



Geological Investigations and Ground Characterisation for Tunnelling and Cavern Construction

(14 PDUs)

Workshop Details

Venue : CEE Seminar Room B
(BLK N1, B1b-14), NTU
Date : 11 – 13 November 2009
Time : 9:00AM–17:00PM

Speakers:

- ★ **Prof. Wulf Schubert**
Graz University of Technology,
Austria
- ★ **Prof. Kurt Klima**
Graz University of Technology,
Austria
- ★ **Dr. Cai Jun Gang**
Tritech Consultants Pte Ltd

Organised by:



Society for Rock Mechanics & Engineering Geology (Singapore)

Supported by:



Graz University of Technology, Austria

Protective Technology Research Centre,
Nanyang Technological University

Synopsis:

Following two very successful short courses on Engineering geology, rock mechanics and tunneling in 2007 and NATM and Observational Methods in Rock Tunnelling in 2008. Professors Schubert and Klima are back with a more advanced course on engineering geology, with a focus on geological investigations and ground characterisation for tunnelling and cavern construction. The short course will also include a lecture on the updated geology of Singapore, and hand-on field trips on rock mapping and core logging, essential steps in rock mass classification.

Registration Fee

SRMEG Members: \$1200.00

Non-SRMEG Members: \$1300.00 (including a one-year membership with SRMEG)

Prof / Dr / Mr / Mrs / Ms: Title and Full Name (underline Surname / Family Name):		Member of SRMEG: YES NO	
Organisation:			
Address:			
Office Phone:	Mobile:	Fax:	
Email:			

Method of Payment

- By bank Draft / Cheque in Singapore Dollars drawn on a bank in Singapore and made payable to: "**Society for Rock Mechanics & Engineering Geology**"

Bank Draft/Cheque Numbers: _____

Issuing Bank : _____

_____ Date

_____ Signature

Please send the Registration Form and Payment to: SRMEG
1 Liang Seah Street, #02-12 Liang Seah Place, Singapore 189022
Tel: +65 6336 2328 , Fax: +65 6336 2583
Email: srmeg@cma.sg

Programme

Short Course on NATM and Observational Methods in Rock Tunnelling
 Prof. Kurt Klima, Prof. Wulf Schubert, Graz University of Technology, Austria
 Cai Jun Gang, Trittech Consultants Pte Ltd

Preliminary Program (11 – 13 November 2009, NTU)

Wednesday, 11 November 2009		
9:00	Introduction	Course organization
9:30	Cai Jun Gang	Geological overview and geological investigations of Singapore
11:00	Klima	Investigation strategy in built up areas; means and methods
12:30	Lunch break	
13:30	Klima	Investigation strategy in built up areas; means and methods
14:30	Schubert	Identification of required information and design parameters with respect to modelling methods; geometrical and mechanical parameters, boundary conditions, environmental aspects
17:00	End of lecture	
Thursday, 12 November 2009		
9:00		Departure to Dairy Farm Quarry
10:30		Field work – scanline sampling, stereophotographic recording of rock mass structures (ShapeMetrix3D)
12:30	Lunch break	
13:30		Field work – core logging
16:00		Return to NTU
17:00	End	
Friday, 13 November 2009		
9:00	Klima/Schubert	Evaluation of investigation results, characterization of ground
11:00	Klima/Schubert	Identification of potential hazards; potential failure modes, ground deformation, groundwater, emissions
12:30	Lunch break	
13:30	Schubert	Conceptual design of rock tunnels and caverns, excavation method, required support, modelling methods, construction sequence; monitoring layout; issues of geotechnical safety management
16:00	Klima/Schubert	Organizational and contractual aspects
17:00	End of lecture	

About the Speakers

Prof. Wulf Schubert



Prof. Wulf Schubert has 30 years of professional experience in tunnelling. After working for GEOCONSULT mainly on tunnel projects around the world for more than 12 years, he was appointed full professor at the Graz University of Technology for Rock Mechanics and Tunnelling in 1992. His focus in research during the last 15 years was on tunnelling in poor ground. He produced more than 100 publications. Parallel to the research and teaching, he has continued with consulting to keep up with the day to day problems, and he has involved in design, construction supervision, and consulting for underground projects in Austria, Germany, Italy, Spain, Greece, Turkey, Iran, Slovenia, Korea, Taiwan, Thailand, Hong Kong, China, Nigeria, Pakistan, Venezuela, USA, Brasil, Argentina, Chile, Bolivia (total approx. 1.200 km tunnels). He is senior partner in the engineering company Gruppe Geotechnik Graz. Prof. Wulf Schubert has served as Vice President for the ISRM, is active in various working groups in the ISRM and ITA, and currently president of the Austrian Society for Geomechanics and editor of the journal FELSBAU.

Prof. Kurt Klima



Prof. Kurt Klima was born in 1950 in Salzburg, and studied Geology at Graz University. He finished his studies with the degree of "Dr.phil." in 1980. Since 1979 he has been with the Institute of Applied Geosciences at Graz University of Technology, and since 1992 in the position as Assistant Professor. The main fields of his research are on the faults and the wide field of rock mass characterisation. Since 1999 he is Professional Engineer and senior partner in the 3G Gruppe Geotechnik Graz ZT GmbH geotechnical consulting company. Besides the research activities, Kurt Klima was involved in many tunnelling and hydropower projects in Austria and abroad (mainly in China and South America).

Dr. Cai Jun Gang



Dr Cai is currently an Executive Director of Trittech Consultants Pte Ltd. He worked in Nanyang Technological University from 1996 to 2004, and was involved in most rock investigation and underground rock cavern projects in Singapore, such as rock cavern development in the Jurong Formation, underground ammunition facilities, underground science city at Kent Ridge, and oil storage rock caverns at Jurong Island. He is the project director of Sintef-Trittech-Multiconsult Consortium for project management and technical review of the on-going Jurong Rock Cavern (JRC), and Underground Rock Cavern (URC) Usage Feasibility Study.

He has 20 years of experience in engineering geology, rock engineering R&D and consultancy, and has published more than 100 technical papers in scientific journals and conference proceedings.