

## **BRIDGE OWNERS FORUM**

### **MINUTES OF MEETING BOF 41: TUESDAY 1st OCTOBER 2013 AT THE BEVES ROOM, KINGS COLLEGE, CAMBRIDGE**

#### **PRESENT**

Campbell Middleton	Chairman & Cambridge University Engineering Department (CUED)
Graham Bessant	London Underground
Peter Brown	Oxfordshire CC and ADEPT
David Castlo	Network Rail
Graham Cole	ADEPT
Barry Colford	FRB and Big Bridges Group
Richard Fish	Technical Secretary
Wayne Hindshaw	Transport Scotland
Rod Howe	Canal and Rivers Trust
Neil Loudon	Highways Agency (HA)
John McRobert	DRD(NI)
Graeme Muir	SCOTS
Stephen Pottle	Transport for London
Mungo Stacy	Transport for Greater Manchester
Paul Fidler	CUED

**NB Although the timing of agenda items varied during the meeting, these minutes reflect the order of items as per the agenda.**

#### **1. Welcome and Apologies**

The Chairman welcomed members to BOF 41 and remarked that he saw this meeting as one in which BOF might return to its original *raison d'être* of concentrating on research needs.

Apologies had been received from the following:

Steve Berry	DfT
Liam Duffy	NRA
Jason Hibbert	Welsh Government
Neil Garton-Jones	CSS Wales
Paul Williams	LoBEG

Richard Fish noted that Robert Humphreys had recently been made redundant from Denbighshire CC and the new CSS Wales representative was to be Neil Garton-Jones. This change had been too late for Neil to attend this meeting.

Neil Loudon reported that BRB(R) had now been absorbed into the Highways Agency although remaining as a separate unit. Neil understood that John Clarke had now retired but suggested that he would cover any BRB issues for the time being. Neil also pointed out that the HA was to become a Government Company in 2015, subject to new legislation, but could not anticipate what changes this might mean.

The Chairman noted that there had been a number of members who had not replied to the invitation to attend this meeting and asked for a response, either positive or negative for future meetings.

ACTION 14: All

**2. Previous Minutes – BOF 40: 22<sup>nd</sup> May 2013**

The minutes of BOF 40 were accepted and, subject to the following correction, could be placed on the BOF website:

- **Page 12, Item 9, Appendix 1, Row 2:** Replace “aging” with “ageing”.

ACTION 1: Paul Fidler

**3. Actions from BOF 40**

References in the text below refer to the numbered actions on the BOF 40 Action Sheet. Boxed reference numbers relate to the BOF 41 Actions:

**Action 2, Temporary Bridge AIP Guidance:**

Neil Loudon hoped that he would be in a position to give advice on this issue at a future BOF meeting.

ACTION 2: Neil Loudon

**Action 5, DfT Framework Contracts:**

The option of using DfT framework contracts will be borne in mind for future use.

ACTION 3: Richard Fish/Neil Loudon

**Action 8, Bridge Deck Slabs with Non-metallic Reinforcement:**

John McRobert reported that all members of the steering group were content with the report. Although Steve Berry had not commented, it was agreed that Paul Fidler should remove the password protection on the BOF website.

ACTION 4: Paul Fidler

**Action 9, Industry Standards Groups:**

The Chairman reported that he had submitted a report to IUK on the need for infrastructure data in the industry but had received no word on how it had been received. Neil Loudon noted that BIM might be used as a tool to unlock the issues around databases. The meeting also noted that only TfL and the Highways Agency were actively developing BIM policies, with the former having established a working group to examine its potential in the highways sector.

Stephen Pottle urged caution against an over reliance on BIM and suggested that the most important issues were a common glossary of terms and the collection of simple and reliable information. With regard to the former, he noted that Crossrail had developed an asset definition dictionary. Stephen also felt that the responsibility should rest with client bodies rather than rely on supply chain consultants or contractors. Wayne Hindshaw agreed and reported that Transport Scotland was in dialogue with the Highways Agency. Barry Colford noted that the present emphasis on BIM seemed to rest with new design and construction projects whereas he believed that its greatest benefit came after construction when the project was in use.

The Chairman briefly described and gave a brief impromptu presentation of the CUED DAIMLER proposal (Digital Asset Information Model for the Lifetime Evaluation of Resilience) which controlled inputs and outputs into any part of the modelling system and ensured communication between all aspects of a project. Although DAIMLER had not initially been supported by EPSRC, the Chairman was considering another approach.

Barry Colford noted that many problems arose simply from dealing with different providers who each used a different system. Mungo Stacy agreed and suggested that improvements in communication between existing systems should be a priority.

David Castlo noted that NR had now devolved into ten geographical area companies and it was essential that they all worked to the same corporate agenda.

**Action 10, Automating Bridge Inspections:**

Stephen Pottle will continue to discuss contractual issues with DfT.

ACTION 5: Stephen Pottle

**Action 11, Surfacing Report from ADEPT's Soils and Materials Group:**

Graham Cole noted that the report was complete and would be circulated in due course.

ACTION 6: Graham Cole

**Action 17, UKBB Business Plan:**

It was agreed that the UKBB Business Plan must include references to BOF.

ACTION 7: Richard Fish

**Action 19, SCOSS:**

The Chairman will invite Alastair Soane to BOF 43

ACTION 8: Chairman

**Action 20, Site Testing Requirements:**

Stephen Pottle had yet to issue TfL's requirements. *NB This was emailed during the meeting.*

ACTION 9: Stephen Pottle

**Action 21, CARES and self-certification:**

Richard Fish has yet to draft the Issues Paper although he reported that various industry figures he had spoken to shared the initial BOF concerns.

ACTION 10: Richard Fish

Neil Loudon reported that the rebar marking issue was still being considered within the EU but it was likely that some marks would still be required. Neil agreed to monitor this issue and report at future meetings but also reported that the HA might consider reintroducing a system of site sampling and testing in the event that the new standard was not considered to be sufficiently robust.

ACTION 11: Neil Loudon

**Action 22/23, Safety Critical Fixings:**

Neil Loudon noted that the RAIB report on Balcombe tunnel had also emphasised this issue. Graham Cole understood that the lack of inspection had been attributed to operational demands preventing access to the tunnel, a fact which was also hindering inspection regimes for other bridge owners. David Castlo reported that an improved understanding was now developing between NR and the Train Operating Companies and that all NR inspectors had received additional training as a result of this incident.

Graham Bessant pointed out that the problem of poor fixings only became apparent once they had failed so there was a difficulty in trying to establish the extent of the problem. He also noted that this issue also related to earlier BOF discussions on self-certification and the only sure way of gaining confidence in the strength of fixings was good supervision.

Neil Loudon reported that IAN 104 was shortly to be re-issued but acknowledged that this covered design aspects more than maintenance. He suggested that this was an area which might benefit from research; Wayne Hindshaw agreed, adding that this could be part of the proposed hidden components work.

**Action 25, CIRIA:**

The Chairman will invite a representative from CIRIA to BOF 42

ACTION 12: Chairman

**Action 26, EPSRC & TSB:**

The Chairman suggested that it would be a good idea to invite representatives from research funding bodies to a BOF meeting to hear the needs of bridge owners. It was agreed that this should be BOF 42.

ACTION 13: Chairman

**All unrecorded actions from BOF 40 had either been completed or were discussed as part of the BOF 41 agenda.**

#### **4. Membership, Funding & Constitution**

The Chairman welcomed David Castlo to his first meeting as the new representative from Network Rail (NR) and asked David to introduce himself. David explained that he had been with NR for 6 months, following an 18 month secondment. His earlier career had been with Aecom and Capita. His recent work was to write a risk based structures asset policy which is currently being discussed with the ORR. Whilst his role within NR was more to do with asset management than research, he had a good understanding of the latter.

The Chairman reported that he had been talking to Sustrans about BOF membership and they were very keen to join. Two representatives would attend BOF 42 but only a single attendee thereafter.

Mungo Stacey reported that TfGM might be represented by Andy Charnock, their Civils and Rail Engineer, at future meetings although the two of them may alternate attendances.

With regard to funding, the Chairman referred to an email just received from Steve Berry which explained that DfT funding had yet to be confirmed. Richard Fish will issue a copy to BOF members. The Chairman expressed his concern at this shift in position from DfT but intimated that the BOF budget was not entirely dependent on DfT funding for the time being.

ACTION 15: Richard Fish

Referring to other unpaid subscriptions, the Chairman thought that LUL and NR had yet to pay. David Castlo reported that, whilst there had been a delay, this had

now been resolved. Graham Bessant was confident that LUL had paid and the Chairman agreed to check this with Lesley Bello.

ACTION 16: Chairman

Steve Berry's email also reported no progress with the procurement of the Bridge Inspector Competency scheme which now had to be referred to the Cabinet Office for approval. This development was received with some puzzlement and frustration from the meeting especially noting that the scheme was self funding and had been with DfT for almost two years. Neil Loudon reported that he had raised the matter with Graham Pendlebury (new Chair of UKRLG) and had been told that DfT expected the scheme to start in April 2014.

All BOF members stated that they would support the scheme and insist on the appropriate level of competence for their inspectors, whether in-house or through consultants. Graham Bessant and David Castlo noted that LUL and NR respectively would also maintain their in-house standards but these would be harmonised with the new scheme as far as was possible. Graham Cole pointed out that the Code of Practice would be updated once the scheme had been introduced.

It was agreed that the Chairman should share the thoughts of the meeting with Steve Gooding at DfT.

ACTION 17: Chairman

With regard to the BOF constitution, Richard Fish reported on a conversation he had had with Mike Winter in the summer in which Mike had described a slightly negative reaction from UKRLG to the role of BOF in support of UKBB. Formally, the minutes of the RLG meeting will "note" the BOF constitution. It was unclear whether this decision was related to DfT's change of heart on funding but Richard Fish suggested that there was little point in escalating the issue, pointing out that the constitution was a means to an end and not an end in itself.

## 5. BOF Research Priorities and Future Direction

The Chairman repeated his introductory remarks and his desire to see BOF return to its original *raison d'être* which had been to identify and promote research driven by the needs of bridge owners. This was timely as UKBB had asked BOF to come up with 3 priorities for research topics. The Chairman suggested that proposals should exclude those either already in receipt of EPSRC support or those which might be more suited to future funding.

Graham Cole endorsed Mike Winter's earlier comments that projects should be realistic and able to be delivered within a short timescale. Neil Loudon supported the concept of producing Best Practice Guides.

A discussion ensued which resulted in a long-list of priorities which is attached at Appendix 1.

As part of the discussion, the Chairman asked BOF members to consider contributions to projects from their own research budgets. It was pointed out that TRL still had a number of historic but valuable research reports which could be used to develop ideas. A link to access these will be put on the BOF website.

ACTION 18: Paul Fidler

In addition to the research suggestions emanating from the meeting, Neil Loudon reported that the Highways Agency was presently working on a brief for a reprise of the “Maunsell Report” from 1989 to be called “The State of Bridge Infrastructure”. As 25 years ago, this would be an audit of 200 bridges but of a variety of forms and materials, not just concrete. Procurement was likely to be through the HA Framework Contract.

As part of the exercise to consider future research priorities had referred to steel protective coatings, Neil Loudon offered Geoff Bowden from the HA to speak at a future BOF meeting.

ACTION 19: Neil Loudon/Chairman

Closing the discussion, the Chairman thanked the meeting for their ideas and suggestions and hoped that both UKBB and DfT would be impressed by this first piece of work. He hoped very much that the role of BOF could be consolidated as the body advising UKBB and UKRLG on bridge related research needs and that DfT would be able to deliver some of the projects. The Chairman also determined that this discussion should be continued at BOF 42

## **6. New bridges & major projects update**

The Chairman stated that he had added this item to the BOF agenda as he thought it important that the group should be aware of new structures as well as the management of existing bridges. He had highlighted some that he was aware of as below:

### **6a Forth Replacement Crossing**

Barry Colford noted that this was now to be called the Queensferry Crossing. He was aware that the towers were soon expected to be out of the water and that work was about to commence on the approach viaducts. Completion was scheduled for 2016 but works were currently about 4 or 5 months behind programme.

### **6b Walton-upon-Thames**

Graham Cole confirmed that the bridge was opened in July 2013.

### **6c Mersey Gateway**

There was no-one at the meeting who had any knowledge of this project but Graham Cole and/or Peter Brown offered to find a name from the client, Halton Borough Council through their ADEPT contacts.

ACTION 20: Graham Cole/Peter Brown

## **6d Other**

Stephen Pottle briefly described a number of major bridge projects which TfL were promoting:

- i. Silvertown Crossing of the Thames east of Blackwall
- ii. The “living” bridge over the Thames at Temple
- iii. A new footbridge near Pimlico
- iv. Major strengthening and refurbishment of Hammersmith flyover – a highly innovative solution which would start in October 2013
- v. Four road over rail bridge replacements

## **7. PIARC Bridge Questionnaire**

The Chairman introduced David Ashurst of Arup who was the UK representative on the World Roads Association (WRA) committee (TC 4.3) charged with considering bridge maintenance. David had recently presented at UKBB and it had been timely to use this meeting of BOF as an opportunity to test his work before being considered by his committee. David explained his task as updating reports first published in 2012, with the revisions due to be promulgated in 2016. His specific areas of interest were New Repair and Rehabilitation Methods and The Estimation of Load Carrying Capacity. He had previously issued a questionnaire which had been intended to seek out current best practice in these fields. David also explained that he had been assisted in both of these topics by Hertfordshire CC and also by the HA and TRL for each project respectively. More information could be gleaned from the PIARC website. David remarked that much of the research work inspired and driven through BOF had been useful to PIARC in the past.

The Chairman thanked David for his presentation and invited comments or questions from the meeting: many contributors questioned the relevance of this work, questioning how innovation could be found in existing methods and materials. Neil Loudon cited the Midlands Links cross-heads where almost every option had already been considered in terms of addressing the loss of structural performance. Stephen Pottle suggested that the work would only deliver a collection of current best practice and be of little use for future ideas. Graeme Muir thought that a commentary on the usefulness or otherwise of recent innovations might be of more use.

Other questions sought clarification on the breadth of PIARC’s global membership: Barry Colford noted that most of the world’s new big bridges were being built in countries such as China, Korea and Russia where significant pioneering innovations were being developed.

Despite a degree of scepticism, the meeting supported a suggestion from Wayne Hindshaw to keep an open mind and that it would be good to support this work in the hope that the occasional good idea would emerge.

## **8. Structures Asset Management**

The Chairman introduced Keith Harwood who, whilst employed by Arup, was seconded to Hertfordshire CC for 4 days a week as Head of Profession for Bridges and Structures.

Keith explained how asset management for HCC's structures was not as well developed for that of the County's roads and lighting. He went on to cover the background to HCC's Transport Asset Management Plan (TAMP) for the county's 1700 structures which had been produced using a modified "Atkins" tool kit to determine the value of the bridge stock as defined by the gross replacement cost. The annual depreciation figure gives an indication of the annual investment needed to keep the stock in a suitable condition. Keith emphasised the importance of accurate data collection. He recognised the problem, which most local authorities have, of dealing heritage structures and the difficulty in assessing the value of such bridges.

During the discussion which followed, it was agreed bridge owners needed a degree of flexibility in terms of manipulating data to provide answers to the "what if" questions before deciding on interventions.

### **8a. Bridge Strike Research**

The Chairman added an additional item to the agenda by introducing Bella Nguyen of CUED who was researching the cause of bridge strikes and methods of prevention. He asked the meeting to share their views on the subject in order to assist Bella's work.

In terms of how to react to bridge strikes, Graham Bessant explained the impracticality of closing bridges on the London underground network after a strike. Unless there had been an extreme event, the LUL priority was to keep the trains moving but an inspection would be carried out as soon as possible thereafter.

The Chairman noted that the concept of an over-height lorry breaking a light beam which triggered a camera had been deemed to be inadmissible evidence in court. Barry Colford noted that even where free flow tolling was in place, such methods required primary legislation. Rod Howe advised that C&RT had some bridges which were equipped with cameras triggered by vibration in an attempt to record vehicles hitting parapets so that insurance claims could be made.

The Chairman also referred to message signs which might be triggered by a lorry breaking a laser well in advance of the bridge but he understood that these were unreliable in poor weather conditions and there were many cases of vehicles not stopping even if the sign flashed a warning message.

David Castlo reported that Network Rail relies on high visibility chevrons as well as advanced warning signs. NR's most vulnerable bridges were now equipped with deck displacement monitors to assist the analysis of impact effects. David also noted that there had been a decline in bridge strikes on rail over road bridges (now to about 1300 per annum) and the greater priority was now thought to be parapet strikes and vehicle incursions.

Stephen Pottle noted that many strikes were on bridges with a headroom higher than the minimum standard with low loaders carrying plant or tipper trucks with their bodies left up.

Wayne Hindshaw gave a brief summary of Transport Scotland's "Strike It Out" campaign and pointed out that there was no legislation controlling the height of vehicles. He also noted that approaches had been made to satnav providers to add a bridge height database to their systems.

The Chairman thanked the meeting for their contributions and BOF members wished Bella well in her work.

## **9. BOF sponsored research projects - update**

The Chairman noted that updates on the few remaining BOF projects had been covered earlier in the meeting:

## **10. Other Bridge Research Update**

The Chairman invited BOF members to advise on their own research projects:

### **10a TfL**

None

### **10b Network Rail**

David Castlo gave brief summaries on the following:

- i. Web stiffener strengthening – Surrey University
- ii. Variation in earthwork fill materials – Sheffield University
- iii. Sonar monitoring of scour development – Southampton University (Rod Howe noted that CR&T were also interested in this work)
- iv. Debris impact on bridges during floods – Exeter University (Richard Fish was also part of this team as was Kevin Dentith of Devon CC, representing ADEPT)

### **10c Highways Agency**

Neil Loudon reported that the Agency were now gathering ideas for 2014/15 but these were likely to include:

- i. Risk based asset management; not just bridges but also roads, lighting, drainage etc.
- ii. Implications of maintenance “holidays”
- iii. Integrated asset management systems

### **10d ADEPT**

Graham Cole repeated the surfacing work via the ADEPT Soils and Materials Group, as previously noted, and the ongoing matter of standards for parapets on local roads.

### **10e TfGM**

Mungo Stacey noted that TfGM were looking at the impact of the next generation of Eurocodes on traffic loading.

### **10f DRD(NI)**

John McRobert reported that Queens University, Belfast were conducting a fully instrumented trial of Weigh-in-Motion (WiM) on the Belfast to Dublin road which had already provided useful information on overweight vehicles. The statistics showed that many lorries were measured at 50t gvw between the hours of 0200 and 0500. Barry Colford noted that WiM on the Forth Road Bridge regularly recorded gvw's of 60t. He pointed out that WiM data was inadmissible and prosecutions could only take place after the police had moved a vehicle to a weigh bridge.

## **11. Any other business**

### **11a Future Agenda Items**

It was agreed that protective coatings should be scheduled for BOF 43 in May 2014.

### **11b Publications**

Nothing was raised under this item.

### **11c Other**

Barry Colford reported on a recent incident on the Little Belt bridge in Denmark in which a lorry carrying cardboard had caught fire and had badly damaged two hangers and the possible impact on the main cable was presently under consideration.

## **12. Proposed dates for future BOF meetings**

The Chairman proposed the following dates:

BOF 42                      Tuesday 21<sup>st</sup> January 2014

BOF 43                      Tuesday 13<sup>th</sup> May 2014.

## **13. Notices**

The Chairman asked members to note the various meetings and conferences which had been included on the agenda.

## **14. Closing/Summing Up**

The Chairman thanked everyone for attending the meeting and for their valued contributions.

Richard Fish,

November 2013

## **Appendix 1**

### **BOF Research priorities (as recorded by the Chairman): Item 5 refers.**

1. Best practice guide for bridge surfacing, waterproofing & joints.
2. Best practice guide for protective paint systems for existing bridges.
3. Best practice guide for connections for bridges e.g. welding, bolting, riveting, glueing etc.
4. Best practice guide for ensuring quality of bridge construction in a self-certified contractual environment.
5. A strategic guidance document on the introduction of BIM for bridge engineering design, construction and operation.
6. Audit report on evidence base for deterioration models and degradation rates for bridge assets (note HA state of bridge infrastructure project).
7. Best practice guide for the repair and strengthening of parapets (N.B. This is a complementary project to the early BOF initiated & DfT sponsored report “Guidance on the Design, Assessment & Strengthening of Masonry Parapets on Highway Structures” prepared by AECOM and Sheffield University in 2012)
8. Best practice guide for cathodic protection of concrete bridges – (see documents on Corrosion Protection Association (CPA) website).
9. Best practice guide for concrete repairs ( including audit of the performance of concrete bridge repairs)
10. Audit for evidence for deterioration models and degradation rates for bridge assets (note HA state of bridge infrastructure project)
11. Hidden components project from previous submission to BB. (This was previously submitted to BB in 2009 and again in 2010 under title “Design, Maintenance and Inspection of Concealed Metal Connectors and Bearing Pins in Moving Bridges (estimated cost £90K) – I believe a spec was prepared by Rod Howe (C&RT) and BOF Project Steering Group and submitted to DfT.
12. What information do we need to collect/obtain for effective bridge management?
13. Procurement strategies for optimising whole life value of bridges.
14. Establishment of an information repository for best practice guides & information.
15. Best practice guide to fast bridge construction.
16. Best practice guide for minimising disruption in bridge construction.