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DEVELOPMENT OF SUSTAINABLE WALL PANEL BY USING BAGASSE ASH & PLASTIC WASTE

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Abstract: We are aware that the various type of damage is done to environment in the manufacture of cement. It involves more number of carbon emission associated with other chemicals. Every one tone of cement manufacture emmite half tone of carbon dioxide that are shown by the researches , that's why there is an immediate need to control the usage of cement. On the handthe waste material produced by such as Sugar Cane Bagasse Ash which are difficult to environment that causes environmental harzard is difficult to dispose which in return is environmental Hazard. The Bagasse ash imparts high early strength to concrete and also minimizing the permeability of concrete. during hydration The Silica present in the Bagasse ash reacts with components of cement and produced additional properties likeal chloride resistance, corrosion resistance etc. Therefore the use of Bagasse ash in concrete not only reduces the environmental pollution but also increase the properties of concrete and also minimize the cost. And also improve the concrete quality

The fastest industrialization and urbanization in the country leads lot of infrastructure development. This process leads to various problems like insufficient of construction materials, increased productivity of wastes and other products. The reuse of plastic waste as partial replacement of coarse aggregate in M30 concrete.

Keywords: *Bagaase ash, plastic waste, compression strength, flexural strength*

I INTRODUCTION

1.1 CEMENT

Cement is a binder, a substance is used for construction that sets, hardens, and to other materials to bind them together. Cement is seldom used on its own as to bind sand and gravel (aggregate) together. Cement mixed with fine aggregate material mortar for masonry, or with sand and gravel, produces concrete. Cement is the most commonly used material in existence and is only behind water as the planet's most-consumed resource.

1.2 BAGASSE ASH

Bagasse is a waste product from sugar industries which is burnt to produce power required for different activities in the factory. The burning of bagasse leaves bagasse ash as a waste, which has a pozzolanic property that would potentially use as a cement replacement material. It has been known that the total production of sugarcane is over 1500 million tons. Sugarcane aqure about 30% bagasse whereas the sugar recovered is about 10%, and the bagasse leaves about 8% bagasse ash (this figure depend on the quality and type of the boiler, modern boiler release minimum amount of bagasse ash) as a waste, this waste of bagasse ash will be of serious concern. As recently tested in some part of 12 word sugarcane bagasse used as cement replacement material for it need. The bagasse ash had found to improve the properties of the paste, mortar and concrete including compressive strength and water tightness in particular replacement

percentages and fineness. The maximum silica content present in the bagasse ash was suggest to be the main cause for these improvements. The silica content is depending on burning conditions may vary ash to ash and other properties of the raw materials including the soil on which the sugarcane is grown, it has been tested that the silicate has a pozzolanic reaction with the hydration products of the cement and results in a reduction of the free lime in the concrete.

1.3 PLASTIC WASTE

There are the various types of plastic waste are being generated. The creation of non–decaying and low biodegradable waste materials, connected with a growing consumer population has resulted in waste disposal crisis. One solution to this crisis is recycling wastes into useful products. Many Government agencies, private organizations and individuals have completed or in the process of completing a wide variety of studies and research projects concerning the feasibility, environmental suitability and improve the performance of construction techniques by using waste product like plastic is used to improving flexural strength not only using cost effective construction material but also save the world from environmental Pollution.

With the increase in development, there is an increase in cost of construction and the maintenance of pavements. So, the Engineers and Designers have been looking for new concept of using waste plastics in cement concrete wall panel and Solid Blocks. This blocks has minimum fatigue or thermal cracking, low stripping due to moisture and offers great durability, little or no impact on processing and also produces ecofriendly construction and costs less. Usually M25 concrete is commonly used for constructional works. Waste Plastics were incrementally added in 0%, 2%, 4%, 6%, 8% and up to 10% replace at the same amount of Aggregate.

1.4 OBJECTIVES

- Partially replacement of cement by using bagasse ash
- Comparison of compressive strength of conventional concrete with bagasse ash concrete
- Comparison of tensile strength & flexural strength of conventional concrete with bagasse ash concrete
- Use of plastic waste to increase flexural strength
- Cost comparison of conventional concrete & bagasse ash concrete
- To make the sustainable wall panels by using bagasse ash & plastic waste

1.5 LIMITATIONS

- Replacement of cement with bagasse ash upto 40%
- If the % of bagasse ash increases then there is also increase in W/C ratio & decrease in compressive strength

II. LITERATURE REVIEW

Various authors have experimented on the related topic and have shared and concluded their results in their paper, the authors have concluded the things as follows:

ReplainMr. G. Siva Kumar[1] et al . (2013) Studied "Biocement preparation using bagasse ash from sugarcane and its hydration behaviour." In this study they used 10 per cent weight as partial replacement in ordinary Portland Cement (OPC). Compressive strength of the sample was performed and it was reported that early hydration is responsible for the cementious material in sugar cane bagasse ash. Bagasse ash pozzolanic activity results in the formation of more C-S - H gel resulting in increased strength and therefore bagasse ash is a potential substitute for cement

Mr. H.S. Otuoze[2] et al., Investigated on "Characterization of Sugar Cane Bagasse ash and ordinary Portland Cement blends in Concrete," the SCBA was obtained by burning Sugar Cane Bagasse at 600-700 degrees Celsius, as the sum of Sio2, Al2o3 and Fe2o3 was 74.44 percent; for strength testing, mixing ratio of 1:2:4 was used and OPC was partially replaced by 0 percent, 5 percent, 10 percent. On the basis of the test carried out, it can be concluded that SCBA is a good pozzolana for concrete cementation, and partial mixtures of it with OPC could give good strength development and other concrete engineering properties. For reinforced concrete with dense aggregate, an optimum of 10 per cent SCBA blends

with OPC could be used. Higher mixtures of 15% and up to 35% of SCBA with OPC are acceptable for aircraft or aircraft Mr. LavanyaM.R[3] et al . Studied "A Compressive Strength of Concrete Experimental Study by Partial Replacement of Cement with Sugar Cane Bagasse Ash." The feasibility of using sugar cane bagasse ash, which is finely grounded by sugarcane industry product, is examined as partial cement replacement in conventional concrete. The test was performed as per Indian Standar .They showed that the addition of SCBA results in improved strength in all cases and, based on the results obtained, it can be concluded that bagasse ash can increase the overall strength of concrete when used up to a cement replacement level of 15 per cent with a W / C ratio of 0.35.

III METHODOLOGY

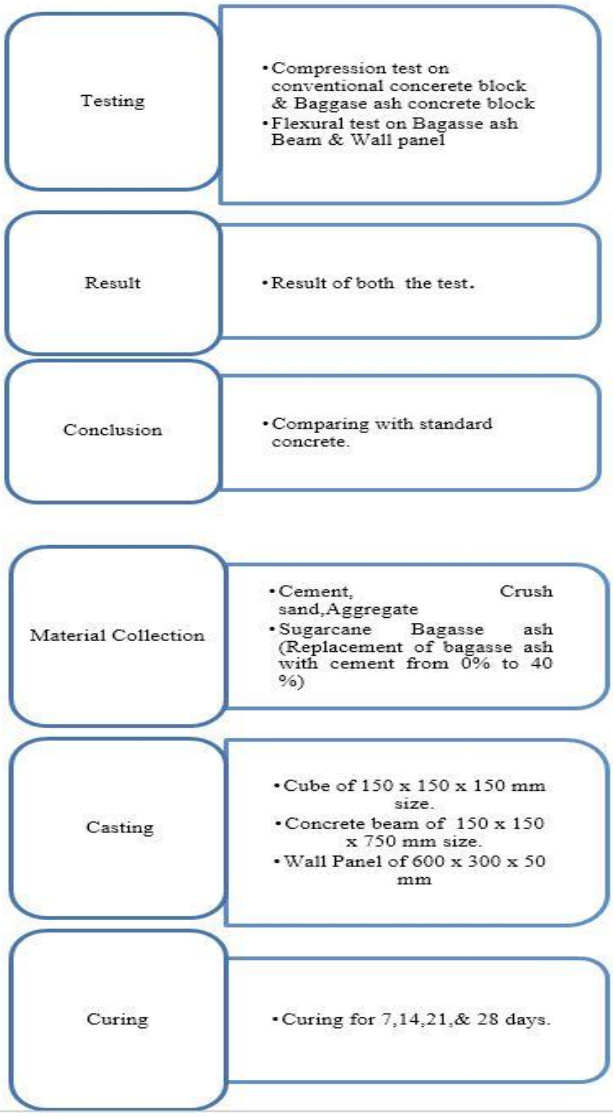


Image 1. Preparation of mould

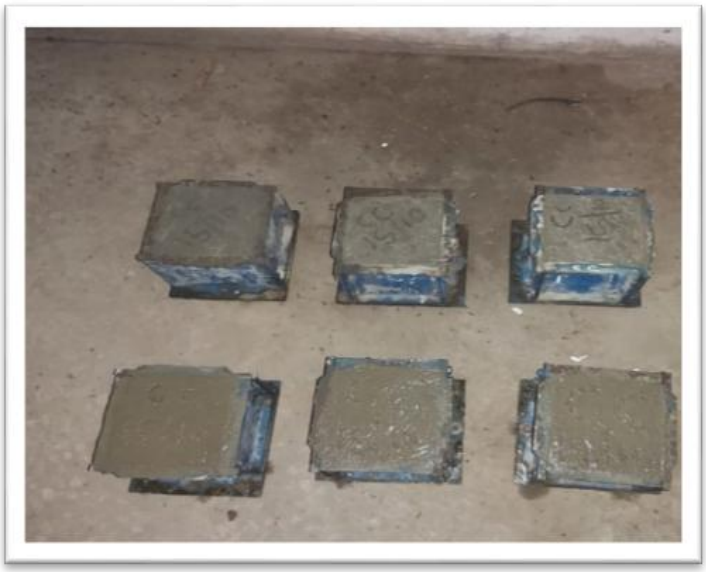


Image 2 Casting of cubes of size 15cm x 15cm x15cm

Image 3. Curing of specimens

IV RESULTS

Table 1. Compressive strength of bagasse ash concrete blocks with 30% replacement of ceme

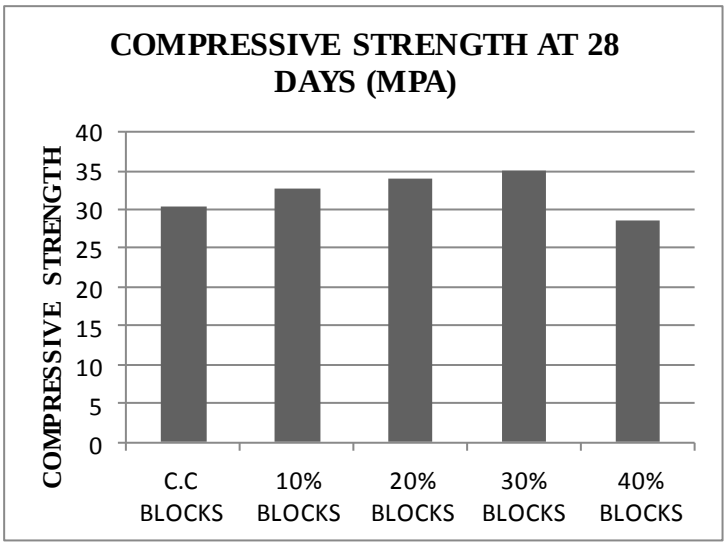
0	COMPRESSIVE STRENGTH OF 30% BA BLOCKS (N/MM^2)			
	BLOCK 01	BLOCK 02	BLOCK 03	Avg.STRENGTH
7 DAYS	27	28.12	29	28.04
14 DAYS	28	30.14	29	29.04
21 DAYS	32.44	30.22	34	32.22
28 DAYS	35.44	34.68	35	35.04

Table 2. Comparison of Flexural Strength

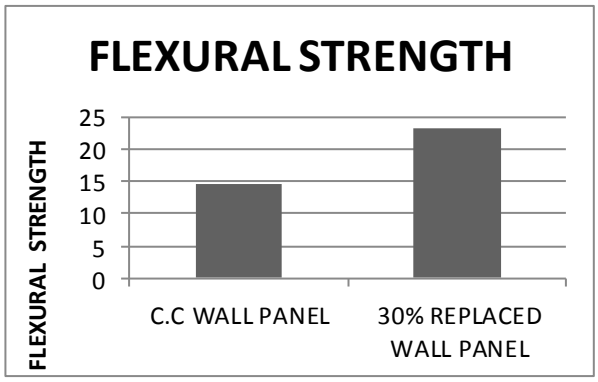
AGE OF SPECIMEN	AVG. FLEXURAL STRENGTHS OF BLOCKS(N/MM^2)	
	F.S. OF CONVENTIONAL CONCRETE WALL PANEL	F.S. OF 30% BAGASSE ASH WITH PLASTIC WASTE COCRETE WALL PANEL
28 DAYS	14.514	23.30

4.1 ANALYSIS

Graph 1. Comparison of compressive strengths at 28 days



Graph .2 Comparison of flexural strengths at 28 days



V CONCLUSION

• According to our conclusion, the compressive strength of bagasse ash concrete blocks is occurs maximum at 30%. And it gives better compressive strength as compare to conventional concrete blocks

• Addition of plastic waste in 30% bagasse ash concrete wall panel gives maximum flexural strength.

• In Concrete, the use of free available bagasse ash in replacement of cement reduces the cost. Hence it is economical. For Ex- The cost for casting of 6 C.C blocks = Rs150 The cost for casting of bagasse ash concrete blocks =Rs120

• These panels can be used as wall panels-

1. In partition wall, bricks can be replaced with wall panel.
2. In external wall, these panels can be used as cavity wall.

VI FUTURE SCOPE

- It will produce low cost concrete as bagasse ash is freely available.
- Economical & profitable.
- Replacement of cement by bagasse ash, produces sustainable wall panels.
- Ultimately reduces the Carbon dioxide emission in the environment.
- Reuse of plastic waste, will increase the flexural strength.

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