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WORK ON REHABILITATION AND RETROFITTING OF CONCRETE

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ABSTRACT
Normal M20 grade of concrete is prepared and similar geopolymer concrete. Cement mortar and geopolymer mortar is prepared strength testing of conventional concrete and geopolymer concrete is done Rehabilitation of cubes are done for partially failed cubes and then reterofitting is done for unfailed and unused cubes. Then test for strength ie' compressive, tensile and flexural is done and results are tabulated. In the true sense, concrete is thus the real building material rather than the ingredients like cement and aggregates, which are only intermediate products. This concept of treating concrete as an entity is symbolized with the progress of ready-mixed concrete industry, where the consumer can specify the concrete of his needs without bothering about the ingredients; and further in precast concrete industry where the consumer obtains the finished structural components satisfying the performance requirements. One of the boat build by him, still in remarkably good condition, is on display in the museum at Brignoles, France. There was very little application of true ferrocement construction between 1888 & 1942 when Pier Luigi Nervi
began a series of experiments on ferrocement. By judicious use of available materials for concrete making and their proportioning, concrete mixes are produced to have the desired properties in the fresh and hardened states, as the situation demands. Retrofitting with FRP materials is a technically sound and cost effective repair technology and is now extensively being used as a seismic retrofitting method all over the world. Due to its small thickness, the self weight of ferrocement elements per unit area is quite small. The thickness of ferrocement elements normally ranges from 10mm to 40mm.

Keywords:
Ferrocement laminates, confinement, rehabilitation ,retrofitting, compressive strength

1. Introduction

Concrete is by far the most widely-used man-made construction material and studies indicating that it will continue to be so in the years and decades to come. Such versatility of concrete is due to the fact that from the common ingredients, namely, cement, aggregate and water (and sometimes admixtures), it is possible to tailor the properties of concrete so as to meet the demands of any particular situation. In the true sense, concrete is thus the real building material rather than the ingredients like cement and aggregates, which are only intermediate products. This concept of treating concrete as an entity is symbolized with the progress of ready-mixed concrete industry, where the consumer can specify the

concrete of his needs without bothering about the ingredients; and further in pre-cast concrete industry where the consumer obtains the finished structural components satisfying the performance requirements. Therefore, treating concrete in its entity as a building material. In this context a concrete mix forms a 'system'. Concrete mixes are also characterized by the fact that, unlike the other common structural materials like steel, these are mostly manufactured at site; the inherent variability of their properties and need for proper quality control, therefore, become important considerations.
Concrete mixes are classified in a number of ways, often depending upon the type of specifications, which are broadly of two types; the 'prescriptive' specifications where the proportions of the ingredients and their characteristics (namely, type of cement, maximum size of aggregate, etc.) are specified, with the hope that adherence to such prescriptive specification will result in satisfactory performance. Alternately, a 'performance' oriented
specification can be used wherein. The requirements of the desirable properties of concrete are specified (example - strength, workability or any other property). Concrete is accepted on the basis of these requirements being satisfied, and the choice of materials and mix

2. Literature
Mahbuba Begum et al (2010) Many structures located in seismically active zones are not capable of withstanding seismic action according to current codes and provisions. Furthermore, recent earthquakes in urban areas have clearly demonstrated an urgency to upgrade and strengthen these seismic deficient structures. Significant amount of research work has been carried out in recent years to develop various strengthening and rehabilitation techniques to improve the seismic performance of structures. Several strengthening methods like addition of new structural elements; external post tensioning, steel plate bonding etc. has been applied in the past with varying degree of success. Among these methods, seismic retrofit with FRP materials has gained notable acceptance from the civil engineering community in recent years. Retrofitting with FRP materials is a technically sound and cost effective repair technology and is now extensively being used as a seismic retrofitting method all over the world. using FRP materials as a retrofitting technique for the structures not designed to resist seismic action has got a new value in the modern retrofitting works . There is huge scope and uses of FRP materials in seismic strengthening of RC structures and masonry retrofitting as well as the seismic retrofitting schemes for steel structures. There are many advantages and limitations of FRP materials .• Zahra Riahi et al (2008) seismic retrofit of deficient reinforced concrete (RC) bridges whose vulnerability has been demonstrated repeatedly in previous seismic events. A class of high performance materials, Fiber Reinforced Polymer composites (FRP), with versatile applications in repair and rehabilitation has been used for this purpose. Mechanical and durability properties of externally bonded FRP's, FRP materials have their merits over conventional materials and retrofit techniques, general seismic flaws and failure modes, and the effects of FRP wraps on the seismic performance oflateral load resisting components of RC bridges are investigated, and practical solutions which help improve the strength of structures have been proposed. MOHAMMED R EHSANI et al (1990-91) The CFRP sheets which are epoxy bonded to the tension face and web of concrete beams and columns to enhance their compression, flexural and shear strengths . The results of an experimental and analytical study of the behaviour of damaged or under strength concrete beams retrofitted with thin carbon fiber-reinforced (CFRP) sheets revealed that CFRP sheets can be used as an effective rehabilitation and retrofitting material. The effect of CFRP sheets on strength and stiffness of the beams is considered for various orientations of the fibers with respect to the axis of the beam. Nineteen beams and many columns were fabricated ,loaded beyond concrete cracking strength ,and retrofitted with three different CFRP systems .The beams were subsequently loaded to failure .Different modes of failure and gain in the ultimate strength were observed ,depending on the orientation of the fibers.

3. Result and Discussion

	CONCRETECUBE in N/mm^2

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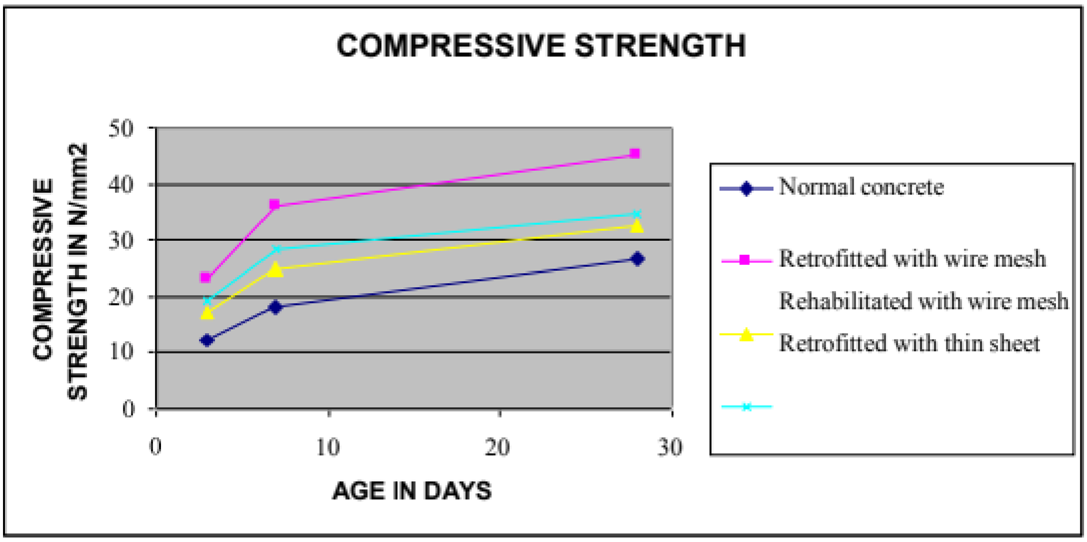
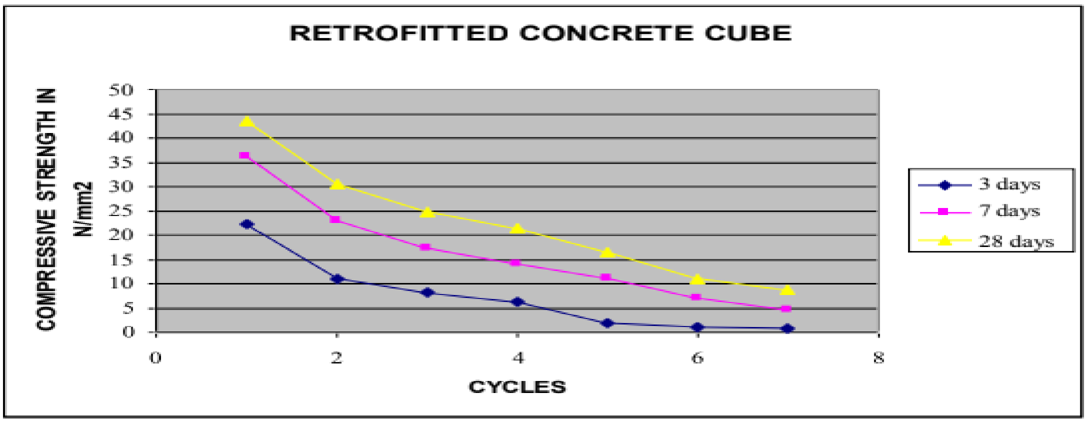
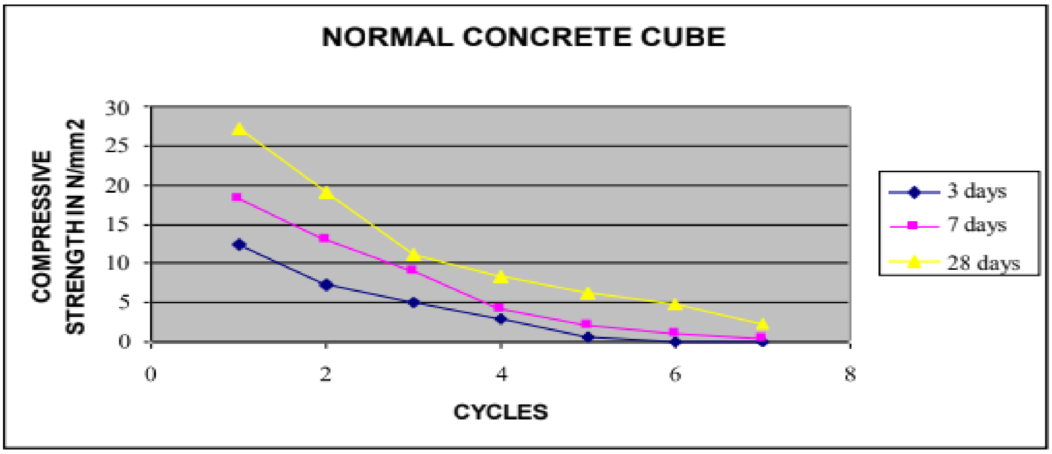
AGEINDAYS	Normal concrete	Retrofittedwith wiremesh	Rehabilitated withwiremesh	Retrofittedwith thinsheet
3	12.3	22.94	17.3	19.14
7	18.2	36.13	24.8	28.2
28	26.49	45.1	32.42	34.7



SlNo.	Cyclicloading of Retrofitted Concrete cube N/mm^2			Cyclicloading of Normal Concrete cube N/mm^2		
	3days	7days	28days	3days	7days	28days
1	22.17	36.3	43.6	12.3	18.2	27.21
2	11.14	22.9	30.45	7.4	13.1	19.11
3	8.09	17.34	24.96	5.01	9.0	11.11
4	6.32	14.05	21.46	2.94	4.3	8.44
5	2.01	10.97	16.38	0.54	2.1	6.22
6	1.11	6.99	11	00	1.01	4.89
7	0.83	4.67	8.61	00	0.50	2.22





CONCLUSION

1. Wire meshes can be used as Retrofitting and Rehabilitation successfully and economically.
2. Wire meshes increases column strength to more than two times gives large confinement to concrete. Hence column compressive strength increases.
3. Tensile and flexural capacity is marginally increased with wire mesh but there is significant ductility and deformability.
4. Wire meshes can be used for both Retrofitting and Rehabilitation for both beams and columns where column strength is almost double and beam strength is increased 10 to 15%.
5. Thin steelsheets behavior is also similar to wire mesh both in compression and flexure which can also be used successfully.
6. The above techniques are implemented at the site successfully through this experimental work .

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