



Vancouver Geotechnical Society

A Local Section of the
Canadian Geotechnical
Society

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NOTICE OF UPCOMING TECHNICAL PRESENTATION

Wednesday, February 3, 2016

SUBJECT: Geomechanics and Control of Soft Mine Floors and Sides

SPEAKER: Dariusz Wanatowski – Ph.D., Associate Professor and Head, Department of Civil Engineering, University of Nottingham Ningbo China (UNNC)

Dr. Dariusz Wanatowski is Associate Professor in Geomechanics in the Department of Civil Engineering at the University of Nottingham, UK. In January 2013 he was appointed as Head of Department of Civil Engineering at University of Nottingham Ningbo, China.

Dr. Wanatowski graduated with MSc Eng in Civil Engineering from Poznan University of Technology, Poland in 1999. Between 1999 and 2001 he worked as a teaching and research assistant at the same university where he was lecturing soil mechanics and foundation engineering courses. He was also involved in several research projects, including effects of various improvements of subgrade on its bearing capacity and experimental investigation of engineering properties of various organic soils. He obtained his PhD from Nanyang Technological University, Singapore in 2006. Prior to joining the Nottingham Centre for Geomechanics of the University of Nottingham in February 2006 Dr. Wanatowski also worked as a post-doctoral researcher at NTU on effects of strength and stiffness anisotropy of geomaterials on the stability and deformation of tunnels.

Dr. Wanatowski's general research interests are focused on experimental geomechanics, particularly strain softening and instability behaviour of granular soils, strain localization in sands, strength and stiffness anisotropy of geomaterials, and effects of intermediate principal stress on the strength and deformation characteristics of soils. More recently, he has focused his research interests on application of soil and rock mechanics principles to mining problems. As a result, he has been working with several European collaborators on mining projects funded by European Commission's Research Fund for Coal and Steel (RFCS). He has published more than 30 journal papers and more than 50 international conference papers.

He is the Editor-in-Chief of the Geotechnical Research, the first Gold Open access journal published by Institution of Civil Engineers in the UK. He is Co-Editor of Geotechnical Engineering, Journal of SEAGS and AGSSEA. Dr. Wanatowski serves as a member of two Technical Committees of International Society for Soil Mechanics and Geotechnical Engineering, TC-208 on Stability of Natural Slopes and TC-303 on Coastal and River Disaster Mitigation and Rehabilitation.

CONTENT: European collieries suffer from severe floor and side deformation due to depth, tectonic stress and the soft strata within and beneath the seams which are also vulnerable to degradation over time, particularly when wet. This presentation will summarize findings from the recently completed research project 'GEOSOFT' funded by European Commission's Research Fund for Coal and Steel. The project developed and applied improved means of measuring, representing and analyzing this behaviour and its interaction with mine support, both in the laboratory and in the field. Its objectives were to improve our understanding of the phenomena and develop enhanced design and construction solutions utilizing stress control, shotcrete, improved reinforcement and/or closed support structural sections. The research partners have come from the UK, Spain and Poland and included industry representatives, consultants and research bodies.

This presentation will focus on geotechnical aspects of the project, including laboratory testing of soft strata carried out on intact, reconstructed and broken samples in order to obtain the strength and stiffness parameters that could be fed into numerical modelling of underground situations. Although coal measure rock types are not normally thought of as demonstrating time dependent (creep) properties, it is known that some roadways driven in soft coal measure rocks demonstrate increasing and continuous closure despite there being no apparent changes to stress conditions in their vicinity, once driven. As a result, attempts were also made using a variety of techniques to measure whether time dependent properties could be identified in both intact and broken samples. The laboratory results were then used to develop and modify numerical constitutive models in FLAC 3D for simulating observed time dependent behaviour of soft materials. Finally, a numerical model of a case study from UK Coal was compared with in-situ closure measurements taken from mine roadways taking into account the time dependent content of this closure predicted by the model.

DETAILS: **Location:** Executive Inn, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6
Social Hour: 5:30 to 6:30 pm (drinks available at the hotel bar)
Technical Presentation: 6:30 to 7:30 pm (No need to RSVP)
Dinner: 7:45 pm (\$30 will be charged for dinner)

If you would like to stay for dinner, please RSVP to Shane Magnusson via email or at the door shane.magnusson@amecfw.com