# The Australasian Wind Engineer

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Welcome Wind Engineers to the December 2009 edition of the AWES Newsletter.

The main item of business in this edition is notice of the AWES Committee nominations, and our Secretary, Katrina Swalwell, has provided all the details.

Next up is the first call for papers for the AWES2010 workshop, to be held in Canberra in August 2010, and Bob Cechet has provided details on this.

In other conference news, several of our members have recently attended the 7th Asia-Pacific Conference on Wind Engineering and John Holmes has reported back with the highlights from Taipei. We also have news from the bid for the 8th Asia-Pacific Conference on Wind Engineering.

The revised wind-loading standard, AS/NZS 1170.2, is presently undergoing a public review, and further details on how comments can be made are inside.

Finally, the international journal *Wind and Structures* has now been in publication for 12-years, with many AWES members either contributing or assisting in its publication, and some further information, along with a message of thanks from one of the editors, John Holmes, is inside.

Enjoy the read, and don't forget to email Katrina if you're interested to be part of the committee for 2010-11!

**Editor**: Leighton Aurelius BMT Fluid Mechanics
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Creation of a dominant opening by the failure of a roller door resulted in a roof failure on this house in Cyclone 'Larry'


Missile impacts will be assumed to be below 25m height for internal pressure calculation for the new version of AS/NZS1170.2

## AWES Committee Nominations

Nominations for the AWES Committee for the period 2010-2011 are now being sought.

Current members of AWES interested in being part of the new committee should email the AWES Secretary, Katrina Swalwell (Katrina.Swalwell@repower.com.au) stating their interest by the 18th of December 2009.

## AWES Workshop 2010

The 14th Australasian Wind Engineering Society workshop is now confirmed and will be held in Canberra at Geoscience Australia on August 5th and 6th 2010. The main focus of the workshop will be ***Wind Engineering: Promoting Community Resilience & Sustainability***.

The workshop will be preceded by a meteorological workshop on ***Southern Hemisphere Extreme Winds*** on August 4th.

The conference committee recommends the following sub-themes:

- Bridges and tall buildings
- Ventilation and human comfort
- Wind hazard (climate change adaptation)
- Wind vulnerability
- Wind risk
- Wind tunnel studies
- Wind energy
- General (CFD, codification, etc.)

This meeting will focus on promoting community resilience and sustainability. In addition, within the sub-themes described above, issues such as wind dynamics/ response, failure and fatigue, risk analysis, topographic effects, wind vulnerability, windborne debris, as well as wind climatology and wind energy will be explored.

The template for abstracts is expected to be available for download by January 1st 2010, and abstracts are to be submitted to the conference coordinators:

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## APCWE7 – In Grand style in Taipei

**Contributor: John Holmes**

The 7th Asia-Pacific Conference on Wind Engineering was held in style at the Grand Hotel, Taipei during November 8-12.

The Grand Hotel, set on the prominent Yuanshan Mountain in Taipei, is in classical Chinese palace architecture with the largest Chinese-style roof in the world. The impressive building is probably only rivaled in Taipei by the Chiang Kaishek Memorial and Taipei 101 (the world's tallest building for about five years, and still with the largest tuned-mass damper). The hotel regularly hosts visiting dignitaries to Taiwan – particularly from mainland China – as was the case during the week of APCWE7.

Matching the grandeur of the building was the extremely efficient and helpful organization of APCWE 7 by the Chinese Taiwan Wind Engineering Group led by Chi-Ming Cheng. The only small criticism was the need to negotiate the overcrowded elevators during the conference (some plenary sessions were held on the 10th floor and some conference sessions in the basement).

A highlight of the conference was the Keynote Presentation by C.C. Wu – a very active atmospheric science Professor from the National Taiwan University who has flown up to four aircraft into typhoons threatening Taiwan – mainly to predict their tracks before landfall in conjunction with numerical models. Taiwan itself is still recovering from the flooding and landslip effects of Typhoon 'Morakot' in August 2009 – one location received nearly 3 metres of rainfall in 3 days.

Also impressive was a paper from Japan describing results from an array of 26 anemometers spaced at about 4 kilometres apart in a location on the west coast of Japan that is regularly affected by downbursts and tornados, and where there have been two train derailments by gusts in recent years.

About ten AWES members from Australia, New Zealand and Hong Kong attended APCWE7 and contributed actively to several sessions – particularly to those on human comfort, windborne debris and codification.

The Regional Assembly of IAWE was held during the Conference. Kenny Kwok was re-elected for another four-year term as Regional Coordinator

for the Asia-Oceania Region.

Although a strong bid and presentation was made by John Cheung on behalf of Adelaide University to host APCWE8, the next regional conference in 2013 will be organized by the Indian Society for Wind Engineering in Chennai. The AWES would like to thank John for his efforts on the bid.

Following APCWE7, a smaller group met on the east coast of Taiwan at Jiaosi for the fifth APEC-WW Workshop on Codification and related activities. New representatives from Nepal and Sri Lanka attended. Highlights of this meeting were Yukio Tamura's presentation on IAWE international activities on wind-related disaster mitigation, collection of data on wind load factors, and Prem Krishna's proposal for an APEC Model Wind Code for small low-rise buildings.

The Grand Hotel, Taipei

John Cheung, University of Adelaide bid for 8APCWE

## Revised Wind Standard out for public review

**Contributor: John Holmes**

The May 2007 edition of the Newsletter reported on some proposed changes to the Wind Actions Standard, AS/NZS1170.2. Those changes and some others have finally reached the public review stage. The slow progress was partially hindered by financial and staffing problems at Standards Australia.

The revised Standard is currently in a public review period until 22 December 2009. Users are invited to make comments on the changes. All submitted comments will be considered by the Standards Australia committee.

The main proposed changes from the 2002 edition of AS/NZS 1170.2 are as follows:

***Torsion provisions***

*Eccentricity in the along-wind loads of 0.3 times the building width to be specified for buildings greater than 50 metres in height.*

***Regional wind speeds***

*Regional wind speeds $V_1$, $V_{250}$, $V_{2500}$, $V_{5000}$ and $V_{10000}$ will be added for serviceability design requirements, for design of public storm shelters in Queensland, and for compatibility with AS/NZS1170.0 (General principles),*

***Dominant openings***

*Roller doors and other types of door are to be treated as dominant openings for internal pressure assessment, 'unless they are capable of resisting the applied wind pressures and debris'.*

*The missile impact resistance for cyclonic areas to be restricted to facades up to 25 metres on any building.*

***Dominant openings on leeward walls, side walls and roofs***

*Correction of factors applied to external pressure coefficients for dominant openings on leeward walls, side walls and roof, to more correctly reflect the relationship between internal and external pressures when multiple openings occur.*

***Internal walls and partitions***

*Addition of a new clause requiring consideration of wind loads on internal walls and partitions. Further numerical advice will be given in the Commentary to AS/NZS1170.2.*

***Debris impact test***

*It is proposed to specify the debris impact loading test for dominant openings separately in a new Clause, and the debris speed has been linked to the regional wind speed. The horizontal impact speed for the 4 Kg timber will be specified as 40% of the regional wind speed.*

***Action combination factor***

*A complete re-draft of Section 5.4.3 of the Standard has been prepared. This allows a factor of 0.9 when two surfaces contribute to a load effect, and 0.8 when three or more surfaces contribute.*

***Local pressure factors***

*Increased local pressure factors, $K_l$ , for small areas on windward walls of high-rise buildings (later extended to all buildings) to 1.5, and of 3.0 for the corners of roofs have been specified. The requirement for local pressure factors of 3.0 on side walls of taller building will be restricted by the building aspect ratio being greater than 1.0, rather than by the building height being greater than 25m as at present.*

***Structural damping***

*It is proposed to remove the current table giving values for structural damping ratios for structures with dynamic response to wind from AS/NZS1170.2, and insert a new section in the Commentary to AS/NZS1170.2 giving advice on possible values as a function of height of building and amplitude of vibration. It is believed that AS/NZS1170.2, as a Standard specifically on wind actions, should not require structural designers to use specific values of structural properties such as natural frequency or damping. Information is available from many other sources for these parameters.*

***Curved roofs***

*A note to the table of shape factors for curved roofs will be added to cover the case of building height to rise greater than 2 – cases that are currently excluded.*

***Cantilevered grandstand roofs***

*The load distribution specified for cantilevered roofs and canopies, covering mainly smaller roofs of grandstands of sporting grounds, will be revised to reflect recent research at the University of Queensland.*

***Circular cylinders***

*Protrusions from, and attachments to, circular cylinders such as ladders and pipes will require the subcritical drag coefficients to be used – i.e. the cylinder should not be treated as 'smooth'.*

***Television antennas***

*Drag coefficients for sections of UHF television antennas Types 1 and 3 will be revised following recent commercially-sponsored studies in the large wind tunnel at Monash University. It is recommended that the value of drag force coefficients for the Type 2 antenna be removed from the Standard, since this type has not been used in Australia or New Zealand for many years.*

There are also numerous minor and typographical changes. However, apart from these and the additional return periods listed above, no other changes to Sections 3 and 4 on wind speeds and multipliers are proposed in the current changes. Possible changes to regional boundaries and regional wind speeds arising from possible climate change effects, and terrain-height multipliers to account for differing profiles in tropical cyclones and thunderstorm events have been discussed, but have been put 'on hold' while the evidence is considered further, and until an ABCB report is released.

Comments can be made as follows and the draft Standard can be downloaded by visiting: https://www.hub.standards.org.au/hub/public/index.jsp, then follow the links to "Comment on draft standard", "SAI Global's Infostore"
Type 'Wind actions' into the box to download .pdf for free

AWES has taken on the task of writing an independent Commentary to the new Standard, and volunteers from members, or others, for this work should contact John Holmes or Chris Letchford.

As Chair of BD006-02 for the last 4½ years, I would sincerely like to thank the members of the committee, including several members of AWES, who have given of their valuable time voluntarily to assist with these revisions and many other issues that the committee has been called on to address.

Unfortunately there are serious problems with the Standards-writing system in Australia and New Zealand, many of which have arisen from the split of the sales and marketing arm into a separate private company. However, influential bodies such as Engineers Australia are now aware of the issues, and there are optimistic signs for improvements in the future.

## Wind and Structures reaches 12-years

**Contributor: John Holmes**

The international journal *Wind and Structures* has now published well over 300 papers in the last 12 years, with a continuous improvement in quality and increasing impact factor.

As part of the 'stable' of journals published by Techno Press of Korea, it is developing a focus on both the structural aspects of wind engineering, and on the Asia-Pacific Region.

AWES members have authored a number of excellent papers in recent issues of W & S – for example:

*J.D. Ginger, J.D. Holmes and G.A.Kopp, "Effect of building volume and opening size on fluctuating internal pressures", Vol. 11, pp 361-376.*

*M. Mason, D.L. James and C.W. Letchford, "Wind pressure measurements on a cube subjected to pulsed impinging jet", Vol. 12, pp 77-88.*

*M. Mason, G.S. Wood and D.F. Fletcher, "Influence of tilt and surface roughness on the outflow wind field of an impinging jet", Vol. 12, pp 179-204.*

*D.J. Henderson , J.D. Ginger, M.J. Morrison and G.A. Kopp, "Simulated tropical cyclonic winds for low-cycle fatigue loading of steel roofing", Vol. 12, pp 383-400*

*X.R. Qin, K.C.S. Kwok, C.H. Fok and P.A. Hitchcock, "Effects of frequency ratio on bridge aerodynamics determined by free-decay sectional model tests", Vol. 12, pp 413-424.*

Many AWES members and supporters have also assisted me with reviewing duties during the last four years and I am very happy to acknowledge them here:

F. Albermani, M. Chay, J.C.C. Cheung, L.S. Cochran, R.G.J. Flay, J.D. Ginger, M. Glanville, D.J. Henderson, P.A. Hitchcock, J. Kepert, K.C.S. Kwok, A. Jeary, R. H. Leicester, C. Leitch, C.W. Letchford, M. Mason, S.E. Oliver, P.J. Richards A. Rofail, B. Samali, G.R. Walker, G.S. Wood.

Next year special issues of the journal are planned on windborne debris, human response to wind-induced vibration and high-frequency force/base balance.

Prospective authors, reviewers and subscribers for the journal are invited to visit the web site: http://technopress.kaist.ac.kr/?journal=was

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Well, that's it for this edition of the AWES Newsletter. Many thanks must go to our contributors.

As always, a newsletter cannot exist without news, so any stories, photos or information on upcoming events will always be appreciated.

Cheers,

Leighton Aurelius
AWES Newsletter Editor.

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