FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

Visit to University of Wisconsin-Madison: May 1st, 2018

This report summarizes the visit of John D. Hooper from Magnusson Klemencic Associates to the University of Wisconsin-Madison on May 1st, 2018.

AGENDA

TIME:	ACTIVITY:
9:00 AM – 10:30 AM	Welcoming Breakfast and Meeting with EERI Student Chapter Officers
10:30 AM – 11:00 AM	Meeting with Prof. Gustavo Parra
11:00 AM – 12:30 PM	Guest Lecture by John D. Hooper
12:30 PM – 1:30 PM	Lunch
2:00 PM – 2:30 PM	Meeting with Prof. Brock Hedegaard
3:00 PM – 3:30 PM	Meeting with Prof. Jose Pincheira
3:45 PM – 5:45 PM	UW-Madison Campus Tour
6:00 PM – 7:30 PM	Dinner with Chapter President and Vice-President

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S): {Ángel L. Pérez Irizarry, chapter president, angel.perez@wisc.edu}

- {Gustavo J. Parra-Montesinos, chapter faculty advisor, gustavo.parra@wisc.edu}
- {Mohamed Al-Tameemi, chapter vice-president, altameemi@wisc.edu}
- {Han Xiao, chapter secretary, hxiao29@wisc.edu}
- {Vinay Damodaran, chapter role, vdamodaran@wisc.edu}

VISITING PROFESSIONAL LECTURE OVERVIEW

A brief introduction to the goals and programs within EERI was presented, followed by a presentation on current practice and new trends in performance-based seismic design (PBSD). The lecture included a discussion on current modeling and analysis techniques used in PBSD, an overview of fragility curves and estimation of repair cost, downtime and injuries after a major event, and how this information is used within the framework of PBSD to assess the seismic performance of buildings. Furthermore, an example of how PBSD is used to optimize the design of structures was discussed.

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: 1) Operational, 2) Immediate Occupancy, 3) Life Safety and 4) 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. An example will be presented: using nonlinear response history analysis to fine-tune the seismic design and reduce construction costs.

The example 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 loss information for their buildings including repair costs, repair time, unsafe placards, embodied energy and carbon, and 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 ACTIVITES

Welcoming Breakfast and Meeting with Officers

The welcoming breakfast started at 9 a.m. The four chapter officers attended the breakfast meeting with Mr. Hooper. After a quick introduction of the leadership of our student chapter, bagels and coffee were shared with the visiting professional over an informal conversation. Some main points of the discussion with Mr. Hooper were: 1) Job opportunities for structural engineers with Ph.D degrees outside academia; 2) Sample designs, engineering challenges and design techniques, addressed by or used by Mr. Hooper and colleagues at the MKA design office; and 3) a brief discussion about each student research project and interests.

UW-Madison Campus Tour

The campus/city tour was guided by the chapter president. The walking tour started at the hotel where Mr. Hooper was staying and consisted of walking up State Street (centric street where most of the city life takes place), getting to see some of the campus favorite spots. The first stop was at the Wisconsin State Capitol, where we walked through the corridors and chambers of the capitol and went up to the rooftop observation deck to

get a view of the city and campus. After this we walked down to Memorial Library (one of many campus libraries) and continued towards Memorial Union, center of activities and student life. Lastly, we decided to enjoy the beautiful view of Lake Mendota by sitting down at the Union Terrace (iconic and arguably the badgers favorite spot on campus). The student chapter president and Mr. Hooper stayed at the Terrace enjoying conversation until it was time join the chapter vice president for dinner.

Dinner with Student Chapter's President and Vice-President

After the UW-Madison campus tour was completed, the president of the EERI student chapter, Ángel L. Pérez Irizarry, and the vice president, Mohamed Altameemi, took Mr. Hooper to The Great Dane, a local restaurant in Wisconsin, for dinner. We enjoyed a friendly discussion about the student life in Madison, and the different activities that the students can participate in during the school year. Some advices were given by Mr. Hooper to the two officers present about how to overcome the challenges a PhD student may face during his or her studies. Furthermore, Mr. Hooper re-instated his support and EERI's support to our chapter, gave us recommendations on how to increase awareness of the challenges and needs within earthquake engineering, and encouraged us to stay in contact. After dinner, the two officers dropped off Mr. Hooper at his hotel.

RESULTS, FEEDBACK AND LESSONS LEARNED

Our student chapter did not face any noteworthy challenges during the professional's visit. The biggest challenge for us as a chapter is recruiting students interested in earthquake engineering in a region of the U.S.A. that is not threatened by earthquakes regularly. Some of the topics that are of interest and would be good for future visits are:

- Repair and retrofit of reinforced concrete and vulnerable structures.
- Lessons learned from recent earthquakes and engineer's role in earthquake reconnaissance work.
- Efficient use of viscous dampers and base isolation techniques.
- Mitigation of the effects of soil liquefaction on our built environment.

ACKNOWLEDGEMENTS

The University of Wisconsin-Madison EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the visit of John D. Hooper through their Friedman Family Visiting Professional Program endowment.

APPENDIX 1 – LECTURE FLYER

EARTHQUAKE ENGINEERING RESEARCH INSTITUTE

UNIVERSITY OF WISCONSIN MADISON STUDENT CHAPTER

FRIEDMAN FAMILY VISITING PROFESSIONALS PROGRAM
INVITED LECTURE

John Hooper, P.E, S.E.

Senior Principal/Director of Earthquake Engineering
Magnusson Klemencic Associates

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

"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: 1) Operational, 2) Immediate Occupancy, 3) Life Safety and 4) Collapse Prevention.

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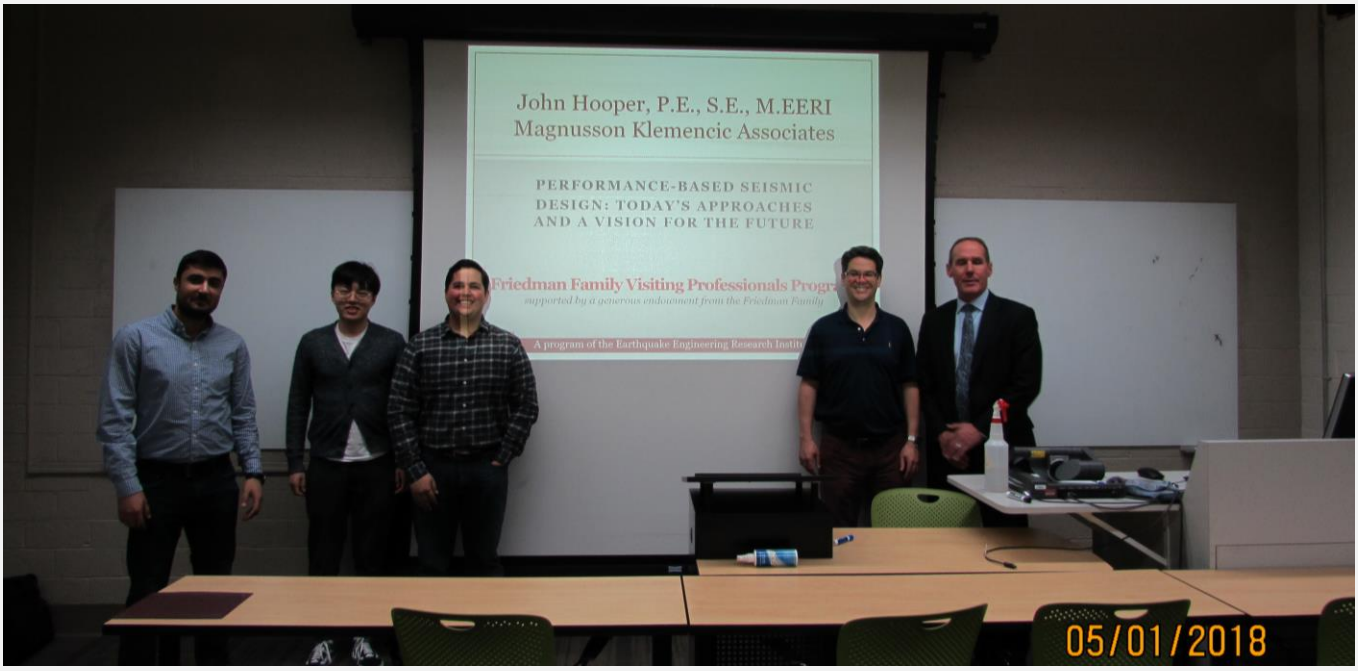
TUESDAY, MAY 1, 2018 @ 11:00 AM

3418 Engineering Hall

APPENDIX 2 – EVENT PHOTOS


LFE Learning From Earthquakes Program
05/01/2018


John Hooper, P.E., S.E., M.EERI
Magnusson Klemencic Associates
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supported by a generous endowment from the Friedman Family
A program of the Earthquake Engineering Research Institu
05/01/2018