FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

Visit to University of Purdue University: March 25th, 2025

This report summarizes the visit of **John D. Hooper** from Magnusson Klemencic Associates that took place at Purdue University on March 25th, 2025.

ITINERARY OR AGENDA

TUESDAY, MARCH 25th, 2025			
Time	**Event**	**Location**	**Escort/Notes**
10:00- 11:00 am	Discussion Table	HAMP 4144	Students
11 am-11:45 am	Research presentations by EERI Leadership	HAMP 4144	Edwin/Lissette/Oscar presenting
12:00-1:00 pm	**Lunch**	HAMP 4144	Lunch with Students
1:00 – 2:00 pm	Bowen Lab + IISL tour	Bowen	Tour with Edwin
2:00 - 2:30 pm	Meeting with Prof Sharma	Bowen	
2:30 - 2:45 pm	Transportation	HAMP 4144	Mohammed will drive you back to HAMP
2:45 – 3:30 pm	Meeting with Prof Rarmirez	HAMP 4144	
3:30 - 4:15 pm	Interview with CEGSAC	HAMP 4144	Interview with Edwin
4:15 - 4:30 pm	Free time, head to the seminar room	HAMP 4144	Lissette will escort you
4:30 - 5:20 pm	**Seminar**	HAMP 1144	Lissette to introduce
6:30 – 8:00 pm	**Dinner with Students and Faculty**	Thai Essence, West Lafayette	We will meet at the restaurant.

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Lissette Iturburu helped with the organization of the agenda and presented his research. President, liturbur@purdue.edu.
- Edwin Patino helped with the organization of the agenda and the tour to Bowen. He also held an interview that was published as part of our Graduate Student Organization newsletter. He also presented his research. Secretary and Treasurer, patino7@purdue.edu.
- Oscar Forero helped with the organization of the agenda and presented his research. Vice President, oforero@purdue.
- Luis Fernandez gave the tour at Bowen. Student member. fernan93@purdue.edu.
- Prof Sharma was also part of the tour at Bowen.
- Mohammed Gomma helped with the transportation between HAMP and Bowen. Student member.

- Prof Ayhan Irfanoglu as our faculty advisor assisted with organization of events and scheduling of rooms.
- Prof Varma and Prof Ramirez held discussions with the speaker.

VISITING PROFESSIONAL LECTURE OVERVIEW

We were excited to host John Hooper, the EERI Friedman Family Visiting Professional, for a full day of learning and connection. The visit began with a student discussion table, where Mr. Hooper shared his career path, advice for young engineers, and his experience in the industry. This was followed by research presentations from EERI leadership, which provided insight into current work happening across the field.

After a lunch with students and faculty, Mr. Hooper toured our Bowen Lab and the Intelligent Infrastructure Systems Lab, where he saw our research and testing facilities. He then met with Dr. Amit Varma, followed by a meeting with civil engineering faculty to talk about research and teaching with Dr. Julio Ramirez, and Dr. Shirley Dyke.

Later, Mr. Hooper had a conversation with the CE Graduate Student Advisory Council, answering questions about his professional development and trends in earthquake engineering. He then gave a seminar that was open to the department, where he shared his experience from his work at MKA titled ***"Performance-Based Seismic Design: Current Approaches and Future Trends".*** The day ended with dinner with students and faculty. This event gathered +60 students in the room.

Mr. Hooper's visit gave students, researchers, and faculty the chance to learn from someone with deep experience in the field, and we're grateful for the time he spent with us.

Figure. John Hooper delivers his seminar titled "Performance-Based Seismic Design: Current Approaches and Future Trends" to students and faculty during his visit as the EERI Friedman Family Visiting Professional.

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.

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 40 years of engineering experience in the fields of renovation and earthquake engineering and has been involved in the majority of MKA's Performance-Based Seismic designs over the past 25 years. He is Past 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. John has been a Member of EERI for nearly 30 years.

SUPPLEMENTAL ACTIVITES

EERI Chapter Student Presentations

PhD students Lissette Iturburu, Oscar Forero, and Edwin Patino introduced Mr. Hooper to different research projects related to structural engineering that aim to explore AI in structural Engineering, real-time hybrid simulation, and moonquakes.

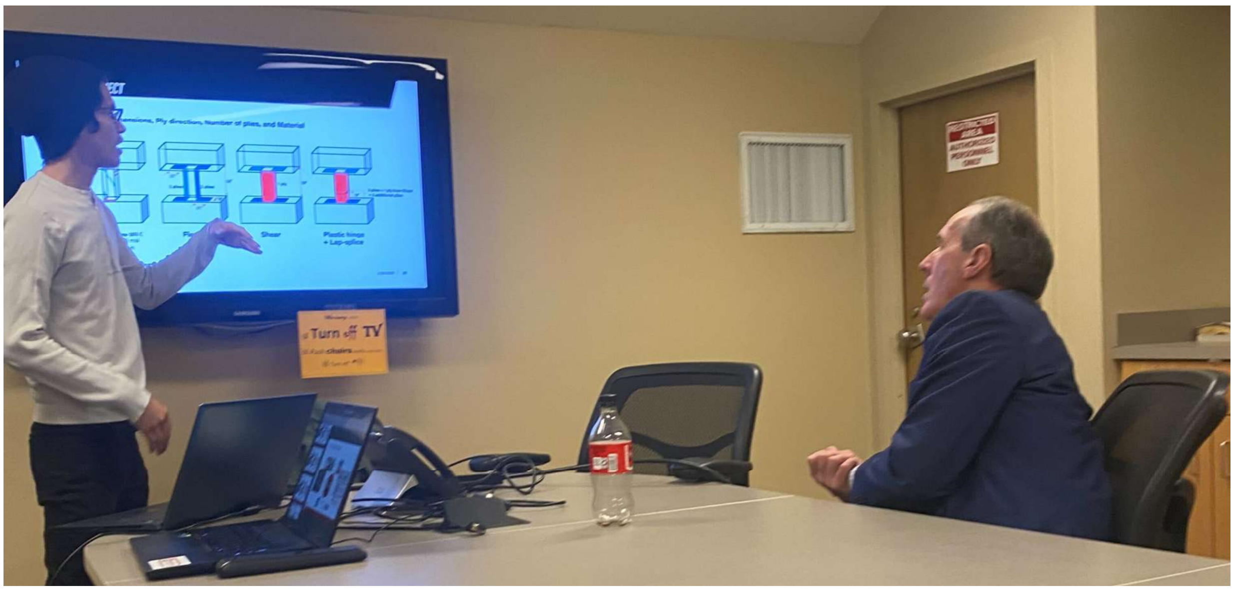

Figure. Edwin Patino presents his research on real-time hybrid simulation to retrofit columns.

Tour to Bowen Lab

Professor Akanshu Sharma from the Structures Department provided a tour of the Bowen Lab and IISL lab facilities, explaining various ongoing research projects in composite materials, anchorages in concrete, and hybrid simulations. The tour was joined by EERI student members Lissette Iturburu, Edwin Patino, and Luis Fernandez.

Figure. Prof Sharma presents his research in the lab for ACI.

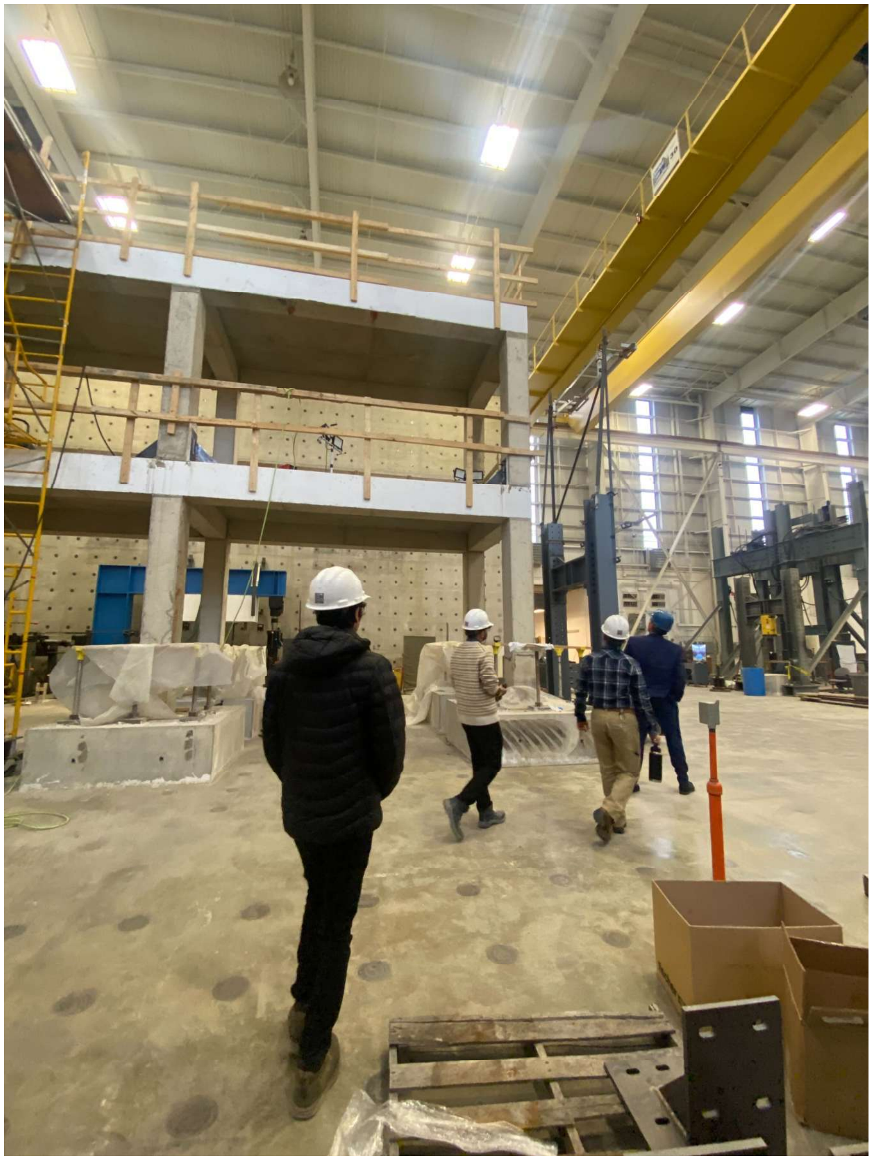

Figure. Prof Sharma presents his research in the lab on retrofitting moment frames.

Interview to Speaker

PhD Student Edwin interviewed about his career in structural engineering, key lessons from four decades in the field, and the skills essential for future engineers. Find the interview in the attachments.

Dinner

Mr Hooper, EERI leadership and professors joined a dinner at the end of a busy day.

Figure. Mr Hooper and EERI members enjoy dinner at the end of the day.

RESULTS, FEEDBACK AND LESSONS LEARNED

- During the visit, EERI member Edwin presented his research on real-time hybrid simulation for retrofits. Mr. Hooper pointed out his vast experience of similar topics, and now his PhD thesis has been potentially enriched.
- The visit of Mr. Hooper raised significant interest among students to join EERI, resulting in 2 new additional undergraduate memberships. Another example of the lecture's impact was its effect on one undergraduate student. The lecture inspired her, and she joined us for dinner as well. She was able to get career advice from Mr Hooper, which is quite a unique experience as a Sophomore at Purdue.
- We believe that this program is of great benefit for the student population. We would like to have a new speaker every semester instead of this being a yearly event.

ACKNOWLEDGEMENTS

The Purdue 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

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 event

PURDUE UNIVERSITY | Lyles School of Civil and Construction Engineering

Purdue Chapter Earthquake Engineering Research Institute

STRUCTURES SEMINAR

Performance-Based Seismic Design: Current Approaches and Future Trends

By

John Hooper, P.E., S.E., M. EERI
Senior Principal/Director of Earthquake Engineering
Magnusson Klemencic Associates
25th March 2025, Tuesday
4:30 PM
HAMP 1144

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.

Biography

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 40 years of engineering experience in the fields of renovation and earthquake engineering and has been involved in the majority of MKA's Performance-Based Seismic designs over the past 25 years. He is Past 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. John has been a Member of EERI for nearly 30 years.

- Item 2, Interview posted as the CEGSAC newsletter

John Hooper, P.E., S.E., M.EERI

In this interview, we speak with John Hooper, Senior Principal and Director of Earthquake Engineering at Magnusson Klemencic Associates, about his career in structural engineering, key lessons from four decades in the field, and the skills essential for future engineers. The conversation followed his visit to our campus, where he was hosted by the EERI Purdue Student Chapter and gave a Structures Seminar on Performance-Based Seismic Design: Current Approaches and Future Trends on March 25, 2025.

Career Inspiration and Early Influences

- **What inspired your interest in structural engineering?**

It started when I felt my first earthquake at five years old, similar to what people experience in Latin America. That was really intriguing. By the time I was in 8th grade, I already knew I wanted to be a structural engineer. I went on to study engineering in college, and by my sophomore year, that early experience with earthquakes came back to me. That's when I knew I wanted to focus on earthquake-based design. So, the inspiration started early and kept showing up throughout different stages of my life.

- **Was there a defining moment in your career that confirmed this was the right path for you?**

Yes, working on my undergrad thesis, on the dynamic behavior of a three-story building, was the first big moment. After graduating, I worked in the industry for two years and realized I really wanted to stay focused on earthquake design. But I also realized I didn't know enough about earthquakes and design. So, I went back to school and got my master's at Berkeley. That decision—to go to Berkeley—was a seminal one. That experience gave me the foundation to really keep going in this direction.

Education and Professional Growth

- **During your two years of professional work, did you feel a need for advanced education?**

Oh yeah, that's what drove me to Berkeley, because I was designing 20-story buildings for earthquakes, and I didn't understand all. I read the codes, and I read other material and other textbooks, and it didn't really give me the information clearly enough that I wanted to have. So, if I'm going to continue on this path, I wanted to learn more about the fundamentals, the foundational information.
So, when I went to Berkeley, I didn't do just structural and seismic engineering—I did ground motions, I did geotechnical engineering as well. So you can understand the entire issues related to earthquakes, yeah.

- **What areas of seismic design do you think are most promising or in need of innovation?**

Boy, there's a lot of opportunities there. New ideas for new systems are always helpful, SpeedCore is a great example. We've been working on that for almost 15 years, and students have been a part of it all along the way. You might just be one piece of a long-term innovative project. But always remember, whatever you're working on, it has to get built.
Think about how it's going to be done in the field. You can have the best idea, but if it can't be built economically, it'll never be used. Don't be afraid to try something totally different, you never know what might hit. Be creative because the next big thing could come from something no one thought of before.

Skills and Qualities for Success

- **What skills are most important for students pursuing a career in engineering?**

Assuming you've built a solid technical foundation, three non-technical skills are key: leadership, communication, and teamwork. You need to lead when needed, communicate clearly with clients and design teams, and work effectively in a group. Engineering is never done alone; it's always a team effort. These skills are essential not just in earthquake engineering, but in all types of engineering and probably in life. The best graduates show they can step up, speak clearly, and collaborate. That's what we look for when hiring, those three traits beyond just technical strength.

- **What qualities do you look for in young engineers when hiring or mentoring?**

Beyond technical skills, I want to see curiosity and the desire to learn and for new hires to ask questions. Don't be afraid to look silly if you don't know something, ask someone! Find the balance between independent learning and knowing when to reach out. I learned more in my first month of work than four years of undergrad, and even more after grad school. Stay curious, keep learning, and have the confidence to ask and grow.

Evolution of Earthquake Engineering

- **With 40 years of experience, how has the field of earthquake engineering evolved since you started?**

Tremendously. At first, I used punch cards for analysis. Now, laptops solve huge problems quickly. Analytical tools have improved a lot. Our seismic design toolkit has expanded with energy dissipation devices, seismic isolation, but we still mostly use three systems: shear walls, brace frames, and moment frames. Technology lets us study problems in more detail and with more confidence. But in terms of fundamental approaches, we haven't evolved as much as we could. I wish we had more innovation beyond reconfigurations of those three basic systems.

- **What impact do you think functional recovery will have on building codes and design in the future?**

We're working on a specification appendix for functional recovery, it's a new performance target. Right now, it's voluntary, but jurisdictions can adopt it. I think in 5–10 years we'll know if it's gained traction. It's a major shift: not just life safety, but how long it takes for a building to function again. That's new. We're defining outcomes clearly for the first time. But will people adopt it? We don't know. Like any new idea, we need to educate and convince, not force.

- **What trends or technologies in earthquake engineering excite you most?**

I'm excited about software that can directly evaluate performance targets, both safety and functional recovery, without relying on current performance-based guidelines. It's being developed for wind now and could be adapted for seismic. You'd input your building details and get a direct yes/no on meeting your targets. It's powerful, but also a black box, it must be benchmarked. It's based on OpenSees and very robust. If we can trust it, you could input anything and know immediately if your design performs as needed. That kind of direct evaluation would be a big leap.

Advice for Students

- **If you could give advice to yourself as a graduate student or early-career engineer, what would it be?**

Maybe if I'd do one thing differently—it's that I worked really hard. I mean, it was a job to me. I was there from 7:00 AM to 11:00 PM every day. I should've had more fun. I'd come home for dinner for an hour, then go back to study. I felt I had this one chance, and I didn't want regrets. But my one regret is I took it too seriously. Don't lose sight of who you are. Work-life balance? I had none then. That matters more than I realized at the time.

- **Are there any professional resources or organizations you recommend for civil engineering students?**

EERI is number one for earthquake engineering, no question. If you want to get into codes and standards, then ASCE. If you're into materials, like concrete or masonry, then get involved with ACI, The Masonry Society, or the American Wood Council. If you care about how we design with these materials, you can really change the world. The key is: if you want to do something bigger than yourself, help society in a larger way, get involved in what you're passionate about. That's how it starts.