



American Association
for Wind Engineering

THE WIND ENGINEER

NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

May 2003



Damaged dormitory (see story on p. 2)

The Hurricane, Tornado and Related Hazards Research Bill Re-introduced in the U.S. House of Representatives

On May 7, 2003, the Hurricane, Tornado and Related Natural Hazards Research Act was re-introduced in the U. S. House of Representatives, by Reps. Dennis Moore (D-KS) and Mario Diaz-Balart (R-FL). The bill has been assigned number H.R. 2020 and the progress in the legislature may be tracked through the Library of Congress site at <http://thomas.loc.gov>. This bill was originally introduced in the last Congress but it was not enacted.

The development of the legislation was spearheaded by the American Association of Civil Engineers (ASCE), with significant participation by many engineering, scientific and industry groups. This effort was carried out under an umbrella of the Wind Hazards Coalition (<http://www.windhazards.org>) formed by the ASCE.

The introduced legislation would establish a National Wind Hazard Reduction Program that would seek a measurable reduction in losses of life and property due to wind hazards over a 10-year period.

The AAW E has been involved in activities of the Coalition and will continue to provide its assistance to the Coalition, Congressional staffers, and to other entities, as requested. We intend to inform the AAW E members about further developments in this area and on progress in the legislation, through the AAW E newsletter, website and via direct communication.

The AAW E members are urged to contact Congressmen in their districts and to encourage them to join the Congressional Wind Hazards Reduction Caucus and to support this legislation.

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President's Message

We are completing a transition phase in activities of the AAW E Officers. I would like to express my gratitude to Dr. Mike Gaus for his assistance in this process and for his dedicated service to AAW E and to wind engineering in general, during his term as the President of AAW E and throughout his professional career. My thanks are also due to Dr. Partha Sarkar for his service as the AAW E Secretary/Treasurer, and to Drs. Art Chiu, Joe Golden and Ahsan Kareem, who have completed their term as the members of the AAW E Board of Directors.

Recent damaging tornadoes reminded all of us about the need to reinvigorate our effort in wind engineering research and practice, and to stimulate societal awareness of benefits of supporting such activities, in context of the national goal to reduce human losses and material damage due to wind hazards.

AAWE Reconnaissance of May 4 and 8, 2003 Kansas-Missouri Tornadoes – A Preliminary Synopsis

Collision of cold dry air moving from the Rockies with warm moist air from the Gulf of Mexico resulted in giant supercell storms and strong tornadoes in up to eight states: Arkansas, Kansas, Mississippi, Missouri, Nebraska, Oklahoma, South Dakota, and Tennessee. Touchdowns of damaging tornadoes and significant human toll as well as material losses were reported in South-Eastern Missouri, Eastern Kansas, Tennessee and in Oklahoma. This weather pattern was then repeated in various locations of that region.

With support from the Structural Systems and Hazards Mitigation of the National Science Foundation, the American Association for Wind Engineering (AAWE) rapidly assembled a team to collect perishable information in areas that were impacted by tornado touchdowns in Kansas and Missouri, on May 4 and 8 of 2003. The team members were: Dr. Bo Bienkiewicz (Colorado State University), Dr. Mike Gaus (Gaus Associates), Dr. Marc Levitan (Louisiana State University) and Tom Smith, AIA, RRC (TLSmith Consulting Inc.). They were joined by Dave Low, PE (Greenhorne & O'Mara).

The AAWE team visited a total of ten sites affected by the Kansas-Missouri tornadoes. The sites inspected in Missouri included Pierce City, a country site near Pierce City and four other cities: Battlefield, Stockton, Gladstone, and Liberty. In Kansas, reconnaissance was carried out at three locations in Leavenworth/Wyandotte areas and at one location in Lawrence.

The following is a brief synopsis of information collected during the team's visits. Further documentation of the team's findings will be presented in a report to be published by the AAWE in the near future.



Figure 1 Exterior and interior of the National Guard armory in Pierce City, where people sought shelter. One fatality was reported



Figure 2 Most of historic business buildings in Pierce City were damaged



Figure 3 Undercarriage of a manufactured home approximately 100 feet from its original location



Figure 4 Damage to house under construction



Figure 5 Horse trailer became a missile and struck house. This house lost its roof structure



Figure 6 Severe damage to residential structure. Note missile penetrating wall



Figure 7 Damaged fire station



Figure 8 Emergency/fire rescue vehicles were trapped inside the fire station



Figure 9 Damage to retail facility



Figure 10 Damage of interior of retail facility



Figure 11 Tornado missiles



Figure 12 House shifted off its foundation and lost its roof structure



Figure 13 Loss of wall sheathing due to wind suction



Figure 14 Garage door and wall failure



Figure 15 Collapse of brick chimney and loss of roof structure



Figure 16 Damage to William Jewell College dormitory



Figure 17 Failure of pre-stressed concrete building



Figure 18 Failure of roof beam due to combined effects of wind uplift and pretension. The beam seats did not provide resistance to wind uplift



Figure 19 Three-inch thick concrete wall panel was penetrated by a UFM (unidentified flying missile)



Figure 20 Failure of stadium light standards at William Jewell College



Figure 21 Collapse of metal transmission tower



Figure 22 Metal transmission tower struck residence



Figure 23 Failure of apartment complex in Lawrence, KS



Figure 24 Failure of strap between wall and roof truss



Figure 25 Damage to residence caused by debris from adjacent apartment complex

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Established in 1966

Objectives:

- The advancement of science and practice of wind engineering.
- The solution of national wind engineering problems through transfer of new knowledge into practice.

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