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Comparison of Conventional Bricks with Composite Bricks

Dhanasekar. K[1], Murugesh.V[2], Hari Haran.V[3], Amudhan. T[4], Hemachandran. R[5], Selva Aravind. N[6]
Professor[1, 2], BE Student[3, 4, 5, 6]
Department of Civil
Panimalar Engineering College, Chennai, India

Abstract:
Due to rapid growth in construction activity the available sources of natural sand are getting exhausted and also good quality sand may have to be transported from long distance, which adds to the cost of construction. In some cases natural sand may not be of good quality therefore, it is necessary to replace natural sand in bricks by an alternate material partially without compromising the quality of bricks. Here we have find out strength on brick by adding partial replacement on cement, fly ash, sawdust, and complete replacement of sand with M-Sand.

I. INTRODUCTION

The brick is made with a saw dust ,fly ash, M sand and cement since the large demand has been placed on building material industry especially in the last decade owing to the increasing the population which causes a chronic shortage of building materials the civil engineers have been challenged to convert the industrial waste to useful building and construction material accumulating of unmanaged waste especially in developing countries has resulted in an increasing environmental concern .Recycling of such wastes as building materials appears to be viable solution not only to such pollution problem but also to the problem of economic design of buildings .the increase in the popularity of using environmentally friendly ,low cost and light weight construction materials in building industry has brought about the need of investigate how this can be achieved by benefiting to the environment as well as maintaining the material requirements affirmed in the

II. OBJECTIVE

The major objective of the project is replacing the costly and scares conventional building walls uses of wood waste and fly ash by innovative and alternative building wall materials. This satisfies the following characteristics.

- Required
- Cost effective
- Environmental friendly
- Less weight
- Easily available

1.3 USES OF WOOD

1. MAKE FAKE SNOW: Manufactures use these common by-products in countless ways: to make a practical board or as a fuel source for boilers for example if your are working on a own improvement projects changes are you have got a few piles of saw dust in your garage, too. Here are some ways to keep it out of the trash bin. Mix sawdust with white paint and glue cover holiday crafts with simulated snow.

2. GET A GRIP: Winter loggers spread saw dust on their truck paths it provides traction and strengthens compacted snow while protecting the ground underneath.

3. SOAK UP SPILLS: Keep your bucket handy for accidents saw dust is highly absorbent and can quickly contain spills of oil or paint.

4. FEED YOUR PLANTS: Saw dust mixed with a manure or nitrogen supplement keeps your plants healthy and moist, too.

5. FILL WOOD HOLES AND DEFECTS: Used by professional floor refinishers, very fine sawdust or "wood flour" makes excellent stainable filler when mixed into a putty with wood glue.

6. PACK A PATH: Tamp saw dust in to a dirt walk way to curtail erosion and create a soft fragrant path way through your garden or wooden lot.

7. LIGHTEN UP CEMENT: Saw dust mixed in to a mortar as long been used when erecting cordwood walls to aid in a bonding the logs together. Do the same when casting light weight vessels and moisture – loving planters.

8. CLEAN A FLOOR: Moisten a pile of saw dust with water and use a push broom to sweep it around concrete floor of your garage, basement, or shop. The wet saw dust will capture and observe find dust and grime.

9. CHASE AWAY WEEDS: Saw Dust from walnut wood is a natural weed killer. Sweep this variety between the cracks of your walk way.

III. MATERIALS USED AND METHODS

MATERIAL USED

- Cement
- M Sand
- Fly ash
- Saw Dust
- Water
- Mould




IV. CASTING OF BRICK

Preparation of surface

For the manufacturing of bricks, the site should be selected based on some important consideration such as the ground should be of plain surface. The site should be connected with communicating roads from transporting materials etc.; the site should offer all facilities to the workers. And at the plain surface placed the steel smooth sheet or wooden ply woods for the smooth surface in bottom and easy for the unmolding of bricks, And applying a oil for the upper face sheet for the soft Dying and free unmoulding

Placing of Mould

After placing the steel sheet and mould should be the placed on the upper face of steel sheet and then applying oil for all the inner sides of the mould

Mixing of Brick Materials

First taken a plastic bond and then taken raw materials like cement M Sand, Fly Ash and Saw Dust. Then all the materials are mixed in to a plastic bond and finally adding water and then well mixed by using trowel. After that mixing placed into the mold

Compaction process

Compaction should be occurs in a three stages and first stage is placed the sample into the mold at a certain height and then well compacted by using tamping rod or any other rectangular shape materials. And tamping well at corners of the bricks for avoiding the air voids and for the wonderful shape, Then the same process should be occur for the another two stages

Finishing of bricks

At the top surface of the mould an excess amount of sample should be taken out and leveling with trowel for soft dying of surface.

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Setting Time of Bricks

The Minimum setting time of the brick is 10 to 15 Hours; after that curing process should be occur

Curing Process

After finishing the setting time all the bricks should be taken and fully submerged in water for a curing process. A curing process should be taken for 7 days, 14 days and 28 days

Composite brick


After the compression test

V. RESULT AND DISCUSSION

COLOUR AND WATER ABSORPTION OF CONVENTIONAL BRICK AND COMPOSITE BRICK

DETAILS OF CONVENTIONAL BRICKS

Trial	**color**	**Dry weight In kg**	**Wet weight In kg**	**% of absorption**
Trial 1	Red	3.206	3.315	3.28
Trial 2	Red	3.112	3.270	4.68
Trial 3	Red	3.254	3.370	3.44
Average				**3.80**

DETAILS OF COMPOSITE BRICKS

Trial	color	Dry weight in kg	Wet weight in kg	% of water absorption
Trial 1	Light Grey	3.468	3.488	2.01
Trial 2	Light Grey	3.906	3.915	0.925
Trial 3	Grey	3.994	4.000	0.575
Trial 4	Grey	4.306	4.312	0.55
Trial 5	Grey	4.332	4.337	0.475

COMPRESSIVE STRENGTH OF CONVENTIONAL BRICKS

TRIAL	AFTER THE BURNING PROCESS	STRESS IN Kg/cm^2
Trial 1	68.1 KN	40.5
Trail 2	137.3 KN	81.85
Trail 3	118.6 KN	70.70
Average stress		64.38

COMPRESSIVE LOAD OF COMPOSITE BRICK

TRIAL	7 DAY KN	14 DAY KN	28 DAY KN
Trial 1	13	25.2	42.9
Trial 2	35.1	35.7	60.7
Trial 3	80.4	92.5	111.2
Trial 4	291	312.5	352.2
Trial 5	308	325.4	411.8

COMPRESSIVE STRESS

TRIAL	28 DAY KN	STRESS IN Kg/cm^2
Trial 1	42.9	25.57
Trial 2	56.2	36.18
Trial 3	85.2	66.28
Trial 4	352.2	209.95
Trial 5	411.8	245.48

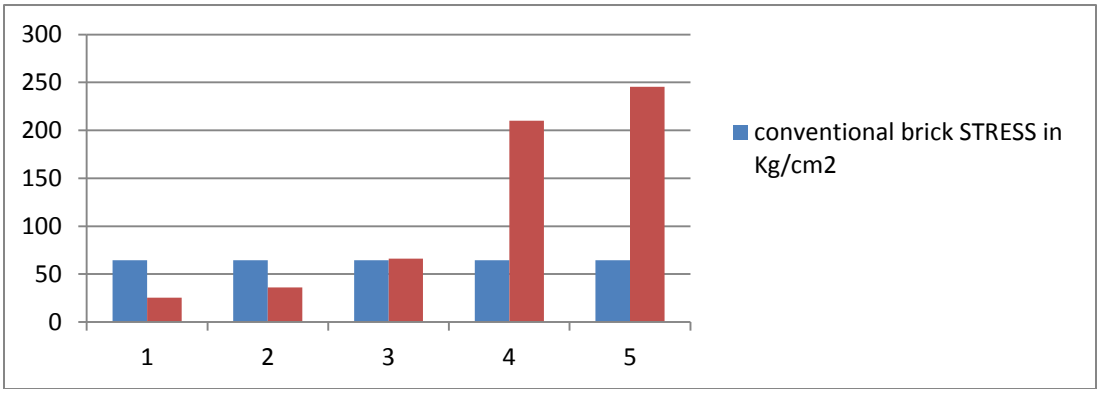

Figure.1. Graph for Stress

Cost for composite Brick

Trials	Cement gms	cost/ kg	Rate	Fly ash gms	cost	Rate	M sand gms	cost	Rate	Saw dust gms	Labour / brick	Total Cost In Rs
Trial 1	325	6.4	2.08	120	0.8	0.09	700	2	1.4	100	0.5	4.07
Trial 2	500	6.4	3.2	260	0.8	0.19	2800	2	5.6	250	0.5	9.495
Trial 3	600	6.4	3.84	240	0.8	0.18	2600	2	5.2	225	0.5	9.72
Trial 4	700	6.4	4.48	220	0.8	0.16	2500	2	5	200	0.5	10.15
Trial 5	800	6.4	5.12	200	0.8	0.15	2400	2	4.8	175	0.5	10.57

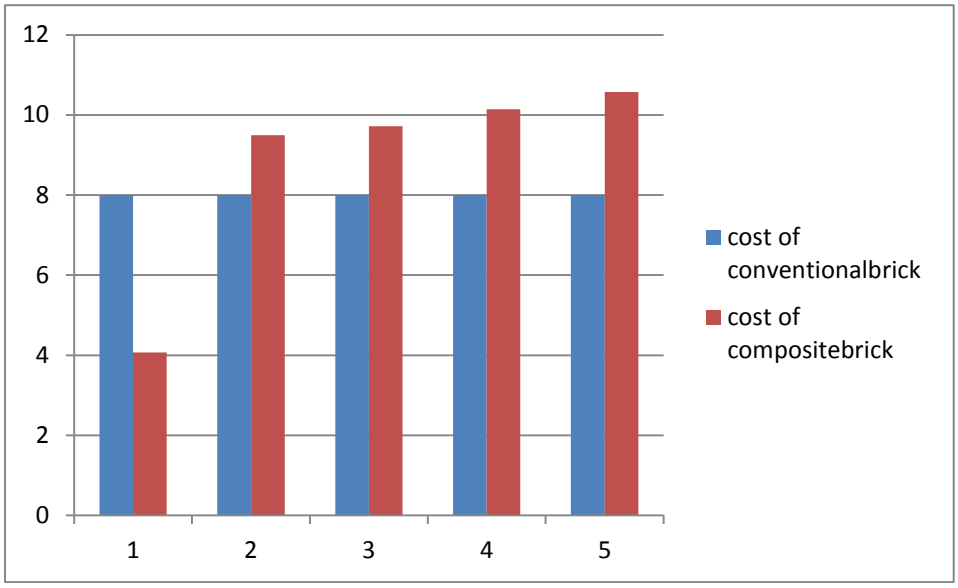

Figure.2. Graph for Brick Cost

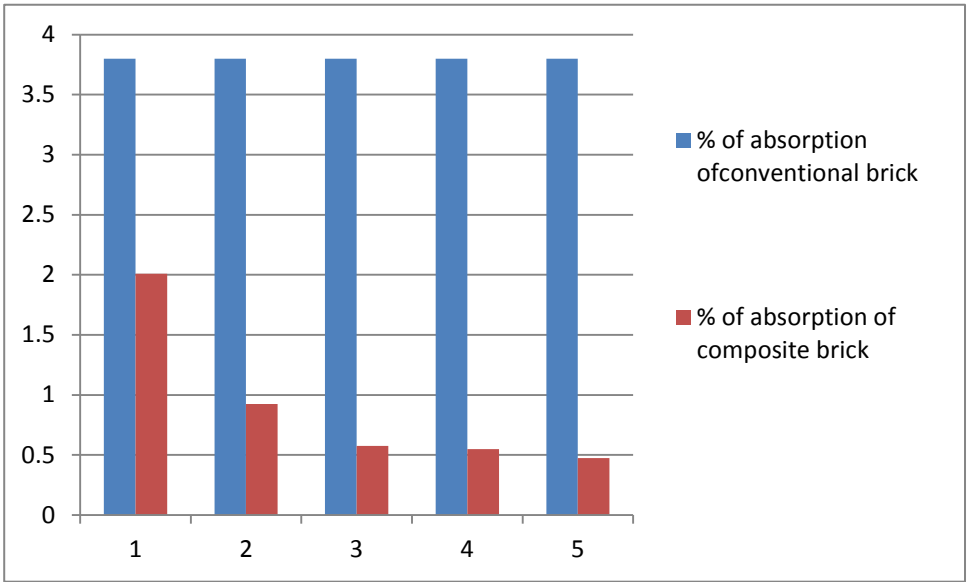

Figure.3. Graph for Water Absorption

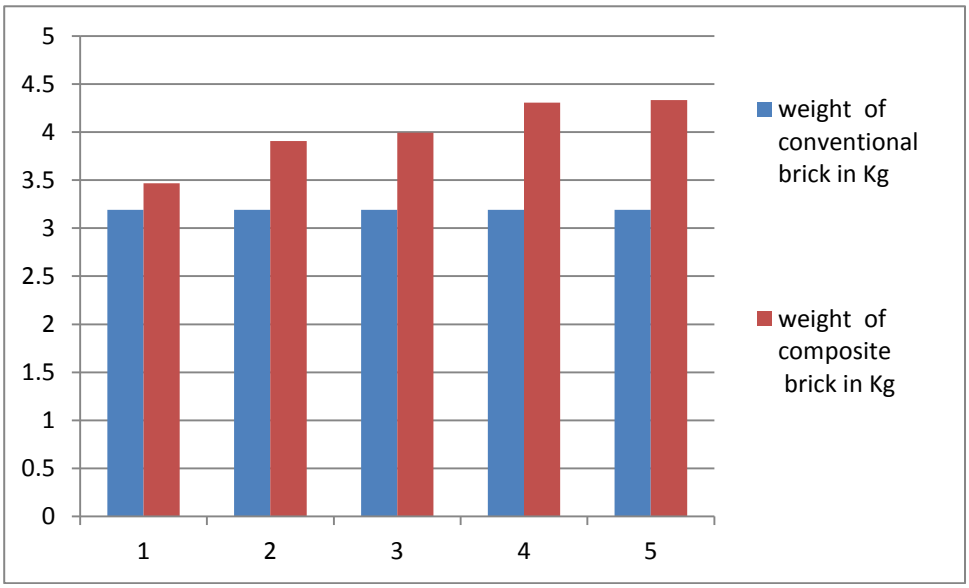

Figure.4. Graph for Brick weight

VI. CONCLUSION

1) The feasibility of producing bricks with adding M sand ,fly ash ,sawdust was showed technically in this study.
2) 28 days compressive strength of the concrete decreased gradually with increasing the replacement percentage
3)This saw dust and brick ballast concrete can be used in the production of non load bearing precast concrete units ,flooring and pavement concrete ,hallow blocks and flooring tiles
4)The composite bricks did not qualify for use as high strength external construction materials since their strength is considerably low and their structural integrity is affected by damp conduction
5) cost vise also it is slightly equal to normal conventional bricks

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