



Compressive Strength of Concrete Blocks using Waste Materials

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Abstract:

Concrete is one of the most used materials in the construction industry. The problem is that generating concrete has a large impact on global warming. The plastic is very harmful for the environment. It can be classified as poly propylene, high density polymers, poly vinyl chloride etc., The solution is to use concrete mixtures that contain waste plastic materials like polythene bags, water bottle caps etc., The waste materials are used in concrete to reduce environmental impact, cost and payoff, energy efficiency, water efficiency etc. In this project utilization of waste material such as Polyethylene (PE) and High density polyethylene (HDPE). Fine aggregates can partially replace by PE (10%, 20%, and 30%) and HDPE with proportion of (5%, 6%, and 7%). In addition of all material is to be testing of compressive strength.

Keywords: Polypropylene, Compressive strength, High density polyethylene, global warming.

I. INTRODUCTION

Brick is the oldest manufactured building material. The earliest brick, made from mud (sometimes with added straw), was invented almost 10,000 years ago [1, 2]. Clay brick started to appear about 5,000 years ago, when builders borrowed pottery manufacturing techniques to improve its strength and durability. From some of the oldest known structures to modern buildings, clay brick has a history of providing shelter that is durable, comfortable, safe, and attractive. Primary raw materials for modern clay bricks include surface clays, fire clays, shale's or combinations of these. Units are formed by extrusion, molding or dry-pressing and are fired in a kiln at high temperatures to produce units with a wide range of colors, textures, sizes and physical properties. Clay and shale masonry units are most frequently selected as a construction material for their aesthetics and long-term performance [3]. While brick and structural clay tile are both visually appealing and durable, they are also well-suited for many structural applications. This is primarily due to their variety of sizes and very high compressive strength. Concrete brick is a very effective way to make a strong first impression. When people walk up or drive by a home with concrete brick, second glances are common reactions [4]. Concrete brick has more benefits than its striking visual qualities. They deaden exterior noise, providing a buffer from traffic noise, airplanes flying overhead and other various disruptions. Fire protection is another benefit as is reduced maintenance. Finally, concrete brick walls can improve the thermal mass qualities of exterior walls, thus reducing energy bills [5].

II. LITERATURE REVIEW

Jaydevbhai J. Bhavsar et al with this paper, *foundry sand* are used as a partial replacement of fine aggregates to achieve different properties of concrete. The percentages of replacements were 0%, 10 %, 20% and 30 % by weight. Tests were performed for compressive strength for all replacement levels at different curing periods (28-days & 56-days). Replacement level up to 30% found to have greater strength. The water absorption test is also carried out at 28 days. Noorezlin A. Basri et al In this study different ratio of Polystyrene beads were used 25%, 50% 75% and 100% were

mixed with sand Tests such as workability and absorption were carried out. No segregation was observed in any concrete mixes. The Absorption test were conducted on the concrete samples for each age of 7, 14, 28 days and then average was taken. Lower absorption rating less than 1.1 %. Absorption has been reduced up to 82.05 % for 100% replacement of polystyrene. The replacement of conventional aggregate materials by using polystyrene showed a positive application as an alternative material in concrete mix for lightweight concrete. Rajeshkumar. K et al, This paper describes an attempt made to incorporate to geosynthesis and *polypropylene* material used reinforced soil as fibre concrete. When compacting concrete, water can be slowly released. Subhan et al In this paper, incorporating lightweight aggregate such as *polystyrene beads* in high strength concrete might be resulting different properties from normal weight high strength concrete. Experimental results by showed that creep and drying shrinkage of polystyrene aggregate concrete. Increased, while compressive strength and modulus of elasticity decreased with decrease in the density of concrete. However, polystyrene beads have its drawbacks when incorporating in concrete mixture: (a) it is very light which can cause segregation in mixing, and (b) its hydrophobic (difficult to wet when mixing) characteristic, so chemical treatment on its surface is needed

III. MATERIALS AND METHODS

The materials used in this investigation are Cement, Water, fine Aggregates, Polyethylene, and Polypropylene .Different composition are prepared .Block mould size are flange and web is 119 x 70 & 165 x 46 mm.

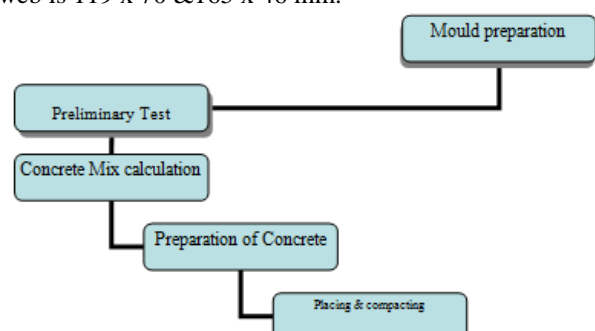


Figure.1. Material and methods

IV. PRELIMINARY TEST RESULTS

Table.1. Preliminary Test Results

Tests	Values
Fineness test	1
Normal consistency	26%
Final setting time	26min
Specific gravity	2.97
Fine modulus	2.87
Specific gravity of fine aggregates	2.406
Water absorption of fine aggregates	1.92%

V. COMPRESSIVE STRENGTH

A compressive strength of blocks is estimated by using compression testing machine. Compressive stress is calculated by compressive load to Area of the blocks .when blocks are placed in the machine. The load is applied gradually and load reading from dial gauge of the machine.

Table.2. compressive strength of concrete blocks

Sample	Compressive strength
CC	24.06
A1	21.98
A2	18.99
A3	17.68
A4	16.79
A5	18.75
A6	17.89
A7	16.87
A8	15.69
A9	18.15
A10	14.89
A11	15.81
A12	12.01
A13	13.45
A14	14.47
A15	13.91
A16	12.32
A17	11.45
A18	15.12
A19	12.14

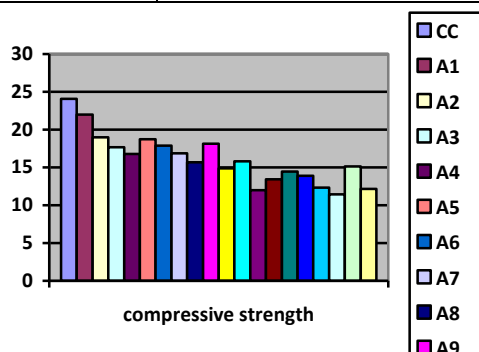


Figure.2. Compressive Strength

VI. CONCLUSION

A different types of waste material have been studied when a production of blocks

- Use of waste material into this concrete, has low compressive strength when compared to ordinary concrete blocks.
- When increase the waste material percentage the strength will decrease
- The various methods are studied while production of bricks like cementing ,firing , compacting , preparation of mould etc.,
- The production of blocks has further research needed to improve the quality of blocks and it will needful to the society.
- If artificial binding agent is not used in this concrete. In future binding agent will added and test to be carried out.

VII. REFERENCES

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