

Stress Distributions in Hollow Masonry Due To Concentrated Loading

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Abstract:

Vertical concentrated loads, such as floor or roof beam loads, are frequently imposed upon masonry walls. However, little is known about the dissipation of these loads in hollow concrete unit masonry walls. Three dimensional finite element analyses were performed to assess the elastic stress distributions considering the effects of geometry and modular ratio between units and mortar. Two types of lateral tensile stress were observed, i.e., "splitting" stress which occur some distance below the load and, "tearing" stress which occur at the top of a wall adjacent to the loads. Distributions of lateral stress in the face shells and webs were obtained and three flexural mechanisms of behavior were identified.

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