

BRIDGE OWNERS FORUM

MINUTES OF MEETING BOF 42: TUESDAY 21st JANUARY 2014 AT THE BEVES ROOM, KINGS COLLEGE, CAMBRIDGE

PRESENT

Campbell Middleton	Chairman & Cambridge University Engineering Department (CUED)
Graham Bessant	London Underground
Peter Brown	ADEPT (Oxfordshire CC)
Graham Cole	ADEPT
Barry Colford	FRB and Large Bridges Group
Huw Davies	Sustrans (morning only)
Liam Duffy	NRA (Ireland)
Richard Fish	Technical Secretary
Rod Howe	Canal and Rivers Trust
Neil Loudon	Highways Agency (HA)
John McRobert	DRD(NI)
Graeme Muir	SCOTS
Stephen Pottle	Transport for London
Nigel Ricketts	Network Rail
Santosh Sansoa	Highways Agency
Paul Thomas	Railway Paths Ltd.
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 42 and especially Huw Davies and Paul Thomas of Sustrans and Railway Paths Ltd respectively who were attending their first meeting. He also welcomed Santosh Sansoa of the Highways Agency who was attending for this meeting only, and Nigel Ricketts who was substituting for David Castlo.

Apologies had been received from the following:

Mark Atkinson	Northern Ireland Rail
Steve Berry	DfT
David Castlo	Network Rail
Richard Frost	Network Rail
Jason Hibbert	Welsh Government
Wayne Hindshaw	Transport Scotland
Neil Garton-Jones	CSS Wales
Mungo Stacy	TfGM
Paul Williams	LoBEG
Mike Winter	UKBB and ADEPT

The Chairman noted that another invited organisation, Northern Ireland Rail, had now joined BOF but their representative, Mark Atkinson, had had to give last minute apologies. He also noted that Mungo Stacey had left TfGM and they would be represented in future by Andrew Charnock. Stephen Pottle noted that Paul Williams had changed jobs but a new LoBEG representative had yet to be agreed.

2. Previous Minutes – BOF 41: 1st October 2013

The minutes of BOF 41 were accepted and, subject to the following corrections, could be placed on the BOF website:

- **Page 1, Item 1:** Remove Graham Cole from list of apologies.
- **Page 7, Item 5, penultimate paragraph:** Replace “Boden” with “Bowden”.

ACTION 1: Paul Fidler

3. Actions from BOF 41

References in the text below refer to the numbered actions on the BOF 41 Action Sheet. Boxed reference numbers relate to the BOF 42 Actions:

Action 2, Temporary Bridge AIP Guidance:

Neil Loudon reported no significant progress but updated the meeting on the present position. Firstly, it had to be borne in mind that standard temporary bridge products had never been subject to a rigorous design process but were based on historical information which included load testing. The Highways Agency’s Terry Robinson is about to contact all suppliers to ascertain their compliance with, and progress towards, Eurocodes. The Agency will then produce a generic report which will be issued via UKBB and BOF and should be ready for BOF 43 in May 2014.

ACTION 2: Neil Loudon

Action 3, DfT Framework Contracts:

Richard Fish reported that he had yet to have the opportunity for a meeting with Paul Hersey at DfT. Neil Loudon briefly explained the current T-TEAR call off contracts which were shared between DfT and the HA: there are four lots with a number of sub-consultancy suppliers as well as lead consultants. The Agency generally use these contracts for research projects or development of standards. Neil noted, however, that the contracts are to be re-tendered in 2015.

Action 5, Automating Bridge Inspections:

Stephen Pottle suggested, and the meeting agreed, that further action on this item was unlikely to be fruitful. Stephen will contact Paul Hersey at DfT with a view to obtaining the TRL report as it currently stands.

ACTION 3: Stephen Pottle

Action 6, ADEPT Soils and Materials Group Report:

The meeting was unaware of further developments on this Group's report into bridge surfacing. Graham Cole undertook to find out when publication is expected.

ACTION 4: Graham Cole

The Chairman prompted a short discussion by questioning when national standards could be amended or ignored by local government or private organisations. The debate also extended into the choice between output or performance based specifications and the more traditional prescriptive models. It was agreed that this was particularly problematic when specifying products which were based on a long life expectancy and the consequent problems of attempting to recover costs in the event of failure. Graham Bessant noted that LUL have an approved products register from which they specify named materials but recognise that this is becoming more difficult in terms of compliance with European standards and procurement directives. Graham believed that individual contracts could still specify named products.

Returning to the subject of surfacing, Neil Loudon noted that his technical remit also covered pavement research and he advised that the Highways Agency were currently investigating surfacing options which could effectively waterproof a bridge deck without a separate waterproofing membrane.

Action 7, UKBB Business Plan:

Richard Fish will ascertain the status of the 2014 UKBB Business Plan at the meeting on 12th February and ensure that BOF features appropriately.

ACTION 5: Richard Fish

Action 10, CARES and Self-certification:

Richard Fish had drafted the Issues Paper which would be issued with the BOF 42 Actions.

ACTION 6: Richard Fish

Action 11, EU Harmonised Rebar Standard

Neil Loudon reported on recent developments with respect to CARES: DCLG (Guy Bampton) was now aware of the issues and the matter had been raised with the EU Standing Committee on Construction. Neil believed that it was likely that a slightly modified CARES scheme might fit the EU requirements.

The Chairman made comparisons with quality control in the nuclear build programme where CUED were involved in a project which would enable every rebar to be traced from source to construction. The project was exploring cheap and easy methods but the key issue was traceability.

Action 13, EPSRC and TSB:

The Chairman is to invite Roger Singleton-Escofet to BOF 43 to present on the work of research funding bodies.

ACTION 7: Chairman

Action 15, BOF Subscriptions:

The Chairman named those organisations whose BOF subscriptions had yet to be paid.

Action 16, BOF CUED Secretariat:

The Chairman requested that all BOF emails should in future use the address: sec@construction.cam.ac.uk

ACTION 8: All

Action 17, Bridge Inspector Competency Scheme:

The Chairman noted that the DfT specification for scheme accreditation and certification had now been released. Copies of the title and contents pages of this draft specification were tabled by the Chairman. He had found that there were still gaps in the document and felt that more work was needed. Neil Loudon reported that he had also received the documents and understood that there was now a two week period before a PIN was to be issued and the start of the procurement process. The programme then shows 120 days before award. The Chairman had offered BOF support to DfT as part of this process but it was agreed that there was little need for input at this stage. He agreed to upload the full document on the BOF website.

ACTION 9: Paul Fidler

The Chairman asked if BOF members would be supporting the scheme. Nigel Ricketts outlined the Network Rail policy which he suggested was probably more onerous than highway authorities. He noted, however, that a similar problem of lack of resources was probably generic across all owners with a general loss of competence and capacity. The Chairman agreed and expressed concerns that inexperienced inspectors were being employed and that the level of supervision and checking by Chartered Engineers could be better. With regard to the take up of the scheme, he hoped that all owners would embrace it, if only to complement existing systems.

Stephen Pottle noted that the BOF Project Steering Group had early input into the document but this had been some time ago. He considered that up to 80% of the scheme was complete and agreed that there was no need for further input for the moment and that the priority should be to ensure that the scheme became established.

Graeme Muir pointed out that the scheme must be incorporated into the next revision of the Code of Practice. Neil Loudon noted that BD 63 was being revised and that reference to the scheme would be included. It was agreed that these points and other BOF concerns should be raised at the next meeting of the UKBB.

ACTION 10: Richard Fish

Action 19, Protective systems and structural steelwork presentation:

Neil Loudon suggested that Geoff Bowden's presentation should include steelwork as well as paint. The Chairman will decide whether this should be at BOF 43 or 44.

ACTION 11: Chairman

Action 20, Mersey Gateway:

The Chairman noted that a contractor had now been appointed and remained keen to have a presentation at a future BOF meeting. He would contact Ian Draycott of Halton Borough Council.

ACTION 12: Chairman

All unrecorded actions from BOF 41 had either been completed or were discussed as part of the BOF 42 agenda.

4. Membership – introduction to new members

4a. Sustrans

The Chairman welcomed Huw Davies and Paul Thomas of Sustrans and Railway Paths Ltd. (RPL) respectively. The former gave a presentation which explained the origin of Sustrans from the start of the National Cycle Network some 30 years ago and focussed on educational and behavioural change issues as well as infrastructure. RPL had been formed about 15 years ago and was a "sister" charity to Sustrans. Paul Thomas also presented, noting that RPL had some 1200 structures varying in size from viaducts to culverts. RPL's concerns were around scour or flood damage, listed viaducts, overbridges supporting the highway and remote culverts. Both presentations would be made available on the BOF website.

ACTION 13: Paul Fidler

4b. Highways Agency

The Chairman formally welcomed Santosh Sansoa to the meeting and invited her to describe her role within the HA: Santosh explained that she had a Business Support post to the Structures Project Team and, latterly, the Structures Policy Team. Her workload had included the following:

- The “State of Bridge Infrastructure” project
- Working with Geoff Bowden on steelwork protection
- Revisions to the DMRB 1800 and 1900 series
- BD 35 revision
- Working with Network Rail exploring common specification opportunities

4c. Network Rail

The Chairman invited Nigel Ricketts to inform the meeting of his role with Network Rail. Nigel briefly covered his career in bridges and noted that he was currently the Civils Technical Specialist, based in Milton Keynes, and explained his workload. Although he was substituting for David Castlo at this meeting, it was likely that he would be the Network Rail representative on BOF in the future.

4d. Other

The Chairman noted that Northern Ireland Railways were to be represented at BOF in the future by Mark Atkinson. He had also invited Waterways Ireland to join and this was pending.

5. BOF Research Priorities and Future Direction – continuation from BOF 41

The Chairman referred to discussions at BOF 41 which had lead to the drafting of a list of suggested research topics which had also been taken to UKBB. He asked the meeting for any further thoughts on the list or for any additions to it.

Issues of procurement were raised and the problems associated with decision makers who look at short term capital expenditure as opposed to whole life considerations, in terms of both cost and performance. Graham Bessant noted the trend towards value engineering which only considered initial cost issues. The Chairman offered to continue dialogue with DfT and other contacts in Government Departments.

ACTION 14: Chairman

The Chairman asked BOF members to review and rank the original list of research proposals (and to add any additional items) so that it could be aired at the next UKBB meeting. Similarly, any organisation which could offer contributions to funding for any proposed project should also indicate that possibility.

ACTION 15: All

6. New bridges & major projects update

Continuing the pattern from BOF 41, the Chairman invited updates as below:

6a Queensferry Crossing

Barry Colford reported that the central tower was now clear of the water and that the approach viaducts were progressing well. Completion remains scheduled for 2016 but he understood that the works were currently about 6 months behind programme. There are three prospective bridge operating contractors who are currently tendering and one will be appointed in 2015. At this point, the Forth Road Bridge FETA staff will TUPE over. The Chairman offered to invite the new crossing's Project Manager to present at a future BOF.

ACTION 16: Chairman

6b Mersey Gateway

The Chairman reminded the meeting of his intention to invite a representative from this project to present at a future BOF. He also noted that the construction consortium was largely made up of European contractors, a trend which now seemed the norm in large projects. He also cited the ongoing UK Cost Review which was investigating reasons why UK Construction costs are more expensive.

6c Lower Thames Crossing

Neil Loudon reported that this proposal was out to public consultation and a decision was to be taken this year.

6d Other

Stephen Pottle noted that the London proposals remained as reported at BOF 41:

- 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. Prevention of Bridge Jumping

John McRobert presented a paper, which had been tabled at the start of the meeting, and outlined options for possible suicide prevention measures. The background to this was the growing number of suicides from the Foyle Bridge which had reached the point where political pressure was increasing to do something.

The Chairman invited comments and discussion:

Barry Colford and Richard Fish cited recent high profile incidents at Erskine and Humber bridges respectively which had lead to local politicians making

significant and expensive decisions for their structures. In the latter case, modifications to parapet height had triggered significant changes to the bridge's articulation under the increased wind load.

Richard Fish also reported that he had written an article for Bridge Design and Engineering magazine in 2011 which drew on international experiences, including the Golden Gate bridge in San Francisco. (*PMN: Article is in BD&E Issue No 66, First Quarter 2012*). He described findings from his research which included a study in the British Journal of Psychiatry that new wire barriers on the Clifton Bridge in Bristol had seen a dramatic drop in suicide attempts *across the city* not just at the bridge. One of the conclusions was that suicides are not always premeditated but can be impulsive actions when the opportunity to jump presents itself.

Neil Loudon noted that there was more helpful input from a study by the Department of Health – Consultation on the Prevention of Suicide.

The meeting noted that Bill Valentine, now retired from Transport Scotland, had produced a paper on this topic for UKBB. John McRobert offered to locate this and arrange for its issue to BOF.

ACTION 17: John McRobert

The Chairman summarised the discussion and suggested that all bridge owners should make themselves aware of all of the issues and make their own policy decisions in consultation with relevant politicians.

ACTION 18: All

8. Hidden Defects in Bridges – CIRIA Research Proposal

The Chairman introduced Chris Chiverell from CIRIA who gave a presentation on this proposal:

Chris explained that the origin of this work had partly come from BOF and the suggestion for a research topic from Rod Howe. Although this had been one of BOF's research priorities, lack of funding had precluded progress. Following meetings with Barry Colford on suspension bridge cables and Donald Pearson-Kirk who had been working on Hammersmith Viaduct, Chris was considering options for revising and expanding the scope and invited input from BOF members into this process. The Chairman suggested and it was agreed that members should comment on the scope by Mid-March 2014.

ACTION 19: All

The Chairman opened a wider discussion by asking about timescales and budgets. Chris explained that he was hoping to start work this coming Spring but could not yet be clear on a budget as this was dependant on scope. Ball park estimates, however, were between £100,000 and £140,000 which included editorial and

initial print runs. The output would be a document of between 250 and 300 pages. Chris noted that CIRIA were no longer able to generate income from publication sales and he was therefore hoping that bridge owners could pledge funds towards the cost of the project. He already had commitments from Transport Scotland and the Highways Agency but would welcome others. The Chairman invited BOF members to advise CIRIA accordingly.

ACTION 20: All

The Chairman expressed concern that there was a risk that the output report might be regarded as superficial in view of the ratio of budget to scope. Richard Fish agreed and noted that more breadth than depth might mean that the report might only signpost the reader to other papers. Nigel Ricketts' preference was for guidance on problem issues followed by strategies for dealing with them.

Chris Chiverell accepted that there was a need to produce a balanced document but felt it was important to say something about everything but address the most important issues in some detail.

Chris also stated that the CIRIA practice of inviting industry consortia to bid for the drafting was a possible way forward but that he would also consider setting up a steering group, probably (for the most part) made up of organisations who were financially supporting the work.

The Chairman concluded the discussion by requesting that BOF should receive suitable recognition in the form of acknowledgement and a logo when it had made a significant contribution in instigating a piece of work.

9. Bridge Scour Manual

Chris Chiverell remained for this item whilst the Chairman introduced Andrew Kirby of Mott MacDonald (MM) who had been commissioned by CIRIA to write the revision to their scour manual, C551. Andrew agreed that his presentation could be placed on the BOF website.

ACTION 21: Paul Fidler

Andrew addressed the question as to why an update to C551 was needed: since first being published in 2002, there had been several international publications (NCHRP in USA, New Zealand based research etc.) as well as a number of bridge failures due to scour (e.g. Cumbria, Malahide and Feltham). MM, together with other partners including HR Wallingford had been awarded the contract in January 2013 and a final draft was anticipated in March 2014 with publication in June. A formal launch event was being planned for September. The main changes/additions to C551 included a review of legislation, a risk management approach and updated case studies.

The Chairman invited questions from the meeting:

Neil Loudon noted that the Highways Agency had responsibility for disused rail bridges now that BR (residual) had been wound up. He noted that he therefore had to deal with two different methodologies: road and rail bridges. Andrew confirmed that both would be considered, noted and evaluated in the new document.

Liam Duffy expressed a desire to see some commentary about monitoring options. This was confirmed. Nigel Ricketts briefly reported on some work being undertaken by Professor David Richards of Southampton University on the use of Sonar techniques, including field trials on the River Hamble in Hampshire.

The Chairman asked if the latest draft of C551 could be placed on the BOF website under password protection. After discussion and input from Rod Howe and John McRobert, BOF members who sit on the steering group, it was decided that this would not be worthwhile at this stage.

10. Proposals for Research Projects

10a Flood risk assessment of masonry bridges

The Chairman introduced a summary paper on this proposal from Dr Prakash Kripakaran of Exeter University which had been tabled at the start of the meeting. Richard Fish reported that he had attended an exploratory meeting at Exeter (together with David Castlo of Network Rail, Kevin Dentith of Devon CC (and UKBB) and Bill Harvey) when the idea had been proposed and developed. The research was to target the various issues associated with floods and the effects on masonry arches including debris impact and build up. In the event of a successful bid to EPSRC, a steering group had been suggested with Richard as Chair, in his role as BOF Technical Secretary. The meeting offered broad support for the proposal and endorsed Richard as steering group chairman. The Chairman noted that this would be another opportunity for BOF to be promoted and its profile increased. Richard agreed to update future meetings of progress.

ACTION 22: Richard Fish

10b Bridge Decision Support System

David Hester, a Research Fellow at Exeter University, had been invited to present on his proposal at BOF 42 but had had to give last minute apologies due to a family bereavement. Richard Fish explained that he had met with David and Dr James Brownjohn (previously University of Sheffield) and had offered to make contact with a number of bodies and individuals who had an interest in bridge management and data collection.

Opening a short discussion, the Chairman emphasised the need to extract value from monitoring data and thought this proposal was worth pursuing. Nigel Ricketts commented that the use of sensors tended to be iterative: one had to put

sensors on a bridge before it could be ascertained exactly where they should be positioned. He noted the current Network Rail practice of concentrating instrumentation on rolling stock instead of fixed assets.

The Chairman noted that CUED was working on a Best Practice Guide for Structural Health Monitoring Systems (SHMS) on behalf of the Cambridge Centre for Smart Infrastructure and Construction (CSIC) but he expressed a desire for BOF to spend some time on this subject especially from the point of view of bridge owners and what value SHMS could add.

ACTION 23: Chairman

11. BOF Sponsored Research Projects – Update

The Chairman noted that the Automated Bridge Inspections and Bridge Inspector Competency Scheme projects had been discussed in detail under Item 3 of this meeting's agenda.

12. Other Bridge Research Update

The Chairman invited BOF members to update the meeting on any research that they were promoting or undertaking:

12a TfL

None

12b Network Rail

Nigel Ricketts reported on work with TWI on ultra sonic assessment of encased webs.

12c Highways Agency

Firstly, Neil Loudon reported that the Agency's move towards a Government Company was underway. The legislative process was due to start this Spring with the new company formally in place in 2015. Discussions were in progress on the HA's regulatory role but it was also to be hoped that the new arrangement would provide increased certainty of research funding

Neil summarised research initiatives as follows:

- i. Identification marking of assets, including sign gantries, to enable them to be moved between sites. This was soon to be awarded;
- ii. Interactions between deck waterproofing and surfacing systems;
- iii. The State of Bridge Infrastructure project (as noted in Item 4b above) which was hoped would influence future decision making on all aspects of bridge management including standards;
- iv. An Asset Management System, applicable not just to structures, which was also about to be awarded;

- v. Work on cost information and cost saving opportunities for Government projects which could lead to “maintenance holidays” for some structures in appropriate situations;
- vi. DMRB reviews for concrete specification (1700 Series). Along with the 1800 and 1900 series reviews mentioned in Item 4b above, the additional aim here is to work towards harmonisation with Eurocodes. (Timescales: 1800 and 1900 – to be completed in April 2014 and 1700, in August/September 2014;
- vii. The HA have bought a helicopter drone for remote inspections of the network. (Nigel Ricketts noted that Network Rail have a manned helicopter which is used when the railway is at risk from falling trees or landslips);
- viii. Finally, Neil reported on a Sino-UK project using satellite technology and GNSS (the UK equivalent of GPS) aimed at deriving the behaviour of bridges in a more exact way. This was being trialled at the Forth Bridge.

12d CUED

Referring to the reference above (12b), the Chairman reported that Cambridge University were working with other partners, including TWI, on acoustic monitoring using a Guided Waves tool. Whilst this was initially intended for pipe lines, he hoped that the application to suspension bridge cables might also work.

13. Any other business

13a Future Agenda Items

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

ACTION 24: Chairman

13b Bridge Assessment Results

John McRobert referred to three adjacent bridges in Northern Ireland which had assessment results of 17t, 7.5t and 17t respectively. As it was impractical to weight restrict the route, a more rigorous, FE, assessment, supported by load testing, was undertaken and all were found to be able to carry 40t, although the report carried the disclaimer that the “weakest” bridge’s working life might be limited.

During discussion, Nigel Ricketts stressed the importance of the owner having a thorough understanding of a bridge’s behavior and not simply relying on theoretical performance. The Chairman also expressed concern that the assessed capacity might mean that materials were only just on the linear part of the stress-strain curve and it was not an exact science as variable workmanship quality might detract from the theoretical answer. Graham Bessant referred to a paper he had written for the ICE Bridge Engineering Proceedings in which he described how he had reviewed a number of assessment “failures” and most of them had

now passed 40t. Graham affirmed that the key issue was to retain an in-house client technical capability.

13c Concrete based carbon fibre product

Liam Duffy asked if anyone was aware of such a product but there was no knowledge of anything from those at the meeting.

14. Proposed dates for future BOF meetings

The Chairman proposed the following dates:

BOF 43	Tuesday 13 th May 2014
BOF 44	Tuesday 23 rd September 2014.

As above (Item 13a), the Chairman noted that as BOF 43 was to be held in London and would include a visit to Hammersmith, it would require a second day and he offered to ask his secretary to establish a preference between Monday 12th and Wednesday 14th. *(PMN: due to commitments in the Chairman's diary, **BOF 43 has now been scheduled for Monday 12th and Tuesday 13th May 2014**)*

15. Closing/Summing Up

The Chairman thanked everyone for attending and for their valued contributions to the day's discussions.

16. Notices

The Chairman drew attention to the various meetings and conferences which had been included on the agenda. *(PMN: Also note the Fourth International Footbridge Conference to be held in London on the 19th to 20th July 2014)*

Richard Fish,

February 2014