

## **BRIDGE OWNERS FORUM**

### **MINUTES OF MEETING BOF34: TUESDAY 24th MAY 2011 AT THE BEVES ROOM, KING'S COLLEGE, CAMBRIDGE**

#### **PRESENT**

Campbell Middleton	Chairman & Cambridge University Engineering Department (CUED)
Graham Bessant	London Underground
Brian Bell	Network Rail
Graeme Brown	DoRD(NI)
Peter Brown	ADEPT and Oxfordshire County Council
Richard Fish	Technical Secretary
Rod Howe	British Waterways
Neil Loudon	Highways Agency (HA)
Andy Phillips	Welsh Government
Stephen Pottle	Transport for London
Paul Williams	LoBEG
Paul Fidler	CUED
Graham Webb	CUED
Neill Hault	Queen's University, Ontario (part)

#### **INTRODUCTION**

The Chairman welcomed members to BOF 34. Key elements of today's agenda were to receive updates and discuss implications of the M1 fire and the latest position on scour. He had also taken the opportunity arising from a visit to Cambridge of Professor Neill Hault for an update on research he was undertaking on concrete bridges in Canada.

#### **1. APOLOGIES FOR ABSENCE**

Steve Berry	DfT
John Clarke	BRB (Residuary) Ltd.
Graham Cole	ADEPT and Surrey County Council
Albert Daly	NRA (Ireland)
Peter Hill	Large Bridges Group and Humber Bridge Board
Robert Humphreys	ADEPT (Wales)
Graeme Muir	Society of Chief Officers of Transportation in Scotland (SCOTS)

The Chairman noted that several late apologies had been received with some being attributable to travel problems due to the Icelandic ash cloud.

He also reported that Andrew Oldland had moved from DfT. Steve Berry (Paul Foskett's replacement) had been due to attend but had then sent apologies.

**2. PREVIOUS MINUTES – BOF33 1st FEBRUARY 2011**

The minutes of BOF33 were accepted subject to the following corrections:

**Page 10 Item 7d**

Remove "South" from Graham Bessant's update.

**Page 10 Item 7d**

The penultimate paragraph incorrectly attributes research work to BWB: delete last sentence and Action Box.

The Chairman reported that the minutes had been available on the BOF website for some time. Brian Bell noted that an early email circulation would have been helpful and it was agreed that this would be the case in future.

ACTION: Paul Fidler

The meeting agreed that the corrected minutes could be made public.

**3. ACTIONS FROM BOF33**

The Chairman noted that the 9 actions attributable to Andrew Oldland were to have been referred to Steve Berry but his late apology for this meeting meant that there had been no time to seek written answers.

References below are linked to the BOF33 Action Sheet:

**BOF33, Section 3, Action 1:** Stephen Pottle reported that UKBB had discussed the possibility of maintaining a collapse database but he will raise the matter again at the June meeting.

ACTION: Stephen Pottle

**BOF33, Section 3, Action 5:** Whilst the Chairman had spoken to Steve Berry, he had yet to arrange a meeting but will do so shortly.

ACTION: Chairman

**BOF33, Section 3, Action 6:** Discussed later in this meeting but Brian Bell noted that the UKRLG and Boards were to be funded through a levy on Trunk Road Authorities.

**BOF33, Section 5a, Action 2:** Neil Loudon reported that a technical paper was being prepared by Lindsey Wilson and Chris Burgoyne as a follow up to her Great Bridges Revisited work.

**BOF33, Section 5b, Action 1:** Although Su Taylor's presentation had been uploaded on to the BOF website, there was discussion on some subsequent actions and emails which questioned the process around project management and individual responsibilities. The Chairman reaffirmed that draft reports should go to the chair of the Steering Group to allow comment before an agreed final report was issued to DfT. Brian Bell pointed out the potential issue of intellectual copyright which was with the DfT. However, in view of the widely recognised poor performance of DfT's project management in these areas, it was agreed that it was unclear whether final reports were being promulgated. The Chairman suggested that, once approved by DfT, reports could be placed on the member's only section of the BOF website. Stephen Pottle suggested that they could also be issued to the Transport Advisory Board administered by CIHT.

**BOF33, Section 6b, Action 1:** The meeting declined to set up an expert panel and agreed that BOF itself was an appropriate forum.

**BOF33, Section 6e, Action 1:** The Chairman and Neil Loudon are yet to meet to discuss scanning of HA Research Reports.

ACTION: Chairman/Neil Loudon
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**BOF33, Section 6f, Action 1:** Although this had been an action for Andrew Oldland, the Chairman reported that he had contacted John Dowie and Steve Berry and that DfT approval had been received just before the deadline. He also reported that he had recently met a number of senior civil servants, not least from the Cabinet Office, who had been very positive about BOF related issues.

**BOF33, Section 7a, Actions 2 & 3:** Stephen Pottle had only recently issued TfL guidance on bridge joint inspections and Neil Loudon will decide how this should be promulgated. Brian Bell noted that he had been involved with BBA some time ago to work up a European standard for bridge joints and suggested that defects identified in existing joints should be reported to those specifying new joints. Stephen noted that the TfL work was aimed at improving the knowledge of bridge inspectors but he had also been in discussions with joint manufacturers over problems with life span being less than stated. Problems had also been experienced with excessive noise levels, especially on elevated highways close to residential properties.

ACTION: Neil Loudon
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**BOF33, Section 7c, Action 1:** It was noted that the Transport Select Committee report into the Cumbria floods had still not been published, even though the Chair of the committee, Louise Elman MP, still held the position in the new parliament. Stephen Pottle will raise the matter at the next UKBB meeting to see if pressure can be applied to publish.

ACTION: Stephen Pottle

**BOF33, Section 7d, Action 1:** Although the Chairman had decided not to consider the use of Eurocodes for temporary bridges and precast concrete as part of the BOF34 agenda, Neil Loudon reported on discussions between the HA and John Carpenter's Temporary Works Forum and, separately, with temporary bridge suppliers. Both had been very positive and the latter were keen to embrace the use of Eurocodes. He agreed to report further at a future BOF meeting.

ACTION: Neil Loudon

**BOF33, Section 7d, Action 3:** Brian Bell confirmed that Network Rail's internal guidance on concealed metal connections had yet to be cleared for wider issue.

**General discussion on research:** It was noted that, despite the economic climate, DfT were still promoting research. It was agreed that BOF's strategy, however, should be to emphasise one or two key projects which had the highest priority and research bids should focus strongly on "benefits realisation". Stephen Pottle gave an example of a bespoke trench plating system which enabled works to buried utilities to be undertaken with reduced congestion and pollution. Richard Fish pointed out that benefits could be measured in two ways: open, such as saving time, money etc. and hidden, such as providing higher levels of confidence and safety. It was agreed that future BOF bids would follow this approach with sharper presentation of the proposal.

#### 4. Technical Session 1 – M1 Bridge Fire

Neil Loudon gave a presentation on the fire in a scrap yard under the Dean's Brook Bridge which carries the M1 north of London and had resulted in the full closure of the motorway over a number of days. Although it was almost certain that the fire had been started deliberately, there were wider implications in terms of lessons that could be learned from the incident including regulation of space under bridges and other actions that bridge owners might need to consider.

Dean's Brook bridge is a precast prestressed M-beam deck and was managed by Connect Plus (CP) as part of the M25 DBFO. Decisions around the assessment of the damage and the impact on the motorway were taken by CP with the Highways Agency only offering technical support, as necessary. With a priority to reopen the bridge, CP elected to install temporary props to provide an alternative load path from the deck to a founding slab. The full damage has yet to be determined as structural investigations are still underway.

As a result of this incident, the Secretary of State announced a review of business activities under bridges which is due to report by the end of May 2011. Neil's presentation also covered the scope of the review and its assessment of risk. The figures showed that there some 1558 bridges, greater than 5m span (the criterion for the review) on the Motorway and Trunk Road network in England. Of these, about 50 were considered high risk but less than 10 were in sensitive locations. Previous similar incidents were limited to 1984 (hay bales under bridge – another case of suspected arson) and 1986 (a fire under the footbridge linking Keele Services). The 2005 Buncefield oil storage depot fire had led to similar network management issues but this was not bridge related. The review had also identified a greater risk from fires starting in vehicles travelling on the network and coming to rest or parking under bridges. Of extreme risk, and in common with Dean's Brook bridge, was the presence of pressurised gas containers: protocols on the carriage of such cargo were being considered as well as advice to Fire Services on how to deal with such incidents. Andy Phillips noted that the Welsh Government had banned parking of vehicles under bridges.

The chairman advised that Bill Valentine was to have reported on another incident in Scotland, had he been able to attend the meeting. He invited wider discussion but noted that, in its present form, Neil's presentation could not yet be posted on the BOF website. Neil agreed to update future BOF meetings.

ACTION: Neil Loudon
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Brian Bell suggested that there was a danger of over-reacting to this incident: Neil's review had shown that fire was not a major issue in terms of national bridge safety and he had emailed Mike Winter to suggest that UKBB maintains a sense of proportion with respect to the possible outcomes from the review. He also noted that Network Rail owns the land under its bridges, in contrast to the HA, but conceded that there were still potential problems with tenants who have unhindered enjoyment of their lease.

Brian considered that the major issue was one of planning. It was ironic that consents could be granted by planning authorities with only minimal statutory consultation with transport authorities, mostly with regard to traffic impact assessments. The exception here was BWB who were a statutory consultee for any development affecting their under-taking. He proposed that the best approach should mirror the role of a Planning Supervisor under CDM: a single individual should be responsible for ensuring that all risks associated with a development were properly managed. It also seemed sensible for all Transport Authorities to be put on the same footing as far as statutory consultations were concerned.

Brian had also investigated current advice on fire damage to bridges, notably the 1984 CIRIA report which was in need of revision, and suggested that more research into resilience should be promoted through bodies such as ESPRC, Futurenent and SmartEN. This was another example where international collaboration would provide financial and professional support.

Graham Bessant reported that LUL had a robust policy in place in terms of dealing with tenants and tabled a paper which set out LUL's requirements. He asked for names to be removed before it was made available on the BOF website.

ACTION: Paul Fidler

Graham also supported Brian Bell's request for a proportionate response, pointing out that LUL had had no fires under bridges for some 20 – 30 years.

Stephen Pottle noted that TfL's elevated section of the A4 had approximately 1000 tenants, mostly with no tenancy agreements in place. It was only through bridge inspections that TfL were made aware of any change of use under a bridge. With a relatively large number of bridge spans covering scrap yards or travellers' sites, there were about 2 minor fires every month on average. TfL's greater concern in terms of risk was the impact of a vehicle fire inside a tunnel.

Peter Brown pointed out that the problem was even greater in local authorities as each took their own approach in terms of policy.

In summary, the Chairman proposed that this issue is reviewed at BOF35 in September when appropriate BOF members would be able to respond to the Secretary of State's report. He also suggested that the technical knowledge on the structural impact of fire damage needed updating and that this should be a topic for further research. He also thought that lessons could be learned on how to minimise the time a road/bridge was unable to carry traffic. Stephen Pottle also suggested that possible research might be extended into examining options for passive fire protection systems which may be worth considering at high risk sites.

ACTION: Chairman

Neil Loudon noted that an internal HA paper on tunnel fires was being prepared and he should be able to discuss this at BOF35.

ACTION: Neil Loudon

## 5. Technical Session 2 –Scour

Neil Loudon gave the presentation he had given at the Surveyor Conference in March. This will be placed on the BOF website.

ACTION: Paul Fidler

In terms of structures, Neil reported on the work to update the BA74 advice note: a draft was available on the members' only section of the BOF website and comments were still welcomed. *(NB Richard Fish declared a professional interest in this matter as he had been employed as part of the team revising the BA.)* Neil noted that the emphasis was still on scour with secondary issues such as debris impact, hydraulic loading and uplift being covered in BA 59/94 (Design of Bridges for Hydraulic Action). This document had only been the subject of a

superficial review so far and, similarly, it was proposed that BD63 would also be reviewed to tie all 3 documents together. In terms of the extent of the problem, Neil revealed that 10% of the HA network was vulnerable to flooding and that there were approximately 1800 incidents a year, with 60% of these being asset related and 40% due to climatic events. He acknowledged that this was only likely to increase in line with climate change predictions.

The Chairman referred to the recent exchange of correspondence between SCOSS (John Carpenter) and UKBB (Mike Winter) in which the latter had suggested that BOF could assess the effectiveness of existing scour monitoring systems. Brian Bell pointed out that, in the USA, the FHWA had produced a report some 8 or 9 years ago which summarised all available techniques. This was referenced in the CIRIA scour document. Brian expressed the view that he was sceptical of any instrumentation providing real time information on scour hole development.

Graham Bessant noted that LUL have a risk based system of scour assessment but only use instrumentation to identify that thresholds have been reached which require a temporary closure of the network. Brian Bell noted that Network Rail's procedures were similar but bridges were only reopened following a diving inspection which confirmed the safety of the bridge.

The Chairman agreed to review the US position and to decide whether to discuss scour monitoring at BOF35.

ACTION: Chairman

**Presentation by Professor Neill Hoult, Queen's University, Ontario – Protecting Canada's Concrete Bridges**

The Chairman introduced Professor Hoult, explaining that he had taken the opportunity to invite Neill to inform BOF of his Canadian research work as the date of the meeting coincided with a visit to the UK. Neill's presentation will be placed on the BOF website.

ACTION: Paul Fidler

**6. Technical Session 3 – Ultrasonic Impact Treatment**

The meeting noted the letter from Richard Jalowiecki, a Director of Ultrasonic Management Ltd. from Devizes, Wiltshire, but there was little discussion and no further action to be taken.

**7. BOF Research Projects Update**

The Chairman introduced this item and asked Steering Group Chairs to summarise progress:

**a. Revision of BS6779 Part 4 (Masonry Bridge Parapets)**

Brian Bell reported that the final draft of the report had been circulated in mid-May with comments due back by 27<sup>th</sup> May. Brian himself still had concerns that there were gaps in the document and that the Steering Group may be unlikely to recommend it going forward. BSI also had concerns, mainly in the text, but need to recognise that this is intended to be a stand-alone standard. He noted that Andy Bailey had been working hard within DfT but he was keen for the Steering Group to reach a consensus. Brian's other concerns relate to the consistency of advisory over regulatory language and over the yet to be released Appendices. He advised that there would need to be at least one more meeting of the Steering Group.

Brian also noted that the project had suffered from the contractor not always meeting the requirement of the specification. The Chairman agreed to ask for copies of the contract documents from the DfT and to arrange for BOF to undertake a review of contractors' performances.

ACTION 1 & 2: Chairman

**b. Bridge deck slabs with non-metallic reinforcement**

Graeme Brown reported that he had been given the final report from Su Taylor and that he intended to review it himself initially before passing it to other members of the Steering Group. He agreed to send a copy of the first draft to the Chairman.

ACTION: Graeme Brown

It was understood that Su Taylor had asked DfT for additional funding for more monitoring work but this had not been with the knowledge of the Steering Group.

Discussion extended into the possible need for peer reviews of project outputs. Stephen Pottle pointed out that whilst peer reviews took place at proposal stage, this was mostly from an academic perspective and he felt there was a need for bridge owners to review outputs. It was agreed that the subject of peer reviews should be covered at a future BOF meeting.

ACTION: Chairman

**c. Carbon composites for strengthening steel structures**

Brian Bell reported that there had been a meeting of the Steering Group in February and another was planned for June 2011. Brian noted that work seemed to be progressing well, a view endorsed by Peter Brown who had been very encouraged by ongoing laboratory work during a recent visit.

**d. Automatic Bridge Inspections**

Stephen Pottle noted some concerns and reaffirmed the point made at BOF33 that the contractor had been attempting to secure additional funding from DfT for what was effectively a fixed price contract. He was trying to arrange a meeting with DfT on this issue. Richard Fish noted that this could only be resolved by scrutiny of the contract. He recalled that Andrew Oldland had just taken over as DfT Project Manager at the time of BOF33 in January and had been actioned to “advise TRL that they must deliver to their contractual obligations and that they must present a robust financial case if they required an extension” and to “send copies of the contract and specification to the Chairman, Stephen Pottle and Richard Fish”. With Andrew moving on, it was not clear whether anything had happened. The Chairman agreed to raise with Steve Berry when he met him.

ACTIONS: Chairman

**e. Scanning of HA Research Reports**

Neil Loudon agreed to arrange a date to meet the Chairman at HA’s Bedford office to discuss taking this forward.

ACTION: Chairman/Neil Loudon

**f. Bridge Inspector Qualification (Part II)**

Stephen Pottle reported that the contract for Part II had now been let (to TRL) and a start-up meeting had already been held. A Steering Group meeting was scheduled for 22<sup>nd</sup> June 2011. Although the contract had been let by DfT, in this case it was not funded by them and, therefore, the contractual relationship would be slightly different. Stephen was to discuss this with Steve Berry at DfT

ACTIONS: Stephen Pottle

The Chairman paid tribute to the work of Stephen and the Steering Group in securing the next phase of this highly important project. He asked for his thanks to be formally recorded and also to Steve Berry for getting the proposal through the DfT procurement procedures before the end of the financial year.

Stephen agreed to circulate the project programme and further noted that a series of workshops were to be arranged around the UK to help inform the output from the project. The Chairman encouraged attendance.

ACTION: Stephen Pottle

**g. CIPFA Asset Management Accounting Tool (additional item)**

Stephen Pottle reported that Steve Berry had also been very helpful in progressing this project which had recently been awarded to Atkins. Although not a BOF promoted project it would lead to a very useful strategic planning tool for all bridge owners.

#### **h. LoBEG VfM project (additional item)**

Stephen also referred to this project, also awarded to Atkins, which was looking at Value for Money and Whole Life Costing issues for bridges and highway structures. He also noted that TfL were working on a cross-asset approach to VfM covering lighting and roads as well as bridges.

### **8. Other Bridge Research Update**

The chairman invited BOF members to advise on their current and proposed research initiatives:

#### **a. TfL**

Stephen Pottle reported that he had just issued papers on expansion joint failures as mentioned at BOF33.

He also referred to work at TfL aimed at designing a system of bespoke trench plates which could cover open utility trenches and allow traffic to unrestricted use of the road at peak times. Similarly, TfL were also developing a temporary draw bridge system for expansion joint replacement which would also give traffic all lanes during peak hours. TfL were proposing to pre-order systems for planned maintenance and to have others available for reactive works. Neil Loudon advised that HA had been using a similar system on the M20 which gave a very positive return on a cost-benefit basis.

#### **b. Network Rail**

Brian Bell noted that there had been no recent project starts but briefly covered the following:

- (1) **Fibre Optic Chloride Sensor:** A project with Queens University, Belfast and City University, London. A chemical which fluoresces when in contact with chlorides is detected by optic fibres. This could have retrospective applications as well as in new build.
- (2) **ACTS (Advanced Composite Truss Structures):** Network Rail and other partners are developing a 3-D carbon fibre node for trusses and frames. A dissemination event is planned on 14th September in Crewe.
- (3) **Lightweight Low Energy Concrete:** Working with Queens University, Belfast, trials have been undertaken with Northern Ireland precast manufacturers. The mix design now has Carbon Trust accreditation.
- (4) **ESPRC network:** Materials project starts on 15 September in Bath.

### c. Highways Agency

Neil Loudon reported on the following:

- (1) **Thaumasite/Sulphate attack:** Repaired columns from a damaged bridge were buried 10 years ago and are about to be dug up and tested at BRE.
- (2) **Concrete hinges:** As part of bridge replacements on the M1/M6 junctions, 6 no. 900mm diameter cores are being taken to test historic performance of concrete hinges.
- (3) **Benchmarking Study:** This is the review of the Maunsell report and involves giving 200 bridges a “super” principal inspection over a 2 year period, including materials sampling and testing.
- (4) **Risk Based Inspections:** Based on the work of TfL and Transport Wales, HA are introducing risk based inspections in their new Area 2 agency contract. They will then review the method before deciding on whether to use it across the rest of the network. Stephen Pottle suggested that a shared review with all parties who had adopted this approach might be helpful. After discussion, it was noted that most BOF members would be interested and Stephen agreed to arrange a meeting with key players to consider a way forward.

ACTION: Stephen Pottle

### d. Other – ESPRC Network

The Chairman gave an update on recent developments with EPSRC and CUED:

- (1) **Resilience and Sustainability of Infrastructure Assets:** This was a one-year grant awarded to Cambridge and Leeds Universities which would lead to at least 2 substantive research projects. It links to the Future Infrastructure Forum and the Chairman agreed to email more details to BOF members.

ACTION: Chairman

- (2) **International Knowledge Centre:** This was a Cambridge University project concerning the applications of new technology.
- (3) **Masters Degree in Construction Engineering:** This will be sponsored by Laing O’Rourke. The Chairman will send an electronic version of the brochure to all BOF members.

ACTION: Chairman

### e. LUL (additional item)

Graham Bessant referred to the last meeting when he reported on collaboration with the University of Glamorgan on concrete porosity and carbonation and reported that ESPRC funding had been secured for this work.

## 9. Any Other Business

### a. BOF & UKBB

The Chairman referred to the email from Mike Winter (Chair of UKBB) that had been tabled at the start of the meeting in which he set out his view of the relative functions of BOF and UKBB and reporting and governance arrangements and invited comments.

It was unanimously agreed that BOF should not be seen as a sub-group of UKBB. Brian Bell and Graham Bessant both disagreed with the assumption that UKBB had a mandate for rail bridges.

Stephen Pottle felt that the governance of BOF was irrelevant. The more substantive issue was whether BOF provided added value and delivered real benefits. The Chairman agreed, suggesting that BOF's independence had enabled to successfully deliver on a number of initiatives over the years. An additional benefit was achieved through forging a team of BOF members and their wider networks.

Richard Fish suggested that BOF's independence should be maintained not only because that had enabled it to strengthen links with commercial and academic sectors but also because it gave real opportunity to establish international collaboration, an area where there was room for improvement. At a high level, he suggested that UKBB should focus on bridge policy and strategy whilst BOF dealt with project delivery and with a view of upcoming research needs to inform and refine future strategies.

It was generally accepted that the dissemination of BOF outputs was working but to improve awareness, it was agreed that a short summary paper should be issued to UKBB and ADEPT within a few days of each BOF meeting.

ACTION: Richard Fish

The chairman planned to meet Mike Winter, probably at the same time as his meeting with Steve Berry and/or John Dowie, to discuss these points.

ACTION: Chairman

### b. Infrastructure UK and National Infrastructure Plan

The Chairman reported that information on these topics was on the BOF website and that he had been invited to sit on one of the 3 steering bodies under the chairmanship of Brian Collins, the Government's Chief Scientist.

**c. Andy Phillips**

The Chairman noted that this was possibly the last BOF meeting for Andy Phillips, depending on the exact date of his forthcoming retirement. He thanked Andy for his contribution over the years. Andy recalled that he had been present at BOF1 and had thoroughly enjoyed his time as a member.

**10. Proposed dates for other 2011 meetings**

September	BOF35	Tuesday 27 <sup>th</sup> September 2011
January	BOF36	To be confirmed

Richard Fish  
June 2011