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SEMINAR

Reliability assessment of damage potential of buildings caused by an adjacent excavation

By

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Abstract

Deterministic procedure for assessing damage potential of buildings caused by an adjacent excavation is first introduced, followed by a discussion of a framework for a fully-probabilistic analysis of the building damage potential. Herein, the Damage Potential Index (DPI), which is a function of angular distortion and lateral strain, is used to assess building damage potential. A serviceability limit state is established in which the resistance is expressed in terms of the "limiting" DPI, and the load is represented by the "applied" DPI. In this context, damage to the building adjacent to an excavation is said to occur deterministically if the applied DPI is greater than the limiting DPI. For the fully-probabilistic analysis, both parameter and model uncertainties of the limiting and applied DPI are first characterized. The analysis framework is then presented and demonstrated with a case history. Finally, sensitivity analysis is performed to identify the factors to which the probability of damage are most sensitive, and to analyze the effect of various assumptions of the input parameters on the computed probability of building damage. Additionally, simplified charts are also developed based on the results of this study for "first-order" estimate of the probability of damage without performing detailed reliability analysis.

Date : 6 November 2009, Friday
Time : 10:30 am – 12:00 noon
Venue : Room 3574 (Lift 27/28)
Conference Room of Dept. of Civil & Environmental Engineering
Chia-Wei Woo Academic Concourse
The Hong Kong University of Science and Technology
Language: English

Biography

Prof. Juang obtained his Bachelor's and Master's degrees from National Cheng Kung University in 1974 and 1976, respectively, and Ph.D. degree from Purdue University in 1981. He has been teaching at Clemson University since 1982, rising from Assistant Professor to Associate Professor in 1986 and Full Professor in 1992. Prof. Juang is currently a Fellow of ASCE and Chairman of ASCE/GI's Technical Committee on Risk Assessment and Management. He is on editorial board of several eminent geotechnical engineering journals such as Engineering Geology, Journal of Geotechnical and Geoenvironmental Engineering, and GeoRisk. Prof. Juang has received numerous awards. To name a few: The T.K. Hsieh Award in 2001 from the Institution of Civil Engineers (ICE), Outstanding Editorial Board Member Award in 2008 from the ASCE, Best Paper Award in 2008 from the Taiwanese Geotechnical Society, and Clemson University Board of Trustees Award for Faculty Excellence in 2009. Prof. Juang is currently also appointed as Visiting Chair Professor at National Central University and National Taiwan University of Science and Technology.

* * * ALL ARE WELCOME * * *

Remark: This seminar is free of charge and no prior registration is required. The number of participants is limited to 30 and the seats will be allocated on a first-come-first-served basis. For enquiries, please contact Ms Rebecca Yau at Tel: 2358 7164.