



Seismic Response of a High Plasticity, Diatomaceous Naturally Cemented Soft Clay Deposit

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Monday, April 4, 2016

3:00 pm – 4:00 pm – B218 Newmark CEE Laboratory



High plasticity deltaic estuarine clays (non-liquefiable NEHRP F sites) are the predominant soils in Guayaquil City in Ecuador. A new geotechnical characterization scheme for these soils was proposed based on geological studies, historical data of geotechnical and insitu explorations. Accordingly, some correlations were developed between geotechnical parameters and seismic response properties to characterize the Guayaquil soil deposits for dynamic analyses. Based on the calculated elastic and inelastic responses of these soils, a seismic zonation for the city was proposed. In addition, a detailed procedure for estimating a design site response spectrum for Guayaquil City's prevalent soil conditions was developed. The experimental results and numerical procedures presented in this research provide a framework for understanding the mechanical behavior of the estuarine-deltaic, high plasticity, diatomaceous, naturally cemented clay and provide key information for the design of engineered systems in Guayaquil and for cities worldwide, with similar geomorphological, seismic, and geotechnical characteristics.

Xavier Vera-Grunauer earned an undergraduate degree in Civil Engineering at the Catholic University of Santiago de Guayaquil (UCSG), MS degree at the National University of Mexico (UNAM), and a Ph.D in Geotechnical Engineering at the University of California, Berkeley. He has over 18 years of professional experience in the field of Civil Engineering. He has worked on various engineering projects; civil, petrochemical, offshore, and port projects in Ecuador, USA, Mexico and Peru. He is currently the Director of the Engineering Institute at the UCSG and CEO of Geostudios, a geoscience-consulting firm.

Refreshment will be provided!