

Impact Resistance of Residential Wall Systems to Wind-Borne Debris

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Abstract:

Typical wood frame residential wall assemblies with oriented strandboard sheathing and either fiber cement siding, vinyl siding, or brick veneer were tested to determine their resistance to hurricane and tornado generated missiles. Most of the tests were performed using a 9 lb (40 N) 2 x 4 in. (50 x100 mm) timber, which is the standard for hurricane missiles. The perforation speed for the fiber cement siding and vinyl siding was 25 mph (40 km/hr). This was only slightly greater than the perforation speed for just the 1/2 in. (13 mm) oriented strandboard sheathing, which was determined to be between 22 and 25 mph (35 to 40 km/hr). The perforation speed for the brick veneer is in excess of 80 mph (129 km/hr). The speed of 80 mph (129 km/hr) greatly exceeds the 34 mph (55 km/hr) required for high velocity hurricane zones in the Florida Building Code. Brick veneer anchor spacing did not appear to affect the behavior. The results of the 15 lb (67 N) tornado missile indicated a perforation speed of approximately 50 mph (80 km/hr) for the brick veneer. Brick veneer by itself does not provide sufficient missile penetration resistance for a tornado safe room. However, it does offer substantially greater resistance than other types of siding.

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