

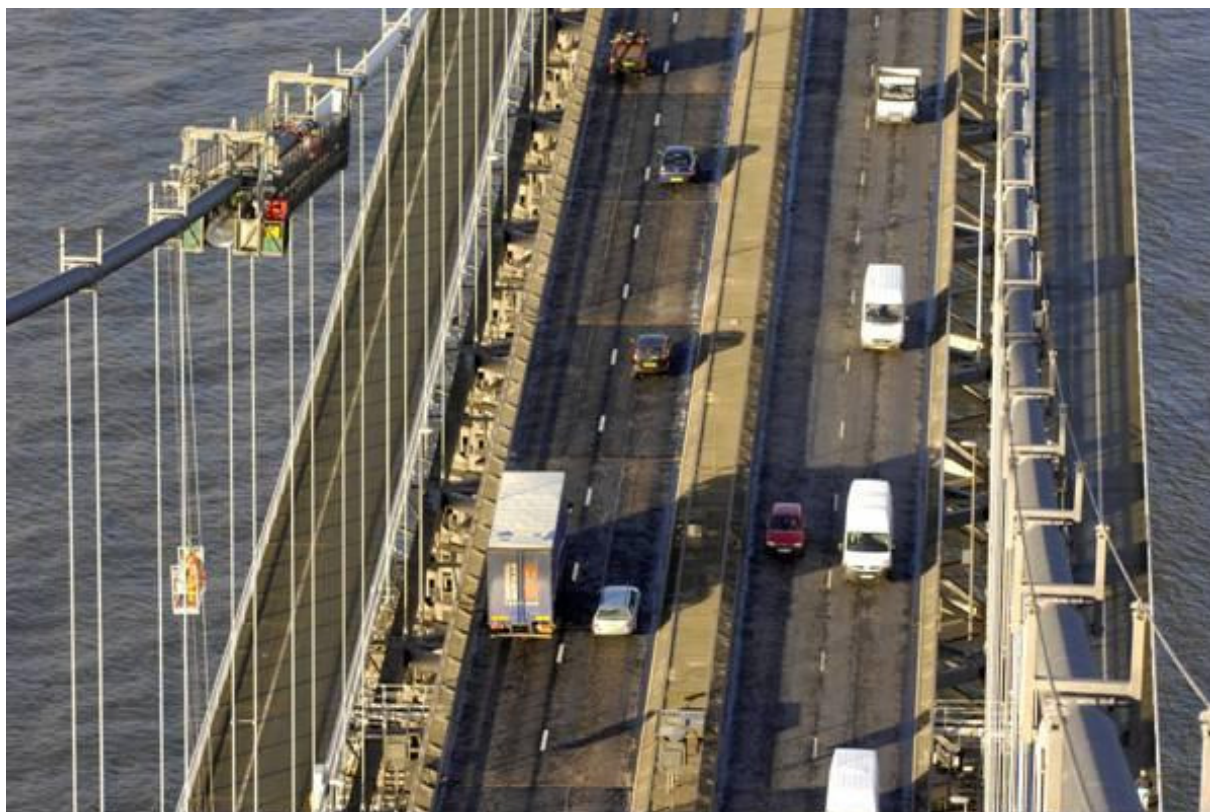


IABSE NEWS

Newsletter of the British Group of the
International Association for Bridge and Structural Engineering

No. 27

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Forth Road Bridge Main Cable Dehumidification

Images courtesy of Faber Maunsell

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IABSE British Group News

Editorial

Welcome to *IABSE News*, the British Group of IABSE.

Since the publication of the last newsletter there has been a change of speaker for the Annual Lecture, to be held on 27 November (see 'Events'). The lecture will now be given by Dr Allan Mann of Jacobs. The Executive Committee are particularly grateful to Allan for agreeing to present the lecture at what has been relatively short notice. He is a true expert in his field and we await his lecture with keen anticipation.

You will also note from 'Events' that from 2009 the annual calendar of the British Group has been turned upside down! That is to say that in future the Milne Medal Lecture will be given in November and the prestige IABSE Annual Lecture in May. Amongst several advantages offered by the new arrangements, the changes will mean that in future the award of the Milne Medal and the presentation of the medal-winner's lecture will take place in the same calendar year. There are also some advantages to administrative matters. The AGM and Annual Dinner will move to the spring starting in 2009.

The 2008 AGM will be held on 27 November and all members of the British Group will be very welcome to attend. However, like the proverbial London bus, the 2009 AGM will be along (relatively) shortly afterwards, with the exciting prospect of an Annual Lecture by John Armit to follow.

With best wishes,

Andrew Martin
Editor

New Members

A warm welcome to IABSE and to the British Group is extended to the following new members:

James Brownjohn James Eyre Ewan Jones Marvin Sabado

Cover Image – Forth Road Bridge – Main Cable Dehumidification

When opened in 1964, the Forth Road Bridge was the fourth longest span suspension bridge in the world with a main span of 1006m and equal side spans of 408m. It forms a vital link in the Scottish road network carrying 24 million vehicles a year across the Firth of Forth 15km west of Edinburgh.

The Forth Estuary Transport Authority (FETA), which is responsible for the inspection and maintenance functions, appointed Faber Maunsell in conjunction with Weidlinger Associates of New York to carry out an internal inspection of the main cables during 2004/5, which unexpectedly revealed corrosion and broken wires. Calculations suggested a strength loss of some 8 to 10% and future strength predictions suggested that traffic restrictions might be required as early as 2014 if the corrosion could not be halted. It was clear that even with careful maintenance the existing cable corrosion protection system was inadequate and better protection was urgently required. FETA considered that dehumidification was the best option for their cables and appointed Faber Maunsell in association with Nippon Steel Engineering of Japan in early 2006 to design a suitable system and carry out the consultancy work.

The objective of the system is to introduce dry air into the cables to remove moisture and to maintain a level of condition that will suppress further corrosion. The entire length of both cables is being wrapped and heat sealed to improve air tightness and prevent moisture ingress. All work affecting traffic has to be done using overnight or limited weekend carriageway or lane closures to minimise delays to bridge users, therefore sophisticated platforms have been developed that are able to move along the cable from panel to panel. These platforms provide a well contained and safe workplace. The dehumidification plant is designed to provide long term efficiency of operation leading to low energy usage, with remote web-based control and monitoring systems to record key data.



‘Certainty and Uncertainty in Structural Engineering’



The IABSE Annual Lecture for 2008 will be given on Thursday 27 November by **Dr Allan Mann**. The lecture will take place at the Institution of Structural Engineers HQ in London starting at 6.00pm.

Allan Mann is currently a Senior Consultant for Jacobs UK working on projects with a special technical content and frequently associated with steel, including stadia, long span structures, cable supported structures and large observation wheels.

He has lectured widely on a variety of technical subjects, published numerous papers, received a number of awards and participated in drafting many technical publications and codes of practice. His achievements have been recognised by election to the Royal Academy of Engineering. Allan is a member of the UK Standing Committee on Structural Safety and has a very close association with the IStructE.

Lecture Synopsis. Having confidence in our predictions of structural behaviour is vital. Yet we face challenges in dealing with extraordinary events, in building ever more complex structures and in assessing the adequacy of existing stock. Drawing on experience, Dr Mann will present both basics and anomalies which highlight when we can be confident in our predictions and conversely when we need to beware.

Events

<u>Date</u>	<u>Time</u>	<u>Event</u>
Thursday 27 November 2008	5.00pm	<u>Annual General Meeting</u>
	6.00pm	<u>IABSE Annual Lecture 2008</u> <i>Certainty and Uncertainty in Structural Engineering</i> Allan Mann (Jacobs)
	8.00pm	<u>Annual Dinner</u> †
Thursday 21 May 2009	5.00pm	<u>Annual General Meeting</u> *
	6.00pm	<u>IABSE Annual Lecture 2009</u> * John Armitt , Chairman, Olympic Delivery Authority
	8.00pm	<u>Annual Dinner</u> † *
Mon 6 – Weds 8 July 2009	Residential (fee payable)	<u>Henderson Colloquium</u> <i>Performance Based Approach</i> Magdalene College, Cambridge
18 – 23 September 2011		<u>IABSE Symposium</u> QE2 Conference Centre, London

† Pre-booking essential. Fee payable.

* From 2009 onwards, the AGM, Annual Lecture and Annual Dinner will take place in May

Unless noted otherwise, all events take place at the Institution of Structural Engineers, 11, Upper Belgrave Street, London. Tea is usually served before evening lectures and meetings from 5.30pm.



IABSE in London for 2011

Professor David Nethercot, Chairman of the IASBE British Group, writes:

Each year in September IABSE organises its major conference alongside meetings for its Executive, Administrative and Technical Committees, Working Commissions and Scientific Committees for upcoming international events in a different location. September 2008 was Chicago and before that in Weimer, Budapest, Lisbon, Shanghai, Lucerne, Melbourne. September 2011 will be London's turn.

Particular features include:

- Dates fixed as 18-23rd September;
- A joint event with IASS (International Association for Shell and Space and Spatial Structures);
- Capitalises on newly (or soon to be) completed Olympic facilities for technical visits;
- Gives delegates the opportunity to experience central London by holding the conference at the QE2 Centre in Westminster.

A core group has been working (some what intermittently) for over a year to investigate the feasibility of a London event of this type. This has confirmed the financial viability and established a preliminary budget, reserved the conference venue, identified suitable accommodation for the committee meetings, obtained support from IStructE, ICE and RAEng and has established centrally from both IABSE and IASS that London 2011 is now confirmed. Co-chairs for the scientific and organising committees have been identified as David Nethercot and Ian Firth respectively from IABSE and Sergio Pellegrino and Brian Smith respectively from IASS.

Of course, much remains to be done to ensure a successful event but with a timetable has already been established for all the important planning activities, placement of key people in key roles and identifying and reserving key venues. Thought has been given to content and we believe that we are well ahead with the arrangements. The combination of London as an attractive and easily reached location, the proximity of the Olympics, a joint event and careful planning do, we believe, provide confidence that IABSE 2011 will be a memorable experience.

As we move towards the date, further items detailing more specific developments will appear in this Newsletter. Since the conference is not restricted to IABSE members, we trust that readers will inform their colleagues and encourage them to plan to attend. The UK rarely stages major Structural Engineering Conferences; this is your chance to attend a truly international event without leaving these shores.

Henderson Colloquium 2009

Performance Based Design – Benefits and Challenges

Jeff Young and Gerard Canisius write:

The annual Henderson Colloquium provides a forum for a high standard of debate concerning the issues that are faced by structural engineers. The 2008 colloquium continued this tradition and has set a challenge for the 2009 colloquium to follow. The 2009 Henderson Colloquium will be held at Magdalene College, Cambridge, from the 6th to the 8th July and will explore the issues surrounding Performance Based Design. The following summary explains the proposition that will form the basis of the colloquium

Current design is largely governed by proscriptive standards that emanate from the collective views of editorial committees. The process has been highly successful in capturing advances in the understanding of structural and materials engineering. However, many of the major advances have themselves been forced on the industry through major technical omissions or deficiencies of the previous standards when applied, often unknowingly in circumstances where they were inappropriate. The reactive/iterative processes that have lead



to the present codes which are used to regulate design at the beginning of the 21st Century will be put under increasing pressure as the pace of change increases in response to demands to meet society's needs which are becoming more complex. The time now needed for the development of new or updated codes (e.g. Structural Eurocodes) is increasing as their scope and geographic area of application spreads.

Increasingly technical expertise resides outside the main organisations that are procuring structures. This demise of internal technical expertise and desire to manage risk has lead to some organisations to seek to procure an outcome (e.g. an operational life expectancy). Whilst the adoption of an output specification is often said to encourage innovation the absence of proscriptive standards for new materials or structural concepts will in many instances be regarded by suppliers as too high a risk and conventional current practice is adopted. A fresh look is required to see how we define and verify the requirements of our structural designs. This would need to address the more complex outcomes that we increasingly have to meet and which will become more pressing as natural resources become scarce requiring evermore efficient use of materials and the introduction of new materials.

Topics that are expected to be considered at the 2009 Henderson Colloquium are:

- Performance we demand from our historic infrastructure
- Understanding the performance we now require from our structures
- Performance embodied within the Structural Eurocodes
- Predicting the performance that future generations will demand of our structures
- How can clients convey the performance that they require?
- Performance specifications – an examination of current practice

Henderson Colloquium 2008

'Changes to Structures with Time'

*St Catherine's College, University of Cambridge, June 30th to 2nd July. Report by **Jonathan Wood***





Since 1975 the British Group of IABSE has held a two day colloquium in Cambridge every summer. The emphasis is on congenial confidential discussions, triggered by short papers on a chosen theme, following the tradition developed by Bob Milne.

For 2008 the theme was 'Changes to Structures with Time' and the colloquium was convened Dr Jonathan G. M. Wood of Structural Studies & Design Ltd.

The objective of this colloquium was to bring together those with experience of maintaining and adapting structures of all ages and types with those involved in the design of new structures where long term durability with low maintenance is a specific objective for achieving sustainability.

The presentations were as follows:

- **Tim Abbott** (Mott MacDonald) *'Newcastle High Level Bridge – Functioning Heritage'*
- **Neil Loudon** (Highways Agency) *'Learning from worldwide events - a Client perspective'*
- **Andrew Martin** (Arup) *'Changes to Bridges with Time: the Sustainability Perspective'*
- **Tony Oakhill** (Gifford) *'Steel Bridges: Their Life in Your Hands'*
- **Angus Palmer** (Buro Happold) *'London Transport Museum: Refurbishment of Grade II listed Market at Covent Garden'*
- **Andrew Lawrence** (Arup) *'Timber is our oldest building material, but can it match the durability of its modern counterparts?'*
- **Oliver Caroe** (PMT Architects) *'Bruce Castle, Tottenham: a journey towards sustainability for a Grade I listed museum'*
- **Deborah Lazarus** (Arup) *'St Pancras Chambers - A Future for the Past'*
- **Chris Bolton** (Sellafield Sites Ltd) *'Structures for nuclear waste management'*
- **Jonathan G M Wood** (Structural Studies) *'Changing the Environment for Structural Materials'*
- **Stuart Davies** (Mott MacDonald) *'Blackfriars Bridge - predicting performance for modern use'*
- **Eugen Brühwiler** (EPF Lausanne) *'Extending the lifespan of bridges of high cultural value'*
- **Marios Chryssanthopoulos** (Surrey University) *'Life Extension Options for Metallic Railway Bridges'*
- **Brian Bell** (Brian Bell Associates) *'Appraisal of Existing Structures'*
- **Jim Solomon** (Buro Happold) *'Battersea power station chimneys'*
- **Chris Page** (Birmingham University) *'Carbonation of concrete structures'*
- **John Forth** (Leeds University) *'Creeping and sagging: Changes in the shape of concrete with time'*
- **Jeff Young** (Mott MacDonald) *'Materials - if only we knew'*
- **Stuart Alexander** (WSP) *'Designing structures for second time around'*
- **Roger Davies** (Gifford) *'Fire hazard to heritage'*
- **Ian Liddell** (Ian Liddell Engineering Ltd) *'Tension and fabric structures'*
- **Steve Denton** (Parsons Brinkerhoff) *'The evolution of FRP composites'*
- **Chris Burgoyne** (Cambridge University) *'Durability of Glass, Carbon and Aramid'*

The final discussion covered:

- Lessons for aging structures
- Lessons for new designs and materials
- Research needs



- Wider dissemination of papers from the colloquium

The abstracts of all the papers will shortly be placed on the IStructE web site (<http://www.istructe.org>) with a summary of the final discussion. Full papers will be added as authors finalise them. Individual presentations are often developed into papers for IStructE, IABSE and ICE journals.

The Colloquium topics over the years are listed at <http://www.istructe.org/IABSE/DB/701.asp>. This has links to pdf files of contributions to the Colloquia in 2004 and 2006. Most of the papers to past Colloquia since the 1970s are held in the IStructE and/or ICE libraries.

The organisers of the colloquium are grateful to Andrew Jackson, a post-graduate PhD student at Cambridge University, who acted as reporter for the discussion sessions.



'Inside Henderson' – Colloquium participants listen attentively to one of the oral presentations

Structural Engineering International

The ongoing opportunity exists for all members to have articles published in *SEI*, the international journal of IABSE. Rules for publication are available through the IABSE website at www.iabse.org. David Doran is the UK Correspondent for *SEI* and can offer assistance to prospective authors (see Directory).

IABSE on the Internet

The website of the British Group can be accessed at www.iabse-uk.org, where proceedings of Henderson Colloquia and back editions of *IABSE News* are available in downloadable form. We are grateful to the Institution of Structural Engineers for their continued generosity in hosting the website.

The international website of IABSE at www.iabse.org contains comprehensive information on IABSE organisation, activities and publications.

The views and opinions expressed in *IABSE News* are those of the respective authors and not those of either the Executive Committee of the IABSE British Group or the Editor. Whereas effort has been made to ensure the accuracy of statements and acknowledgements, we reserve the right to be as wrong as everyone else.



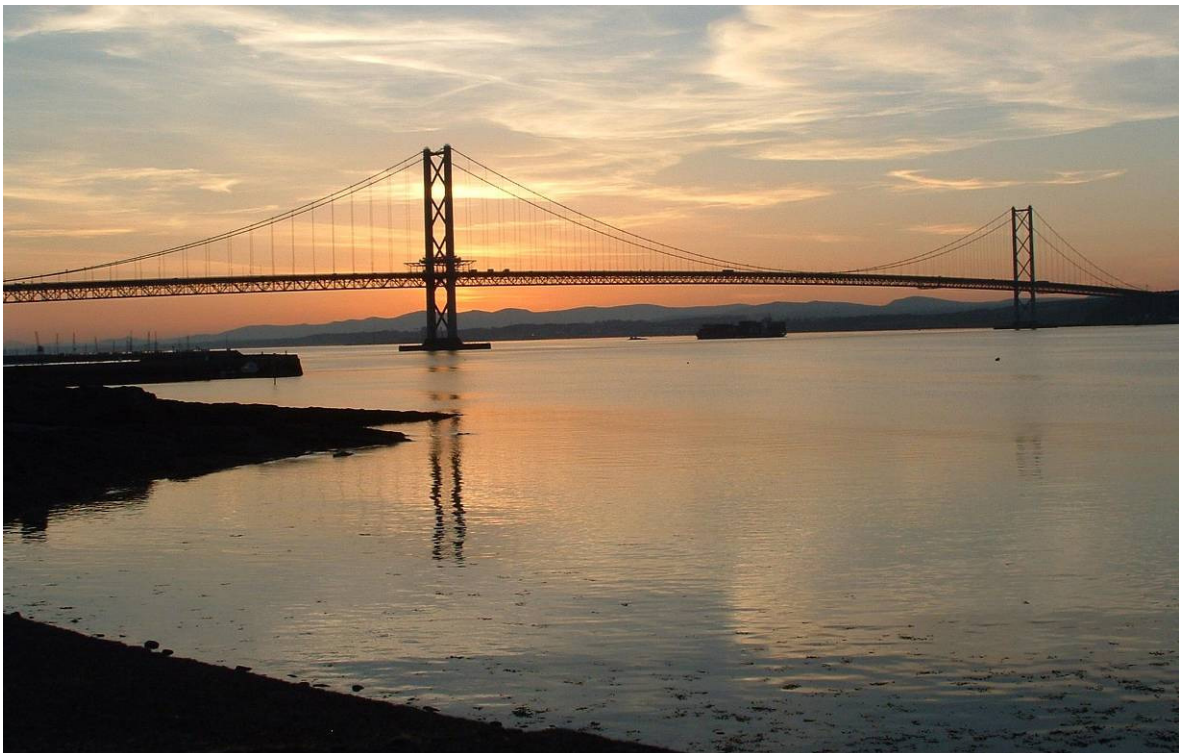
Obituary

Alec Sandberg OBE FREng

Dr Graham Tilly writes:

Alec Sandberg aged 85 died peacefully on 1 August 2008 after a long period of relatively poor health. He was the third generation of Sandberg to lead the family firm. He was a very astute businessman and steered the firm through some difficult times when many of his competitors failed. He took the firm into materials testing and assisted the then Department of Transport in dealing with problems in the construction of the new motorway network. When he proposed setting up independent testing laboratories to deal with problems on site, the Department jumped at it. The relationship lasted for 20 years until fee competition was introduced. In the 1970s, following the collapses of bridges at Milford Haven and abroad, he made a major contribution to the national programme of work on steel box girders. Notable bridges that he worked on included Severn, Wye, Erskine and Humber. On completion of the box girder work he moved on to contribute to the emerging problems caused by corrosion in reinforced and prestressed concrete. More recently he realised that railways had become an important sector and developed that side of the business.

Alec was a founder member of the British Group of IABSE and remained an active supporter until his poor health made this no longer possible. He was instrumental in adding value to the Henderson Colloquia by attracting contributions from influential people from outside the engineering community. He supported a series of Chairmen and rarely missed attending a meeting of the Executive. In recognition of this service he was appointed a Member of Honour of the British Group, joining Messrs A.W. Hill, D.W. Quinion, D.K. Doran and The Lord Hacking. Alec was given national recognition in 1998 when he received the OBE. Alec had a fantastic, clever and original sense of humour, which he exercised annually in Sandberg's Christmas Cards. These have since become collectors items. On a visit of the French Civils group to Normandy he disguised himself as a Breton Onion seller. When the firm celebrated its centenary it was entirely in keeping that he should draw attention to the Battersea Dog's Home having been established in the same year. He was an enthusiastic bridge player and his partners included Oleg Kerensky and William Henderson. Alec Sandberg retired in 2000 and his youngest son Neil followed him as head of the firm.



Forth Road Bridge at sunset

Image courtesy of Faber Maunsell



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Dr P. Chana	British Cement Association
Mr C.R. Cockerton	Consultant
Mr G. Hayter	Highways Agency
Mr W.I. Liddell CBE FREng	Consultant
Mr A.M. Low	Arup
Mr A.J. Martin	Arup
Mr S.J. Matthews	WSP Civils Ltd
Mr J. Moriarty	London Underground Ltd.
Mr N. Ricketts	Network Rail
Mr P.J. Williams	Institution of Structural Engineers
Mr S. Withycombe	Halcrow
Dr J.G.M. Wood	Structural Studies & Design Ltd
Mr J. Young	Mott MacDonald

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The Lord Hacking	Mr A.W. Hill

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