

# FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



## Visit to McMaster University: April 4, 2018

This report summarizes the visit of **Dr. Faiz Makdisi** from SAGE Engineers, Inc. that took place at McMaster University on April 4, 2018.

### ITINERARY OR AGENDA

TIME:	ACTIVITY:
9:30 AM – 10:00 AM	Student Chapter President and VP Finance meets & welcomes Visiting Professional to campus.
10:00 AM – 11:00 AM	Tour of Applied Dynamics Lab by the Chapter's previous President. Views of current research lab work as well as discussions on historical research.
11:00 AM – 12:00 AM	Informal meeting with department graduate students.
12:00 AM – 1:30 AM	Lunch with the student chapter leadership from this year.
1:30 PM – 2:30 PM	Tour of McMaster campus by incoming Chapter President.
2:30 PM – 4:00 PM	Guest lecture by Dr. Faiz Makdisi.
4:00 PM – 5:00 PM	Informal meeting with department graduate and undergraduate students.
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6:30 PM – 8:30 PM	Dinner with Department of Civil Engineering Professors

### STUDENT CHAPTER VISIT PLANNING COMMITTEE

#### LEAD ORGANIZER(S):

- Bryanna Noade, Chapter President, noadeb@mcmaster.ca
- Kevin McNamara, VP Finance, mcnamark@mcmaster.ca
- Paul Steneker, VP Communication, stenekpr@mcmaster.ca
- Taylor Steele, General Member (previous president), steeletc@mcmaster.ca
- Dr. Dimitrios Konstantinidis, Faculty Advisor, konstant@mcmaster.ca

### VISITING PROFESSIONAL LECTURE OVERVIEW

Dr. Faiz Makdisi's presentation was well received with roughly 40 attendees, comprised of undergraduate students, graduate students, and faculty members. The presentation was engaging from both a technical and practicing stand point, with an introduction on the effects of earthquakes on dams followed by in-field examples of Makdisi's work. Light refreshments were offered at the lecture by the generous support of the McMaster Engineering Co-op and Career Services office. The advertising poster for the lecture is included at the end of this report (Item 1).



Guest Lecture by Faiz Makdisi



Faiz Makdisi with past, present and future executive members of EERI McMaster

## Lecture Abstract

The presentation will describe the effects of earthquakes on dams, and the state-of-practice for evaluating the seismic stability and earthquake-induced deformations of embankments and slopes. Methods for evaluating the stability of slopes and embankments during earthquakes have evolved from estimating factors of safety while applying to the slope a horizontal inertial force (termed the pseudo-static seismic coefficient), to estimating deformations using Newmark's concept of yield acceleration and sliding block analyses, to detailed two-dimensional dynamic response analyses using equivalent linear approaches, and more recently, to evaluating deformations using fully-coupled nonlinear response and deformation analyses.

The presentation will describe procedures and examples from current practice for: a) estimating earthquake ground motions at a dam site; b) estimating the dynamic response and earthquake-induced accelerations within an embankment; c) estimating post-earthquake factors of safety and yield accelerations using limit equilibrium slope stability analysis; and c) estimating earthquake-induced deformations. Simplified methods as well as detailed equivalent linear analyses, and recently developed nonlinear analyses will be described. Case histories of seismic retrofits of embankment dams will also be presented.



## Professional Bio

Faiz I. Makdisi is a Senior Principal Engineer with SAGE Engineers, Inc. in Oakland, California. He received his Bachelor of Engineering degree from the American University of Beirut, Lebanon, and his M.Sc. and Ph.D. degrees in Geotechnical Engineering from the University of California at Berkeley. He has over 39 years of specialized experience in geotechnical and earthquake engineering. Dr. Makdisi has been actively involved in studies of the seismic behavior of earth and rock fill dams and embankments. He developed and published (with the late Professor H. Bolton Seed) widely used simplified procedures for estimating the dynamic response and permanent deformations in earth and rock fill dams. Recently, Dr. Makdisi has been involved in development of seismic design criteria, evaluation of seismic stability, and design of alternative remedial measures for more than 25 embankment dams.

Dr. Makdisi is a member of the Earthquake Engineering Research Institute (EERI), and the Earthquake Committee of the United States Society on Dams (USSD) and serves on the ASCE 1 Committee involved in updating the "Standard for Geotechnical Analysis, Design, Construction, Inspection and Monitoring of Nuclear Safety-Related Structures."

## SUPPLEMENTAL ACTIVITES

## Tour of Applied Dynamics Lab

This activity was organized to show Makdisi the active research projects in earthquake engineering at McMaster University. The tour was given by Taylor Steele - previous EERI president and final year PhD student. Taylor discussed past, present and future testing set-ups taking place within structural engineering at McMaster. In addition to Taylor Steele, Kevin McNamara, and Bryanna Noade helped guide the lab tour.

## Informal Meeting with department Graduate Students

This activity was planned to allow graduate students to gain knowledge on earthquake engineering in a field other than structural engineering, the dominant research field in earthquake engineering at McMaster University. As well, this time provided an opportunity to ask a working professional for resume, interview and job tips for those graduate students soon to be graduating. This activity was attended by many graduate students who were very interested in Makdisi's transition from graduate school to the professional industry.

## Lunch with the Student Chapter Leadership

This activity was organized to discuss the productivity of EERI McMaster and gain insight from Makdisi on other activities we could be organizing as a student chapter. Makdisi has visited many EERI Student Chapters through the FFVPP and we valued his input on our own student chapter activities. Makdisi showed interest in our Annual Earthquake Engineering Competition for high school students and had short recommendations on our chapter activities. This event was attended by the executive members of EERI McMaster:

Bryanna Noade – Chapter President  
Kevin McNamara – VP Finance  
Paul Stenecker – VP Communication  
Matt Ficara – Director of Outreach  
Ricard Darlington – Co-Director of SDC Team  
Matthew East – Co-Director of SDC Team  
Taylor Steele – Previous Chapter President

## RESULTS, FEEDBACK AND LESSONS LEARNED

Due to being located in Canada our university semesters are off set from those of U.S. universities, this resulted in the timing of the visit to be scheduled based on Makdisi's availability during the last week of classes in our winter semester. We believe students would be more receptive to the day's social activities if the visit was scheduled within the middle of the semester rather than in the final days. However, aside from the social activities throughout the day the guest lecture itself was well attended, Makdisi himself commented that he believes it was the most attended lecture he has given.

In the future visits, the chapter would like to continue the focus on practicing engineering. This is motivated by two unique reasons: strong undergraduate attendance is generated from the attraction of seeing the implementation of their newly acquired academic teachings and; our chapter has had an abundance of visiting scholars who generously provide their time for a presentation. Due to these reasons, an emphasis has been set to attract more industry related talks in the future.

In a related field, one of the ongoing formal goals set out by the chapter in its yearly report has been to acquire an industry liaison who can assist the chapter executive in securing more visiting professionals, a similar role to the current academic liaison.

## ACKNOWLEDGEMENTS

The McMaster University EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of Faiz Makdisi through their Friedman Family Visiting Professional Program endowment. We would also like to acknowledge the financial support provided by McMaster's Department of Civil Engineering and the Engineering Co-op and Career Services.

## 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 – Guest Lecture Poster: Dr. Faiz Makdisi

# Faiz I. Makdisi, PhD, PE, D.GE

Senior Principle Engineer

## Seismic Stability and Deformation of Embankment Dams

April 4<sup>th</sup> 2:30 pm, BSB 119



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### ABSTRACT

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