

**AEG & ASCE LOS ANGELES SECTION GEOTECHNICAL GROUP JOINT MEETING
MEETING NOTICE**

Wednesday, March 21st, 2012

UNCERTAINTY IN SEISMIC SLOPE DEFORMATION MODEL PREDICTIONS

Joseph Wartman, Ph.D., P.E.

University of Washington

Abstract

In this talk I will discuss how variability in driving and resisting force parameters together translate into uncertainty in seismic slope deformation predictions. Predictive uncertainty of the Newmark rigid-block and Makdisi-Seed decoupled deformation-based methods was evaluated by performing a series of probabilistic Monte Carlo simulations for two idealized slope models. Results from these analyses demonstrate that the highly non-linear relationship between acceleration ratio and displacement associated with the deformation models dictates the way in which parametric variability is propagated through the analysis and can lead to varying degrees of uncertainty in the deformation predictions. Based on this observation, three zones along the displacement-acceleration ratio relationship will be identified according to their relative degree of nonlinearity and correlated with their relative influence on predictive uncertainty; these are: (i) highly uncertain, (ii) moderately uncertain and (iii) low uncertainty. Using this framework, the widely held notion of generic “order-of-magnitude” estimate for deformation predictions is a misnomer. Based on this, it is recommended that realistic levels of parametric variability be incorporated in the seismic slope deformation analysis to establish the operating conditions of the slope system. Systems identified as highly uncertain or moderately uncertain require a more robust probabilistic analyses to meaningfully interpret poorly constrained deformation predictions. The findings will be discussed in the context of three well documented case studies of earthquake-induced deformation in natural slopes.

Bio

Joseph Wartman is the H. R. Berg Associate Professor of Civil and Environmental Engineering at the University of Washington. The author of over 60 professional articles, Wartman is an editor of the ASCE Journal of Geotechnical and Geoenvironmental Engineering and former chair of the Geo-Institute (GI) Committee on Embankments, Dams, and Slopes. He is the recipient of several awards and honors including, most recently, the 2011 Prakash Research Award and selection in 2011 for the National Academy of Engineers' Frontiers of Engineering program. Prior to his arrival at the University of Washington in 2010, Wartman spent nearly 10 years at Drexel University, where he was a founding Co-Director of the Drexel Engineering Cites Initiative. From 2007 to 2008, he was a Visiting Scholar at the Universitat Politècnica de Catalunya (UPC) in Barcelona, Spain. Before his career in academia, Wartman was a professional practitioner in California and Pennsylvania for 5 years. He received his B.C.E. from Villanova University, and his M.S., M.Eng., and Ph.D. degrees from the UC Berkeley. Wartman is a Registered Professional Engineer in Pennsylvania and California.

SOCIAL HOUR:	5:30 p.m.
DINNER:	6:30 p.m.
PROGRAM:	7:30 p.m.
PLACE:	Stevens Steak House 5332 Stevens Place, City of Commerce Southwest Corner of I-5 & Atlantic Boulevard
PRICE:	\$35 with reservation (free with valid Student ID); \$40 at the door
RESERVATIONS:	Andrew Liu By e-mail to: ahl_77@yahoo.com

**Please make reservations by e-mail prior to:
12 noon, Friday, March 16, 2012**