



**Australian Geomechanics Society**

*Sydney Chapter*

Auditorium: Ground Floor, 8 Thomas Street, Chatswood

**TECHNICAL PRESENTATION**

**Wednesday 10 March 2010**

Light refreshments at 5.30 PM prior to 6.00 PM meeting



## The 2010 EH Davis Memorial Lecture

# Recent Advances in the Application of Vertical Drains and Vacuum Preloading in Soft Soil Stabilization

**Speaker: Professor Buddhima Indraratna**

University of Wollongong, Australia

### SYNOPSIS

Pre-construction consolidation of soft formation soils by applying a surcharge load alone often takes too long. Moreover, attributed to the low permeability and high thickness of low-lying clay deposits, the required surcharge load to achieve more than 90% degree of consolidation can be excessively high over a prolonged period. A system of vertical drains combined with vacuum pressure and surcharge preloading has become an attractive ground improvement alternative in terms of both cost and effectiveness. This technique accelerates soil consolidation by promoting rapid radial flow, decreasing the excess pore pressure while increasing the effective stress.

Over the past 15 years, Prof. Buddhima Indraratna and his co-workers have developed numerous experimental, analytical and numerical approaches that simulate the mechanics of prefabricated vertical drains (PVD) and vacuum preloading including both two-dimensional and three-dimensional analyses and more comprehensive design methods.

This lecture presents an overview of the theoretical and practical developments and salient findings of soft ground improvement via PVD and vacuum preloading with applications to selected case histories in Australia, Thailand and China.

*Attendance may be credited (1 point) towards Continuing Professional Development requirements. Members are responsible for recording CPD for audit purposes.*

Booking is not required.

For further information contact Mark Adams (mark.adams@arup.com.au)



**ENGINEERS  
AUSTRALIA**  
Sydney Division



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### Brief CV

Prof. Buddhima Indraratna is a Civil Engineering graduate from Imperial College, University of London, and completed his Masters degree in Soil Mechanics also at Imperial College and subsequently his PhD in Geotechnical Engineering at University of Alberta, Canada. Having worked in Geotechnical Industry for a number of years, he decided to join academia.

Currently he is Professor of Civil Engineering, and Head of School of Civil, Mining and Environmental Engineering at University of Wollongong. He is also the Director of the Centre for Geomechanics and Railway Engineering.

He was a recipient of Swedish Geotechnical Society award for Contributions to Ground Improvement in 1999, and in 2007 he received Robert Quigley award from the Canadian Geotechnical Society for his contribution to ground improvement for an article on soil consolidation published in the Canadian Geotechnical Journal. In 2008, Prof. Indraratna was awarded the Medal for Outstanding Contributions to the Region by the International Association for Computer Methods and Advances in Geomechanics. In 2009, he was the recipient of Business and Higher Education Round Table Award sponsored by the Australian Commonwealth for Outstanding R & D Contributions to Australian Rail Track Innovations.

Prof. Indraratna has been an active geotechnical consultant and a UNDP expert for various geotechnical projects in both Australia and overseas. He has been a Keynote Speaker and Special Guest Lecturer at over 25 international conferences. He has published over 300 articles in refereed journals and conferences, and the author of 4 books. He has supervised 35 PhD students in his career thus far. His research contributions to geotechnical engineering have been significant across a wide range of subject areas covering soft clay engineering, ground improvement, transportation geomechanics, embankments and dam engineering, waste materials utilisation and physical modelling of geotechnical processes.

He is a Fellow of the Institution of Engineers Australia, Fellow of American Society of Civil Engineers and a Fellow of the Geological Society, London.

Prof. Buddhima Indraratna is the 2009 E.H. Davis Memorial Lecturer of the Australian Geomechanics Society.

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