JHU Civil Engineering
Laboratory Manual

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Last updated in September, 2016
1. About the Manual

This document provides laboratory safety regulations and policies for the Department of Civil Engineering at the Johns Hopkins University. It is intended for all of the students, staff, faculty, and visitors that perform experimental research and utilize facilities, equipment, and tools in the JHU CE laboratories. The JHU CE laboratories in this manual include Sensor Technology and Infrastructure Risk Mitigation Lab (Latrobe 13) Undergraduate Teaching Lab (Latrobe 14), Structures Lab (Latrobe 15), Thin-Walled Structures Lab (Latrobe 16), and the Soil Mechanics Lab (Latrobe 18).

This manual also presents safety training sessions for equipment and tools that the CE department offers. All of the students must participate in the training sessions prior to the use of equipment and tools at the first time. The safety training sessions cover, but are not limited to, drill press, band saw, grinder, soldering tools, measurement tools, power tools, etc.

The laboratory safety agreement form is attached at the end of this manual. Upon agreement and with approval of the research advisor, students have to sign the sheet to access the JHU CE laboratories. Those who have submitted the sheet to the academic program coordinator (Lisa Wetzelberger) shall request keycard access to the laboratories from the department office.

2. The JHU CE Laboratories

The Department of Civil Engineering at the Johns Hopkins University houses the Undergraduate Teaching Lab, Structures Lab, Thin-Walled Structures Lab, and the Soil Mechanics Lab. Contact information for each laboratory is listed in Table 1. For questions about each lab such as research opportunities, contact the lab director.

Table 1. Contact Information for the JHU CE laboratories

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Room</th>
<th>Director</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor Technology and Infrastructure Risk Mitigation Lab</td>
<td>Latrobe 13</td>
<td>Prof. Judith Mitrani-Reiser</td>
<td>(410) 516-7763</td>
<td><a href="mailto:jmitrani@jhu.edu">jmitrani@jhu.edu</a></td>
</tr>
<tr>
<td>Teaching Lab</td>
<td>Latrobe 14</td>
<td>Prof. Ben Schafer</td>
<td>(410) 516-7801</td>
<td><a href="mailto:schafer@jhu.edu">schafer@jhu.edu</a></td>
</tr>
<tr>
<td>Structures Lab</td>
<td>Latrobe 15</td>
<td>Prof. Ben Schafer</td>
<td>(410) 516-7801</td>
<td><a href="mailto:schafer@jhu.edu">schafer@jhu.edu</a></td>
</tr>
<tr>
<td>Thin-Walled Structures Lab</td>
<td>Latrobe 16</td>
<td>Prof. Ben Schafer</td>
<td>(410) 516-7801</td>
<td><a href="mailto:schafer@jhu.edu">schafer@jhu.edu</a></td>
</tr>
<tr>
<td>Soil Mechanics Lab</td>
<td>Latrobe 18</td>
<td>Dr. Lucas de Melo</td>
<td>(443) 695-5330</td>
<td><a href="mailto:ldemelo@jhu.edu">ldemelo@jhu.edu</a></td>
</tr>
</tbody>
</table>

All JHU CE laboratories are located in the north side basement of Latrobe Hall. Figure 1 shows a schematic layout of the JHU CE laboratories in Latrobe Hall.
Laboratory Coordinator: Prof. Lori Graham-Brady  
Office: Latrobe Hall 210, Phone: (410) 516-8167, Email: lori@jhu.edu

Laboratory Manager: Nickolay Logvinovsky  
Office: Latrobe Hall 10, Phone: (410) 302-2435, Email: nickcivil@jhu.edu

The laboratory coordinator oversees the educational and research activities in the JHU CE laboratories to ensure the safety and security. The laboratory coordinator also arranges coordination among research groups to facilitate student activities. For general questions, concerns, and requests about the JHU CE laboratories including regulations and policies, contact the laboratory coordinator.

The laboratory manager assists design of test setups, preparation of specimens, and installation of instrumentation. The laboratory manager also offers training sessions of equipment and tools. If you are not sure about your work in the lab, consult the laboratory manager.

3. Emergency Contacts

Below is a list of emergency phone numbers.

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Emergency</td>
<td>911</td>
</tr>
<tr>
<td>Fire</td>
<td>911</td>
</tr>
<tr>
<td>Ambulance Service</td>
<td>410-516-7777</td>
</tr>
<tr>
<td>Sexual Assault Center</td>
<td>410-828-6390</td>
</tr>
<tr>
<td>Security Office</td>
<td>410-516-7777</td>
</tr>
<tr>
<td>First Aid</td>
<td>410-516-7777</td>
</tr>
<tr>
<td>Student Health and Wellness Center</td>
<td>410-516-8270</td>
</tr>
<tr>
<td>Safety Office</td>
<td>410-516-8798</td>
</tr>
</tbody>
</table>
4. Safety Regulations

Safety is a primary concern in all of the engineering laboratories. While working in the labs, students must be always cautious of any work and surrounding environment. Follow the safety regulations below to prevent injuries and accidents.

Attire and Protections

- All people in CE labs must have eye protection, covered shoes, and hair tied back. Loose clothes, sandals and heels are not allowed. These conditions cover all people in the lab: students, faculty, staff and visitors. Anyone not following these regulations will be immediately asked to leave the lab.
  
  Note: Some labs have regular office space inside the labs. These spaces will be formally designated with caution tape on the floor. Normal office attire applies in these spaces.

- **Hand Protection:** Students must wear safety gloves during the work that may have any hazard to hands (e.g., lifting heavy metal pieces). Pairs of gloves can be found in the cabinet at each lab.

- **Head Protection:** While working on assembly of test setups and perform dynamic or destructive tests, students have to wear a hard hat to protect their head. Hard hats can be found in the cabinet at each lab.

- **Mouth Protection:** During the work that have potential risks for air quality such as soldering and painting, wear protection masks. Masks can be found in the cabinet at each lab.

- **Ear Protection:** While using noisy power tools such as band saws, use ear plugs or protection to prevent ear injuries. Ear plugs can be found in the cabinet at each lab.

Other Regulations

- **Common Sense:** Use common sense to ensure safety of the work in the labs. If you are not sure about the safety of your work, never attempt. Ask the laboratory manager.

- **Awareness:** If you observe a potentially dangerous act in the labs, report it to the laboratory coordinator or the laboratory manager. It is your responsibility to reduce risks of injuries and accidents in the JHU CE laboratories.

- **Electric Power:** Several types of power supply including high voltage and AC/DC power supplies are used for equipment and tools in the JHU CE labs. Read specifications of the devices prior to connecting power supplies. Use only the specified power supply.

- **Hydraulic Power:** Hydraulic systems used for actuators and loading frames are under high pressure. Before starting hydraulic pumps, always check that valves are closed and connections are clean. If leakage is found, stop the pump immediately and notify the laboratory manager.

- **Ventilation:** Do not turn off ventilation fans to keep the air in the labs clean. If extra ventilation is needed (e.g., in case of indoor painting), consult the laboratory manager and arrange the schedule to perform the required work.

- **Lifting and Moving Heavy Items:** When lifting and moving of heavy items are required, students must consult the research advisor and the laboratory manager. Do not attempt without presence of at least one of them. Use protection items and appropriate items such as overhead crane with an assistance of advisor or the laboratory manager.
5. Laboratory Policies

To maintain the efficiency of the labs and facilitate coordination of educational and research activities, the JHU CE labs enforce policy described below.

General Policy

- **No Food and Drink:** Students are not allowed to eat and drink in the labs.
- **Buddy System:** Whenever possible follow the buddy system and work in teams of 2 or more in the lab. However, all people working in the labs should make sure at least one other person knows they are in the lab at that time. A video system accessible by all in the department will be put in place to facilitate an ‘online’ buddy system for situations when it is not practical to have two people working at the same time.
- **Security:** Laboratory doors must be closed at all times for security reasons. If you are the last person to leave the lab, you must check if all of the doors are locked.
- **Housekeeping:** Keep the labs always clean. Students must clean up equipment, tools and used space, especially drill press and band saw. Never leave the mess you made during your work.
- **Tools:** Students are allowed to use power and hand tools owned by the department. Here are the locations for common tools.
  - **Power Tools (electric screw drivers, etc.):** Latrobe 10, ask the laboratory manager
  - **Hand Tools (wrenches, etc.):** Latrobe 16
  - **Protection Items (safety glasses, etc.):** Latrobe 10
  - **Spare Materials:** Latrobe 11, ask the laboratory manager
  
  Students must return tools to the original place by the end of the day. It is your responsibility to maintain the departmental tools. To check out equipment and tools, see the below.
- **Disposal:** Hazardous/industrial waste has to be properly handled base on the university rule. Do not throw screws, metal pieces, rags with hydraulic oil, etc., into trash bins. Consult the laboratory manager if you have hazardous waste.
- **Computers:** Personal computers in the labs are maintained by the director of each lab. If you need to access computers, consult the director. Students must not use any computers without permission from the laboratory director.
- **Storage:** The JHU CE laboratories do not offer storage space for students. If one needs personal storage space, ask the director of the lab. Note that the laboratory manager is not in charge of student’s properties in the labs.
- **Communication:** It is essential to communicate with the laboratory manager and the other lab users to make the work performed smoothly. Use professional communication skills.
- **Working in Evening and Weekend:** In some occasions (close to the deadline of research papers, etc.), students may need to work in evening or weekend. Students must notify the research advisor of type and hours of work in the lab as well as their contact information. Students should not perform any work that has potential hazards to cause injury and accidents.
- **Visitors:** Students are not allowed to bring visitors to the JHU CE labs unless the directors of the lab give permission. It is the student’s responsibility to ensure the safety of visitors.
Equipment Checkout

It is not recommended to check out equipment and tools (students are expected to use tools in the lab and return them by the end of the day). However, if it is necessary to do so, ask the laboratory manager. Students must notify the laboratory manager of duration of checkout and location of use, and get permission. Note that the laboratory manager has an authority to take checked tools at any time.

Do not take out any equipment and tools out of the JHU CE laboratory area.

6. Annual Cleaning of Laboratories

The major cleaning of the labs occurs annually during the summer in July to coincide with the WSE’s (Whiting School of Engineering) annual office and laboratory cleanup. At this time, WSE places dumpsters near buildings to be used for all trash items and provides the labor to remove and dump the trash. The CE Laboratory Manager coordinates this activity and is the liaison with WSE’s Facilities Manager.

Steps to Prepare for Lab Cleaning:

1. During the spring semester, the PI of each lab will identify non-hazardous items to be removed from their lab and trashed by providing a list to the CE Laboratory Manager.
2. The CE Laboratory Manager will schedule a meeting with each PI to do a walk-thru to identify the items to be trashed.
3. Labels marked as Trash will be adhered to the items to be removed and placed in the dumpster.
4. The CE Laboratory Manager will contact the WSE facilities Manager to coordinate the removal of the items for the dumpster.

Note: For ad hoc cleaning during the year, contact the CE Laboratory Manager to coordinate any type of lab cleanup that is needed when projects start and end. The steps outlined above will also be followed for this.

7. Basic Laboratory Training

The Department of Civil Engineering at JHU offers a basic training session to students who will perform experimental research. The training session is intended to provide safety instructions of equipment and tools that students are allowed to use in the JHU CE laboratories. The session needs to be requested by the research advisor to the laboratory manager with the types of equipment. The laboratory manager will arrange the schedule and offer the session. The items that can be covered include:

- Electric Screw Driver
- Drill press
- Magnetic Drill Press
- Band Saw
- Soldering Gun
- Grinder
- Measurement Tools (e.g., Caliper, Dial Gages)
For special equipment such as hydraulic actuators and welding equipment, training and permission will be handled case by case based on the student experience and type of work. Consult the research advisor and the laboratory manager.
APPENDIX A: LAB SAFETY AGREEMENT FORM

Department of Civil Engineering at the Johns Hopkins University

I have read, understood, and will comply with regulations and policies outlined in the JHU Civil Engineering Laboratory Manual. I will take full responsibility for any action while working in the JHU CE Laboratories.

STUDENT:

Last Name (Print)                                    First Name (Print)

Signature                                      Date

ADVISOR:

Last Name (Print)                                    First Name (Print)

Signature                                      Date

LAB MANAGER:

Last Name (Print)                                    First Name (Print)

Signature                                      Date