



How wind engineers can promote mitigation and reduce losses due to wind and other natural hazards

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ABSTRACT

The devastating damage in Darwin following Cyclone Tracy spurred increased research into wind loads and the performance of building materials. This research led to significant changes to building codes and test standards in Australia. In the United States, Hurricane Andrew in 1992 had a very similar impact on the state of Florida which ultimately led to the statewide adoption of the Florida Building Code (FBC) in 2002. Field observations following Hurricane Ian that impacted the Fort Myers area in 2022 have shown that structural damage was virtually eliminated for homes constructed after 2002 to the modern FBC. However, roof covers continue to experience high failure rates. There is still work to be done to better understand wind loads and emerging technologies (e.g., air-permeable systems, pavers, wall cladding systems, roof-mounted solar panels). Given our current state of understanding, the three factors that will have the biggest impact on reducing damage due to high winds are:

- *development of product test standards that represent the true performance of materials under realistic wind loading,*
- *universal adoption of modern building codes, and*
- *enforcement and inspection of construction.*

Building on the pioneering work at the Cyclone Testing Station, state-of-the-art full-scale testing is discussed along with the broader application of wind engineering expertise. Expertise that is also critical in the understanding of the spread of wildfire and how to prevent catastrophic suburban conflagration events such as those in the Camp Fire in Paradise, CA (2018) and in Lahaina, HI in 2023.

The consequences of natural hazards are rising across the globe. This rising risk demands new, proactive approaches and scientific innovation—and, in the author’s opinion, wind engineers must seize opportunities to be at the center of the conversation. We must actively pursue opportunities to take research from the academy to the arena, to bring our expertise into multidisciplinary scientific and policy discussions, and to promote mitigation activities that will affect positive change in communities.