards
  - Crushing hazards from dropping weights on floor
- Rules
  - Full closed footwear
  - No food or drink.
  - Follow instructions of lab notes and teaching assistants.
  - Do not swap apparatus or weights between setup
  - Do not apply additional load
HYDRAULICS RESEARCH AND TESTING FACILITY (E3-230)

- Alexander Wall (alexander.wall@umanitoba.ca)
- Supported Courses
  - Fluid Mechanics CIVL 2790, Hydraulics CIVL 3740, Hydrology CIVL 3750, Watershed CIVL 4470
- Hazards
  - Noise from pumps and slipping and tripping hazards
- Rules
  - No food or drink allowed in the lab and full shoes must be worn
  - Safety glasses must be worn on the lower level of lab
  - Laptops are prohibited
Victor Wei (victor.wei@umanitoba.ca)

Supported Courses
- Environmental Analysis CIVL 3690, Environmental Engineering Design CIVL 3700, Water Treatment Plant Design CIVL 4120, Hazardous Waste Treatment CIVL 4350

Hazards
- Acids, bases, corrosive and toxic compounds and microorganisms, slips from spills

Rules
- No food or drink allowed in the lab and full shoes must be worn, gloves, lab coat and safety glasses must be worn
- WHMIS certification required
GEOTECHNICAL ENGINEERING LABORATORY (E1-317)

- Kerry Lynch (kerry.lynch@umanitoba.ca)
- Supported Courses
  - Geotechnical Material and Analysis CIVL 3730, Groundwater Hydrology CIVL 4250, Geomatics CIVL 2840 (field component)
- Hazards
  - Crushing hazards from heavy weights, slipping hazards
- Rules
  - Full shoe closed toe required
  - No food or drink
Chad Klowak (chad.klowak@umanitoba.ca)

Supported Courses

- Civil Engineering Materials CIVL 2770, Properties & Design of Concrete Mixtures CIVL 4022, Structural Design I CIVL 3770, Masonry Design & Construction CIVL 4020, undergrad student teams

Mandatory orientation held at the beginning of each term (walkthrough and video)

Hazards

- Crushing hazards, noise hazards, respiratory hazards from dust and solvents

Rules

- Dependent on specific lab; full shoe closed toe, hard hat, eye protection, hearing protection, gloves and breathing protection
- No food or drink
Undergraduate Computing Facility (E2-368 & E2-365)

- Virgil Sumaling (virgil.sumaling@umanitoba.ca)

- Supported courses
  - All courses requiring specialized software, course syllabus will indicate if the computing facility is required

- Rules
  - No food or drink
  - Don’t unplug the computers and monitors
  - Don’t leave data on the drive - the drive resets after every reboot. Instead, save to your USB stick, or the your network assigned space (U: drive)
  - General usage guide is posted near the entrance or outside of each computer lab
  - Emergency numbers are by the phones in the lab.
  - General support available by emailing: engitsup@umanitoba.ca