

# update

The newsletter for subscribers to **Bridge design & engineering**

## Reminder emails

Subscribers to *Bd&e* are invited to sign up for our 'reminder email' service, which lets you know each time a new edition of the magazine is published.

If you sign up for this service, we will give you advance notification by email when a new issue is about to be sent to you. This will enable you to ensure that you receive your copy – and to advise us if it does not arrive.

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## Forth cables contract aims to halt corrosion

A US\$15 million contract to install dehumidification equipment on the Forth Road Bridge in Scotland was awarded this month (*December*). The Forth Estuary Transport Authority has appointed contractor C Spencer to install the system on the main cables of the suspension bridge in an attempt to halt the corrosion that has been discovered.

The equipment will inject dry air into the bridge's two main cables; although the technique is already used extensively in Japan, it is believed this will be the first time it has been retrofitted to try and halt corrosion on this scale.

Nippon Steel has assisted consultant Faber Maunsell with the design of the system, with installation work due to start next April and the

system expected to be ready for operation by September 2009.

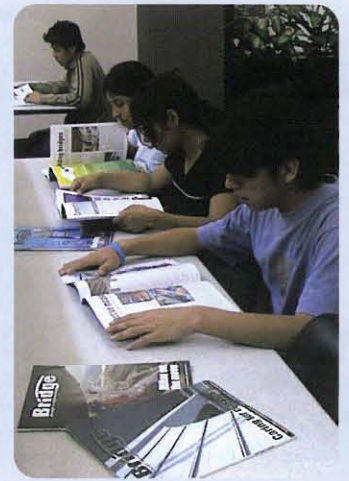
A thorough investigation of the state of the cables was prompted in 2004, following the discovery of corrosion in older suspension bridges in the USA. FETA became the first European bridge authority to carry out an internal main cable inspection, which revealed significant corrosion. A loss of strength of up to 10% was suggested, a conclusion later verified by a Scottish Executive-commissioned independent audit. If the corrosion cannot be halted, weight restrictions may have to be introduced as early as 2013.

FETA bridgemaester and general manager Alastair Andrew said: "If relative humidity of the air within the

*continued on page 4 >*

## READING MATTERS

Back copies of *Bridge design & engineering* donated by a UK subscriber are now being used by engineering students in Peru with the help of charity Bridges to Prosperity. The unusual arrangement came about after subscriber Mike Luckett of Saint Gobain contacted *Bd&e* to ask for suggestions on where to donate old issues of the magazine that he no longer needed. With the help of Zoe Keone, director of operations for Bridges to Prosperity in Peru, *Bd&e* identified the Sencico Technical School in Lima, Peru as a suitable recipient. Head of department Felipe Garcia has a passion for bridge design and hopes that the magazines will inspire his students with ideas for future projects. *Bd&e* contributed by shipping the magazines to Peru, along with a Spanish-language copy of Leonardo Fernandez Troyano's book on bridge engineering. Bridges to Prosperity is currently in the first year of its bridge building programme in Peru; for further information on the programme, and details of how to donate, please visit [www.bridgestoprosperty.org](http://www.bridgestoprosperty.org)



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## DIARY DATES

### COMING SOON

#### JANUARY 2007

**19-20:** Pacific Earthquake Engineering Research Center annual meeting. The practice of performance-based earthquake engineering. San Francisco, CA, USA.  
<http://peer.berkeley.edu/2007AM/index.html>

**21-25:** TRB annual meeting. Washington DC, USA.  
[www.trb.org](http://www.trb.org)

**22-25:** Asset management for Gulf road networks. International conference and workshops. Dubai, UAE.  
Organised by IQPC Middle East  
Email: [inquiry@iqpc.ae](mailto:inquiry@iqpc.ae) [www.iqpc.ae](http://www.iqpc.ae)

#### MARCH 2007

**14:** Bridges 2007. Annual conference and exhibition for bridge engineers and practitioners. Nottingham, UK.  
Organised by Surveyor Magazine  
Contact: Lisa Madigan  
Email: [l.madigan@hggluk.com](mailto:l.madigan@hggluk.com)

### NEW LISTINGS

#### MARCH 2007

**27-28:** Innovative pavement management systems. Singapore.  
Organised by: IQPC  
[www.iqpc.com.sg](http://www.iqpc.com.sg)

#### JULY 2008

**2-4:** Footbridge 2008 conference, exhibition and awards. Porto, Portugal. Full details to be announced.

**13-17:** The 4th international conference on bridge maintenance, safety and management. Seoul, Korea. Abstracts of 300 words should be submitted to the conference secretariat together with the preliminary registration form  
Deadline: 31 May 2007 Contact: Professor Jeeho Lee  
Email: [secretariat@iabmas08.org](mailto:secretariat@iabmas08.org)  
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## COMPOSITE CURVER



A new bridge has just opened over the Guadiela River, close to Buendia reservoir in Cuenca province in Spain. The bridge has a 162m-long main span which consists of a steel truss superstructure on a plan radius of 800m. The total length of the bridge, which was designed by consultant Estudio AIA and built by contractor Sacyr, is almost 320m; the 162m-long main span and two side spans, one 63m long and the other almost 95m. It is 11m wide and carries a single-carriageway road. The superstructure of the bridge is a composite structure consisting of steel trusses with a concrete slab deck, and another concrete slab at the bottom of the truss at the location of the pier supports. The alignment of the road in plan made it necessary to adapt the geometry of the trusses to suit. Transverse beams connect the two trusses and the depth of the trusses ranges from 4.5m at midspan and at the abutments to 10m over the pier supports. The top chord is made of a steel box section with dimensions 750mm by 550mm, and the bottom chord has the same dimensions but a different thickness. The diagonals are also steel box sections, this time with dimensions of 450mm by 550mm, and are connected to the chord at 9m centres. The abutments and pier supports are concrete of class C35/40. The difference in length between the side spans and the main span means that there is a vertical tie-reaction at the abutments. Hence the abutments have been designed to enable them to resist the vertical reaction in two directions. The intermediate supports are 23.5m-high piers with a rectangular section of 8m by 2.5m, and are supported on 25m-long piles of 1.2m diameter. The superstructure was built in five sections alongside the abutments, then lifted into its final position using a high-capacity crane. Client for the bridge is the Ministerio de Medio Ambiente and the bridge was opened at the end of October.

## Elevated toll road starts construction

Erection of launching gantries for a new elevated toll road in Bangalore, India, starts this month. Concession company Bangalore Elevated Tollway awarded VSL India the contract for the erection of 8km of viaduct, including the supply and operation of the launching gantries, post-tensioning and bearing installation.

The viaduct will carry four lanes of traffic and will be built along the median of the existing highway, between Bangalore city and Electronic City.

Bangalore Elevated Tollway is a joint venture of three contractors, each of which will build one of three equal sections of the tollway. Each contractor also has a separate casting yard and VSL will supply, erect and operate three gantries, one to each section.

The construction of the viaduct is span by span quarter point to quarter point method with three stitches per span; a total of 2860 segments will be erected. The viaduct is built up of 32 modules, each of which has eight spans of continuous construction, and is 262m long. Each eight-span module consists of six 34m-long spans with 29m-long spans on the first and last span; all spans are supported on bearings.

The launching gantries are designed to receive the 90t segments delivered from the ground or from the deck. The main trusses have three supports, the two main supports transferring load to the pier via the pier segment and the front temporary support leg through a pier bracket. The gantry will be launched to final position and the front temporary support engaged to the pier bracket. The pier segment is then placed using the winch onto temporary jacks, the main field segments can be then hung to the gantry on stress bars. This configuration allows the adjustment and nailing of the pier segment and grouting of the permanent bearings to be completed away from the critical path.

The three gantries required for the project will be fabricated in China due to tight programme constraints.

Each of the gantries will be erected using heavy lifting techniques, due to a lack of large-capacity cranes in India and the congested site conditions. VSL's modular tower system will be used to effectively erect the gantry from the top down. Completion of the viaduct is scheduled for May 2008.

## LIFECYCLE ASSET MANAGEMENT FOR GULF ROAD NETWORKS

International Conference: 23-24 January 2007  
Interactive Workshops: 22 & 25 January 2007  
The Grosvenor House Hotel, Dubai, UAE

For more information please fax +971 4 363 1938

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