



Vancouver Geotechnical Society

A Local Section of the Canadian Geotechnical Society

www.v-g-s.ca

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NOTICE OF UPCOMING TECHNICAL PRESENTATION

WEDNESDAY, APRIL 16, 2014

SUBJECT: **Less is more: Step Zero and back of the envelope calculations**

SPEAKER **Professor David Muir Wood**
University of Dundee, UK

David Muir Wood read Mechanical Sciences at Cambridge University, graduating in 1970. He received his PhD there in 1974 for research on the true triaxial behaviour of clays, followed by a lectureship at Cambridge from 1975-1987.

He held the Cormack Chair of Civil Engineering at Glasgow University until 1995 when he was elected to the Chair of Civil Engineering at Bristol University, becoming Dean of the Faculty of Engineering in 2003. He was Professor of Geotechnical Engineering at Dundee University from 2009-2014. He is now Affiliated professor in geotechnik at Chalmers University, Göteborg, Sweden. He was elected a Fellow of the Royal Academy of Engineering in 1998 and Fellow of the Royal Society of Edinburgh in 2012.

David Muir Wood's current research explores themes concerned with the particle continuum duality of soils. He is developing constitutive models for soils with breakable particles, for soils whose finer particles are being transported away by internal flow of water, and for soils whose mechanical response is improved by the addition of short flexible fibres. The ongoing challenge for each of these is to obtain appropriate experimental data to support the modelling hypotheses.

He has written four books: Soil behaviour and critical state soil mechanics (1990), Geotechnical modelling (2004), Soil mechanics: a one-dimensional introduction (2009), Civil engineering: a very short introduction (2012).

CONTENT: Before embarking on complex numerical modelling or physical modelling, Step 0 is 'to write down the answer'. If you have no idea what answer to expect then you will not recognise when the modelling has gone awry. Step 0 estimates are best supported by 'back of the envelope' calculations which may be based on simplified modelling which manages to include the important mechanisms of response. 'System' as opposed to 'element' treatment is often possible.

One example is the use of parabolic isochrones for analysis of consolidation. Such a system model can be used to estimate the progress of consolidation around an embankment on soft clay with vertical drains.

The volume shrinkage that occurs in cement/soil mixtures as the cement hydrates leads to pore pressure changes. Careful consideration of the processes involved leads to a rather simple governing equation for which an analytical solution is available. The problem of an

undersea pipeline sliding on a consolidating interface is also amenable to rather simple treatment.

These are examples in which formulating the problem in terms of dimensionless quantities produces results which may be approximate but are capable of rather general application - particularly in support of Step 0 estimates.

DETAILS

Executive Inn, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6 (Phone: 604-298-2010)

Social Hour: 5:30 to 6:30 pm (drinks available at the hotel bar)

Technical Presentation: 6:30 to 7:30 pm

Dinner: 7:45 pm (\$30 will be charged for dinner)

If you would like to stay for dinner please RSVP to ali.amini@shaw.ca or at the door with Robyn Barnett.