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REVIEW PAPER ON CONSTRUCTION OF FERROCEMENT WATER TANK USING CHICKEN MESH WIRE

VEDANT DATTA MALI

DEPARTMENT OF CIVIL ENGINEERING
ALARD COLLEGE OF ENGINEERING & MANAGEMENT.
PUNE, INDIA.

SUMEDH ULHAS JAGTAP

DEPARTMENT OF CIVIL ENGINEERING.
ALARD COLLEGE OF ENGINEERING & MANAGEMENT.
PUNE, INDIA

POOJA JAISINGH GADEPATIL

DEPARTMENT OF CIVIL ENGINEERING.
ALARD COLLEGE OF ENGINEERING & MANAGEMENT.
PUNE, INDIA.

ANIKET G. PAWAR

DEPARTMENT OF CIVIL ENGINEERING.
ALARD COLLEGE OF ENGINEERING & MANAGEMENT.
PUNE, INDIA.

GUIDENCE

-PROF. RACHANA VAIDYA MAM.
DEPARTMENT OF CIVIL ENGINEERING.
ALARD COLLEGE OF ENGINEERING & MANAGEMENT.
PUNE, INDIA.

Abstract:- The Ferro cement technology is nowadays used for various purposes like contracting houses, villas, storage tanks, slab, staircase, etc. The Ferro cement water tank is a tank made of thin wall having width of 3cm - 10cm, depending on the size and capacity of the tank. The purpose of this project is to make fibrocement tanks more durable and keep it economical, so that it can save money and also serve one's requirement. In this paper we will see some of the problems as well as solutions and methods studied in different research papers by various researchers, authors and students. The whole purpose is to understand the methods, solutions and use of fibrocement and fibrocement water tanks.

Keywords: Ferro-cement, Ferro-cement water tank, chicken mesh wire, welded wire mesh, cement sand mortar

INTRODUCTION:-

Ferro cement is a form of reinforcement concrete but differs from the conventional types in that the reinforcement consist of closely spaced, multiple layers of mesh or fine rods completely surrounded by cement mortar. Ferro cement is much thinner than reinforcement concrete, and the mesh can be formed to any shape without a conventional form and then plastered or mortared by hand. The metal commonly used is iron or steel rods, and the mesh wire with a diameter between 0.5 and 1 mm. The cement is typically a very reach mix of cement and sand in a 3:1 ratio.

Tanks made of fibrocement are used in many countries for the collection and storage of water for drinking, washing, for animal used and irrigation.

REVIEW OF LITERATURE:-

In this case study of Nervi P.L., it has been observed by us that Ferro cement construction of water storage tank is very pocket friendly and at it has nothing to do with the compromise in strength, rigidity and workability. At the same time, it is discovered

that, this process is around 40% cheaper as compared to the conventional RCC tanks. If not 50% or more and also it is very easier when it comes to construction because it does not need formwork or shuttering in any of the ways. The major raw materials to be used are steel, mesh, rebar's, Portland cement, fine aggregate, water and suitable admixtures. It can be used for a vast range of application including construction of boats, water tanks, slabs and roofs, and lining of tunnels.

Furthermore, it resists cracking very well and due to its thinness, uses very less amount of cement. According to this research paper of e. abdul karim, the application for the fabrication of small capacity water tanks is elaborated.

These are ideally suited for residential and community users. The demand for small water tanks can be estimated to be as large as the demand for the constructed houses themselves. There is also a huge demand for the community type water tanks in the view of the large number of schemes proposed by the Government for providing treated and hygienic water supplies to the rural areas within the country. According to this research paper presentation of p paramasivam, some of case studies of Ferro cement applications are based on the research scheme and development work carried out at the National University of Singapore. They have demonstrated that quality of growth and development of the economy can be achieved by way of modern construction techniques.

Basic consideration of the raw materials used, fine galvanized wire mesh and cement rich mortar coil pled with good crack controlling characteristics; indicate that Ferro cement can provide better durability, easy maintenance and lower lifecycle cost compared to conventional reinforced concrete. Experience at National University of Singapore with Ferro cement structures built and in use for more than a decade represents that its durability has not been an issue with proper construction techniques and regular maintenance of the property. As per this research paperwork, of gray f. moita the Ferro cement construction

technique is revisited with the aim of applying the raw material in the civil engineering structures, particularly in the large water tanks for water treatment stations. The plastic potential, the unsophisticated construction techniques and the low cost of production justifies its use, which is especially suitable for the developing countries. This work elaborates the experimental and numerical tests for big Ferro cement tanks, the part of the water plant treatment facility in Divinopolis, Brazil.

Different infinite element models have been used up in the case analysis with an objective to evaluate the effect of few adopted simplifications. Some comparisons of the investigated approaches with the experimental data are also included, as well as remarks and comments on the use of different constitutive models, homogenisation techniques and accuracy of the modelling data. This research paper of samual ariadurai describes a low cost of rainwater harvesting tank, constructed and tested at three location in the dry and wet zones of Sri Lanka to study the affordability of such tanks in solving acute domestic water storage shortage. By using the locally available raw materials and labourers during its construction, the cost of construction can be decreased. The tank uses bamboo as a reinforcing material and polypropylene as a water proofing membrane, both of them are available locally in the rural areas. In this research paper, the study has been done in order to investigate experimentally the durability of polymer and fly ash modified Ferro cement elements. In this case study of v.bhikshma, the determination and comparison of the durability of polymer – modified Fero cement with fly ash modified ferro cement elements. The corrosion performance in conventional ferro cement is compared with polymer Ferro cement and fly ash modified Ferro cement. It is observed that, the corrosion inhibiting property of fly ash and polymer Ferro cement is remarkably upgraded with a hike from 0% to 30% of fly ash, 0% to 12.5% of polymer and decline with specific surface of reinforcement. While studying this research

paper on Fiber Reinforced Ferrocement (FRF) composites using a new combination of two non-corrosive reinforcing materials, namely the PVC-coated steel weld mesh and synthetic barchip (polyolefin) fibers. The energy absorbed by the FRF slabs was found to be higher than that of plain ferrocement slabs (cast with PVC mesh only). The impact energy increases with an increase in the number of mesh layers, and also increases with an increase in percentage of bar chip fiber. Also, we figured out that Ferro cement is an appropriate material for repairing or reshaping the defective RCC structural elements and enhancing its performance as its features.

ADVANTAGES:-

- Basic raw materials are readily available in most countries.
- Fabricated into any desired shape.
- Low labour skill required.
- Ease of construction, low weight and long lifetime.
- Low construction material cost.
- Better resistance against earthquake.

DISADVANTAGES :-

- It requires time for binding and fabrication of steel bars and mesh wire.

METHODS:-

Basically there are three types of methods in which the Ferro cement construction can be carried out:

1. Armature system
2. Closed mould system
3. Integrated mould system

Armature system: In this system the skeleton steel can be welded into any desired shape surrounded with the numbers of wire mesh and then the mortar is pushed through these meshes towards inside and supporting

temporarily from other side. As the skeletal steel is inside the add the dead weight without proving any strength .Closed mould system: numbers of wire meshes are tied towards the mould and then the mortar is filled inside the mould. After the work is done the mould can be removed and can be reused afterwards

.Integrated mould system: I this method the numbers of wire meshes are placed inside the mold and filled with mortar and then the plastering is done on the mould. In this method the mould becomes the permanent structure

APPLICATION

OF

FERROCEMENT:

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1. Liquid retaining structures: Water tanks : rectangular , circular, spherical, small and large size, open, covered, loft tanks, ground service reservoirs , underground and elevated, hopper and shell bottom . Effluent treatment plants: septic tanks, clarifiers, settling tank, digesters, humus tanks, sludge-dryingbeds.

2. Soil retaining structures: Soil retaining walls, counter fort walls, grain silos, face wall panels and anchor plates for reinforced earth techniques.

3. Building components: Foundations- parabolic shaped, multi-build under-reamed piles, RCC columns encased in Ferro concrete, double walling for compound walls on expansive soils.

4. Large size space structures: Large size conduits for stream diversion and egg-shaped storm water drains, outfall sewers, precast canal sections in parabolic shapes.

5. Precast Ferro concrete products: All types of small size units, in water retaining structures, building components and soil retaining structures.

6. Special Application: Foldable Ferro concrete elements, lining to tunnels, tanks, basements, canals, Earthquake resisting structures, Precast pre-stressed girders of T, I,

U sections, Polymerized ferroconcrete railway sleepers etc.

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