

Experimental Study on Ferro cement Composite Slab

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ABSTRACT

Today's structures are situated in more aggressive environment. These leads to the development of ferrocement structures. Ferrocement is a type of thin wall reinforcement concrete commonly constructed of hydraulic cement mortar, reinforced with closely spaced layer of continuous and relatively small diameter mesh. But in general ferrocement can be defined as "A composite material consist of a matrix and a reinforcement in a finely distributed manner which act together to form a new material with characteristics superior to either of its constituents. In this we can see the basic history of ferrocement and profile of ferrocement and literature review ,ingredients used in ferrocement concrete slabs .The most extensively used building medium in world today is concrete and steel combined to make reinforced concrete ;familiar uses are in high rise buildinds ,highway bridges and roadways. Ferrocement technology does not have sufficient knowledge about its durability and production cost are competitive in special circumstance .There are three distinct phases in the ferrocement history amongst the 1850's, 1940's, 1960's decades. The basic essential properties of ferrocement .various research works on ferrocement carried out throughout the world so far reveal that ferrocement possesses the following characteristics. Ferrocement has found widespread applications in housing particularly in roofs, floors, slab and walls. Advantages of ferrocement based on construction side and on material side and disadvantages on ferrocement construction.

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I. INTRODUCTION

Ferrocement is a type of thin wall reinforcement concrete commonly constructed oh hydraulic cement mortar, reinforced with closely spaced layer of continuous and relatively small diameter mesh. First well known reinforced concrete was ferrocement boat. In 1850's Lambot began the history of reinforced is concrete and ferrocement only on concrete construction in massive form has a great success. In 1940's Nervi rediscovered ferrocement and he gave it a dimension ever seen. In 1960's decade, Nervi's accomplishment simulated the worldwide application of ferrocement. The properties are ability to construct thin shells at any shapes and elimination of shrinkage and temperature cracking due to inherent material properties and improvement in tensile strength compared with plan or ordinary reinforcement concrete. A characteristic in ferrocement was ease of construction, high resilience, high static ductility ,high resistance in cracking ,improvement in toughness ,fatigue ,resistance ,impermeability ,reduced dimension ,vibration resistance ,fire resistance compared with timber. An application was water tank, pipes, ferrocement gates ,aqueducts ,pipes ,culverts ferrocement has been widely accepted as suitable m,aterial for biogas structure and for marine application such as boats ,biogas ,pontoons ,treatment plant shops ,floating docks etc. Benefits based on construction side was easy to repair and cracking réistance on material side. Disadvantage is unskilled and semi skilled labour is high,

II. LITERATURE REVIEW

M.A.MANSUR, MOHAMED MAALEJ AND MOHAMMAD ISMAIL Study on corrosion durability of ferrocement. Distributed and evenly dispersed reinforcement elements in Ferro cement compared with traditional reinforced concrete, accumulation of rust around the fine wire resulted in the development of bursting pressure sufficient to generate cracking. S.K.KAUSHIK, D.N.TRIKHA & R.R.KODAWALA 1982, a study of simply supported and the restrained ferrocement beams. 20 lab size of ferrocement strips, beams and lintels to study the effect of mesh reinforcement on the ductility, cracking and moment were tested. The increase in the volume fraction of the mesh was decrease with the ultimate rotation and moment of resistance. 30 to 40 % was decreased by the max observed crack width at the mid span of the restrained beam .WAIL N. AL RIFAIE ,SHUKRI H. KALAF, investigate the behavior and ultimate strength of long span ferrocement shells under one point load applied at crown of shells. Three long span ferrocement shell unit were constructed and tested. P.PARAMASIVAM and R. SRI RAVINDRARAJAH , reported on the presence of wire mesh reinforcement in ferrocement improves crack resistance , impact strength and toughness.

III. INGREDIENTS USED IN FERROCEMENT SLAB

The materials used for this investigation were the same as that used for the normal cement mortar mix such as cement, fine aggregate (FA), water and wire mesh.

CEMENT: Cement is the most important ingredients used. Hence selection of proper grade and quality of cement is important for obtaining rich mix. Selection of cement at various ages, fitness, heat of hydration, alkali content, tricalcium aluminate and silicate, dicalcium silicate and compatibility with admixtures etc.

AGGREGATE: It is desirable to use coarser variety of fine aggregate having a high fitness modulus for making workable and strong concrete. The optimum gradation of fine aggregate is determined more by its effect on water requirement than on physical packing.

WATER: Water is an important ingredient of concrete as it chemically participates in the reaction with cement to form the hydration product, C-S-H gel. Quality and quantity of water is required to be looked very carefully. Water conforming to the requirement of BIS: 456-2000 is found to be suitable for making CM. It is generally stated that water fit for drinking is fit for making CM.

WIRE MESH: Mild steel wire mesh layers of 2mm diameter and 25mm spacing of wire mesh. Square mesh is used in this experiment.

IV. CONCLUSION

This paper proves that reinforced concrete slabs successfully used for the ferrocement cover indicates the study reported in preliminary investigation. This could be greatly offset by sparing millions of pounds spent on repairing damaged structures caused by cracked or spalled normal concrete covers. It allows existing conventional concrete material and practices to be used. A slight improvement in the bending capacity of the specimens with ferrocement cover was observed. Full composite action can be achieved by shear connector used to inter connect between the shear loading panel of ferrocement slab, then it increases the shear behavior. That reinforced concrete slabs with ferrocement tension zone cover is superior in crack control, stiffness and first crack moment to similar slabs with normal concrete cover. The above introduction and literature review says the characteristics, advantages and disadvantages of ferrocement based on material side and construction side.

REFERENCE

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