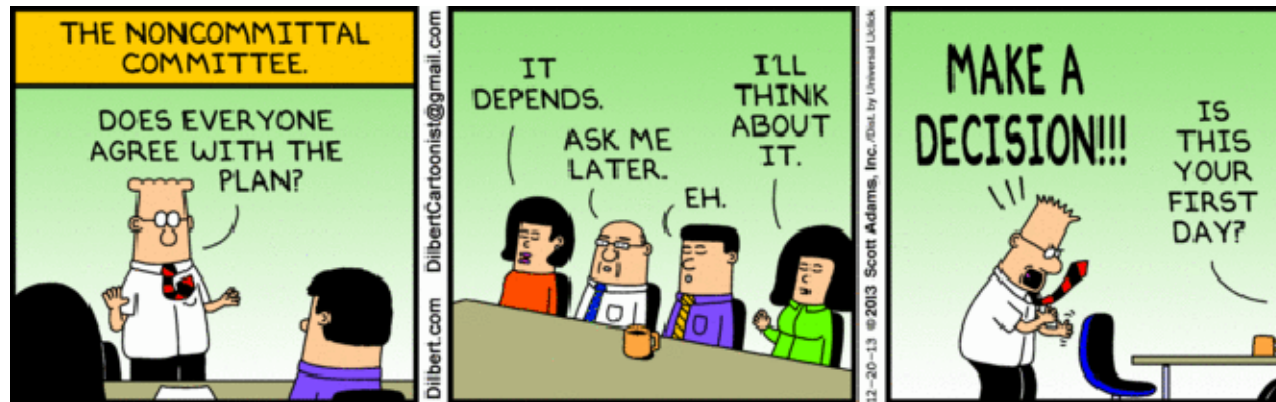
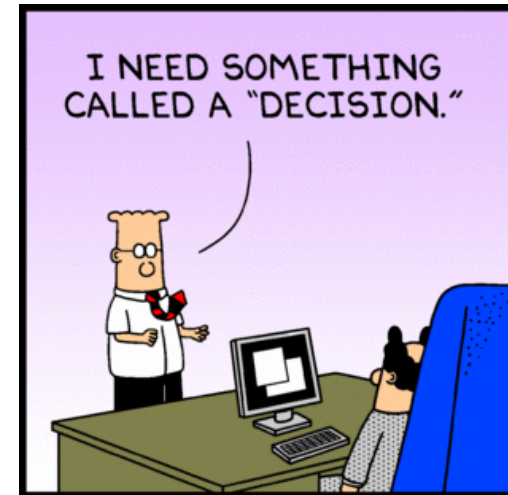


# How do Large Consultancies Develop Ground Source Solutions?

Michael Chendorain  
Arup Global Geothermal & Ground Source Lead

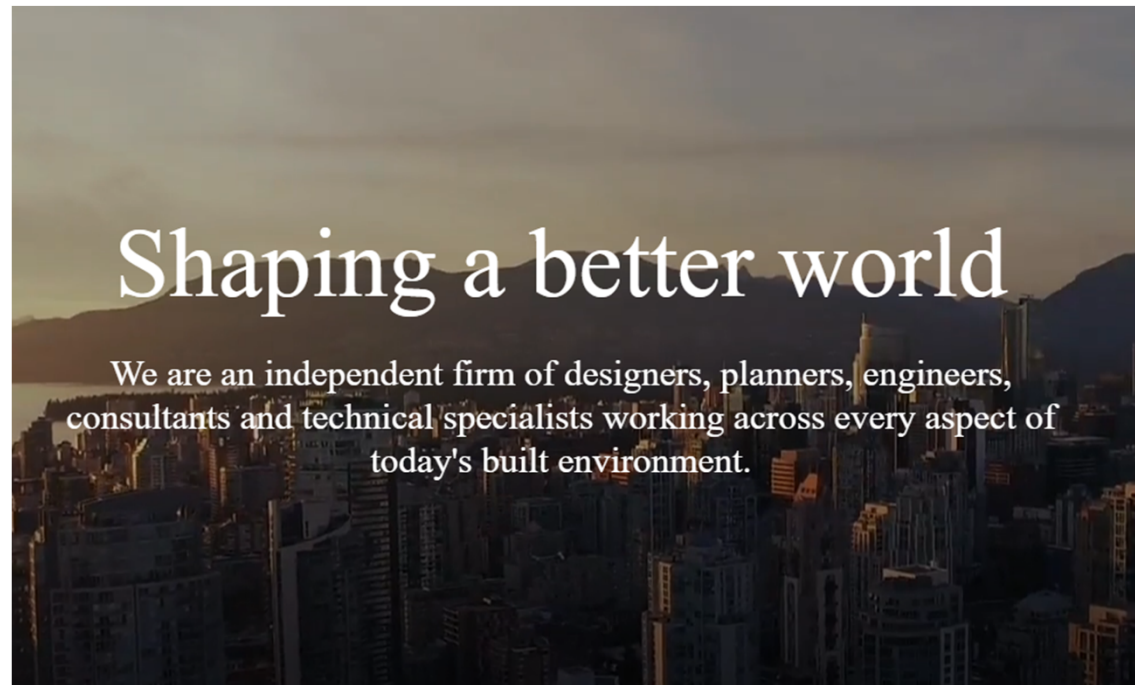
# Outline

- My role at Arup
- The ‘process’
- Large consultancies
- Examples
- How designers and installers can help while helping themselves

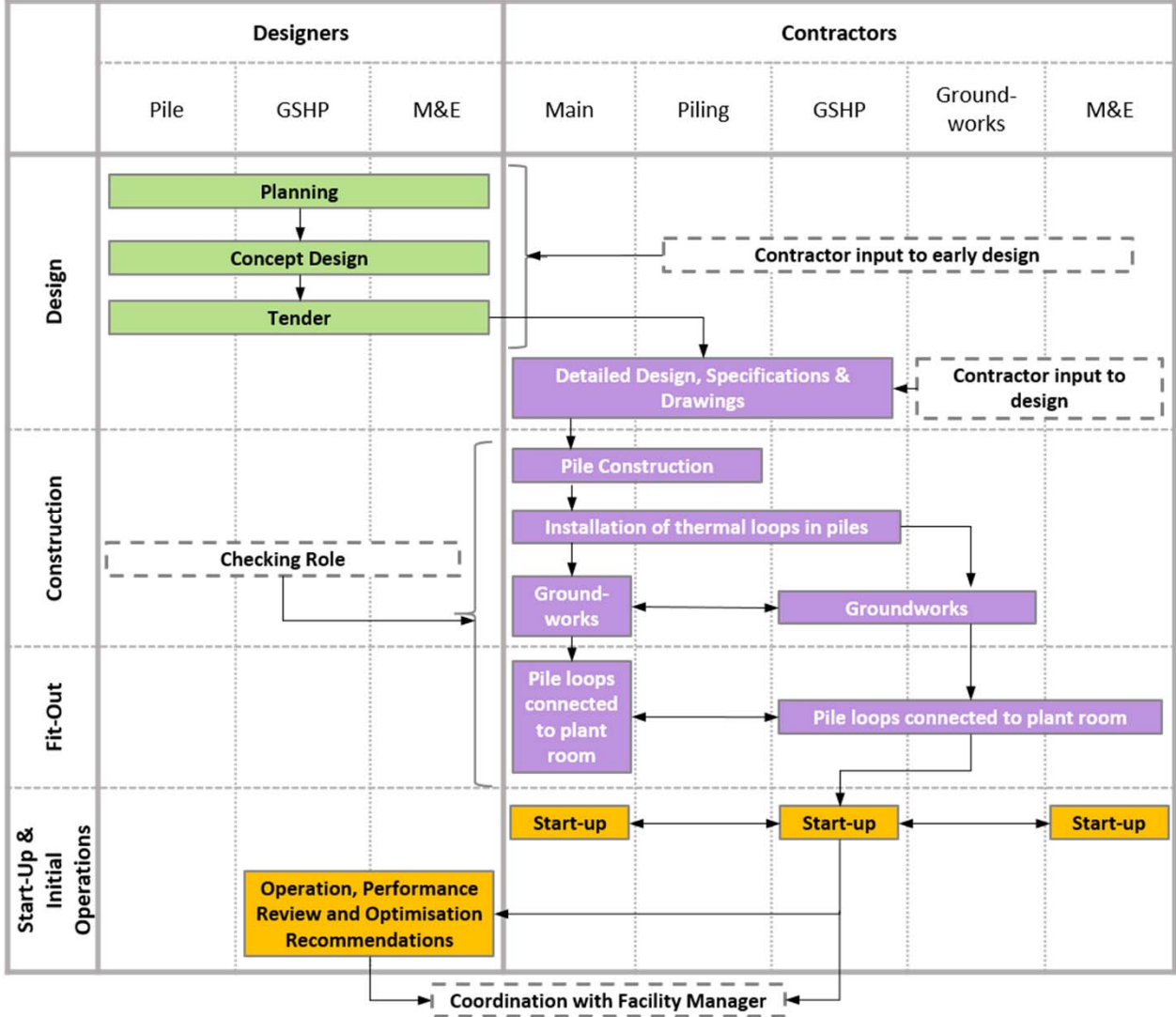


# Arup

- 13,000+ globally
- Employs specialists in
  - Planning
  - Energy
  - M&E
  - Ground Source
  - Sustainability
- My role:
  - Sit in London within Geotechnics
  - Lead ground source, geothermal, and hydrogeology practices
  - Success within Arup is built on **visibility & communication**

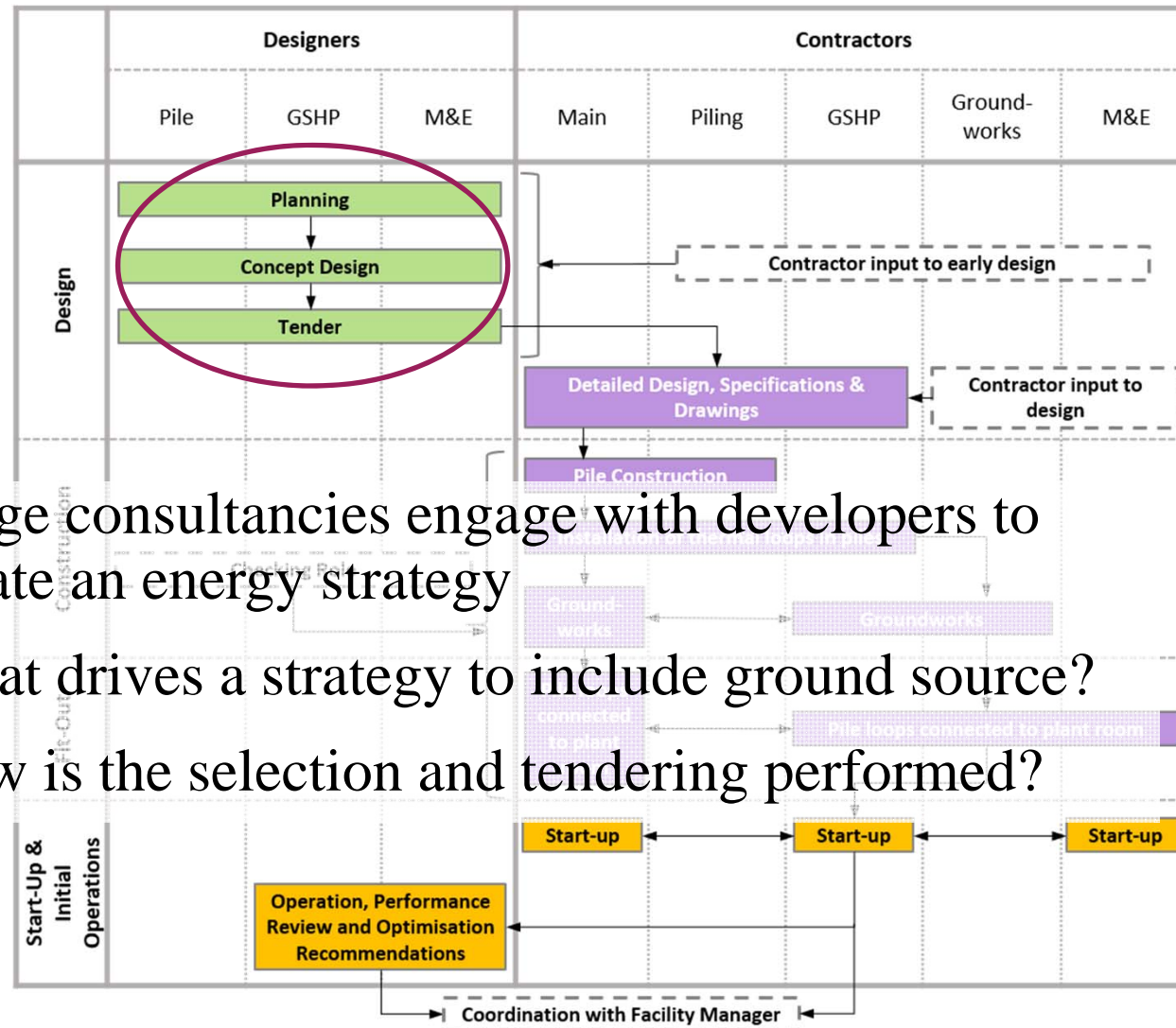


# Typical Design Process



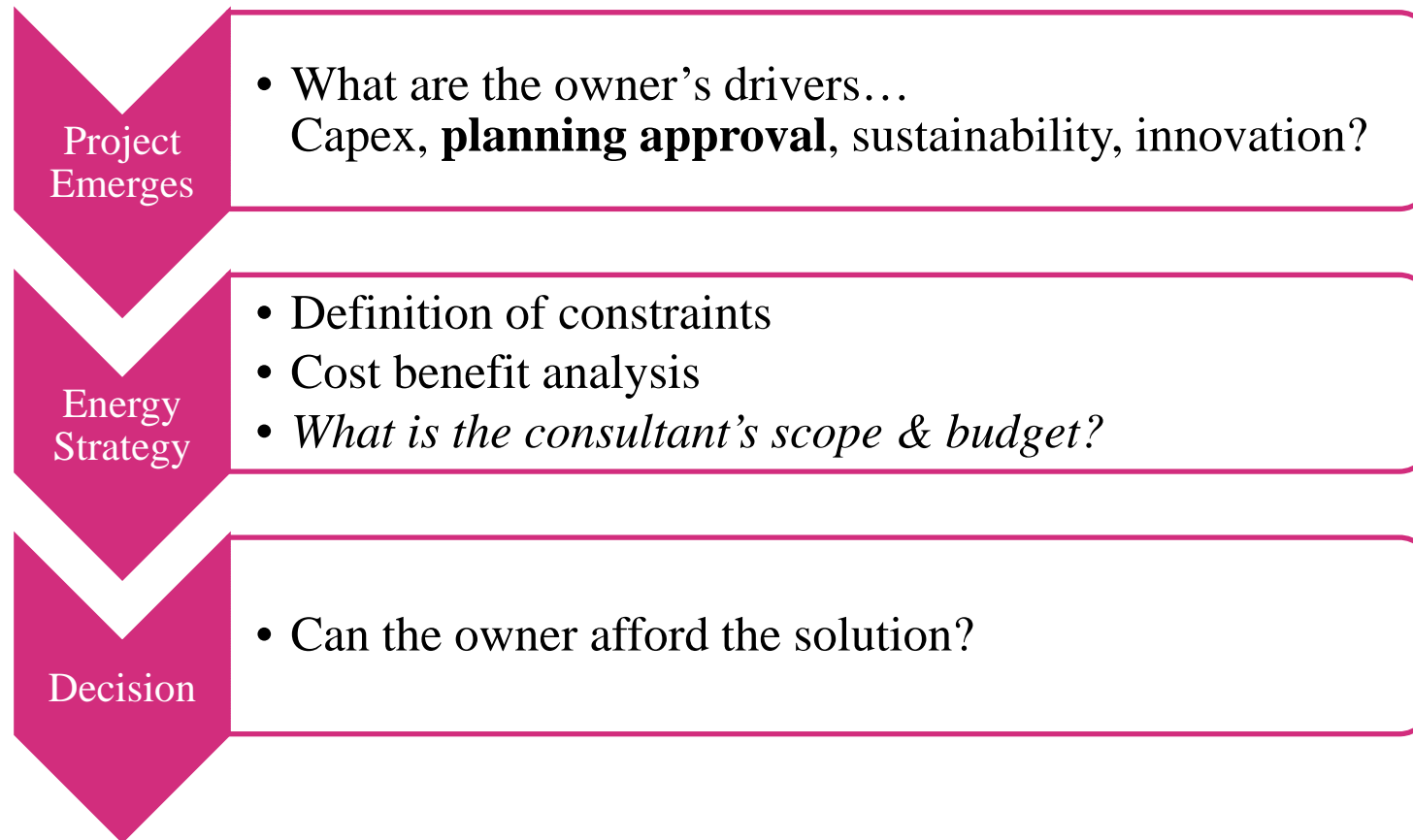
Taken from 2017 revised GSHPA revised thermal pile standard

# Typical Design Process



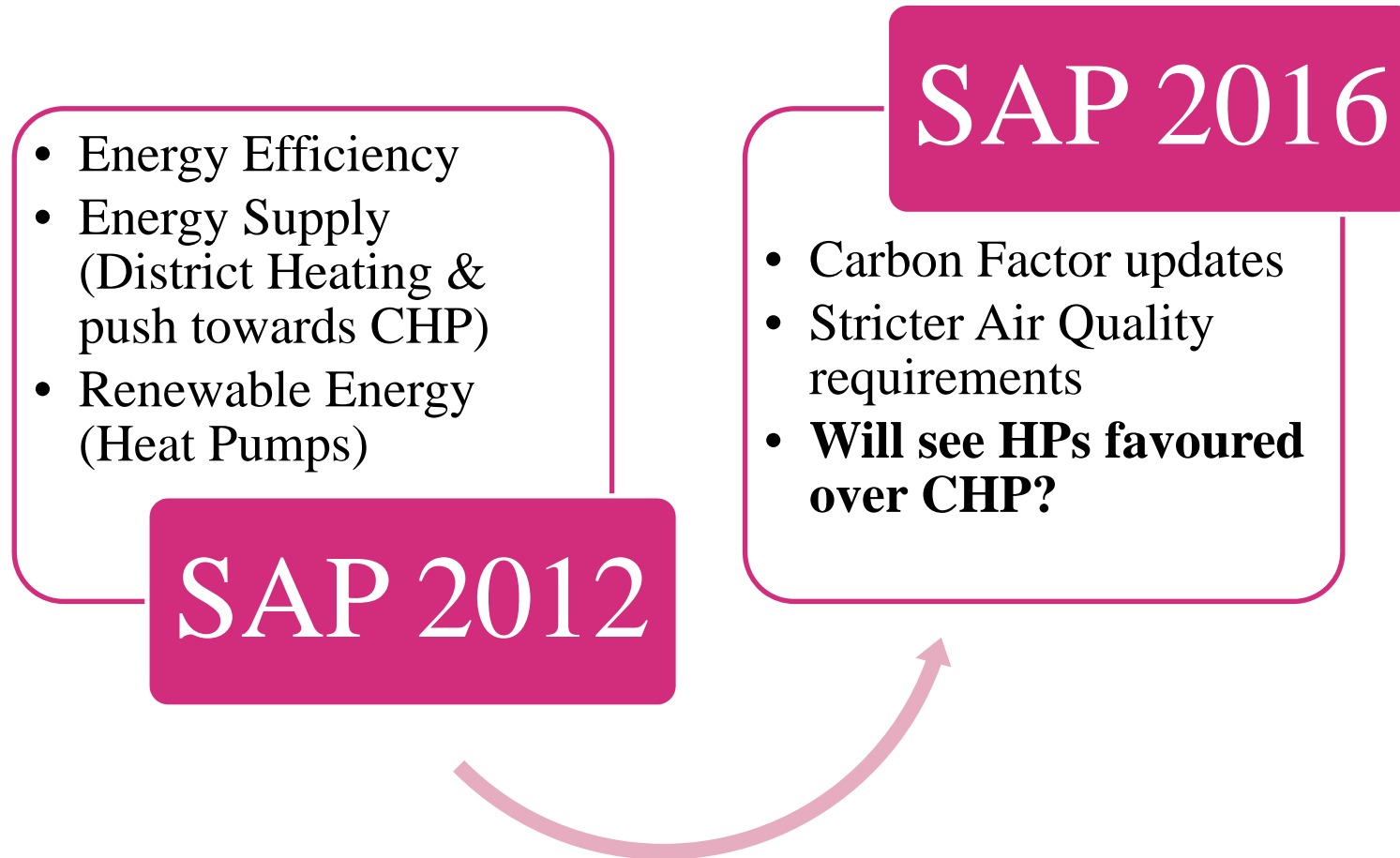
- Large consultancies engage with developers to create an energy strategy
- What drives a strategy to include ground source?
- How is the selection and tendering performed?

# The Selection Process



In London '35% better standard than Part L'

# Planning Hierarchy in London



Also, in London '35% better standard than Part L'



# Large Consultancies

- Thousands of employees... mostly engineers and scientists
- Bureaucracy
- What is driving us?
  - Our Budget
  - Delivering on Time
  - Value to Client (repeat business)



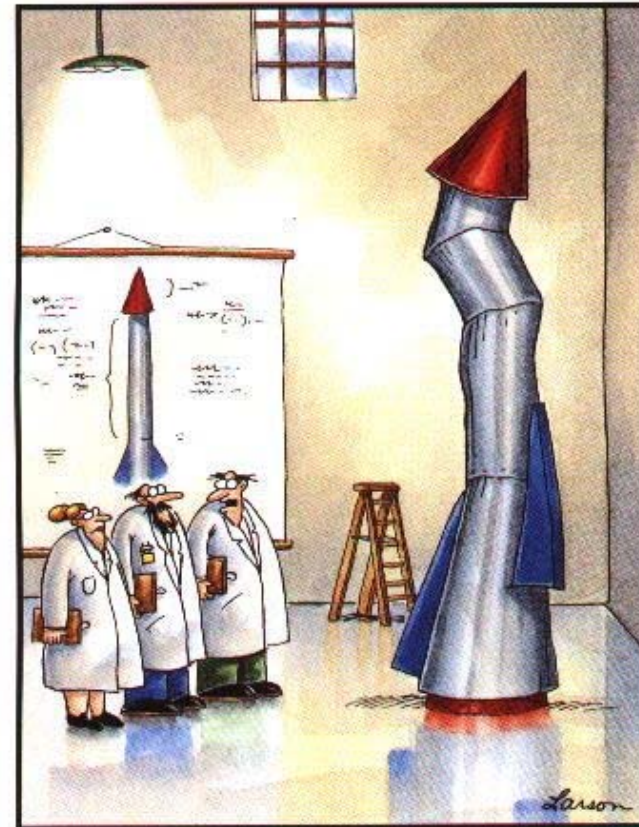
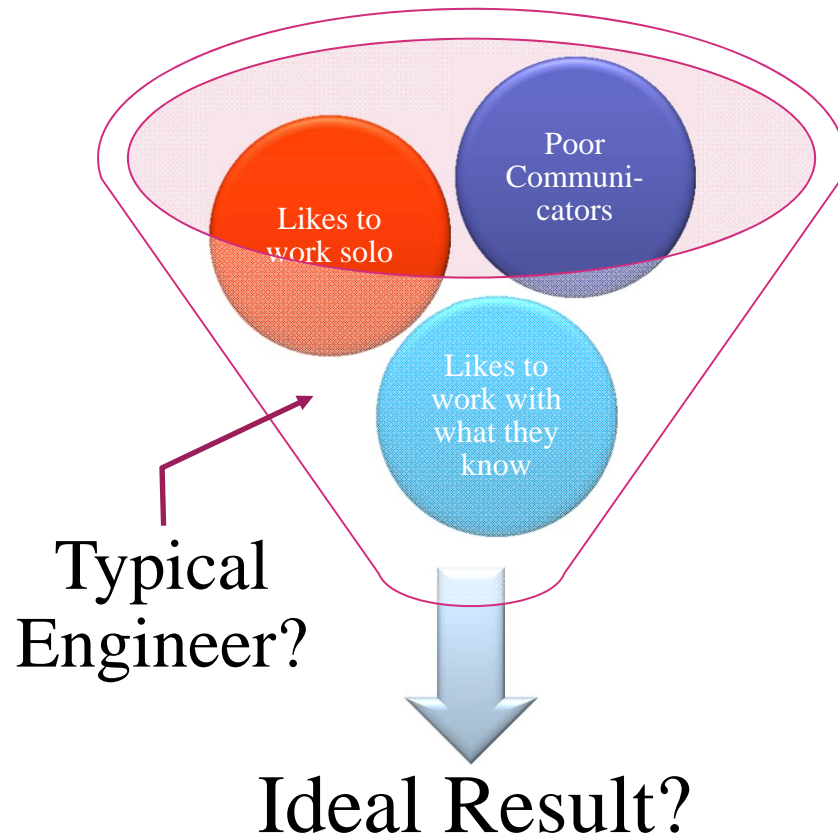


# Pop Quiz!

- Arup employs around:
  - A. 3,000
  - B. 13,000
  - C. 30,000
  
- AECOM employs around:
  - A. 9,000
  - B. 19,000
  - C. 90,000



# Engineers as planners?



"It's time we face reality, my friends. ...  
We're not exactly rocket scientists."

Projects are successful when we rise above these stereotypes

# Pop Quiz!

- Arup employs...
  - A. Ground Source & Geotechnics Engineers
  - B. Planning Specialists
  - C. M&E Engineers
  - D. Sustainability Specialists
  - E. Contractors
  - F. All of the above
  - G. All but E





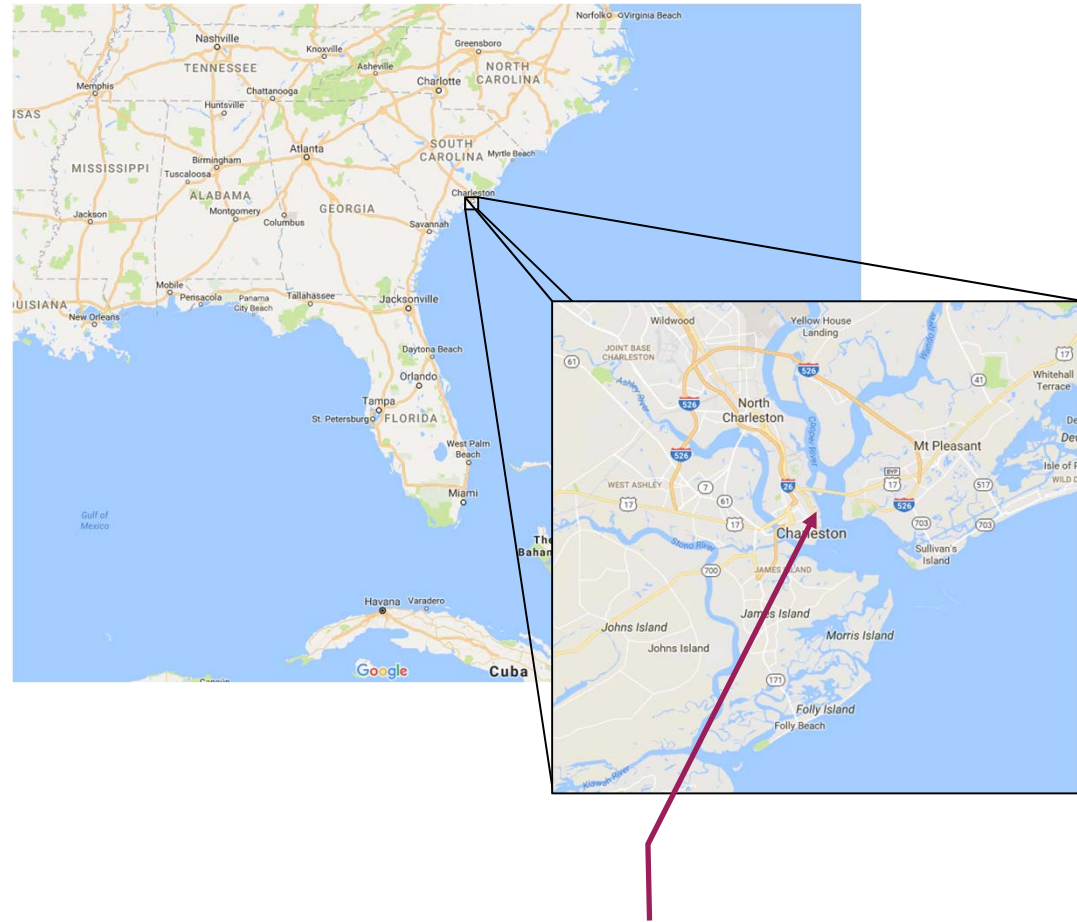
# One New Change: A good day

- Successfully developed ground source opportunity
- Worked with contractors to ensure robust design
- Strong interdisciplinary communication within Arup
- Early identification of opportunity
- Result: 'Showcase Example' of Ground Source in London



# South Carolina USA: Not a good day

- Signed up to 100% heating & cooling from ground source
  - No consideration of River Source
  - Lacked robust cost benefit analysis
  - Poor communication
- 
- Result: Lost opportunity



Site is at mouth of river

# How to help?



- Offer to share knowledge
  - Lunchtime talks
  - Early contractor/designer engagement
  - Maintain an **independent & unbiased** views
  - Good route to introductions
- Remember their drivers
  - Budget, schedule, value to client
- Be patient & courteous
  - They may not be in control (even if they should be)
  - It's ok to send reminders... they are busy and pulled in many directions

# Open Discussion

