

Welcome to Engineering and the Environment

Professor William Powrie FREng
Dean of Faculty

The Faculty in numbers.....

- 1,684 undergraduates
- 256 postgraduate taught students
- 400+ research postgraduate students
- 340 academic staff
- 140 other staff
- Turnover £65M

(Teaching £20M, Research £30M, Enterprise £9M,
Other £6M)

Figures from the 2012-13 budget

Transportation research and education

Main areas of activity

- Transport operations and logistics (TRG)
- Railways (National Infrastructure Laboratory, ISVR)
- Aerospace (ISVR, Computational Engineering)
- Noise (ISVR)
- Infrastructure (National Infrastructure Laboratory)
- Maritime (SMMI)

Funding and strategic industry partnerships

Programme and collaborative grants

- TRACK21: railway track for the 21st century: £3.14M
- High speed railway track - getting it right: £1M
- iConnect (engineering interventions for travel): £2.3M
- UK Infrastructure Transitions Research Consortium: £4.7M
- Sixth Sense Transport (developing flexible 24/7 transport): £0.7M
- iSMART (infrastructure slopes: Sustainable Management And Resilience assessment): £1.7M
- International Centre for Infrastructure Futures : £3.4M

Strategic industry partnerships UNIVERSITY OF Southampton

- Airbus (UTC in aircraft noise) £1.8M since 2008
- Lloyds Register (UTC in ship design for enhanced environmental performance) £2.6M since 2008
- Network Rail (Strategic Research Framework on future infrastructure systems £1M, 2012-17)
- Rolls-Royce UTCs in gas turbine noise and computational engineering £5M

Some achievements

g public transport

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Our bus priority systems
research has reduced travel
times for London commuters

Keeping Britain moving

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A nighttime photograph of a city street. On the left, a modern building with lit windows is visible. In the foreground, a white car is moving, leaving a long, bright light trail. In the background, a tall, illuminated clock tower stands prominently against the dark sky. The street is lit with various streetlights, and other vehicles are visible in the distance.

We set up the first integrated management, control and information centre in the UK, it is used throughout the UK and is a leading example in Europe

lway noise

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Over 13 countries are now using rail damper technology developed in conjunction with Tata steel to reduce rail noise

Reducing aircraft noise

The image shows two men in an anechoic chamber. The man in the foreground, wearing a light blue shirt and a dark vest, is adjusting a white, cylindrical component mounted on a black stand. The component is positioned in front of a large, polished metal jet engine nacelle. The background is filled with brown, pyramid-shaped acoustic absorbers. A second man in a dark shirt is visible in the background, looking at the equipment. The floor is a blue metal grating.

For over 40 years our engineers have been working in partnership with industry to cut the noise from aircraft, resulting in new noise-reduction technologies being incorporated into today's planes.

Infrastructure slopes

Many infrastructure slopes are over-steep and are held up by vegetation-induced suctions in the soil



Infrastructure slopes

But seasonal variations in soil moisture content driven by vegetation water demand cause cycles of shrinkage and swelling that cause problems for railway operation (Photo: Graham Birch)

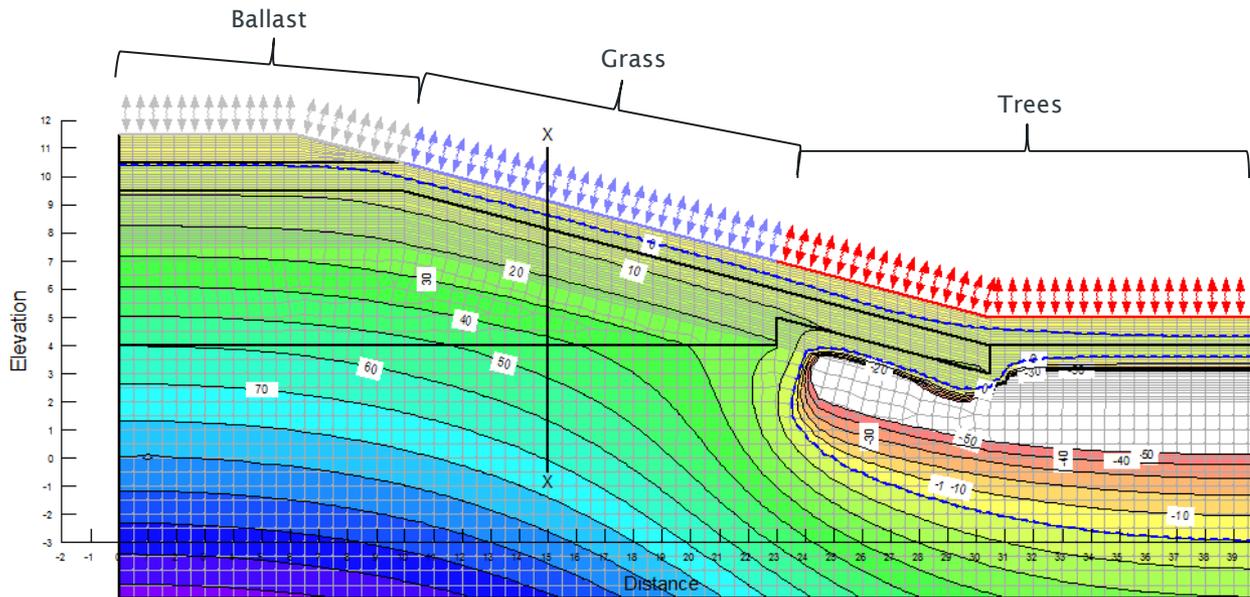


Infrastructure slopes

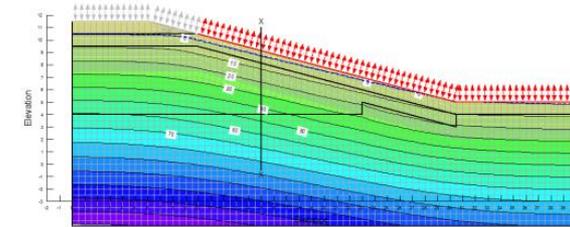
Removing the vegetation can
cause loss of stabilising suction
and failure of the earthwork

Modelling vegetation effects

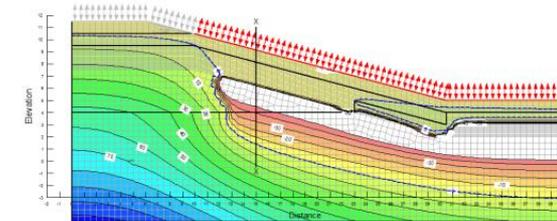
End of a wet winter (February 2001)



(a)



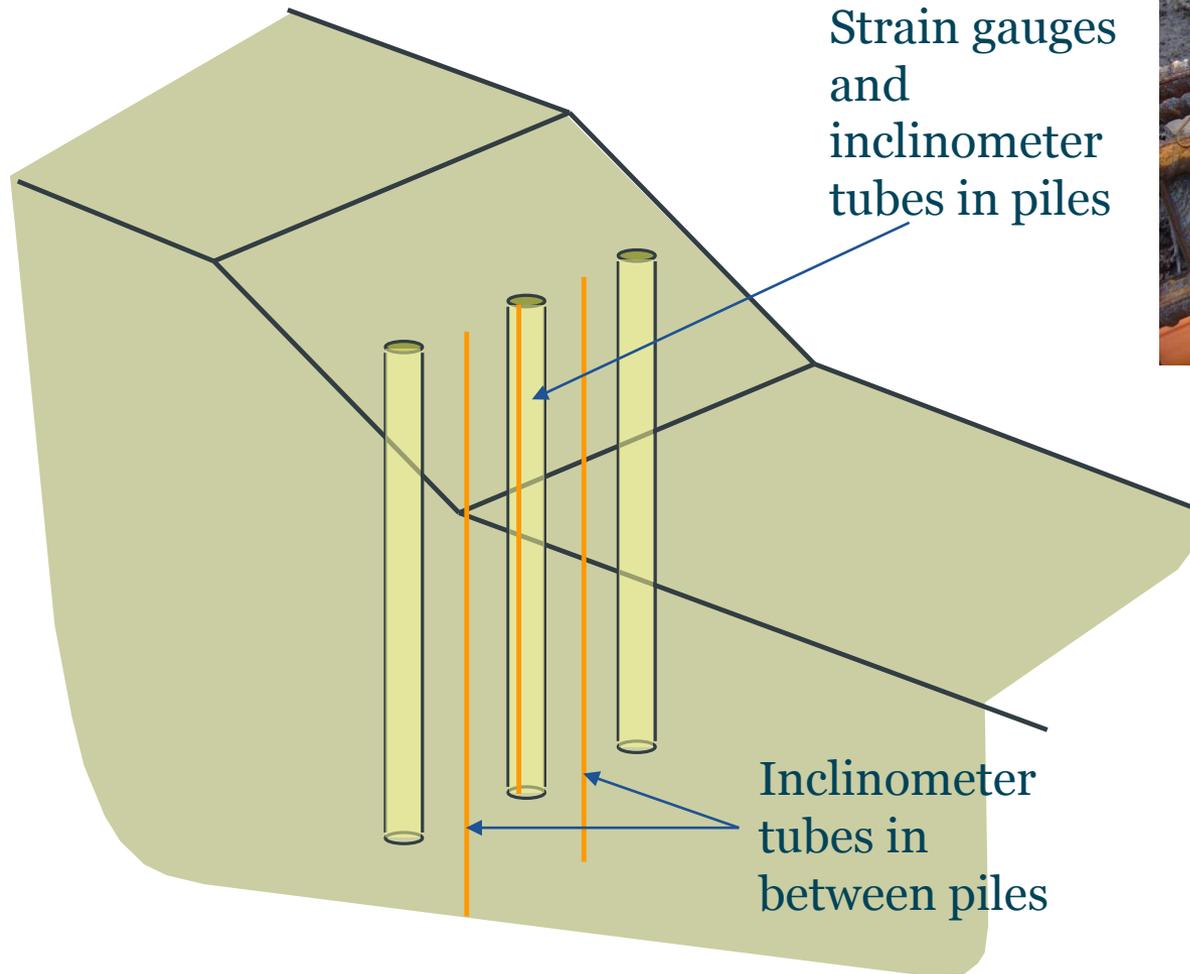
(b)



(c)

End of winter (February 2001) pore water pressure contours (a) For a slope with trees at the toe only (b) for a grass covered slope and (c) for a tree covered slope

Discrete pile stabilization of infrastructure slopes



Also:

- Inclinometer tubes at toe and crest of slope
- Piezometers
- Raingauge

Discrete pile stabilization: monitoring



Hildenborough, Kent



Grange Hill



Mill Hill East

National Infrastructure Laboratory

Current research funded by EPSRC and Network Rail is developing low maintenance, high performance new track forms



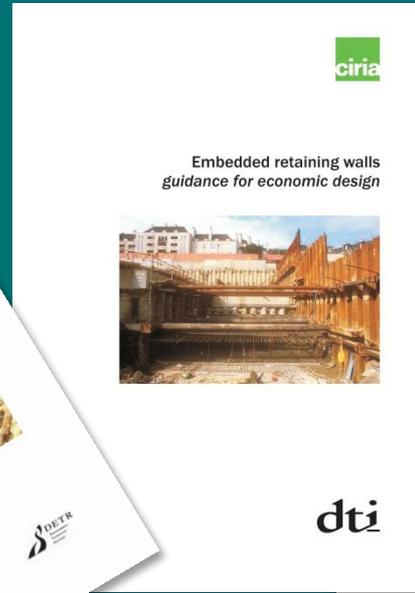
Influencing policy

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Our research has contributed to changes in Government standards and policy helping to improve the safety and efficiency of transport in the UK

Setting standards



Our research outputs are consistently incorporated into industry standards, guidance and codes of practice

The future

Boldrewood Engineering Campus



The University of Southampton and Lloyd's Register are working together to create a £116 million world leading engineering Centre of Excellence (ECE) on the University's Boldrewood campus, at the heart of the Solent Maritime Cluster.

Fluid dynamics laboratory

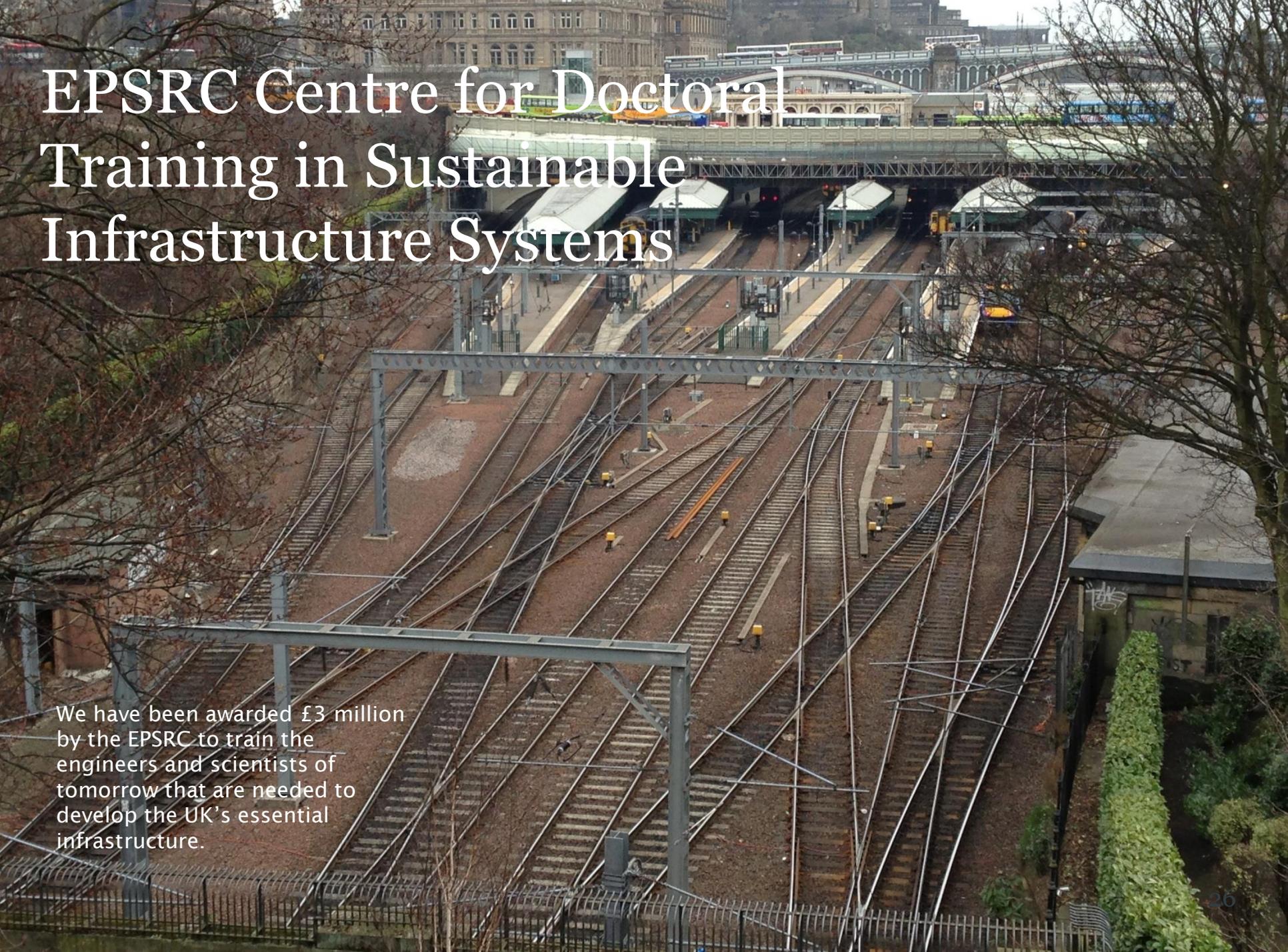


The Maritime Centre for Excellence will define a completely new way of delivering engineering education and research to meet the major global challenges facing society.

National Infrastructure Laboratory

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An aerial photograph of a railway station. The image shows several parallel tracks with overhead power lines supported by metal gantries. In the background, a large bridge spans across the tracks. The surrounding area includes trees and buildings, suggesting an urban setting. The text is overlaid on the top left of the image.

EPSRC Centre for Doctoral Training in Sustainable Infrastructure Systems

We have been awarded £3 million by the EPSRC to train the engineers and scientists of tomorrow that are needed to develop the UK's essential infrastructure.

Thankyou