

FRIEDMAN FAMILY VISITING PROFESSIONALS PROGRAM



Visit to University of British Columbia: January 28, 2021

This report summarizes the visit of **John Hooper** from Magnusson Klemencic Associates that took place at the University of British Columbia on January 28, 2021.

ITINERARY OR AGENDA

Provide the itinerary of the visit. For example:

TIME:	ACTIVITY:
12:00 PM – 1:30 PM	Informal meeting with graduate students of Dr. Carlos Molina Hutt’s research group where they present, share and discuss their research projects to get insight and feedback from John Hooper.
2:00 PM – 3:00 PM	Informal question and answer session with department graduate students about structural design in practice and research topics that can be beneficial to the industry.
3:30 PM – 5:00 PM	John Hooper’s lecture titled, “Performance-Based Seismic Design: Today’s Approaches and a Vision for the Future.”

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

Preetish Kakoty, President, EERI UBC Student Chapter
Pouria Kourehpaz, Vice-President, EERI UBC Student Chapter
Professor Carlos Molina Hutt, Faculty Advisor, EERI UBC Student Chapter

VISITING PROFESSIONAL LECTURE OVERVIEW

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. An example will be presented: used 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 following loss information for their buildings:

Repair costs
Repair time
Unsafe placards
Embodied energy and carbon
Casualties.

Professional Bio

John Hooper is senior principal and the director of earthquake engineering at Magnusson Klemencic Associates (MKA) in Seattle, WA. Mr. Hooper is one of the preeminent structural earthquake engineers in the United States. He has led the seismic analysis and design of numerous large, iconic structures located around the world and he has contributed to the development of seismic design code.

SUPPLEMENTAL ACTIVITIES

Informal meeting with graduate students of Dr. Carlos Molina Hutt's research group

Seven graduate students of Dr. Carlos Molina Hutt's research group (i.e., the Engineering for Seismic Resilience Lab at UBC) gave 8-10 minute presentations about their current research to Mr. Hooper. The sessions had two-way interaction where Mr. Hooper asked questions to the presenters about their research, and each presenter had prepared questions to ask Mr. Hooper about the best way to proceed in a specific topic in their research. Mr. Hooper clarified the student's queries and also provided information of organizations/individuals the researchers could contact for more detailed information.

Informal Q&A session with department graduate students about structural design in practice

Over 50 civil engineering graduate students joined us in this informal online session to ask general questions to Mr. Hooper about structural design in practice. Questions covered topics such as transitioning from a student-life to industry/academia, challenging projects in Mr. Hooper's career, methods to increase collaboration between the industry and academia, and possible research topics that might be of interest to the industry.

RESULTS, FEEDBACK AND LESSONS LEARNED

Due to the ongoing coronavirus pandemic, the nature of Mr. Hooper's visit was modified from an in-person campus visit in March 2020 to an online visit in January 2021. Despite of the challenges involved in planning an online event, Mr. Hooper's visit was greatly appreciated, and all events were interactive. Organizing informal sessions helped students to freely ask their questions to Mr. Hooper.

Topics to cover in future visits:

The University of British Columbia EERI student chapter recently organized an event to showcase the importance of collaboration between difference disciplines (e.g., social science, geoscience, structural engineering) in the earthquake resilience sector. Our goal is to focus on this topic and increase participation in our student chapter from disciplines other than structural engineering. We would love to have visits from professionals currently working in social science, risk modeling, planning, policy-making, or emergency management.

Brief description of challenges during the process, general reception of the program and Visiting Professional. Also, a description of other topics or disciplines the Student Chapter would like to cover in future visits, and related goals.

ACKNOWLEDGEMENTS

The University of British Columbia EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring John Hooper's visit.

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, i.e. flier for event
- Item 2, professional slide show or other handouts
- Item 3, other items