

FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



Visit to University of Nevada, Reno: March 1st, 2019

This report summarizes the visit of **David Friedman, SE.**, EERI President, CEO and Board Chair of Forell/Elsesser Engineers Inc. that took place at the University of Nevada, Reno on March 1st, 2019.

ITINERARY OR AGENDA

TIME:	ACTIVITY:
10:00 AM	Student Chapter President meets & welcomes Visiting Professional to campus
10:00 AM – 10:30 AM	Tour of campus with Visiting Professional, focusing on visiting the UNR-Earthquake Engineering Laboratory
10:30 AM – 12:00 PM	Graduate student meeting with department graduate students, Postdoctoral students, and visiting scholars for career guidance and more information related to EERI, EERI Student Chapter and EERI activities
12:00 PM – 1:00 PM	Lunch
1:00 PM – 2:00 PM	Guest lecture by Visiting Professional

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Ali Hammad, EERI President, ali.hammad@nevada.unr.edu
- Luna Nurdianti Ngeljaratan, EERI Secretary, lngeljaratan@nevada.unr.edu
- Elif Ecem BAS, EERI Treasurer, Basel@nevada.unr.edu
- Mohamed A Moustafa, Ph.D., PE., Faculty Advisor, mmoustafa@unr.edu
- Prof. Ian G Buckle, Ph.D., Foundation Professor, igbuckle@unr.edu
- Ecem Ozsahin, Volunteer, ozsahin@nevada.unr.edu
- Mahmoud Aboukifa, Volunteer & Graduate student meeting participant, maboukifa@nevada.unr.edu
- Deependra Subedi, Volunteer & Graduate student meeting participant, deependrasubedi@nevada.unr.edu
- Azin Ghaffary, Graduate student meeting participant, aghaffary@nevada.unr.edu
- Jose Benjumea Royero, Graduate student meeting participant, jbenjumea@nevada.unr.edu
- Mohamed Abokifa, Graduate student meeting participant, mabokifa@nevada.unr.edu
- Matthew Clodfelter, Graduate student meeting participant, mclodfelter@nevada.unr.edu
- Suiwen Wu, Ph.D. (Postdoctoral fellow), Graduate student meeting participant, seismic1989@gmail.com
- Dr. Junfeng Jia (Visiting scholar), Graduate student meeting participant
- Dr.Zhigou Sun (Visiting scholar), Graduate student meeting participant

VISITING PROFESSIONAL LECTURE OVERVIEW

In the first part of the lecture, besides introducing himself and his career path, Mr. Friedman also briefly presented some big earthquakes which affecting his professional career. From San Fernando/Sylmar in 1971, Loma Prieta in 1989, Kobe in 1994, Banda Aceh in 2004, until Christchurch and Tohoku in 2011 were some of the earthquake and tsunami events in which he involved in *EERI-Learning from Earthquake* projects. These events affected his interest more about earthquakes and provided him with a new perspective related to earthquake reliefs. Christchurch in 2011 for example, even though the country already had good structural engineers and updated building codes but severe damages were still unescapable. Therefore, he sees earthquake more as a multidisciplinary event since earthquake event involves not only structural, earthquake, and geotechnical engineers but also environmental, social science as well as other disciplines as an integral chain in the disaster preparedness, recovery as well as in risk reduction efforts.

Sharing about his professional perspectives about problems being faced by structural engineers was the second part of the lecture. As a structural engineer himself, he stated that a good structural engineer was also a good earthquake engineer and he defined the profession (i.e. structural engineer) in such a unique way. For him, structural engineer is "the art of molding materials we do not entirely understand, into shapes we cannot precisely analyze, so as to withstand forces we cannot really assess, in such a way that the community at large has no reason to suspect the extent of our ignorance." Unreliable building codes, construction phasing, sequence, and administration as well as sustainability and communication were some problems that we, as structural engineer, should deal throughout our professional career. Building codes, for example, they were designed as a life safety code without any definition/description related to reliability. We need more resilient codes to control/to specify damages, so that our structures may operate quicker after an earthquake. Irregular/contemporary buildings, the more preferable shape mostly for the architects, were also challenging in the design and analysis, as our recent codes were not specifically prepared for the irregularity of the structures.

The last part of the lecture was about two interesting projects related to seismic retrofit that he was involved in several years ago. The first project was the seismic retrofit of San Francisco city hall, which was retrofitted using almost 438 elastomeric bearing. Isolating structure using elastomeric bearing or other base-isolation system was still the most effective way to dissipate seismic energy, according to his professional experience. Fixed-based structure, with high inter-story drifts, causes more structural damages as compared to the base-isolated ones. With base-isolated structure, longer period is obtained, causing the structure to perform more flexible during earthquake. The second project was the UC Berkeley memorial stadium, which was designed by John Galen Howard. It was located at the base of the Berkeley Hills directly at the mouth of Strawberry Canyon and because the approximate location of the Hayward Fault, it was potential for significant earthquakes. Therefore, in early 2010 the University's Board of Regents approved the retrofit plan and the complete renovation of the stadium. During this reconstruction, which cost an estimated \$445 million, the stadium was entirely gutted. Only the exterior wall had to be left untouched because of the stadium's status as a protected landmark. The bleachers and all athletic and spectator facilities were completely rebuilt according to the latest seismic mitigation techniques. The old press box was demolished and a new structure built in its place, independent of the rest of the stadium.

Lecture Abstract

-See attached flyer-

Professional Bio

David is a Senior Principal, and emeritus President, CEO and Board Chair of Forell/Elsesser Engineers Inc., with over 40 years of professional practice (35 years at F/EI) in structural and earthquake engineering. His strength, gained over the breadth and depth of his career, is a holistic perspective of a projects' planning, design and construction and the collaborative integration of creative structural solutions with architects, engineers and builders.

With a specialty in seismic engineering and retrofitting of existing structures, particularly those with historic designation, David has solved numerous structural and earthquake engineering challenges during his career with Forell/Elsesser Engineers. Principal examples of his projects include the base isolation retrofits of San Francisco City Hall and the Asian Art Museum, the adaptive reuse and retrofit for the San Francisco Conservatory of Music, and the seismic safety corrections and remodeling of UC Berkeley's California Memorial Stadium.

David is devoted to world-wide seismic risk reduction and is a former director of the Earthquake Engineering Research Institute, and a current director of Build Change. He is also deeply involved in many other civic, philanthropic and not-for-profit Boards including The San Francisco Foundation, SPUR, UC Berkeley Foundation, Jewish Senior Living Group, Faultline Foundation and the United States Resiliency Council (USRC).

SUPPLEMENTAL ACTIVITIES

UNR-Earthquake Laboratory Visit

The visit was started with the tour of UNR-Earthquake Engineering laboratory facilities and was guided by Prof. Ian G Buckle, Ph.D., the Foundation Professor of the Department of Civil, Structural, and Environmental Engineering of UNR. The facility was a home to three biaxial shake tables as well as one 6-degree-of-freedom table. The building included 29,000 square feet of new laboratory, office and auditorium space. The currently-under construction large-scale soil box facility located at the Large-scale Structure Laboratory was also shown to the visitor. The U.S. Department of Energy (DOE) funded the project and it was a multi-institutional project to investigate SSI effects in nuclear facilities. The fabrication was a 400-ton, laminar, biaxial soil box and corresponding shake table, which would be used to explore SSI phenomena at a scale not currently possible in the U.S., and to validate the ESSI nonlinear computational framework, developed by UC Davis.

Meeting with Graduate Students

The meeting with graduate students was started directly after the laboratory visit. About eleven students (i.e. 8 graduate students, a postdoctoral fellow student and 2 visiting scholars) attended the meeting. The purposes of the meeting were to introduce EERI organization as most of the students were coming from overseas, to share the visitor experience related to his professional career, and to inform students more about EERI Student Chapter and other EERI activities. The meeting was started by students introduction, who mostly came from earthquake-countries, then continued by presenting their research activities as well as their future career goals. The visitor also shared his own experience about how EERI changed his life and recommended the students to get involve more in EERI student chapter or other EERI-related activities. Therefore, the students would get expose more into multidisciplinary activities in earthquake engineering since the earthquake preparedness, recovery and risk reduction were not a stand-alone effort but a world-wide effort from multidisciplinary research/subjects.

RESULTS, FEEDBACK AND LESSONS LEARNED

- The meeting with graduate students generated positive impacts as most of the graduates were about to finish their program. They learned from the visitor how EERI changed his life and how EERI acted as an advocate in disaster preparedness, recovery and risk-reduction efforts. The meeting broadened their insights about EERI especially encouraged them to get involve in earthquake risk reduction activities during their professional career in the future;
- More than 150 students and faculties attended the lecture in which most of the students were undergraduates who were about to finish their study by May, 2019. The feedbacks from the students were that this type of lecture was more effective than the traditional stand-and-deliver lectures they usually attended. The lecture prepared them more for their professional career and they also learned about the realities that would challenge them later in the field;
- University of Nevada, Reno EERI Student Chapter would like more professionals to visit and to deliver the lecture as the respond from the students' feedbacks. A lecture from a professional will engage the students closer to their profession, and will prepare them more to their future career choice.

ACKNOWLEDGEMENTS

The University of Nevada, Reno EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of David Friedman, SE. through their Friedman Family Visiting Professional Program endowment. We also thank our volunteers, colleagues and faculties who actively involved in the 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, flier for event
- Item 2, pictures from graduate student meeting
- Item 3, pictures from the lecture



**Earthquake Engineering
Research Institute**



EERI@UNR Student Chapter Seminar Series

Guest Speaker:

David A. Friedman, SE

Senior Principal, Emeritus CEO & Boar Chair
Forell/Elsesser Engineers, Inc.

"Earthquakes & Structural Engineering Practice & 2 Unique Projects"

**Friday, March 1st, 2019 1:00 PM
EEL auditorium**

Abstract:

My 44-year career as a practicing engineer has been inextricably linked to earthquakes, past, present, and future. The practicing structural engineer today must not only have a broad understanding of earthquakes and structural engineering, but must be knowledgeable about architectural, M/E/P systems, construction delivery methodologies, and the construction process. All projects come with their own litany of challenges and constraints, and the structural engineer is one of the key players in achieving the optimal solution. The project's budget, the selected performance and design criteria, the architectural form, and the operating systems all affect the selection of the appropriate structural materials and the force resisting systems. Then the analysis must get translated into a design, and the design must clearly and carefully be delineated into construction documents including plans, details, sections and technical specifications, with appropriate attention to sequencing, phasing and constructability. This all gives rise to the notion of today's structural engineer as a "Master Builder", one who can articulate their way through a complex labyrinth of form finding, criteria setting, risk evaluation, design and documentation and construction (and hopefully not litigation). Two projects that highlight these issues include:

- San Francisco City Hall
- UC Berkeley California Memorial Stadium

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Fig 1. Meeting with graduate students



Fig 2. Graduate student Mohamed Aboukifa (stand) was showing his tested specimen in the lab



Fig 3. Lecture





Fig 4. Lecture



Fig 5. Ali Hammad (EERI President, UNR Student Chapter) awarded a certificate to the visiting lecture, David Friedman, SE.