# Ferro Cement Tank

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**Abstract: Water storage tanks are essential components of high-rise buildings, ensuring a reliable water supply for various purposes. This abstract presents a comparative analysis between Ferro Cement (FC) and Reinforced Concrete Cement (RCC) tanks, focusing on their suitability for a 1000-liter capacity in high-rise structures.**

**WEIGHT: Ferro Cement tanks, owing to their construction with a thin layer of cement mortar over a skeletal structure of mesh reinforcement, exhibit significantly lighter weight compared to RCC tanks of similar capacity. This aspect is crucial for high-rise buildings where structural loads are carefully managed.**

**COST: Ferro Cement tanks generally offer cost advantages over RCC tanks due to their simpler construction method and lower material requirements. However, the actual cost depends on factors such as labour costs, local market conditions, and the specific design requirements.**

**Construction Time: Ferro Cement tanks typically require less time for construction compared to RCC tanks. The construction process involves forming the skeletal structure, applying layers of mortar, and curing, which can be accomplished relatively**

**quickly compared to the more complex formwork and curing processes involved in RCC tank construction. Reduced construction time can contribute to overall project efficiency and timely completion of high-rise buildings.**

**While both Ferro Cement and RCC tanks have their advantages and considerations, Ferro Cement tanks emerge as a favourable choice for high-rise building water storage applications due to their lighter weight, cost-effectiveness, comparable fire resistance, and shorter construction time.**

**Keywords: Ferro cement tank, RCC tank, high-rise, water storage, comparative analysis, weight, cost, construction time.**

## I. INTRODUCTION

Ferro cement is a modern fabric which was utilized to begin with for Paddling the watercraft in 19th century in France. Ferro cement Water tanks are more unmistakably as comparable to the that of The RCC water tanks but the distinction between them are That the thickness of Ferro cement water tanks can be Seldom more than 25 mm while the thickness of the RCC Water tanks can lead up to more than 100 mm. The wealthy Mortar made of Portland cement is utilized in the Ferro Cement water tanks not counting the coarse totals Inside it. The Ferro cement water tanks compared to the RCC water tanks covers more region as little distance across of the Wire work and wires are secured along the entirety surface. The Ferro cements ductile to weight quality is more as Compared to that of the RCC water tank. As the Ferro Cement can be formed into distinctive shape the Prerequisite of the formwork in Ferro cement is neglected. The utilize of Ferro cement in development is broadly utilized around the world. Ferro cement is a sort of lean Strengthened concrete development in which conduct cement mortar is used in put of concrete and tremendous Amounts of small-diameter wire networks are utilized uniformly over the cross area in put of discretely Set strengthening bars. The most popular sort of support is metallic work. As fortification, alkali-Resistant glass fibre networks and woven texture made of plant filaments counting jute, burlap, and bamboo have both Been tried. The primary theme of this exposition is steel wire work.

## II. COMPOSITION

Ferro cement is regularly composed of a mortar blend that comprises of cement, sand, and water. This mortar is connected in lean layers, frequently between 10 to 30 millimeters thick, to create the craved shape or structure. Ferro-cement is a composite fabric made up of mortar and light wire steel work. It is a profoundly flexible frame of strengthened concrete. The work is shaped into the shape of the structure in lean areas, and ought to work uniformly all through the cross-section.

Rebar is in some cases utilized as a implies of solidifying the structure. On both sides of the support layer the firm mortar is connected to the required thickness. Care must be taken to totally cover with metal with mortar, or else the metal may be at chance of corrosion. The quality of the Ferro-cement is decided by the quality of the sand/cement mortar mix and the amount of the strengthening materials used. Ferro-cement is regularly utilized to generally lean but solid surfaces and structures, such as for shell rooftops, water tanks, and so on. Due to the expanded sum of work required for the development handle, Ferro-cement structures tend to be found in nations with moo work costs, such as in Asia and the Pacific districts.

## III. OBJECTIVE

The aim of constructing a Ferro Cement tank is to provide an efficient and cost-effective means of water storage with a focus on flexibility in design, affordability, and durability.

OBJECTIVES

1. Ferro cement tanks are generally more cost-effective than RCC tanks
2. Ferro cement tanks are lighter in weight compared to RCC tanks
3. Ferro cement offers more flexibility in design compared to RCC tanks
4. Ferro cement tanks are often easier and quicker to construct compared to RCC tanks.

B)A comparison of a 1000-liter RCC (Reinforced Cement Concrete) water tank and a Ferro cement water tank can be based on several

FACTORS:

1. Material and Construction:- RCC Tank: Made of concrete with steel reinforcement bars. Construction involves formwork, steel placement, and pouring of concrete.- Ferro cement Tank: Constructed using a thin layer of mortar reinforced with layers of mesh or metal.
2. Cost: - RCC Tank: Typically more expensive due to the cost of materials, labor, and construction complexity. - Ferro cement Tank: Generally less expensive due to simpler construction techniques and lower material costs.
3. Construction Time:- RCC Tank: Longer construction time due to the need for formwork and curing of concrete.

Ferro cement Tank: Can be quicker to construct due to simpler techniques, although proper curing is still necessary

4. Weight :- Ferro Cement tanks, owing to their construction with a thin layer of cement mortar over a skeletal structure of mesh reinforcement, exhibit significantly lighter weight compared to RCC tanks of similar capacity. This aspect is crucial for high-rise buildings where structural loads are carefully managed

## IV. LITERATURE

V Rishabh Narayan, Dr . GB Ramesh Kumar (2019) – This paper mainly focuses on Ferro cement could be a combination of cement ,sand And reinforcement within the completely different layer of mesh. In bolstered cement concrete and Ferro cement, there's some Comparison.

Manasi Patil1, Shahil Patel1 Yuti Dhonde1, Purav Patel (2015)- In this paper they have concluded that Ferro cement can moreover be called as Ferro concrete.

As RCC water tanks are used as worldwide Ferro cement water tanks can be the modernized technique to replace the RCC water tanks.

Vedant Datta Mali, Sumit Ulhas Jagtab, Pooja Jaisingh Gadpatil (2022)- In this paper the author The Ferro cement technology is Nowadays used for various purposes like Contracting houses, villas, storage tanks, slab,Staircase, etc.

Yauz Yardim (2018) – In this paper the creator have concluded that Ferrocement has had a long history since it was to begin with patented in 1856. Its noteworthy benefits as development fabric have been demonstrated with various theoretical and test considers all through the world for numerous years. Sumit S. Khandare1, Darshan G. Gaidhankar2, Mrudula S. Kulkarni3 Sumant N. Shinde4, Pravin Minde(2022) In these Paper the creator states that around Moo living benchmarks, extraordinary destitution, natural deterioration, and a lodging shortage influence most of the creating nations. S.M. Gawande1,Y.M.Wadje1*, D. R. Patil2, D. H. Giramkar2,N. A. Bagat3(2021)- In these Paper the creator states that almost the around the world significance of the water and its conservation is on the

prime significance presently as days. The low-cost preservation and capacity system for the house hold reason draws in the consideration of the unused engineering. Boshra Eltaly, Mohammed Abd-Alla (2013)- In these Paper the creator states that almost the later a long time, auxiliary wellbeing observing for respectful structures utilizing Test modular investigation has been developed. P.C Sharma and V.S Gopalaratnam(2018)- In these Paper the creator states that approximately the issues related to water capacity and supply are of increasing concern in most portion of creating nations.

B.Antonin Gnana Jenofer , U.Prem Anandh , R.Dhinesh , S.Kumar (2018)- In these Paper the maker states that nearly the Ferrocement is the most prepared outline of the fortified concrete, dating back two centuries. It is collected of mortar and chicken and weld wire mesh. Renjith Raju1, Dr.Vasudev (2018)- In these publication the makers states that around the Reinforced concrete is most broadly utilized construction texture. Columns are one of the crucial assistant components in the structures. Darshan Gaidhankar, Mrudula. S. Kulkarni(2015)- In these Paper the maker states that around the Ferrocement is a shape of invigorated concrete that differs from standard braced or prestressed concrete basically by the way in which the invigorating components are scattered and organized.

## V. METHODOLOGY

1 The foundation is prepared

- The levelled site is cleared of debris
- Topsoil is removed to a depth of 100mm

2) Base chunk is laid

- The location is secured with 50mm of concrete
- Wire support, with steel underpins joined,
- Is set over the concrete some time recently it sets
- A moment layer of concrete is laid over the wire Fortification to ground level

3) The divider outline is constructed

The divider support is connected to the steel underpins utilizing authoritative wire For bigger tanks, wooden covering may be developed to donate included bolster to the wire outline

4) Work is connected to the frame Layers of Wire work (or 'chicken wire') are connected to cover the outline on both the outside and the interior pre-Treatment steps

5) Fittings are installed Fittings are joined to the wire support some time recently the dividers are put. The tap below is held safely in put by a plate welded to the pipe and implanted in the ferrocement.

Extra cement mortar is put around the tap to anticipate spillage.

6) Plastering

- The tank is plastered on the outside first.

7) The Plastered tank When the cement mortar is set on the outside, step ladders are used to access the inside of the tank, which is also then plastered.

8) Roofs To prevent evaporation, pollution, and the breeding of mosquitoes, all tanks should have roofs.

Arched ferro cement roofs are increasingly being used, because they are cheaper than those

made of reinforced concrete.

## VI. CONCLUSION

Ferro cement tanks are generally more cost-effective than RCC tanks. The materials used in Ferro cement construction, such as wire mesh and cement mortar, are often less expensive compared to the steel reinforcement and formwork required for RCC tanks.Ferro cement tanks are lighter in weight compared to RCC tanks. This can be advantageous during transportation, installation, and in seismic-prone areas where lighter structures are preferred.

Ferro cement offers more flexibility in design compared to traditional RCC tanks. The construction process allows for curved or irregular shapes, which can be beneficial for fitting the tank into tight spaces or accommodating specific site requirements.Ferro cement tanks typically have shorter construction times compared to RCC tanks due to the simpler construction process and the ability to customize the design more readily.

## VII. CASE STUDY

FERRO CEMENT TANK IN MALAD EAST.

The project was constructed by Bandorkar construction Pvt. Ltd. For Residential building in Malad East. Capacity of tank was 22,500 litres tank. Dimensions of tank is 10m×1.5m×1.5m.

Fig No. 15

Fig No. 16

VIII. REFERENCE


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