

BRIDGE OWNERS FORUM

MINUTES OF MEETING BOF 47: TUESDAY 3 NOVEMBER 2015 AT THE BEVES ROOM, KING'S COLLEGE, CAMBRIDGE

PRESENT

Campbell Middleton	Chairman & Cambridge University Engineering Department (CUED)
Nick Burgess	London Underground
Graham Cole	ADEPT
David List	Large Span Bridge Group
Rob Dean	Network Rail
Richard Fish	Technical Secretary
Keith Harwood	ADEPT
Wayne Hindshaw	Transport Scotland
Rod Howe	Canal and River Trust
Neil Loudon	Highways England
John McRobert	Transport Northern Ireland
Jacqueline Mynott	CSS Wales
Stephen Pottle	Transport for London
Santosh Sansoa	Highways England
Paul Fidler	CUED
Bella Nguyen	CUED (Part)
Charlotte Murphy	CUED (Part)

Introduction

The Chairman welcomed everyone to BOF 47 and noted a number of items on the agenda including some which would be presented by, or of interest to, CUED students who had been invited to attend.

1. Apologies

Apologies had been received from the following:

Huw Davies Sustrans

Liam Duffy	NRA
Jason Hibbert	Welsh Government
Tomas Garcia	HS2
David MacKenzie	SCOTS
Paul Monaghan	LoBEG
Paul Thomas	Railway Paths Ltd.

The Chairman noted that Mark Atkinson, the representative from Northern Ireland Rail, continued to reaffirm his interest in BOF but had yet to attend a meeting. He will offer him the opportunity to attend BOF 48 before reconsidering the arrangement.

2. Previous Minutes – BOF 46: 19th May 2015

No points of accuracy raised and it was agreed that the minutes could be uploaded to the BOF website.

ACTION 25: Paul Fidler

3. Actions from BOF 46

References in the text below refer to the numbered actions on the BOF 46 Action Sheet. Boxed reference numbers below relate to the BOF 47 Actions:

Action 1, Temporary Bridge AIP Guidance:

Neil Loudon gave a presentation prepared by Highways England's Terry Robinson who had been working on this issue. This was still work in progress and Neil will check any matters of confidentiality before issuing a version of the presentation suitable for uploading to the BOF website.

ACTION 1: Neil Loudon/Paul Fidler

Neil noted that the various temporary bridge suppliers designed their bridges to different codes. Two were Eurocode compliant and the desire was to bring all up to the same standard. Highways England (HE) has a procedure for the rapid deployment of a temporary bridge “in the event of an incident”, including draft AIPs and Departures from Standard proforma. It was hoped that HE would also produce a similar procedure for non motorway or trunk road usage. Liaison with temporary bridge suppliers was ongoing and there were particular concerns over the control of components which were re-usable, especially with regard to fatigue issues.

Neil posed a number of questions:

- i. Do Local Authorities etc comply with BD2?
- ii. How do Local Authorities deal with Departures from Standard?
- iii. How should HE publish/promulgate the output from this work?

In response to i and ii above, all Local Authorities etc followed the Technical Approval process in BD2. It was noted that choosing to depart from nationally approved standards was high risk and compliance was almost universal.

Stephen Pottle asked if temporary bridges could be deemed to be proprietary products and hence CE marked. Neil confirmed that this was not the case. Stephen also suggested that a catalogue of possible Departures would be helpful but Neil replied that some were commercially sensitive to particular suppliers. Richard Fish noted that, on many occasions, the use of a temporary bridge was planned as part of a sub-standard bridge management plan or as part of a temporary diversion to enable strengthening or replacement works.

In response to Neil's question iii above, the Chairman suggested that an area of the BOF website could include a section for all matters relating to temporary bridges.

In general, the HE work was well received by BOF members. Neil asked for any further thoughts to be sent to him.

ACTION 2: All

Action 2, Atkins Study into Bridge Deck Water Management:

Neil Loudon gave a presentation into the Atkins work which had now been completed. Neil agreed to make the report available to all BOF members.

ACTION 3: Neil Loudon

The Chairman suggested that everyone should independently review the report ahead of a discussion at BOF 48.

ACTION 4: BOF 48

Wayne Hindshaw referred to a problem in Glasgow in which bridge drainage had become blocked with solid calcium deposits.

Action 3, Guss Asphalt Surfacing:

Neil Loudon reported that HE was reviewing recent developments and he will provide an update at BOF 48.

ACTION 5: Neil Loudon

Action 5, Hidden Defects in Bridges: CIRIA Research Proposal:

Rod Howe gave a brief progress report and agreed to circulate the full membership of the Steering Group. He also announced his forthcoming retirement (after BOF 48) and agreed to advise on his successor on the Group.

ACTION 6: Rod Howe

Action 6, Hidden Defects in Bridges: Transport Scotland Procedure:

Wayne Hindshaw had very recently issued this document which should be treated as work in progress as there were issues of confidentiality. Wayne agreed to give an update at BOF 48.

ACTION 7: Wayne Hindshaw

Wayne noted that some of the work was based on the Stewarton Bridge collapse in 2009 and Rob Dean confirmed that the RAIB report was in the public domain. It was confirmed that the Transport Scotland work was being addressed as part of the CIRIA project.

Actions 7 & 10, Premature Bolt Failures:

As Barry Colford was now working in the USA, David List agreed to try to contact Barry for any further information.

ACTION 8: David List

Actions 8, Leadenhall Buiding Bolts:

In view of Paul Monaghan's absence, this action will be carried forward to BOF 48.

ACTION 9: Paul Monaghan

Action 9, SCOSS and CROSS

Neil Loudon repeated his call for all BOF members to sign up for the SCOSS and CROSS newsletters and to encourage members of staff to participate in the feedback processes.

ACTION 10: All

The Chairman reiterated this suggestion and asked BOF members who assist in the organisation of the Surveyor Bridge Conference to propose Alastair Soane as a speaker on this topic.

ACTION 11: BOF members on Surveyor Conference Organising Committee

Action 12, Presentation to Parliamentary Infrastructure Groups:

The Chairman reported that he had investigated this option but had held back as he wanted to have a clear message to deliver. Wayne Hindshaw suggested that the need for maintenance spending should be a priority. The Chairman felt there was a need to address issues of risk and have a clear statement on the *value* of maintenance in the context of the need for a Whole Life Performance (WLP) strategy. Neil Loudon advised that Highways England were now fully committed to WLP and this was now being monitored by the ORRR. Rob Dean noted that Network Rail were also beginning to adopt WLP principles but acknowledged that there was some time before it could be considered to be fully embedded, especially with the constant need to deal with reactive issues.

Action 13 & 14, Bridge Consultants Forum and/or Bridge Contractors Forum:

The Chairman noted that these would be covered later in the agenda.

Action 15, BOF Grand Challenges Document:

Paul Fidler noted the problems of trying to locate a sharing website which would be easily accessible to all BOF members. It was agreed that the Grand Challenges Document should be issued to all BOF members who, in turn, would send their comments to Richard Fish. Richard would prepare a revised draft for discussion at BOF 48.

ACTION 12: All/Richard Fish

Action 16, Tagging Technology:

Neil Loudon advised that the HE scoping study based on Radio Frequency Identification (RFID) was now complete and he offered to give an update at BOF 48.

ACTION 13: Neil Loudon

Stephen Pottle reported that he had recently attended a demonstration of the RFID technology at the Cambridge Smart Infrastructure Centre (CSIC). The Chairman went on to explain the two different types of RFID that were being developed: passive, which required a scanner to pick up information, and active, which included a power source to provide continuous reporting. Stephen noted that TfL were considering RFID on one of their projects.

Action 17, Technical Approval Guidance on Phased Works:

Neil Loudon will give an update at BOF 48.

ACTION 14: Neil Loudon

Action 18, Parapet Research and Testing:

Wayne Hindshaw reported on two Transport Scotland projects being undertaken respectively by CH2M Hill and URS (now Aecom). The brief had been to consider novel and innovative systems but Wayne had been disappointed by the work to date. He agreed, however, to issue the final reports in due course.

ACTION 15: Wayne Hindshaw

Rob Dean recounted a similar Network Rail study based on ALARP (As Low As Reasonably Practicable) which was out to tender for scoping. The project had partly been driven by the Froxfield incident and the aim was to improve value for money in restraint systems. Rob agreed to provide updates at future meetings.

ACTION 16: Rob Dean

Action 19, Scottish Road Research Board

Wayne will provide feedback from a forthcoming meeting

ACTION 17: Wayne Hindshaw

Action 20, De-icing Materials:

David List will discuss this issue with the Large Span Bridge Group and report back at BOF 48.

ACTION 18: David List

Action 27, BOF Subscriptions:

The Chairman reported that reminders had been sent to those organisations who had yet to pay their subscription (Irish Rail, Network Rail, ADEPT and Transport Northern Ireland). Rob Dean asked for the Network Rail invoices to be copied to him. All parties were asked to chase payment.

ACTION 19: All

Action 34, BIM:

Rob Dean reported on conversations following the ICE BIM Conference and recognised that more work was needed to match BIM techniques with management and maintenance of existing infrastructure. Discussion extended to the UKBB BIM project being managed by TfL and Stephen Pottle agreed to provide updates at future meetings.

ACTION 20: Stephen Pottle

Action 36, Lean Construction:

It was agreed that this topic should be incorporated into the revised Grand Challenges document.

ACTION 21: Richard Fish

Action 37, Bridge Inspector Competency:

Stephen Pottle and other members of the Steering Committee provided a progress report on the accreditation scheme being developed by LANTRA: a launch was planned for January 2016 and the scheme should be up and running from March. Eight assessors had been appointed who would test inspectors' competency. There was widespread support for the scheme from most BOF organisations although concerns had been expressed about the costs of obtaining accreditation. John McRobert noted that most of his bridge stock consisted of small span masonry arches and questioned the need to train all inspectors in a broad spectrum of types and materials. He acknowledged, however, that current budget constraints were also a consideration. Stephen Pottle reported that this point had been discussed by the Steering Group and the breadth of competence for senior inspectors was considered essential. Rob Dean noted that were similarities between Northern Ireland and the Network Rail stock. He agreed to share how Network Rail would be approaching this issue.

ACTION 22: Rob Dean

Neil Loudon emphasised HE's commitment to the scheme and suggested that this issue had been ongoing since the original BOF Grand Challenges document and that it should feature in the proposed revision. Neil noted that an IAN was due to

be published in December which would include scope for Inspector and Senior Inspector roles. Stephen Pottle noted that discussions were ongoing about the link to the revised Code of Practice.

The Chairman asked for other views on take up of the scheme from the meeting:

- Nick Burgess repeated earlier points that LUL's scheme was closely aligned but he could not yet fully sign up to the proposal.
- David List noted that most large bridges had specifically trained inspectors but he would raise the matter at the Large Bridge Group.
- Jacqueline Mynot noted that, whilst CSS Wales would encourage joining the scheme, it would be down to individual authorities to decide.
- Keith Harwood noted that some ADEPT members had reservations, particularly over costs.
- Graham Cole acknowledged that there was a risk that qualified inspectors would be in demand and hence may not stay with one employer for long periods.
- Rod Howe asked about private sector commitment; Neil Loudon replied that most consultants who either were or wanted to be HE Agents were very supportive.

The Chairman encouraged all BOF members to commit to the scheme. He suggested that the LANTRA website should provide further information but any short term email queries could be directed to any of Stephen Pottle, Neil Loudon or Liam Duffy.

ACTION 23: All

Action 43, Network Rail/ADEPT national agreement:

Rob agreed to investigate any regional differences in the application of the agreement and report back.

ACTION 24: Rob Dean

All unrecorded actions from BOF 45 had either been completed or were discussed as part of the BOF 46 agenda.

4. Membership Update & Introductions to New Members

The Chairman introduced CUED students, Bella Nguyen (post graduate) and Charlotte Murphy (under graduate) who had interest in some agenda items.

He also introduced David List, the General Manager of the Tamar Bridge and Torpoint Ferry, who was the new BOF representative from the Large Span Bridge Group. David gave an account of his career prior to taking up his present post 15

years ago. He also gave more details of the Large Span Bridge Group, including its membership and links with the International Cable Supported Bridge Owners.

The Chairman thanked David and formally welcomed him to BOF.

5. Feedback from UK Bridges Board and UKRLG

Richard Fish gave feedback from the meeting of the UKBB on 19th October 2015, specifically the discussions on the following:

- The Bridge Inspector Competency and Accreditation scheme and its links the soon-to-be revised Code of Practice
- The current research proposals proposed by BOF
- The UKBB Business Plan
- Boundary issues
- The recent RAC FoI request on weight restricted bridges.

6. Deterioration Modelling Research Proposal

The Chairman reminded the meeting of the recent research prioritisation exercise undertaken at BOF 45 which had seen three projects approved by UKBB and UKRLG.

Keith Harwood, as nominated project lead, reported on progress with the bridge deterioration modelling project which was running slightly behind the others. This was partly due to difficulty Keith was having in confirming DfT financial commitments from either Steve Berry or Louise Iveson. Contributions from BOF members were confirmed as follows:

- Highways England £10k
- Network Rail £10k
- Transport Scotland £10k
- Transport Northern Ireland £5k

The Chairman asked other BOF members to consider financial support.

ACTION 26: All

Keith was working on the draft scope which he agreed to circulate to BOF members.

ACTION 27: Keith Harwood

The following were currently represented on the project steering group:

- Canal and River Trust
- Welsh Government
- ADEPT
- TfL
- Network Rail
- HS2
- Highways England

Keith agreed to take on the role as Chair of the Steering Group

Discussion extended into procurement with Neil Loudon suggesting that the HE T-Tear Framework up to February next year or the new SPATS framework after that date.

The connection with the Atkins Toolkit was also discussed. Keith noted that this also linked to HAMFIG and, as this was chaired by Chris Allen-Smith of Hertfordshire CC, Keith would ensure coordination throughout the project.

7. Rapid Bridge Deterioration Case Studies

John McRobert gave a presentation on two case studies from Northern Ireland: Boyne Bridge in Belfast dating from 1935 and Abercorn Bridge, an original Mouchel/Hennibique design built in 1932. A short discussion followed with specific reference to chloride penetration accelerating deterioration.

8. Safety Critical Fixings Research Project

Neil Loudon and Santosh Sansoa gave a presentation on this research project which had also arisen from BOF 45 and was being led by HE. Neil initially highlighted a number of parallel initiatives including a recent NCE survey (which had been sponsored by Hilti!) and a CIRIA project. He acknowledged that there was a risk of overlap and duplication, especially with the latter where a recent tele-conference had seen CIRIA agree to modify their focus to concentrate on Building Fixings. That said, there was still a possibility of further collaboration at a later point or that CIRIA might be a channel for the eventual publication of the BOF project.

As there was already sufficient guidance on design and installation, Neil noted that there was very little on in-service inspection and maintenance. With regard to design, IAN 104 was soon to be updated (from 104/07 to 104/15). Neil also highlighted recent SCOSS newsletter headlines concerning resin fixing failures.

In summary, Neil proposed that the project scope should focus on the *Management* of Safety Critical Fixings and would be part of HE's national structures programme. In response to a question from Stephen Pottle, Neil confirmed that the project would need to be incorporated in a revision of the Bridge Inspection Manual.

Santosh then went on to present the details of the project which had been awarded through the T-Tear framework and would be starting this month (November 2015) with a nine month programme. Funding contributions had been finalised as below:

- Railway Paths £2k
- Transport Infrastructure Ireland £10k
- Transport Scotland £10k
- Welsh Government £5k
- DfT £45k
- Transport Northern Ireland £5k
- Highways England £13k
- Network Rail TBC

Santosh advised that a project steering group was to be set up with an inception meeting soon to be held with the contractor. The output was likely to be a free download with presentations to be given to both BOF and UKBB. Richard Fish noted how quickly this project had been implemented, especially as it was only a proposal at BOF 45. The Chairman asked for the BOF logo to be incorporated in the finished publication.

ACTION 28: Neil Loudon/Santosh Sansoa

Santosh's presentation will be uploaded onto the BOF website.

ACTION 29: Paul Fidler

9. Bridge Bashing

The Chairman introduced CUED's Bella Nguyen who gave an excellent presentation on the various methods to prevent bridge strikes by over height vehicles, including a camera system presently being trialled by LUL.

A discussion followed in which Rob Dean noted that there were typically several hundred strikes per year. A number of preventative systems and incidents were mentioned:

- Neil Loudon cited an incident at the Dartford Tunnel when a lorry had been detected, turned back and then tried again – bringing down a clutter beam.

- Wayne Hindshaw noted that research for Transport Scotland's work in this area had revealed that there was no regulation of vehicle height. Transport Scotland use a Siemens Infra Red system.
- David List reported that automatic tolling used Laser sensors to remotely recognise vehicle types.
- Rob Dean referred to a Network Rail ALARP study to determine an appropriate ratio for low cost/high technology depending on the site. They were also attempting to persuade SatNav companies to include bridge heights.
- Rob also noted that bridge bashing remained the biggest cause of network outage in terms of minutes lost.
- Stephen Pottle noted that many strikes were due to unsecured loads and TfL had also found that many hauliers did not measure heights before leaving depots.
- Stephen also referred to cumulative glancing blows through which an initial problem could be exacerbated.
- Rob Dean suggested that NR could also extend their scope to cover parapet strikes.
- John McRobert reported a warning system which itself had been damaged by an over height vehicle.

The Chairman summarised the issues as:

1. Detection
2. Prevention
3. Inspection after a strike
4. Prosecution of driver/haulage company.

Rob Dean noted, with regard to 3 above, Network Rail use a risk based system to allow trains to move after a strike but usually rely only on a visual inspection. The Chairman suggested that accelerometers on bridges could provide similar assessments.

The Chairman enquired about any recent developments with ESDAL. Rob Dean reported that he sat on an AIL coordination group which had had input into ESDAL. Neil Loudon undertook to provide an update at BOF 48.

ACTION 30: Neil Loudon

The Chairman also referred to earlier discussions concerning clutter beams; it was suggested that legally such a beam could not be isolated from a bridge but had to be fixed to it. Whilst the Highways Act was quoted in this regard, it was shown that the local Highway Authority had some discretion in this matter. The Chairman also reported on a recent conversation with Nick Rainsford in which the latter had suggested that if there was a problem with the legal position then it was not impossible to change the law.

Rob Dean and Wayne Hindshaw agreed to provide Bella with contacts in their respective organisations for further discussion.

ACTION 31: Rob Dean/Wayne Hindshaw

The Chairman thanked Bella for her presentation and the meeting for a helpful discussion.

10. BOF Sponsored Research Projects - Update

10a. Bridge Inspector Competence

The Chairman noted that this had been fully covered under Item 3.

11. Other Bridge Research Update

11a. Network Rail Research Programme

i. Parapets

Rob Dean gave a presentation on Network Rail's Parapet Risk Study which had been prepared by Mott MacDonald (MM). This worked on the basis that risks should be eliminated *So Far As Is Reasonably Practicable* (SFAIRP). The overall outcome was that non-motorway road over rail bridges and footbridges should generally be set at 1.8m, although this could be reduced if based on an appropriate risk analysis. Rob agreed to release the MM report to the Chairman for onward distribution to BOF members.

ACTION 32: Rob Dean/Chairman

Discussion extended into the numbers of potential suicides prevented by increasing parapet height and partly reprised debates at recent BOF meetings. It was suggested that increasing height to 1.8m would result in a 10% reduction in suicides which in turn equated to nine or ten lives a year on the rail network. David List noted that Humber Bridge was proposing an increase in height to 1.8m. Wayne Hindshaw reported that Erskine Bridge was already 1.8m but also pointed out that both examples were pedestrian protection only with separate vehicular restraint. Wayne also noted that the Transport Scotland document which included input from other partners such as the NHS and Samaritans had recently been updated.

ii. Asset Innovation, External Specialist Liaison and Future Competence Strategies

Rob gave a second presentation which illustrated Network Rail's needs in managing the network in terms of Research and Development. This represented a draft road map and gave a visual indication of what needs to be done and by when.

iii. Aerial Surveys

Rob also presented on progress being made as part of the Network Rail ORBIS initiative (Offering Rail Better Information Systems). This utilised LIDAR technology from helicopters and enabled a variety of information for all railway assets to be presented visually.

Neil Loudon noted that Highways England used a vehicle based system to assess asset performance but this was limited to the main carriageway only, with nothing picked up either above the road or at the foot of embankments. Wayne Hindshaw reported that Transport Scotland had used LIDAR as a geotechnical survey to detect movements on an unstable slope.

The Chairman questioned the amount of post-processing needed to convert base data to useful graphic information. Discussion also extended into the potential benefits of digital engineering in the management of existing structures but it was agreed that this was a subject worth pursuing. It was agreed that this topic should be included in the forthcoming revision of the Grand Challenges document.

ACTION 33: Richard Fish

Rob Dean agreed to check any confidentiality issues before issuing the presentation(s) for uploading to the BOF website.

ACTION 34: Rob Dean/Paul Fidler

11b. Highways England: Neil Loudon reported that Highways England have a member of staff who is liaising on technical interaction between HS2 and the strategic road network. He also suggested that a new set of research proposals should be prepared for UKBB and DfT consideration in Spring 2016. It was agreed that all BOF members should propose, and send to Richard Fish, three possible projects for consideration at BOF 48.

ACTION 35: All

A discussion ensued regarding the amount of time that data should be retained, especially as accountancy recommendations suggested that seven years was the legally accepted minimum. The Chairman proposed that data relating to bridge assets should be retained in perpetuity and requested that UKBB should be made aware of this issue.

ACTION 36: Richard Fish

Neil also referred to the “Maunsell 2” report which was currently in progress and a review of 700 bridge inspections. He agreed to give an update at a future meeting.

ACTION 37: Neil Loudon

11c. TfL: Stephen Pottle referred to UWE research into long term frequency responses from several different types of bridges.

11d. Network Rail: As well as 11a above, Rob referred to research being undertaken at Nottingham University. Of particular note was the apparent variation in galvanizing deterioration around the UK.

11e. LUL: Nick Burgess reported that LUL were working on solutions to a number of hidden fixings issues. Rod Howe and Nick Burgess will review links between LUL and the CIRIA project.

ACTION 38: Rod Howe/Nick Burgess

Nick also agreed to give a presentation on LUL's research programme at BOF 48.

ACTION 39: Nick Burgess

12f HS2: Not taken.

12g ADEPT: Graham Cole referred to research on masonry arch structures at Salford and Sheffield Universities, now nearing completion. The output is to be new guidance on the assessment of arches available early in 2016 which could be a subject for a presentation at BOF 49.

ACTION 40: Chairman

12h Transport Northern Ireland: John McRobert referred to ongoing research into condition monitoring of a bridge with half joints using embedded sensors for chloride content and half-cell potentials.

12. New Bridges and Major Projects Update

Neil Loudon referred to the Lower Thames Crossing in which HE was about to announce preferred options. He also noted the proposed major tunnels on the A303 at Stonehenge and the Trans Pennine Tunnel.

Stephen Pottle reported that the Silverton Tunnel was at the Development Consent stage. He also noted that the Garden Bridge proposal might be suitable for a BOF presentation at a future meeting.

ACTION 41: Chairman/Stephen Pottle

13. Any Other Business.

13a. Surveyor Bridge Conference: A number of possible presentation topics were discussed. Keith Harwood agreed to feedback to Adrian Tatum at Surveyor.

ACTION 42: Keith Harwood

13b. Digital Bridges Project: The Chairman will contact BOF members to gauge interest in this proposal.

ACTION 43: Chairman

13c. Future Agenda Items: It was agreed that a review of the draft Grand Challenges document at BOF 48 would trigger other possible agenda items.

13d. BOF 50: The Chairman will consider how best to mark BOF 50 in October/November 2016.

ACTION 44: Chairman

14. Proposed Dates for Future BOF Meetings

Dates were proposed as 26th January 2016 (BOF 48) and 17th May 2016 (BOF 49). Rob Dean noted that Nick Tedstone was the new Head of Structures at Network Rail.

Richard Fish
Technical Secretary
3rd December 2015