GEO-INSTITUTE

Los Angeles Chapter

Presents:

Dinner and Presentation By:
Dr. Mehrad Kamalzare

Understanding of the Process of Levee Failure due to Erosion and Reduce the Risk of Failure

Wednesday January 17, 2018

PLEASE NOTE THE NEW LOCATION

Alpine Village
883 W. Torrance Blvd.,
Torrance, CA 90502
Phone: (310) 327-4384

SCHEDULE

5:30 – 6:30	Registration and Social Hour
6:30 – 7:30	Dinner
7:30 – 8:30	Presentation

Dr. Mehrad Kamalzare

ASSISTANT PROFESSOR in the CIVIL ENGINEERING DEPARTMENT at the CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

BACKGROUND

Presentation Summary: The objective of this research is to develop tools that would improve the understanding of the process of levee failure due to erosion and reduce the risk of failure. Hydraulic erosion is a complicated phenomenon and depends on many different parameters. To improve design criteria for levees, embankments and earthen structures, the development of realistic computer models that can simulate the erosion process is necessary. Verification of these computer simulations, as with any simulation, is a necessity. In this research, a large number of physical levee erosion tests were performed at 1-g and at high g's using a geotechnical centrifuge. Centrifuge tests were performed to simulate real (prototype) size levees, and thus to obtain a more realistic model. The erosion was modeled physically in detail, from beginning to end, that is from the time the levee overtopped until the levee breached. Conventional three-dimensional scanning was used to precisely verify the calculated dimensions of initial and final computer model geometries, but did not yield interim data or measurements of the quantity of eroded soil during the tests. A Kinect device was used to scan and evaluate the volume of eroded soil and variation of the shape of the channels as a function of time. Three-dimensional images were obtained, and variations of the depth of the eroded channels along their length were plotted. Typical quantities measured as a function of time were the depth, width and volume of rills, number of junction points, shape of the rills (straight or meandering), sediment transport quantities, and finally, breach. Based on recorded videos and pictures taken during the tests it was discovered that the Kinect results agreed well with the physical models. The Kinect is a low-cost sensor, and enabled the measurement of the rate of soil erosion, which if done at all, usually requires expensive equipment. The Kinect device was also used in the centrifuge experiments, and functioned well in the high g environment. It is believed to be the first use of a Kinect device in a centrifuge. The application of this method in other laboratory experiments was also investigated.

Biography: Dr. Mehrad Kamalzare is an Assistant Professor in the Civil Engineering Department at the California State Polytechnic University, Pomona. He received his Ph.D. in Geotechnical Engineering from the Rensselaer Polytechnic Institute (RPI), located in Troy, New York. He is the author of a book, and more than 50 technical papers in the area of geotechnical engineering. His primary areas of research include embankment dams, deep foundations, experimental soil mechanics, geosynthetic reinforcement, and numerical modeling. Dr. Kamalzare is a member of the American Society of Civil Engineers, and International Society for Soil Mechanics and Geotechnical Engineering. He is the Editor-in-Chief of the Journal of Geotechnical and Transportation Engineering (JGTTE) and the Associate Editor of the International Journal of Geotechnical Engineering. Dr. Kamalzare is a register Professional Engineer (P.E.) and in the past few years has been involved in a number of consulting projects such as New York city subway system expansion (MTA), Port Authority Trans-Hudson inspections (PATH), Doha Red line metro construction, and California High-Speed rail project.

REGISTRATION

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Registration Fee[1]

Early registration *(registration and payment received on or before 1/12/18)*……..$40

Regular *registration (registration and payment received after 1/12/18or on-site)*……...$50

Full-time student registration[2]……..……..Free

[1]No refunds for cancellations requested after 1/15/18.

[2]Proof of full-time student status required on-site.