EPSRC
Engineering and Physical Sciences Research Council

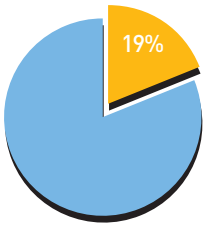
Structural and ground engineering

At a glance

This theme covers construction materials (including reinforced concrete and masonry), structural engineering (including load and impact assessments, structural dynamics, structural health monitoring, and fire engineering), geotechnical engineering (including soil and rock mechanics, ground reinforcements, tunnelling, and slopes and embankments) and pavement engineering (design of materials and methods for the construction, operation and maintenance of roads and highways).

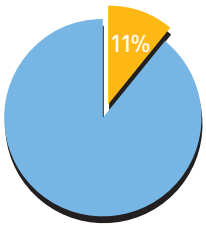
Grants funded

93
19% of Programme



Grants value

£29.3M
11% of Programme



Greatest cross sub-theme connectivity
Waste and pollution
Water and coastal engineering
Built environment

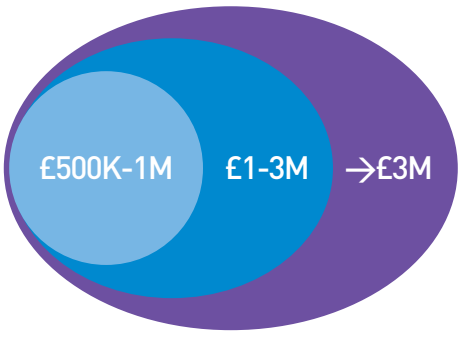
Greatest user collaboration
Metronet Rail SSL Ltd.
Highways Agency
Building Research Establishment
ARUP

Leading centres based on EPSRC funding

- School of Civil Engineering and the Environment, University of Southampton
- Department of Civil and Environmental Engineering, Imperial College
- Department of Civil and Structural Engineering, University of Sheffield
- School of Civil Engineering, Nottingham

Universities within sub theme by EPSRC funding

£500K-1M	£1-3M	→£3M
Oxford	Loughborough	Southampton
Birmingham	Nottingham	Imperial
UCL	Newcastle	Sheffield
Leeds	Bristol	
Bath	Manchester	
	Queen's University Belfast	
	Cambridge	



Data is based on EPSRC's current portfolio in January 2009

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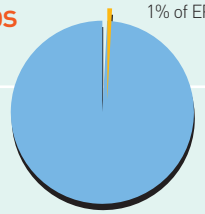
Research capability

Doctoral training centres

University	Name of centre	
Loughborough	Innovative and Collaborative Construction Engineering IDC	

PhD & Postdoc fellows

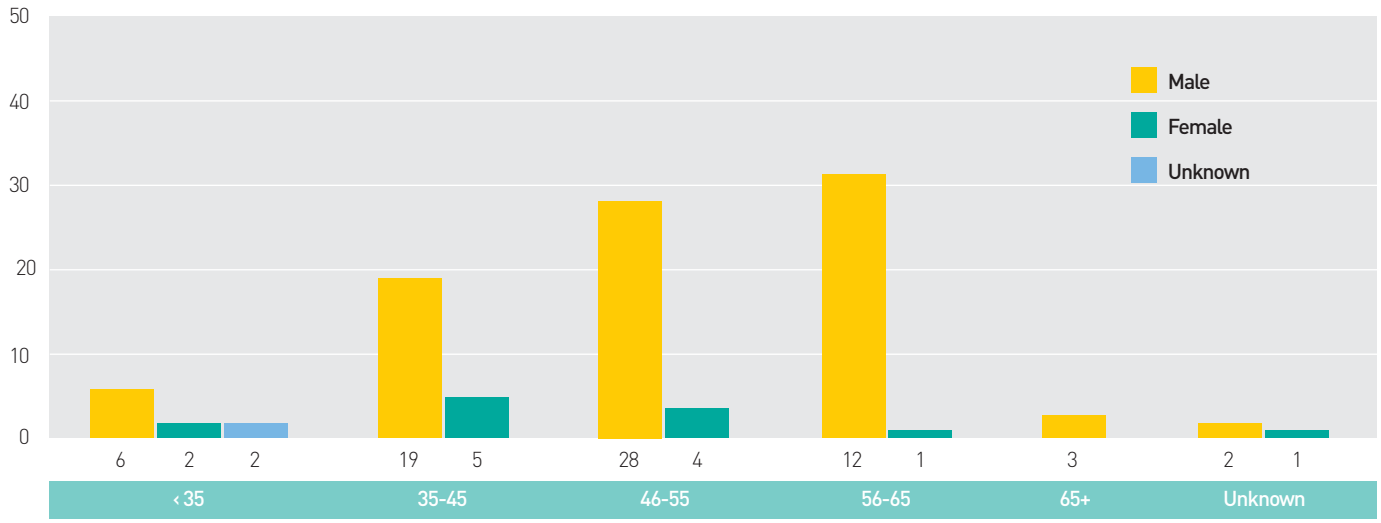
Total PhD Studentships (all EPSRC sources)	Number of Postdoctoral Fellows
96	0



Fellowships

	Advanced research fellows	Senior research fellows	Career acceleration fellows	RA Eng
Number	4			
% Total	2%			
	Prof. S Adhikari – Swansea			
	Prof. A Pavic – Sheffield			
	Dr M Gilbert – Sheffield			
	Dr JHG Macdonald – Bristol			

Demographics



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Swot analysis

Strengths

- Of the 93 grants in this area, 15 are first grants. There are also 2 Challenging Engineering awards in this theme. There is a reasonable number of younger investigators, although the area is heavily male dominated
- This area is well linked to industry – over half of the grants have project partners
- The recently funded Industrial Doctorate Centre in Innovative and Construction Engineering at Loughborough will help provide the next generation of researchers in the area of construction
- There are 4 Advanced Research Fellows which is a relatively high number for an engineering discipline; however, there are no new CAFs or LFs and no postdoctoral research fellows
- The area is relatively well supported through responsive mode.

Weaknesses

- International connectivity is moderate: there are 5 grants with international institutions as collaborators. There are 2 international networks in this theme
- There is very little connectivity with other disciplines as demonstrated by almost negligible co-funding across EPSRC programmes, although there are links to other area of engineering such as sensors and water engineering. There are also links to environmental science within ground engineering
- The vast majority of grants in this sub-theme are small (£100k-500k). There is potential for larger, more ambitious projects in this area.

Opportunities

- Despite the economic climate there are still plentiful examples of flagship building projects like the London 2012 Olympics and the Channel Tunnel Rail link, which will benefit from innovative design and building solutions
- The move towards taller and slenderer structures has made structural dynamics an important area for study. Given the UK's ageing infrastructure, sensors and structural health monitoring are also areas of growth
- There is plenty of scope for collaboration with other disciplines, and scope for more ambitious research projects
- Sustainability and climate change agendas present a wealth of grand challenges.

Threats

- The already modest project contributions from a conservative, risk-averse and regulation limited UK construction industry are threatened by the global economic downturn.

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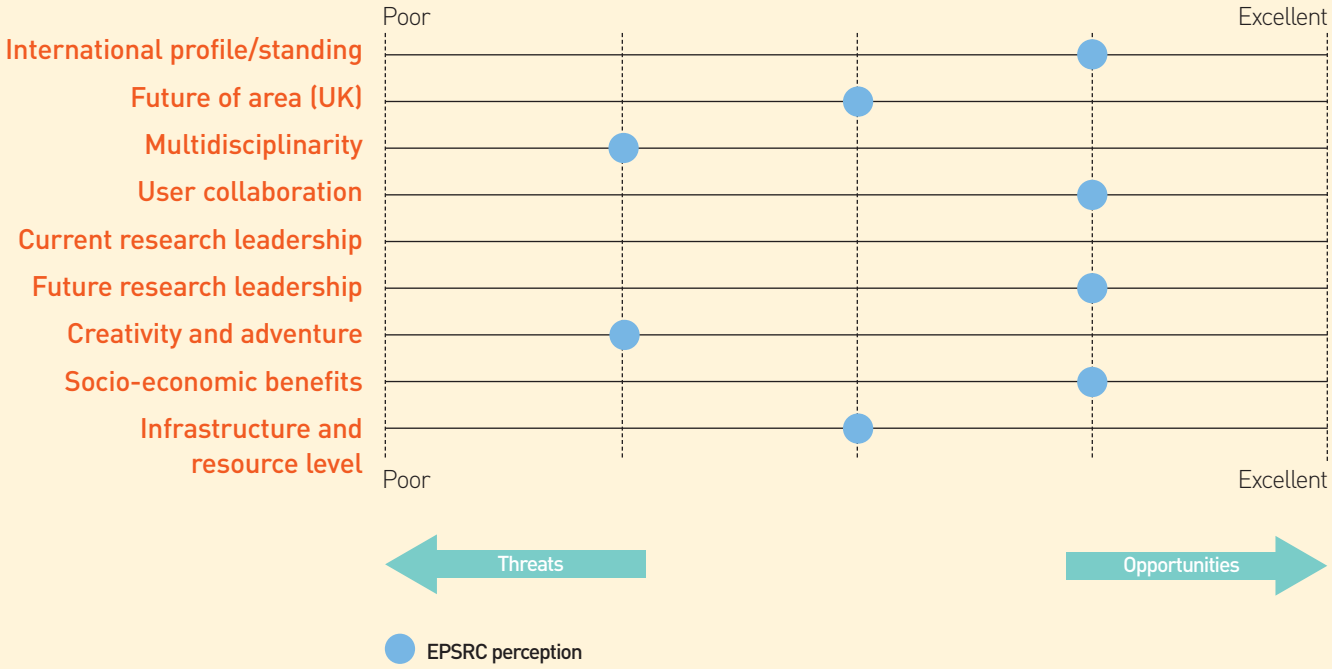
Perceptions

Our perception of the current position of structural and ground engineering research



Summary

The UK traditionally has a strong international reputation in this area, especially in geotechnical engineering. This is enhanced by a number of UK-based civil engineering companies and their involvement in flagship building projects worldwide. The future of the theme looks secure: it performs well in responsive mode and there are a reasonable number of first grant holders.

However, there is wide scope for more ambitious and creative, far-reaching, cross-disciplinary work in this area. Research in this area tends to be incremental and conservative, concerned mainly concerned with finding practical solutions to immediate problems.

There is scope for increased collaboration with the UK construction industry. Through its links with the Institution of Civil Engineers and the IStructE, EPSRC is trying to address this. The strategic partnership with ARUP is a positive step.

The benefits to UK society are obvious in the sub-theme. Civil engineering has a large role to play in finding solutions to the problems brought about by a changing climate.

Engineering and Physical Sciences Research Council

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