

FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



Visit to Virginia Tech: February 18, 2021

This report summarizes the visit of **John Thornley** from Golder Associates Inc. that took place at Virginia Tech on February 18, 2021.

ITINERARY OR AGENDA

Provide the itinerary of the visit. For example:

TIME:	ACTIVITY:
3:30 PM – 4:30 PM	Research roundtable discussion with graduate students and faculty conducting earthquake engineering and geotechnical engineering related research
5:00 PM – 6:15 PM	Guest lecture by Visiting Professional
6:30 PM – 7:30 PM	Meet and Greet with Virginia Tech Students

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S): Kaleigh Yost, Co-President, kmyost@vt.edu

- Mohsen Zaker Esteghamati, Co-President, mohsenzaker@vt.edu
- Mahdi Bahrampouri, Treasurer, mahdibp@vt.edu
- Rosie Dixon, Seismic Design Team Liaison, rosie27@vt.edu
- Adrian Rodriguez-Marek, Faculty Advisor, adrianrm@vt.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

John's presentation was both well-attended (~25 students and faculty from the geotechnical and structural engineering departments, primarily) and well-received by the audience. John presented on a very interesting project located on a remote island in the Pacific Ocean and described a very detailed site-specific liquefaction analysis that he was involved with. The project itself and the methods were very informative and relevant to several students and faculty at Virginia Tech who study soil liquefaction.

Lecture Abstract

John will be presenting on a project he recently led related to liquefaction mitigation of loose coral sand below large tank foundations on the remote island of Kwajalein. The results of initial CPT work indicated, based on typical liquefaction screening methods, significant potential for seismically-induced settlement. However, coral sand differs substantially from quartz and silica sand, which are the majority of case histories used to develop liquefaction screening methods. Bulk samples of the coral sands were collected and a series of CPT cone calibrations, triaxial and cyclic direct simple shear tests were performed to develop a constitutive framework that was used to understand the liquefaction triggering of coral sand. Findings from the study indicate that the Kwajalein coral sand is less susceptible to liquefaction.

Professional Bio

John Thornley, PE is an Associate and Senior Geotechnical Engineer at Golder Associates Inc. in Anchorage, Alaska. He has over 14 years of geotechnical and earthquake engineering experience. Recently John was a co-lead for the EERI Learning from Earthquakes Reconnaissance effort for the November 30, 2018 M7.1 Anchorage, Alaska Earthquake. John is currently the chair of the Municipality of Anchorage Geotechnical Advisory Commission. He has served as field manager of geotechnical studies and prepared recommendations for a variety of infrastructure projects including buildings, roads and airports, large liquefied natural gas and water storage tanks, pipelines, wind and cellular towers, and utilities. As part of John's work across Alaska, he has been involved in seismic hazard studies, seismic site response analyses planning studies for large infrastructure buildouts, and cold regions and permafrost engineering. His design work includes ground improvement in liquefiable soils, deep and shallow foundations, slope stabilization, retaining structures, and embankments.

SUPPLEMENTAL ACTIVITIES

Research Roundtable

During this activity, eight students and two professors whose research was related to earthquake or geotechnical engineering met virtually with John. Each student prepared a few slides to showcase their research and a discussion was had amongst all attendees. The goal of this activity was to introduce John to the research activities going on at Virginia Tech and let him meet with some of the graduate students and professors in the department.

Meet and Greet

During this activity, John had the opportunity to meet informally as a group with any students who were interested in learning more about his lecture or geotechnical engineering in practice. Approximately 15 students joined the Zoom meeting from both geotechnical and structural engineering backgrounds. The goal of this activity was to help introduce careers in geotechnical engineering practice to Virginia Tech students and let John discuss other projects he has worked on in addition to the one that was the topic of his lecture.

RESULTS, FEEDBACK AND LESSONS LEARNED

Overall, the virtual Friedman Family visit was a success! All events were well-attended and well-received. John's lecture topic was extremely pertinent to several of the Virginia Tech researchers, and he received good questions about his presentation. In general, the remote format of the visit worked well, although we did miss having the opportunity to meet John in person. The VT EERI student chapter leadership met with John virtually prior to his visit to introduce themselves and make sure the technology was worked out for the day of. The biggest challenge was that Virginia Tech had a significant ice storm the day of the event and the University actually closed for the day. Fortunately, there were not widespread power outages as were anticipated and we were able to host the events as planned. Considering that earthquake-related research is not as frequent in the Eastern US, such visits could cultivate a seed of passion in graduate students interested in the EERI mission. Therefore, we will gladly appreciate being considered in future visits. Based on our experience, the topics our body of students are interested to learn more about are as follows:

- Collaboration between geotechnical and structural engineers
- Use of numerical modeling in earthquake engineering
- Real-world seismic resiliency and retrofitting projects with a focus on application of novel methods and digital workflows
- Earthquake reconnaissance from a recent event

ACKNOWLEDGEMENTS

The Virginia Tech EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of John Thornley 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, flyer for the event

Register [here](#) for the
Friedman Family Visiting Professionals Program
Virtual Lecture

Thursday, February 18th, 2021
5:00pm to 6:15pm (ET)



Guest Speaker:

John Thornley, PE
Senior Geotechnical Engineer
Golder Associates Inc., Anchorage, AK

Topic:

Liquefaction Susceptibility of Coral Sands

Speaker Bio:

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The [Friedman Family Visiting Professionals Program](#) is endowed by the Friedman Family to foster better understanding and communication between and among earthquake practitioners and academics.

Please direct any questions about the lecture to virginia.tech.eeri@gmail.com.