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REHABILITATION OF INFRASTRUCTURE USING EXTERNALLY BONDED FRP COMPOSITES

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ABSTRACT

The aim of this paper is to highlight effectiveness and efficiency of externally bonded fiber reinforced polymer (FRP) composites in rehabilitating various components of Infrastructure. The components considered for the rehabilitation are reinforced concrete (RC) beams, columns, beam-column joints, un-reinforced masonry walls and Infill walls. The results presented in this paper are the outcomes of various sponsored research projects, carried out by the authors during last decade.

1. INTRODUCTION

Rehabilitation of reinforced concrete (RC) and other structures using advanced fiber-reinforced polymer (FRP) composites has become very popular in the last few years [1-16]. This is due to the needs for upgrading many essential infrastructure in all parts of the world, and the well-known advantages of FRP composites including both good resistance and ease for site handling due to their light weight. The continuous reduction in the material cost of FRP composites has also contributed to their popularity.

Nowadays, different types and shapes of FRP materials are commercially produced. Carbon FRP (CFRP), Glass FRP(GFRP), and Aramid FRP (AFRP) are some of the well known FRP types. They are available in rods, fabrics, and strands. They are also produced in one, two, and three-dimensional fabrics and rods. The FRP, in comparison to steel, are still expensive but due to their superior characteristics; for example, 100 kg of steel can be replaced by 5 kg of CFRP to provide the same strengthening capability for a bridge, [11]; there is an indispensable and keen tendency toward using FRP to rehabilitate infrastructures.

In this paper, authors have studied effectiveness and efficiency of externally bonded fiber reinforced polymer (FRP) composites in rehabilitating various components of Infrastructure. The components considered for the rehabilitation are reinforced concrete (RC) beams, columns, beam-column joints, un-reinforced masonry walls and Infill walls. The results presented in this paper are the outcomes of various sponsored research projects, carried out by the authors during last decade.