

BRIDGE OWNERS FORUM

MINUTES OF MEETING BOF25: TUESDAY 13 MAY 2008 AT KINGS COLLEGE, CAMBRIDGE

PRESENT

Campbell Middleton	CHAIRMAN University of Cambridge
Brian Bell	Network Rail
Graham Bessant	London Underground
Peter Brown	CSS
Graham Cole	CSS
Albert Daly	National Roads Authority-Ireland
Peter Hill	Large Bridges Group
Rod Howe	British Waterways
Robert Humphreys	CSS Wales
Neil Loudon	Highways Agency (HA)
John Menzies	TECHNICAL SECRETARY
Jim Moriarty	London Underground
Graham Muir	Society of Chief Officers of Transport in Scotland (SCOTS)
Stephen Pottle	Transport for London
Andy Phillips	Welsh Assembly
Bill Valentine	Transport Scotland
Ronnie Wilson	DoRD(NI)
Paul Fidler	Cambridge University Engineering Department (CUED)

Invitees for Agenda items 5, 6 and 7

Miles O'Reilly	Independent Consultant
John Perry	Mott MacDonald
Graham Tilly	Gifford
Chris Chiverrell	CIRIA
Fiona Steele	SERCO

APOLOGIES FOR ABSENCE

Apologies were received from:

John Clarke	BRB (Residuary) Ltd
Richard McFarlane	LoBEG
David Stork	Manchester Ship Canal Company
Awtar Jandu	HA

INTRODUCTION

The Chairman welcomed BOF members to the meeting.

Membership of BOF: The Chairman informed the Forum of changes in membership as follows:

- Awtar Jandu, representing the Highways Agency, is retiring shortly and will be replaced at BOF by Neil Loudon
- David Stork, representing Manchester Ship Canal Company, is moving to Faber Maunsell and has recommended his place at BOF be taken by Tim Bownes, Chief Engineer, Mersey Docks & Harbour Company.

- Jim Moriarty, representing London Underground, is moving to a new post at LUL and is to be replaced at BOF by Graham Bessant, the London Underground Bridges and Structural Engineer.

The Chairman thanked Jim Moriarty as one of the founding members of BOF in 2000 for his help and support in the work of the Forum since its first meeting.

Meeting goals: The Chairman indicated that a main goal of the meeting was to receive presentations from the contractors who had undertaken the Dry Stone Walls and the Iron and Steel Bridges projects and to evaluate the research outputs. Other goals were to receive a presentation on the ESDAL [Electronic Service Delivery for Abnormal Loads] project, to discuss the arrangements for the International Bridge Forum meeting in September 2008, and to review the current status of BB/BOF research projects.

1. **MINUTES OF PREVIOUS MEETING – BOF24: 15 January 2008**

The minutes were accepted except that it was agreed that:

(1) under Item 7, the reference to the paper ‘Masonry Arch Assessment: the MEXE Method’ be amended as follows:

‘The paper ‘Masonry Arch Assessment: The MEXE Method’ prepared by Graham Cole was introduced by him. It was noted that CSS is supporting further testing work at Salford University in conjunction with Essex CC by M Gilbert and C Melbourne – anticipated completion date is April/May 2008’.

Fuller records of points made under the ‘bullets’ under item 7 were:

Fourth bullet – Experience shows that most arch structures said to be below standard actually perform quite satisfactorily; the same can be said of structures made of other materials.

Sixth bullet – Most reliance in controlling collapse risk of arches should be placed on monitoring and inspection of condition. A good asset management approach for bridge structures should take both inspection and assessment into account.

Ninth bullet and conclusion 1) Replace ‘Essex work’ by ‘CSS work’.

(2) under Item 9a, the last sentence be amended to read: ‘It was agreed that the paper on bridge assessment that Richard Fish presented in China would be placed on the BOF website’.

2. **ACTIONS ARISING**

The actions listed in the tabled Summaries of Actions, which were not to be covered in later Agenda items, were reviewed as follows:

Item 2: 14b Network Rail

It was agreed that, in view of the passage of time, the Chairman of the National Composites Network will not now be invited to make a presentation to BOF.

Item 2: ‘Intelligent monitoring of concrete structures’

It was pointed out that the report is in fact a CIRIA report, yet to be published, and that there are three DTI reports relating to this work.

Item 4: 2006/7 BOF Research Projects – 2006/7 Training of Bridge inspectors

It was agreed that a note on progress of the TfL project on Qualification of Bridge Inspectors would be distributed to BOF members by attachment to these minutes.

Item 5: Shortlisting of Research Proposals 2008/9: Project 6/13

The Chairman indicated that a contribution of £10k had been offered from Bill Valentine at Transport Scotland.

The Chairman asked BOF members to consider the tabled list of BB/BOF Projects set out so that financial contributions to projects could be entered. An error in the list was noted and the Chairman agreed to re-issue the list after correction. On receipt of the corrected list, BOF members were asked to enter the financial contributions that their organizations are providing/would be prepared to provide and to return the list to the Chairman.

ACTION: CHAIRMAN

ACTION: All

Item 5: Shortlisting of Research Projects 2008/9: Project 15/13

The Chairman requested responses for a request for financial contributions to this project from British Waterways, Transport for London, Network Rail and the County Surveyors Society.

ACTION: Rod Howe

ACTION: Stephen Pottle

ACTION: Brian Bell

ACTION: Graham Cole

It was noted that the CSS is offering some financial support for the Project: Review of Bridge Inspection Competence and Training.

The Chairman reported his understanding that, although he has not received written confirmation from DfT, all BOF 2008/9 Research Proposals were accepted by the Bridges Board and were put forward to the RLG.

Item 7: Research Update: London Underground

It was agreed that London Underground would be invited to give a presentation on the LUL Whole Life Management Study at a future BOF meeting.

ACTION: CHAIRMAN

4: BOF Research Projects

The Technical Secretary was asked to prepare a note on the lessons learned so far from the experience of managing BOF research projects.

ACTION: John Menzies

7. Response to W Harvey's Article on Masonry Arch Bridge Assessment

It was reported that the updating of BA16 and BD21 is not now a high priority for the Highways Agency.

9. Research Update (a. Highways Agency)

It was agreed that Richard Fish would be asked to provide a copy of his paper presented in China for placing on the BOF website.

ACTION: Paul Fidler

Requests for letters of support for research proposals: The Chairman raised the question of whether BOF should provide letters of support to proposers of new research projects. In discussion it was found that BOF members generally receive many requests for support letters from research proposers. It was concluded that BOF as a body should

not respond to such requests and that they should be responded to directly by the bridge-owning organization to which they are addressed.

ACTION: All to note

3. INTRODUCTION OF NEW BOF MEMBER – COUNTY SURVEYORS SOCIETY: WALES

The Chairman welcomed Robert Humphreys, representing CSS Wales, to the meeting and invited him to make an introduction.

Robert Humphreys began by giving a brief summary of his experience in civil engineering – he currently works for Denbighshire County Council which is one of the 22 North Wales Unitary Authorities. The county is rural with two coastal towns, Rhyl and Prestatyn. He has over 20 years experience of working in consulting engineering and local authorities, and has been with Denbighshire for about a year.

He drew attention to several interesting projects with which he has been involved – Flintshire Bridge (a £30m construction and management job including a bridge monitoring system; Rhuddlan viaduct incorporating 46m long prestressed beams; carbon fibre strengthening of King Street cast iron bridge; Packhorse 16C arch bridge).

Robert said that CSS Wales, derived from the former organization WATO, has a Bridges Group that meets three times a year to discuss issues relating to the 7800 road bridges (excluding trunk road bridges) in Wales. In Denbighshire there are 250 road bridges of which about half are masonry arches and about 25% are listed structures. About 3800km of retaining walls are known to exist.

Major issues relate to funding for bridges management:

- There is a maintenance backlog of about £60m and a requirement of £120m for strengthening.
- About 72% of assessments are not completed.
- There is a recruitment and skills shortage in the field of bridge management which the Unitary Authorities are trying to ameliorate by more collaborative working.
- Robert indicated he was not aware of any needs for research apart from those already being considered by BOF.

In reply to a question, it was indicated that about 29% of bridges have ‘failed’ assessment.

The Chairman thanked Robert Humphreys for his presentation.

4. STATUS OF BOF RESEARCH PROJECTS

The Technical Secretary presented the tabled paper ‘DfT Commissioning of BB/BOF Approved Projects – Progress’. Four Project Specifications had been prepared, two of which had gone forward to DfT for procurement action. Progress with these actions was not known because of an almost total lack of feedback from DfT officials. In addition, offers to DfT to assist with the work had not been acknowledged. BOF members expressed disappointment and frustration at this situation especially since agreements on

DfT/BOF collaboration to progress BB/BOF Project commissioning had been agreed at the meeting of the Chairman, Technical Secretary and David Yeowell with DfT (Paul Foskett, Edward Bunting, Andrew Oldland) on 10 December 2007.

Further discussion followed. The Chairman indicated that he was trying to arrange a meeting with senior DfT representatives to discuss the lack of DfT collaboration, to try to find out the reasons for it and to try to find a way forward. It was suggested that it would be useful if a senior person from DfT Procurement were present at the meeting.

ACTION: CHAIRMAN

It was suggested that the possibility of a Parliamentary Question and/or an article by the Chairman in, say, New Civil Engineer be considered to expose in the public domain the waste of public resources arising from the paucity of DfT collaboration and the resulting detrimental effects on the work of bridge owners and the associated research community. It was felt that actions of this type should be considered after the proposed meeting with DfT.

The operation of Project Steering Groups in the preparation of Project Specifications was raised during the discussion. It appeared that the draft Specification for the project 'Review of Bridge Inspection Competence and Training' had not been seen by all members of its Steering Group. Draft Specifications are issued by the Technical Secretary to Steering Group Convenors as part of the process for finalizing them. The Technical Secretary suggested that it is for Convenors to obtain the agreement of their Group members to draft Specifications and inform him so that he can then proceed with a request to DfT for procurement action.

ACTION: Stephen Pottle

5. DRY STONE WALLS PROJECT – PRESENTATION

The Chairman welcomed Miles O'Reilly, John Perry and Chris Chiverrell (CIRIA).

Miles O'Reilly presented an overview of the results of the project [His PowerPoint presentation may be reviewed on the BOF website].

It was indicated that the project report is now in the last stages of editing and checking, following which it will be sent for external peer review and a final editing will be completed by July and publication expected in late Summer 2008.

Chris Chiverrell indicated that CIRIA may produce the report as a 'Funders report' on CD prior to the publication in the Summer.

It was reported that there is a very high dry stone wall adjacent to the Ffestiniog Railway which might provide a good illustration for the project report.

In discussion, the benefits of repair as opposed to replacement were commented upon. It was emphasized that asset management should be proactive rather than reactive. Replacement of all assets is not practicable nor is it necessary. However a proactive approach is necessary and requires a managed process to gain adequately up-to-date knowledge of the existing assets, to programme inspections, repair and, where necessary, replacements.

It was said that the DfT will agree to Single Tender Action (STA) for a research project if no more than two thirds of the cost is to be carried by DfT. It was suggested also that, in the case of CIRIA-run projects, the DfT has agreed in the past to STA if DfT is represented on the Project Steering Group. These points were thought possibly to be relevant to the earlier discussion on the DfT procurement of BB/BOF research projects.

The Chairman thanked the visitors for their work on the project and for their contributions to the meeting. He also thanked the members of the Steering Group for their efforts on the project.

6. **IRON AND STEEL BRIDGES - PRESENTATION**

The Chairman welcomed Graham Tilly and Chris Chiverrell and invited them to present the report which had been published.

Graham Tilly made a PowerPoint presentation [The presentation may be reviewed on the 'Members only' section of the BOF website].

In discussion, the possibility that the use of the report would have prevented the Minnesota bridge collapse was discussed. It was acknowledged that collapse prevention cannot be certain since several contributory factors are generally associated with bridge collapses, but the use of the report can be expected to reduce the risk of such collapses. It was pointed out that the presence of cracking in the Minnesota bridge structure was known prior to the collapse and that prevention of collapse in any bridge depends on a realistic evaluation of the known defects, the likelihood of unknown defects and their implications in the light of the circumstances of use of the bridge at present and in the future.

BOF was informed that movement had been reported in the Coalport bridge which has led to the setting up of a programme of monitoring there.

The Chairman asked whether there were, in the light of the experience of the project, improvements that BOF could make in its management of research projects. In discussion it was suggested that specifications for research projects are often to some degree aspirational and that it is desirable for there to be some flexibility to allow the specification to evolve as the project evolves. A workshop format for the first project steering group meeting can often be very helpful. Also the steering groups should adopt a consistent approach to avoid abortive effort and needs for rewriting.

It was agreed that the report title should refer to 'good practice' rather than 'best practice'. [Technical Secretary comment: The BOF Terms of Reference may need revision in the light of this decision]

Members of BOF were asked to note that the CIRIA suite of Asset Management Good Practice Guides (Embankments, Cuttings, Masonry Arch Bridges, Iron and Steel Bridges, Dry Stone Retaining Walls, Tunnels) are to be presented at a meeting in York on **Thursday 11 September 2008**.

It was noted that CIRIA is considering preparation of Good Practice Guides on Culverts and on Infrastructure Drainage.

The Chairman thanked Graham Tilly and Chris Chiverrell for their presentation and work on the project and for their contributions to the discussion. He also thanked BOF members of the Project Steering Group for their work on the project.

5 & 6 (continued)

Evaluation of Projects – Dry Stone Walls – Iron and Steel Bridges

Now that these two BB/BOF projects are completed, the Chairman sought views on the experience of their management and possibilities for improving performance on future research projects.

Comments had been prepared by the two Steering Group Convenors, Ronnie Wilson and John Clarke. In discussion it was agreed that the ‘ownership’ of projects is an important issue and that a drawback of projects commissioned through a CIRIA contract is that CIRIA regards the project as ‘theirs’. It was suggested that CIRIA, when commissioned to manage a BB/BOF project, should work as a contractor to BOF and the project outputs should not be issued/published without full BOF agreement. It was proposed that the membership of Steering Groups should be drawn from the organizations that had provided the financial support for the research. It was agreed to be important to set out responsibilities clearly in Project Specifications.

A shortcoming of the ‘Dry Stone Walls’ report, it was suggested, is that it does not give a legal basis for accepting qualitative assessments.

The Technical Secretary was asked to prepare a note on the evaluation of these projects based on the discussion and the written comments received from the project Convenors.

ACTION: John Menzies

7. ESDAL PROJECT - PRESENTATION

The Chairman welcomed Fiona Steele to the meeting and invited her to make a presentation.

Fiona Steele introduced ESDAL (Electronic Service Delivery for Abnormal Loads) using a PowerPoint presentation. She indicated it would be necessary for her later to confirm whether the presentation can be released for placing on the BOF website.

ACTION: Paul Fidler

In the subsequent discussion she indicated that the Highways Agency is funding SERCO to run the ESDAL service for two years. Funding for further development of ESDAL is being sought.

Access to the ESDAL system is only possible through a ‘bridge owner’. ESDAL covers foreign hauliers. It does not cover ferry crossings. About 30 hauliers are currently using the system.

It was pointed out the hauliers of abnormal loads are required to indemnify bridge owners against damage due to the passage of the load. Bridge owners cannot stop vehicles crossing a bridge; only the police can do that and then only on grounds of the size of the vehicle. This limitation in powers to stop vehicles crossing bridges was thought to be a shortcoming of current legislation.

The Chairman asked whether the ESDAL system has potential for development as a notional bridges database. Fiona Steele thought such a development is unlikely to be made and could only occur if required as a result of legislation.

The Chairman thanked Fiona Steele for her presentation and contributions to the discussion.

8. RESPONSE TO MASONRY ARCH STRENGTHENING SESSION AT BOF17

It was noted that the County Surveyors Society (CSS) is currently sponsoring research at Salford University and that the Union Internationale des Chemins de Fer (UIC) is about to publish new guidance on masonry arch bridge assessment.

9. BOF STRATEGIC GOALS

The Chairman opened a discussion on the longer term goals of BOF. He suggested that BOF could do more to stimulate initiatives to improve the longer term management of the bridges infrastructure by developing views on strategy and ways forward which could be promulgated, possibly in the form of position papers, to the Bridges Board and the Roads Liaison Group.

In discussion it was suggested that BOF is in effect the ‘research arm’ of the Bridges Board. The Institute for Highways and Transportation (IHT) is currently being considered as a body to undertake the management of the RLG and it was thought that the preparation of position papers was envisaged as a possible output from the IHT if it is commissioned for the RLG management role.

Doubt was expressed about whether BOF would be able to fulfill the role outlined by the Chairman. Nevertheless the Technical Secretary was requested to draft a revision to the BOF Terms of Reference which includes an item to cover the role for consideration at BOF26.

ACTION: John Menzies

10. RESEARCH UPDATE

a. Highways Agency

The Highways Agency has commenced a new project on the state of the bridges infrastructure. The Agency’s work on the implications of the bridge collapse at Minneapolis is focusing on identifying vulnerable and safety critical structures, on reviewing BD79 in the light of the collapse, on cable supported structures, and on safeguarding against bridge failures due to scour.

b. Network Rail

It was reported that a Network Rail funded PhD at Surrey University dealing with FRP patching of fatigue cracks has been completed and the CIRIA report on “Whole Life Infrastructure Asset Management” is now at final draft stage.

Three new projects have started:

1. TSB Lightweight structures call 2007 (3 year duration each)

- a. Bentley Cars Ltd. - ACTS – (Advanced Composite Truss Structures), a cross industry project with partners from universities, civil, automotive and aerospace engineering.
 - b. Queens University Belfast - Low energy lightweight concrete for novel structural applications(including the flexible concrete arch).
2. CIRIA (Mott MacDonald) – Noise and vibration (dealing mainly with advice to developers on how to mitigate the effects of transport noise).

Three further projects are expected to start in the near future

1. CIRIA – Culvert design and maintenance (Environment Agency principal funder)
2. EPSRC/UWE – Fatigue behaviour and service life assessment of masonry arches (CSS also participating)
3. EPSRC Case award/Surrey University – Corrosion of steel bridges

Brian Bell has recently been invited to join the ICE’s Innovation & Research Panel and would be attending a meeting of the International Construction Client Forum hosted by Constructing Excellence in London and the launch of the DBERR Strategy for Sustainable Construction in the near future.

Finally, it was reported that an international consortium, including Network Rail, had submitted a proposal to the EU in response to the most recent FP7 funding call. The title of the proposed project is “Effective Bridges”; initial feedback is expected by July and, if successful, a project start early in 2009 is anticipated. Other UK partners are Mouchel and Surrey University.

c. London Underground

The following work was reported to be in progress:

1. Whole Life Costing Model - Creation of a Whole Life Costing and management accounting model based on a statistical sampling model.
2. Lifecycle Plans and Risk Based Maintenance - Maintenance regimes at present follow time-based intervention. It is hoped to develop a system that is based on risk and whole life costing.
3. Asset Risk models - Develop asset risk management methodology.
4. Competency Assessment - Develop a competence assessment system for asset managers that bridges the traditional boundaries of business manager, engineering specialists, operations and maintainers. It will endeavour to ensure that its management staff have the right core competencies.
5. Asset Management Training - This will develop a training programme to equip new members of staff with skills, tools and techniques for asset management. It will dovetail into the asset management competency assessment mentioned above.
6. Asset Deterioration Modelling - This is a development of Intervention planning to replace the deterioration modelling as the prime mechanism for investment planning. rather than wait for assets to deteriorate and then apply for funding to repair them, it hopes to be able to predict when assets will deteriorate,

and so predict the optimum time for intervention and thus be able to predict funding requirements.

7. Co-Patch Project - This is a project being led by Associate Professor Tsouvalis of the National Technical University of Athens into FRP repairs. London Underground has agreed in principle that their structures can be used to test FRP bonding and materials trials.

d. Transport for London

Stephen Pottle introduced a Progress Update – attached to these minutes – on the TfL work on Qualification for Bridge Inspectors.

e. Other research

Mention was made of the National Physical Laboratory (NPL) work on the monitoring of a concrete footbridge.

It was reported that Rutgers University has been appointed by FHWA as the contract manager for the US Long-term Bridge Performance project.

Work is in progress on the concrete hinges of M4 bridges in Wales including testing, finite element analyses and assessment.

A recent meeting at Cambridge University on US/Europe sensor technology has been held.

11. INTERNATIONAL BRIDGE FORUM: Cambridge: 15-17 September 2008

The Chairman indicated that the arrangements for the IBF meeting in September were proceeding and asked members to let him know that they are able to attend.

ACTION: All

Since there is only one 'slot' in the IBF programme for a UK presentation, the Chairman proposed that he would present a paper on behalf of BOF.

12. ANY OTHER BUSINESS

a. The Chairman would like to appoint a Chairman and Members for Project Steering Groups for each of the remaining BOF research projects that are in the pipeline however he felt there was no point doing this until after the forthcoming meeting with DfT at which procurement issues and progress with the list of projects will be discussed.

b. Graham Muir asked if the BOF minutes could be disseminated to SCOTS members. At present the policy of BOF is to make everything possible public however there are from time to time some issues discussed that need to remain confidential to members; usually on matters relating to upcoming contracts or tenders or other commercially sensitive issues. Thus minutes are listed for members only or public. At present very few have been made public purely as it is a major job to go back through all the minutes to exclude confidential sections. It was agreed that for all future BOF minutes members would be asked to confirm that the minutes may be made public, or else indicate which sections should be for members only.

ACTION: John Menzies
Chairman

- c. A request was made for further information on the causes of the Clyde Arch cable failure. Bill Valentine advised that this bridge belongs to Glasgow Council. At present no final report has been issued but it appears that the primary cause related to a material problem. SCOTS will be asked to keep BOF informed of developments and advise BOF as soon as a final report is published.

ACTION: Graham Muir

13. PROPOSED MEETING DATES FOR 2008/9

Tuesday 13 May	BOF25
Tuesday 16 September	BOF26
Tuesday 13 January 2009	BOF27

14. CLOSE OF MEETING

The Chairman thanked those present for attending and closed the meeting at exactly 4.30pm.

John Menzies