

## Ground Improvement Pre Support & Reinforcement

Two day Training session for continuous Professional Education  
Geneva, Friday 31.05 – Saturday 01.06 2013



FGU Fachgruppe für Untertagebau  
GTS Groupe spécialisé pour les travaux souterrains  
GLS Gruppo specializzato per lavori in sotterraneo  
STS Swiss Tunneling Society



### Friday 31.05

#### Last minute registration, check in and distribution of the documents

07.15 - 08.15 Training session Reception desk CICG

#### Welcome and Opening

08.15 – 08.30: WTC2013, ITA-AITES, STS and ITACET Foundation representatives

#### General Overview

08.30 – 09.30: Basic considerations on auxiliary measures | Georgios Anagnostou (CH-ETH Zurich), Daniele Peila (I-Politecnico di Torino)

09.30 – 10.30: Design of injection works in rock | Eivind Grønvold (NO - SINTEF, NTNU)

10.30 – 11.00: Coffee Break

#### Injections

11.00 – 12.00: Design of injection work in soil | Michel Chopin (F / CH - G.C.I. Lausanne)

12.00 – 13.00: Ground improvement for tunneling projects | Kurt Kogler, Harald Krenn (AT - Züblin)

13.00 – 14.00: Lunch

14.00 – 15.00: Injection materials | Hans-Olav Hognestad (NO - BASF UGC), Davide Michelis (I - MAPEI UTT), SIKKA delegatee

15.00 – 16.00: Compensation grouting - Fundamentals and case history | Chris Menkiti (UK - Geotechnical Consulting Group)

16.00 – 16.30: Coffee break

16.30 – 17.30: Grouting in fault zones – Lessons learned from the Gotthard Base Tunnel | Heinz Ehrbar (CH-Heinz Ehrbar partners)

#### Drainage

17.30 – 18.30: Design of drainage works | Sara Zingg (CH - ETH Zurich)

#### From 18.30 Open exchanges with the lecturers and Closing of the day

### Saturday 01.06

#### Forepoling & Face reinforcement

08.00 – 09.00: Forepoling design | Daniele Peila (I - Politecnico di Torino)

09.00 – 10.00: Face reinforcement design | Marco Ramoni (CH - Basler & Hofmann)

10.00 – 10.30: Coffee break

10.30 – 11.30: Execution & Technology | Gilles Lequertier (F - INFRA TUNNEL SA)

11.30 – 12.30: Case histories | Giovanna Cassani (I - Rocksoil SpA)

12.30 – 13.30: Lunch

#### Jet Grouting

13.30 – 14.30: Design & Application to Tunnelling including case histories | Piernigorgio Grasso (I - Geodata)

14.30 – 15.30: Execution aspects incl. case histories | José L. Machado do Valle (P - CPT), Akira Koshima (BRA - Novatecna)

15.00 – 15.30: Coffee break

#### Ground Freezing Application

16.00 – 17.00: Ground freezing design & application to tunneling incl. case histories | Wolfgang Orth (D-ORTH Ingenieurbüro)

17.00 – 18.00: Execution aspects incl. case histories | Paul C. Schmall (USA - Moretrench)

18.00 - 18.30: Discussions & Closing

#### Distribution of the course certificates & collection of the evaluation form

13.00 - 13.30: Training session reception desk CICG

### Registration & information:

Register to [www.wtc2013.ch](http://www.wtc2013.ch) | Standard fee Chf 360 - Reduced fee for Students Chf 180.00

## Ground Improvement Pre Support & Reinforcement

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Geneva, Friday 31.05 – Saturday 01.06 2013



Between May 31 and June 7, 2013 the prestigious World Tunnel Congress – WTC 2013 – together with the 39th General Assembly of the International Tunnelling and Underground Space Association (ITA) will be held for the first time in Switzerland, Geneva.

In Switzerland many pioneering underground projects literally have opened up ways to the future and also in more and more other countries the underground space is seen as an option for development and sustainability.

The traditional training session preceding the WTC congress will be devoted to present the state of the art of design and execution of auxiliary measures such as grouting, ground freezing or forepoling, some crucial topics for engineers and contractors, especially but not exclusively in urban tunnelling. The course will highlight the theoretical and practical aspects of the wide catalogue of auxiliary measures.

The program of the event has been prepared by the ITA-CET Committee for Education and Training. The training session is co-organized by the ITACET Foundation and the Swiss Tunneling Society.

A prestigious panel of international speakers, from the corporate and academic communities will give in depth information about these topics and will also review several related case studies.

Several open discussion will be held and will give the opportunity to the audience to interact with the speakers. Last but not least, this training session is also an unique occasion for each participants to meet fellow engineers from all over the world and expand its professional and social network.

Welcome to Geneva, welcome to Switzerland and be part of this outstanding event!

Felix Amberg  
Chairman of the OC of the WTC 2013  
ITACET Foundation co-founder and Council member  
ITA-AITES Treasurer



## Objective and development

The objective of the course is to present the state of the art of design and execution of auxiliary measures such as grouting, ground freezing or forepoling. The course will highlight the theoretical and practical aspects of the wide catalogue of auxiliary measures.

Beside the theoretical aspects of the adequate design also the basic principles of the execution (installation, handling and materials) and several interesting case studies from all over the world will be presented.



Photo Credits: L. to R.: Sørdal highway tunnel, K.G Holter Basf/Meyco | Geological Profile, Vince Suwansawat | Grouting annular Gap, M.Thewes, ill. Babendererde ltd | Pipe Umbrella work, I.M Lee, ill. D. Peila | Bologna Highspeed railway, R. Mair & A.Pigorini

## Who should attend ?

The targeted participants are interested engineers of private companies or public bodies as well as students, consultants, contractors, suppliers and clients.

## Benefits for the participants

- Receive the latest state of the art information from internationally well known expert presentations and discussions
- Be informed on the different technique and latest technological development
- Receive a Certificate of Attendance
- Course and references material. A notepad illustrated with all the slides to be used during the seminar, abstracts of the lectures and a short bio of the lecturers. A digital copy (CD-ROM) of all slides used during the lectures.
- Extend social and professional network

## Organization

This event is co-organized by the Swiss Tunnelling Society and the ITACET Foundation.

The ITACET Foundation is to be developed into a center of Excellence for Education and training on Tunneling and underground Space Use and fulfils its mission by notably organise specialised Training Sessions.

## Contact

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Tel. + 41 21 693 08 67 | Fax + 41 21 693 41 53 | [secretariat@itacet.org](mailto:secretariat@itacet.org)

## Lecturers

 in the order of their intervention

**Georgios Anagnostou** (CH-ETH Zurich)  
Teaches Tunnelling and Rock Mechanics courses at ETH Zurich and is currently involved as an expert and consultant on several large tunnelling projects.



**Eivind Grøv** (NO -SINTEF NTNU)  
Professor in engineering geology and rock mechanics at the University of Science and Technology in Trondheim, Chief Scientist with SINTEF infrastructure



**Michel CHOPIN** (FR/CH - G.C.I.Lausanne)  
Manager - Executive Consultant in Geotechnical Engineering for Underground Construction Projects.



**Kurt Kogler** (AT - Züblin)  
Managing Director and senior project manager, specialist for drilling & grouting works.



**Hans-Olav Hognestad** (NO - BASFUGC)  
Technical Manager Injection in BASF UGC worldwide team.



**Harald Krenn** (AT - Züblin)  
Senior Project Manager; Specialist for drilling & grouting works, measurements and mechatronic systems.



**Davide Michelis** (I - MAPEI UTT)  
Engineer for the underground Technology Team of MAPEI, provide technical assistance in underground construction projects and to develop new products.



**Chris Menkiti** (UK-Geotechnical Consulting Group)  
Consultant and geotechnical adviser for the design of ground movement mitigation measures for historical monuments.



**Heinz Ehrbar** (CH - Heinz Ehrbar Partners llc)  
Owner & CEO. Chief Construction Officer at Alp Transit Gotthard Ltd, responsible for the civil works on the 57 km long Gotthard Base Tunnel.



**Sara Zingg** (CH - ETH Zurich)  
Research assistant & Doctoral student at the Institute for Geotechnical Engineering.



**Daniele Peila** (I - Politecnico di Torino)  
Professor of "Tunnel Construction" at Politecnico di Torino, Faculty of Engineering and director of the Post-graduate Master Course on "Tunnelling and Tunnel Boring Machines".



**Marco Ramoni** (CH - Basler & Hofmann)  
Project Manager in Underground Constructions.



**Gilles Lequertier** (F - INFRA TUNNEL SA)  
Specialized in ground reinforcement and tunnel renovation. Leads several projects in railways and road tunnels.



**Giovanna Cassani** (I - Rocksoil SpA)  
Technical Director and project manager of numerous metro, road and rail tunnels projects.



**Piergiorgio Grasso** (I - Geodata)  
President and Principal Engineer of Geodata, a consultancy company specialised in the design and management of underground works, in urban environments and mountain areas.



**José L. Machado do Valle** (P - CAPI)  
Former President of SOMAGUE, President of the Portuguese Society of Geotechnics.



**Akira Koshima** (BRA - Novatecna)  
Technical manager, responsible for jet grouting works in Brazil and abroad. Led teams of experts on numerous projects in ground improvements and ground reinforcement.



**Wolfgang Orth** (D - ORTH Ingenieurbüro)  
Executive consultant and adjunct professor at the Karlsruhe Institute of Technology



**Paul C. Schmall** (USA - Moretrench)  
Vice President and Chief Engineer, responsible for complex groundwater control projects involving dewatering, grouting, ground freezing and artificial recharge.