

BRIDGE OWNERS FORUM

MINUTES OF MEETING BOF36: TUESDAY 28th FEBRUARY 2012 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
John Clarke	BRB (Residuary) Ltd.
Graham Cole	ADEPT and Surrey County Council
Richard Fish	Technical Secretary
Jason Hibbert	Welsh Government
Rod Howe	British Waterways
Neil Loudon	Highways Agency (HA)
Graeme Muir	SCOTS
Stephen Pottle	Transport for London
Bill Valentine	Transport Scotland
Paul Williams	LoBEG
Paul Fidler	CUED

INTRODUCTION

The Chairman welcomed members to BOF 36 and apologised for the length of time since the last full meeting in May 2011. Key elements of today's agenda were to bring members up to date with research project progress and to receive two presentations from academic colleagues at CUED. The Chairman also noted his new role and responsibilities as the Laing O'Rourke Professor of Construction Engineering, the establishment of which had taken much of his time in the last year or so. Despite this, he gave assurance that BOF was still a priority and he was keen to get the group working effectively once more.

1. APOLOGIES FOR ABSENCE

Steve Berry	DfT
Liam Duffy	NRA (Ireland)

Peter Hill Large Bridges Group and Humber Bridge Board
Robert Humphreys ADEPT (Wales)
Mike Winter UKBB and ADEPT

The Chairman welcomed Jason Hibbert to his first meeting, replacing Andy Phillips as LGC (Welsh Government) representative. Jason's responsibilities cover bridges, highway structures, tunnels and geotechnics.

Bill Valentine reported that this was to be his last BOF meeting. He was leaving Transport Scotland in April and subject to further reorganisations, a replacement representative will be advised.

Graeme Brown also advised that he was retiring at the end of April and John McRobert would be representing NI Roads Service.

Graham Cole also reported that he was leaving Surrey CC on 2 March but he was going to continue as Vice-chair of the ADEPT National Bridges Group and hoped to be able to remain on BOF in that capacity.

The Chairman thanked all 3 for their service and contributions to BOF over the years.

Brain Bell advised that his last meeting was likely to be in May when he will advise BOF on the name of his replacement. He was taking up roles as Visiting Professor at both Surrey and South Bank Universities.

John Clarke noted that his team within BRB was to transfer to the Highways Agency in March 2013, albeit as a separate division and with a ring-fenced budget. Continued representation on BOF would be decided in the next year. (It was noted that the anomaly of this would be that the English Highways Agency would be responsible for bridges in Scotland and Wales.)

Rod Howe reported that BWB was to become a charity in June 2012 – the Canal and River Trust – covering England and Wales. Scotland will have a Scottish Waterways Board.

2. PREVIOUS MINUTES – BOF34 24th MAY 2011

The minutes of BOF34 had only just been issued and the Chairman suggested that comments on accuracy should be made known by 13th March. Following this date, they would be deemed to be acceptable and placed on the BOF website.

ACTION: Paul Fidler

Brian Bell asked for the sentence “Network Rail are the only UK partner” to be removed from **Page 10 Item 8b (4)**.

It was agreed that a single page summary sheet should be prepared and issued as had been the case for BOF34.

ACTION: Richard Fish

Richard Fish pointed out that minutes and actions had been prepared and sent to the Chairman for the mini-BOF35, held after the FIF1 event on 27th September 2011 but these had not been issued. It was agreed that these should be made available and included on the agenda for BOF37.

ACTION: Chairman/Richard Fish

3. ACTIONS FROM BOF34

References below are linked to the BOF34 Action Sheet:

BOF34, Section 3, Action 1, Bridge Collapse Database: Graeme Muir supported the idea of maintaining a collapse database but pointed out that if any errors in the present system were identified these should be reported to the Chairman. The Chairman agreed to review and to consider finding resources to keep it up to date.

ACTION: Chairman

BOF34, Section 3, Action 4, Bridge Joints: Neil Loudon agreed to consider the promulgation of advice, probably through an IAN.

ACTION: Neil Loudon

BOF34, Section 3, Action 5, Transport Select Committee Inquiry into Cumbria Flooding: With no further news of the Transport Select Committee's report into the 2009 Cumbria floods, discussions took place on options open to BF to secure a copy. Neil Loudon agreed to discuss a possible way forward with Steve Berry.

ACTION: Neil Loudon

BOF34, Section 3, Action 6, Use of Eurocodes for Temporary Bridges: Neil Loudon gave a confidential report on recent discussions on the issue of availability of temporary bridging. It was noted that individual highway authorities had previously held their own stock but this had been sold off over the years. The Chairman suggested that an inventory would be a good idea and would raise this at the next meeting with DfT. Neil Loudon agreed to circulate any information which may come to light in the interim but would report formally at BOF37.

ACTION: Neil Loudon

Graeme Brown noted that Mabey were always helpful when temporary bridging was needed but their total temporary bridging inventory was unknown. The Chairman suggested a possible presentation by Mabey at BOF37.

ACTION: Chairman

On a related matter, Neil Loudon reported that the Highways Agency were also investigating US ABC (Accelerated Bridge Construction) techniques, as used to rebuild the I-35W after the 2007 collapse, and suggested it would be worth getting some information on this.

ACTION: Neil Loudon

Graham Bessant noted that there could be problems in trying to re-build a bridge immediately after a collapse due to problems with services and police “scene of crime” investigations. He also reported that LUL used to have a contingency plan for all its bridges but that these had now probably been lost. Brian Bell reported that there was a related research project underway regarding accelerated infrastructure construction which was due to report in 2 or 3 years time. Bill Valentine suggested that wider network management issues needed to be considered, such as suitability of diversion routes.

BOF34, Section 4, Action 2, LUL Fire Procedures: Graham Bessant had emailed the LUL procedures. Paul Fidler to check their status on the BOF website (members only area).

ACTION: Paul Fidler

3a. Feedback on M1 Fire (Dean’s Brook Viaduct)

Neil Loudon recorded that he had updated UKBB on developments relating to the investigation but confirmed the official HA report had not yet been published. It is to be issued to the Secretary of State for Transport at the end of March 2012 and she will decide on further action or promulgation. Neil also reported that the DBFO issues had added complications to the process of reporting and accountability.

In the interim, Neil described some work which the HA had undertaken in order to establish other potentially vulnerable sites and the reviews carried out on some 50 similar bridges. This work had also increased awareness of related problems such as planning applications to store hazardous materials under bridges which could lead to a policy change within HA regarding ownership of land under structures. Investigations had also been extended to gather information of fire mitigation and protection measures both from tunnel fires and work that was underway in the USA.

Paul Williams described a similar incident in London last Autumn when an overnight fire in materials stored, as well as fly tipping, had damaged a 1930s RC deck. The bridge had had to be propped which had cost some £100k for the 6 months or so to date. Paul also noted that this episode had exposed a lack of knowledge in the agent’s team of their powers to enter under the Highways Act. Brian Bell suggested that there might be a clash between Highways Act powers and those held by tenants under lease holder rights. This was similar to the use by

hauliers of the Abnormal Load Statutory Instrument which meant that a Highway Authority could not prevent an AIL movement as long as the Haulier had given the appropriate indemnity.

The Chairman questioned the availability of fire expertise in the bridges fraternity, doubting that it was something that many consultants would claim to have on call. It was noted that BRE had such experience and Brian Bell recorded that CIRIA had reported on fire damage implications. The Chairman also suggested that there should be a section on fire prevention and damage on the BOF website: Jason Hibbert and Brian Bell respectively offered information on the Bryn Glas and Channel Tunnel fires.

ACTION: Chairman

Richard Fish suggested that fire issues might be included in the next review of the Bridges Code of Practice and that the issue should be possibly be raised with SCOSS.

ACTION: Richard Fish

**4. Meeting with Steve Berry (DfT) and Mike Winter (UKBB Chair)
– Future of BOF**

Richard Fish reported on the positive outcome of this meeting held on 15th November 2011, speaking to Mike Winter's note which had been circulated. He cited three main issues: BOF's position with respect to UKBB, BOF's visibility in the wider bridge community, and communications between various parties.

Brian Bell suggested that point 12 from Mike's notes, UKBB's intention to publish an annual bridge condition report could only be limited to highway bridges. Stephen Pottle believed, and Brian Bell confirmed, that Network Rail were looking at international bench marking with, among others, Australia, New Zealand, Sweden and Denmark.

In terms of BOF's proposed closer affiliation with UKBB, Brian Bell expressed concern that BOF minutes could be subject to FoI requests as a subsidiary to a "public" body. (UKBB minutes can already be accessed via FoI).

In terms of raising BOF's visibility, it was suggested that a BOF representative (probably Richard Fish as Technical Secretary) could be a formal member of UKBB. The Chairman agreed to discuss with Mike Winter and Steve Berry. Neil Loudon suggested that, if this was to be the case, each UKBB agenda should have a standing item on BOF. The Chairman also hoped that closer relationships would add to the recent improved performance in DfT management of BOF research projects.

ACTION: Chairman

Stephen Pottle suggested that BOF could be given a slot at a future Surveyor bridge conference and that there could be a number of BOF “open” meetings on subjects such as fire, scour, arch bridges, bench marking, CIPFA/HAMFIG rules etc.

At the Chairman’s invitation, the meeting then reviewed the possible funding arrangements which had initially been discussed at BOF33 when a de minimis annual subscription level of £500 had been mooted.

The present positions were as follows:

- TfL: Stephen Pottle suggested that if BOF could be positioned as a sub-group to UKBB, then TfL funding was probable.
- Network Rail: Brian Bell clarified his original position that the originally quoted £2,500 figure had been based on the contribution NR made to the Geotechnical Forum. This figure was achievable with BOF, if suitable justification was made.
- Transport Scotland: Bill Valentine confirmed that funding was probable, subject to acceptable ordering/invoicing arrangements.
- Highways Agency: A Highways Agency decision would benefit from a BOF fact sheet showing the benefits of membership.
- SCOTS: Graeme Muir reported that SCOTS would be unable to contribute.
- ADEPT: Graham Cole reaffirmed that funding would not be forthcoming: a bid to the ADEPT Research Committee had been rejected.
- LUL: Graeme Bessant suggested that a £2,000 contribution was viable.
- BWB: Rod Howe confirmed that £500 would be acceptable.
- BRB: John Clarke confirmed that, in the present circumstances, £500 was possible.
- Welsh Government: Jason Hibbert thought that funding was possible but would also need justification.
- LoBEG: Paul Williams thought that LoBEG could fund £500.

DoRD (NI): Graeme Brown thought funding was probable, again subject to justification.

The Chairman suggested that DfT could enhance their funding contribution to effectively cover English transport authorities (say, £2,500) and that funding levels of £1,000 might be appropriate for Scotland, Wales and Northern Ireland. He agreed to draft a letter on a joint CUED and BOF letter head to send to each organisation. He hoped the letter would then trigger purchase orders against which invoices would be raised.

ACTION: Richard Fish/Chairman

5. Research

The Chairman gave a short presentation on some developments from around the world that he had identified since the last meeting, including the Indonesia collapse, BIM issues, New South Wales' IAP (Intelligent Access Program) and eRoads – a New Zealand company which mined data on truck movements to minimise fuel consumption.

He also reported that both Steve Berry and Mike Winter had expressed a wish for BOF to resume its original role of prioritisation and management of research projects.

5a Research into hidden components

Graham Cole noted that UKBB were still keen for this to go forward despite its initial rejection. Stephen Pottle suggested that DfT were still looking to retain a research budget and the recent issues with Hammersmith flyover had raised the profile of bridge resilience in Government. Brian Bell suggested that other funding partners could be found to help to support this project. It was agreed that the original proposal should be reviewed and re-scoped. Rod Howe agreed to forward the document to BOF members.

ACTION: Rod Howe

5b Design guidance for parapets on local roads

Graham Cole reported that ADEPT had agreed funding to update this work which would revise and correct the previous document. Brian Bell suggested that the original guidance had been aimed at road bridges at the expense of others. Graham reported that the document was on the UKRLG website and Paul Fidler agreed to put a link to it on the BOF website.

ACTION: Paul Fidler

Bill Valentine described a recent fatal accident in Highland Council when a 4x4 had gone through an aluminium P2 parapet on a local road carrying only some 400 vehicles per day. The Sherriff's report stated that a secondary steel barrier

would have prevented loss of life; a view which was influencing the Council's parapet prioritisation. Bill agreed to forward a link to the Sherriff's report.

ACTION: Bill Valentine

6. **Masonry Arch Bridges**

Graham Cole gave an update on the various elements of the EPSRC project, being undertaken by Sheffield and Salford Universities which started in mid-2011 and is scheduled to last 40 months:

Package 1: consists of 8 full scale tests at Salford and 45 medium sized tests at Sheffield.

Package 2: will develop numerical modelling methods.

Package 3: will aim to revise the rules and guidance for arch assessments.

Clive Melbourne had presented to the UKBB and ADEPT Bridges Group and described: how the tests would utilise photographic measuring techniques, how the project would move from purely static loading to dynamic loads, and how SLS issues would also be addressed. It was agreed that Clive Melbourne should be invited to speak to a future BOF meeting on this subject.

ACTION: Chairman

Brain Bell also reported on the work nearing completion at UWE Bristol which was investigating fatigue effects. Brian also appraised the meeting of some of his concerns on this project.

7. **Technical Session 1 – Hammersmith Flyover**

Stephen Pottle introduced this item, explaining how Dr Chris Burgoyne of CUED had been commissioned by TfL to offer some independent advice on dealing with the Hammersmith flyover problems.

Chris then gave a presentation, in part using contemporary photographs from the ICE archives, which highlighted defects in the original design, detailing, construction and maintenance. A copy of the presentation will be posted on the BOF website.

ACTION: Paul Fidler

8. **Technical Session 2 – Fibre Optics for Structural and Geotechnical Monitoring**

The Chairman introduced Mohammed Elshafie of CUED who presented on this subject with particular reference to optical fibre instrumentation of cast in-situ piles. A copy of the presentation will be posted on the BOF website.

ACTION: Paul Fidler

9. National Infrastructure Plan/Infrastructure Cost Review/Infrastructure Data – Bridges

The Chairman introduced this item, referring to an Industry Standards Group chaired by Terry Hill (ex-Arup) which was looking at areas of improvement in costs etc. Together with Steve Denton, he had been asked to provide some evidence with respect to Bridges and had prepared a questionnaire which he would issue to BOF members.

Graham Cole reported that, anecdotally, Eurocodes were said to have added some 66% to design time and were also leading to a significant increase in the quantity of rebar due to additional lap length requirements. Both of these were contributing to a net increase in cost. Neil Loudon reported that early Highways Agency work had confirmed this level of increases but pointed out that it was now too late to change Eurocode implementation. Neil also expressed concern about recent product specification arising from European harmonisation, particularly with regard to the CE mark versus CARES certification of rebar.

10. BOF Research Projects Update

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

Brian Bell reported that this project was running very late (3 years into a 12 month programme) and that, although this would be a useful document when it was eventually published, he had many concerns over the latest report from Aecom. He also suggested that this was an indicator of the poor contract management performance from the DfT in recent years which did not appear to give payments to contractors only when they reached pre-established milestones. Brian's other concern related to the slot that this research had been given at the forthcoming Surveyor Conference in Manchester: he suggested that it would not be appropriate for Aecom to present on unfinished work. It was agreed that other options for this slot should be urgently explored, including a general research update from BOF. This could include a report on the parapet research. Graham Cole agreed to raise this with the organising committee.

ACTION: Graham Cole

b. Bridge deck slabs with non-metallic reinforcement

Graeme Brown reported that he was now content with the final report although he still felt that there was scope for more work on economics and whole life costs. He suggested that the limitation of the project to flat slabs and the few options to use bent bars could lead to further research.

The Chairman said that the full report would be placed on the BOF website, together with comments from the Project Steering Group. Su Taylor had raised some issues over the report being made public in view of possible third party

confidences. It was agreed that a 3 month period should be allowed before going public in order to give Su time to obtain the necessary permissions. Su had also asked if she could publish this work in her own right but it was agreed that this should be checked with DfT.

ACTION: Chairman

The Chairman also suggested that the next BOF meeting should include a formal review of research contractors' performance. This was agreed.

ACTION: Chairman

c. Carbon composites for strengthening steel structures

Brian Bell reported that this project was proceeding very well. He was planning to visit Herriot-Watt University next week to witness a phase 2 test. The Chairman asked Brian to pass on BOF's appreciation of their excellent performance.

ACTION: Brian Bell

d. Automatic Bridge Inspections

Stephen Pottle was unable to report any progress as he had had no update on negotiations between DfT and TRL following the latter's request for additional funding.

e. Scanning of HA Research Reports

Neil Loudon reported that the HA office at Bedford had been flooded and some records badly damaged. Most of the bridge related reports had survived and he was keen to proceed with the scanning. The Chairman said he would need to check on the availability of funding.

ACTION: Chairman

f. Bridge Inspector Qualification (Part II)

Stephen Pottle reported that this programme was proceeding satisfactorily. Draft competencies had been issued for consultation and workshops had been well attended. The next meeting of the Steering Group was scheduled for 19th March. The Chairman congratulated Stephen on this work and asked for similar plaudits to be passed to Atkins and TRL.

ACTIONS: Stephen Pottle

11. Other Bridge Research Update

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

a. TfL

Stephen Pottle reported on the work at TfL aimed at designing a system of bespoke trench plates which could cover open utility trenches and allow traffic to have unrestricted use of the road at peak times. It was intended that such systems would be used as part of lane rental arrangements for utility works. Brian Bell noted that Warwick University had also been working in this area, but with composite plates.

b. Network Rail

Brian Bell reported on the calls to be made later this year as part of the EC FP7 2013 Work Programme.

c. Highways Agency

Neil Loudon reported on the following, updating from his BOF34 report:

- (1) **Thaumasite/Sulphate attack:** The buried specimens had now been recovered and testing was ongoing at BRE. Repair options were looking plausible.
- (2) **Concrete hinges:** The large diameter cores from redundant M6 bridges were being tested at TRL.
- (3) **Benchmarking Study:** The review of the Maunsell report: this is ongoing.
- (4) **Risk Based Inspections:** A report was now available.

d. Other

The Chairman gave an update on recent developments with the IKC (International Knowledge Centre) where the first round of grants (totalling about £17m) were about to be announced, targeting remote sensor technology in smart infrastructure. He also gave brief updates on FIF (Future Infrastructure Forum) and LimesNet.

12. Any Other Business

a. Greenwich University

The Chairman referred to the letter from Greenwich University requesting case study bridges.

b. DfT information request

The Chairman also reported that DfT (Steve Berry) had asked for information on “Concrete Cancer”. He will respond.

ACTION: Chairman

c. Bridge testing opportunity

Stephen Pottle referred to a post-tensioned bridge in the London Borough of Bromley which was scheduled for demolition.

d. Bridge Assessments

Graham Bessant expressed concern about the possible use of Eurocodes for assessment: some 99% of LUL bridges had passed to BD21 but many had been marginal passes. A more onerous requirement could lead to more failures. He urged bridge owners to seek representation on Eurocode drafting committees.

Neil Loudon confirmed his own role on the BSI committee but agreed with Graham’s view. He added that whilst Eurocode assessments were not imminent, they were inevitable at some point and supported the view that input into drafting was essential. Brian Bell added his support and questioned BSI’s capacity in the technical management of these committees.

The Chairman agreed with these concerns and noted that many representatives on BSI committees were from consultants who tended to use meetings as more of a networking opportunity. He agreed to raise this issue with Steve Berry at DfT.

ACTION: Chairman

e. Corrosion in precast panel fixings

Neil Loudon warned of problems being encountered from early corrosion of metallic connections between pre-cast and in-situ concrete. It was noted that this would be covered in the scope for the hidden elements research project.

f. PTSIs

Stephen Pottle referred to the Hammersmith experience and reminded the meeting that PTSIs should not be seen as a one-off inspection but should be repeated at regular intervals. The Hammersmith PTISI of the early 1990s had not revealed the problems that were being dealt with today.

ACTION: All

Neil Loudon reported that Ian Sandle in the Highways Agency was working on an MSc looking especially at inspections of post-tensioned structures. He also noted that TRL had audited some PTISI reports from the 1990s.

g. Scour

Brian Bell raised concerns, also aired at UKBB, that CIRIA were proposing to re-write their scour document despite the fact that the BA74 revision had not been issued and many representations from bridge owners that this was premature. Neil Loudon noted that the BA74 publication was imminent and that a meeting between Highways Agency and CIRIA was being arranged.

ACTION: Neil Loudon

13. Proposed dates for 2012 meetings

May	BOF37	Tuesday 22 nd May 2012
September	BOF38	Tuesday 27 th September 2012

14. Dates for 2012 FIF Meetings

FIF3: Tuesday 17th and Wednesday 18th April 2012
FIF4: Tuesday 11th and Wednesday 12th September 2012

Richard Fish
March 2012