



**Malaysian Geotechnical Society**

Webinar Talk on  
**PREDICTION AND PREVENTION OF  
GEOTECHNICAL FAILURES**

CPD Hours Approved: 2 Ref: IEM21/PP/001/T (w)

**9 March 2021 (Tuesday), 5.00 pm – 7.00 pm**



**Emeritus Professor Malcolm Bolton**  
Cambridge University

**Registration Fee**

MGS / GeoSS / IEM Members: **Free** Non Members: **RM20.00**

[Click here to register](#)

The Zoom link will be emailed to the registered participants prior to the event.

Non members may pay the registration fee of RM20.00 per person to:

Payee: **Pertubuhan Geoteknikal Malaysia or Malaysian Geotechnical Society**

Bank Account No: **28100012316**

Bank Name: **Hong Leong Bank Berhad**

Please email the payment proof for verification purpose and for the issuance of the official receipt.

## ABSTRACT

In the last 50 years the geotechnical profession has attempted to improve the reliability of designs by writing a new generation of Codes of Practice that require design calculations to prevent anticipated limit states. It is assumed that this entails predicting the loads and resistances that may occur in the field, and applying factors to ensure that the probability of the load exceeding the resistance will be acceptably small. However desirable this may be, it may not actually be possible, even in principle. Furthermore, Codes generally focus on ultimate limit states of soil failure, defined using parameters  $c$  and  $\phi$ . Once  $c$  and  $\phi$  are chosen, Codes then specify factors that should be applied for the assurance of safety. This approach is fundamentally flawed, and itself leads to unquantifiable uncertainty. The agenda of Reliability Based Design may similarly be impossible to deliver.

The lecturer will attempt to substantiate these claims, and make alternative recommendations that should be helpful both to infrastructure owners and to practising geotechnical engineers whichever Code of Practice they follow. Emphasis will be given to three stages of best-practice decision-making:

- Declaring worst-credible design scenarios
- Identifying possible failure mechanisms
- Selecting worst-credible design parameters

Specific examples will include: walls retaining sand subject to earthquakes, clay slopes subject to seasonal creep, and spread foundations on sand.

## BIOGRAPHY

Malcolm Bolton graduated in 1967 from Cambridge and went to Manchester University where he took an MSc by research in structural engineering before switching to geotechnics and taking up centrifuge testing as a Lecturer. He returned to Cambridge in 1980 and is now Emeritus, having served as Professor of Soil Mechanics, Director of the Schofield Centre for Geotechnical and Construction Modelling, and Head of the Geotechnical and Environmental Group prior to his retirement in 2013. He is a Fellow of the Royal Academy of Engineering and holds various awards from the UK Institutions of Civil Engineering and Structural Engineering, the British Geotechnical Association and the Canadian Geotechnical Society. He was founding chairman of the ISSMGE Technical Committee on Geo-Mechanics from Micro to Macro (GM3). He collaborated on piles with the Giken company of Japan for 25 years, and was the founding chairman of the International Press-In Association. And he served for 4 years on the Slope Stability Technical Review Board for the Hong Kong Government. He helped to draft BS8002 Earth Retaining Structures and hopes to see fundamental improvements made to Eurocode 7 which has subsumed it. He has over 250 publications on topics ranging from fundamental soil mechanics to a wide variety of geotechnical engineering applications.

**Ir. Liew Shaw Shong**  
**President**  
**Malaysian Geotechnical Society**

