

Structural Behavior of Tie Connections for Residential Brick Veneer Construction

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Abstract:

Laboratory testing was conducted on brick-tie-wood connection subassemblies representing residential anchored brick veneer construction, to explore the effects of tie thickness, tie attachment method, tie eccentricity, and tie embedment length on the strength and stiffness of typical brick veneer corrugated sheet metal tie connections. Experimental results were then used in analytical models of brick veneer wall panels to assess the effects of different tie connection installation procedures on wall system performance. Some veneer tie connections tested that did not meet current minimum installation requirements exhibited significantly lower strength and stiffness (vs. connections that met the minimum specified installation criteria). Tie connection strength and stiffness were each found to affect the ultimate out-of-plane strength of brick veneer wall panel models; the overall leeward wind pressure capacity of brick veneer walls utilizing short roofing nails for attachment to the wood backup was found likely to be inadequate for many applications. The combined experimental and analytical approach presented can serve as a rational method for evaluating a wide variety of tie installation scenarios, toward continued assessment of evolving prescriptive design and construction specifications for residential brick veneer.

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