

## Performance Analysis of Ferrocement Retrofitted Masonry Wall Units under Cyclic Loading

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**Abstract :** A huge portion of old masonry buildings in Bangladesh are vulnerable to earthquake. In most of the cases these buildings contain unreinforced masonry wall which are most likely to be subjected to earthquake damages. Due to deterioration of mortar joint and aging, shear resistance of these unreinforced masonry walls dwindle. So, retrofitting of these old buildings has become an important issue. Among many researched and experimented techniques, ferrocement retrofitting can be a low cost technique in context of the economic condition of Bangladesh. This study aims at investigating the behavior of ferrocement retrofitted unconfined URM walls under different types of cyclic loading. Four 725 mm  $\times$  725 mm masonry wall units were prepared with bricks jointed by stretcher bond with 12.5 mm mortar between two adjacent layers of bricks. To compare the effectiveness of ferrocement retrofitting a particular type wire mesh was used in this experiment which is 20 gauge woven wire mesh with 12.5 mm  $\times$  12.5 mm square opening. After retrofitting with ferrocement these wall units were tested by applying cyclic deformation along the diagonals of the specimens. Then a comparative study was performed between the retrofitted specimens and control specimens for both partially reversed cyclic load condition and cyclic compression load condition. The experiment results show that ultimate load carrying capacities of ferrocement retrofitted specimens are 35% and 27% greater than the control specimen under partially reversed cyclic loading and cyclic compression respectively. And before failure the deformations of ferrocement retrofitted specimens are 43% and 33% greater than the control specimen under reversed cyclic loading and cyclic compression respectively. Therefore, the test results show that the ultimate load carrying capacity and ductility of ferrocement retrofitted specimens have improved.

**Keywords :** cyclic compression, cyclic loading, ferrocement, masonry wall, partially reversed cyclic load, retrofitting

**Conference Title :** ICSRRS 2018 : International Conference on Structural Rehabilitation, Retrofitting and Strengthening

**Conference Location :** Dubai, United Arab Emirates

**Conference Dates :** November 19-20, 2018