What you learned:
During intensive six-hour daily sessions I had an opportunity to extend my knowledge in field of computational geotechnics. One of the aims was to learn how to choose adequate soil model for particular geotechnical problem. Probably the major unknowns in all of geotechnical calculations are input parameters that describe soil behaviour. Numerical modelling with elastic-perfectly plastic models with Mohr-Coulomb linear failure envelope is still frequently seen in practice, although this model has some major limitations. Advanced or second-order soil models, such as Hardening Soil, Hardening Soil with small strain stiffness, etc., are capable of representing soil behaviour more realistically, yet they have some limitations of their own. On several examples from practice it was shown that finite element method is powerful modelling technique, but is just a tool that if used unwisely could be very dangerous. Engineering judgement is inevitable part of every geotechnical design.

People you met:
- Dr. Vahid Galavi                              Plaxis BV, Netherlands
- Prof. Dr. Helmut Schweiger         Graz University of Technology, Austria
- Prof. Dr. Yasser El-Mossallamy Arcadis consultant, Germany
- Prof. Dr. Onder Cetin Middle East Technical University, Turkey
- Assoc. Dr. Mehmet Berilgen Yildiz Technical University, Turkey
- Muge Inanir                                     Director at GEOgrup Insaat A.S., Turkey
- And many other fellow participants that are working on various projects all over the world and have different educational background

Main features of conference:
A four day course was divided into 8 sessions. During first day participants had an opportunity to listen lectures concerning non-linear soil behaviour, drained/undrained conditions, soil modelling with HS and HS-small models and parameter determination of aforementioned models. Exercises referred to simulation of lab tests and construction of deep excavation.
Second day started with modelling of rock behaviour and tunnels in Plaxis, following NATM tunnelling method. Additional models were described such as Hoek-Brown and Jointed Rock model that are suitable for description of rock behaviour. Some implications of distinct element method were given. In the afternoon session explanation of groundwater flow and unsaturated soil behaviour was given, following exercises concerning modelling of tunnel in jointed rock and stability of a dam under drawdown conditions.
Third day was about foundations. Very interesting lectures were held about FEM shallow...
and deep foundation modelling with emphasis on behaviour of piles, pile groups and piled-raft foundations. During exercises Plaxis 3D was utilized.

Fourth day was on dynamic soil behaviour. Lectures covered topics concerning principles of geotechnical earthquake engineering and on the use of Plaxis dynamics. Exercises included modelling of generator on an elastic foundation and response of two adjacent buildings subjected to an earthquake.

Your comments on the conference:
Presentations were great, lecturers did an amazing job trying to explain and give answers to all questions.

Please attach short report (maximum 400 words) suitable for publication in the ISSMGE Bulletin:

COURSE REPORT:
Plaxis Advanced Course on Computational Geotechnics, 17-20 April 2012, Istanbul Turkey

Plaxis BV organizes standard and advanced courses, workshops and users meetings several times annually all over the world. Topics covered are mainly concerning application of numerical modelling in geotechnics. Advanced course was organized jointly by Plaxis BV form Netherlands and GEOgrup Insaat A.S. form Turkey. Participants attending the course were from: New Zeland, UAE (Dubai), Italy, Iran, Lebanon, Serbia, FYR of Macedonia and Turkey.

Lectures were held by internationally recognized University professors and practitioners such as prof. Dr. Helmut Schweiger from Graz University of Technology, prof. Dr. Onder Cetin form Middle East Technical University, prof. Dr. Yasser El-Mossallamy from Arcadis consultant, Dr. Mehmet Berilgen from Yildiz Technical University and Dr. Vahid Galavi the Plaxis representative. Intensive six-hour daily sessions during four days covered topics concerning nonlinear soil response, drained/undrained behaviour, groundwater flow, unsaturated soil behaviour, modelling of rock and NATM tunneling, deep and shallow foundations with emphasizing the methodology of piled raft foundations and modeling dynamic problems.

The programme on the second day ended with a banquet dinner at the Bahcelievler Hacibozanogullari restaurant with Turkish national dishes on the menu.

Many practitioners as well as scientists apply finite element based software in everyday practical work or research. Different software have different solution algorithms and are mesh type and size dependant, etc. which results in need for FE “standardization”. Best way to achieve this is through courses in order for users to understand FEA limitations. As pointed out in the course finite element method is powerful modelling technique, but it is just a tool that if used unwisely could be very dangerous and that engineering judgement is inevitable part of every geotechnical design. If used with caution (assuming that FE modeller has sound theoretical background in FEM) that is followed by elaborate geotechnical field and laboratory investigations, predictions of problem behaviour very close to reality could be obtained. Another important aspect of using such a powerful tool is capability to work on soil parameter calibration for other geotechnical problems performed in same soil types.

I would like to thank each and everyone form ISSMGE Foundation for hearted support and financial help which enabled me to attend the course.

Reported by
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Photographs from Conference:

Fig. 1. Professor Cetin’s vivid lecture on volume increase during shearing - dilatancy effect (left) Professor Schweiger’s lecture on drained/undrained soil modelling in Plaxis (right)

Fig. 2. Banquet dinner, 18th April 2012 - from left to right: Dr. Vahid Galavi, Prof. Dr. Helmut Schweiger and Muge Inanir, from right to left: second on the right - Prof. Dr. Yasser El-Mossallamy, Dr. Mehmet Berilgen with fellow participants