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CELLULAR LIGHTWEIGHT CONCRETE BRICKS USING FOAMING AGENT

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Abstract: Cellular light weight concrete (CLC) is not a new invention in concrete world. It has been known since ancient times. It was made by natural aggregates of volcanic origin such as pumice, scoria. The Greeks and the Roman used pumice in building construction in this paper, parametric experimental study for producing CLC using fly ash is presented. We should use fine fly ash which is available in thermal power plant. This raw material is one hundred percent suitable for cellular light weight bricks. The performance of cellular lightweight concrete in term of density and compressive strength are in studied. From the result, it can be seen that compressive strength for cellular light weight concrete is low for lower density mixer. The increases of voids throughout the sample caused by the foam in the mixer lower the density. The function of foam is to create an air voids in the cement-based slurry. Foam is made separately by using foam generator, the foaming agent is diluted with water and aerated to create the foam.

Cellular light weight concrete block can be used as an alternative to conventional bricks, to reduce environmental pollution and global warming.

I INTRODUCTION

Concrete is most important construction. Concrete is materials used in building construction, consisting of hard, chemically inert particulate substance, known as an aggregate that is bonded together by cement and water. In future there has been an increasing worldwide demand for the construction of buildings, roads and an airfield which has mitigate the raw material in concrete like aggregates. In some ruler areas, the huge amounts of aggregate that have already been used means that local materials are no longer available and the deficit has to be made up by importing materials from other place. Therefore, a new way to cellular lightweight concrete in building and civil engineering construction is used.

1.2 Material Used:

I. Cement

II. Water

III. Fly

IV. Foaming agent

1.3 OBJECTIVES

- Compare the density & compressive strength of foam concrete bricks with conventional brick.
- Compare the specific strength (strength-to-density ratio) of foam concrete brick with conventional brick.
- 3) Compare the cost of foam concrete bricks with conventional brick.

1.4 LIMITATIONS: -

- Cellular lightweight concrete is very sensitive with water content in the mixtures.
- Mixing of cellular lightweight concrete needs more time than conventional concrete to ensure proper mixing.
- Cellular lightweight concrete are porous and shows poor resistance.

II LITERATURE REVIEW

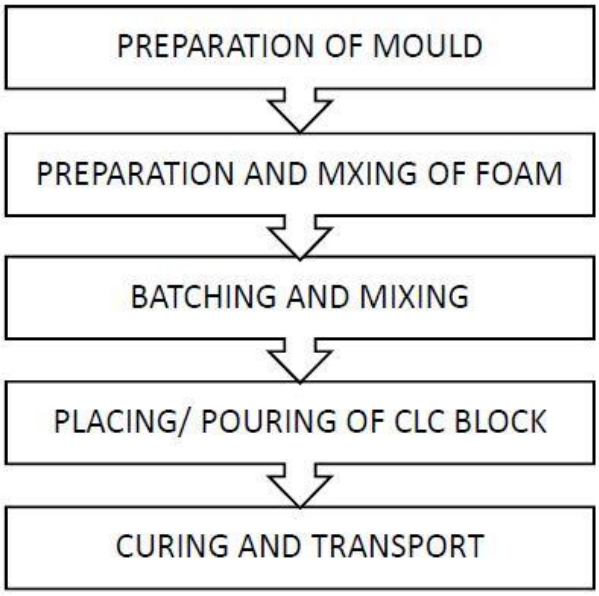
Wan mansoura [1] et al. (2015): - had studied on "development of fly ash- based Geo polymer lightweight bricks using foaming agent" this paper reviews the uses of fly ash as a raw materials and addition of foaming agent to the Geo polymeric mixture to produce lightweight brick. In this research the effect on their physical and mechanical properties have been discussed. In most manufacturing bricks with incorporation of foaming agent have shown positive effects by producing lightweight bricks,

increased porosity and improved the thermal conductivities of fly ash-based Geo polymer bricks. However less of performances in number of cases in terms of mechanical properties were also demonstrated.

M. AbdulSSSSSlahi [2] et al. (2009): - had studied on "equations for mix design of structural lightweight concrete". The equation were used to solve some mix design problems from reputable textural sources. The developed equations are capable of giving material constituent for the first trial batch of structural lightweight concrete. These equations can be used in place of the data in code and would reduce the effort, time and energy expended in the manual process of mix design of structural lightweight concrete the equation is useful for, mixture proportioning alteration.

Shaikh saleem raees [3] et al. (2019): - had studied on "cellular lightweight concrete". The treatment prevents the body slices from cementing the subsequent stream hardening process and may also improve the quality of slabs when hardened this manufacturing method has many advantages but not entirely free of problems and the most dominant one of them is that slab like slices frequently show a great tendency of binding or cementing together during the stream hardening process so that then must be divided from each other by force in which case the products can easily be damaged.

III METHODOLOGY:



IV RESULT

Table: -Compressive strength for c/c brick Period of curing 28 days (N/mm2)

Sr. no	using % of foam	Compressive strength			Avg strength
		Brick 1	Brick 2	Brick 3	
1	1%	7.12	7.584	6.57	7.09
2	2%	8.14	8.9	8.081	8.37
3	3%	8.51	8.33	8.03	8.29

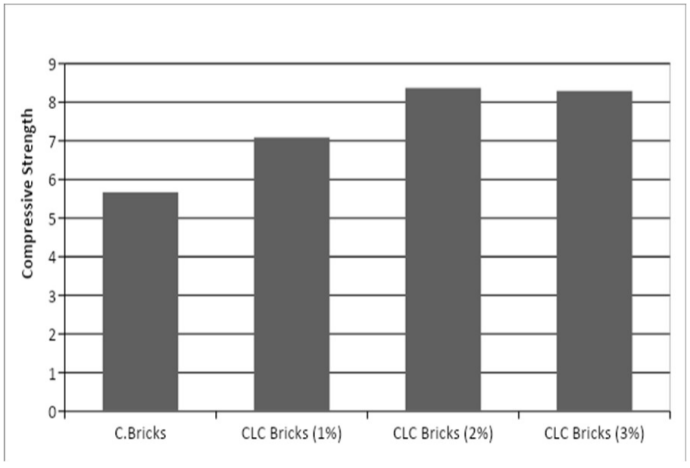
Table: -Density of CLC brick curing 28 days (kg/m3)

Sr. no	using % of foam	Density			Avg
		Brick 1	Brick 2	Brick 3	
1	1%	15261.58	1510.19	1509.13	1526.96
2	2%	1607.74	1665.26	1632.50	1635.16
3	3%	1506.37	1535.14	1514.30	1518.60

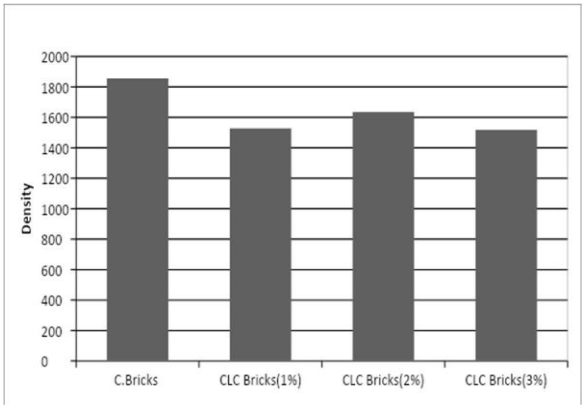
Table: -Strength Density Ratio of CLC brick for 28 days

Sr. no	% of foam	Ratio N-m/kg
1	1%	4643.28
2	2%	5118.06
3	3%	5458.97

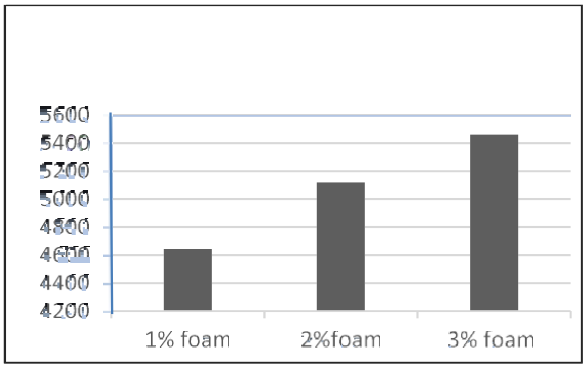
4.1 ANALYSIS



Graph 1- Compressive strength curing 28 days



Graph 2 -Density curing 28 days



Graph 3-Strength Density Ratio of CLC brick for 28 days

V . CONCLUSIONS

1) According to our conclusion the compressive strength and density of foam concrete increases with the age.

2) Compressive strength of CLC brick is accrue maximum at 2% of foaming agent it gives better compressive strength compare to conventional bricks

3) Replacement cement by waste product fly ash reduce the cost of brick and fly ash is eco-friendly product.

4) Density of CLC brick is less due to less density it is easy to transportation.

5) The cellular lightweight concrete bricks using foaming agent can be used in framed structure and partition wall

VI FUTURE SCOPE

1) The CLC brick using foaming agent can be used in framed structure and partition wall.

2) CLC brick can be suitable for earthquake areas as more structural saving for high rise building in earthquake and poor soil areas.

3) Eco friendly and green product.

4) No energy required for CLC brick.

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