Working abroad – Expect the unexpected

Jørgen S. Steenfelt, COWI, Denmark
Working abroad concept

- Romantic notions by young geo-professionals
- Distributed engineering
- Virtue of necessity - individual
- Virtue of necessity – Company
- Challenges galore
- Will it live up to promises & expectations?
Expect the unexpected!
..promises?

a company car and good parking space...
..an office to your taste
a space to rest...
..a nice meeting room
..and then

reality strikes!!!
but the challenges remain
Working abroad - overview
Working abroad - overview

• What is the framework for working abroad?
• What is special?
• Handling the unexpected
• Role of the geo-engineer
• Challenges for the geo-engineer
• Skills required?
• What needs changing?
Framework for working abroad

• Basics still "Terzaghiian"

• Operational environment changed dramatically

• Every decade changes in
  - field testing & laboratory testing
  - numerical & physical modelling
  - constitutive modelling
  - monitoring, ICT
  - construction techniques

• What about this decade?
Framework for working abroad

• Changes in role and Society
  - increasing competitiveness & complexity

• Buzz words
  - "fast tracking" - "turn key projects"
  - "EPC" - "DBO" - "PPP"

• Geotechnical - structural
  - roles and persons merge/separates
  - cross border knowledge and understanding
  - creative use of lateral thinking
  - cross pollination of disciplines & technologies
What is special – how to meet the unexpected?
What is special (overview)?

- Culture & language
- Working habits - safety
- Status of engineers - age – experience
- Ground conditions
- Degree of innovation
"If anyone, no matter who, were given the opportunity of choosing from amongst all the nations in the world the set of beliefs which he thought best, he would inevitably - after careful considerations of their relative merits - choose that of his own country.

Everyone without exception believes his own native customs, and the religion he was brought up in, to be the best; and that being so, it is unlikely that anyone but a madman would mock at such things."

Herodotus 484 – 425 BP
Culture – do's and don'ts
Culture - do's and don'ts

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WORKING ABROAD - EXPECT THE UNEXPECTED
Culture do's and don'ts
Language

Clouds on drawings!!

For Restrooms, Go back toward your behind.

BIG DICK'S HALFWAY INN

HOME OF THE ORIGINAL MINNOW SHOT

RENTAL HOMES  GIFT SHOP

573-374-1919
573-374-3136
Working habits
- status of staff
- age
- experience

Saving face - errors

"Respect thy elders"

"Grey hair is a crown of glory; it is gained by living a godly life"

"Respect is earned purely by character and behaviour"
Working habits - safety
Working habits - teams

- Resource investigator
  - the networker
- Team worker
  - interpersonal relationships
- Co-ordinator
  - facilitate discussions and decisions
- Plant
  - unorthodox, solves difficult problem
- Monitor-evaluator
  - sober, strategic and discerning
- Specialist
  - unique or rare expertise and skills
- Shaper
  - dynamic, thrives on pressure
- Implementer
  - creating systems and processes
- Completer – finisher
  - quality and timeliness of the output

R. M. Belbin (1926- )
Team management guru
Ground conditions
Degree of innovation
Innovative investigation tools?
Innovative materials?
Innovative management processes?
Innovative work processes?
Innovative application of observational method?

Positive proof of global warming.

Unexpected behaviour?
Ruwais Sulphur Expansion, Abu Dhabi

Piled marine structures
Ruwais Sulphur Expansion – innovative O-cell testing

O-cell

O-cell

plug
Conclusion of 1: 1modelling of socket capacity

- Load tests verified tension capacity
  - capacity far higher than 3 WL & >> failure

General findings

- efficiency of shear keys ➔ rock socket diameter rather than pile diameter
- cone uplift scenario is extremely conservative
- min char. shear strength
  832 kPa >> 0.41sqrt(σ_c) at 3-4 mm displacement
- Confidence in design considered daring by PMC
Namibia container terminal – "special soils"?

- Diatomaceous silt
- 20 – 30 m layers
- $\rho_{\text{sat}} = 1.25 \text{ Mg/m}^3$
Namibia container terminal – "special soils"?

- Highly plastic
- $C_{ce} = 0.36$
- $C_{a\varepsilon}/C_{c\varepsilon} = 0.047$
- $\phi_{tr'} = 34-35^\circ$
- $c' = 8 - 16 \text{ kPa}$
- $c_u > 100 \text{ kPa}$
- still special?
Namibia container terminal – "special soils"?

- Search for information
- Google it!
- Place it in perspective
- Then you can handle the unexpected
Role of the geotechnical engineer
Role of the geotechnical engineer

- Immediate response to challenges world-wide
Role of geotechnical engineer

- Immediate response to challenges world-wide
- Need to understand mechanisms and interplay

50°C outside

-5°C inside
Role of the geotechnical engineer

• Immediate response to challenges world-wide

• Need to understand mechanisms and interplay

• Prevent incidents by proper and timely ground investigations

• Use observations!
WORKING ABROAD

EXPECT THE UNEXPECTED
Role of the geotechnical engineer

- Immediate response to challenges world-wide
- Need to understand mechanisms and interplay
- Prevent incidents by proper and timely ground investigations
- Design & construct to reduce env. impacts
Challenges for geo-engineers

Developing countries

- increased use of marginal land
- overcrowding in coastal zones
- housing of another 3 billion people next 50 years
- Desperate need for clean water
- Creation of working infrastructure in MEGA-cities
Challenges for geo-engineers

Developed countries

- Decaying infrastructure in cities
- Traffic congestion & general pollution
- Waste management problems
- Environmental deterioration
- Redevelopment of city centres etc.
- Effects from global warming (glaciation?)
- Sustainability
Skills required

- experience – mentoring - licensing?
- leadership qualities, people skills

Tolerance!  Empathy!!
Skills required

- experience, licensing?
- leadership qualities, people skills

OFFICE MEMO:

May all members of staff please note that there will only be one drink per person at this year’s Christmas Party.

And please bring your own cup!

Regards,
Management

Don't underestimate staff ingenuity
Communication and social skills?

How was your cereal this morning?

Wear a pyjamas in bed!!
Skills required

- experience, licensing?
- leadership qualities, people skills
- bi- or multilingual
- team-worker & communicator
- up-to-date knowledge
- know how to do things right - and the right things to do
- use the appropriate equipment
What needs changing?

- Stop micro-optimization
- Think big & across departments/divisions
- Engineers → poly-technical qualities
- Proficiency in "disciplines" outside comfort-zone
- Welcome well-winnowed experience
- Quest for knowledge – not competence
Working abroad is fascinating ..... 

.. take a leap into the unknown and try it yourself