

FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



Visit to The University of Texas at Austin: February 21, 2024

This report summarizes the visit of **John Hooper** from Magnusson Klemencic Associates that took place at the University of Texas at Austin on February 21, 2024.

ITINERARY OR AGENDA

TIME:	ACTIVITY:
10:45 AM – 11:15 AM	Meeting with Graduate Students
11:30 AM – 11:50 PM	Meeting with Dr. Yunlan Zhang
12:00 PM – 1:30 PM	FFVP Lecture by John Hooper
1:30 PM – 2:00 PM	Meeting with Dr. Ellen Rathje (faculty advisor of EERI Student Chapter)
2:00 PM – 3:00 PM	Meeting with undergraduate members participating in Seismic Design Competition

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Bhushan Raj Selvaraj, President, bhushan@utexas.edu
- Michelle Sabers, Vice-President, msabers@utexas.edu
- Katrina Fierro, Undergraduate Liaison, SDC Captain, katrina.fierro@utexas.edu
- Bartik Pandel, Treasurer, bartikpandel@utexas.edu
- Dr. Ellen Rathje, Professor and Faculty Advisor of EERI Student Chapter, e.rathje@mail.utexas.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

John Hooper delivered a distinguished lecture on **Performance-Based Seismic Design: Today's Approaches and a Vision for the Future**. The lecture was held in-person in the Civil, Architectural and Environmental Engineering lecture hall. The lecture was attended by around 50 students, primarily undergraduate and graduate students from Structural Engineering and Geotechnical engineering specializations, and 3 faculty. Students and faculty appreciated the lecture and learned a new approach towards seismic design using FEMA P-58.

Lecture Abstract

Today's Performance-Based Seismic Design (PBSD) approaches focus on providing Life Safety for Design Earthquake (DE) ground shaking and Collapse Prevention for Maximum Considered Earthquake (MCE) ground shaking for the design of new buildings. An overview of this process will be presented.

A FEMA-sponsored, Applied Technology Council-managed research effort has been underway for over 20 years developing a new approach to PBSD. The results of this effort have been published in FEMA P- 58 Seismic Performance Assessment of Buildings. This portion of the presentation will focus on this new approach, which allows engineers to estimate the following loss information for their buildings:

- Repair costs
- Repair time

- Unsafe placards
- Embodied energy and carbon
- Casualties

Finally, the FEMA P-58 methodology has been extended to evaluate the time frame to achieve Functional Recovery, a new performance objective that is currently under development, which will also be discussed.



Professional Bio

John Hooper is a Senior Principal and the Director of Earthquake Engineering at Magnusson Klemencic Associates, a 150-person consulting structural and civil engineering firm in Seattle, Washington. John has over 40 years of engineering experience in the fields of seismic renovation, seismic design of new buildings (including the use of performance-based seismic design), structural analysis and standards and code development. He is active on numerous research, standards and code committees, including serving as past chair of the American Society of Civil Engineers (ASCE 7's) Seismic Subcommittee, member of the ASCE 7's Main Committee, and chair of the Building Seismic Safety Council's (BSSC's) NEHRP Provision Update Committee. John's project experience includes major healthcare facilities, high-rise buildings, emergency operations centers, and structures with unique architecture.

SUPPLEMENTAL ACTIVITIES

Individual Meetings with Faculty

John Hooper met Dr. Yunlan Zhang and Dr. Ellen Rathje in the Civil, Architectural and Environmental Engineering department.

Meeting with Graduate Students

Graduate students Tanakorn Ngamjarungjit, Bartik Pandel and Bhushan Raj Selvaraj met Hooper. They had an engaging discussion about their research and John Hooper provided valuable feedback and appreciated their work. Hooper also shared his experience in the industry recounting some of the challenging projects he worked on.

Meeting with Seismic Design Competition Team

John Hooper met members of the Seismic Design Competition team in the afternoon. Katrina Fierro, captain of SDC team from UT Austin presented the problem statement and their team's proposal for the 2024 Seismic Design Competition. John Hooper provided valuable feedback on the team's proposal and reviewed their preliminary SAP2000 model. Hooper advised performing modal and static load analysis to design the building model efficiently for torsion. He also talked about choosing material and construction quality. The team found the meeting very helpful and appreciated Hooper's advice.



RESULTS, FEEDBACK AND LESSONS LEARNED

We overcame last year's challenge by planning the lecture between class times and limiting the lecture time. This was made possible by coordinating with the professors and students. One of the professors offered to provide extra credits for students attending the lecture that was also related to their course. John Hooper engaged the audience by asking questions and relating to the concepts learnt in their classes. The audience comprised majorly undergraduate civil engineering students. Many graduate students from the areas of Structural Engineering and Geotechnical Engineering were also present. The students found Hooper's lecture easy to understand despite having different levels of knowledge about earthquake engineering and seismic design of structures.

One of the challenges this year was having two venues for the lecture. Most Structural Engineering graduate students were at the Ferguson Structural Engineering laboratory that is away from the main campus where the lecture happened. The organizing team arranged a virtual session at the lab. There were some technical difficulties associated with arranging both sessions. In the future, this would be taken into account at the planning stage.

Some of the topics or disciplines the Student Chapter would like to cover in future visits and related goals are given below:

- Post-Earthquake Safety Evaluations and Community Response
- Historic Structures and what is done for preservation.
- Plan to host more lectures each semester at varying times to accommodate a wider range of students

The feedback from students and faculty was positive and the student chapter is very thankful to host John Hooper.

ACKNOWLEDGEMENTS

The University of Texas at Austin 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. The student chapter also thanks Dr. Robert Gilbert, Department Chair & Professor of Civil, Environmental Engineering Department, UT Austin for funding the lunch for the audiences in the lecture.

LIST OF ATTACHMENTS

Included at the end of this report are various attachments to supplement the information included above. A list of the attachments is included below:

- Item 1, flier for Friedman Family Visiting Professionals program lecture
- Item 2, flier for social media outreach



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

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

**Senior Principal/Director of Earthquake Engineering
Magnusson Klemencic Associates**

**Wednesday, February 21 – 12:00 to 1:00 PM – ECJ 1.324
Refreshments will be provided**

Today's Performance-Based Seismic Design (PBSD) approaches focus on providing Life Safety for Design Earthquake (DE) ground shaking and Collapse Prevention for Maximum Considered Earthquake (MCE) ground shaking for the design of new buildings. An overview of this process will be presented.

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PERFORMANCE-BASED SEISMIC DESIGN

Today's Approaches and a Vision for the
Future

February 21 | 12 - 1 PM | ECJ 1.324



JOHN HOOPER, P.E., S.E.

Senior Principal, Director of Earthquake Engineering
at Magnusson Klemencic Associates

SPEAKER



A Distinguished Lecture organized by the EERI
UT Austin Student Chapter

Refreshments will be provided