



THE WIND ENGINEER

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In this issue:

Midwest City Adopts Nation's First Building Code Provisions to Address Tornado Hazard	1
Kareem Participates in China's Foreign Experts Symposium with President Xi Jinping	2
AWES Holds Inaugural Winter Lecture	3
Website for 14th International Conference on Wind Engineering	3

Midwest City Adopts Nation's First Building Code Provisions to Address Tornado Hazard

Bill Coulbourne, P.E.

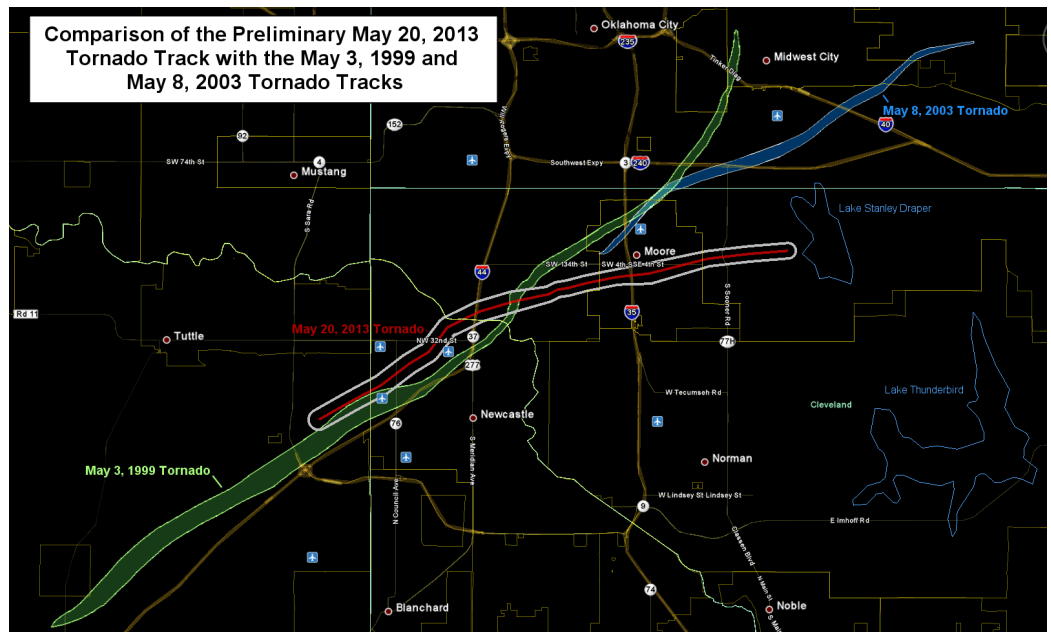
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After the May 2013 tornado hit Moore, OK, an NSF funded investigation team conducted building performance studies on hundreds of homes damaged by the event. Like many other tornado event investigations, this one focused on using the EF Scale to categorize the damage to these residential structures. One of the areas investigated was a neighborhood that had some buildings totally destroyed by the tornado adjacent to other homes that had not received as much damage – a damage pattern often observed from tornado events. In this case, one of the team's participants included local university researchers who took the opportunity to develop and deliver a message to the Moore city council and building department officials. Succinctly that

message was that this damage does not need to recur again – there is something that can be done, and that something is to adopt some building code changes that can reduce damage in residential buildings, especially when the tornado intensity is on the lower end of the EF scale such as an EF0 to an EF2. The upper end of the EF2 wind speed range is 137 mph, which is very similar to wind speeds experienced along hurricane prone coastlines.

Since Moore had been hit by three major tornado events since 1999, the Moore City council and building officials decided that stronger building codes were needed to re-

(Continued on page 2)



"Moore-2013-track-vs-1999" by NWS WFO Norman, OK - <https://twitter.com/NWSNorman/status/336593182760517633/>. Licensed under Public domain via Wikimedia Commons - <http://commons.wikimedia.org/wiki/File:Moore-2013-track-vs-1999.png#mediaviewer/File:Moore-2013-track-vs-1999.png>



(Continued from page 1)

duce damage from these tornado events which would also speed recovery after the event.

The building code revisions include 12 specific residential construction changes required by the adoption of this code change ordinance. They are:

1. Roof sheathing shall be nailed with 8d ring shank or 10d nails at 4" o.c. along the roof edges and 6" o.c. in the field of the roof.
2. Roof framing members shall be 16" o.c.
3. Connections for roof framing shall be designed for both tension and compression and may include nail plates or steel connection plates.
4. Gable end walls shall be tied to the structure and may include steel connection plates or straps.
5. Structural sheathing panels shall be required for gable end walls.
6. Hurricane clips or framing anchors shall be required for all rafter to wall connections.
7. Upper and lower story wall sheathing shall be nailed to the common rim board.

8. All walls shall be sheathed with structural sheathing. Garage door openings shall be framed using the portal frame method.
9. Nailing of wall sheathing shall be increased to 8d ring shank or 10d nails on 4" o.c. along the edges and 6" o.c. in the field.
10. Structural wood sheathing shall be extended to lap the sill plate and nailed to the sill plate 4" o.c. along the edges.
11. Garage doors shall be rated for 135 mph wind or above.
12. Exterior wall studs shall be 16" o.c.

The intent of the ordinance is to have new residential structures be built to resist 135 mph, although interestingly this is not stated explicitly except in the garage door rating required. Presumably, all of the other new prescriptive code requirements will likely achieve satisfactory performance up to 135 mph. While there may be some holes in the prescriptive requirements in order to achieve acceptable performance in 135 mph winds, there is no doubt that the strategy seems sound and the changes are in a positive direction that will undoubtedly improve residential building performance the next time a tornado hits Moore.

Kareem Participates in China's Foreign Experts Symposium with President Xi Jinping

Prof. Ahsan Kareem, inaugural recipient of the Alan G. Davenport Medal, participated in the 2014 Foreign Experts Symposium in Shanghai, China. Organized by the Shanghai Municipal government's Foreign Expert Bureau, the symposium offered a platform for advice and recommendations from a select group of 40 foreign experts who have lived and worked in China and have been heavily involved in the business and local communities.

Prof. Kareem, and nine of the other experts, who had been asked to participate by the Chinese Ministry of Foreign Affairs, were invited to share their recommendations to promote innovation in science and technology, finance, law, social sciences and academia via formal presentations to Chinese President Xi Jinping and other dignitaries.

In his presentation, Prof. Kareem stated: "The halls of academia in the US are filled with talent from China and my first suggestion would be that the brain drain should be controlled by attracting these talented students who go overseas to remain in China. In order to do so, China has to grow a culture of academic curiosity at a higher level that is steeped in scholarship, innovation and discovery!"

Among other suggestions made by Prof. Kareem, he also suggest that "the young faculty in China needs better mentorship by the senior faculty and the university to make their career choice more exciting and successful! Constructive critique of research always help to elevate the quality of work as there is not much gained through mutual admiration. Tenure and promotion procedures may need to be reevaluated. Emphasis on raw number of



Prof. Ahsan Kareem

publications and citations in engineering is not a true judge of ones abilities."

After the symposium, the group had a 90-minute private audience with President Xi Jinping at the State House where they continued discussing a range of topics related to national development, from reforming the talent evaluation system in China to encouraging innovation.

Editor's note: This article has been excerpted from:
<http://engineering.nd.edu/news-publications/pressreleases/kareem-participates-in-china2019s-2014-foreign-experts-symposium-with-president-xi-jinping#.U86qluq1PeU>email

AWES Holds Inaugural Winter Lecture

By Leighton Cochran
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In early July the Australasian Wind Engineering Society (AWES) held its first Winter Lecture in what is hoped will be the beginning of a series of wind-engineering lectures held twice a year (summer and winter) by outstanding lecturers and researchers in our field. One goal of this effort is to make wind engineering more easily accessible to engineering and architecture practitioners. To this end the lecture video will be uploaded on to the AWES website for stake holders, not in Brisbane, to view.

On this occasion AWES had about 100 attendees at the Queensland University of Technology (QUT) venue; most of



Prof. Chris Letchford

whom were from local structural and architectural firms. Prof. Chris Letchford, from Rensselaer Polytechnic Institute (RPI) in New York, gave a fascinating talk about tall-buildings, their dynamic crosswind response, and the urbanization of our cities leading to the need for further high aspect-ratio buildings. Additionally he discussed some fluidic dynamic control work his engineering and architecture students are doing at RPI on this topic.

Many thanks to Dr. Matthew Mason of QUT for organizing this very successful inaugural event.



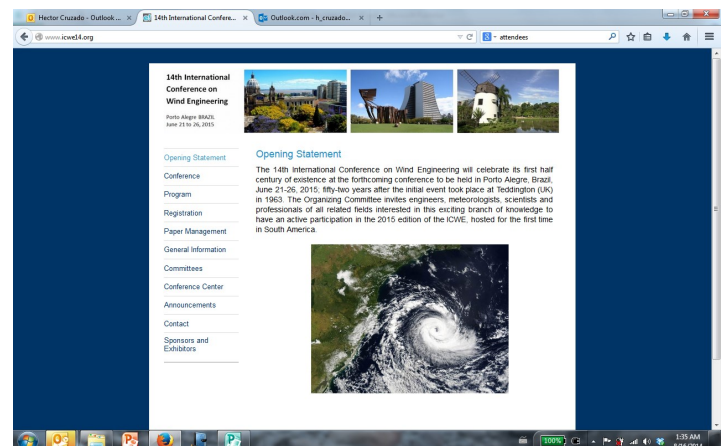
AWES Lecture attendees

Website for 14th International Conference on Wind Engineering

The website for the 14th International Conference on Wind Engineering (ICWE14) is up and running. This conference is being chaired by Prof. Acir Mérico Loredó-Souza of the *Universidade Federal do Rio Grande do Sul*. Prof. Loredó invites you to visit the website, which has the address of www.icwe14.org.

ICWE14 will be held in Porto Alegre, Brazil from June 21 to 26, 2015. It will mark the first time that this conference will be held in South America.

The website invites interested authors to submit 4-page abstract of each proposed paper, before the September 30th, 2014 deadline. It is expected that authors will be informed of the result of the review of their abstract before November 15, 2014.



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