IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A COMPARATIVE STUDY ON CONVENTIONAL CLAY BRICKS AND CONCRETE BLOCKS WITH MODIFIED CAEPET WASTE

Navya A[1], Meena Y R, and S.Kavitha[3]

[1*] PG Student, Department of Civil Engineering, Jain deemed university faculty of engineering technology Kananakapura post Ramnagara District, India,

[2] Assistant Professor, Department of Civil Engineering, Jain deemed university faculty of engineering technology kananakapura post Ramnagara District, India

[3] Associate professor, Department of Civil Engineering, Dr.Ambedkar Institute of technology, Bangalore.

ABSTRACT

Recently, neck brake construction works have been increasing in our country. Therefore, construction wor k for any type of building seems to be an expensive business. Therefore, he must find a way to solve this p roblem in order to construct buildings and reduce costs. Bricks are a great example of saving a cause and p rotecting the environment. Because in the brick making process, a lot of smoke and pollution will be prod uced this will make our environment dangerous.

To overcome and mitigate these problems, porous lightweight concrete blocks can be used as a clay-friendly solution. The project is the analysis and comparison of two identical hospitals on the G+11 floor b ut using different materials than bricks. The bricks used in the first architectural analysis were used in the second architectural analysis, replacing the carpet. The analysis was done using ETABS software and the r esults showed that the modified carpet waste reduced the overall draw.

Keywords: Cost reduction, modified carpet waste, red brick, Hospital block

INTRODUCTION

GENERAL

Bricks play an important material role in any type of construction. Bricks are made of baked clay; porous deep stone of different sizes, aerated concrete blocks, etc. can be separated. In the production of mobile st one products, less energy is required than conventional bricks, so there is no pollution and pollution from waste carpet production. Replacement carpet waste also comes in three special grades, all of which are les s expensive than red brick. For this reason, two G+11 high-thrust models were taken and the fabric in these two models was converted into bricks and compared.

Due to the lightness of cellular lightweight concrete blocks, there is less material to make the structure. If t he inanimate load is much smaller than the shrinking of steel bars, the component will shrink in size and t he concrete will also shrink on a large scale. The surface of the carpet saves very well instead of throwing it away, so there is no need. For coarse sand plastering on the wall, which means saving coarse sand and c ement, it also reduces the total cost of the building. And buildings can be constructed at low cost while pro tecting the environment. This measurement was made with the ETABS software program.

ECO EFFICIENT BLOCKS

Sustainability is one of the most important concepts in the construction industry. Building materials la rgely determine the energy consumption and environmental impact of buildings and have a significant impact on the sustainability of buildings. Based on environmental analysis of household products and educational research

CONCRETE INGREDIENTS

The concrete mixture of the following ingredients:-

1. Cement
2. Water
3. M-Sand
4. Micro silica
5. Carpet waste

CARPET WASTE

Waste carpet is made by manufacturing processes such as trimming the edges of the carpet and formin g the yarn. Currently, most of the carpets after customers are discarded or incinerated in landfills or ce ment plants.

Table 1: Chemical properties of carpet

Sl.no	Material	Specific gravity	Water absorption
1.	Polypropene (60%)	20%	no
2.	Nylon (15%)	5%	4.1%to4.5%
3.	Wool (5%)	1.32	13% to 15%

LITERATURE REVIEW

J. S. Sudarsan, Shruti Vaishampayan & Padma Parija (2022)
The construction industry contributes more than 35% to global emissions over the life cycle of the structu re. Every stage of construction, from raw materials to demolition, generates carbon emissions in the form of embodied or working carbon. Recycled metal, recycled concrete, etc. Reduce carbon emissions by usi ng new and sustainable construction techniques, often using circular economy strategies and energy-efficient equipment to increase the use of materials such as
Prutha Patel, Anant Patel (2021),
Sustainability in architecture is now the most important thing as it has many advantages. The internationa l trend is towards sustainable development, so sustainable development has an important role in the const ruction industry. Many environmental problems have arisen due to large-scale works in big cities.
Research on sustainability of building materials, Yiming Song Hong Zhang(2018)
Sustainability is one of the most important concepts in the construction industry. Building materials large ly determine the energy consumption and environmental impact of buildings and have a significant impac t on the sustainability of buildings. Based on environmental analysis of household products and education al research

OBJECTIVE OF PRESENT STUDY

1. To Estimate cost of Carpet waste block.
2. To Create Bill of Quantity of Hospital block and give a report on overall cost for building construction.
3. To show Cost difference between normal brick and Modified carpet waste block

MIXING PROPERTIES

The hybrid product is designed according to the IS code method for a characteristic power of 25Mpa. The process of selecting and relatively determining suitable stones to create stones with the desired strength, d urability and efficiency as a business is called stone mixed design. One way to determine the properties of aggregate is to use the number or ratio of cement and fine aggregate. By product volume or size. With car pet (5mm) (1%, 1%).5%, 2% and 2.5%), micro silica makes up 15% by weight of cement.

SLUMP CONE TEST

This is the best known and most cleverly used method of characterizing the workability of new stone. Th e device has a dielike truncated conical mold with a base diameter of 200 mm, a top diameter of 100 mm and a height of 300 mm. In this test, new concrete is filled into a mold of the same shape and size, and set tling or collapse is measured when the supporting mold is removed. The precipitation increases with incr easing water content. The slump test indicates the consistency or workability of cementitious concrete.Th e comparable designer's cone of collapse is 120 mm.

COMPRESSION STRENGTH TEST

The compression test is the most common test for hard concrete. Rock is strong in compression and weak in
tensile.

Table 2: Compression strength test results

Percentage of Carpet waste	7 Days (Mpa)	14 Days (Mpa)	28 Days (Mpa)
1	11.42	11.81	15.43
1.5	11.24	12.34	15.13
2	11.83	14.71	16.54
2.5	10.61	11.22	14.54

FLEXURAL STRENGTH TEST

The flexural strength of concrete, also known as the modulus of rupture or flexural strength, is a property defined as the stress before material flows in a flexural test.

Table 3: Flexural strength test results

Percentage of Carpet waste	**7 Days (Mpa)**	**14 Days (Mpa)**	**28 Days (Mpa)**
1	7.42	8.12	8.78
1.5	7.56	8.02	8.34
2	7.98	8.15	9.11
2.5	7.19	7.52	7.78

SPLIT TENSILE STRENGTH TEST

Tensile strength is one of the most important and important properties of concrete. Due to its low tensile Strength and brittleness, rock is not generally expected to withstand direct stress.

Table 4: Split tensile strength test results

Percentage of Carpet waste	**7 Days (Mpa)**	**14 Days (Mpa)**	**28 Days (Mpa)**
1	2.85	3.56	3.6
1.5	2.37	2.67	3.18
2	1.84	2.15	2.75
2.5	1.5	1.9	2.45

BUILDING GEOMETRY

Table 5. Building configuration data

1.Length	48 m
2.Width	20 m
3.No. of Storey	G+20
4.Storey Height	3.2 m
5.Total No. of Column	61
6.Column size	(450X600) mm
7.Beams size	(200X450 mm)
8.Slab thickness	150 mm
9.Wall thickness	230 mm
10.Grade of concrete	M35
11.Steel grade	Fe500 and Fe415
12.Density of Concrete	35.00 kN/m3
13.Density of Brick	21.0 kN/m3

LOAD CONSIDERED FOR THE ANALYSIS

- Dead load as per IS 875 (Part I)
- Live load as per IS 875 (Part II)
- Floor Finish: 1.5 kN/sqm,
- Floor Finish on top floor: 2 kN/sqm,

Live Load

- All rooms and kitchens :2 kN/sqm
- Toilet and bath rooms :2 kN/sqm
- Corridors, passages, staircases including tire escapes and store rooms :3 kN/sqm
- Balconies : 3 kN/sqm
- Live Load on roof: 1.5 kN/sqm (terrace floor)

Wall load of 230mm thick BBM

- 230mm thick BBM of height 3m is 12 kN/m.
- 230mm thick Parapet wall is 4.5 kN/m.

Seismic loading as per IS: 1893(Part I):2016

- Zone – I I
- Zone factor – 0.10
- Soil Type – Type II, medium soil
- Importance Factor – 1.5 and
- Response Reduction factor – 5.0

MANUFACTURING COST OF MODIFIED CARPET WASTE BLOCK

It is different from place to place. This is calculated as per Bangalore location
Calculate by using below formula;
An attempt to find the approximate cost of Block is made as follows:

- Basis: 750 blocks per day.
- Dimension: 230mm×110mm×70mm.
- Weight of one brick= 1.8Kg
- Mixing Ratio :(1:1:2)
- Cement – 35%, (630gm)
- M Sand – 48%, (865gm)
- Carpet waste – 2 %(36gm) and
- Micro silica– 15 %(250gm)

1. Labor cost = 250×5 members = Rs 1050/-
2. Electricity = Rs 65/-(Rural area)
3. Carpet waste = Rs 150/-

4. Cement = 630 gm. for each brick
   - For 750 brick= 630×750 = 472,500gm
   - =470 Kg, 50Kg cement= Rs 340/ - 1Kg cement =6.5
   - 470Kg Cement=?
   - Cost of Cement = (470×6.5) = Rs 3000/-

5. M Sand:
   - 1 tractor = 5 tons = 5000 kg = Rs 1000/ -
   - 865gm of Sand is required for each brick.
   - For 750 brick = 865×750 = 648,750gm = 650 Kg
   - For 5000 Kg = Rs 1000/ -
   - For650 Kg =?
   - Cost of Sand = (650×1000)/5000 = Rs 130/-

6. Micro silica:
   - For each brick = 250gm
   - For 750 bricks = 750×250 = 187,500gm = 180Kg
   - For 1 Kg = Rs 10/ -
   - Cost of Super plasticizer = (180x8) = Rs1440/-
   - Total cost for 750 bricks = 1050+65+150+3000+130+1440=Rs 4,700/
   - Cost of each brick =4700/750 = Rs 6.2/ -
   - Manufacturing cost of each brick = Rs 6.2 /-

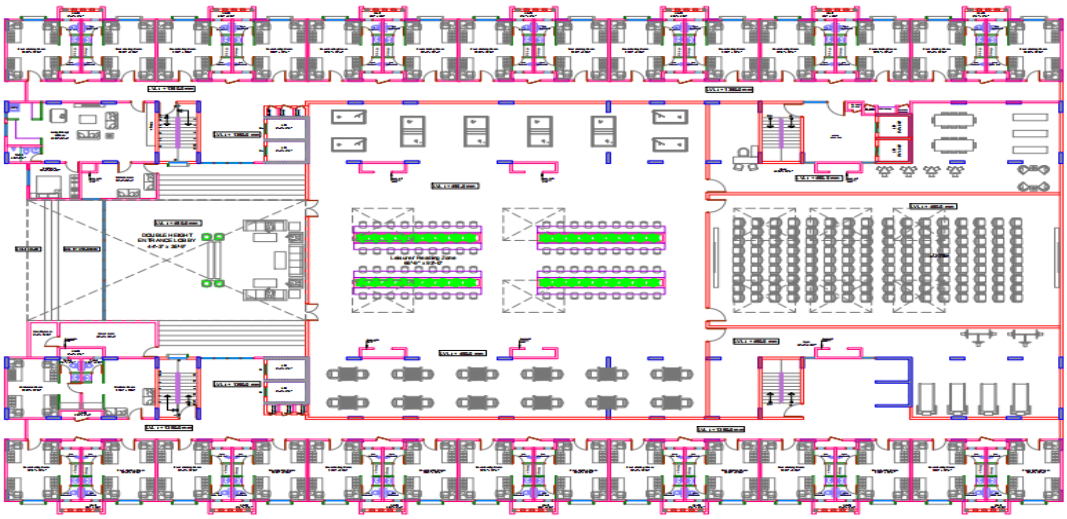

Figure 1 Floor plan

RESULTS AND DISSCUSSION

- Per brick cost in Bangalore- Rs 8
- No of bricks per square meter = 60
- Therefore; Cost of brick per Square meter = 60x8 = Rs480

Cost is calculates in both the cases and results are shown

COST COMPARISON

In this cost comparison there is a graph plotted between overall construction cost of brik Vs modifies carpet waste block

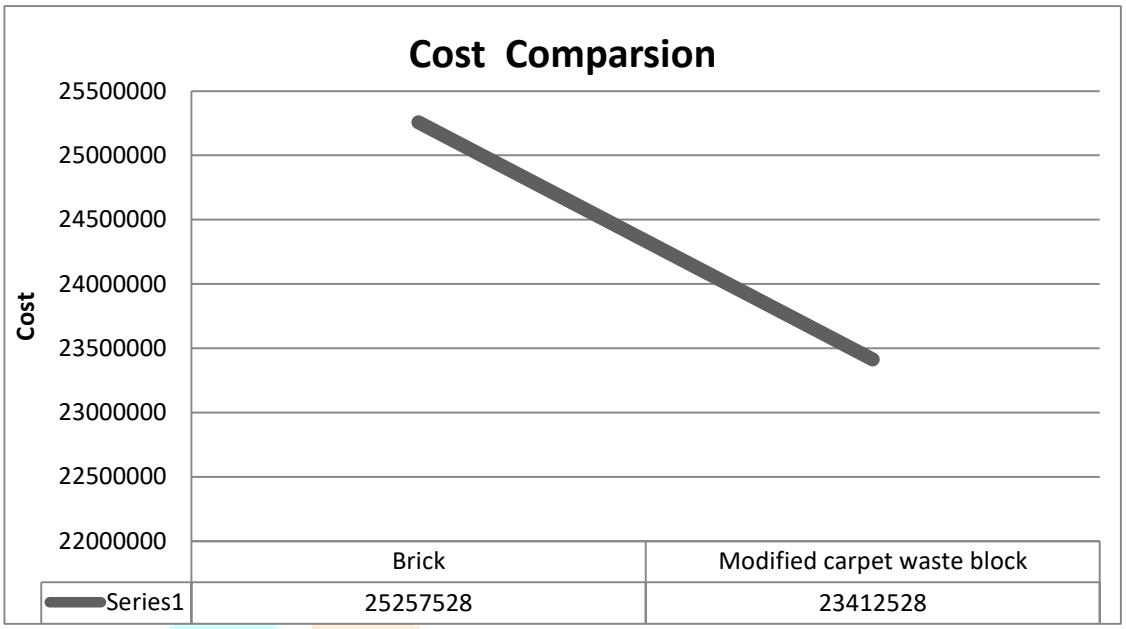

Figure 2: Cost comparison

CONCLUSION

1. Estimation for production of carpet waste block is prepared which is approximately Rs 6.2 per block
2. Bill of quantities is prepared for hospital block in which estimation is given for each and every material.
3. This study can conclude that the cost for construction is decreased by using this Modified carpet waste block

REFERENCE:

1. N. Singh, Journal of Indian Building Congress, 23,97 (2016).

2. Umar, U. A., Khamidi, M. F. & Tukur Hassan , Management in Construction Research Association conference, Malaysia (2012).

3. A. B. Mokal, A. I. Shaikh, International Journal of Application or Innovation in Engineering & Management, 4, 244 (2015).

4. P.O. Akadiri, Buildings 2, 126 (2012)

5. Song, Y., Zhang, H., IOP Conference Series: Materials Science and Engineering, 452, (2018)

6. M. Sandeep, International Journal of Intellectual Advancements and Research in Engineering Computations, 1297 (2018).

7. P. Agawam, Leonardo Electronic Journal of Practices and Technologies, 12, 15 (2008).

8. A. Chel, G. Kaushik, Alexandria Engineering Journal, 57, 655 (2017).

9. GRIHA. Griha for Affordable Housing. 2017,

10. Mahira Homes, Sec -68, Gurugram (Haryana), India 11. Mahira Homes, Sec 103, Gurugram (Haryana), India