

Current challenges in Geotechnical Earthquake Engineering

Dr Stavroula Kontoe

Senior Lecturer, Imperial College London

Seminar overview:

Recent seismic events (e.g. L'Aquila 2009, Italy; Christchurch 2010-2011, New Zealand; Tohoku 2011, Japan) have shown that the effects of earthquakes on the urban environment can be catastrophic even in countries with up to date seismic codes and an advanced construction industry. In most of these cases, the ground response is responsible for a significant part of the observed damage. Areas of urban development are often located in the vicinity of irregular topography (close to cliffs or within narrow valleys) and are therefore exposed to topographic amplification of the ground motion and/or are founded on fluvial deposits which are prone to soil liquefaction.

The first part of this seminar will focus on recent developments in predicting how topography modifies the seismic ground motion. Recent work at Imperial College demonstrated the interaction of topographic amplification with site response, suggesting that soil and topographic amplification peaks do not occur in the same frequency range. These findings have the potential to impact upon existing code prescriptions (e.g. EC8) that propose the application of a constant topographic aggravation factor across the entire frequency range without considering the bedrock depth or the interaction with the site response. The second part of the seminar will focus on soil liquefaction and will examine evidence from the 2010-2011 Christchurch seismic sequence which suggests that the vertical component of the ground motion may have a detrimental effect on soil liquefaction. This hypothesis will be further supported by a series of numerical analyses.



When and where:

Wednesday, 18 November, 18:00

Venue: TBA

Queries:

Orestis Adamidis
oa245@cam.ac.uk

Current challenges in Geotechnical Earthquake Engineering

Short biography:

Dr Stavroula Kontoe is a Senior lecturer in the Department of Civil & Environmental Engineering at Imperial College London. She received her degree in Civil Engineering from the National Technical University of Athens in 2001. Dr Kontoe continued her studies at the Department of Civil & Environmental Engineering at Imperial College, where she obtained an MSc in Soil Mechanics and Engineering Seismology in 2002 and a PhD in Computational Geomechanics in 2006. Her main research field is the development and application of numerical methods to study the performance of geotechnical structures under static, dynamic and seismic loading. Dr Kontoe has led a large number of research projects on the seismic performance of tunnels, retaining structures and dams, on site response analysis and its incorporation in seismic hazard studies, topographic effects on seismic ground motion, modelling vibrations induced by pile driving and slope stability in strain softening materials. She serves on various committees in her field (SECED, ISSMGE TC203, EAEE), sits on the editorial boards of *Géotechnique* (2013-2015) and *Computer & Geotechnics* and was awarded the 2008 BGA medal.



When and where:

Wednesday, 18 November, 18:00

Venue: TBA

Queries:

Orestis Adamidis
oa245@cam.ac.uk