

15th C.W. Lovell Distinguished Lecture

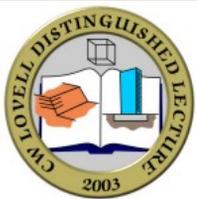
4:00 pm, Friday, October 20, 2017

Lawson Hall, Room 1142, Purdue University

Professor Ross W. Boulanger

Seismic Response Of An Embankment On Loose Saturated Sand Treated With Soil-cement Panels: Centrifuge Tests And Numerical Analyses

Numerical simulations of a centrifuge model test of an embankment on a liquefiable foundation layer treated with soil-cement panels are presented. The centrifuge model approximates a configuration that has been used for liquefaction remediation at several dams, and the numerical analyses evaluate common approximations used in the design of some of these projects. The centrifuge model was tested on a 9-m radius centrifuge and corresponded to a 28 m tall embankment underlain by a 9 m thick saturated loose sand layer. Soil-cement walls were constructed through the loose sand layer over a 30 m long section near the toe of the embankment and covered with a 7.5 m tall berm. The model was shaken three separate times using an earthquake motion scaled to peak horizontal base accelerations of 0.05 g, 0.26 g, and 0.54 g. The latter two events caused liquefaction in the loose sand layer. Crack detectors indicated that the soil-cement walls sheared through their full length in the third event. Two-dimensional nonlinear dynamic analyses using FLAC were performed using equivalent composite properties for the soil-cement treatment zone and the constitutive model PM4Sand for the embankment and foundation soils. The results of the centrifuge model test and two-dimensional nonlinear dynamic simulations are compared. Capabilities and limitations in the two-dimensional simulations of soil-cement grid reinforcement systems, with both liquefaction and soil-cement cracking effects, are discussed. Implications for practice are discussed.



C. W. LOVELL DISTINGUISHED LECTURE

Professor Emeritus C. W. "Bill" Lovell was a native of Louisville, Kentucky, and received his BCE from the University of Louisville. He served in the U.S. Navy Construction Battalions (SeaBees) during World War 2, and taught at the University of Louisville after the War. In 1948, he came to Purdue University, and he remained in that employment until 2012, receiving MSCE and Ph.D. degrees in the process. His service in Civil Engineering extended over 48 years, including major professorship for 60 theses and authorship for almost 200 papers. During his distinguished career at Purdue University, Prof. Lovell was major professor to 112 students, 60 of whom wrote research theses, and published in excess of 200 papers. His research interests were broad and varied including soft rocks (shales), compaction and compacted properties, soil fabric and pore size distribution, slope stability and erosion, cold regions, pavements, and uses of waste materials in geotechnical engineering. In 1994, Bill became a facilitator/coach in Human Resources Services at Purdue. He specialized in delivering a variety of FranklinCovey leadership/personal development seminars, and received a "Facilitator of the Year" award from FranklinCovey. Bill was active in community volunteer organizations, and continued to be an avid fly fisherman.



Detailed information on the 15th C. W. Lovell Distinguished Lecture can be found at the following website:
<https://engineering.purdue.edu/CE/Academics/Groups/Geotechnical/Details/seminar/Lovell>



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Professor Ross W. Boulanger is the Director of the Center for Geotechnical Modeling in the Department of Civil and Environmental Engineering at the University of California, Davis. He received his PhD and MS degrees in Civil Engineering from the University of California at Berkeley, and his BASc degree in Civil Engineering from the University of British Columbia. His research and professional practice are primarily related to liquefaction and its remediation, seismic performance of dams and levees, and seismic soil-pile-structure interaction. Over the past 25 years, he has produced over 250 publications and served as a technical specialist on over 50 seismic remediation and dam safety projects. His honors include the TK Hsieh Award from the Institution of Civil Engineers, the Ralph B. Peck Award, Norman Medal, Walter L. Huber Civil Engineering Research Prize, and Arthur Casagrande Professional Development Award from the American Society of Civil Engineers (ASCE), and election to the National Academy of Engineering in 2017.

Beginning in 2003, the C. W. Lovell Distinguished Lecture series was established through the generosity of Professor Bill and Mary Ellen Lovell, who expressed an interest in creating a lecture series at Purdue that will have staying power - one in which a track record of scholarship is clearly established. Thus, each year, lecturers with outstanding accomplishments in geotechnical engineering research are invited to Purdue University. The lecture series creates an excellent opportunity for our graduate students to meet and interact with some of the most important names in geotechnical engineering in person at Purdue.

A dinner will be held at the Ross Ade Pavilion, Shively Media Center. Reservations to attend the dinner are required by 3:00 pm on October 12, 2017. For more information, please contact Carie Herbst (herbstc@purdue.edu); ph: 765-494-5025

