

IMPROVING THE RESILIENCE OF EXISTING HOUSING TO SEVERE WIND EVENTS



David Henderson¹, John Ginger¹, Martin Wehner²

¹ Cyclone Testing Station, James Cook University, QLD ² Geoscience Australia, ACT

Typically, older houses do not offer the same level of performance and protection during windstorms as houses constructed to contemporary building standards [1, 2, 3]. Many of us live in older homes that contribute a higher proportion to community wind risk. This project will investigate windstorm risk mitigation by developing vulnerability models for structural strength of representative housing types, and evaluate potential upgrading and retrofitting of older houses.

This project has just commenced and the following points are a brief outline:

- ▶ The proposed work will categorise houses into types based on the building features that influence windstorm vulnerability, using survey data collected by Geoscience Australia and CTS-JCU. From these, a suite will be selected representing those contributing most to windstorm risk.
- ▶ This project will involve end-users and stakeholders to assess amendments and provide feedback on practicality and aesthetics of potential upgrading methods for a range of buildings. Strategies will be developed and costed for key house types.
- ▶ Vulnerability functions will be developed for each retrofit strategy, using survey data, author's vulnerability models and NEXIS. Case studies will be used to evaluate effectiveness in risk reduction. Economic assessment using the same case studies, will be used to promote uptake of practical retrofit options.



There are existing guidelines for the upgrading of older houses [4, 5] that were released nearly 20 years ago. However, there has been minimal uptake, as is evident by recurring severe wind damage to older houses. Existing details and methods will be reviewed to consider reasons for lack of use.



GOAL

The uptake of retrofitting and maintenance of house structure will increase community resilience and reduce the needs of response and recovery following severe wind events.

Promotion of retrofit investment by the home owner is needed.

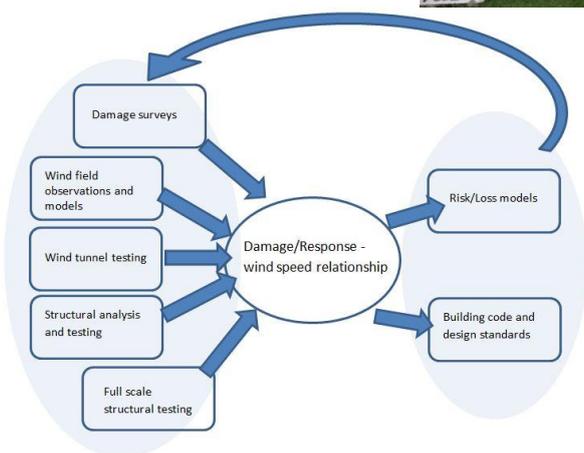
Incentives to encourage this action through insurance and government initiatives can be based on the economic modelling from this project.

Contact

This is a significant and long term project. The Cyclone Testing Station would like to hear from any organisation that would like to be involved. Anyone who is interested is welcome to contact David Henderson at david.henderson@jcu.edu.au

References

- [1] Henderson, D., Ginger, J., Leitch, C., Boughton, G. and Falck, D. (2006). *Tropical Cyclone Larry - Damage to buildings in the Innisfail area*. Cyclone Testing Station, James Cook University, Report TR51.
- [2] Leitch C., Ginger J., Harper B., Kim P., Jayasinghe N., and Somerville., (2009) *Investigation of Performance of Housing in Brisbane Following Storms on 16 and 19 November 2008*, Cyclone Testing Station, James Cook University, Report TR55
- [3] Boughton G., Henderson D., Ginger J., Holmes J., Walker G., Leitch C., Somerville L., Frye U., Jayasinghe N. and Kim P. (2011). *Tropical Cyclone Yasi: Structural damage to buildings*. Cyclone Testing Station, JCU, Report TR57.
- [4] Standards Australia (1999). *HB 132.1:1999 Structural upgrading of older houses, Part 1: Non-cyclonic areas*.
- [5] Standards Australia (1999). *HB 132.2:1999 Structural upgrading of older houses, Part 2: Cyclone areas*.



Australian Government
Geoscience Australia