

## *Woh Hup Distinguished Lecture*

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Department of Civil and Environmental Engineering

# Recent developments in the modelling of slope failure for flood defences

By

**Professor Michael A. Hicks**

*Head of the Section of Geo-Engineering*

*Chair of the Department of Geoscience and Engineering*

*Faculty of Civil Engineering and Geosciences, Delft University of Technology*

**Date:** Friday, 20 July, 2018  
**Registration:** 4.30 pm to 5.00 pm  
**Time:** 5.00 pm to 6.30 pm  
**Refreshment:** 6.30 pm  
**Venue:** Lecture Theatre 2,  
Faculty of Engineering,  
National University of Singapore



Click [here](#) to register

## Abstract

The spatial variability of soil properties leads to uncertainty in the ground conditions, as well as influencing material behaviour and geo-structural response. This lecture reviews recent geotechnical research at Delft University of Technology into the modelling of slope failures associated with flood defence systems. The focus is on preliminary 2D and 3D modelling of retrogressive, large-deformation slope failures in heterogeneous soils using the Random Material Point Method. However, it also includes an overview of two other current research projects: “Reliable Dykes”, involving a full-scale field test and the development of reliability-based geomechanical assessment tools for dykes and embankments; and “Role of Scour Protection on Prevention of Static Liquefaction-Induces Flow Slides”, involving physical modelling using a large purpose-built liquefaction tank.

## Speaker Biography

Michael Hicks is Professor of Soil Mechanics, Head of the Section of Geo-Engineering, and Chair of the Department of Geoscience and Engineering at the Faculty of Civil Engineering and Geosciences of Delft University of Technology. Previously he was Senior Lecturer at the University of Manchester, where he also obtained his



undergraduate and PhD degrees. He has over 30 years' experience in the development and application of novel finite element codes in geotechnical engineering, specialising in constitutive modelling, soil heterogeneity, static liquefaction, strain localisation, stochastic analysis, adaptive mesh refinement and the material point method. Current projects include: probabilistic slope stability assessments for embankments, accounting for uncertainties associated with soil variability; the role of large deformation analysis, both in the evolution and consequences of slope failure and in the ultimate limit state design of dykes; and mitigating the liquefaction potential of scour holes near the Oosterschelde Storm Surge Barrier in the Netherlands.

Professor Hicks is a member of the European network ALERT Geomaterials and has chaired several international conferences, including Géotechnique's 2005 Symposium in Print, "Risk and Variability in Geotechnical Engineering", the 8th European Conference on Numerical Methods in Geotechnical Engineering (Delft, 2014), and the 4th International Symposium on Cone Penetration Testing (Delft, 2018). He is on the Editorial Boards of the international journals "Computers and Geotechnics" and "Georisk", and was awarded the Institution of Civil Engineers' Geotechnical Research Medal in 1998 for a Géotechnique paper on the static liquefaction of the Nerlerk underwater berm.

**General Enquiry/Registration: Ms Norela Tel: 6516 4314, Email: [nor@nus.edu.sg](mailto:nor@nus.edu.sg)**

**\*\*\*Seats are limited. Please register early. All are welcome and admission is free\*\*\***

## Location Map

