



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

WEDNESDAY, NOVEMBER 12, 2014

SUBJECT: Instrumented Becker Penetration Test for Liquefaction Assessment in Gravelly Soils

SPEAKER Dr. Mason Ghafghazi, P.Eng.
Post-doctoral scholar and lecturer, University of California Davis

Mason is a Project Scientist at the University of California Davis. He obtained his BSc. in Civil Engineering and MSc. in Geotechnical Engineering from Sharif University of Technology in Iran. In 2004, he came to Vancouver to work on his PhD at UBC. His PhD work focused on estimating the in-situ state parameter by modelling cone penetration. After completing an internship at the Golder Associates Burnaby office, he joined BC Hydro. At BC Hydro, Mason worked on evaluating seismic performance and internal erosion susceptibility in embankment dams and their foundations. He joined the University of California Davis as a post-doctoral scholar and lecturer in 2012 to work on liquefaction assessment in gravelly soils.

CONTENT: Characterisation of cohesionless soils is of interest to a number of geotechnical problems, including liquefaction potential assessment. In gravelly soils found in most alluvial deposits, performance of conventional methods such as SPT and CPT are adversely affected by the presence of larger particles. The Becker Penetration Test (BPT) is a widely used tool for characterisation of gravelly soils in North America. The test is performed by driving a closed ended pile into the ground and reporting the number of blows per foot of penetration after correcting for the hammer energy. Interpretation of data obtained using the conventional BPT system to estimate soil properties below the driving shoe has significant challenges. The main source of the difficulty is that a large percentage of the energy delivered by the hammer is absorbed by the frictional resistance developed along the pile shaft.

The instrumented Becker Penetrometer (iBPT) bypasses the shaft resistance issue by directly measuring the energy transferred from the driving shoe to the underlying soil. The iBPT penetration resistance is represented by per foot blow counts normalized to the energy measured behind the driving shoe, NB30. The improved NB30 profile obtained by the iBPT offers near perfect repeatability and robustness to the driving energy and shaft resistance. In order to enable the application of existing liquefaction assessment methods, a correlation is developed for estimating equivalent SPT N60 values from iBPT NB30. iBPT has been used at three sites in California where liquefaction of gravelly soils is a concern. Application of the continuous iBPT measurements provides improved liquefaction assessment in a wide range of materials including those with significant gravel content. The method is increasingly used in California and further testing is planned for a number of dams across the state.

DETAILS

Executive Inn, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6 (Phone: 604-298-2010)

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: 7:45 pm (\$30 will be charged for dinner)

If you would like to stay for dinner, please RSVP to Robyn Barnett via email or at the door Robyn.Barnett@tetrattech.com.