



Department of Civil & Environmental Engineering
The Hong Kong Polytechnic University



香港
鋼結構學會

Hong Kong Institute of
Steel Construction



The Hong Kong Institution of Engineers
Joint Structural Division

Technical Seminar

Three-dimensional Seismic Analysis of Tall RC Core-Wall Buildings at Near-fault Regions and Design Implications

By **Dr. Marios Panagiotou**

Department of Civil & Environmental Engineering, University of California, Berkeley

Organized by

Young Members Group, The Hong Kong Institute of Steel Construction

Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University

Supported by

Joint Structural Division, The Hong Kong Institution of Engineers

Date :	26 March 2014 (Wednesday)
Venue:	Room QR404, The Hong Kong Polytechnic University, Hung Hom, Kowloon
Time :	6:15 pm (registration) for 6:30 pm to 8:00 pm

About the Seminar

Reinforced concrete (RC) core-wall buildings are a common type of construction for tall buildings in urban areas of high seismicity. When subjected to strong pulselike near fault ground motions (NFGM), these buildings develop major inelastic deformations, while due to higher modes and system effects they also develop large shear forces. Such level of deformations and forces can result in irreparable post-earthquake structural damage. Moreover, current seismic design philosophy for tall buildings does not attempt to ensure post-earthquake functionality. This philosophy may result in unprecedented economic and social losses, following a major earthquake. Presented first are recent research findings on the presence of multiple strong pulses in historical NFGMs. Next, a three-dimensional (3D) beam-truss modeling approach for the seismic analysis of RC wall buildings is discussed. Afterwards, using 2D and 3D nonlinear response history analysis, the response of 20-story RC core-wall buildings at near-fault regions of California is presented. Next, results from the full-scale shake table test of a 7-story RC wall building slice are presented. Finally, the analytical development of low-damage and post-earthquake functional 20-story tall reinforced concrete (RC) buildings using seismic isolation devices and new rocking core walls is discussed.

About the Speaker

Marios Panagiotou received his Ph.D. from University of California (UC) San Diego in 2008, where he was responsible for the seismic design and shake table testing of a full-scale 7-story RC wall building slice, the tallest structure ever tested in USA. He was awarded the 2012 Alfred Noble Prize bestowed by the American Society of Civil Engineers for his journal paper related to the 7-story building project. Currently, he is an Assistant Professor in the Civil and Environmental Engineering Department of UC Berkeley. His research includes the analytical and experimental development of earthquake-resilient structures, computational modeling of RC structures subjected to earthquake loading, soil structure interaction, and characterization of earthquake ground motions.

Official Language English will be the official language.

CPD Certificates This seminar is recommended for **1.5** CPD hours. Attendance certificate will be issued.

Free attendance but places are limited and priority will be given to Young Members Group (HKISC) members. Please send the completed **standard registration form** to **Mr. Jake Chan**, **by 12:00 noon, 22 March 2014** through **ymg@hkisc.org**. For more information, please contact Dr. Alfred Fong at 2601-9810.