Organised by Civil & Structural Technical Committee, Special Task Division
and Jointly Organised With Aurecon Group

Digital Innovation in Geotechnical Engineering

Date: 4 August 2017

Time: 1pm to 5pm

Venue: Furama Riverfront Hotel
405 Havelock Road
Singapore 169633
Venus II, Level 3

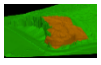
Fees:
$100 (Members)
$180 (Non Members)

CPD Program:
STU (Structural) – Pending Approval
PDU – Subject to Approval

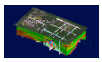
12.45pm	Registration
1.00pm	Opening Address by Special Task Division Chairman: Er. Jonathon Kok
1.15pm	Recovery and Resilient Design for the Future – a Case Study from Christchurch, New Zealand *By: Ms. Camilla Gibbons*
2.15pm	Geotechnical Seismic Design in Maritime Structure *By: Mr. Andy Fung*
3.15pm	Tea Break
3.45pm	Using Digital Innovation to Reduce Uncertainty in Geotechnical Engineering *By: Ms. Camilla Gibbons*
4.45pm	Question & Answer
4.55pm	Token of Appreciation
5.00pm	End of Seminar

Fees Include:

7% GST and 1 Tea- Break* **(No pork, No Lard – Should you require HALA Certified food, please indicate in the registration form)**



Complimentary Car Park Coupons*



E -cert will be sent within 1 Working Week based on Time Out

Recovery and Resilient Design for the Future – a Case Study from Christchurch, New Zealand

The city of Christchurch on the east coast of New Zealand's South Island experienced multiple major earthquakes starting in 2010 and peaking in 2011 centred on the city. Widespread damage occurred to properties, infrastructure and roads. In the six years since, significant work has been undertaken to recover from the disaster, much of which is ongoing. The south of the city extends up the flanks of the extinct Lyttelton Volcano. The steep north-facing basaltic slopes have various cliffs and many suffered significant collapses during the earthquakes. Additionally, large quantities of boulders were released from the many rock outcrops above residential areas. A vast amount of geotechnical information was gathered, analysed and used by the government in the subsequent hazard zoning of the land across the city.

This paper describes the early emergency response and recovery work undertaken by the Canterbury Earthquake Recovery Authority (an agency formed in response to the earthquakes by the New Zealand Government) and the engineering community. The wider recovery efforts are briefly described, particularly the implications of the land zoning on future events and the robustness of the engineering designs to provide resilient solutions to withstand future earthquake events. The paper discusses engineering implications of the zoning using a case study of the key cliff collapse and large mass movement area. Shag Rock Reserve, located in Sumner, is a local reserve area with an 80m high historic sea cliff, at the western end of which lies the Deans Head landslide comprising 50,000m3 of soil at risk of landslide failure. The basaltic cliff receded approximately 20m horizontally during the major earthquake events, and the landslide cracks totalled >1.5m. The project to reduce the risk from cliff collapse and mass movement to the lifeline road below, required close collaboration between the Christchurch City Council and the Canterbury Earthquake Recovery Authority, local iwi (indigenous tribes), engineers, project managers, the city's infrastructure rebuild team, insurance companies, local businesses and various other stakeholders.

Ms. Camilla Gibbons is a Chartered Engineering Geologist with experience in geotechnical engineering. Her main skills include geohazard analysis and mitigation, geotechnical emergency response, demolition of residential properties in hazardous locations, assessment and mitigation of rockfall, cliff collapse and landslide risks, planning and supervision of large geotechnical site investigations, slope stability analysis, design of mechanically stabilised slopes, in addition to project management. Camilla has led major geotechnical ground for tunnels, metros, large industrial infrastructure and offshore structures in addition to smaller commercial and residential investigations and slope stability investigations and monitoring schemes. Camilla currently leads the Geohazards Team in Christchurch.

Geotechnical Seismic Design in Maritime Structure

Southeast Asia is currently experiencing a busy moment of port development with no less than five major projects underway. These projects are located in a region of variable seismic hazard, ranging from high seismic hazard associated with the subduction process beneath the Indonesian and Philippine archipelagos to moderately low seismic hazard across a large stable region that contains the Malaysian peninsula and Singapore. With the increasing importance of such infrastructure to the countries' economies, greater emphasis has been placed to consider the seismic effects in the design of these structures even in areas with low seismic activities. This talk will cover the geotechnical design aspects in the following areas:

1) Current geotechnical seismic design considerations from the in-situ and laboratory tests and analysis methods,
2) National requirements,
3) Cost vs acceptable geotechnical design risks,
4) Aurecon recent project experiences

Mr. Andy Fung is a Chartered Professional Civil Engineer with 16 years of consulting, construction experience in a wide range of civil, building, transport and maritime infrastructure projects in Singapore, Indonesia, Malaysia, and Australia. He had designed and supervised the construction of various industrial building structures, bridges, jetties, foundations and retaining systems. He has experience working in the offshore marine environment; from planning to marine operation as offshore site manager and lead engineer in offshore geotechnical site investigations. His technical expertise is in port and marine development, maritime structural design, soil characterisation and interpretation for foundation engineering design.

Using Digital Innovation to Reduce Uncertainty in Geotechnical Engineering

Digital technology is playing an ever increasing role in all forms of the engineering industry. As clients place more and more emphasis on efficient designs and winning tenders becomes more about shaving off the "buffer" in designs, geotechnical engineers are finding there is ever decreasing room for error and greater accuracy and reliability on geological and geotechnical interpretations at earlier stages in projects and designs are required.

One way of overcoming this, or at least reducing the risks involved, is to improve our understanding of the ground conditions using digital technology. The industry in Christchurch, New Zealand has taken a leap forward in terms of innovation in engineering as a result of having to find efficient ways to meet the new seismic design criteria whilst keeping costs to a minimum for clients.

This talk will cover some of the new innovative, digital techniques that have become part of the normal daily work for Aurecon's Christchurch office. The talk will cover aspects of digital terrain modelling, survey monitoring and laser scanning, three dimensional modelling of buildings, tunnels and other structures and how these interact with the ground. Applications for virtual reality and real time digital data capture and review in addition to the use of remote controlled excavators to access high risk areas.

The digital techniques however are only part of the innovation that has been driven forward since the earthquakes, other aspects of geotechnical engineering innovation are a little more traditional, designing buildings to be resilient in future events, not just for seismic situations, but for various types of disruption, monitoring settlement underneath new motorway embankments using "digital geosynthetics", developing efficient ground improvement methods to reduce the risk of liquefaction and develop modern heating systems using centralised ground sourced heating systems for multiple commercial buildings.

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TERMS & CONDITIONS

Registration

1. Registration is based on first come first served. Please click HERE to register

2. Booking through phone will not be entertained.

Payment Mode

1. Payment via VISA/Master online

2. Payment via AXS Machine (Please click HERE for procedure). Remember to retain your receipt for verification.

3. Payment by Crossed Cheque payable to "**IES**"

*For cheque payment, please indicate Participate name & Event name at the back of the cheque and send to:

The Institution of Engineers, Singapore
70 Bukit Tinggi Road
Singapore 289758
Attn: Shelly Ng

Confirmation of Course

Confirmation of registration will be given 5 days prior to the commencement date of event via email. Otherwise, please call Ms Shelly Ng @ 6461 1222 to check on your confirmation.

(Please remember to check your Junk/Spam folder if you did not receive the confirmation)

Cancellation

In the event that participants are not able to attend, please inform us in writing **at least 3 working days** before the event date. Otherwise **full payment** is still applicable even if you did not turn up for the talk.

(Please be informed that there will be a cancellation charge of 4.5% if cancelled by participant)