

Keller Group plc

Keller Ground Engineering

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Agenda

- Introduction to KGE
- Background to award of Olympic Stadium contract
- Original scope of work
- Keller's alternative solution
- Summary



Introduction to KGE

- UK's leading independent specialist ground engineering contractor
- Distinguished by its ability to offer tailored solutions
- Broad product range enhanced by two recent acquisitions
 - Phi in 2006 and Systems Geotechnique in 2007
- 2007 revenue of circa £80m
- 800 employees operating across UK



Background to award of Olympic Stadium contract

- Many of the world's top sports stadia supported by Keller foundations:
 - e.g. Manchester – Commonwealth Games; Sydney – Olympics; Dallas – Dallas Cowboys Stadium
- KGE has good local knowledge and an excellent track record with the team (contractor and engineer) on this project
 - Millennium Dome and conversion to O2 Arena
- Experience on several smaller, Olympics-related contracts
 - preparation of sites for relocation of businesses from Stratford Park
 - installation of anchors at Pickett's Lock
- Design and construct capability was key to winning this contract



Original scope of work

- 5,000 pre-cast piles and CFA piles
- Why choose pre-cast piling?
 - at least three tenders could be sought
 - pre-cast particularly suitable for uplift loads (during construction)



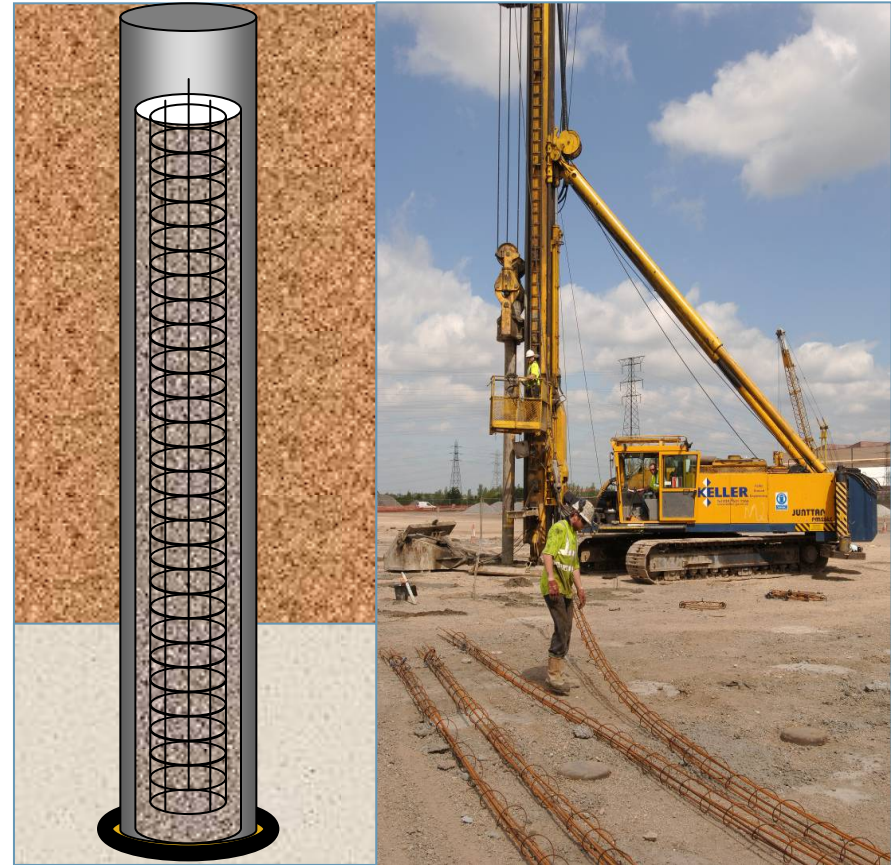
Pre-cast Piling
Conforming Solution

Keller's design and construct alternative

- Required loads and performance considered
- Alternative solution designed by KGE combines three techniques:
 - Driven Cast In Situ (DCIS) piles where high loads required
 - Continuous Flight Auger (CFA) piles to deal with uplift and wind load
 - Vibro Concrete Column (VCC) system to reduce programme time
- KGE has extensive experience of all three techniques

Driven Cast In Situ construction sequence

- Steel tube driven to depth
- Reinforcing cage lowered into place
- Concrete poured into tube
- Steel tube removed
- Expendable shoe provides clean base



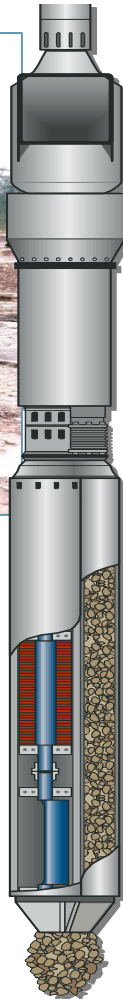
Continuous Flight Auger

Benefits of CFA

- Versatile system – can be used in most soils
- Quiet and low vibration
- Well understood by engineers
- Necessary for retaining wall locations and high loads



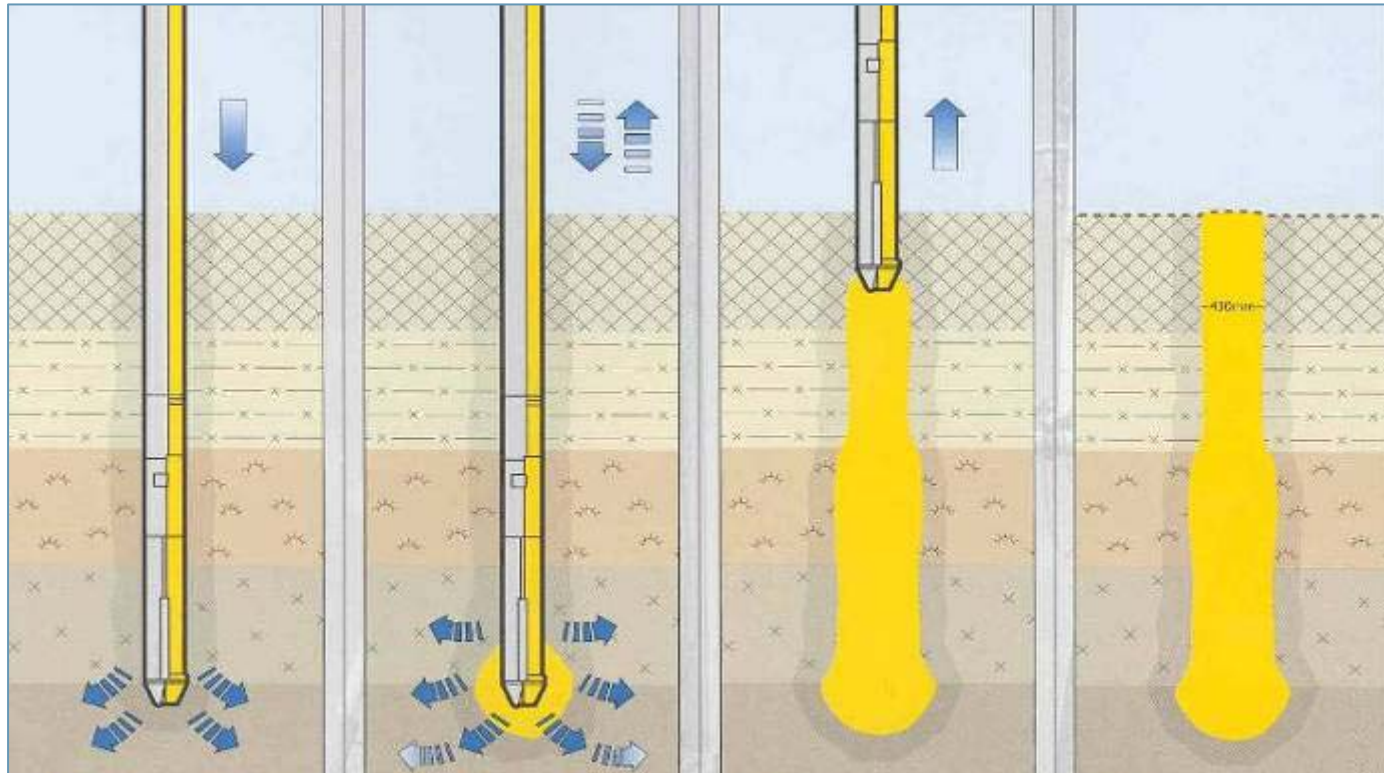
Vibro Concrete Columns



Benefits of VCC

- No spoil
- Low noise and vibration
- Rapid production – reduces programme time
- Shorter than ALL other systems
- Less costly than piling

VCC construction sequence



Why did the Keller alternative succeed?

- Buy-in from Team Stadium
- Price and programme advantages
 - around 25% saving against the price of the conforming scheme
 - programme time reduced by around six weeks
- Use of alternative systems better suited to site conditions
 - DCIS extremely robust and can tackle difficult ground and a range of obstructions
 - maximises capacity at minimum length
- Sustainable solution



Sustainability and environment

- No spoil - no muck away lorries
- Locally-produced concrete (ODA supply) - piles not transported by road
- Re-use of materials in concrete (PFA and GGBFS)
- DCIS and VCC systems are shorter than other systems, so use less materials

Summary

- Broadest product range in the industry
- Design and construct capability a big advantage
- Excellent industry relationships
- Importance of local knowledge
- Good prospects for further work related to London's 2012 Olympics



