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A Review on Compressive Strength of Ferrocement

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ABSTRACT
To study how ferrocement is alternative to conventional types of RCC, PCC, etc. and perform good against compression and is economical without required any skilled workers. On other hand ferrocement is good alternate material depends upon location of application. This study will also show that the load taken by ferrocement depends upon size and no. of reinforcing mesh layers used in ferrocement.
Keyword: Ferrocement, Wire Mesh, Concrete

I. INTRODUCTION

Ferrocement (likewise called slim shell concrete or ferro-concrete) is an arrangement of built up mortar or mortar (lime or concrete, sand and water) applied over layer of metal lattice, woven extended metal or metal-strands and firmly divided flimsy steel bars, for example, rebar. The metal usually utilized is iron or a steel of some sort. It is utilized to build somewhat slim, areas of strength for hard and structures in many shapes, for example, bodies for boats, shell rooftops, and water tanks. Ferrocement began during the 1840s in France and is the beginning of built up concrete. It has a wide scope of different purposes including model and pre-assembled fabricating parts. The expression "ferrocement" has been applied likewise to other composite materials, including a few containing no concrete and no ferrous material.

Concrete and cement are utilized conversely yet there are specialized qualifications and the importance of concrete has changed since the mid-nineteenth century when ferrocement began. Ferro-implies iron albeit metal usually utilized in ferro-concrete is the iron amalgam steel. Concrete in the nineteenth 100 years and prior implied mortar or broken stone or tile blended in with lime and water to shape areas of strength for a. Today concrete normally implies Portland concrete Mortar is a glue of a cover (generally Portland concrete), sand and water; and cement is a liquid combination of Portland concrete, sand, water and squashed stone total which is filled formwork (covering).

II. LITERATURE REVIEW

GursewakDass Volume 8, No. 4, May 2017 (Special Issue) in his paper entitled "Review Paper on Ferro cement in construction" has conducted ferrocement is better than conventional types RCC, PCC etc and perform good against lateral displacement, fire resistant etc economically without required any skilled worker. On other hand ferrocement is a good alternate material depends upon location of application. This study also shows that the load taken by ferrocement depends upon opening size and the no. of reinforcing mesh layer used in ferrocement.

It has been concluded Ferrocement is a good material. Further modification in ferrocement can make it best materials in structure as compared to RCC or other type of material and also ferrocement is economical in nature and having a good performance against lateral load.

Kamanuru Naga Deepika July, 2015 in his paper entitled "Experimental studys on Effects of Ferrocement" has conducted Ferro cement is a composite material made up of cement matrix and

reinforcement in the form of multiple layers of mesh Ferro cement structures are flexible and strong, due to the fact that they are thin and the steel reinforcement is distributed widely throughout the mortar. The present investigation aims the study on behavior of Ferro cement stab panels using self-compacting mortar (SCM) with varied W/C ratio, fly ash replacement and incorporating polypropylene fibers. Use of SCM instead of cement mortar in ferro cement slabs plays a vital role in order to eliminate the external vibration and to overcome the difficulties and problems in the construction process.

An experimental study has been carried out in ferro cement slabs by using self-compacting mortar to avoid the requirement of skilled mason and speedy in construction. The study indicates that the ferro cement slabs by using self-compacting mortar is possible.

R.Elavarasan, M.Ragapriya, S.R.Renjusha, N.M.Sangeetha, P.Soundariya Devi Volume 5, Issue-1, International Journal of Mathematical Sciences and Engineering (UMSE), March 2016 in his paper entitled "Experimental Study on Flexural Strength of Wire Mesh Concrete Slab" has conducted an experimental investigation performed on ferrocement slabs, where plain cement mortar of 1:3 mix ratio reinforced with two types of reinforcing wire meshes was studied. Steel meshes with wire woven hexagonal openings and galvanized iron mesh were compared with their performance against impact and fire exposure.

The aim of this study is to observe the influence of using ferrocement in enhancement of the mechanical properties of reinforced concrete slabs subjected to impact and fire exposure. The paper provides evaluation of performance by using the new technique ferrocement, as a strengthening material of reinforced concrete slabs compared with the existing reinforced concrete slabs of heavy self weight and brittle characteristics. Wire mesh is a form of reinforcement that differs from conventional reinforcement by the manner in which the reinforcing elements are dispersed and arranged. The main findings showed that the use of the ferrocement as a reinforcement to concrete slabs enhanced the perforation resistance and reduce the heat transfer through the thinner thickness of the steel mesh reinforced cement matrix Ferrocement is a relatively new material consisting of wire meshes and cement mortar.

Y. B. I. Shaheen, B. Eltaly and M. Kameel Vol. 4(4), pp. 157-167, May, 2013 in his paper entitled "Experimental and analytical investigation of ferrocement water pipe" has conducted to investigate the possibility of using Ferrocement concrete in constructing water supply pipe. The current work presents the comparison between the performance of ferrocement pipe and reinforcement concrete pipe under static load as starting step to study the performance of this type of pipe under impact load.

The main goal of the current research is studying the ability of using ferrocement concrete in design and construction of the water supply pipes. Four ferrocment pipes that were different in the reinforcement system were casted and tested up to failure and their results were compared with anther casted and tested reinforced concrete pipe. From the current results, it can be concluded that the investigation finite element models for the five types of pipes give accurate results in comparison with the experimental results. Furthermore it can be clearly seen that the ferrocement pipes behaves under the applied load better than the reinforced pipes. Ferrocement pipes were produced with high strength, crack resistance and 25% economic saving could be useful for developed and developing countries alike.

Paramasivam, National University of Singapore, Singapore August, 2001 in his paper entitled "Ferrocement Structural Applications" ferrocement is ideally suited for thin wall structures as the uniform distribution and dispersion of reinforcement provide better cracking resistance, higher tensile strength-weight ratio, ductility and impact resistance. By adapting available mechanised production methods and proper choice of reinforcements it can be cost competitive in industrialised countries. The salient features of the design, construction, and performance of some of these applications of ferrocement structural elements are highlighted in this paper.

These have demonstrated that quality and economy can be achieved using modern construction techniques. Basic considerations of the materials used, fine galvanised wire mesh and cement rich mortar coupled with good crack controlling characteristics: indicate that ferrocement can provide better durability, easy maintenance and lower lifecycle cost compared to conventional reinforced concrete Experience at National University of Singapore with ferrocement structures built and in use for more than a decade shows that durability has not been a problem with proper construction techniques and regular maintenance.

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III. CONCLUSION

After lot of literature study on a few significant focuses connected with Ferrocement is the most ideal choice for building development. Part of degree is there in material and strategy normalization. A few significant focuses from writing study are

1. Compressive strength test of concrete will reduce as the replacement of steel reinforcement by wire mesh.
2. It will reduce cost by R.C.C.
3. It will reduce time of construction by about 10-15% of R.C.C.
4. It will be more durable, waterproof than R.C.C.
5. It can be made to resist higher temperatures.
6. It will have less self-weight by about 50% of R.C.C.

REFERENCES

[1]. www.technoconstructor.org..
[2]. Wikipedia
[3]. Surfcivilblogsport.com
[4]. Ferrocement the best resistance material of construction J.A. DESAI
[5]. www.ijsret.org
[6]. J.A. Desai Ferrocement Pvt. Ltd.
[7]. Ferrocement is construction by S.P. Shah.
[8]. Gani, M. S. J. Cement and Concrete. London: Chapman & Hall, 1997. 8. Print.
[9]. Chambers, William, and James Donald, eds. "cement", Chambers' Etymological Dictionary of the English Language. London, Edinburgh: W. & R. Chambers, 1873. 66. Print.
[10]. "cement, n." Oxford English Dictionary. 2nd. ed. 2009. CD-Rom.
[11]. Ward-Harvey, K. Fundamental Building Materials. 4th ed. Boca Raton, Fla: Universal-Publishers, 2009. Print.
[12]. Augustus de Rohan Galbraith, "The Hennebique System of Ferro-Concrete Construction". Journal, P. F. Nursery, ed. Society of Engineers. London. E & F. N.Spon. 1903. 177-208. Print.
[13]. Nedwell, P. J.. Ferrocement: Proceedings of the Fifth International Symposium on Ferrocement. UMIST, Manchester, 6–9 September 1994. London: E & FN Spon, 1994. 28-30. Print.
[14]. fauxboisconcrete.info
[15]. Jackson, G and Sutherland, W. Concrete Boatbuilding. George Allen and Unwin Ltd, 1969, p43