



IABSE NEWS

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International Association for Bridge and Structural Engineering

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Industrial Ring Road Bridges, Bangkok, Thailand

Image courtesy Mott MacDonald

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IABSE British Group News

Editorial

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

With the e-mail distribution of this edition are details of an exciting venture organised by Ian Firth (vice-chairman) – a Study Tour to Switzerland in November 2008 to visit some of the famous bridges by Robert Maillart, together with more recent masterpieces by Christian Menn and Jurg Conzett. The trip will be self funding and I would urge you to consider taking part in this great opportunity to see some of the most well-known bridges of the modern era.

Those of us who are designers continually build up our knowledge bank of ideas, in part through critical appreciation of the work of others. What better opportunity could there be than to see these famous structures in person, to appreciate their design and construction at first hand and to draw inspiration from them for our own work.

With best wishes,

Andrew Martin
Editor

New Members

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

Cezary Bednarski	Jing Cao
Graham Dodd	Edkian Eshett
Ziemont Lukawski	Edward Maunder
Anamaria Ruiz	

and to new collective member:

Atelier One

Cover Image - Industrial Ring Road Bridges, Bangkok, Thailand

Mott MacDonald was the joint consultant for the feasibility study, preliminary design and detailed design of the road crossing of Bangkok's Chao Phraya River, which connects the industrial area south of Bangkok with the Port. The location is 3km downstream from the existing Rama IX Bridge where a looping meander of the river leaves a neck of land 600m wide. The feasibility study evaluated bridge, together with bored and submerged tube tunnel options, along various alignments. The study recommended the construction of the bridge option with some 5km of elevated structure being required. The project comprises two cable stayed bridges, with main spans of 398m and 326m, connected by a high level viaduct carry dual three lane carriageways with an additional climbing lane for heavy goods vehicles on the approaches.

The concrete pylons are of diamond configuration. Two planes of stay cables support the outer edges of the main span decks which are designed in steel composite construction. The pre-stressed concrete back spans are supported from the ground and provide the necessary reaction to the stay forces under the most unfavourable live load combination. Between the two bridges an elevated central interchange connects the main North-South route with the western approach. The three elevated approaches to the main bridges are designed as continuous concrete box girders with spans varying between 64m for the high level viaducts to 36m for the lower level viaducts. Construction started in March 2003 and all three contracts were completed in September 2006. The project was opened to traffic on 20 September 2006.



IABSE British Group News

Events

<u>Date</u>	<u>Time</u>	<u>Event</u>
Thurs 7 – Sun 9 November 2008	Residential (fee payable)	<u>British Group Study Tour to Switzerland</u> (see article for details and application form)
Thursday 27 November 2008	5.00pm	<u>Annual General Meeting</u>
	6.00pm	<u>IABSE Annual Lecture 2008</u> Challenging Structures Henry Bardsley, RFR (Paris)
	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> Performance Based Approach Magdalene College, Cambridge
September 2011		<u>IABSE Symposium, LONDON</u>

† 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.

Henderson Colloquium 2008

The annual Henderson Colloquium took place at St Catharine's College, Cambridge, from 30 June to 2 July on the theme 'Changes to Structures with Time'. Twenty three participants from a variety of backgrounds presented papers and enjoyed the ensuing discussions, both formal and informal. A report on the Colloquium will be included in the next issue of *IABSE News* and the papers made available through the British Group website.

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).

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.



Milne Medal 2007

Angus Low

Report by *Andrew Martin*

The Milne Medal for 2007 has been awarded to **Angus Low** of Arup. The medal was presented by Professor David Nethercot on 29 November.

The award of the Milne Medal recognises excellence in an individual engineer and was made to Mr Low in particular recognition of his contribution to the design of three bridges:

- Arstaviken Viaduct, Stockholm, Sweden;
- Nesciobrug, Amsterdam, Netherlands;
- Drachten Wheel, Drachten, Netherlands.

On 13 March 2008, as part of the Milne Medal award, he described these structures in his Milne Medal Lecture together with aspects of his approach and philosophy of design in the Milne Medal Lecture (reported in *The Structural Engineer* of 1 April 2008, p12).

Since joining Arup as a graduate engineer, Angus Low has specialised in bridge engineering and has gained over 30 years of broad-based experience. This extends from the development of fundamental theory, through research and lecturing, to all aspects of design and analysis, with an equal fluency in the use of either steel or concrete, and a particular interest in the interaction of bridge structures with the ground.

In addition to the three bridges noted in the citation for the Milne Medal, Angus Low has had major roles in the design of the Medway Viaduct (CTRL-HS1), Oresund Bridge (Denmark-Sweden), Pero's Bridge (Bristol, UK), A14 Viaduct (Nanterre, France), Chelsea Reach Lifting Bridge (London, UK), Chepstow Viaduct (England-Wales) and Runnymede Bridge (England).

As a designer he has used his basic thinking to develop fresh ideas which have contributed to winning designs both in the spotlight of design competitions and also in the commercial world of minimum costs. Currently he works on concepts for competitions and proposals, and leads the bridge skills activity globally throughout Arup.



Angus Low receiving the Milne Medal from Professor David Nethercot



Nesciobrug Foot & Cycle Bridge, Amsterdam, Netherlands

Angus led the engineering concept and detailed design of this monocabable suspension pedestrian and cycle bridge, curved in plan, with a steel box girder main span of 170m over a canal. Opened in 2006.



Arstaviken Viaduct, Stockholm, Sweden



Competition winning design for a new 810m long railway bridge over the Arsta Straits in central Stockholm. The viaduct is a dramatic visual statement with its 3D curved prestressed concrete shell in red concrete rising above the track level which contains much of the rail noise which is a key issue at this site and it naturally provides a 4m wide raised deck to act as the required cycleway. Opened in 2005.

Drachten Wheel, Drachten, Netherlands

A landmark combined cycle and pedestrian bridge with 2 x 17.75m spans crossing a major road. Completed in 2006.





Annual Lecture 2007

‘Concept into Reality – the Art of Heavy Lifting’

Report by *David Doran*

The 2007 Annual Lecture of the IABSE British Group took place on 29 November and was given by Mike Wade of Dorman Long Technology Ltd under the title ‘*Concept into Reality – the Art of Heavy Lifting*’.

Mike Wade addressed and enthralled a packed house at the Institution of Structural Engineers with a superbly illustrated talk on current practice in dealing with the lifting of heavy construction loads. After introductory remarks, the lecture discussed how proposals for erection by heavy lifting were translated from ‘concept into reality’, how operations on site were planned and executed.

The range of proprietary heavy lifting equipment available was reviewed including cranes, strand jacks, climbing jacks and self-propelled mobile trailers (SPMTs). He explained in some detail the *modus operandi* of jacking systems and illustrated

the ease with which very heavy loads could be transported by SPMTs. Heavy lifting equipment had been developed and refined to meet the needs of modern sophisticated structures and was now encouraging designers to be even more adventurous.

Mike emphasised not only the speed of erection to meet fast track programmes that heavy lifting can offer but also the finger-tip control achievable over all operations. A great deal of care is taken to ensure safe working practices and thorough training and management of personnel was an essential prerequisite to successful operations. Typical pre-operation checks included provision of appropriate staff, the definition of roles and responsibilities, assessment of ground conditions, installation of temporary works, selection and testing of equipment, third party approvals (client, statutory authorities, etc), site lighting, security and communications.

During operations, monitoring of load, lift distance, structural deflections, weather conditions and unplanned incidents were important. In spite of close control, Mike admitted that some ‘fettling’ was sometimes necessary to match up meeting parts of structures before final bolting or welding could take place. His talk was illustrated by nearly 200 slides of recent work that included the Wembley Arch, Heathrow Airport Control Tower, Paddington Bridge, The Maari Well Head Jacket, Large Vessel installation for China Steel and numerous other, equally demanding projects.

Questions from the floor covered the desire for exposure of practice on television, overstress of structure during lifting, overcoming initial inertia in lifting, deterioration of equipment during a lift, differing statutory requirements in foreign countries, fettling to achieve good fit, the ultimate limit of lifting capacity, daylight or night-time lifting and short possession times.

In his Vote of Thanks, Ian Firth, Deputy Chairman of the British Group, reminded the audience that he and Mike had begun their careers together and suggested that the spectacular work in the area of heavy lifting should be used as a show-case to encourage young people into the construction industry.



Mike Wade (right) with Professor David Nethercot

IABSE British Group Website

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.



Report

Young Researchers' Conference, 2008

Ada Law, a Research Student at Imperial College, London, writes:

On 19 March 2008, the 10th Young Researchers' Conference was heralded by the Past President, Professor David Nethercot at the International Headquarters of the Institution of Structural Engineers in London. Since 1998, it has been a successful annual conference for young researchers and many former winners have already become professional high flyers, recalled by the Chairman of the conference. As usual the event was divided into oral and poster presentations. This year more than 40 young researchers participated in the event. Nine shortlisted candidates were invited for oral presentation while there were twelve posters displayed.

The keynote speech was given by Dr. Sarah Williamson, who shared her experience of being a PhD student 10 years ago with the young researchers. She described the 'real' research process as a cycle comprising of three main elements; inspiration, desperation and elation and she encouraged the young researchers that although research life was difficult and lonely, the reward was invaluable. Concluding, she brought out the message that research is for all the problem solvers and thinkers from both academia and industry, who could question results and face the unknowns competently and that was 'to strive, to seek, to find, and not to yield', quoted from the poem of Tennyson 'Ulysses'.

The judges for the oral presentations this year were Mike Banfi from Arup Research & Development, Dr Bassam Burgan from the Steel Construction Institute, Professor Steve Denton from Parsons Brinckerhoff, and Dr Dennis Lam from Leeds University. The poster judges included Dr Toby Mottram from University of Warwick, Dr Leroy Gardner from Imperial College London, Costas Georgopoulos from Concrete Centre, Dr Paul Howson from Cardiff University, Jo' Kenward from Hyder Consulting and Dr Mauro Overend from the University of Nottingham.

At the award presentation, Dr. Toby Mottram, Chairman of the poster judges, said that the judges were impressed by the high quality and the wide range of topics covered. He suggested that more figures could improve the overall presentation, provided that they were labelled sufficiently and equations should be avoided if the presenters could not define and fully understand the terms involved. The selection process was difficult and complex as views from judges varied. Mike Banfi, Chairman of the IStructE Research panel and of the oral judges, also commented that graphics was the best tool for presentation as a picture could tell thousands of words.

In the oral category, the first prize was awarded to Chris Mundell from University of Bath with the value of £350 plus Institution plaque on his topic 'Large-scale testing of drystone retaining structures'. The joint second prize with the value of £200 was given to Ka Ho Nip from Imperial College London on his topic 'Response of steel bracing members under cyclic axial loading' and Yuan Yuan Song from Sheffield University on her topic 'Dynamic analysis of industrial steel frames in fire'. In the poster section, Ying Hu from Sheffield University was awarded the first prize with the value of £350 plus Institution plaque on his topic 'Numerical and experimental study on robustness of simple steel connections (flexible and plates) in fire'. The runner up was Jeanette Abela from Imperial College London and she was awarded the prize with the value of £250. Her topic was 'Upheaval buckling behaviour of blinding struts'. The third prize was given to Babatunde Faleye from University of Glamorgan with the value of £150 on his topic 'The strengthening and rehabilitation of metallic structural elements with FRP composites'.

In closing, Professor Nethercot encouraged the young researchers to keep up their work as the event could not be successful without their involvement and most importantly that they are the future of the world.

This conference not only gave a chance for delegates to express their views, but also provided a valuable networking opportunity. As the event was intended to cover the whole spectrum of structural engineering applications, including conventional structures, bridges, foundations, offshore, harbour and coastal structures, with a wide range of materials and different loading conditions, both presenting or non-presenting delegates were able to meet their peers to discuss the interesting topics being presented and exchange ideas on the problems being encountered in their own research. As one of the delegates, I was deeply impressed by the enthusiasm and tenacity of the young researchers. Although inevitably the path ahead may not be an easy one, we all look forward to the coming challenges!



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