A Moment Magnification Approach for Unreinforced Masonry Design

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Abstract:

The 2008 Building Code Requirements for Masonry Structures developed by the Masonry Standards Joint Committee incorporated a moment magnification method to account for second-order effects in the strength design of unreinforced bearing walls. The background of the code development of the moment magnification method is presented. Three methods for accounting for second-order effects, complementary moment design, long column reduction factor, and moment magnifier, were considered. The complementary moment design and the long column reduction factor are used for strength design of reinforced masonry. However, due to its rationality, accuracy, and familiarity, the moment magnification method was chosen for unreinforced masonry design. A slenderness ratio for which second-order effects do not need to be included is determined. An intermediate slenderness ratio is also determined, for which second-order effects do not need to be included provided the design strength is reduced. The moment magnification strength design approach is compared to allowable stress design. The method is validated by comparison to test results.

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