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Light weight components Onmultistory building

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ABSTRACT

In this project we are introducing a light weight block and concrete in multi storied building. In case of the multi storied building partition wall construction is one of the major item which is required for the partition work and to create various internal units of block and concrete are more weight, so there is need to find the replacement of waste materials and adding of waste materials to reduce the weight. The conventional block walls and concrete are moreover lot of dead weight is imposed on the structure with respect to gravity. A light weight material is needed so as to reduce the dead load on the structure. So we can contribute the Mix Proportion is divided into two case. Case I: Replacement of Cement (75%) With Fly ash (25%) and fine aggregate (75%) with quarry dust (25%) and adding 20% of waste material like thermocol (10%) and coconut Husk (10%). Case II similarly the proportion is changed with 50% Replacement and Adding 40% Waste Materials. The best of the mix proportion of project is selected in the result of testing of specimen of these mix proportion better than other in strength and weight. The purpose of adding 20 % and 40 % coconut husk and thermocol is to reduce the weight of the block and concrete. coconut husk is also useful in creep in between concrete and thermocol. The waste materials are used to minimize the volume of conventional material of concrete and also reduce the weight of components on multistory building, it is ecofriendly. It is economic and maintenance is inexpensive.

I. INTRODUCTION

Lightweight concrete has extreme importance to the construction industry. Most of current concrete research focuses on high-performance concrete, by which is meant a cost-effective material that satisfies demanding performance requirements, including durability.

The other main specialties of lightweight concrete are its low density and thermal conductivity. So its advantages are that there is a reduction of dead load, faster building rates in construction and lower transport and handling costs. Lightweight concrete maintains its large voids and not forming laitance layers or cement films when placed on the wall. Sufficient water cement ratio is vital to produce adequate cohesion between cement and water. Insufficient water can cause lack of cohesion between particles, thus loss in strength of concrete.

What is the light weight concrete?

Light weight concrete (foamed concrete) is a versatile material which consists primarily of a cement based mortar mixed with at least 20% of volume air. The material is now being used in an ever increasing number of applications, ranging from one step house casting to low density void fills. Light weight concrete has a surprisingly long history and was first patented in 1923, mainly for use as an insulation material..

LITRATURE REVIEW OF THE LIGHTWEIGHT CONCRETEAMARNATH YERRMALLA (2012) et al studied the strength of coconut shells (CS) replacement and different and study the transport properties of concrete with CS as coarse aggregate replacement. They concluded that

a. Increase in CS percentage decreased densities of the concrete.

b. With CS percentage increased the 7 days strength gain also increased with corresponding 28 days curing strength.

II. MATERIALS

REPLACEMENT MATERIALS

- Fly ash
- Quarry dust.

WASTE MATERIALS

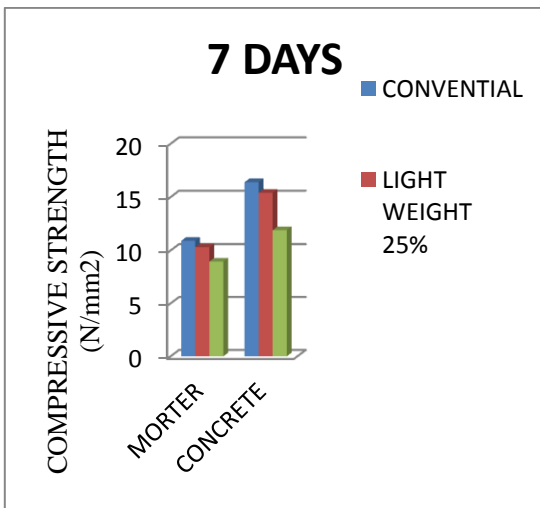
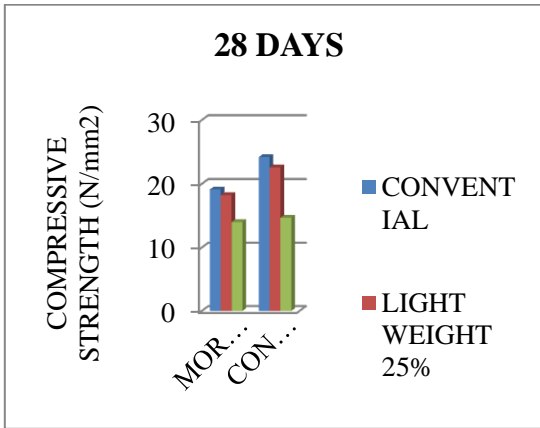
- Coconut husk
- Thermocol

III. MIX DESIGN

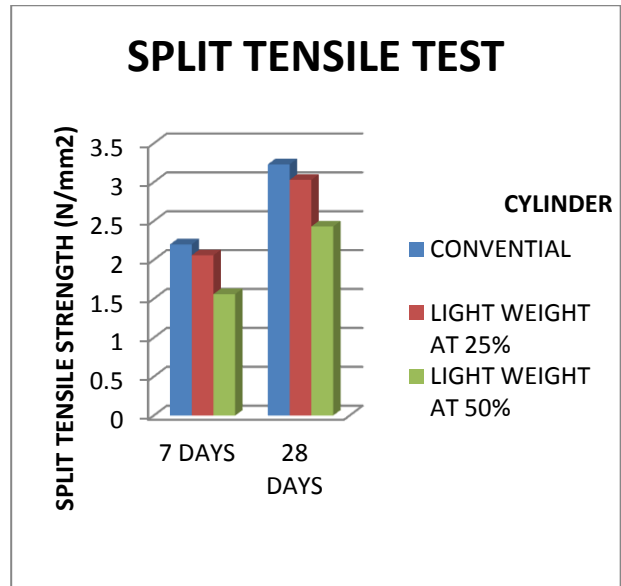
PERCENTAGE OF REPLACEMENT MATERIALS

MAERIALS	BLOCK		CONCRETE	
Cement	75%	50%	75%	75%
Fine aggregate	75%	50%	75%	75%
Fly ash	25%	50%	75%	50%
Quarry dust	25%	50%	25%	50%
Waste material	20%	40%	20%	40%

4. TESTING COMPRESSIVE STRENGTH OF CONCRETE

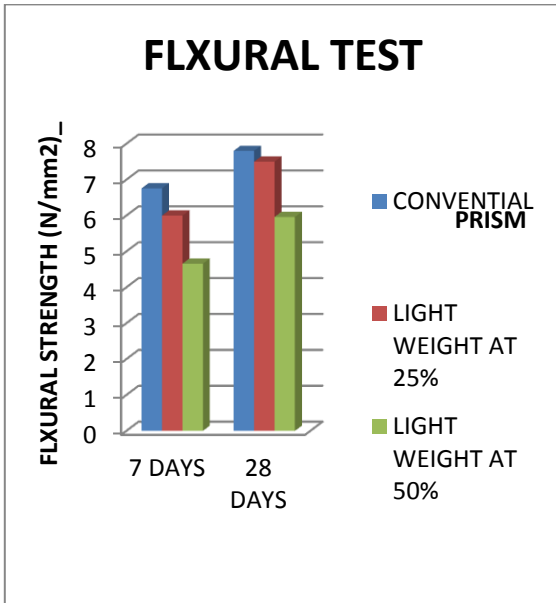


4.2 SPLIT TENSILE TEST



4.3 FLEXURAL TEST

S. N O	SPECIMEN		C.C IN F _{ck}		LW.C IN F _{CK}			
			7	28	25%		50%	
					7	28	7	28
1	CU BE	M	10	19.14	10	18	8	14
		C	16	24.2	15	22	11	14
2	CYLINDER		2.2	3.23	2	3	1	2
3	PRISM		6	7.80	6	7	4	5



V. RESULT DISCUSSION

The Various Test result of conventional Components and Light Weight Components are given below

The strength compression of conventional and light weight components.the satisfy by the early strength at 7 days and 28 days of curing

VI. MODELING

The light weight concrete and block of modeling of size and percentage replacement are fixed of the result of the specimen of various test. The 50% of alternative materials and waste materials is low strength compare to 25 % replacement of materials.

So we can selected the 25 % replacement of materials are convenient in apply block and concrete. The size of block are mostly refer at various literature collection. The following size of block and cube are contribute the modeling of the project

BLOCK

Size of block (20 cm X 10 cm X 10 cm)



CUBE

Size of cube (15 cm X 15 cm X 15 cm)

Comparison of Weight of Modeling

S.NO	SPECIMEN	CONVENTIONAL COMPONENTS WEIGHT (Kg)	LIGHT WEIGHT COMPONENTS WEIGHT (Kg)
1	BLOCK	4.150	2.870
2	CONCRETE CUBE	8.400	6.130

VII. APPLICATION OF LIGHTWEIGHT CONCRETE APPLICATION

- 1) The primary use of light weight concrete is to reduce the dead load of the concrete structure, which then allows the structural designer to reduce the size of the column, footing and other load bearing elements.
- 2) Structural lightweight concrete mixture can be designed to achieve similar strength as normal weight concrete.

ADVANTAGES AND DISADVANTAGES OF LIGHTWEIGHT CONCRETE

Advantages and disadvantages of using lightweight concrete as structure.

Advantages

- i) rapid and relatively simple construction

- ii) Economical in terms of transportation as well as reduction in manpower
- iii) Significant reduction of overall weight results in saving structural frames, footing or piles
- iv) Most of lightweight concrete have better nailing and sawing properties than heavier and stronger conventional concrete

Disadvantages

- i) Very sensitive with water content in the mixtures
- ii) Difficult to place and finish because of the porosity and angularity of the aggregate. In some mixes the cement mortar may separate the aggregate and float towards the surface
- iii) Mixing time is longer than conventional concrete to assure proper mixing.

VIII. CONCLUSION

Light weight components of test and by performance to behave structurally in much the same manner as normal concrete. For properties which differ, the differences are largely those of degree. The designer must consider the benefits of light weight and better insulation in relation to the extra cost of the light mix.

The light weight components of block and concrete on 25% replacement of materials and adding of 20% waste material of mix proportion is achieve the strength of compare to the conventional components. So we can successfully completed the project of reduce load weight a light weight component

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