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WIND
ENGINEERING
SOCIETY



Newsletter

Dr. Graham Knapp, Editor

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Wind Engineering Society
c/o the Institution of Civil Engineers
One Great George Street
Westminster
London SW1P 3AA
Telephone: +44 (0) 20 7665 2238
Fax: +44 (0) 20 7799 1325
wes@ice.org.uk
www.ukwes.bham.ac.uk

WES Newsletter Editor
Graham Knapp
Buro Happold Ltd
2 Brewery Place
Brewery Wharf
Leeds LS10 1NE
Telephone: +44 (0)113 204 2200
DDI: +44 (0)113 204 2961
Fax: +44 (0)870 787 4144
Graham.Knapp@BuroHappold.com

❖ Chairman's Column



David Mackenzie, Flint and Neill Partnership

My term as Chairman is drawing to a close. As of May 6th, we welcome John Owen as the new Chairman of the Wind Engineering Society. John is a lecturer at Nottingham University working in across a wide range of wind related issues; John and I share particular interests in monitoring the effects of wind loading on structures using structural health monitoring systems.

This month we host two meetings; Ian Castro is chairing the meeting on Flying Debris on May 6th with Chris Baker and Peter Richards, of Birmingham and Auckland respectively, speaking on the subject. It promises to be not only informative but also an entertaining evening as both Chris and Peter are very accomplished speakers!

The second meeting is the presentation on the Eurocode EN1991-1-4. This is an all day affair at the Institution on the 11th May. Speakers include Andrew Allsop, Nick Cook, Professor R. S. 'Naray' Narayanan, Brian Smith, John Rees and Paul Blackmore so it will be a landmark event. The emphasis will be on to draw out the background to the National Annex and what changes have taken place in the way we assess the effects of wind on our structures. You can register for the event at the ICE. There is a reduced rate for WES members and members of the ICE.

I would take this opportunity to reaffirm my commitment to WES and to seeking to expand the outside interest in the Society which will bring in more members, but, more importantly, provide us with the opportunity to expand the list of meetings to provide the membership with a wider coverage of interests. I have enjoyed my time as Chairman, and look forward to continuing to serve on the committee. I look forward to seeing you at the AGM and at the Eurocodes conference.

David MacKenzie

01.05.09

Webmaster needed

Following many years of loyal service as newsletter editor and then webmaster, Dr Mark Sterling has moved on, providing an opportunity for someone new to step into this position. This would be an ideal way for an engineer approaching chartership to demonstrate involvement with professional activities and stay up to date with wider wind engineering activities. Any interested parties should contact Adam Kirkup at the ICE on +44 (0)20 7665 2262 or email adam.kirkup@ice.org.uk



❖ Codes and Standards

Brian Smith

Eurocode on Wind Actions

The Eurocode on Wind Actions (BS EN 1991-1-4) was published in April 2005 and the National Annex to the Code was issued by BSI in September 2008, over three years later. The National Annex provides the parameters specific to a Member State (such as a Wind Map), and other Nationally Determined Parameters for which the Eurocode provides recommended values but which allows these to be replaced. Safety factors are an example of such parameters. Those parameters which can be included in the National Annex are set out in the Eurocode.

The responsibility for the production of the National Annex (NA) rested with the members of the British Standards Institution Sub-Committee (B525/1/WG2)*. This Sub-Committee was responsible to B525/1, the main Committee on Loading. The work of the Sub-Committee was constrained by:

- Drafting on an unpaid basis
- Limited scope for amending clauses in the Eurocode. Only those clauses that provided reference to the National Annex could be addressed.

The work on the NA started soon after publication of the Eurocode and a draft for Public Comment was issued by BSI in July 2006, with a closing date for comments of mid September 2006.

It became clear that for the Eurocode and its National Annex to be accepted by Industry a calibration exercise would be necessary. This was proposed to Government in late 2005 and agreement to submit a formal request for funding was given by Government in early 2007. This was not authorized until July 2007 and the work was completed in October 2007.

As a result of the calibration work, revisions to the National Annex became necessary and the amended final draft was circulated to BSI in April 2008 for publication.

I only set out this time-table of events to indicate the reasons why there has been such a delay in finalizing the National Annex.

The scope of the Eurocode and its National Annex is limited to buildings and bridges – both within constraints of height (for buildings), span (for bridges) and configuration. However it will be the head code for wind loading of many forms of structure and it will need to be used with caution in such cases.

*Members of the Sub committee are:

| | |
|-------------------------|--------------|
| R S Naryanan (Chairman) | A. Robertson |
| A. Allsop | E. J. Rees |
| P. Blackmore | B. W. Smith |
| N. Cook | N. Tutt |

Published Document for the Wind Action Code

A background document to BS EN 1991-1-4 and its NA will be published by BSI as a 'Published Document', (PD 6688-1-4). This will contain information on the calibration work and a short background to the specific clauses in the NA that differ from the Eurocode itself. Examples are the wind structure that is based on the model produced by N. Cook for BS 6399, updated for later meteorological data and taking due account of the change to a ten minute mean wind speed in the Eurocode; the revised altitude factor and the treatment of the size factor and dynamic factor.



The PD will also contain a replacement for Annex E to the Eurocode that deals with vortex shedding and aeroelastic instability. The content of Annex E is retained but augmented with rules for the aerodynamic response of bridges based on the provisions of BD49, the British Design Rules published by the Highways Agency.

Eurocode on Steel Towers, Masts and Chimneys

The Eurocode for the design of steel towers masts and chimneys was published in May 2008 in two Parts:

BS EN 1993-3-1: Towers and Masts

BS EN 1993-3-2: Chimneys

For various reasons these two documents became the last Eurocodes to be published. One reason was because amendments had been introduced in BS EN 1993-3-1 by our European colleagues after the formal vote for acceptance had been passed. These needed to be reviewed and changes proposed to the published document. Accordingly a Corrigendum to this Part has been prepared and it is hoped this will be published shortly. Another reason was the fact that the Eurocode depends on the Wind Actions Eurocode that, as noted above, was not published until April 2005. The subsequent delay in publishing the National Annex to the Wind Code has had a knock on effect on the production of the National Annex for the Tower and Mast Code and the Chimney Code, both of which rely on the basic wind structure to derive appropriate wind loading for these structures.

The responsibility for the agreement to publish these Eurocodes and the production of their NAs rests with the UK Mirror Committee on Towers and Masts (B525/32)*.

A draft of the NA for BS EN 1993-3-1 has been prepared and this will be discussed at the B/525/32 meeting and hopefully will be agreed for publication for Public Comment. The NA has been written on the assumption that the Corrigendum to the Eurocode will be published ahead of the NA.

A draft of the NA for BS EN 1993-3-2 has also been prepared but publication, for Public Comment, will wait until a short calibration exercise has been completed by chimney industrialists; this work could not commence until the NA to the Wind Code was available.

It should be noted that the Eurocode for Wind Actions only provides wind structure information up to a height of 200m. In order to deal with the higher heights of towers and masts, Nick Cook is providing an extended set of values to be used, which will be incorporated in the NAs to both the Tower and Mast Part and to the Chimney Part.

*Members of B/525/32 are:

| | | | |
|---------------------|-----------|---------------------------|---------------------------|
| B. Smith (Chairman) | D. Gould | E. J. Rees | M Beaumont |
| G.Allcock | M. Grant | J. Short | (representing the chimney |
| A. Allsop | P. Heslop | C. Taylor | interests) |
| K Batten | J. Mearns | T.A Wyatt (corresponding) | |

❖ Announcements

Wind Engineering openings at NREL

A number of wind engineering positions are currently open at the National Renewable Energy Laboratory, Colorado, USA. Details on http://www.nrel.gov/employment/job_openings.html



Director of the CLP Wind/Wave Tunnel Facility and Professor/Associate Professor

A Tenure-Track Faculty Position

Department of Civil and Environmental Engineering, Hong Kong University of Science and Technology

Applications are sought for the position of director of the CLP Wind/Wave Tunnel Facility at the Hong Kong University of Science and Technology. Candidates should have a PhD in wind engineering or a related field and be eligible for a tenure-track appointment with the Department of Civil and Environmental Engineering at the professor or associate professor level based on a record of teaching, research, and service. Responsibilities of this joint appointment include establishing leading research programs in wind engineering fields, pursuing funding to support the wind tunnel activities and managing its operation, and teaching wind engineering related courses. Qualified applicants from non-academic backgrounds in consulting, industry or government will also be considered. Candidates should have a clear understanding of current needs and future directions in wind engineering

and possess a commitment to advancing diversity and interdisciplinary collaboration.

The CLP Wind/wave Tunnel Facility (www.wwtf.ust.hk) was inaugurated in June 2000 and is a central research facility of the university. It is a state-of-the-art wind/wave tunnel facility with a high-speed and a low-speed test sections and a wave tank. The facility is used extensively for teaching, research and consulting in wind effects on buildings and structures, bridge aerodynamics, bluff body aerodynamics, environmental fluid mechanics, urban air ventilation, air pollution dispersion, wind flow over complex terrain and wind power generation. The facility also has a separate building motion simulator for research on human perception of motion and occupant comfort assessment.

The initial contract period is three years and can be extended based on a satisfactory performance review. Salary is highly competitive and will be commensurate with qualifications and experience. A gratuity will be payable upon successful completion of contract. Fringe benefits including medical/dental benefits, annual leave and housing will be provided where applicable.

Applications must include a curriculum vitae, statement of research and teaching interests, and the names, addresses, phone numbers, and email addresses of at least three referees.

Review of applications will begin as soon as they are received and will continue until the position is filled. Please send application materials to Head of the Department of Civil and Environmental Engineering, the Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong (or by Fax: (852) 2335 5493; Email: cejob@ust.hk).

Enquiries can also be sent to cejob@ust.hk. For more information on the Department and the University, please visit website at <http://www.ce.ust.hk>.

(Information provided by applicants will be used for recruitment and other employment-related purposes.)

CROSS News

CROSS Newsletter No 13, January 2009 contains important warnings for structural engineers on wind loading for tower cranes and during construction.

SCOSS News

RISK ISSUES ASSOCIATED WITH LARGE TV/VIDEO SCREENS AT PUBLIC EVENTS

An important topic paper, USC/08/008 has been issued relating to wind loading on temporary TV / video screens at public events.



❖ Forthcoming Conferences

IAWE Events

11th Americas Conference on Wind Engineering (11ACWE)

San Juan, Puerto Rico

June 22-26, 2009

Fifth European & African Conference on Wind Engineering (5th EACWE)

Florence , Italy

July 19-23, 2009

Seventh Asia-Pacific Conference on Wind Engineering (7th APCWE)

Taipei , Taiwan

November, 2009

Fifth International Symposium on Computational Wind Engineering (CWE 2010)

Chapel Hill , North Carolina , USA

May 23-27, 2010

Thirteen International Conference on Wind Engineering (ICWE13)

The Netherlands, Amsterdam

2011

The 7th International Colloquium on Bluff-Body Aerodynamics and its Applications (BBAA7)

China

2012

11th Americas Conference on Wind Engineering

23-27 June 2009

At the Polytechnic University of Puerto Rico in San Juan, Puerto Rico

www.pupr.edu/11acwe





❖ WES Event reports

Sailing: A Wind Engineering Perspective

Ian P Castro, University of Southampton

This was the title of the technical meeting which followed the WES AGM on Wednesday 7th May. Arguably, it broke new ground for WES, for one would perhaps not normally consider sailing as within the Society's remit. Nonetheless, each one of the three speakers had no difficulty at all in relating the crucial issues to topics which are of great interest to Wind Engineers.

The evening began with Ian Campbell's talk on 'Extracting Power from the Wind'. Ian is a long-standing consulting engineer at the Wolfson Unit for Marine Technology and Industrial Aerodynamics, School of Engineering Sciences, University of Southampton. He has vast experience of the various technical matters of importance to sailors, often in the context of 'big' races – in 2007, for example, he was the consulting scientist for the Luna Rosa team's America's Cup challenge. His talk was a splendid mixture of arresting images of racing yachts, presentation of the fundamental vector force diagrams which determine the way in which the wind provides motive power and how the yacht responds, and illustrations of how wind tunnels can be modified to provide proper modelling of the complicating influences of the change in apparent wind direction with height up the mast.

A racing yacht's team are of course greatly concerned with measurement of the real wind vector, and its variability, as well as the yacht's leeway and speed through the water. Wind Engineers are not used to mounting their anemometers on moving platforms, in regions which are in effect near the tip of wings generating significant lift and drag, on poles which flex significantly and are mounted on moving platforms! Nat Ives illustrated the difficulties graphically, drawing from his experience as a race specialist and, currently, a consultant for Yacht Instrumentation Systems. This talk, 'Determining Wind from Moving Anemometry', also contained lots of fascinating photographs as a background to explanations of technical issues. It was surprising (to this writer at least) that in the age of GPS, ultra-sonics and other sophisticated wizardry, most teams still find that paddle wheels are the most accurate way to measure boat speed through the water.

In the final talk, Steve Fiddes spoke on 'Wind, Waves & Wings', drawing heavily on his long experience as a practicing aerodynamicist – first at RAE Farnborough, then as Professor of Aerodynamics at Bristol University, and currently as Technical Director of his own company, Flow Solutions Ltd. He drew direct parallels between efficient aircraft wings and sails, showing how the modern trend is for the latter to become increasingly like the former if high speed is the goal. Indeed, his talk intentionally emphasized the lure of high speed and he predicted that the 50 knot goal would soon be reached. The devices which get closest, currently, are surf boards, but these always rely on high wind conditions, so are unlikely to get much faster than their current record of around 48 knots. On the other hand, properly designed sailing boats, the best of which can currently achieve boat speed to wind speed ratios in excess of two, will surely improve significantly on their current limit of around 44 knots, as the technology of sail and hull design improves. Steve showed some rather startling photos of a number of very weird craft, designed for speed, but unlikely to be used by the average recreational sailor!

All 55-60 people present seemed to enjoy the evening thoroughly, judging by the strong round of applause at the close. Anyone wishing to revisit the event, or see the presentations for the first time, may do so by going to the ICE link: <http://scenta.interwise.com/etechb/OnDemand/CI2154/>



The 8th UK Conference on Wind Engineering

Alan Robins, University of Surrey

The Conference was held at the University of Surrey from Monday 14th to Wednesday 16th July, 2008 and attended by 54 delegates. The proceedings started after lunch on the Monday with an invited talk by Dr. Roger Hoxey on the history and achievements of wind engineering research at Silsoe Research Institute. It all started in 1968 – 40 years of wind engineering and still going, to quote the title. The remainder of the day was given over to a further 6 papers on a variety of topics encompassing wind loading on roofs, railway trains and exceptionally tall buildings.

The Tuesday started with a second special presentation, Prof. Brian Lee reviewing the likely impact of climate change on wind engineering, in particular the implications of the IPCC 4th Assessment Report for design wind speeds in NW Europe. The main conclusion was that there was no reason at present to change structural design wind speeds, with a caveat that this conclusion ought to be reviewed on a decadal basis. The sessions that followed covered a range of topics with far more emphasis than is usually the case at WES Conferences on atmospheric dispersion and urban boundary layers. To some degree this reflected the interests of the host institution but also the considerable field, laboratory and computational effort expended in this area in recent years. Other wind engineering topics were not forgotten though, with papers on wind energy, pressure fluctuations, tornado modelling and wind loads on a 125m tall Buddha figure. The conference dinner was held that evening and attended by the great majority of delegates – it had been a long day and this proved a just reward.

The programme on Wednesday returned to more traditional wind engineering topics, such as bridges, vibration and fatigue. A talking point of the day proved to be a paper on the “strange” aerodynamics of the modern soccer ball. The conference closed with lunch and poster viewing, followed by informal tours of the EnFlo laboratories.

Thirty two papers were presented and, thanks to the attention of the chairmen and women, the programme ran almost perfectly to schedule. The overall standard was high and interest was maintained throughout, with the wide range of topics proving that wind engineering research remains a lively subject. As Roger Hoxey said in the opening address it all started with a threat ... but it's still going.

The conference, co-hosted by the University of Portsmouth and I would like to acknowledge the considerable assistance from Brian Lee in the organisation of the even, also the help from the Institution of Civil Engineers and the sponsorship from Biral UK. A pdf of the full proceedings (12.9MB) has been prepared and can be downloaded from <http://131.227.181.10/~xarobins/Teaching/WES>.



❖ Future WES Events

at the Institution of Civil Engineers, One Great George Street London SW1P 3AA, unless otherwise stated

Wednesday 6 May 2009 at 6.15pm

Flying Debris

(Refreshments available from 5.30pm – This technical meeting will follow the AGM which begins at 6.00pm)

Chairman: Ian Castro, Professor of Fluid Dynamics, University of Southampton

A review of recent research into the flight of wind borne debris

Chris Baker, Professor of Environmental Fluid Mechanics, School of Civil Engineering, University of Birmingham

Experimental work on the flight of wind borne debris

Peter Richards, Associate Professor, Mechanical Engineering Department, University of Auckland

Please note there is no charge and non-members of the Society are welcome to attend.

Seats will be allocated on the day with tea/coffee served from 5.30 – 6.00pm. For further information, please contact Sophina Khan, at the ICE:

Tel: 020 7665 2229. Fax: 020 7799 1325. Email: Sophina.khan@ice.org.uk

Monday 11 May 2009 9.30am-5.20pm

New Eurocode on Wind Loading

Member Cost: £ 69.00 + 15% VAT

Non Member Cost: £ 99.00 + 15% VAT

events.ice.org.uk/windloading

This one-day conference is intended to present **Eurocode BS EN 1991-1-4, the wind loading code**. The conference is recommended for engineers working on structures that are affected by wind loading.