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THE WIND ENGINEER

NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

In this issue:

The First Joint FIU/UF NSF NHERI EF User Workshop

Kurt Gurley, University of Florida
Arindam Gan Cowdhury, Florida International University

The The Wall of Wind at Florida International University and the Powell Family Structures and Materials Laboratory at the University of Florida are among the seven designated shared-use Experimental Facilities (EFs) under the National Science Foundation's (NSF) Natural Hazards Engineering Research Infrastructure (NHERI) program (http://nsf.gov/news/news_summ.jsp?cntn_id=136380). These two independent facilities have complementary and non-overlapping capabilities that offer the wind hazard research community access to full-scale experimental testing of full system and component performance, as well as full-scale and scale model wind load quantification. They are available to be utilized through NSF-funded programs as of January 1st, 2016.

FIU and UF have embarked upon a collaborative effort to build, inform and learn from the potential user base. This began with the first joint FIU/UF NSF NHERI EF User Workshop, held on December 3rd (at FIU) and 4th (at UF) 2015. The workshop provided information about the capabilities of the FIU and UF EFs, user services provided by EF staff, the process for accessing NSF funding for EF use, and the science plans and major themes for both EFs. It also provided opportunities for attendees to network with fellow researchers, propose guidance and long term strategies for effective use of these

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EFs, develop collaborative programs, and initiate proposals.

Future workshops will be held at each facility, beginning in the summer of 2016 at FIU. Those interested in attending workshops and/or developing proposals to use either or both facilities are encouraged to contact the following faculty:

- Arindam Gan Chowdhury - chowdhur@fiu.edu
- Ioannis Zisis - izisis@fiu.edu
- Forrest Masters - masters@ce.ufl.edu
- Kurt Gurley - kgurl@ce.ufl.edu

8th International Colloquium on Bluff Body Aerodynamics and Applications

We are pleased to announce that Northeastern University will host the 8th Internaonal Colloquium on Bluff Body Aerodynamics and Applicaons on June 7-11, 2016. The conference is co-sponsored by the Interna onal Associa on of Wind Engineering (IAWE) and the American Associa on for Wind Engineering (AAWE). We invite you and the members of your research groups to be a part of this mee ng. The conference features a panel of plenary speakers and technical sessions that span forefront topics in bluff body aerodynamics, wind engineering, wind energy, fluid-structure interac on, experimental and numerical methods for turbulent flow analysis. The four-page abstract submission deadline is January 15, 2015. More details and instruc ons may be found on the website h+p://www.northeastern.edu/bbaa8/.

We look forward to seeing many of you at the conference, which will be held at Northeastern University's Campus in Boston, United States. Please distribute this announcement to interested students and colleagues. Registra ons will open in early 2016, and a second announcement will follow then.

Sincerely yours,

Luca Caracoglia
Chris Letchford
Co-Chairs, BBAA VIII (2016), bbaa8@neu.edu

UK Wind Engineering Conference 2016

The Wind Engineering Society will hold its 12th Biennial Conference from the 5th to the 7th of September, 2016. The conference will be held at the University of Nottingham's University Park campus.

For more information, please visit: www.wes2016.co.uk.

Resisting Tornadoes and Hurricanes

Patrick Condon, PhD
West Tampa Glass

Important lessons are learned from the 1992 Hurricane Andrew in south Florida. Wind borne debris breached windows that created internal pressures (i.e. the egg beater effect), tearing apart interiors, uplifting roofs and destroying walls. Florida adopted a building code in 2001 to establish standards to survive wind loads and simulate wind borne debris. In 2010, ASCE-10 modified wind speed maps so the probability of exceeding the map wind speed relates to the type of facility: 6% for Risk III/IV and 13% for Risk II over a 100 year period. In 2009, the International Building Code (IBC) adopted "The Standard for the Design and Construction of Storm Shelters" (ICC 500) establishing construction standards for Storm Shelters, both Hurricanes and Tornadoes. The ICC500 wind maps include Hurricane and Tornado with a near 0% of being exceeded in 100 years. Since the survival nature of storm shelters is similar to Essential Facilities, including hospitals, these standards also have application for these facilities.

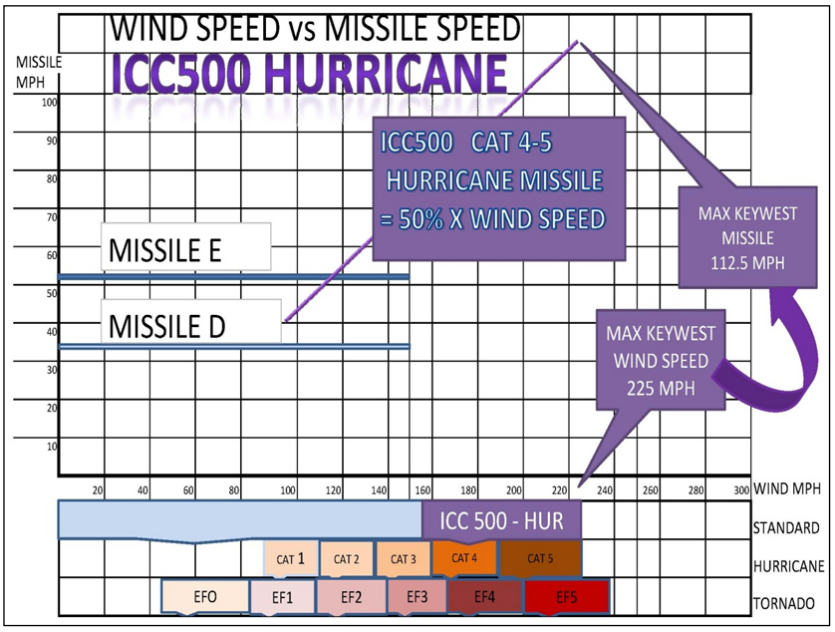

Figure 1. Wind Speed vs. Missile Speed for Hurricanes

The lessons from Andrew are still valid, namely stop wind borne debris from breaching windows. Most buildings are constructed as "enclosed", based on ASCE-10 load formulas. But when windows are broken, the status changes from "enclosed" to "partially enclosed" with up to a 35% increase in internal pressure. The relationship between speed of wind and speed of wind borne debris is graphed below for Hurricanes and Tornadoes, based on ICC500. In both graphs, Missile D and Missile E are in the Florida Building Code (similar for International Building Code) with wind speeds that correspond to Hurricane Cat1-3 and Tornadoes EF0-2. To furnish building protection for higher wind speeds, the ICC500 specifies storm shelter requirements up to Cat5 Hurricanes and EF5 Tornadoes. In the ICC500 Hurricane (graph below), wind borne debris is simulated as a 9 lb, 2x4 at 50% of the wind speed; thus, maximum Hurricane wind speed, 225 mph implies missile speed 112.5 mph. In the case of ICC500 Tornadoes (graph below), wind borne debris is simulated with a 15 pound 2x4 missile with speeds up to 100 mph.

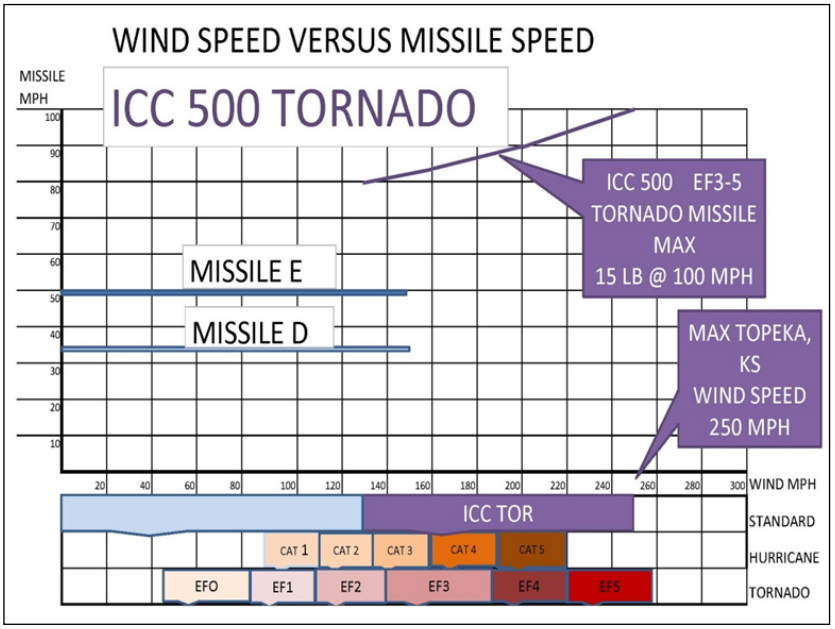

Figure 2. Wind Speed vs. Missile Speed for Tornadoes

As a result of Hurricane Andrew and subsequent code modifications, building envelope design now considers: building type (Risk II, III, IV), expected wind speeds and wind borne debris. With the addition of the ICC500, building codes now cover Hurricanes from CAT 1 to CAT5 and Tornadoes EF0 to EF5.

American Association for Wind Engineering

Established in 1966

A professional organization dedicated to the advancement of the science and practice of Wind Engineering and the solution of national Wind Engineering problems through transfer of new knowledge into practice.

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