

PRESS RELEASE

TO: Editor in Charge

CONTACT: Janet Scheffer, Mana Means Communications, (808) 521-1160

DATE: November 2, 2017



Building Hawaii Homes to Withstand Hurricanes

(Honolulu, Hawaii) November 2, 2017 - As seasoned islanders know, June 1st through November 30th is 'Hurricane Season' for the Central Pacific. With hurricanes and heavy storms hitting the eastern United States this year, it's important to think about hurricane-proofing our homes.

Hawaii's older homes, especially those built prior to 1980, are particularly susceptible to damage during tropical storms and hurricanes due to building standards of the time. As high-wind consideration codes were added, some counties adopted the International Residential Code after 2000, which considers wind speeds not exceeding 100mph. With a hurricane being classed as a tropical cyclone with maximum sustained winds above 74mph, it is possible homes following this Code would sustain structural damage during a category 2 hurricane or stronger.¹

Topography can also significantly affect windspeed when dealing with natural disasters. With Hawaii's peaks and valleys, some areas of the islands could see windspeeds significantly higher than 120mph.

When constructed to current building code standards, wood performed very well in the event of high winds. Throughout history, wood-framed dwellings have survived wind, flooding, and quakes due to its flexibility. In fact, two of the oldest forms of construction, post and beam and log cabins, can withstand earthquakes, tornados, and hurricanes.

There are a few things to consider when retrofitting or building your home with wood to provide a safer dwelling.

...continued

¹ Buildings permitted under the International Residential Code do not have engineering requirements. Buildings permitted under the International Building Code have engineering requirements and should be able to withstand higher wind speeds. It is always important to check which Code was used when retrofitting.

1. Continuous Load Path:

A continuous load path is a way to construct the house that acts as a chain that ties the roof to the foundation using wood, metal connectors, fasteners (like nails and screws), and shear walls.

Having a home with a continuous load path is critical during an earthquake or hurricane because it grounds any outside pressures that try to pull the home apart. Therefore, a home is more likely to withstand a seismic or high wind event, and stay structurally intact, when all parts of the house – roof, walls, floors, and foundation – are connected using this construction technique.²

2. Home Framing:

Extra framing around windows and doors can also help strengthen a continuous load path, as openings often take a higher wind load. Extra 2x4's or 2x6's are recommended to beef up weaker spots. Hurricane clips can also offer extra support for beams, posts, and openings.

3. Wood Strength:

Well-designed wood frame homes constructed using the latest building code provisions performed very well structurally in high hurricane winds.³ Certain wood varieties can withstand 150 mph.

The species of wood predominantly used in Hawaii is Douglas Fir. Douglas Fir is often the standard against which all other framing species are measured due to its superior strength-to-weight ratio, high specific gravity, dimensional stability, and moderate decay resistance of its heartwood. These attributes have given Douglas Fir an excellent performance record against strong winds, storms, and earthquakes.

In addition to its superior framing qualities, Douglas Fir is also tightly knotted and close grained, giving it the added appeal of appearance. The color, grain pattern, knot size and type are addressed in the rules for appearance grades.

4. Roof Design:

In the case of new construction, home design plays a large part in wind uplift. For example, Hipped (or Hip) roofs, as used by Native Hawaiians in construction, perform better under high wind uplift than traditional Gable roofs. Hip roofs are more aerodynamic and create a more stable load path due to their sloping sides.

One example of a successful hipped roof is seen on the Honolulu Museum of Art's Beretania Street campus.

...continued

² Some homes permitted under the International Residential Code do not have a properly engineered continuous load path for higher wind uplift.

³ As seen by residences in Florida in the wake of Hurricane Charley in 2004.

5. Building for Floodwater:

During natural disasters, flooding is imminent, especially in low-lying valleys across the islands. Using wood that follows FEMA's Flood Damage-Resistant Materials Requirements⁴ is essential in reducing damage during hurricanes.

Structural materials, including beams, subfloors, and framing, should be treated with a product that has been approved for its application. Most homes in Hawaii today are built with Douglas Fir wood treated with borates (often known by its tradename Hi-Bor). Wood products in direct contact with the ground or left exposed to weather will require treatment with preservatives such as alkaline copper quaternary (ACQ) or copper azole (C-A). Other treated wood includes recycled plastic lumber (RPL), fiber-reinforced wood, or high-density polyethylene (HDPE) plywood, up to 95%.

For more building references, please visit Hawaii Lumber Product Association's building professional resource page <http://hawaiilumber.com/lumber-links.php>

#

⁴ https://www.fema.gov/media-library-data/20130726-1502-20490-4764/fema_tb_2_rev1.pdf