

Behavior and Design of Multi-Story Masonry Walls under In-Plane Seismic Loading

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Abstract:

Two types of full-scale concrete masonry specimens with openings, reinforced and grouted, were constructed and tested in the laboratory. Each specimen was loaded vertically by constant loads representing gravity loads on the shear walls' tributary areas, and horizontally by quasi-static, reversed in-plane shear loads at the two floor levels. Observed behavior was compared with design assumptions and analytical predictions. Based on the test results and analytical predictions, a general design approach is proposed for coupled and perforated walls of reinforced masonry subjected to seismic loadings. The proposed approach leads to masonry walls with predictable strength and stable load-deflection behavior under many cycles of reversed cyclic load, and is recommended for design of reinforced masonry walls in seismic zones.

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