

Technical Talk on “Insights from Reliability-Based Design to Complement Eurocode 7 Design Approach”

by the Recipient of the 2019 Thomas A. Middlebrooks Award from the American Society of Civil Engineers (ASCE)

(Organised by Geotechnical Engineering Technical Division, IEM)

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Date : 8th Aug 2019 (Thursday)
Time : 5.30 pm – 7.30pm (*Refreshments will be served at 4.45 pm*)
Venue : Tan Sri Prof. Chin Fung Kee Auditorium,
3rd Floor, Wisma IEM, PJ
Speaker : Ir. Dr. **LOW BAK KONG (B.K. Low)**, Fellow ASCE
Assoc. Prof. Nanyang Technological University, Singapore

SYNOPSIS

Reliability-based design (RBD) can overcome some limitations and ambiguities in partial factor design approaches like the Eurocode 7 (EC7) approach and the Load and Resistance Factor Design (LRFD) approach. However, most practitioners are unfamiliar with the concepts and procedure of RBD using the first-order reliability method (FORM). In contrast, EC7 and LRFD principles are easier to understand. Hence RBD-via-FORM cannot replace EC7 or LRFD at this stage. But RBD-via-FORM can play a valuable complementary role to EC7 and LRFD, for example in situations with parameters not covered in EC7, different parametric sensitivities across different problems, cross-correlated or spatially autocorrelated parameters, and design aiming at a target reliability or failure probability. The aim of this talk is to show how RBD-via-FORM can complement EC7. Intuitive perspective and efficient procedure on RBD-via-FORM are offered. Insights from RBD for three geotechnical engineering examples are presented. The differences and similarities between the design point in RBD and those in EC7 are explained. The ability of RBD-via-FORM to provide valuable information at its design point and to automatically reflect parametric uncertainties, correlations and case-specific sensitivities and to resolve subtle load-resistance duality is demonstrated. It is suggested that RBD-via-FORM can be conducted in tandem with partial factor design methods like EC7 and LRFD in order to overcome limitations and ambiguities which sometimes arise in the latter.

SPEAKER'S BIODATA

<http://alum.mit.edu/www/bklow>
https://www.asce.org/templates/award-detail.aspx?id=1489&all_recipients=1



Ir. Dr. Low Bak Kong (B. K. Low) obtained his BS and MS degrees from MIT, and PhD degree from U.C. Berkeley. He is a Fellow of the American Society of Civil Engineers (ASCE), and a registered professional engineer of Malaysia.

He is the recipient of the 2019 Thomas A. Middlebrooks Award, a prestigious award from ASCE, for his paper "Insights from Reliability-Based Design to Complement Load and Resistance Factor Design Approach," that appeared in the November 2017 issue of Journal of Geotechnical and Geoenvironmental Engineering.

Apart from his long teaching and research career at NTU Singapore, he also conducted research while on sabbatical leaves at HKUST (Sept-Dec 1996), University of Texas at Austin (Jan-April 1997) and Norwegian Geotechnical Institute (May- August 2006). Courses he taught over his years at NTU include topics on engineering geology, soil improvement methods, soil mechanics, foundation engineering, earth retaining structures, soil slope stability, rock slope stability, calculus, informal logic and writing skills, applied statistical methods, stereographic projection, rock mechanics and underground rock engineering.

Ir. SIN PENG TEAN.

Chairman,

Geotechnical Engineering Technical Division, IEM

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