

Triplet Shear Tests on Retrofitted Brickwork Masonry Walls

Authors : Berna Istegun, Erkan Celebi

Abstract : The main objective of this experimental study is to assess the shear strength and the crack behavior of the triplets built of perforated brickwork masonry elements. In order to observe the influence of shear resistance and energy dissipating before and after retrofitting applications by using the reinforcing system, static-cyclic shear tests were employed in the structural mechanics laboratory of Sakarya University. The reinforcing system is composed of hybrid multi-axial seismic fabric consisting of alkali resistant glass and polypropylene fibers. The plaster as bonding material used in the specimen's retrofitting consists of expanded glass granular. In order to acquire exact measuring data about the failure behavior of the two mortar joints under shear stressing, vertical load-controlled cylinder having force capacity of 50 kN and loading rate of 1.5 mm/min. with an internal inductive displacement transducers is carried out perpendicular to the triplet specimens. In this study, a total of six triplet specimens with textile reinforcement were prepared for these shear bond tests. The three of them were produced as single-sided reinforced triplets with seismic fabric, while the others were strengthened on both sides. In addition, three triplet specimens without retrofitting and plaster were also tested as reference samples. The obtained test results were given in the manner of force-displacement relationships, ductility coefficients and shear strength parameters comparatively. It is concluded that two-side seismic textile applications on masonry elements with relevant plaster have considerably increased the shear force resistance and the ductility capacity.

Keywords : expanded glass granular, perforated brickwork, retrofitting, seismic fabric, triplet shear tests

Conference Title : ICUEEUS 2017 : International Conference on Urban Earthquake Engineering and Urban Systems

Conference Location : Prague, Czechia

Conference Dates : September 04-05, 2017