

Load Capacity of Dry-Stack Masonry Walls

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Abstract:

An experimental study was performed to investigate the capacity and behaviour of dry-stack interlocking masonry units and walls subjected to axial compression, lateral tension and bending parallel and perpendicular to the bed joint. Walls of 3 m (118.11 in.) width and 2.5 m (98.43 in.) height were built using interlocking blocks and subjected to axial compression. Three full-scale dry-stack interlocking masonry wall systems were tested under lateral loading with three different span lengths: 1.5 m (59.1 in.), 3 m (118.11 in.) and 6 m (236.22 in.). Further tests on six scale models (prisms) were subjected to flexural bending parallel and perpendicular to the bed joint. This paper highlights the experimental set-up and reports the failure loads, modes of failure and general structural behaviour under in-plane and out-of-plane loading. The test results were used as a basis for the development of a model for the prediction of the load capacity of the dry-stack system. Comparison between the experimental and computed results shows good agreement.

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