

# Concepts of Shear Friction Applied to Masonry Shear Walls

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## Abstract:

Currently, the TMS-402 *Building Code Requirements for Masonry Structures* (2011) contains no provisions for shear friction in concrete and clay masonry wall construction. Various concrete and masonry codes have equations that are primarily based upon Mohr Coulomb theory with a coefficient of friction applied to the summation of the axial load and vertical reinforcement contribution in a wall. A shear friction equation is proposed in which the contribution to friction from applied normal force and vertical reinforcement are separated. The coefficient from applied normal force is obtained from previous unreinforced masonry tests and from inclined plane tests. The inclined plane tests examined sliding with various joint roughness conditions including block-on-block, a broken bed joint, block on a trowel-smoothed mortar joint, and joints subjected to cycles of pushing and pulling. A coefficient of friction of 0.80 is proposed for this contribution. The contribution of vertical reinforcement perpendicular to the sliding surface, herein referred to as the steel efficiency factor, was obtained based upon previously reported dowel tests, with a value of 0.45 being proposed. The proposed model is compared to full-scale wall tests and was found to decrease the variability in prediction by almost a factor of two for concrete masonry over models that combine both the axial load and steel contribution terms and utilize only one coefficient.

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**DOI: 10.70803/001c.137820**

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