

## Visit to University of Massachusetts, Amherst: April 13, 2022

This report summarizes the visit of **John D. Hooper** from MKA that took place at the University of Massachusetts, Amherst on April 13th, 2022.

### ITINERARY OR AGENDA

TIME:	ACTIVITY:
9:00 AM – 9:45 AM	Meet and greet with department heads, faculty, EERI graduate chapter, and graduate students
10:00 AM – 11:30 AM	Brack Structural Labs Tour
12:20 PM – 1:45 PM	CEE 542: Advanced steel design - Guest lecture with John D. Hooper
2:30 PM – 3:30 PM	Guest lecture by Visiting Professional
3:45 PM – 4:15 PM	Seismic design team meeting and presentation
6:00 PM – 9:00 PM	Dinner with students

### STUDENT CHAPTER VISIT PLANNING COMMITTEE

#### LEAD ORGANIZER(S):

- Divyansh R. Kapoor, President, [dkapoor@umass.edu](mailto:dkapoor@umass.edu)
- Hernan Castaneda, Vice-President, [hcastaneda@umass.edu](mailto:hcastaneda@umass.edu)
- Thomas Vitalis, Treasurer/outreach chair, [tvitalis@umass.edu](mailto:tvitalis@umass.edu)
- Prof. Scott A. Civjan, Faculty Advisor, [civjan@umass.edu](mailto:civjan@umass.edu)

### VISITING PROFESSIONAL LECTURE OVERVIEW

Mr. Hooper's FFVP lecture was attended by 45+ undergraduate students and SEM graduate students and faculty members. The lecture started off with an introduction to EERI, EERI's mission, and various reasons why students should get and stay involved both during and after school. This was followed up with a detailed look at performance based design and covered topics such as what is PBD, the reasons for adopting the design approach, the PBD process, existing guidelines, a case study, and future trends.

The lecture was rich in information and was well received by the attendees with lots of discussion both during the lecture as well as the Q&A session. Below is a picture of Mr. Hooper presenting his lecture in the Guinness Student Center presentation room -



#### Lecture Topic

##### ***Performance-Based Design Current Approaches & Future Trends***

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, and casualties.

## Professional Bio

John D. 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 40 years of engineering experience in renovation, earthquake engineering, and structural analysis and has been involved in the majority of MKA's Performance-Based Seismic high-rise designs over the past 20 years.

He is Chair of the American Society of Civil Engineer (ASCE 7's) Seismic Subcommittee, a member of ASCE 7's Main Committee, and Chair of the Building Seismic Safety Council (BSSC) NEHRP Provisions Update Committee. He currently serves on AISC's TC-3, TC-5, and Committee on Specifications.

## SUPPLEMENTAL ACTIVITIES

### Department meet and greet breakfast

We started the day off with coffee and a light breakfast with Mr. Hooper, our department heads, and graduate students and university staff. Mr. Hooper interacted with the attendees in an informal setting where he discussed his career and took general questions from the attendees.

### Brack Structural Labs Tour

After breakfast, we all headed over to Brack Labs, our structural testing facility, where current graduate students gave Mr. Hooper a walking tour of the facility, briefly shared verbal presentations, and discussed and got feedback on their research projects. This was followed by a discussion on career paths suited to graduate students in the industry.

### CEE 542: Advanced steel design - Guest lecture with John D. Hooper

Mr. Hooper delivered a special guest lecture in Prof. Civjan's advanced steel design class where he discussed tips and tricks for rule of thumb design, some case studies, as well as some of the design practices at MKA. This was followed up with a discussion on career paths suited to undergraduate students in the Industry.

## RESULTS, FEEDBACK AND LESSONS LEARNED

The program was well received by students as well as faculty members with large turnouts at each of the events. Based on the lessons learned from previous experiences, we aggressively advertised the events and

involved student led groups outside the EERI graduate chapter (UMass SDC and UMass ASCE) to promote awareness about the event and get students excited.

In the future, we would like to build up on this trend and continue hosting events that both our students and visiting professionals enjoy. Additionally, we would also like to involve graduate students and faculty from our geotechnical and geology department to diversify the crowd in attendance as this visit's event's were almost entirely comprised of undergraduate students and structural engineering graduate students and faculty. Some topics we would like to cover in future visits are more case studies on performance-based design.

## ACKNOWLEDGEMENTS

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

The chapter also gratefully acknowledges the support of the UMass Amherst Dept. of Civil and Environmental Engineering for their help with organizing and funding the event. Special thanks also go out to our faculty members for their involvement and for letting us to promote the event in their classes as this helped us reach a large number of undergraduate students.

## LIST OF ATTACHMENTS

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

- Photo from dinner
- Shared fliers for public events

Dinner Photo -



**Fliers on next page**



## 2022 Friedman Family Visiting Professionals Program

### John D. Hooper, P.E., S.E., F.SEI, F. ASCE

Senior Principal/Director of Earthquake Engineering, Magnusson Klemencic Associates, Seattle, WA

Time (EST)	Location	Events
10:00 AM	Robert B. Brack Structural Lab (Tillson Farm Road)	Structural laboratories tour
12:20 PM	Gunness Student Center, Marcus Hall	Steel design guest lecture and careers in the industry
2:30 PM		"Performance-Based Design Current Approaches & Future Trends" FFVP Talk and Q&A Session
3:45 PM		Seismic design team meeting and presentation

**John D. 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.

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## STRUCTURAL LABORATORIES TOUR

(Robert B. Brack Structural Lab at 10:00 am)

Join us for an in-person tour of the structural engineering laboratories at UMass Amherst to learn more about our current testing capabilities and active experimental projects from our current SEM Graduate students.

Following this, John Hooper, our EERI Friedman Family Visiting Professional, will spend some time taking questions and sharing his insights about careers in the industry.

**Current and prospective graduate students are encouraged to attend**



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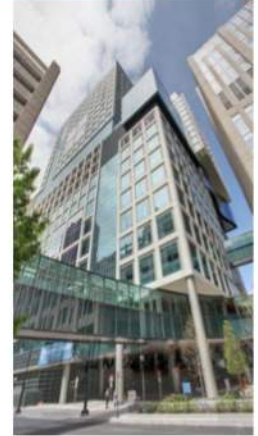
## CEE 542: Advanced Steel Design Guest lecture

(Gunness Student Center at 12:20 pm)

Join the current CEE 542: Advanced Steel Design class and SEM graduate students for a guest lecture by John D. Hooper, this year's Friedman Family Visiting Professional, to learn about some of MKA's latest award-winning projects as well as design practices in the industry.

Participants will have the opportunity to discuss practice trends as well as career paths available in the industry.

**All are encouraged to attend**



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## 2022 Friedman Family Visiting Professionals Program Seminar

### **"Performance-Based Design: Current Approaches & Future Trends"**

(Gunness Student Center at 2:30 pm)

**John D. Hooper, P.E., S.E., F.SEI, F. ASCE**

Senior Principal/Director of Earthquake Engineering, Magnusson Klemencic Associates, Seattle, WA

Please join the UMass EERI chapter and SEM department for this year's Friedman Family Visiting Professionals Seminar with guest Speaker John D. Hooper from MKA, Seattle to learn about the latest approaches to and future of performance-based seismic design (PBSD). PBSD is a design methodology that allows for a realistic and reliable understanding of the risk to life, occupancy, and economic loss which makes it a promising tool that can be used to reduce damage from earthquakes and other similar disasters.

**Pizza and refreshments start at 2:15!**

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## UMass SDC Team Presentation

(Gunness Student Center at 4:00 pm)

Join the UMass Amherst Seismic Design team that annually designs and builds a 6 feet balsa wood scale model of a skyscraper for the EERI Seismic Design Competition. This year the competition is being held in Salt Lake City, Utah and involves the designing of a tower that can withstand seismic loading taken from actual earthquakes! We design and test our structure using SAP 2000 to simulate how the structure will behave in the competition on a shake table. Join us to learn more about the team and ways to get involved.

**Undergraduates are encouraged to attend!**



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