

Performance of Wall Structures With Lime Stone Mortar Adhesive As Materials for Restoration of Heritage Buildings

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ABSTRACT

This study aims to determine the shear strength and flexural strength of red brick masonry, determine the adequate thickness of quenched lime mortar with a mixture ratio of 1Kp:2Ps, and determine the failure pattern of red brick masonry due to the load received during the direct shear and flexural strength test.

The research was conducted by experimental method. The tests carried out were the direct shear and flexural strength tests. Variation of successive mortar thickness of 1 cm; 1,5 cm; and 2 cm. Each thickness variation consists of 3 specimens, so there are 18 specimens. Data analysis used descriptive quantitative by finding the average value of the red bricks shear strength and flexural strength.

Based on the research results, the average compressive strength and split tensile strength of the mortar were 0,613 MPa and 0,0414 MPa. The average compressive strength of red brick is 3,43 MPa. The average shear strength of red masonry with a variation of 1 cm; 1,5cm; and 2 cm mortar thickness, respectively of 0,025 MPa; 0,020 MPa; and 0,016 MPa. The average flexural strength of red bricks with a variation of 1 cm; 1.5cm; and 2 cm mortar thickness, respectively of 0,034 MPa; 0,045 MPa; and 0,041 MPa. In the masonry shear test, the adequate thickness of the mortar was found at a thickness of 1 cm with a maximum shear strength of 0,025 MPa. In contrast, in the flexural test of the masonry, the adequate thickness of the mortar was found to be a thickness of 1,5 cm with a maximum flexural strength of 0,045 MPa. The pattern of failure in the direct shear strength and flexural strength tests of red bricks is included in the mortar failure.

Kata Kunci: shear strength, flexural strength, lime mortar, masonry, damage pattern