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Solid Waste Used As Construction Material

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Abstract: - *There is increase in population in very large amount due to this the disposal of solid waste is a major problem. The main objective of this study is to investigate the potential use of various solid wastes for producing construction materials (such as bricks). The present paper is based on the innovative work in solid wastes in which various admixtures are used such as fly ash & glass fibers to increase brick strength. This paper also shows the results which are taken by the test on bricks.*
Keywords: *- Solid waste,Flyash,Brick*

I. INTRODUCTION

Our world is facing severe problem of population. People are using various kinds of products, which are produced from household, industries, hospitals, public place, etc from which solid waste is generated in large quantities. Due to which pollution is generated. To recover this problem of pollution and disposal of solid waste in proper manner the invention is made of preparing fire bricks from solid waste for using it for firing. So from this we got the inspiration of using solid waste in construction field for casting bricks by using various materials. The cost of construction materials is increasing day by day because of high demand, scarcity of raw materials, and high price of energy. From the standpoint of energy saving and conservation of natural resources, the use of alternative constituents in construction materials is now a global concern. For this, the extensive research and development works towards exploring new ingredients are required for producing sustainable and environment friendly construction materials. The present study investigates the potential use of various solid wastes in the production of construction materials.

II. EXPERIMENTAL WORK:

Introduction: - The mass quantity of solid waste is generated in Nasik city is very big problem. Hence by using such mass quantity of waste and by using some other admixture for manufacturing of bricks as construction material.

III. MATERIALS:

Solid waste: In Nasik city there is large amount of solid wastes, which are generated from household, hotels, streets and from commercial areas in the form of papers, plastic bags, bottles, jute bags, wrappers etc., then this solid waste made in powder form after drying it in sunrays.

Clay: Clay is a naturally occurring aluminium silicate composed primarily of fine – grained minerals. Clay deposits are mostly composed of clay minerals, a subtype of phyllosilicate minerals,

which impart plasticity and harden when fired or dried; they also may contain variable amounts of water trapped in the mineral structure by polar attraction. Organic material which does not impart plasticity may also be a part of clay deposit.

Formation: Clay minerals are typically formed over long period of time by the gradual chemical weathering of rocks, usually silicate –

S.N.	Year	Population	Waste Generation (TPD)
1	2008	1,620,000	140
2	2009	1,689,604	180
3	2010	1,856,653	220

bearing, by low concentration of carbonic asset and after leaching through upper weathered layers. In addition to the weathering process, some clay minerals are formed by hydrothermal activity. Clay deposits may be formed in place as residual deposits in soil, but thick deposits usually are formed as the result of secondary sedimentary deposition process after they have been eroded and transported from their original location of formation. Clay deposits are typically associated with very low energy depositional environment such as large lakes and marine deposits. This clay is used for making bricks.

Fly ash: Generally the ash is generated from thermal power plant to generate the electricity which has producing mass quantity of ash and this is also a major problem how to dispose the ash. Hence it can be used as one of the admixture for manufacturing of bricks.

Glass fibers: Glass fibre is made of silicon oxide with the additional of small amount of other oxides. The basic component of glass fibre is silica

SiO2.in its pure form is exist as polymer, (SiO2). It has no true melting point but soften up to 2000 degree C, where it starts to degrade. It is usual to introduce impurities into the glass in the form of other materials to lower its working temperature.

Water: The water available from river natural resource is used for mixing the clay, solid waste and admixture for manufacturing of bricks.

S.N.	Type of brick	Compression strength in N/mm^2
1	CL+W	0.3508 N/mm^2
2	CL+SW+W	0.5263 N/mm2
3	CL+SW+FA+W	2.80 N/mm^2
4	CL+SW+GF+W	2.16 N/mm^2
5	CL+SW+GF+FA+W	1.87 N/mm

Fig. 1 Molding of Brick

IV. PROCEDURE

The process of marking brick generally consists the following steps: Gathering, crushing, grinding, screening, and mixing the raw materials; making the brick; and setting, drying, firing, packaging and inventing the final product. The mixing of raw material with solid waste and fly ash for manufacturing of bricks is same as conventional method and then drying it in sun rays. Then dried bricks make a small kiln and burnt it up to 2000 degree. Then after cooling the bricks the bricks are ready for transport and for use on the site. Manufacturing processes and percentage content of materials as shown in table no.1

V. RESULT & DISCUSSION

Test Setup:

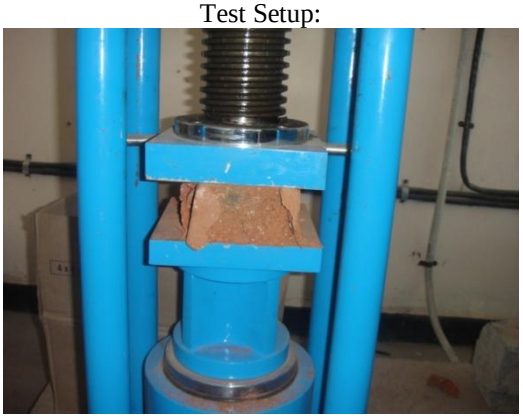

Fig.3 Compression Testing Machine

Burned bricks are used for the compression test only. The test result is shown in the following table.

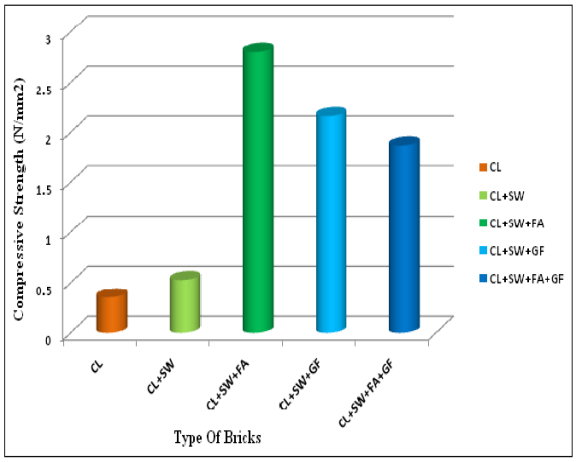

Fig.4 Compressive Load

S.N.	Material In (%)	Types of bricks				
		CL+W	CL+SW+W	CL+SW+FA+ W	CL+SW+GF+W	CL+SW+GF+FA+W
1	Clay	100	60	30	60	32.6
2	Solid waste	----	40	40	38	32.6
3	Fly ash	----	----	30	----	32.8
4	Glass fibers	----	----	----	2	2

VI. CONCLUSION

From this study on the solid waste used as construction material that means by making of bricks and it has been concluded that our study is successful, brick gave much higher strength and light weight as compared to normal brick used for construction. So the bricks can be used in construction work.

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