Society for Rock Mechanics & Engineering Geology

Seminar on

Water Control Grouting and Steel-Fiber Reinforced Sprayed Concrete (State of the Art, Specifications, and Standards)

by Mr Gan Cheng Chian & Mr Alve Rutgersson

Date: 9 May 2008, Friday
Venue: Nanyang Technological University Alumni Club, Level 6, Multipurpose Hall
11 Slim Barracks Rise (Off North Buona Vista Road), Singapore 138664

Programme:
1300 ~ 1330 Registration
1330 ~ 1500 Part 1 (Grouting)
1500 ~ 1520 Refreshments
1530 ~ 1700 Part 2 (Shotcrete)

Admission:
SRMEG Members: $40.
Non SRMEG members: $50.

Registration

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

❑ Cash

_____ _____
Date Signature

Please send registration and payment to:
Ms AN Xinmei, Blk N1.1, #B3-02, 50 Nanyang Avenue, Singapore, 639798
Tel: (65) 6790 6895 Fax: (65) 6790 6841 Email: anxi0001@ntu.edu.sg Website: www.srmeg.org.sg

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Water Control Grouting and Steel-Fiber Reinforced Sprayed Concrete
(State of the Art; Specifications; and Standards)

Grouting

1. GROUTING MATERIALS
1.1 General
1.2 Cementitious products
1.2.1 Properties
1.2.2 Additives
1.2.3 Testing methods for cementitious materials
1.3 Chemical grouts
1.3.1 Testing methods for chemical grouts

2. GROUTING DESIGN
2.1 General
2.2 Exploration methods for grouting need
2.2.1 Working methods
2.2.2 Drill pattern design and grouting order
2.2.3 Recipes and grouting speed
2.2.4 Grouting Pressure
2.2.5 Controlling grouting and stop criteria
2.2.6 Post-grouting

3. QUALITY AND COMPLIANCE CONTROL
3.1 Quality control of grouts
3.2 Control of grouting procedure
3.3 Verification of grouting effectiveness
3.4 Acceptability control and actions due to unaccepted quality

4. SPECIFICATIONS and CONTRACTS
4.1 Specification Requirements
4.2 Contracting Arrangements
4.3 Full Scale Trials

Fiber Reinforced Concrete:

1. FIBER REINFORCED CONCRETE MATERIALS
1.1 General
1.2 Base materials
1.2.1 Properties
1.2.2 Testing methods for cementitious products
1.3 Admixtures
1.3.1 Properties
1.3.2 Testing methods for additives
1.4 Steel Fibers
1.4.1 Properties
1.4.2 Testing methods for steel fibers

2. FIBER REINFORCED CONCRETE DESIGN
2.1 General
2.2 Q-Chart
2.2 ASTM/ EN
2.3 Base material/ Admixtures/ Steel Fibers
2.3.1 Energy Absorption Requirements
2.3.2 Flexural strengths (1^{st} peak, ultimate, residual) of fiber reinforced beam specimens

3. QUALITY AND COMPLIANCE CONTROL
3.1 Quality control of fiber reinforced concrete
3.2 Control of batching procedure
3.3 Control of application of fiber reinforced concrete procedure
3.4 Verification of Fiber content of fiber reinforced concrete
3.4 Acceptability control and actions due to unaccepted quality

4. SPECIFICATIONS and CONTRACTS
4.1 Specification Requirements
4.2 Contracting Arrangements
4.3 Full Scale Trials

About the Speakers

Mr. Gan Cheng Chian, Bekaert Sales Manager, Building Products Asia

Mr. Gan graduated from The University of Singapore in 1989 as a civil engineer & has worked in the construction industry for 19 years in various capacities – Civil & Structural Engineer, Resident Engineer, Project Manager and Technical Manager. He is currently working for Bekaert Singapore as Sales Manager, Building Products Asia and operates out of Singapore. He is also the President of Engineering Alumni Singapore for 2007/2008. In his 10 years working for Bekaert, he has been involved in many prestigious underground projects and construction projects around Asia. Some of the projects he has been involved with include Qinling Railway & Highway Tunnel Xian, China; Mandai Underground Cavern Singapore, BMW Shenyang, China, Daimler Chrysler Beijing, China, Busan International Exhibition & Convention Center, South Korea and Jurong Rock Cavern Singapore among others. Bekaert celebrates its 125^{th} anniversary in June 2005.

Alve Kjell Robert Rutgersson, UGC Regional Technical Manager, BASF Constrution Chemicals Asia Pacific

Mr Rutgersson has been working in the underground construction industry for the past 19 years. Areas covered included underground surveying, shotcrete supervisor, tunnel supervisor and workshop supervisor. He is currently working for BASF Construction Chemicals Asia Pacific as UGC Regional Technical Manager. He has extensive experience in providing technical support in Asia Pacific for underground construction projects in the area of shotcrete; rock support and pre- & post-grouting technologies; designing, manufacturing, repairing & maintenance of specialized shotcrete equipment for Asia Pacific; providing consultation services and technical services on pre- and post-grouting using injection materials like micro-cements, colloidal silica, PU & Acrylic. Some of the projects, he has been involved includes Mandai Underground Cavern (Singapore), Route 3 road tunnel (Hong Kong), Bakun Dam (Malaysia), Lantau MTR Tuunel (Hong Kong), Musi Hydropower (Indonesia), Three Gorges (China) diversion tunnels and penstock.