VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELGAUM – 590 014

A DISSERTATION

On

"FLEXURAL BEHAVIOUR OF GFRP WRAPPED MASONRY BEAMS"

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Submitted in partial fulfillment of the requirement for the award of the degree of

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"STRUCTURAL ENGINEERING"

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ABSTRACT

Experimental data of strengthened reinforced masonry beam specimens are presented in this study. Strengthening was attained with the adhesion of glass fiber reinforced polymer (GFRP) sheets to the tension side of the reinforced brick masonry beam specimens. The degree of composite behavior of a layered member is largely dependent on the behavior of the connection functioning to resist the tendency of the layers to slip relative to each other. For this project it was proposed to connect the GFRP sheet and masonry beams with resins Nitowrap 410 and Nitoprime 25 in addition anchored Bolts of 6 mm dia were also provided at the both ends ie. L/3 of the beam to act as shear key. 6 numbers of bolts were provided at each side. The flexural capacity and central deflection of the strengthened groups of brick masonry beam were compared with those of brick masonry beam specimens of the control group to evaluate the effectiveness of strengthening techniques. The results indicated that the flexural strength of reinforced brick masonry beam can be increased by gluing GFRP sheets to the tension face. The increases in the load capacities of the brick masonry beam due to wrapping are discussed at service, yield and ultimate load levels. Furthermore, the influence of the wrapping on the structural ductility and mode of failure are also presented.

Keywords: Brick masonry walls, composites, FRP, sheets, strengthening, shear key.