



**Earthquake Engineering Research Institute
University of British Columbia Student Chapter**

Friedman Family Visiting Professional Program

Mr. John Hooper, S.E.
March 20th and 21st 2006

The EERI sponsors the Friedman Family Visiting Professional Program to match potential visiting professionals with host institutions, usually universities, for a two to three day workshop of current topics related to earthquake engineering and earthquake risk reduction. This exchange is meant to be part lecture and part informal discussion with faculty and students. The visiting professionals come from a wide range of disciplines, including engineering, earth science, seismology, architecture, planning, public policy and the social sciences.

Following the success of the visit by Bill Holmes in 2005, the UBC-EERI Student Chapter once again participated in the EERI Friedman Family Visiting Professional Program. The Chapter was extremely fortunate to have the opportunity to host Mr. John Hooper, S.E. on March 20th & 21st of 2006. Mr. Hooper is a Principal and Director of Earthquake Engineering at Magnusson Klemencic Associates (MKA), a 140 person structural and civil engineering firm in Seattle, Washington.

Mr. Hooper was met on UBC's campus by the Chapter Co-Chairs Kevin Riederer and Houman Ghalibafian. Mr. Hooper introduced himself over lunch, where Kevin and Houman introduced him to UBC, the Department of Civil Engineering and the UBC-EERI Student Chapter.

Mr. Hooper presented the first of his three lectures to the 4th year undergraduate class at UBC. The lecture was held in the new Civil Engineering Design Studio and the lecture focused on the business side of structural engineering consulting including how MKA is organized and managed. He also discussed the importance as a structural engineer to understand the needs of the owner and architect to create a successful project. He concluded the lecture with detailed descriptions of several of MKA's highest profile projects including the U.S. Federal Courthouse--Seattle, Experience Music Project, and the Seattle Public Library.

The second presentation was given to practicing engineers, graduate students and faculty at a downtown hotel. This presentation discussed the unique design challenges of highrise concrete buildings as it relates to residential and hotel uses.

Mr. Hooper spoke about how the 2003 International Building Code, which is the governing code for the majority of the United States, and the 1997 Uniform Building Code, which is enforced in the State of California, limit the use of shear wall only systems to 240 feet for core-only buildings in high seismic regions. He also discussed the performance-based design approach required to verify its code-equivalent performance to other systems along with the challenges of its implementation. The discussion, which involved a great deal of interaction with the audience, also highlighted some of the differences in design philosophy of the American and Canadian building codes with respect to concrete highrise buildings.

After morning meetings with faculty members, the second day of Mr. Hooper's visit commenced with a round table discussion with 20 members of the UBC-EERI Student Chapter. Six students presented their ongoing research, with each presentation being followed by an interactive discussion with those in attendance. Having Mr. Hooper present for these discussions gave students the unique opportunity to receive input on their research from a well respected industry representative as well as their academic peers.

The final presentation of Mr. Hooper's visit to UBC was given at the weekly Structural and Earthquake Engineering Seminar. His presentation detailed the seismic upgrade of the North Wing of the Harborview Medical Center in Seattle. The lecture detailed a testing program of a single sided FRP retrofit to concrete spandrel beams on the exterior of the building. He explained the challenges associated with such an important structure and the requirement to retrofit the building while allowing the hospital to remain fully functional during the retrofit. This presentation provided an excellent example of collaboration between industry and academia.

A copy of each of Mr. Hooper's presentations can be found on the Student Chapter Website:

<http://www.civil.ubc.ca/research/EERI/>

On the evening of March 20th, Mr. Hooper was joined by several members of the UBC-EERI Student Chapter and the Faculty Representative Dr. Ken Elwood for dinner at an Italian Restaurant on Vancouver's famed Robson Street. Dinner conversations dealt with a variety of topics including earthquake engineering, the fields of research and professional practice, and of course non-engineering related issues such as politics, sports and family.

The UBC-EERI Student Chapter would like to thank those who made Mr. Hooper's visit possible. In particular we would like to thank the EERI Friedman Family Visiting Professional Program, the UBC Department of Civil Engineering and the Vancouver Structural Engineers Group Society (VSEGS). Finally, would like to express our sincere gratitude to John Hooper for his enlightening and pleasant visit to UBC.



John Hooper (middle back) with members of the UBC-EERI Student Chapter including Faculty Representative Dr. Ken Elwood (back far right).

Please see below for a complete itinerary and copies of the presentation advertisements including abstracts.



**The UBC Student Chapter of the
Earthquake Engineering Research Institute**



invites you to attend a lecture on

Structural Engineering at Magnusson Klemencic Associates

By

John Hooper

Magnusson Klemencic Associates, Seattle, WA

March 20th, 1:00 - 2:00 pm

CEME Design Studio

- John Hooper is a Principal and the Director of earthquake engineering of Magnusson Klemencic Associates, a 140-person structural engineering and civil engineering firm in Seattle, Washington. He has over 24 years of experience in seismic renovation, seismic design of new buildings, structural analysis, and building code development. John Hooper is active on various research, standards and code committees. His recent projects include Marion Oliver McCaw Hall renovation, Qwest Field (Seattle's Football stadium), several emergency operations centers, and numerous hospital projects.
- This presentation will introduce the firm, how it is organized and managed, and will highlight some of the unique projects MKA has designed in the past five years, including the U.S Federal Courthouse--Seattle, Highcliff, and the Seattle Public Library.



**The UBC Student Chapter of the
Earthquake Engineering Research Institute**



invites you to attend a lecture on

**Reinforced Concrete High-Rise Construction
in Seismic Regions**

By

John Hooper

Magnusson Klemencic Associates, Seattle, WA

March 20th, 6:00 - 8:30 pm

**Grouse Room, Hyatt Regency Vancouver, 655 Burrard
Street, Vancouver BC (see the map below)**

Snacks and drinks will be provided

John Hooper is a Principal and the Director of earthquake engineering of Magnusson Klemencic Associates, a 140-person structural engineering and civil engineering firm in Seattle, Washington. He has over 24 years of experience in seismic renovation, seismic design of new buildings, structural analysis, and building code development. John Hooper is active on various research, standards and code committees. His recent projects include Marion Oliver McCaw Hall renovation, Qwest Field (Seattle's Football stadium), several emergency operations centers, and numerous hospital projects.

This presentation will discuss the unique design challenges of highrise concrete buildings as it relates to residential and hotel uses. Currently, both the 2003 International Building Code, which is the governing code for the majority of the United States, and the 1997 Uniform Building Code, which is enforced in the State of California, limit the use of shear wall only systems to 240 feet for core-only buildings in high seismic regions. However, the majority of residential and hotel projects are generally best served functionally utilizing the core-only system. In order to use this system, a performance-based design approach was required to verify its code-equivalent performance to other systems. This performance-based design approach, along with the challenges of its implementation, will be presented.



The UBC Student Chapter of the Earthquake Engineering Research Institute



invites you to attend a lecture on

"Harborview Medical Center--North Wing Seismic Upgrade."

By

John Hooper

Magnusson Klemencic Associates, Seattle, WA

UBC Dept. of Civil Engineering – Weekly Structures / Earthquake Group Seminar
- Tuesday March 21st, 2006 3 - 4pm – CEME 1204

The North Wing at Harborview Medical Center in Seattle, Washington, houses portions of the Emergency Department and non-ambulatory nursing floors for the Pacific Northwest Region's Level 1 Trauma Center. Originally constructed in the early 1970s, the cast-in-place concrete building structure does not meet current seismic design standards for Essential Facilities. Due to the facility's 24/7 occupancy and operations, the seismic upgrade solution requires minimal impact and interruption during construction. The use of Fiber Reinforced Polymers (FRP) for structural reinforcement is proposed to provide additional capacity to specific deficient elements. The lateral resisting system for the North Wing consists of concrete shear walls around the elevator and stair core and an exterior concrete frame/punched shear wall. The FRP reinforcement is designed to current standards where applicable and available. For strengthening structural elements that are not effectively covered by current standards, the application of FRP reinforcement has been designed based on results of a testing program utilizing scaled replicas of critical elements.

The testing program includes the unique application of FRP to only one side of the spandrel beams, which are critical building elements. The placement of FRP on one side only was tested to replicate the application of the material to the outside of the building. The results of the test program were used to represent element behavior in a nonlinear, three-dimensional analysis. The design results in a building that will have the ability to respond in a predictable manner to seismic forces and will remain safe to occupy following the design-level seismic event. Furthermore, FRP reinforcement is very economical and can be applied with minimal interruption to building operations.



2006 UBC EERI Friedman Family Visiting
Professional
John Hooper Itinerary



Monday, March 20th

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| 12:00pm – 1:00pm | Lunch with Chapter Co-Chairs |
| 1:00pm – 2:00pm | Tour of Civil Engineering Facilities <ul style="list-style-type: none">• Earthquake Lab• Structures Lab• Soils Lab |
| 2:00pm – 3:00pm | Lecture in the Civil Engineering Design Studio <ul style="list-style-type: none">• Audience: Undergraduate / Graduate Students and Faculty |
| 3:00pm – 6:00pm | Depart UBC and Check-in at Hotel |
| 6:00pm – 8:00pm | Public Lecture Downtown (Location TBA) <ul style="list-style-type: none">• Audience: Students, Faculty, Local Professionals |
| 8:30pm – 10 pm | Dinner with Members of the UBC-EERI Student Chapter |

Tuesday, March 21st

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| 9:00am – 11:00am | Morning Activity Options <ul style="list-style-type: none">• Meetings with Faculty and Students |
| 11:00am – 2:00pm | Roundtable Discussion <ul style="list-style-type: none">• Brief presentations from Graduate Students on Research being Conducted at UBC with time for discussion• General Discussion• Lunch |
| 3:00pm – 4:00pm | Structural & Earthquake Engineering Seminar <ul style="list-style-type: none">• Weekly seminar for Graduate Students and Faculty in Structural Engineering and Earthquake Engineering |