

Department of Civil Engineering and Engineering Mechanics Columbia University

The Dongju Lee Memorial Lecture

Geotechnical implications of the M 7.1, M 6.3 AND M 6.0 Canterbury Earthquakes of 4 September 2010, 22 February 2011 and 13 June 2011

Professor Michael C R Davies
University of Auckland, Auckland, New Zealand
Vice President for Australasia and First Vice President of the ISSMGE



September 5, 2012 (Wednesday)
Time: 2:00 pm - 3:00 pm
Location: Davis Auditorium

In September 2010, February 2011 and June 2011 three large shallow earthquakes occurred in the Canterbury region of New Zealand. The magnitude of the first earthquake was M 7.1, the second M 6.3 and the third M 6.0. The epicentre of the 2010 earthquake was 44 km to the west of the central business district (CBD) of Christchurch - which, with a population of 390,300, is the second largest city in New Zealand - whilst the epicentres of both 2011 earthquakes were 6 km from the CBD. Although of a lower magnitude than the September 2010 earthquake, mainly as a result of the proximity of the epicentres to the CBD and the eastern and southern suburbs of Christchurch, the 2011 earthquakes resulted in significantly greater groundshock in these areas. This explains why the lower magnitude earthquakes had a more destructive effect on structures and lifelines; with a resulting greater number of casualties in the first of these. Geotechnical observations and implications of these earthquakes, such as surface fault rupture, rockfalls, liquefaction and lateral spreading are presented.

Biography: Professor Michael Davies has been the Dean of Engineering at the University of Auckland since May 2007. Prior to this, from 1997 he was the Professor of Civil Engineering at the University of Dundee in Scotland, where he was also Deputy Principal and Dean of Engineering and Physical Sciences. Professor Davies was previously a lecturer in the School of Engineering at Cardiff University, Wales. He obtained his first degree from King's College, University of London and his Masters and PhD degrees from Cambridge University. Following this he was a NATO/SRC Research Fellow at the University of California, Los Angeles. He is an Honorary Professor at the University of Dundee and is a Chartered Engineer.

Professor Davies' research embraces different forms of physical and analytical modelling. His most significant contributions to these fields have resulted from the application of the technique of geotechnical centrifuge modelling to investigate geotechnical boundary value problems. To facilitate this research he established geotechnical centrifuge research laboratories at both Cardiff University and the University of Dundee (in 1994 and 1999, respectively). Professor Davies' research interests range from land reclamation techniques to soil reinforcement, slope stability, earthquake engineering and constitutive modelling of soils. In addition to his research in mainstream geotechnical engineering, he has worked in collaboration with engineers and scientists at the interface between geotechnical engineering and engineering geology and other disciplines, such as climatology and biology. Interdisciplinary research projects have included the effects of global warming on alpine slope stability and the use of vegetation to stabilise slopes. In recognition of the novel research he initiated at the interface between plant biology and geotechnical engineering Professor Davies was appointed as an Honorary Professorial Fellow of the Scottish Crop Research Institute in 2001. In 2003 he was elected a Fellow of the Royal Society of Edinburgh (Scotland's National Academy of Science & Letters).

Throughout his career Professor Davies has participated very actively in learned society and other professional activities. He has been Chairman of the Institution of Civil Engineers Wales - Ground Engineering Group (of which he was a founding member), Chairman of the Institution of Civil Engineers - Scottish Geotechnical Group and, most notably, from 2005 to 2007 Chairman of the British Geotechnical Association. In 2008 he was elected as a member of the Management Committee of the New Zealand Geotechnical Society.

<http://www.civil.columbia.edu/ling/seminar>

The Dongju Lee Memorial Lecture was established with a generous contribution from the Lee Family. DJ, as Dongju preferred to be called, passed away on February 26, 2003 while he was a student working toward the doctoral degree. We would like to express our gratitude to DJ's father, Prof. Yong-won Lee, for his support in establishing the Lecture and an Award. DJ obtained his Master's and Professional degrees from Columbia University