For favor of posting

ASCE Hong Kong Section Seminar

Jointly organized by RISUD, Hong Kong Polytechnic University

Kinematic Framework for Evaluating Seismic Earth Pressures on Retaining Walls

By

Prof. Jonathan P. Stewart

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Abstract

During earthquake ground shaking earth pressures on retaining structures can cyclically increase and decrease as a result of inertial forces applied to the walls and kinematic interactions between the stiff wall elements and surrounding soil. The application, based on limit equilibrium analysis, of a pseudostatic inertial force to a soil wedge behind the wall [the mechanism behind the widely-used Mononobe–Okabe (M–O) method] is a poor analogy for either inertial or kinematic wall–soil interaction. This seminar demonstrates that the kinematic component of interaction varies strongly with the ratio of wavelength to wall height (λ/H), asymptotically approaching zero for large λ/H, and oscillating between the peak value and zero for λ/H<2.3. Base compliance, represented in the form of translational and rotational stiffness, reduces seismic earth pressure by permitting the walls to conform more closely to the free-field soil displacement profile. This framework can explain both relatively low seismic pressures relative to M–O predictions observed in recent experiments with λ/H>~10, and relatively high seismic earth pressures relative to M–O from numerical analyses in the literature with λ/H=4.

Date : 17 December, 2015, Thursday
Time : 6:30 pm – 7:30 pm
Venue : Room ST111, Hong Kong Polytechnic University, Hung Hom

Registration: http://goo.gl/forms/3zjFknKqK2

Enquiry : Dr. Songye ZHU (ceszhu@polyu.edu.hk) Tel: 3400 3964

The seminar is free of charge. One-hour CPD certificate will be issued after the seminar.

Biography of Speaker

Jonathan P. Stewart is Professor and Chair of the Civil & Environmental Engineering Department at UCLA, where he has been since 1997. All of his degrees (BS, MS, PhD) are from UC Berkeley. Stewart's technical expertise is in geotechnical earthquake engineering and engineering seismology, with emphases on soil-structure interaction, ground motion characterization, performance of levees and other embankments, and ground failure. His work has impacted the US National Seismic Hazard Maps; the Global Earthquake Model; building code documents (ASCE-7); and guidelines documents for existing structures (ASCE-41), soil-structure interaction (NIST, 2012), and landslide hazards (SCEC, 2002). He is a former Chief Editor for the ASCE Journal of Geotechnical and Geoenvironmental Engineering and is the current Editor of Earthquake Spectra.

*** * * ALL ARE WELCOME * * ***

Map to the venue