Synopsis
You would have heard of the old Chinese saying: 愚公移山(yu gong yi shan). Before the advent of mechanization, you would literally be called a fool (if not mad) to attempt to move a mountain. Every sane person knows that moving/removing mountains is in the realm of planetary geologic forces only at the disposal of Mother Nature. Nowadays, we really move mountains on a routine basis within a geologic blink of an eye in land reclamation works. There is a bunch of unassuming professionals called geotechnical engineers who play a critical role in these literally earth moving activities. The name “geotechnical engineers” won’t ring a bell with the general public, but you may like to know that some of us are living or driving on land created out of the sea by these engineers.

This lecture presents an unfolding story of how our research group in NUS worked hand in hand with our research partners in government agencies and local consultants to contribute to this nation building activity. Land reclamation has traditionally been carried out using sand, which is currently in short supply. The research challenge essentially boils down to a search for a viable alternate material in place of sand for future reclamation works. We are by no means the first to encounter this challenge nor would our eventual research outcomes have the final say this search in any definitive way. Now, looking for an "alternate" material sounds rather simple like choosing between Pepsi or Coke in 7‐eleven, until one realizes the immense scale (millions of cubic metres of materials) associated with a typical reclamation project. This sheer scale essentially eliminates almost all engineered materials (too costly to manufacture), all natural materials from other countries (possible but one needs to calculate the
dollars and cents very carefully), and we are left with only locally available natural materials - which is essentially sand and sea bed clay. If we do not consider sand, it so happens that the other abundantly available natural material, clay, is as bad for reclamation as sand is good (kind of evil twin). Overall, we are facing a rather massive challenge, but it should be fun to see if we can make a dent with our research. The pay back is huge if we can solve the details.

**Biography**

Kok-Kwang PHOON is Provost’s Chair Professor in the Department of Civil and Environmental Engineering, National University of Singapore (NUS). His research interests broadly lie in geotechnical engineering. He was conferred the Norman Medal in 2005, which is the highest and most prestigious technical paper award bestowed by the American Society of Civil Engineers. He was the recipient of the NUS Outstanding Researcher Award and the NUS Annual Teaching Excellence Award in 2010. He was appointed the Kwang-Hua (光华) Chair Professor by Tongji University, China in 2010. He is the Editor-in-Chief of Georisk and has served as the Scientific Advisor to the International Centre for Geohazards, Board Member of the Civil Engineering Risk and Reliability Association, Board Member of the International Association for Computer Methods and Advances in Geomechanics, Strategic Advisory Board Member, Taiwan Building Technology Centre, National Taiwan University of Science and Technology, and Scientific Council Member to the Inter-Polytechnic Doctoral School of Italy. He is a Professional Engineer in Singapore, past President of the Geotechnical Society of Singapore, Fellow of the Institution of Engineers Singapore and Fellow of the American Society of Civil Engineers.