

Performance of Poor-Quality Indigenous Brick Walls Strengthened by GFRP

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Abstract:

A laboratory study was conducted to evaluate the effectiveness of two types of composite reinforcement systems that are surface-applied to masonry walls to improve seismic performance. The walls were designed to mimic poor-quality indigenous bricks used in many developing countries and their methods of construction. In-plane cyclic load tests on three double-wythe panels and out-of-plane cyclic load tests on 19 double-wythe narrow wall sections were conducted. A bare (unimproved) wall and narrow wall sections, and walls and narrow wall sections strengthened with glass fiber reinforced polymer (GFRP) were tested. The two GFRP systems used were SikaWrap Hex 100G and Saint Gobain Tech-Feb Super FibaCrete (SFC). Issues to be addressed were the lack of adequate in-plane shear strength to resist lateral loads and the lack of minimum reinforcement within the walls. In-plane and out-of-plane resistance to shear and bending were significantly improved using the GFRP overlay reinforcement systems.

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