

The Capacity of Shear-walls Made with Caribbean Timber Species

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Abstract: *Timber has traditionally been used to construct buildings in the Caribbean, and is still utilised fairly extensively in low-rise residential buildings. These timber buildings are generally non-engineered structures and perform poorly when subjected to hurricane forces. Improved hurricane performance could be achieved by understanding the complex load transfer mechanisms in buildings subjected to wind loads. The lateral force-resisting system comprises the diaphragms (roof and floors) and shear-walls. The shear-walls are the primary structural sub-component responsible for providing lateral load-resistance capacity in timber buildings. Robust design of these elements is predicated on the availability of reliable shear-wall capacity data and engineering design properties for the relevant timber species. However, design data are not available for Caribbean timber species. Experimental research was conducted on nailed, plywood-sheathed shear-walls with Caribbean Pitch Pine framing to produce shear capacity data, which in-turn can inform the design of hurricane-resistant buildings using these Caribbean timber species in accordance with the National Design Specification for Wood Construction (NDS-2005) and the Special Design Provisions for Wind and Seismic Design (SPDWS-2005) codes. A total of ten shear-walls were tested in accordance with the American Standard for Testing Materials, ASTM E-564 procedures. The results obtained from this testing programme were compared with results from the SPDWS-2005 for wood-frame plywood shear-walls of similar construction.*

Keywords: *Timber, Buildings, Shear-walls, Racking, Hurricane forces, Lateral loads*