

TC306: Geo-Engineering Education

Workshop:

Industry meets academia:

**What should future geo-engineers be
learning in school?**

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Topics which I believe deserve the attention of the representatives of Industry

1. Selection of parameters values
2. Treatment of geotechnical risk
3. Teaching of realistic geotechnical designs
4. Provision of suitable and relevant case histories

Selection of Parameter Values

- A major factor that differentiates geotechnical structural design from structural design is that in geotechnical design engineers need to select the values of geotechnical parameters for use in design calculations
- How should the selection of geotechnical parameter values be taught?
- Characteristic value: "A cautious estimate of the value affecting the occurrence of the limit state"
- (Workshop on Characteristic values: 15.00 in Fintry)

Geotechnical Risk

- Geotechnical designs involve many uncertainties and simplifications
- Soil variability, Parameters uncertainty – testing and correlations, Model uncertainty
- Hence geotechnical designs are inherently risky
- How should the assessment and treatment of geotechnical risk in geotechnical design be taught?

Realistic Geotechnical designs?

- Many structures fail due to excessive ground movements and cracking rather than due to overall shear failure.
- Geotechnical designs are often based on ultimate limit state analyses with overall factors of safety to prevent the occurrence of serviceability as well as ultimate limit states and with settlements predicted using simple linear elastic analyses
- How should more realistic geotechnical designs be taught?
- Using simple analytical models so that fundamentals of soil behaviour are understood or finite element analyses so that predictions are close to reality?

Suitable and Relevant Case Histories

- A major difficulty for many academics in teaching geotechnics is obtaining suitable and relevant case histories to illustrate lectures
- Case histories are often not available due to the complexity of the design situation or due to legal problems
- Can industry provide suitable simple and relevant case histories for use in teaching?
- Good place to publish case histories is Proc. ICE Geotechnical Engineering
 - Recent submissions:
UK 13%, Rest of Europe 10%, China+India+Iran+Turkey 53%: