



WIND  
ENGINEERING  
SOCIETY

# Newsletter

## ❖ Ramblings

As you would have guessed by now we have had difficulties in producing a newsletter. Craig Miller kindly undertook to produce the newsletter at the end of last year and produced our last newsletter Vol.4 December 2001. However, Craig has been very busy with demands of work and now his move to Canada has meant that he has been unable to produce any more newsletters.

I have agreed to stand in for a short until we resolve the difficulties. This, somewhat shorter newsletter is to keep you up to date with developments. It is also to take the opportunity to advertise that we need an Editor for the newsletter and to add that the WES Committee accepts that we need to make some payment towards the costs of putting the newsletter together. You will find an advertisement for the Editor on page 4 and I hope a number of you will feel inclined to apply **without additional pressure being applied**. We all recognise the importance of the newsletter in keeping the membership informed of what is happening and in giving us all a broader outlook on our common interest in Wind Engineering.

There is not a separate Chairman's column in this newsletter so in this editorial I would like to express my thanks to all those who have helped with the organising and contributing to the WES Conference held in Nottingham from 4<sup>th</sup> - 6<sup>th</sup> September. A full report on the conference will be included in the next newsletter, so please send in any individual views on the conference for the next newsletter.

## ❖ Snippets

- Last winter saw a number of particularly intense windstorms that affected Northern England and Scotland. Of particular note were the reports of vehicles being blown over resulting in deaths and injuries. As Wind Engineers is there nothing we can do to mitigate this? A report on the severe weather appears on page 3.
- Science for a sustainable future 2002-2007. The Natural Environment Research Council (NERC) has set out strategic and scientific priorities for the UK Environmental Sciences. There are several opportunities for Wind Engineers to contribute to "delivering world class environmental science" including mitigating the impacts of climate change and providing sustainable solutions to the challenges associated with energy, land use and hazard mitigation. You will find more information on the NERC website, [www.nerc.ac.uk](http://www.nerc.ac.uk).
- CP3 has gone, long live 6399! A sentiment that has not struck a chord with some structural engineers as you will know if the columns of 'The Structural Engineer'\* are your bedtime reading. A recent contribution from Rollo Reid, Technical Director of John Reid & Sons, begins 'Professor Cook has ticked me off ...!'. Don't take it personally Rollo, we have all been there. I've been told Nick is mellowing - I hope not!  
*\*The Structural Engineer is the journal of The Institution of Structural Engineers online at [www.thestructuralengineer.org.uk](http://www.thestructuralengineer.org.uk)*

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## ❖ Committee Report

*This is a regular feature that will keep members up to date with the work of the Executive Committee. If you have strong views on these or any related subjects that the Committee should address please let them know.*

This year, the Committee has met at ICE on 6<sup>th</sup> February and 8<sup>th</sup> May and at Nottingham on 4<sup>th</sup> September. It will meet again on the 6<sup>th</sup> November.

Gordon Breeze has replaced Eric Savory on the Committee. Eric took up an appointment at the University of Western Ontario, Canada, at the beginning of this year. We will shortly be looking to replace Craig Miller who is also going to UWO.

The Committee approved the Strategy Document prepared by a small working group led by Paul Freathy. The document was presented at the AGM in May and copies are available.

There has been frequent contact with ICE relating to the organisation of affiliated learned societies, with pressure on societies to contribute more to the running costs incurred by ICE. The dialog continues: we recognise the valuable service we receive from ICE, in particular the support we receive from Eunice Waddell.

Other routine business has been conducted and an ongoing programme of Society meetings organised.

## ❖ Meeting Report:

### **Technical Meeting: Aerodynamic Stability of Bridges Wednesday 6<sup>th</sup> February 2002**

It was gratifying to welcome over 80 participants to this afternoon meeting at the Institution. The subject of aerodynamic stability of bridges clearly interested both the researchers and the practising engineers as both were well represented to hear the four presentations.

It was in March 1981 that the British Design Rules for the Aerodynamic Stability of Bridges were presented for the first time at a seminar at the Institution of Civil Engineers. The Rules were subsequently produced as a Highways Agency Standard, issued as BD 49/93. Since then, further desk study research and wind tunnel testing - particularly on plate girder bridge models - have been undertaken and the Rules have been revised and recently published by the Highways Agency as BD 49/01.

Mr Ron Ko, a senior technical advisor on loading at the Highways Agency, introduced the topic explaining the role of the Agency as a Network Operator responsible for the stock of bridges, their management, maintenance and safety. Regarding the design criteria, the Agency have a direct involvement in the wind standards including their own 'BD' documents as well as British and European Codes. The agency saw the two principal objectives of BD 49 as firstly to identify if there is an aerodynamic problem and secondly to try to avoid the expense of undertaking wind tunnel testing.

David MacKenzie, a Partner at Flint & Neill Partnership, presented the amended Rules, outlining the background to the issue of the aerodynamic response of bridges from the failures of Menai Straits bridge and Brighton Chain Pier to Tacoma narrows. He explained that the underlying philosophy of the Rules was to provide criteria dependent on the geometric, structural and dynamic properties of the bridge decks which determine whether the Rules are applicable. If they are, simple rules to assess aerodynamic effects are provided; if not then wind tunnel testing or further studies are recommended.

The revised Rules are based on a parametric series of wind tunnel tests on both box girder and plate girder bridge models, augmented by studies into bridge response and feedback from users of the Rules since they were first published. The original test for the applicability of the Rules was based arbitrarily on span lengths; this has been replaced by criteria incorporating geometric, structural and dynamic properties. It has long been recognised that aerodynamic behaviour is very sensitive to leading edge details and one of the greatest difficulties was to provide guidance on the multitude of edge beams, parapets and safety fence configurations likely to be used.

The Rules cover aspects such as vortex excitation - providing empirical formulae to predict amplitudes, turbulent gust effects - where vertical motion is critical and divergent amplitude response - where the Rules provide limiting critical wind speeds.

Dr Tom Wyatt, visiting Professor at Imperial College, outlined the background to much of the new material in the Rules. He expressed concern that the initial screening parameter that sets the applicability of the Rules for the onset of divergent amplitude response had been derived for exposed locations uppermost in mind. As this parameter included the square of the wind speed it might give a too favourable view for sensitive structural forms at inland sites, particularly when these were constructed at low level - a very



unlikely situation and he accepted that the Rules are acceptable for run-of-the mill bridges. He outlined the treatment of wind inclination pointing out that the BD is less onerous than theory would predict. He expressed some caution on the behaviour of long viaducts on slender columns where horizontal response could become a critical design issue.

The fourth presenter, Dr Albert Daly a Project Manager in the Infrastructure Division of TRL outlined the 'flow chart' procedure of the Rules and showed the results of using the document on both actual and hypothetical bridge sections. He showed some of the practical difficulties associated with the geometric constraints which could preclude certain sections from being considered.

All speakers pointed out that the Rules had been derived for highway bridges and the configuration of footbridges with proportionally higher edge details frequently resulted in their being excluded from the guidance given in the Rules.

A lively discussion period followed covering questions on the accuracy needed in wind tunnel models to the likely problems that can occur during erection. The problems associated with footbridges were echoed by several contributors, and possible remedial work in the form of fairings was suggested. The meeting closed at about 5.30pm.

Brian Smith

## ❖ Severe Weather in the UK

### Summary of Events 28<sup>th</sup> January - 4<sup>th</sup> February

Severe weather hit the UK on Monday 28<sup>th</sup> January 2002. Windstorm Jennifer caused damage from Northern Ireland to Sweden during Monday 28<sup>th</sup> and Tuesday 29<sup>th</sup> January. Bremen and Hamburg suffered the worst damage in Germany. Most damage in the UK was focused on southern Scotland, north-eastern England and northern parts of Northern Ireland, with gusts of up to 85 mph being reported in coastal regions. There were some reports of roof and masonry damage with the most intense damage being experienced between Dundee, Glasgow, Edinburgh and Durham. Power cuts were experienced by 90,000 in Scotland, 20,000 in Newcastle-upon-Tyne and 7000 in Northern Ireland. In addition, transport routes were significantly disrupted.

On Friday 1<sup>st</sup> February more than 60 flood warnings were in place across the country. By 2<sup>nd</sup> February, there were 3 severe flood warnings in Scotland and more than 70 flood warnings on rivers from the Tay in north-east Scotland to south-west England. Between

1<sup>st</sup> February and 3<sup>rd</sup> February, there was once again widespread disruption to power lines, road, railways and ferry services across the country and some reports of flooding in specific locations.

A total of 12 lives were claimed between the 28<sup>th</sup> January and 4<sup>th</sup> February 2002 and rescue forces coped with numerous cases of capsized lorries, fallen trees, ships in need of salvage operations and injuries from violent gusts of up to 85 mph. There have been limited reports of property damage to date, and the general consensus is that the overall damage is likely to be less than that recorded for Autumn 2000.

Further storms swept in from the Atlantic bringing further heavy rain. Severe flood warnings remained in place on the 3<sup>rd</sup> February for:

- the River Wye at Monmouth
- the River Wye from Hereford to Ross-on-Wye
- the River Wye at Lydbrook
- the River Monnow in the Watery Lane area of Over Monnow

A further 32 flood warnings remained in force on Sunday 3<sup>rd</sup> February. The Environment Agency claimed that river levels on the Wye approached that of Autumn 2000 and there was flooding to the main A40 at Monmouth, a caravan park and around 15 properties in the Monmouth and Lydbrook area.

### Flooding in Northern Ireland

Severe flooding to homes and roads caused havoc in parts of County Down. Some streets in Ballyhalbert, Newry and Portaferry were reported to be under water on the 1<sup>st</sup> February 2002. A seawall in Newcastle was washed away. Storm damage was caused by a combination of high tides and strong southerly winds with gusts of up to 70mph. A total of 3,300 homes had electricity supply disrupted.

### Flooding in Wales

On Friday 1<sup>st</sup> February there was severe flooding in the Cardigan Bay area of Wales. The river Towy in Camarthen burst its banks and a landslide disrupted rail services between Camarthen and Llanelli.

The town of Crickhowell in central Wales was cut off on Saturday 2<sup>nd</sup> February as rising waters from the River Usk flooded access road and some premises were under two feet of water. The situation at Crickhowell eased but the river levels remained high and the area remained vulnerable.



Several people had to be evacuated from their homes following landslips in South Wales. Other areas of concern on 3<sup>rd</sup> February were the Lower Dee Valley, North Wales, between Llangollen and Chester, and several parts of the River Teifi in Ceredigion, West Wales. Twenty families were evacuated from mobile homes in Monmouth as the River Wye rose threateningly.

There were severe flood warnings in place for south-east Wales and the border England/Wales areas around Ross-on-Wye and Ludlow.

## **Flooding in England**

Some homes in Burrow-on-Furness, Cumbria were inundated with at least two feet of water on Friday 1<sup>st</sup> February..

The River Severn flooded out of its banks among many rural stretches but without extensive flooding to property. A car park flooded at Frankwell in Shrewsbury and some roads were flooded near the river in Worcester. South of Worcester, at Kempsey, the Environment Agency warned that some properties may be flooded.

Rural flooding occurred along the River Teme in Shropshire where the river has exceeded the level of Autumn 2002 but fear of flooding in Tenbury receded.

Some flooding was experienced along parts of the River Soar and River Trent with the impact being mainly on low-lying fields and isolated properties.

CAT – i,  
Catastrophe Information, Guy Carpenter & Company

## **❖ UK WEB SITE**

To make it easier to contact the Wind Engineering Society we now have a domain name of ukwes.org so you can get to our web site through [www.ukwes.org](http://www.ukwes.org) or you can email the society by putting a name in front of @ukwes.org. At the present time all emails will come to Roger Hoxey to be forwarded or dealt with.

## **❖ IAWE News**

The 11<sup>th</sup> International Conference on Wind Engineering will be held in Lubbock, Texas from 2<sup>nd</sup>

– 5<sup>th</sup> June 2003. Planning is well in hand and the deadline for receipt of abstracts is the end of October 2002. An advantage of holding the conference in Lubbock is that there are few distractions and delegates will be able to concentrate on wind engineering!!! This is the main event of the International Association of Wind Engineers and is held once every four years. The 10<sup>th</sup> ICWE was held in Copenhagen in 1999 where there were many distractions.

Details of the 11<sup>th</sup> ICWE can be found on the Texas Tech website [www.icwe.ttu.edu](http://www.icwe.ttu.edu).

## **(Editors personal comments)**

### **❖ Editor Required**

The Wind Engineering Society requires an Editor for the newsletter. We would like to produce four editions per year to appear two weeks before Society meetings.

Each edition is expected to be of 6 to 10 sides of A4 with most of the material provided by WES members who often require editorial pressure to obtain timely contributions.

The Editor is required to prepare the document and submit it as an MS Word file for production.

The Executive Committee has agreed that a fee will be paid to cover preparation costs. In replying to this request please indicate the fee required for each edition.

The Committee will consider replies at their meeting on the 5<sup>th</sup> February 2003.

### **❖ AGD Symposium**

This event took place from June 19 to 22 and was in recognition of the contribution made by Alan Davenport. The Symposium was very successful attracting contributors from around the world including many past students of Alan's. Personal reflections of the Symposium will be included in the next newsletter.

### **❖ Some recent papers by WES members**

Listed here are just some of the papers with an author who is a member of the Wind Engineering Society published in the last 2 years. More to follow in the next newsletter, including papers in Wind and



Structures. If you have written a paper that is not included, please send me a copy. I intend to include a few abstracts in the future when the list is shorter.

M.P. Straw, C.J. Baker, A.P. Robertson  
Experimental measurements and computations of the wind-induced ventilation of a cubic Structure. JWEIA 88: 2000. 213 – 230

A.E. Holdø, R.K. Calay, M. O'Brien  
Flows generated by the interaction of an inlet and a cross-flow. JWEIA 88: 2000, 1 – 23

R.I. Harris  
Control curves for extreme value methods. JWEIA 88: 2000, 119 – 131

Nicholas J. Cook, Wayne Pearce  
An extensible open encapsulated protocol for quality-assured wind engineering time-series. JWEIA 87: 2000, 113 -- 130

P.J. Richards, R.P. Hoxey, J.L. Short  
Spectral models for the neutral atmospheric surface layer. JWEIA 87: 2000, 167 -- 185

S.J. Cox, D.W. Salt, B.E. Lee, M.G. Ford  
A model for the capture of aerially sprayed pesticide by barley. JWEIA 87: 2000, 217 -- 230

Paulo J. Oliveira, Bassam A. Younis  
On the prediction of turbulent flows around full-scale buildings. JWEIA 87:2000, 203 -- 220

R.H. Barnard  
Predicting dynamic wind loading on cantilevered canopy roof structures. JWEIA 85: 2000, 47 -- 57

R.I. Harris  
The accuracy of design values predicted from extreme value analysis. JWEIA 89: 2001, 153 -- 164

C.J. Baker, D.M. Hargreaves  
Wind tunnel evaluation of a vehicle pollution dispersion model. JWEIA 89: 2001, 187 -- 200

Nicholas J. Cook, R. Ian Harris  
Discussion on Application of the generalized Pareto distribution to extreme value analysis in wind engineering by J.D. Holmes, W.W. Moriarty. JWEIA 89: 2001, 215 -- 224

J.D. Holmes, W.W. Moriarty  
Response to discussion by N.J. Cook and R.I. Harris. . JWEIA 89: 2001, 225 -- 227

Castro, I.P.  
Weakly stratified laminar flow past normal flat plates, JFM 454, 2002, 21 – 46

Hunt, J.C.R., Sandham, N.D., Vassilicos, J.C., Launder, B.E., Monkewitz, P.A. & Hewitt, G.F.  
Developments in turbulence research: a review based on the 1999 programme of the Isaac Newton Institute, Cambridge, JFM 436 , 2001, 353 - 391

Davila, J. & Hunt, J.C.R.  
Settling of small particles near vortices and in turbulence, JFM 440 , 2001, 117 – 145

Reynolds, A.M.  
On the Application of a Lagrangian Particle-Puff Model to Elevated Sources in Surface Layers with Neutral Stability. Journal of Applied Meteorology 39, 2000

G.C. Chapin, J.R. Randall, C.J. Baker  
The turbulent ventilation of a single opening enclosure. JWEIA 85 (2000) 145-161

A.D. Quinn, C.J. Barker, N.G. Wright  
Wind and vehicle induced forces on flat plates – Part 1: wind induced force. JWEIA 89 (2001) 817-829

A.D. Quinn, C.J. Barker, N.G. Wright  
Wind and vehicle induced forces on flat plates – Part 2: vehicle induced force. JWEIA 89 (2001) 831-847

P.M. Berry, J.M. Griffin, R. Sylvester-Bradley, R.K. Scott, J.H. Spink, C.J. Baker, R.W. Clare  
Controlling plant form through husbandry to minimise lodging in wheat. Field Crops Research 67 (2000) 59-81

A.H. England, C.J. Baker, S.E.T Saunderson  
A dynamic analysis of windthrow of trees. Forestry Vol. 73, No. 3, 2000

C.J. Baker, D.M. Hargreaves  
Wind tunnel evaluation of a vehicle pollution dispersion model. JWEIA 89 (2001) 187-200

C.J. Baker, S.J. Dalley, T. Johnson, A. Quinn and N.G. Wright  
The slipstream and wake of a high-speed train. Proc Instn Mech Engrs Vol 215 Part F, 2001



## ❖ About WES

### Executive Committee

The current committee is as follows. Contact details can be obtained either from the WES website or from Eunice Waddell at the ICE.

|                         |              |
|-------------------------|--------------|
| Chairman                | Roger Hoxey  |
| Vice Chairman           | Paul Freathy |
| Hon. Sec/Treasurer      | John Wills   |
| Chairman, Research Ctte | Brian Lee    |
| Chairman, Strategy Ctte | Paul Freathy |

|         |                 |
|---------|-----------------|
| Members | Chris Baker     |
|         | Dick Barnard    |
|         | Gordon Breeze   |
|         | Roger Gawthorpe |
|         | Craig Miller    |
|         | Brian Smith     |

|                  |               |
|------------------|---------------|
| Co-opted members | Andrew Allsop |
|                  | Ian Castro    |

|   |           |
|---|-----------|
| Structures & Building<br>Board representative | Tom Wyatt |
|---|-----------|

### ICE Support

Our contact at the Institution for all administrative support is Eunice Waddell. She can be contacted at

Tel: 020-7665-2238  
Fax: 020-7799-1325  
e-mail: Eunice.Waddell@ice.org.uk

WES website [www.ukwes.org](http://www.ukwes.org)

## ❖ Forthcoming WES Meetings

6 November 2002, evening meeting at 5.30 pm at Institution of Civil Engineers, 1 Great George Street, London.

### Implementation of Euro codes: wind actions.

Speakers: **Dr Paul Blackmore**, Building Research Establishment, **Prof. Narayanan** of Cadogan Tietz, **Brian Smith**, Flint & Neill partnership. Chairman will be **Andrew Allsop** of Arup

5 February 2003, evening meeting at University of Birmingham on Vehicle Aerodynamics.

7 May 2003, AGM and evening meeting at ICE on Urban Wind.

10 September 2003, University Day, an afternoon meeting at ICE with student presentations which are reviewed and a prize awarded.

7 November 2003, 8<sup>th</sup> Scruton Lecture at ICE. Details to be announced shortly.

## ❖ Other Forthcoming Conferences

2004

*5<sup>th</sup> Bluff Body Aerodynamics Symposium*  
Ottawa, Canada

## ❖ Contact Point

Contributions and responses to:



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Please help to fill this space by contributing news clippings, people news, details of key projects or facilities that might interest others or notices of new books and meetings. **In the next newsletter we would like to include services offered by our corporate members.**