

## **BRIDGE OWNERS FORUM**

### **MINUTES OF MEETING BOF 39: TUESDAY 29th JANUARY 2013 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
Peter Brown	ADEPT and Oxfordshire County Council
Graham Cole	ADEPT
Liam Duffy	NRA (Ireland)
Richard Fish	Technical Secretary
Jason Hibbert	Welsh Government
Wayne Hindshaw	Transport Scotland
Rod Howe	Canal and River Trust
Neil Loudon	Highways Agency (HA)
John McRobert	DRD(NI)
Graeme Muir	SCOTS
Eoghain Nagle	Irish Rail
Stephen Pottle	Transport for London
Paul Williams	LoBEG
Paul Fidler	CUED
Paul Vardanega	CUED

#### **Introduction**

The Chairman welcomed members to BOF 39. He noted that, although BOF 38 had featured Brian Bell's valedictory, Brian was still in post and in attendance today. Brian confirmed that his latest leaving date had yet to be fully confirmed with Network Rail. The Chairman also noted that a possible change was imminent with regard to the representation from the UK Big Bridge Group, with Barry Colford succeeding Peter Hill, but neither had been able to attend this meeting.

## 1. Apologies

Steve Berry	DfT
John Clarke	BRB (Residuary) Ltd.
Barry Colford	FRB and Large Bridges Group
Peter Hill	HBB and Large Bridges Group
Robert Humphreys	CSS Wales
Mungo Stacy	Transport for Greater Manchester
Mike Winter	UKBB and ADEPT

## 2. Previous Minutes – BOF 38: 25<sup>th</sup> September 2012

The minutes of BOF38 were accepted and, subject to the following corrections, could be placed on the BOF website:

- **Page 2, Item 1:** Add Robert Humphreys to the list of apologies.
- **Page 14, Item 13c, third bullet:** Replace with “A new bench marking survey into the state of bridge infrastructure will be commissioned by the HA.”

ACTION 1: Paul Fidler

## 3. Actions from BOF 38

References in the text below refer to the numbered actions on the BOF 38 Action Sheet. Boxed reference numbers relate to the BOF 39 Actions:

### **Action 2, Bridge Joints:**

Neil Loudon noted that two documents could now be accessed on the HA website:

- IAN 168/12 Strategy for the repair/replacement of Joints.
- IAN 169/12 Temporary Cover Plates over Bridge Expansion Joints.

### **Action 3, Temporary Bridge AIP Guidance:**

Neil Loudon is still seeking approval to release this information.

ACTION 2: Neil Loudon

### **Action 4, Temporary Bridge AIP Guidance:**

Wayne Hindshaw had brought a memory stick with information on a 40 metre span, two way traffic temporary Beaver bridge in Scotland. This will be uploaded onto the BOF website.

ACTION 3: Paul Fidler

Neil Loudon reported that he was still pressing for Eurocode design for temporary bridges. He expected temporary bridge companies to promote design by testing as Eurocodes permit.

**Action 5, Deans Brook Viaduct Fire Damage Report:**

Richard Fish will continue to ask DfT for the release of this report.

ACTION 4: Richard Fish

**Action 7, Overloaded Vehicles:**

The Chairman decided to put this issue on hold until it could be added to an agenda of a future meeting.

ACTION 5: Chairman

A discussion then took place on the relative merits of the two systems, ABLOADS versus ESDAL. Stephen Pottle reported that the M25 agents were keen to use ESDAL but Graham Bessant noted that LUL did not prefer ESDAL. Stephen also reiterated the general TfL view that Abnormal Load movements were a traffic management issue and suggested this should be seen as good advice elsewhere.

Brian Bell argued that the subject of overloaded vehicles could not be equated to Abnormal Load movements. He suggested that VOSA should be approached to see what information was available from the various Weigh-in-Motion (WiM) sites around the UK. Stephen Pottle reported that TfL WiM data was starting to emerge and was showing an average axle overloading of about 15%

**Action 8, Scanning of HA Reports:**

Richard Fish confirmed that he had been advised by DfT that no funding was available for this work. He agreed to keep options open with Neil Loudon for other possible opportunities for this work to be done.

ACTION 6: Richard Fish

**Action 9, Contractor Evaluation:**

John McRobert is continuing to seek approval for the release of the DRD evaluation model.

ACTION 7: John McRobert

Neil Loudon also suggested that access to the HA/DfT framework contracts might be a good way of procuring some research work. Richard Fish will raise this with DfT.

ACTION 8: Richard Fish

**Action 10, BOF Membership:**

John Clarke had given the Chairman a contact from SUSTRANS who was interested in joining BOF.

ACTION 9: Chairman

**Action 11, ESDAL:**

Richard Fish will raise this issue when he attends UKBB on 28<sup>th</sup> February 2013.

ACTION 10: Richard Fish

**Action 13, Subscription letters to BOF members:**

A number of BOF members (Brian Bell, Liam Duffy, John McRobert and Paul Williams) reported that they had not received a letter from the Chairman requesting subscription payments.

Graham Cole and Peter Brown questioned whether the letter to DfT had raised the issue of ADEPT membership being covered. The Chairman agreed to follow up both of these matters.

ACTION 11: Chairman

**Action 14, Proposed meeting with DfT:**

Although he had hoped to arrange a short meeting as part of a visit to London on other business, Richard Fish reported that this had not been possible to date. He would continue to try to do so as and when an opportunity arises.

ACTION 12: Richard Fish

**Action 16, Bridge deck slabs with non-metallic reinforcement**

John McRobert reported that Su Taylor (QUB) was proposing to publish a paper on this research in the ASCE journal. She had also told him that she understood that Steve Berry was going to upload the report onto the DfT website.

Liam Duffy stated that Albert Daly, as original chair of the project Steering Group, still had issues over the quality and conclusions of the report and had expressed concerns that it should not be widely disseminated. At the very least, Albert's view was that the report should carry a disclaimer from the Steering Group.

The Chairman expressed his own concerns over this situation and also emphasised the need for BOF to be recognised in the final versions, both in terms of the BOF logo and an appropriate acknowledgement. In this particular case, he proposed to delegate a BOF response to Steering Group members, John McRobert, Liam Duffy and Albert Daly. He also suggested that any other BOF member with concerns should email John.

ACTION 13: John McRobert, Liam Duffy

Stephen Pottle warned of the risk of reputational damage to BOF in the event that research reports of poor quality and dubious conclusions were in the public domain.

Questions were also asked on the contractual relationships between QUB and DfT and BOF's role therein. Brian Bell suggested that Intellectual Property rights had to be determined and set out in the contract. John McRobert said that he had been

unable to locate the original contract but he had a copy of the QUB tender which he agreed to forward to the Chairman.

ACTION 14: John McRobert

**Action 19, Carbon composites for strengthening steel structures:**

Brian Bell confirmed that he discussed the final report with Andy Bailey at DfT and that it was now on the BOF website.

**Action 22, Future Infrastructure Forum**

The Chairman reported that EPSRC had declined to release the projects they were funding. He understood that 30 proposals had been received, 15 had been shortlisted, 4 interviewed and 2 confirmed as funded: these were thought to be a Warwick University led project on durability of composites and a Newcastle University proposal for monitoring embankment and cutting slopes. He also understood that a Cardiff University project on self-healing materials, called "Materials for Life", was also successful. Jason Hibbert reported that he had been asked to sit on this project's steering group. Lastly, the Chairman reported that an announcement was soon expected on a Cambridge University proposal for work on super-BIM. He suggested that more information could be found on the EPSRC website.

**Action 23, Industry Standards Group**

This report has yet to be placed on the BOF website.

ACTION 15: Paul Fidler

**Action 24, Surveyor Conference paper on BIM**

John McRobert reported that he had been unable to locate this paper. Jason Hibbert thought it related to the Port Talbot bypass and offered to try to find it.

ACTION 16: Jason Hibbert

The Chairman offered to contact the editor of surveyor to ask for permission to have Surveyor Conference papers put on the member side of the BOF website. He would also try to determine copyright issues between Surveyor and Authors.

ACTION 17: Chairman

**Action 25, Exploratory Meeting with HMT on BIM**

The Chairman has yet to set up an introductory meeting on this topic.

ACTION 18: Chairman

**All unrecorded actions from BOF 38 had either been completed or were discussed as part of the BOF 39 agenda.**

#### 4. Membership Update

The Chairman noted imminent membership changes:

- As noted above, he was still unsure as to who the representative would be from the UK Large Bridge Group and was awaiting discussions with Peter Hill and/or Barry Colford.
- He would extend an invitation to Sustrans.
- He would invite Jim Harvey of Waterways Ireland to the next meeting.

ACTION 19: Chairman

The Chairman also suggested that invitees would be given only two opportunities to attend a meeting before losing their place on BOF.

#### 5. BOF Funding and Constitution

The Chairman tabled copies of a BOF summary statement and letter which had been sent to BOF members requesting subscription payments for 2013/14. Paul Williams noted that the agreed figure for LoBEG should have been £1000. This was agreed.

The Chairman also tabled a copy of the latest constitution which still gave him some concerns over the degree of independence of BOF and the perception that it was only a sub-group of UKBB. Recognising the need to make progress with the constitution to ensure continued DfT support, members were asked to forward any comments on this version to Richard Fish by 14<sup>th</sup> February in order to be able to have the latest draft ready for discussion at UKBB on 28<sup>th</sup> February. Graham Cole offered to assist in the review of a draft which could be shared with Mike Winter.

ACTION 20: All/Richard Fish

Discussion took place on the eligibility or otherwise for BOF to be subject to Freedom of Information requests. It was accepted that, as BOF could not be deemed to be a public body, this was not an issue.

Links to the World Roads Association were also discussed but any such relationship was considered not to be relevant to the constitution.

#### 6. Historic Bridge and Infrastructure Award

Richard Fish had been invited on behalf of BOF to the awards ceremony at ICE on 7<sup>th</sup> March but was unable to attend. Stephen Pottle agreed to represent BOF. Richard Fish agreed to advise David Greenfield.

ACTION 21: Richard Fish

## 7. Fires under Bridges – SCOSS

Firstly, it was noted that this issue was more than just fires and it should be extended to cover hazardous or inappropriate land use under bridges. Neil Loudon noted that this would suit the emphasis being placed on this subject by the Transport Minister.

Richard Fish reported that he had had an email exchange with Alastair Soane at SCOSS who was interested in this topic and would consider its inclusion in a future SCOSS report.

Examples of incidents were to be sent to Richard Fish. Neil Loudon suggested that Richard should also discuss the release of the Dean's Brook report with DfT as and when the opportunity arose.

ACTION 22: All

Discussion extended into the issues of tenancy and occupancy under bridges. Graham Bessant noted that LUL had no jurisdiction in this matter as all tenancies etc. were managed by TfL Property Section. Stephen Pottle noted that new bridges could be subject to much tighter controls but the problem remained with respect to existing bridges. He cited examples of tenants making unauthorised changes which had a significant effect on the structures concerned.

A similar issue was then raised, that of damage to structures by Utility Companies, especially those who did not give any notice under NRSWA. It was suggested that this might also be of interest to SCOSS and Richard Fish offered to continue the dialogue with Alastair Soane.

ACTION 23: Richard Fish

The Chairman suggested that links to SCOSS, CROSS and their international equivalents should feature regularly on BOF agendas.

ACTION 24: Chairman

Paul Fidler was asked to check/set up links to SCOSS from the BOF website.

ACTION 25: Paul Fidler

## 8. Bridge Collapse Detection and Warning System

This proposal had been received via Bell-Johnson. After discussion, it was decided that it was not a cost effective suggestion to be applied generically but might be worthy of consideration for some high risk simply supported spans.

## 9. FRP Composites for Bridge Structures

The meeting received a presentation on this topic from Jon Shave of Parsons Brinckerhoff who was also a member of the Network Group for Composites in Construction (NGCC – see website [www.ngcc.org.uk](http://www.ngcc.org.uk) ) and leads the sub-group on FRP Bridge Design. The presentation will be placed on the BOF website.

ACTION 26: Paul Fidler

The Chairman invited questions: Graham Bessant noted LUL's concerns over FRP longevity (they worked to a 40 year design life) and vulnerability to vandalism, especially fire damage. Jon cited the example from his presentation of the footbridge over the railway in St Austell, Cornwall where fire resistance had been increased by the detailing of additional mouldings outside the structural elements. In terms of design life, he quoted BD 90 which states a 60 year design life but he was also aware of signed AIPs which had stated 120 years. Neil Loudon noted that the technology transfer from other industries where FRP was in more widespread use had helped in the understanding of longevity. Brian Bell expressed his confidence that design life was not an issue. Wayne Hindshaw questioned the robustness of the material in terms of non-UV embrittlement and resistance to everyday chemicals such as road salt, petrol and animal waste. Stephen Pottle suggested that guidance for inspection and maintenance should be developed alongside design guides.

## 10. Timber Bridge Research

The Chairman introduced Steven Kinnersley, a fourth year under-graduate at CUED who was working on the design and construction of timber bridges in the UK. Steven gave a short presentation on his work and tabled a short questionnaire to identify the use (and blockages to use) of vehicular timber bridges. The Chairman asked members to complete the questionnaire for him to collect and give to Steven.

ACTION 27: All

He also invited general comments: Neil Loudon pointed out the HA experience that Glulam facilities in the UK were limited for larger or longer sections. Wayne Hindshaw noted that there some examples of Ekki hardwood bridges in Scotland. Brian Bell expressed concerns over a prescriptive definition of timber highway bridges, pointing out that not all elements were likely to be timber. He also advised of work being undertaken at Napier University in Edinburgh into the use of dowelled fixings as an alternative to Glulam; this project was also supported by the Forestry Commission. Rod Howe cited many examples of short span timber bridges over canals, maintained by C&RT. He also suggested that Steven should seek support in his work from TRADA. John McRobert spoke of four timber footbridges in Northern Ireland which were almost 40 years old although one had been damaged by an arson attack. John also pointed out that there was a dearth of

knowledge with respect to traditional detailing, especially with respect to joints and was concerned that traditional skills were being lost. The Chairman considered that the stigma over longevity was misplaced as evidence across the world suggested that design life was not an issue. He also asked how many BOF members were committed to carbon calculations for new bridges. Wayne Hindshaw was the lone voice in saying that Transport Scotland was doing this.

## **11. BOF Research Priorities and Future Direction**

The Chairman reiterated the need for BOF to revisit its research priorities, which he believed should include some of those that had previously been dropped due to funding shortages such as the project to investigate methods for surveying the condition of hidden components. This would be an item on the BOF 40 agenda.

## **12. BOF Research Projects Update**

### **12a. Revision of BS6779 Part 4 (Masonry Bridge Parapets)**

Brian Bell reported that the project was complete and guidance was on the UKRLG website. He pointed out, however, that this was not yet a replacement for BS6779 part 4.

### **12b. Bridge deck slabs with non-metallic reinforcement**

John McRobert noted that his update had been covered under Item 3.

### **12c. Carbon composites for strengthening steel structures**

Brian Bell reported on the recent Steering Group meeting in December: work on the guidance was progressing well but a final meeting of the Group would be needed in the spring. He also pointed out that a presentation on the work was part of the Surveyor Bridge Conference in April.

### **12d. Automating bridge inspections**

Stephen Pottle noted that he had heard nothing more from DfT regarding TRL's request for additional payment. The Chairman offered to discuss contractual with DfT.

ACTION 28: Chairman
---------------------

### **12e. Scanning of HA Research Reports**

Neil Loudon suggested that this matter should now be left until some future point when scanning might be more achievable. Graham Cole pointed out that the TRL report archive could now be accessed via their website. Neil confirmed that unpublished TRL reports were now with HA.

## **12f. Bridge Inspector Qualifications (Part II)**

Stephen Pottle reported that he had chased Steve Berry and Paul Hersey at DfT who understood that DfT procurement were in turn asking more questions of Atkins regarding the administration of the process of certification. Neil Loudon had also offered assistance of a colleague with sector scheme experience. Both Stephen and the Chairman agreed to continue to liaise with Steve Berry at DfT.

ACTION 29: Stephen Pottle/Chairman

In response to concerns from the meeting, Stephen Pottle explained that whilst the project covered both training and certification, it would be possible for an experienced inspector to be certified without having undergone specific training. He also reaffirmed that the project had received strong support from all sectors, not just from bridge owners. Graham Cole noted that the link with the Code of Practice must be borne in mind and eventually the Code would need to be updated accordingly.

## **13. Other Bridge Research Update**

### **13a. TfL**

- i. Stephen Pottle gave a progress report on TfL's work on a BIM pilot which he had mentioned at BOF 38. The current work focused mainly on design and construction but would also cover the importance of the handover on completion. Eight schemes were being trialled with a variety of structural form and scale. The work was being undertaken by TfL's design agents, Ramboll/Parsons Brinckerhoff, but driven by TfL. He offered to update future BOF meetings.
- ii. Stephen also noted that TfL were investigating alternative materials that could be used for post tensioning.
- iii. Finally, Stephen reported that design work on permanent strengthening of Hammersmith flyover would be starting in the autumn of 2013.

### **13b. Network Rail**

- i. Brian Bell noted that Network Rail was supporting a project, funded by the European Union, on composites and nano-materials being undertaken at Newcastle University.
- ii. Network Rail was also investigating methods of accelerating the curing of precast concrete to improve productivity, using micro-waves.
- iii. Brian was also supporting the CIRIA work on the revision of their scour manual. He also noted that CIRIA were proposing to update their guidance on waterfront walls. The meeting agreed to Brian's view that this proposal had not been driven by the need of owners.

### **13c. Highways Agency**

Neil Loudon outlined the 2013/14 HA research programme:

- i. Value Management.
- ii. Fatigue properties of FRP decks – being undertaken by Bristol University.
- iii. Supporting CIRIA in research into hidden defects. The Chairman queried whether CIRIA were following the original BOF research brief. Neil thought that this was the case.
- iv. Modeling of degradation of assets (also in collaboration with CIRIA).
- v. Embedded retaining walls (also in collaboration with CIRIA).
- vi. Optimum construction methods for concrete bridge decks (in collaboration with the Concrete Bridge Design Group (CBDG)).
- vii. The implementation of Eurocodes and the development of the next generation.

### **13d. LUL**

Graham Bessant reported on a project which LUL were undertaking with the University of Glamorgan to plot concrete deterioration. This was picking up on work which started about 20 years ago and was to revisit embedded sensors in LUL structures. The project was hoping to secure EPSRC funding and, if appropriate, could be the subject of a presentation to a future BOF meeting.

### **13e. DRD (Northern Ireland)**

John McRobert reported on the following projects which DRD were supporting:

- i. DRD were also working with CIRIA on the revised scour guide.
- ii. Driven by a lack of maintenance to bridge joints, DRD were investigating cathodic protection to concrete on bearing shelves which had been damaged by chlorides. The question had also been raised of how long sacrificial anodes were expected to last. Neil Loudon reported that HA had just completed a draft specification for cathodic protection which was about to be reviewed by a Technical Project Board. Regarding the life of sacrificial anodes, Neil suggested that, where possible, this should be referred back to the original supplier.
- iii. DRD were also working with University College, Dublin and Queen's University, Belfast on weigh-in-motion which included instrumentation of a bridge on the A1 Belfast to Newry road. This was linked to reductions in bridge life expectancy and deterioration due to overweight vehicles. It was agreed that this could be the subject of a presentation to a future BOF meeting, possibly linked to the proposed review of ESDAL.
- iv. John also reported on further developments of the flexi-arch. Liam Duffy reported that he had used flexi-arch but was concerned to note that the blocks were now reinforced which seemed an unnecessary serviceability issue. The design guidance also recommended an in-situ cover slab and waterproofing. John explained that the reinforcement

was in the form of small links designed to hold the fabric in place and maintained that the system still represented good value for money.

- v. John also referred to work on slope stability risk assessments linked to GIS data from an OS ground model. The method identifies embankment or cutting slopes of a certain height and/or steepness and prioritises those which should be subject to an enhanced inspection regime. It was agreed that this was a good way of demonstrating that duty of care responsibilities were being adhered to. It was also suggested that there might be links with the Newcastle University research referred to in Item 3 above (BOF 38, Action 22)

### **13f. LoBEG**

Paul Williams reported that more improvements were planned for the BridgeStation database which was now used by about one third of local authority bridge owners in the UK. The new aspects included whole life accounting applications. After a brief discussion on other databases, Stephen Pottle suggested that at some point TfL's work on BIM techniques could be incorporated into bridge management systems.

### **13g. Irish Rail**

Eoghain Nagle briefly highlighted a study that Irish Rail was engaged in on bridge inspection techniques which included NDT and scour. He offered a presentation on this at the next BOF meeting.

ACTION 30: Chairman/Cathal Mangan/Eoghain Nagle

### **13h. ADEPT**

Peter Brown reported that the ADEPT research fund had been discontinued and all funds were now managed as a central pot. Graham Cole mentioned that the Soils and Materials Group of ADEPT (a parallel group to ADEPT Bridges Group and chaired by Steve Child, ex-Surrey CC) were investigating surfacing on bridge decks. Graham also noted that the work on parapet standards for local roads was about to start, following the completion of BOF research on unreinforced masonry parapets.

### **13i. NRA (Ireland)**

Liam Duffy reported on work with Trinity College, Dublin, into whole life costing and deterioration modeling. The Chairman asked if any relevant information could be transferred to the BOF website.

ACTION 31: Liam Duffy

Liam also described another project, also with Trinity College, on reviewing the hierarchy of masonry arch assessment methods. Brian Bell noted that TRL had previously undertaken such a review on behalf of Network Rail. He also referred to a paper published in the ICE Bridge Engineering Journal in September 2012 on some work carried out with EPSRC funding at Sheffield and Salford Universities.

### **13j. Transport Scotland**

Wayne Hindshaw described work being undertaken with SCOTS and the Scottish Roads Research Board. The two projects of relevance to BOF were on bridge strike prevention and load road vehicle restraint systems.

## **14. Any other business**

### **14a. International Cable Supported Bridge Operators' Conference**

Richard Fish advised of this conference which was being hosted in Edinburgh in June this year by Barry Colford from Forth Bridge.

### **14b. Bridge Strikes**

The Chairman reported that CUED had recruited a new lecturer from Georgia Tech who was interested in bridge strike prevention systems. BOF members commented on historical systems that had been trialled in the UK. Wayne Hindshaw described Scotland's "Strike it Out" campaign which was principally aimed at hauliers; it was estimated that Scotland was spending some £500k per annum on the consequences of bridge strikes and have a map of the high risk bridges.

Further discussion agreed that prevention was more of a network management issue. Stephen Pottle noted that the UK Bridge Strike Prevention Group was discussing options with satnav companies. Peter Brown noted that the laser system, in which a beam is broken by an over-height vehicle and triggers a warning, was said to cost about £5k per site in terms of annual running costs

### **14c. Corrosion Protection**

Neil Loudon noted that the BBA had expressed a wish to give a presentation to BOF on this topic.

### **14d Safety Critical Fixings**

Neil Loudon said that the awareness of this issue had been heightened following the recent collapse of roof panels in a tunnel in Japan. HA were developing an approach for the UK which Neil would like to present at the next BOF meeting.

ACTION 32: Chairman/Neil Loudon

### **14e. BOF website**

Jason Hibbert asked about the status of the BOF website and whether there was any aspiration to improve it. Peter Brown suggested that the website should be the prime source for dissemination but the present shortcomings did not facilitate matters. The Chairman agreed that the search facility was not ideal and agreed to review the site and options for enhancement with Paul Fidler.

ACTION 33: Chairman/Paul Fidler

## 15. Proposed dates for future BOF meetings

The Chairman proposed the following dates:

BOF40        Tuesday 21<sup>st</sup> May 2013  
BOF41        Tuesday 1<sup>st</sup> October 2013

The Chairman confirmed that BOF40 would be held at the Forth Bridge in Edinburgh, hosted by Barry Colford. He was hoping to include site visits to either or both FRB and FRC, possibly on the day after the BOF meeting and would forward details of the arrangements in due course.

ACTION 34: Chairman
---------------------

## 16. Closing/Summing Up

The Chairman closed the meeting and thanked everyone for their contributions.

Richard Fish  
February 2013