



Vancouver Geotechnical Society

A Local Section of the
Canadian Geotechnical
Society

www.v-g-s.ca

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NOTICE OF UPCOMING TECHNICAL PRESENTATION

Thursday, 23 March 2023

TOPIC: Shear Wave-Velocity of Liquefied Soil: an Update

SPEAKER: Robert Kayen, Ph.D. –Professor, University of California, Berkeley.

Robert Kayen teaches Engineering Geology, extreme-event hazard-and-risk methods, and Engineering Geomatics at the Dept. of Civil and Environmental Engineering, U.C. Berkeley, and for nearly three decades has been a research scientist at the United States Geological Survey, Menlo Park, CA. Always sitting on the fence, he has a Ph.D. from U.C. Berkeley in Civil Engineering, Masters degrees in Civil Engineering & Earth Science, and an Undergraduate degree in Civil Engineering from Tufts University. He is one of the founders and a long-time steering committee member of the National Science Foundation (NSF)-sponsored GEER - Geotechnical Extreme Events Reconnaissance Association (www.geerassociation.org) and has received honors that include the Thomas Middlebrooks Award from ASCE. Since 1989, he has led and participated in over thirty earthquake or extreme-event missions for National Science Foundation and the USGS.

CONTENT: The shear-wave velocity (V_s) offers a means to determine soil's seismic resistance to liquefaction by a fundamental soil property. This talk will present the results of a decades-long international project to gather V_s site data and develop probabilistic correlations for seismic soil liquefaction triggering using shear wave velocity. The first correlation, published in 2013, analyzed 121 sites from the literature and 310 test sites we investigated in China, Japan, Taiwan, Greece, and the United States.

We are updating the initial correlation and have expanded the data set to approximately 650 sites, mainly through new testing of the M9.0 2011 Tohoku Earthquake, Japan, and the 2011 Christchurch and 2010 Darfield Earthquakes, New Zealand. Of critical importance, these new case histories occupy locations previously investigated by penetration testing. Bayesian regression and structural reliability methods facilitate a probabilistic treatment of the V_s catalog for performance-based engineering applications. Analysis of the uncertainties of the variables comprising both the seismic demand and the soil capacity is integral to the study and allows for the reduction of overall model error.

DETAILS: **Location:** Centennial Room, Executive Hotel, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6

Social Hour: 5:30 to 6:30 pm (drinks available at the hotel bar)

Technical Presentation: 6:30 to 7:30 pm (No need to RSVP)

Dinner: 8:00 pm (\$20 will be charged for dinner). If you would like to stay for dinner, please RSVP to Ali Jahanfar via email (ali.jahanfar@stantec.com) or at the door.