228_Experimental Study on Strengthening of Load Bearing Structures by Ferrocement Lamination

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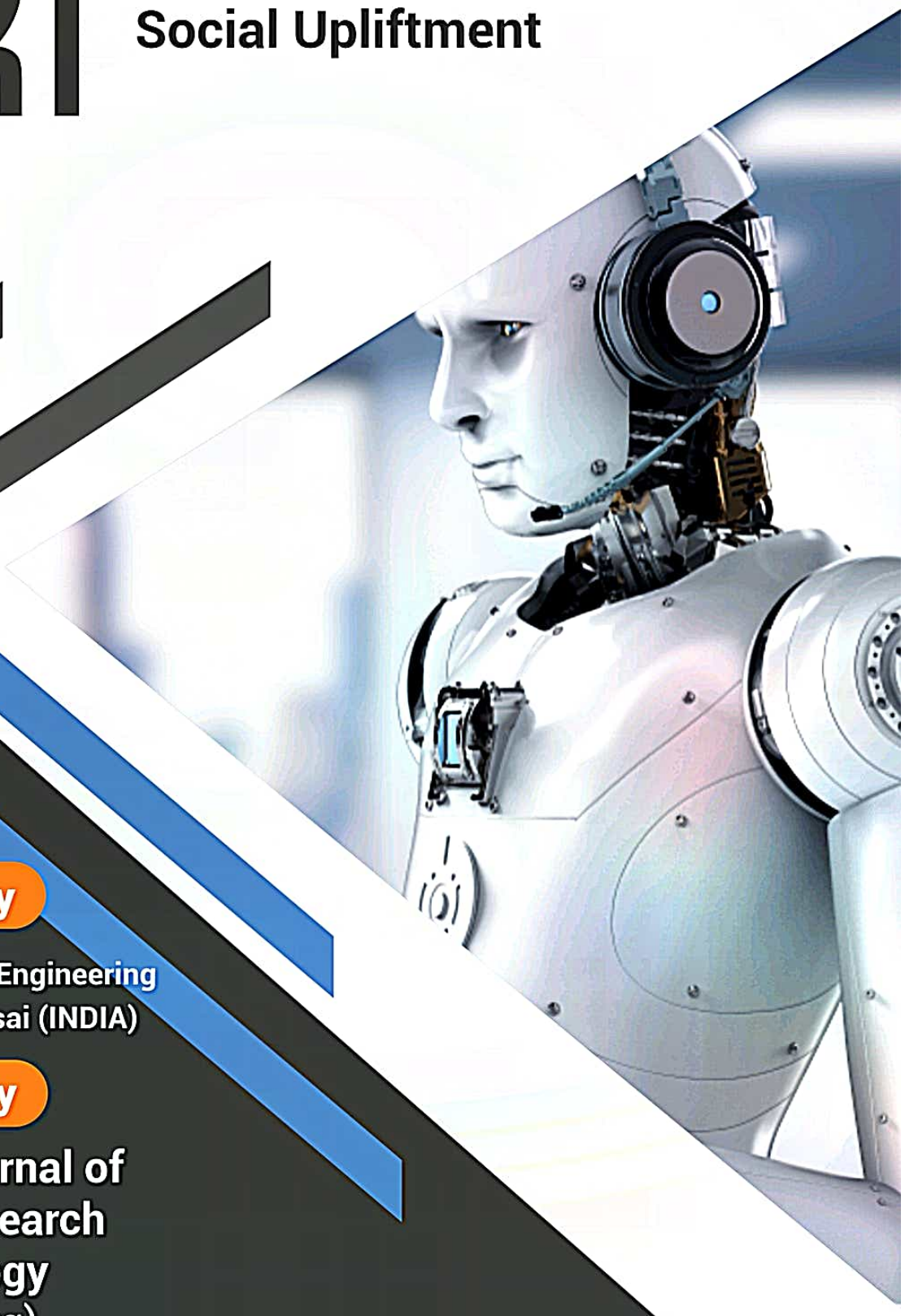

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Experimental Study on Strengthening of Load Bearing Structures by Ferrocement Lamination

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Abstract— **Ferrocement can be used as a retrofitting material due to its property of quick application on a damaged element without requirement of special bonding material with less skilled labours. The aim of this research is to provide ferrocement lamination to preexisting brick masonry structures as well as pre-damaged brick masonry structures and observe the increase in load bearing capacity of the structure. In recent years, repairs of damaged and unstrengthened members by external repair technique of bonding such as ferrocement lamination is increasing which demands needs of research work on behaviour of ferrocement confinement of column with ferrocement laminates considering the change in parameters. Brick is perhaps the oldest manmade material used in the building construction. The strength of brick masonry work depends upon the compressive strength of the bricks and mortar used. Brick masonry is primarily used as load bearing walls to carry out vertical loads. In these work, an attempt has been made to identify the increase in load carrying capacity under the application of point load on damaged walls after providing lamination with ferrocement. This paper aims to study the work carried out for strengthening of load bearing structures by ferrocement lamination on existing brick masonry as well as predamaged structures before collapse.**

Keywords—Ferrocemnt, lamination, retrofitting, brickwork.

I. INTRODUCTION

As compared to the present era, brick work are the oldest housing systems that humans have created. Compressive strength of the brick and the type of mortar used are the two factors on which strength of masonry wall depends. The primary use of brick masonry walls is that it is used as load bearing walls to carry vertical loads. The setup of reinforced mortar or plaster over layers of chicken mesh or metal wire mesh or fibers and possibly closely spaced small diameter steel rod such as rebar is called as ferrocement or ferrocrete. It is a flexible material which contributes much less to pollution and does not requires skilled labours and can be constructed with locally available materials that eventually reduces the cost of construction.

Wire mesh used can be available in different forms such as square, hexagonal, diamond shape which may be either steel or galvanized in nature. The alignment or aspect of reinforcement which is the angle in degree between reinforcement mesh provided and particular direction of applied stress has also a specific importance or consideration related to compressive strength of ferrocement. Ferrocement applications in water tightening structures like swimming pool, retaining wall, water tank, etc. have been in need of this concept. In ferrocrete, cement mortar mix does not crack as these forces that contribute to the cracking are taken by the steel wire mesh provided immediately below the surface. The overhaul of the particular damaged structural component or element is one of the best remedial measures instead of replacing it. The overhaul of the structure can be done basically in two ways i.e. global or local. In local method only the part damaged or to be repaired is provided with retrofitting whereas in case of global method the whole structure has to be retrofitted. Lamination construction around the structure is a preferred method of retrofitting. One of the best advantage of ferrocement is that it can be casted into any shape having higher degree of complexity without making it costlier in case of formwork. Strength enhancement and retrofitting are the two major areas where engineers are finding issues. Many of the individuals have recommended ferrocement as the enveloping material for strengthening of various structural components.

II. LITERATURE REVIEW

There has been a lot of research work about uprising trend of ferrocement applications in repairs and retrofitting of damaged structures in the construction era. The following are the 10 literature reviews done for this research: