STReSS LAB

Laboratory for Structural Testing of Resilient and Sustainable Systems

STReSS Laboratory
Safety Training Memorandum

STReSS Laboratory
October 3, 2013

Introduction

This memo outlines the policy regarding safety, safety gear, clothing requirements, crane operation, and hydraulic test equipment operation for all personnel working or observing activities in the Northeastern University STReSS Laboratory.

Safety training sessions

Students and employees

The STReSS Laboratory requires that all students, employees, and others who will be working for some length of time at the Lab take part in a Lab safety and awareness training session. In this session, the person reviews the contents of the Safety Training Memorandum directly with STReSS staff, and then signs the Agreement Statement. The Agreement Statement affirms that the person has read the Safety Memo and agrees to abide by its contents. New workers will be trained on STReSS tools and equipment to ensure proper and safe use. An equipment training record will be filed for each worker for each tool or piece of equipment they have been trained on.

Visiting researchers and research teams

The STReSS Laboratory requires that all visiting researchers and research teams take part in a Lab safety and awareness training session. In this session, the researcher and team review the contents of the Safety Training Memorandum directly with STReSS staff, and then each signs the Agreement Statement. The Agreement Statement affirms that the person has read the Safety Memo and agrees to abide by its contents. Visiting researchers will be trained on STReSS tools and equipment to ensure proper and safe use. An equipment training record will be filed for each researcher for each tool or piece of equipment they have been trained on.

Potential safety hazards

The STReSS Laboratory is active with research projects that are associated with the heavy civil construction industry. In order to accomplish the requirements of a project, a wide range of equipment is utilized to construct and perform experimental tests on various size specimens. This is cause for numerous potential safety hazards. Following the proper safety procedures and wearing the proper safety gear and clothing can reduce the chance of injury caused by improper use of hydraulic test equipment (MTS Equipment), crane operation, power tools, scissors lifts, ladders and scaffolding, or contact with hazardous objects.

A wide variety of equipment and hazardous procedures are necessary to complete tasks in the STReSS Laboratory. Experimental research has many potential safety hazards and may include the following:

- Unsafe workers
- Insufficient, cluttered, and/or shared work space
- Hydraulic test equipment:

- hydraulic actuators and material test frames
- hydraulic fluid at an operating pressure of 3000 psi and operating temperature of approximately 140 degrees Fahrenheit, which has the potential to burn skin
- high-force testing
- brittle material testing
- large scale specimen testing

➢ Equipment and tools:

- hand tools
- welding and torching equipment
- pneumatic and electric power tools
- pallet jacks and portable lift equipment
- concrete mixers

➢ Ladders, scaffolding, and scissor lifts

➢ Confined spaces such as the pump room or crosshead for which there is no clear path for exit

➢ Working at elevated heights

➢ Overhead cranes and trolley systems

➢ Rigging and moving loads

➢ Chemical and bio-hazards

Safety gear and proper clothing

When working in hazardous surroundings, hard hats, steel-toe boots, work gloves, safety glasses, coveralls or work pants, and sleeved shirts are necessary items. When working in the STReSS Lab, these items must be in your possession at all times, and must be worn when involved in the following activities:

➢ Conducting activities adjacent to personnel operating the crane

➢ Conducting activities involving the construction, removal, or demolition of a specimen or load frame

➢ Removing or placing items into storage

➢ Operating the scissors lift

➢ Conducting/observing experiments involving hydraulic actuators, screw jacks, or other testing apparatuses capable of generating large forces

➢ Using any hand tool or power tool

Personal protective equipment requirements (PPE)

- Hearing protection, consisting of earplugs and/or earmuffs, is required when operating equipment that creates loud noises. A dust mask or powered air purifying respirator (PAPR) is required when working in dusty or vaporous conditions. Rubber gloves are available when working with wet concrete and other chemicals. A full-face shield is required when grinding.
- Hard hats, safety glasses, steel-toe rubber boots, steel shoe coverings, foam inserts for hearing protection, dust masks, and rubber gloves are available in the STReSS Lab. Please see a STReSS staff member if you cannot locate these items or if replacement items need to be ordered.
- When using welding or torching equipment, an approved upper-body leather jacket must be worn with leather welding gloves to prevent burns, and earplugs must be used to prevent sparks from entering your ear canal. When torching, you must use tinted goggles or face shield. When welding, you must wear a full-face welding helmet. You must be pre-qualified by the Lab Manager to use the welding equipment.
- It is your responsibility to purchase steel-toe boots.

  Steel-toe boots are available at most shoe stores, and range in price from under $50 to over $150. Steel-toe boots are required in the STReSS lab and shall have, at a minimum, an impact rating of 50 and a compression rating of 50.
- Each student or employee who works in the lab will be issued a pair of work gloves and safety glasses. When the gloves are worn out, you may exchange them for a new pair.
- When a project requires work at heights above six feet, fall protection equipment must be worn and affixed to a secure tie-off point. Fall protection gear consists of a full-body harness and a lanyard. Please see the Lab Manager for training and the location and procedures for installing fall protection equipment.
- Shorts, skirts, dresses, tank tops, and open-toe (sandals) and high-heel shoes are not considered proper apparel in the STReSS Laboratory at any time. A limited number of lockers are available in the Lab for people interested in storing work clothes. Contact the Operations Manager or the Safety Officer for locker space.

Chemical safety

Special training is required for employees who work in hazardous conditions and with hazardous substances (chemicals, bio-hazards, etc…). This training is required for all employees of the Northeastern University and if you have not had this training please see the Lab Manager to arrange a training session.

A copy of the Department of Civil Engineering Chemical Hygiene Plan is located in the STReSS lab, which contains procedures for the handling and storage of

chemicals, and information about what hazards might exist with the chemical you are using.

STReSS Policies

Crane operation

Only permanent STReSS personnel may operate the crane.

Scissors lift and fork lift

Only permanent STReSS personnel may operate the forklifts. All project personnel and temporary STReSS personnel will be trained in scissors lift operation and an equipment training record will be filed once training is complete.

Hydraulic testing equipment

Only permanent STReSS personnel may operate the hydraulic testing equipment.

Work Plan Information

Before any project can begin work at STReSS, a work plan must be completed and approved by the Lab Manager.

The work plan shall include a list of tasks, specimen and load frame drawings, calculations, schedule, list of equipment and personnel to carry out the work tasks, instrumentation plan, rigging plan, and space requirements.

General Lab rules

Number one rule

- Do not be afraid to ask questions. We are here to assist you.

The following rules apply:

- **Do not step on or set equipment or debris on any signal or actuator controller cable.**

  Damage that is not visible may occur in the cable. Please cover all cables that are on the floor with angle or channel sections.

- **Never use your finger to align bolt holes.**

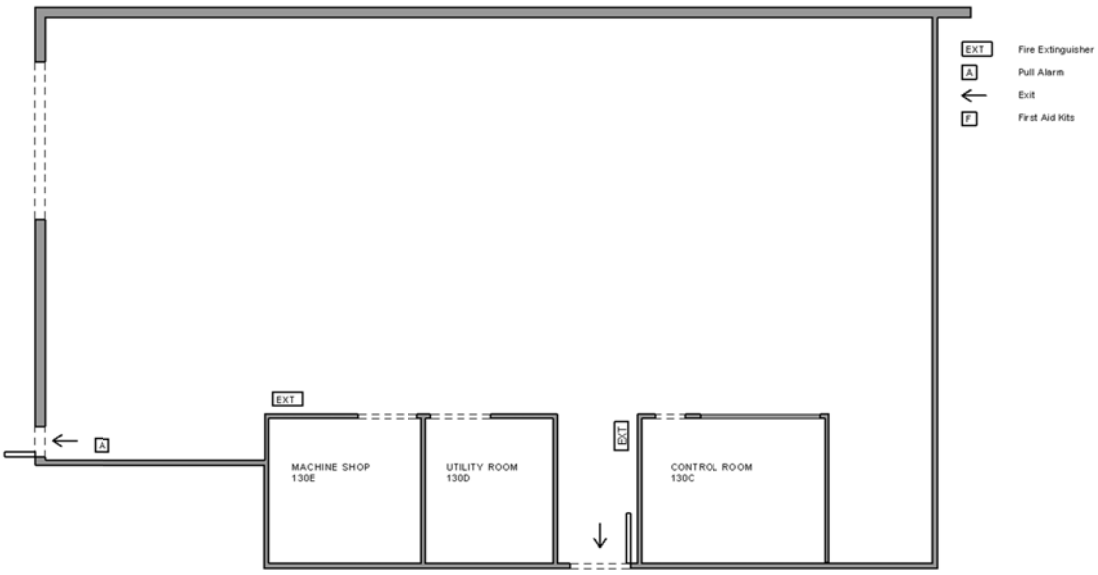
  When you are erecting objects that require aligning bolt holes of two separate components, always use a spud wrench or drift pin.

- **You must keep your work area clean and free of debris**.

- **Never place any part of your body in an area that is considered a crush point**.

  Crush points include areas adjacent to all hydraulic equipment, rigging components, lifting equipment, pallet jacks, torque multipliers, torque wrenches, etc.

- If you break or notice any defects in the equipment you are using, immediately inform the STReSS staff. This ensures that you will not be held responsible for repairing the equipment.
- Do not leave tools on load frames or specimens, and at the end of the day put all tools back where they belong. Never leave brooms, pry bars, etc. against actuators or camera towers. Do not put tools on camera tower shelves.
- You are prohibited from operating any equipment or conducting any physical work in the STReSS Lab if you have taken cold or flu medication (over-the-counter or prescription), pain medication, or you are under the influence of mood altering substances (drugs, alcohol, etc.).
- If you are taking medication(s) prescribed by a doctor, please inform a STReSS staff member and provide a note from the doctor stating what physical activities you can and cannot perform. This information will be kept private.
- If you have a medical or physical condition that prevents you from doing certain tasks, please inform a STReSS staff member so other arrangements can be made. This information will be kept private.
- On objects that have the potential to impale someone, for example, rebar sticking out of concrete, place a piece of Styrofoam or plastic cap on the end of the bar. It is everybody's responsibility to be aware of these risks.
- Please visit www.osha.gov and www.ehs.neu.edu for additional safety information that may be specific to your needs.
- Work methodically and at a steady pace, and do not be afraid to ask your fellow students to assist you. UGRAs are available, and you should schedule their services prior to undertaking any major activities.
- When you invite visitors/volunteers to work in the lab, file a "Release of Liability" form with the Operations Manager or the Safety Officer.
- All electrical cords must be protected and removed from aisle/walkways on a daily basis. If the electrical cord is cut or broken, do not repair it. Throw away any cut or broken electrical cord. Use a properly rated electrical cord for the equipment you are using. An underrated electrical cord is a safety and fire hazard.
- Know the location of all fire extinguishers (shown in floor plan below). If you use one, inform the Operations Manager or the Safety Officer immediately so the fire extinguisher can be refilled.



In case of injury

- **All injuries must be reported.**

  If you are a University employee, file an employee incident report. Fill one out, and have your supervisor sign it and FAX it to the University Workmans' Compensation Department.

Policy violations

Students and employees

For students not adhering to this policy, the following shall apply.

- First offense – verbal or email reminder.
- Second offense – email or written notification of violation(s) to Advisor(s), and STReSS Lab Director.
- Third offense – suspension of work and a mandatory safety review.

Visiting researchers and research teams

For visiting researchers, research teams, or team individuals who do not adhere to the Lab safety policy, the following shall apply.

- First offense – the Lab Manager reviews the situation with the involved individual and/or team.
- Second offense – the Operations Manager makes a verbal or written report to the Principal Investigator.
- Third offense – the Lab Manager sends written notification of violation(s) to the Principal Investigator, and STReSS Lab Director.

Agreement Statement

I, _____, have read the STReSS Laboratory Safety Training Memorandum dated October 2, 2012.

I fully understand its content and agree to abide by it.

Signature: _____ Date: _____