

Department of Civil Engineering

McMaster University

PROJECT HANDBOOK

Department Safety Report

Safety Rules

Standard Operational Procedures

Final Draft
May 27, 2003

APPLIED DYNAMICS LABORATORY

STANDARD OPERATIONAL PROCEDURES

At all times when working on the main floor you must wear safety boots, hard hat and safety glasses and when required any other safety equipment needed. You will be given your own hard hat and safety glasses prior to starting at ADL.

Regular meetings of users will be held at the end of each month.

Users must submit a plan for lab use outlining their space requirements, equipment needed and time schedule.

Your project will be posted on the PROJECT BOARD with the list of equipment and space needed as well as a work and home phone number and who your supervisor is and his work number.

ALL one-man jobs will be done by the researcher. The technicians are used only in areas where two people are required or in areas with special training requirements (electronics, welding etc).

Every Friday ADL will be closed from 2 pm for maintenance. There will be no work scheduled for that time.

At the end of each day, or when the work is completed for that day users of the lab **are required** to put all the tools they used back in their designated places. If this is not done, you will be billed a \$50/hour cleanup charge at no less than one hour. Allow this time at the end of your day.

It is required to have a **qualified* person near-by** who understands the potential hazards and safety procedures. During normal working hours (Monday to Friday 8:30 am to 4:30 pm), there must be a qualified person in **the same lab** with you.

There is **no working outside working hours** without a technician or your supervisor present at all times.

No equipment may be used without **prior training**.

* technician or supervisor

DEPARTMENTAL SAFETY REPORT

CIVIL ENGINEERING

McMASTER UNIVERSITY

Everyone in Civil Engineering is required to fill out a Departmental Safety Report before they may start their experimental research or any work in a laboratory. Each Departmental Safety Report will be reviewed and may be returned for revision before acceptance by the health and safety committee and the space allocation committee.

A concise safety report is to be prepared and submitted to the safety committee for approval. No one can commence their experimental work until their report is submitted and **approved** by the supervisor and the departmental safety committee **and** WHMIS and other required training **has been successfully completed**.

MSDS and Designated Substance Assessments (if applicable) must be included with the safety report.

AREAS TO BE ADDRESSED

1. In a few sentences describe your research objective.
2. The potential hazard under the day-to-day routine operation (falling objects, crushing hazards electrical, high pressure, toxic, fire/explosion, chemical or biological hazards).
3. List the potential possible emergencies or accidents that are possible in a worst-case scenario.
4. List the personal protective devices required, and location of safety showers, emergency eye wash station and first aid kit.
5. List the procedures for emergencies, e.g.: clean-up, evaluation, medical.
6. List all equipment needed for your project.
7. List space requirements for your project (construction, testing, storage and the time frame for each).

NEAR BY ASSISTANCE

If, on review of the safety report by the Departmental Safety Committee, the experimental work is deemed to be potentially hazardous, you must never work alone. It is required to have a **qualified person near-by** who understands the potential hazards and safety procedures. During normal working hours (Monday to Friday 8:30 am to 4:30 pm) there must be a qualified person in **the same lab** with you.

There is no working outside working hours without a technician or your supervisor present at all times.

No equipment may be used without **prior training**.

Every person who works at the ADL must read and sign the ADL SAFETY sheet.

ADL SAFETY

- 1) **The emergency number is "88".**
Leave the building when the fire alarm sounds.
- 2) No person shall participate in an unsafe act at any time in ADL.
- 3) Report all injuries to the technician at once.
- 4) When on the main floor, hard hats, safety shoes & safety glasses must be worn.
- 5) When grinding/torching/welding or any other activity that can cause damage to the eyes, the proper eye protection must be worn.
- 6) When using epoxies etc., gloves and eye protection must be worn.
- 7) When working more than 3 metres off the floor on the ladder or the scaffolding the safety harness must be worn and connected.
- 8) When using the man-basket the safety harness must be connected to the main hook.
- 9) There is **no working alone** in the building at any time: McMaster University Risk Management Manual #304.
- 10) There is no working in ADL after hours or weekends without a technician present.
- 11) No person shall operate a piece of equipment at ADL without having been trained by the technician.
- 12) No lifting more than you deem physically possible, up to a maximum of 22 kg without help.
- 13) No dust shall be generated from concrete grinding in ADL unless the samples are too big to be moved.
- 14) When grinding, a dust mask must be worn.
- 15) All mess generated must be cleaned up when finished or at the end of the day.
- 16) All tools will be put away when finished or at the end of the day.
- 17) ADL is closed every Friday from 2 pm for maintenance and cleanup. No work or testing shall be done.

EQUIPMENT

Riehle Test Machine	Training course needed
600k Newton Tinius Olsen Test Machine	Training course needed
300k Pound Tinius Olsen Test Machine	Training course needed
All power saws, gas and electric	Training course needed
Electric plainer	Training course needed
Hammer, drill	Training course needed
Drill press	Training course needed
MTS system	Training course needed

Technician only equipment

10 ton overhead crane
Arc welder
Cutting torch
Milling machine
Lathe

LIFTING

1. Never lift more than 22 kg without help.
2. Use a wide-balanced stance with one foot slightly ahead of the other.
3. Get as close to the load as possible to the load.
4. When lifting, keep your lower back in its normal arched position and use your legs to lift.
5. Pick up your feet and pivot to turn. **Do not twist your back.**
6. Lower the load slowly maintaining the curve in your lower back.
7. Avoid lifting above shoulder height, this causes the back to arch placing heavy stress on the small joints of the spine.
8. Push rather than pull. Pushing allows you to maintain normal curves in your back.

SAW SAFETY

Circular Saw

Sabre Saw

Table Saw

Chop Saw

Reciprocating Saw

Quick Cut Masonry Saw

Masonry Table Saw

1. Keep free hand away from blade.
2. Wear eye protection.
3. Wear hearing protection.
4. Never use in wet locations.
5. Never use with loose clothing or anything else that can get caught in the saw blade or other moving parts.
6. Never remove, modify, or defeat guards.
7. Disconnect power source before making adjustments. The technician will change blades as required.
8. Use the proper blade for the material being cut.

ENVIRONMENTAL LABORATORY SAFETY

PROTECTIVE EQUIPMENT

This material can also be found at: http://www.eng.mcmaster.ca/safety/full_handbook.htm#14

14. PERSONAL PROTECTIVE EQUIPMENT

For any work in a laboratory a lab coat, eye protection, gloves and proper footwear is recommended. Personal protective equipment suitable for the operation as specified by the supervisor must be worn. It is the individual's responsibility to maintain personal protective equipment in good condition. The supervisors are responsible for supplying the required personal protective equipment.

14.1 GLOVES

Gloves can protect your hands from many hazards. There are many different types of protective gloves available and they should be chosen carefully to offer the best protection for specific procedures and chemicals. Be aware that different glove materials have different chemical permeabilities and this should be checked with the manufacturer before choosing a specific glove type. Nitrile and neoprene gloves offer good protection against chemicals. Always check the integrity of your gloves before starting work. Scientific stores carry a number of different gloves but for specialized needs individual orders must be made through Purchasing. Remove gloves before leaving the laboratory.

14.2 EYE PROTECTION

Remember contact lenses must not be worn while working in a laboratory with chemicals. Depending on the protection required during a specific procedure, regular safety glasses, chemical safety goggles or a full face shield may be necessary. Again, follow your supervisor's established procedural guidelines.

NOTE: In all laboratories, eye protection is a requirement.

14.3 LAB COATS

Lab coats provide additional protection and it is recommended that they be worn at all times in a lab especially when working with chemicals. Contaminated lab coats should not be washed at home with other laundry. Lab coats should not be worn outside of the laboratory, except when going from one lab to another.

14.4 HEARING PROTECTION

It is recommended that hearing protection be worn if average noise levels exceed 85 db(A) (decibels) over an 8 hour period. It is permissible to be at noise levels greater than 85 dBA for short periods of time without hearing protection. Contact the Environmental Occupational Health Support Services for more information. Again follow procedural guidelines.

14.5 PERSONAL PROTECTIVE EQUIPMENT AVAILABLE IN SCIENTIFIC STORES

Disposable lab coats; rubber aprons; vinyl, latex, neoprene, nitrile and rubber gloves; insulating gloves; safety glasses and safety goggles; face shields; ear plugs.

For specialized personal protective needs consult safety supply companies.

14.6 ROUTES OF ENTRY

Inhalation is the most common route of entry into the body. Other routes are ingestion, absorption and the eyes. Ingestion - Material enters the body by mouth. Ingestion of toxic materials may occur as a result of eating or drinking in a contaminated work area. Also may occur by mouth pipetting, which is not an acceptable practice. Skin and Eye Absorption - Material that enters by these routes may cause local effects or may be absorbed by the body. Inhalation - Material taken in through the lungs. Most common route of entry. Odour may not be detectable at a level which will not harm you. Exercise caution. Make sure that you read the MSDS before using any chemical.

ENVIRONMENTAL LABORATORY SAFETY

GENERAL LABORATORY RULES

This material can also be found at: http://www.eng.mcmaster.ca/safety/full_handbook.htm#14

15. GENERAL RECOMMENDED GUIDELINES FOR WORKING IN LABORATORIES

- Always be prepared and informed. Know the safety rules and safe procedures.
- There is absolutely no eating or drinking allowed in the laboratories.
- Food and drinks are not to be stored in laboratory refrigerators.
- Working alone especially at off hours is discouraged. Always check with your supervisor if specific procedures require a buddy system. Check the policies in your department regarding “working alone” during off hours and stick to these policies.
- There is to be no mouth pipetting.
- Hazardous chemicals (i.e. solvents) and chemical waste must be transported in approved safety carriers or on a waste cart with solid sides (available on days of waste operation from safety technician).
- Store flammables in approved flammable safety cabinets.
- Wear clothing appropriate for the level of hazard. High heeled or open toed shoes are not acceptable. Long hair, loose clothing and dangling jewellery must be constrained.
- Post suitable warning signs above your work area. Include your name and extension where you can be reached.
- Communicate with fellow researchers and advise of experiments in progress.
- Reagents and samples must be labeled as required by WHMIS legislation.
- Experiments should only be left unattended when it is safe to do so.
- Work involving hazardous materials should be done in fume hood or other containment facility.
- Keep an updated inventory of all material.
- Practice good housekeeping – promptly clean up glassware and dismantle equipment when no longer needed. Never leave chemicals outside of a proper storage area.
- Clean up spills immediately.
- Know the location of emergency equipment in your area.
- Laboratory glassware and utensils that have been used for laboratory operations should never be used to consume food or drink.
- Always report unsafe conditions and accidents promptly to supervisor.
- Do not use extension cords in laboratories on a permanent basis.
- Never block emergency exits, emergency equipment or electrical panels.
- According to the Ontario Fire Code all laboratory doors are fire doors and must be kept closed at all times.
- No rough-housing or pranks in laboratories.
- All lab benches should be kept clear of clutter.

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- 6) When using epoxies etc, gloves and eye protection must be worn.
- 7) When working more then 3 metres off the floor on the ladder or the scaffolding the safety harness must be worn and connected.
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- 9) There is **no working alone** in the building at any time: McMaster University Risk Management Manual #304.
- 10) There is no working in ADL after hours or weekends without a technician present.
- 11) No person shall operate a piece of equipment at ADL without having been trained by the technician.
- 12) No lifting more then 50 lbs without help.
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- 16) All tools will be put away when finished or at the end of the day.
- 17) ADL is closed every Friday from 2 pm for maintenance and cleanup. No work or testing shall be done.

I HAVE READ AND UNDERSTAND ALL THE ADL SAFETY RULES.

NAME : _____

DATE: _____

ENVIRONMENTAL LABORATORY SAFETY GENERAL LABORATORY RULES

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