

A Review Report On Ferrocement Insulated Sandwich Wall Panel

Km Ravikala Gautam¹, Mr.Alok Yadav², Mr.Shakti Kumar³

^{1,2}Dept of Civil Engineering

³Asst. Prof., Dept of Civil Engineering

^{1,2,3}Bansal Institute of Engineering and Technology Lucknow, India

Abstract- The creation of sandwich panels made of ferrocement as non-load bearing building components is examined in this article. The sandwich panels had one layer of wire mesh netting between two thin pieces of ferrocement for reinforcement. Two thin Ferro cement layers strengthened with thermocol sheet made up the sandwich sections. The two iron lattice sections were connected together by steel wires. Three sandwich panels in total were made. Compared to traditional masonry walls and reinforcement concrete panel, the suggested pieces weigh less. This kind of environmentally friendly and earthquake-resistant building method would dominate the construction industries.

Keywords- cement , sand ,stone dust ,wire mess, thermocol

I. INTRODUCTION

The ferro cement sandwich panel building method, which is a concrete with thin walls that has been reinforced; typically made of cement mortar and strengthened with layers of ongoing, relatively tiny wire mesh spaced closely together. [2]The ferrocement's closely spaced and evenly dispersed reinforcement turns the typically fragile substance into a superior flexible hybrid. As a result, ferrocement has come to be thought of as a highly adaptable building substance with special strength and serviceability qualities. [4]No other thin building material can equal its beneficial qualities, which include strength, hardness, watertightness, lightness, longevity, fire resistance, and environmental stability.[8] A potential composite substance for prefabrication and manufacturing of the construction sector is ferro cement. Due to its ability to insulate heat, the post-occupation era uses less energy.[10] Due to its high discomfort and high asset to weight ratios, it also has definite benefits over traditional structural parts.[33] In established nations as a whole and developing nations in specific, ferrocement has not been widely adopted as a substitute for traditional building materials. [8]Its tiny thickness and labour-intensive manufacturing process are the major factors preventing it from being widely accepted. Creating ferrocement sandwich components is one of the solutions presently being advocated for dealing with the thickness issue. [37]This method makes

the sandwich part lightweight and well-heated insulating, in addition to providing bulk. A sandwich panel is a three-layer part made of two thin, flat facing plates of a higher strength material sandwiching a thick core of lower strength and density. Alternatively, it could be made of a thin skin box of fairly higher strength material that is filled with a core of lower strength and density. [35]Those have gone used in the aircraft industry for a lot years and more lately they are getting used as weight carrying components in military constructions.

II. MATERIAL USE

Cement

All compounds can be referred to as cement since it is a general word. There are many different types of cements that are employed to some degree in the building and construction sectors or to address specific issues. Although the molecular makeup of these cements can vary quite a bit, Portland cements account for the vast majority of the concrete used today.

Table No. 1 Properties of cement

S.NO.	PROPERTIES	OBTAINED
1	Fineness Value	6.5
2	Consistency	32%



Figure :1 Cement

Fine Aggregate

Sand that can pass through a 4.75mm IS sieve and is readily accessible nearby is used. The fine material had a specific gravity of 2.634. For making all of the examples, sand that has passed through an IS 4.75mm screen will be used. Substance that will clear a No. 4 filter and be largely kept on a No. 200 sieve is referred to as "fine aggregate." [7] The small material ought to be rounded for improved workability and economy, as evidenced by the use of less cement. The function of the fine aggregate is to serve as a workability agent and cover the spaces left by the coarse aggregate.

Water

A vital component in the creation of concrete is water. It also qualifies as content in and of itself. Gaining knowledge of its impacts on concrete and other construction materials requires a grasp of its properties. Although water is a key component of concrete, there isn't much that needs to be said about the character of the water because it doesn't really affect the quality of the concrete. [45] However, adding contaminants to the water during blending can be problematic because they have a negative impact on the quality of the concrete.

Stone Dust

A refuse product from crusher facilities is stone dust. It might be used in concrete as a partial substitute for native river sand. Stone dust is used in concrete to increase its quality while also preserving natural river sediment for generations to come.

Table No. 2 Properties of Stone Dust

S.NO.	PROPERTIES	OBTAINED
1	Fineness Modulus	2.60
2	Specific gravity	2.40

Thermocol

It is a styrene flexible material that can be moulded into various shapes. [18] The molecule styrene, which produces the manmade polymer thermocol known as polystyrene, is what creates it. It serves as a heat insulator.



Figure:2 Thermocol

Wire Mesh

Mesh was trimmed in accordance with the measurement after the opening was removed. The main mesh reinforcement is thought to be steel wire meshes. This includes the kinds of square welded or woven meshes.



Figure:3 Wire Mesh

III. SCOPE & OBJECTIVE

Ferro cement is a lightweight, powerful composite substance that can substitute more traditional hefty substances in structural components. [13] The results of this study will promote the use of the novel method to create lightweight composite wall components. [15] The research is undoubtedly a move in the correct path towards producing high-quality products.

IV. CASTING OF SPECIMENS

The cast specimens were kept in the moulds for a full day. The specimens were demolded and immediately submerged in water in a curing tank after being identified and having their exposed face marked with a marking pen. For a total of 28 days, the specimens were left to heal underwater. The samples' exact sizes were measured with precision and reported. To make it easier to notice the onset of the first fracture, cement was thinly applied to all of the samples. Sandwich- style construction uses two layers of ferrocement and one layer of thermocol.

TEST METHOD

The panel, measuring 750x150x150 mm, underwent compression and flexural tests. [5] Testing were conducted in accordance with Bureau of Indian Standards' guidelines. At 7 and 28 days after curing, the panel's tests for both tensile and compressive strength were conducted.

V. CONCLUSION

Identity mortar was used in an experimental investigation on ferro cement panels in order to expedite construction and minimise the need for trained masons. According to the study, it is feasible to create a ferro cement panel using self-compacting mortar. The constructions made of ferro cement can withstand loads and deflection and are safe and cost-effective to create. They may also be used to make insulated wall panes that are used in buildings as partition walls. This wall has a lower construction cost, uses less unskilled labour, and is lighter overall.

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