

# FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



## Visit to Lehigh University: April 28, 2017

This report summarizes the visit of **John Hooper** from Magnusson Klemencic and Associates that took place at the Lehigh University on April 28, 2017

### ITINERARY OR AGENDA

Provide the itinerary of the visit. For example:

TIME:	ACTIVITY:
7:30 AM – 8:30 AM	Student Chapter President meets goes on a run with John Hooper
10:00 AM – 11:00 AM	John meets with the student chapter leadership from this year and faculty advisor
11:00 AM – 12:00 PM	Tour of ATLSS (the Lehigh Structural Engineering Lab)
12:00 PM – 1:00 PM	Lunch
1:00 PM – 1:30 PM	Tour of Fritz (another structural engineering lab on campus)
2:00 PM – 3:30 PM	Seminar given by John
4:00 PM – 5:00 PM	Informal happy hour with a few students

### STUDENT CHAPTER VISIT PLANNING COMMITTEE

**LEAD ORGANIZER(S):** Amy Kordosky, president, ank615@lehigh.edu

- Xin Chu, vice president, xic411@lehigh.edu
- Liyang Ma, secretary, lim215@lehigh.edu
- Amirali Shojaeiandivkolaei, treasurer, ses415@lehigh.edu
- Sam Hau, public relations, sch216@lehigh.edu
- Dr. James Ricles, advisor, jmr5@lehigh.edu

### VISITING PROFESSIONAL LECTURE OVERVIEW

The lecture attracted different participants with different background and education ranging from undergraduate students to full professors. The guest speaker, EERI Student Chapter officers, and the participants were extremely excited about the event and the lecture. Discussions and questions on the topic continued for about 20 minutes after the talk was over.

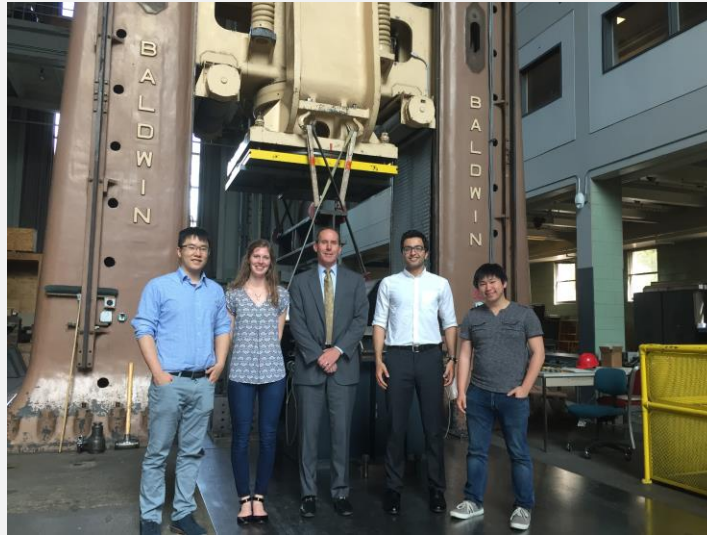


Figure 1: Photo with Liyang, Amy, John, Amirali, and Sam (left-to-right) in Fritz lab

## Lecture Abstract

Performance-Based Seismic Design (PBSD) has been used for decades for the seismic retrofit of existing buildings and the design of new structures. Today's PBSD approaches focus on providing a design that typically targets one of the following performance levels for a one of several ground shaking hazard levels:

- Operational
- Immediate Occupancy
- Life Safety
- Collapse Prevention

The building code performance objective for new, ordinary (Risk Category II) buildings is to provide Life Safety for Design Earthquake (DE) ground shaking and Collapse Prevention for Maximum Considered Earthquake (MCE) ground shaking. PBSD for new buildings is typically targets performance equivalent to a code-prescriptive design. Two examples will be presented: (1) A high-rise concrete structure that exceeds the code height limits and (2) a steel building that used nonlinear response history analysis to fine-tune the seismic design and reduce construction costs.

Both examples evaluated whether the building meets in the intended performance objective of a low likelihood of collapse given MCE ground shaking. Moving beyond solely using collapse as the metric for whether a design is acceptable is the vision for the future. A FEMA-sponsored, Applied Technology Council-managed research effort has been underway for over 15 years developing the methodology. The results of this effort have been published in FEMA P-58 Seismic Performance Assessment of Buildings. The final portion of the presentation will focus on this new approach, which will allow engineers to estimate the following loss information for their buildings:

- Repair costs
- Repair time
- Unsafe placards
- Casualties

## Professional Bio

John Hooper is a Senior Principal and the Director of Earthquake Engineering at Magnusson Klemencic Associates, a consulting structural and civil engineering firm in Seattle, Washington. He received his Bachelor of Civil Engineering from Seattle University and a Master of Science from the University of California at Berkeley.

John has over 30 years of engineering experience in the fields of renovation, seismic engineering, earthquake engineering, and structural analysis. He is Chair of the American Society of Civil Engineer (ASCE 7's) Seismic Subcommittee and is a member of the Main Committee, and a member of the Building Seismic Safety Council (BSSC) NEHRP Provisions Update Committee.

John has been involved in the majority of MKA's Performance-Based Seismic high-rise designs over the past 20 years and has been part of the Project Technical Committee responsible for developing the FEMA P-58 Seismic Performance Assessment of Buildings Methodology.

## SUPPLEMENTAL ACTIVITIES

### Meet with EERI officers and faculty advisor

John met with Amy, Liyang, Dr. Ricles, and Dr. Bocchini in the ATLSS Engineering Research Center on the morning of April 28, 2017. John heard about current research projects happening at Lehigh and shared insight from his industry perspective.

### ATLSS Lab Tour

A tour of the ATLSS Center was given to John Hooper by Peter Bryan. Peter is an employee of the university and has ample experience and involvement in the research and testing done in ATLSS. Peter discussed the various uses and information about the experimental facilities. Ongoing research projects were shown.

### Fritz Lab Tour

A brief tour of the Fritz laboratory was given primarily to see the 5 million pound compression machine. The officers accompanied John on this tour and were able to take a picture together in front of the machine, shown previously in Figure 1.

## RESULTS, FEEDBACK AND LESSONS LEARNED

Based on the feedback received from the participants of the event, the program with John was very rewarding for him, the EERI officers, the faculty he met with, and the students who were able to attend the seminar. He was very helpful in offering career advice to the officers and providing sought after industry connection. In moving forward, the Lehigh University EERI chapter would like to host more seminars from professionals that cover multi-hazard mitigation strategies, community resilience, and the transition to performance based design standards. Other goals of the chapter include:

- Increasing undergraduate presence in the club and competing in the seismic tower design competition next year, for the second time at Lehigh.
- Organizing a group to go to New York City for a day or two to meet with some of the top structural engineering firms, tour construction sites, and network with students at other universities.
- Increase funding of the club by gaining industry sponsorship or participating in club fundraising activities to allow more flexibility in club activities.

## ACKNOWLEDGEMENTS

The Lehigh University EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of John Hooper through their Friedman Family Visiting Professional Program endowment.

## LIST OF ATTACHMENTS

- Item 1, flier for event
- Item 2, pictures from the seminar



## John Hooper, P.E., S.E.

Senior Principal/Director of Earthquake Engineering at  
*Magnusson Klemencic Associates (MKA)*  
Seattle, WA

Friday, April 28 at 2:00 p.m.  
Neville Hall 002  
Lehigh University, Bethlehem



### Performance-Based Seismic Design: Today's Approaches and a Vision for the Future

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## EERI's Mission

EERI's mission is to reduce earthquake risk by:

1. Advancing the science and practice of earthquake engineering
2. Improving understanding of the impact of earthquakes
3. Advocating comprehensive and realistic measures for reducing earthquake effects



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