International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 03 | Mar 2019 www.irjet.net p-ISSN: 2395-0072

AN EXPERIMENTAL STUDY ON AIR ENTRAINED MORTAR BY UTILISING LATHER AGENT

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ABSTRACT : - Typically, This paper presents a detailed investigation of the effects of refined sugarcane ash (SCA) as partial replacement for cement and which the lather agent is used to attain the condition of light weight mortar. To diagnose its physical property for overcoming inundating characteristics. In this investigation we are partially replaced the cement with SCA in the percentage of 10%, 30%and 50% These light weight blocks can be attained by involving lather agent which creates a foam and air molecules in the fresh mortar. The ingredients are OPC, Lather agent, sugarcane ash, sand and water.

Keywords: Sugarcane ash(SCA), Foam cement.

INTRODUCTION:

Today construction cost is very high with using conventional materials due to unavailability of natural materials. This problem can be solved by total replacement of concrete with different material. Over 3.3 billion tons of cement was consumed globally in 2010 based on survey of world coal association and also cement production emits CO_2 in to the atmosphere which is harmful to the nature. If we can partially replace the cement with the material with desirable properties then we can save natural material and reduce emission of CO_2 in to the atmosphere. When the Cement mixed with fine aggregate produces mortar for masonry, or with sand and gravel, produces concrete. Cement is the most widely used material in existence and is only behind water as the planet's most-consumed resource.

This project outline goes around the preparation of a special kind of motor which named as air entrapped mortar with light weighs and exhibits enormous beneficial in the contemporary world of construction .The major feature of this project is to bring out the prolific outcome The air entrained mortar are the special type of mortar with acceptable compressive strength and less water absorption which can be manufactured by using cement, sugarcane ash ,and water . Lather agent is used as an admixture .It may be defined as the mortar of substantially lower unit weight than that made from gravel or crushed stone. Particularity density of commercial self compacting mortar is between 2000 to 2300 kg/m^3

LITERATURE REVIEW

Partial Replacement of Cement with Fly Ash In Concrete And Its Effect Authors: Vinod Goud (1) Niraj Soni (2) Corresponding Authors: (1) Goutam Varma (2) Kapil Kushwah (3) Sharad Chaurasia (4) Vishwajeet Sharma

In this study, the effect of fly ash will be added without adding any additional admixture to create a concrete with maximum value of the compressive strength. They are performed work for nominal mix M25 grade concrete for 0.35 w/c ratio. With mineral admixture 10%, 20%, and 30% replacement by mass of cement. In this work we studied the effects of different w/c ratio, percentage of mineral admixture over the properties of concrete like workability & strength further more we studied the effect with age of concrete and slump loss In this effect they obtained the compressive strength value in different range of partial replacement of fly ash with different ratio having The 10% and 20% replacement of cement with fly ash shows good compressive strength for 28 days. 6. The 30% replacement of cement with fly ash ultimate compressive strength of concrete decreases.

OBJECTIVIES

- obtain less water absorption property than conventional bricks.
- To produce a robust thermal insulating blocks.
- To attain the sound insulation.
- To achieve the amend durability rather bricks.
- To Reduce the self weight of the concrete
- To characterize the material required for developing the floating concrete.
- To reduce the usage of raw material
- To reduce the whole weight of the structures

USEFULNESS

Used as a replacement to the clay brick and fly-ash brick.

Applicable in the non-bearing partition walls.

Used in hot weather region.

Can be utilised in the manufacture of pontoon

MATERIAL SPECIFICATION

3.1 Fine Aggregate

Fine aggregate is a naturally occurring granular material composed of finely divided rock and mineral particles. Those fractions from 4.75 mm to 150 microns are termed as fine aggregate. The specific gravity of fine aggregate is 2.67

Figure 1: fine aggregate

Cement

Cement ordinary portland cement (opc) of 53 grade conforming to is: 12269-1999 was used for casting the paver bl

Figure 2 : Cement

3. **SUGARCANEASH**

Sugarcane bagasse ash is a byproduct of sugar factories found after burning sugarcane bagasse which itself is found after the extraction of all economical sugar from sugarcane. The disposal of this material is already causing environmental problems around the sugar factories. For every 10 tonnes of sugarcane crushed, a sugar factory produces nearly three tonnes of wet bagasse. Since bagasse is a by-product of the cane sugar industry, the quantity of production in each country is in line with the quantity of sugarcane produced. The high moisture content of bagasse, typically 40–50 percent, is detrimental to its use as a fuel. In general, bagasse is stored prior to further processing. For electricity production, it is stored under moist conditions, and the mild exothermic process that results from the degradation of residual sugars dries the bagasse pile slightly. For paper and pulp production, it is normally stored wet in order to assist in removal of the short pith fibres, which impede the paper making process, as well as to remove any remaining sugar.

The specific gravity value of

sugarcane ash = 2.68

4. FOAM

Foam concrete, also known as Lightweight Cellular Concrete (LCC), Low Density Cellular Concrete (LDCC), aircrete, foamed concrete, foamcrete, cellular lightweight concrete or reduced density concrete, is defined as a cement based slurry, with a minimum of 20% (per volume) foam entrained into the plastic mortar A chemical which facilities the process of forming foam and enables it with the ability to support its integrity by giving strength to each single bubble of foam is known as foaming agent. It may categorize in two parts Protein and Synthetic. It made to form light weight concrete and other concrete materials. Foam produce no reaction on concrete but it serves as a layer which is air trapped and forms no fumes or toxic. Protein based foaming agent requires comparatively more energy to make foam. It is prepared with raw material in presence of Ca(OH)2 and a small portion of NaHSO3. For improving the stability of foaming agent it is modified with the addition of several kinds of gel and surfactants. Few significant improve the workability of foaming agent such as addition of alkyl benzene sulfonate

Material used and methodology

The material used in the mortar are cement, sand, water, foam and sugarcane ash.

Experimental method

In this experiment, we are replacing the cement with SCA in 3 different ratio with mixing and making the mortar. The mortar was designed for MM3 as per Is:2250-1981. The cube specimen of size 15x15x15 cm were prepared at 10%, 30%, and 50%, of SCA After 7, 14 and 28 days of curing, they were tested for compressive strength and water absorption test by owen.

MATERIALS USED AND METHEDOLOGY

Material used

The materials used in SCA concrete are Cement, Fine aggregate, Coarse aggregates, SCA and water.

Experimental method

In this experiment, instead of using cement, sugarcane ash(SCA) can be used to make a mortar. Three different sample of SCA concrete was prepared at different percentage of SCA beads (by vol. of fine aggregates). The concrete was designed for M25 mix design as per the IS 10262: 1982. The cube specimen of size 15x15x15 cm were prepared at 10%, 30%, and 50%, of SCA (by vol. of fine aggregates). After 7, 14 and 28 days of curing, they were tested for compressive strength and water absorption in CTM machine.

Table1: Quantity of material for cube

S.no	Material used	C.C kg	10% Kg	30% kg	50% kg
1	Cement	10.1	9.09	7.07	5.05
2	Fine aggregate	8.83	8.83	8.83	8.83
3	Water	6.41	6.41	6.41	6.41
4	S.C.A	-	1.01	3.03	5.05
5	Foam	-	0.33	0.33	0.33

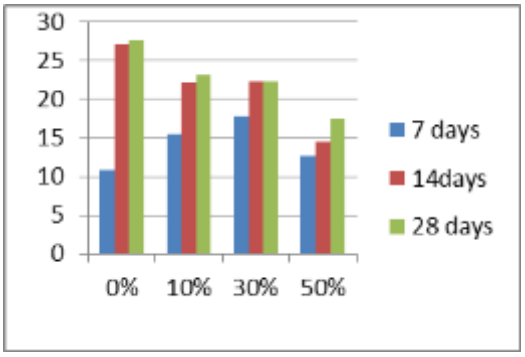
RESULT:

Compressive Strength

The compressive strength of the cube was tested after 7, 14 and 28 days of curing in CTM machine.

Table-2: Compressive strength of mortar

% REPLACED	7 DAYS	14 DAYS	28 DAYS
Conventional mortar	8.9	11.5	13.7
10% replaced	7.6	9.7	11.6
30% replaced	6.2	8.0	9.8
50% replaced	4.7	5.9	7.4

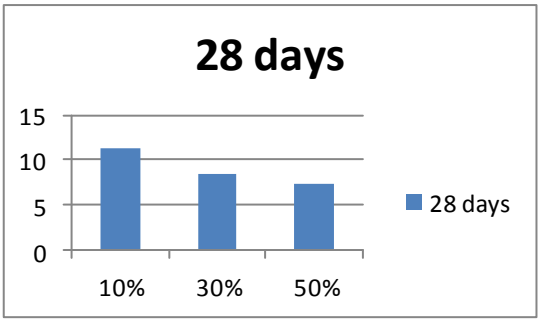


Water absorption:

The water absorption of the cylinder was tested after 7, 14 and 28 days of curing in CTM machine.

Table-3: Water absorption of SCA and standard concrete.

% SCA	At 28 days (N/mm^2)	Conventional Mortar
10%	11.2	12.5
30%	8.5	
50%	7.3	



CONCLUSION:

The special mortar we produced is beneficial in material cost as well as in the making process. The ingredient are mostly available at low price in the market more over sugarcane ash can be collected from the industrial waste outlet. The major significant of this mortar is less in weight and considerably

reduce the dead load of the structure. Mortar is completely environmental, eco friendly and also fulfilling the usage needs respectively. We used the SCA waste as a part of this mortar and reducing the possibility of deposting in the land masses.

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