

# Better management promised for safety critical bridge fixings

Safety of structures is paramount to the UK Bridges Board and recent guidance supported by the Board should ensure that bridge engineers are doing all they can to manage safety critical fixings.

One way of improving safety is by looking to plug gaps in knowledge. The UK Bridges Board had identified the need for guidance on hidden structural components that are not easily inspectable. This month sees publication of new guidance: 'Management of Safety Critical Fixings' that the Board helped to initiate.

When bridges fail the effects can be catastrophic. Last year's FIU bridge collapse in Miami left six people dead; and when the Morandi bridge collapsed in Genoa 43 died. Fortunately, such incidents are extremely rare.

In the UK, inquiries into bridge failures that followed heavy flooding in Cumbria in 2009 helped to raise awareness of issues considered vital for the UK Bridges Board. As a result, the Board supported an update to a CIRIA manual on scour at bridges and other hydraulic structures to help bridge owners to address the risk of scour to infrastructure built in or near rivers and other channels (see *TP* January 2015).

The events in Cumbria also provided a catalyst for establishing the Bridge Inspector Certification Scheme to improve the consistency and



↑ Bridge engineers carefully inspect a structure

competency of bridge inspections. To date there are now 33 bridge inspectors who have gone through the scheme.

And members of the Board have taken decisions, following inspections, to close major bridges when they have had identified safety concerns. Notably, in 2010 Transport for London closed the Hammersmith Flyover and in 2015 Transport Scotland closed the Forth Road Bridge.

↓ Risk of scour at bridges crossing rivers is covered by CIRIA guidance

The UK Bridges Board actively engages with specialist group Structural Safety, which works with industry on safety concerning the design, construction and use of structures. The group has a committee known as SCOSS, which maintains a review of building and civil engineering matters that affect the safety of structures; and a confidential safety reporting scheme known as CROSS that allows lessons to be shared.

Both SCOSS and CROSS play a vital role in the sector and it is worth reading their reports and signing up to their alerts.

But there may still be some gaps in knowledge, according to UK Bridges Board chair Liz Kirkham. "We have rail, air and marine accident investigation boards and we will soon have an accident investigation branch for roads. I think their remit should be expanded to include design failures of infrastructure, as there is currently no statutory body to investigate bridge failures."



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↑ Major highway structures are referenced in a new guide that concerns the management of safety critical bridge fixings FORTH ROAD BRIDGE

**Justin Ward (JW) asks Liz Kirkham (LK) of the UK Bridges Board about the Management of Safety Critical Fixings guidance:**

**JW: Why did the UK Bridges Board decide there was a need to carry out this work?**



**LK:** Following notable fixings failures at Boston 'Big Dig' Tunnel, Massachusetts (2006), Sasago Tunnel in Japan (2012) and closer to home at the Balcombe Railway Tunnel (2011) the

Board saw that it is evident there are some gaps in practice, knowledge and guidance.

**JW: What other publications are relevant to this work?**

**LK:** Supported by the UK Bridges Board, guidance was recently published by CIRIA on 'Defects in hidden bridge components'. This identifies some of the structural challenges and provides excellent advice on how they should be managed.

**JW: What does the new publication do?**

**LK:** The new report details good practice on the management of safety critical fixings, and is therefore complementary to earlier work. There is another link worth noting here; it will also be used alongside further work by CIRIA that examines fixings used primarily in lower risk environments such as facilities management.

**JW: Is there already a standard on fixings within the Design Manual for Roads & Bridges?**

**LK:** While the design of fixings has been covered by guidance such as Highways England's interim Advice Note 104 and elsewhere in manufactures' literature, very little is available to asset owners and consultants, in terms of their onwads managements (records, inspection, testing and repair).

**JW: Surely the design stage must be important to cover?**

**LK:** Although the new report rightly focuses on the management of fixings, there are also lessons to be learnt in terms of improved design. This would mean the need for built-in redundancy and accessibility for inspection, and selection of the most appropriate fixings to meeting design considerations.

The construction stage is also important: the need for quality throughout the process of installation, competency of installers, testing and the importance of record management.

**JW: What questions should bridge owners be asking?**

**LK:** Many bridge owners will be starting from a fairly low point in the management of fixings. They will need to ask questions such as: 'Do they know where safety critical fixings have been used?', 'What assets are being supported by the fixings?', 'Are the records available?', and 'Have the fixings been inspected?'

**JW: What comes next?**

**LK:** There is an opportunity for all bridge owners to instigate changes to their inspections and records to ensure that they have knowledge of where fixings have been used and their visual condition.

**JW: This sounds like it will be useful for the industry.**

**LK:** This report should prove very useful to the construction industry both in the UK and Ireland and further afield. This starts to plug a significant gap.

**JW: Anything else?**

**LK:** I would like to thank the Bridge Owners Forum which instigated this work and also colleagues from the UK Bridges Board for supporting this and helping to secure funding.

The work was funded by the Department for Transport, Highways England, Transport Scotland, Transport Northern Ireland, Transport Infrastructure Ireland, the Welsh Government and Network Rail.

The work was project managed by Highways England and overseen by an industry working group. Consultant WSP drafted the guidance and it will be freely available in March 2019 as CIRIA Report C778.

Also this month, the UK Bridges Board has provided an update to the Structures Toolkit. The main impact of the research will be to facilitate more accurate asset management planning of highway structures.

The Board is encouraged by the response from industry that the toolkit would be useful if it went into commercial software.

## New accreditation process for pavement management systems

Following support from a UK Roads Board meeting in October 2018, the new UK Pavement Management System accreditation process is now moving forwards.

The process is for new entrants wishing to become UKPMS accredited. Some key features of the process are:

- It will be self-funded.
- The focus will be on national reporting requirements.
- Once accredited, new systems will join existing systems on the annual re-testing programme.

The benefit of this process is to provide assurance that outputs for national reporting are produced consistently by all accredited systems. For details visit the RCMG website or contact [ukpms@hyperion-uk.com](mailto:ukpms@hyperion-uk.com)