



The Institution of Engineers, Malaysia

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Submarine Landslide Flows Simulation Through Centrifuge Modelling

Organised by the Geotechnical Engineering Technical Division, IEM
BEM Approved CPD/PDP Hours: 2 Ref No: IEM15/HQ/024/T

Date : 25 March 2015 (Wednesday)
Time : 5.30 pm – 7.30 pm
Venue : Tan Sri Prof. Chin Fung Kee Auditorium, 3rd Floor
Wisma IEM, Petaling Jaya
Speaker : Engr. Dr. Gue Chang Shin

SYNOPSIS

Landslides occur both onshore and offshore. However, little attention has been given to offshore landslides (submarine landslides). Submarine landslides have significant impacts and consequences on offshore and coastal facilities. The unique characteristics of submarine landslides include large mass movements and long travel distances at very gentle slopes. This talk will focus on the development of centrifuge scaling laws, for submarine landslide flows through the study of simulating submarine landslide flows on a very gentle slope in a mini-drum centrifuge. A series of tests were conducted at different gravity fields in order to understand the scaling laws involved in the simulation of submarine landslide flows. The model slope was instrumented with miniature sensors for measurements of pore pressures at different locations beneath the landslide flow. A series of digital cameras were used to capture the landslide flow in flight. The Depth Averaged Material Point Method (DAMPM) was used in the numerical simulations to deal with large deformation such as the long run-out of submarine landslide flows. Parametric studies were performed to investigate the validity of the developed centrifuge scaling laws under the initial and boundary conditions given in the centrifuge tests. Both the results from the centrifuge tests and numerical simulations appear to follow the proposed centrifuge scaling laws, which differ from the conventional centrifuge scaling laws. The results provide a better understanding of the centrifuge scaling laws that need to be adopted for centrifuge experiments involving submarine landslide flows, as well as giving an insight into the flow mechanism involved in submarine landslide flows.

PROFILE OF SPEAKER



Engr. Dr. Gue Chang Shin obtained his B.Eng. degree in Civil Engineering from the Universiti Teknologi Malaysia in 2003. Upon graduation he worked as a Project Engineer in a geotechnical specialist contracting firm in Malaysia before pursuing his postgraduate studies at Imperial College London, UK where he obtained his MSc in Soil Mechanics. He then joined G&P Geotechnics Sdn Bhd as a geotechnical engineer. He was later offered a guest research fellowship at the Norwegian Geotechnical Institute (NGI) / International Centre for Geohazards (ICG), before he pursued his PhD at the University of Cambridge, which was partially funded by NGI/ICG and the Special Cambridge Malaysia Bursary of the Cambridge Commonwealth Trust. He then returned to NGI, Norway as a Post-Doctoral Fellow. He is now a Geotechnical Manager at NGI-G&P (a joint venture between NGI and G&P) in Malaysia. He is also a Committee Member of IEM Geotechnical Engineering Technical Division.

Ir. Yee Thien Seng
Chairman
Geotechnical Engineering Technical Division, IEM

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