

BRIDGE OWNERS FORUM

MINUTES OF MEETING BOF27: TUESDAY 13 JANUARY 2009 AT KINGS COLLEGE, CAMBRIDGE

PRESENT

Campbell Middleton	CHAIRMAN University of Cambridge
Brian Bell	Network Rail
Graham Bessant	London Underground
Peter Brown	CSS
John Clarke	BRB (Residuary) Ltd
Graham Cole	CSS
Albert Daly	National Roads Authority-Ireland
Paul Foskett	Department for Transport
Peter Hill	Large Bridges Group
Rod Howe	British Waterways
Robert Humphreys	CSS Wales
Neil Loudon	Highways Agency (HA)
Richard McFarlane	London Bridges Engineering Group (LoBEG)
John Menzies	TECHNICAL SECRETARY
Graeme Muir	Society of Chief Officers of Transportation in Scotland (SCOTS)
Andy Phillips	Welsh Assembly
Stephen Pottle	Transport for London
Bill Valentine	Transport Scotland
Paul Williams	London Bridges Engineering Group (LoBEG)
Ronnie Wilson	DoRD(NI)
Paul Fidler	Cambridge University Engineering Department (CUED)
Invitee for parts of the Agenda	
Graham Tilly	Consultant

INTRODUCTION

The Chairman welcomed BOF members and a new member, Paul Williams representing LoBEG, to the meeting and indicated that the main goals of the meeting were to receive an introduction from Paul Williams, updates on BOF research projects, to reach decisions on the format, agenda and delegates for the International Bridge Forum (IBF) to be held at King's College in September 2009, and to invite Graham Tilly to give BOF members his technical presentation.

1. APOLOGIES FOR ABSENCE

There were no apologies for absence.

2. PREVIOUS MINUTES – BOF26 16 SEPTEMBER 2008

The minutes were accepted subject to the following corrections:

- In item 9 Whole Life Asset Planning, place a full stop after the word ‘contracts’ and delete the words ‘and that input from the public sector employees who only have the public purse in mind, is essential.’
- Correction of spelling to ‘Beatty’ in Section 11

3. ACTIONS ARISING FROM THE BOF26 MINUTES

The actions which were not to be covered by later items of the Agenda were considered by reference to the minutes and the tabled list:

Actions had been completed apart from:

- i. Minute 1: The issues of concern that Network Rail have had in relation to past Highway Agency/Network Rail joint projects.
ACTION: Brian Bell
- ii. Minute 1: Resubmission of research proposals. This action was reported to be in hand.
ACTION: John Menzies
- iii. Minute 1: Brian Bell’s comments on the Montreal collapse report had not been distributed to BOF members.
ACTION: CHAIRMAN

4. MEMBERSHIP MATTERS

The Chairman reported that Martin Dils, who has moved to work for Scottish and Southern Power, has requested that he be permitted to continue having access to the part of the BOF website confidential to BOF members. Following discussion of a number of options for responding to this request (including seeking more information and allowing limited time access), it was agreed that the Chairman would contact Martin Dils and indicate that BOF aims to put most of its information onto the ‘open’ part of the website and that BOF is not able to agree to making the Members-only part of the website open to him.

ACTION: CHAIRMAN

Attention was drawn to the recent success of Peter Hill in becoming a Fellow of the Institution of Civil Engineers. The news was received with acclamation.

Introduction of new member

The Chairman invited Paul Williams, the Chairman of the London Bridges Engineering Group (LoBEG) to make an introduction.

Paul Williams gave a brief summary of his career and said that he had been the Chairman of LoBEG since Summer 2008. LoBEG allocates funding for maintenance of London’s bridges which are not the responsibility of Transport for London. LoBEG is not involved in bridge research but is working to develop better maintenance systems.

The Chairman thanked Paul Williams for his introduction.

5. PROPOSAL TO REVISE BOF TERMS OF REFERENCE

A proposal for amendment of the Terms of Reference was tabled by the Technical Secretary following the discussion at BOF26. Following discussion, new Terms of Reference were agreed unanimously as follows:

Proposed new Terms of Reference

1. Promote co-operation, collaboration and partnership amongst bridge owners.
2. Identify technical and research needs/priorities to promote good practice in the management of the bridge infrastructure
3. Disseminate information.
4. Recommend research priorities avoiding duplication.
5. Provide technical advice/support to the UK Bridges Board and bridge engineers on issues affecting the bridge infrastructure.

It was agreed that these proposed new Terms would be submitted for the consideration of the UK Bridges Board.

ACTION: CHAIRMAN

6. BOF RESEARCH PROJECTS UPDATE

a. Dry stone retaining walls

Ronnie Wilson introduced the tabled update report. It was noted that from the Steering Group point of view the work is completed and that the report should be published by the end of February 2009. It was agreed that the revised document would be checked and 'signed off' by the Project Steering Group Convenor before it is published by CIRIA.

ACTION: Ronnie Wilson

b. Inspector qualifications project

Stephen Pottle introduced the tabled progress report. The project contractor has interviewed 10 authorities and 73 responses to the questionnaire had been received from bridge owners. The results are being summarized in a draft report which will be considered at the next Steering Group meeting on 28 January. It was noted that a second stage of project work will be needed.

It was agreed that the whole subject of inspector qualification and training will be discussed at BOF28 in May when the Project Steering Group will report to BOF and a presentation by the research contractor may be included.

ACTION: CHAIRMAN

c. Other BOF projects

Paul Foskett introduced the tabled paper covering the following projects:

2006/07

- **Training and qualification of bridge inspectors**
- **Revision of BS6779 Part 4 (Masonry Bridge Parapets)**
- **Bridge deck slabs with non-metallic reinforcement**
- **Carbon composites for the strengthening of steel structures**

2007/08

- **Automating bridge inspections**
- **NDT of Macalloy bars tying prestressed beams**
- **Scanning of HA Research Reports**
- **ESDAL: Electronic Service Delivery of Abnormal loads - project for which BOF support was requested and which received funding.**

Paul Foskett also drew attention to the tabled paper entitled – Guidance on Depreciation of Highway Structures - a non-BOF project being commissioned by DfT on behalf of CIPFA and the UK Roads Liaison Group which may be of interest to BOF members.

Commenting on the recent progress in DfT commissioning of BOF projects, Paul Foskett indicated that it is important to produce project specifications as soon as possible after project proposals are accepted for DfT funding. It is also important to maintain the momentum of the commissioning work.

Currently the DfT is reviewing ‘Themes’ suggested by UK Roads, Bridges and Lighting Boards at their October 2008 meetings. A paper will be presented to the February meeting of the Boards which will set out the cross cutting themes in which specific research proposals will be considered, so that the Boards can take into account when deciding upon their research recommendations to UKRLG. The process will assist UKRLG to provide advice on where it considers research could assist in delivery of its objectives. BOF will in future need to consider how its recommendations to UK Bridges Board aligned to the themes which had been jointly identified by the three Boards.

A brief discussion of the project ‘**Scanning of HA research reports**’ followed. The practicalities of scanning research reports were discussed and some positive experience of use of commercial ‘scanning contractors’ was reported. Members were asked to send details to the HA, copy to the Technical Secretary.

ACTION: John Clarke

ACTION: Stephen Pottle

The Chairman suggested that consideration be given to including the results of this project on the HA research database. Neil Loudon reported that the main current difficulty in starting the project was locating the relevant reports at the various HA office locations.

ACTION: Neil Loudon

Attention moved to consideration of the next steps towards seeking DfT funding for the proposal ‘**NDT of Macalloy bars tying prestressed beams**’ and the seven 2008/09 proposals already put forward by BOF for DfT funding. In order of priority the eight proposals had previously been listed in the following order:

2007/8

- i. **NDT of Macalloy bars tying prestressed beams**
Proposer: University of Edinburgh
BOF spokesperson: Brian Bell

2008/9

- ii. **Review of road restraint systems**
Proposer: Transport for London/British Waterways
BOF spokesperson: Stephen Pottle
- iii. **Inspection of concealed metal connectors and bearing pins**
Proposer: British Waterways
BOF spokesperson: Rod Howe
- iv. **Surface preparation for metallic structures**
Proposer: Oxford Brookes University
BOF spokesperson: Brian Bell
- v. **Best practice for specifying long-life road surfacing for bridges**
Proposer: Scott Wilson Ltd
BOF spokesperson: Stephen Pottle

- vi. **Life-time considerations of FRP strengthening**
Proposer: University of Bath
BOF spokesperson: Graham Bessant
- vii. **Quantifying the reliability of non-intrusive inspection techniques for multi-strand bridge cables using probabilistic assessment**
Proposer: University of Surrey/ University of Edinburgh
BOF spokesperson: Peter Hill
- viii. **Monitoring of a novel flexible concrete arch bridge using fibre optic sensors**
Proposer: Queens University, Belfast
BOF spokesperson: Willie Kerr

Given the progress that had now been made with DfT procurement of the backlog of BOF research projects approved for DfT funding, the Technical Secretary was requested to determine whether the proposers still wish to undertake these projects, to update the proposals linking them to the emerging new 'Themes' and to consult BOF members on priorities with a view to submitting those of highest priority to the Bridges Board with a BOF recommendation they be funded by DfT in the current round.

ACTION: John Menzies

Paul Foskett agreed to send the Technical Secretary a proforma that will assist with the preparation of the Specifications.

ACTION: Paul Foskett

It was agreed that no call for research proposals would be made for 2009/10.

7. **PROJECT STEERING GROUP MEMBERSHIP UPDATE**

The tabled paper on Project Steering Groups was discussed. It was agreed that Albert Daly would be the Convenor of the Project Steering Group for project 'Bridge deck slabs with non-metallic reinforcement' and that Willie Kerr (DoRD(NI)) would be invited to join the Steering Group.

ACTION: Ronnie Wilson

Brian Bell agreed to be a member of the Project Steering Group for project 'NDT of Macalloy bars tying prestressed beams'.

8. **INTERNATIONAL BRIDGE FORUM (IBF)**

The discussion of this Agenda item which was taken after item 9, was as follows:

The Chairman, introducing the tabled papers, indicated that some of those in the list of invited delegates have already responded to the invitation to attend. Whilst BOF members indicated they were in favour of the IBF being held at Kings College in September 2009 as planned, a number of reservations were expressed concerning who should be invited and the format and aims of the meeting. It was suggested that the format should be structured around a number of themes and that there should be sections devoted to concrete bridges, masonry bridges, metallic bridges, large bridges and new materials. It was also suggested that the focus should be on 'Bridge management – what works and what does'nt' and that sessions should have UK chairmen.

BOF members agreed to send as soon as possible to the Technical Secretary (jbmenzies@live.com) their suggestions for themes and other matters, including suggestions for other persons who might be invited to attend.

ACTION: All BOF members

It was also agreed that, following the Chairman's initial work on the IBF, a small Organising Panel be formed to work out the meeting programme and other detailed arrangements. The membership of the Organising Panel was agreed as follows:

IBF Organising Panel

Stephen Pottle
Albert Daly
Brian Bell
Campbell Middleton
John Menzies

9. TECHNICAL PRESENTATION: EU PROJECT ON CONCRETE REPAIRS AND MAINTENANCE

The Chairman welcomed Graham Tilly to the meeting and invited him to make his presentation on the EU project [See BOF website]. The project, called CONREPNET, was 50% funded by the EU and was concerned with assessing the performance of repairs to concrete structures, the overall aim being to find ways to improve repair processes. He indicated that the work showed that the main contributory cause of failures of concrete repairs is the lack of management and supervision of the repair processes. He suggested that independent inspection and supervision of all concrete repair work is needed to gain an improvement in the performance of repaired concrete.

A lengthy discussion followed. It was suggested that a BOF guide on concrete repairs might be a way of encouraging better practice. It was also suggested that the project did not appear to show how much concrete repair practice has improved over recent years. Failure of concrete repairs is a multi-million pound problem and, although many studies have been done of concrete repairs, the information has not been pulled together in a way effective to improve repair processes. BOF members agreed to let the Chairman know their views on this subject and the available guidance on it for discussion at BOF28

ACTION: All BOF members

It was thought it would be useful to invite Stuart Matthews to make a presentation on this subject at a future BOF meeting.

ACTION: CHAIRMAN

The Chairman thanked Graham Tilly for his presentation and contributions to the discussion.

10. BRIDGE RESEARCH UPDATE

a. Highways Agency

No report was given.

b. Network Rail

Brian Bell tabled update information as follows:

Recent publications

: None

Publications expected soon

: CIRIA Tunnels guide

: CIRIA Dry stone wall guide

Recent finishes

: Bath University – Lime mortar project

: Edinburgh University – radar on arches – PhD awarded with minor corrections

Recent starts

: EUcoal and Steel Research fund – BriFaG

: Surrey University – Corrosion in elderly metallic bridges – PhD student now recruited

: Innovative Multi-Materials Jointing Integrity Engineering (IMAJINE) TSB funded, lead partners NPL and ESR Technology. NR and HA invited to join IAG

About to start

: Marie Curie Initial Training Network 2008 call – Smart Management for Sustainable Human Environment (Cyprus Technical University) – Funding confirmation received December 2008 – probable start Spring 2009

On going

: Bath University – Dry stone retaining walls

: Leeds University – FRP on metallic structures

: Surrey University – Risk-based inspections – final meeting February 2009, thesis in preparation

Participation in on-going work by others

: Technology Strategy Board – Lightweight low energy concrete for structural applications.

: Technology Strategy Board – Advanced Composite Truss Structures

: UWE – Fatigue behaviour and remaining service life of masonry arch bridges

: CIRIA – Culvert design and operation guide

: CIRIA – Whole life asset management – final review in progress

: CIRIA – Noise and vibration

: Highways Agency – FRP decking on prestressed concrete beams

: BOF project – Bridge inspection process and inspector competence – Final PSG meeting 28 January 2009

Under evaluation

: EU 7th Framework Programme – Effective bridges – initial evaluation challenged, new evaluation expected in March

: European Science Foundation Research Networking Programmes 2008 – Masonry arch bridges (University College, Dublin) – Accepted as eligible, undergoing evaluation, final decision expected June 2009 for start early 2010

New submissions

: None

Under discussion

: Surrey University – Risk-based inspections – TfL appear interested in a follow-on project

: CIRIA – Risk and value management

: CIRIA – update to guide for building in vicinity of mine workings

: Edinburgh University and Parsons Brinkerhoff – Footbridge dynamics

: European Commission-led market initiative

: Construction procurement (International Construction Client Forum)

Previously reported developments not proceeding

: Marie Curie Initial Training Network 2008 call – Disruption and Damage to Critical Transport and Power Infrastructure (Birmingham University)

: European Commission Security Call – Extreme events on critical infrastructure (Bath University)

Other activities

: Invited paper on use of FRPs in railway civil engineering accepted by ICE Journal Engineering and Computational Mechanics.

: With Neil Loudon invited to prepare a paper for Magazine of concrete Research on FRP strengthening of concrete structures – submission due 19 January 2009

: Invited keynote speaker at ACIC2009, Edinburgh.

c. London Underground Ltd (LUL)

Graham Bessant indicated that the engineering part of LUL is undergoing organizational changes which it may be possible to report to BOF28 in May.

d. Transport for London

The possibility of a study on risk-based inspection at Surrey University is under consideration. Brian Bell agreed to ask Surrey University if a summary of the recent PhD work in this area could be put onto the BOF website.

ACTION: Brian Bell

e. Other research

Graham Cole presented his tabled paper ‘CSS Research on the Assessment of Masonry Arch Bridges’. Some disappointment was expressed that the control of the work following the views expressed by Bill Harvey had been lost to BOF but it was indicated that the main aim of the County Surveyors Society had been to move the debate on. It was agreed that Graham Cole will arrange for the draft report to be distributed to interested BOF members for comment as follows:

Rod Howe
Brian Bell
John Clarke
Bill valentine
Ronnie Wilson
Albert Daly

ACTION: Graham Cole

It was reported that the National Roads Authority of Ireland has commissioned research work in bridge topics. These are:

- a) An assessment framework for masonry arch bridges (PhD project at UCD)
- b) Construction and operational impacts at river crossings on National Road schemes (PhD project at UCD)
- c) Probabilistic analysis of concrete bridges (PhD project at TCD, co-funded by IRSET)

[Secretary’s note: Profiles of these three projects were subsequently received on 28 January. They are available at <http://www.nra.ie/research>]

Richard McFarlane reported that LoBEG has an Asset Management Working Party which is undertaking a review of the long-term prioritization of maintenance work.

11. BOF TECHNICAL TOPICS

a. Clyde Bridge cable failure

Graeme Muir indicated that the bridge has been reopened and that legal action is being taken relating to the failure.

b. Minnesota bridge collapse

It was reported that the HA has commissioned work relating to this collapse. Discussion was deferred until BOF28.

c. Shear capacity of RC slabs

It was reported that the HA has commissioned work relating to this subject. Discussion was deferred until BOF28.

12. ANY OTHER BUSINESS

(1) A brief report was given on an evening meeting at IStructE entitled 'GE19 and the broader picture'. [See BOF27 minutes for BOF previous discussion on the GE19 partial bridge failure] Two interesting points arose in the IStructE discussion: (1) A designer mentioned that the positioning of the PTFE plate between the bridge member and the sloping surface of the pack was a conscious decision made in the design office. It was done to give maximum adjustment for positioning the bridge. A coefficient of friction had been assumed for the PTFE but the friction reduced significantly under load so allowing the resultant force to drive out the packs. At least one other person had experienced this phenomenon, and (2) A consultant said that they had done a risk assessment which showed that untied Omnia planks were a risk during the bridge slide.

(2) A recent road vehicle penetration into the railway boundary was referred to. A car driven at appreciable speed left the road and crashed through a boundary fence demolishing a brick switch room before coming to rest just short of the tracks. The incident occurred on the Jubilee Line at Bridge S13A. The boundary at this point had had a risk of penetration assessment carried out correctly by the local authority in accordance with HA rules. The location scored 62 which is a 'middling' sort of score indicating no particular risk. However a 'common sense' judgement would have indicated that this location is a potentially risky site. Several similar cases appear to exist.

(3) The tabled list of proposed invitees to speak at BOF meeting was discussed. It was agreed to add Garry Sterritt and Professor Clive Melbourne/Dr Matthew Gilbert to the list. The Chairman agreed to update the list and to invite them to BOF28.

ACTION: CHAIRMAN

Rod Howe referred to a certification scheme (ICAATS) for painting steel.

13. PROPOSED DATES FOR 2008/9 MEETINGS

BOF28	13 or 19 May 2009 – Chairman to advise	King's College
IBF/BOF29	14 -16 September 2009	King's College
BOF30	19January 2010	King's College

14. The Chairman thanked those present for their contributions and closed the meeting.

John Menzies,
Technical Secretary BOF