




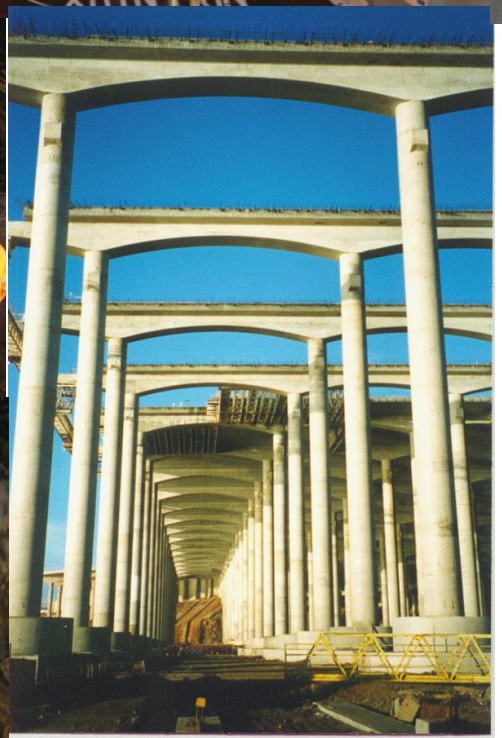


INDUSTRY MEETS ACADEMIA: WHAT SHOULD FUTURE GEO-ENGINEERS BE LEARNING IN SCHOOL

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Project Director

Mott MacDonald Ltd

Mott MacDonald

INDUSTRY MEETS ACADEMIA: WHAT SHOULD FUTURE GEO-ENGINEERS BE LEARNING IN SCHOOL

- Introduction
  - Peter Rutty MSc DIC CEng FICE FIEI
  - 30 years experience in geotechnics
  - Project Director in MM, Foundations & Geotechnics
  - We employ c.100 geotechnical engineers and engineering geologists
  - We recruit 5 – 6 graduates/year

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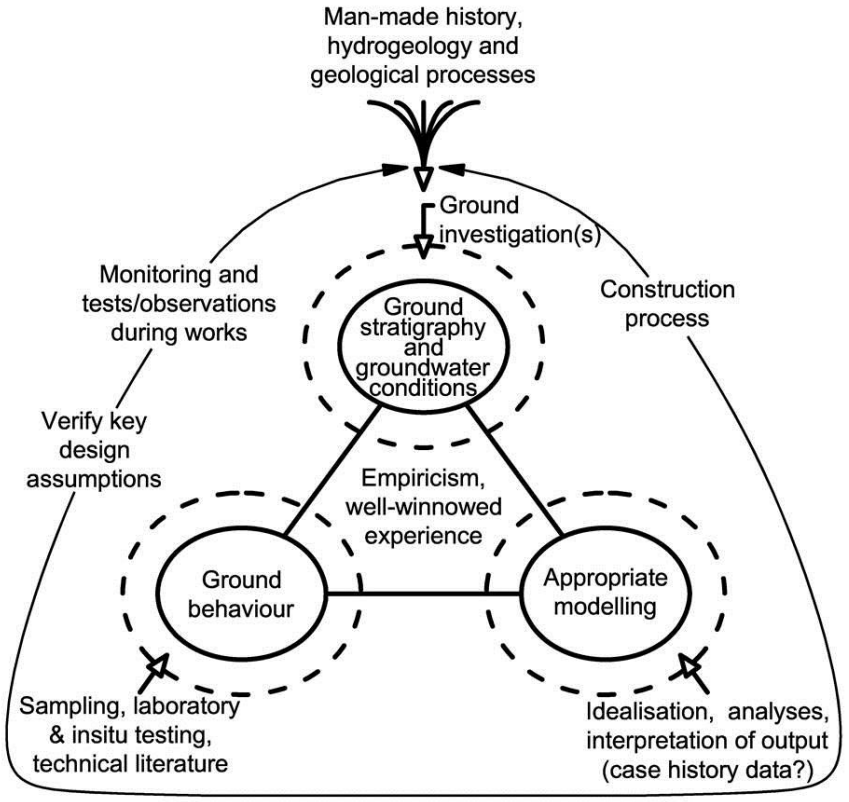
- Basics (Terzaghi, Peck, Burland)
  - Engineering geology
  - Properties of soils
  - Models
  - Knowledge of precedent
- Rigour
- Reporting/ Communication



(Burland, 1989, 2012)

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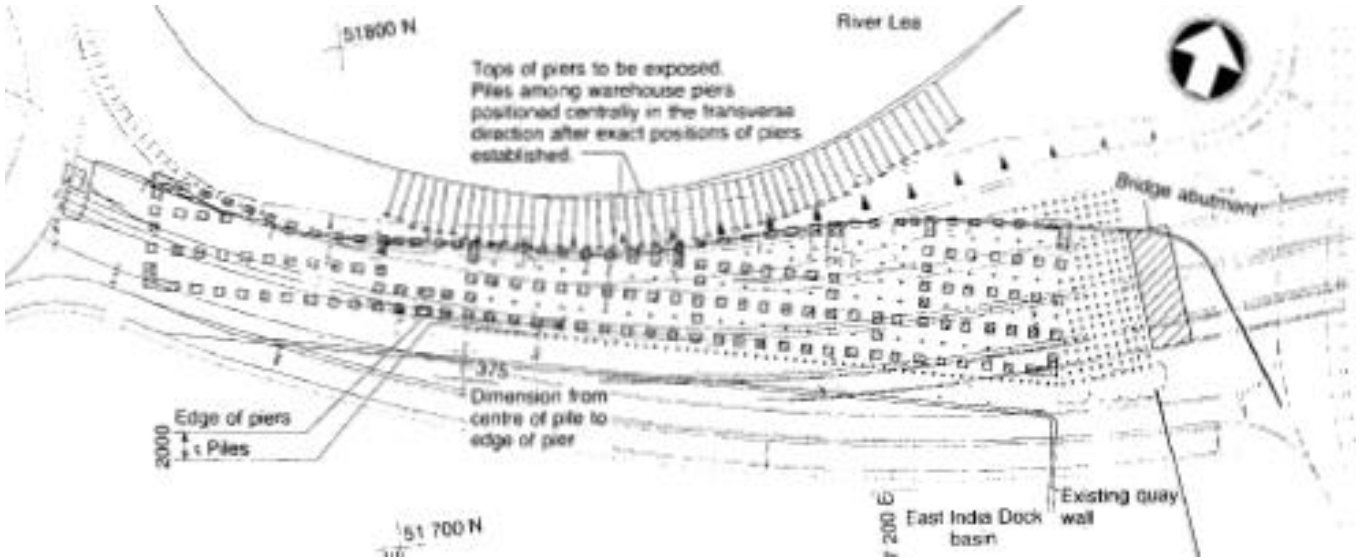
Isle of Dogs highways (1984)



- Site history – previous infrastructure reused
- Ground profile
- Settlement reducing pile design

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Limehouse Link & the observational method (1990-1994)

- Top-down cut and cover tunnel
- Active pressure loads v Passive resistances
- Interaction between ground and structure
- Interpretation of real behaviour

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Extension of Funchal Airport runway (1995-1998)

- Volcanic geology
- Basic pile behaviour
  - Rock socket friction
- Communication (Portuguese/Brazilian, French, Dutch)

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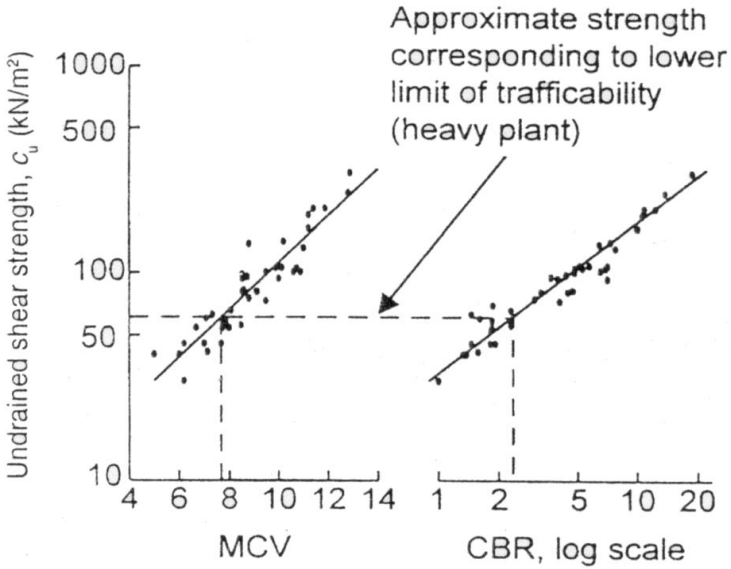
Ireland – Earthworks (2000 – 2010)

- Glacial geology
- Earthworks testing/correlations
- Learning from previous experience



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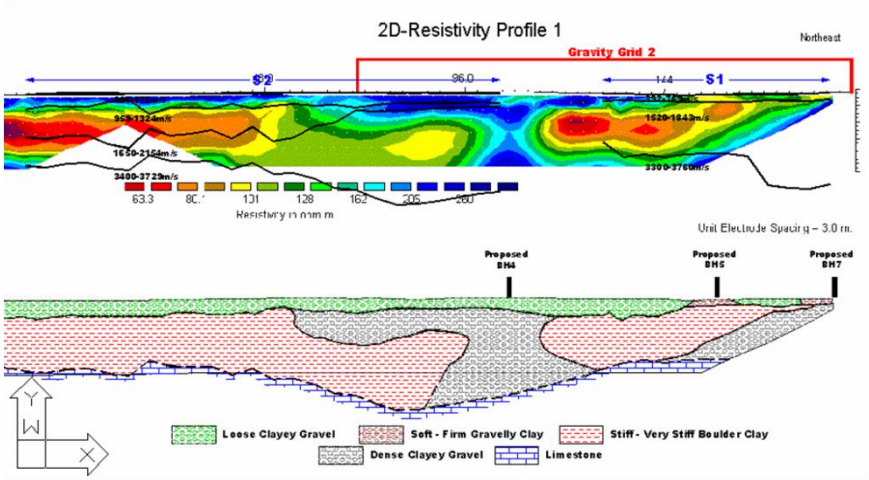
Ireland – Karst (2007)

- Physical processes
- Risk management
- Geophysics
- Design solutions
- Construction implementation



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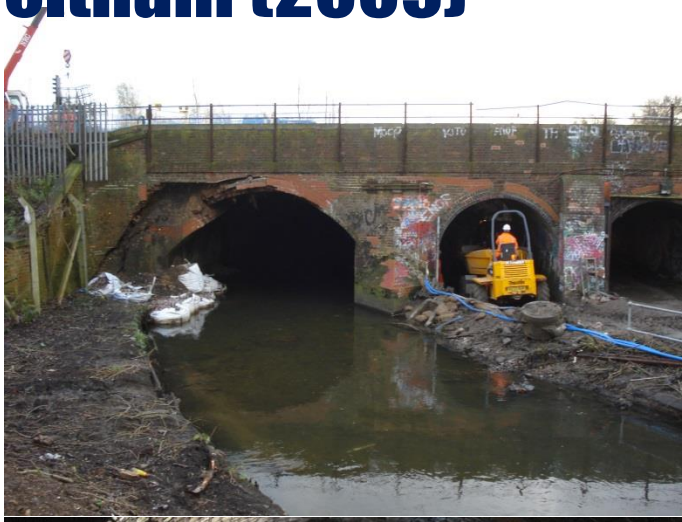
Replacement of Railway Bridge, Feltham (2009)

- Speed – pile design in 3 weeks
- Site history
- Near surface ground profile
- Access and working constraints
- Pile design for vertical and lateral loads



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Victoria Station Upgrade (2010-2015)

- Embedded pile walls
- Jet grouting/tunnelling
- Impact of new works on existing infrastructure
- Numerical modelling

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Summary

- Changes in 20 years – numerical modelling
- Preparing for future challenges – we adapt
- Change geo-education – basics are important (Terzaghi to now)
- Balance between education and industry – UK 4 years (+MSc?) + typically 6-8 years to CEng
- Selection of parameters – experience and guidance
- Geotechnical risk – rigour, consider all the data, professional obligations

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Summary (cont'd)

- ULS/SLS – EC7 requires explicit consideration of SLS in every case
- Case histories – invite industry to lecture to students AND tell your students to go and listen at meetings of professionals
- Geo-engineers? – anyone who designs works in the ground – does it matter? Registration (UK RoGEP)?
- Civil/geotechnical/geologists - at MM FNG we blur these distinctions, we look to give all our junior staff a variety of experience and allow people to choose career paths

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Summary (cont'd/2)

- Technical v soft skills – a sound technical base + good communication skills (MM 'CLASS')
- 'How' future engineers learn – industry is interested in the output c.f. ICE CEng – CPR is a test of what the person has become not how they achieved it
- Interns & scholarships – MM FNG have a programme with University of Surrey
- Please don't be seduced by results of numerical models