

## ECO-FRIENDLY BRICK USING COW DUNG ASH AND WOODEN ASH

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**ABSTRACT** - Cow dung is commonly utilized in the production of eco-friendly and cost-effective bricks. The process involves drying cow dung in the sun and then burning it to obtain cow dung ash. Research has been conducted to investigate the characteristics of bricks made with fly ash and a partial substitution of cow dung ash and wood ash. This project aims to analyze and compare the beneficial properties of bricks by incorporating cow dung ash and wood ash as additional materials in clay bricks. The objective of this project is to examine and compare the advantageous properties of bricks by incorporating cow dung ash and wood ash as additional materials. The utilization of cow dung ash has led to enhanced strength, durability, and workability.

**Key Words:** Eco-Friendly, Cost-Effective, Cow Dung Ash, Durability .

### 1.INTRODUCTION

The rising need for affordable housing and the soaring prices of construction materials have highlighted the necessity to investigate sustainable methods within the construction sector. Bricks, being a fundamental material in building construction, are commonly manufactured from clay that is either sun-dried or fired. While the latter method is costly and labor-intensive, sun-dried bricks can be easily produced by individuals without specialized skills. Overall, the research conducted in this study aimed to explore the feasibility of using wood ash and cow dung ash as additives in ash bricks. By examining the properties of the resulting composite material, the study contributes to the development of sustainable building materials. The findings of this research could have implications for the construction industry, offering a more environmentally friendly alternative for producing ash bricks.

### 2.OBJECTIVES

Cow dung can be utilized to create a respiratory system that is capable of thriving in hot climates without emitting an unpleasant odor.

Cow dung ash and wood ash are effective in reducing pollution associated with development activities.

These eco-friendly bricks have the potential to revolutionize the construction industry by providing a greener and more affordable building material.

Cow dung ash and wood ash have been found to significantly reduce pollution caused by development materials.

### 3.LITERATURE REVIEW

#### 3.1Strength and Durability Properties of Cow Dung Stabilized Earth Brick; Dorothy Manu, Ghana.

The researcher studied the properties of brick earth when stabilized with cow dung. Better compressive strength and durability was seen when cow dung was mixed with brick earth. Best results were seen at addition of 20% of cow dung. There was increase in compressive strength and also abrasive resistance and decrease in water absorption capacity of the brick up-to this 20% of cow dung to the weight of brick earth.

#### 3.2 Development of Eco Brick and Concrete with the partially replacement of cow dung; A. S. Hilal, Coimbatore, India.

The author studied compressive, tensile and flexural strength properties of brick and concrete with the partially replacement of cow dung. Bricks and concrete showed best results of compressive strength when 10% of cow dung was added to them. Though the other properties which are tensile strength and flexural strength showed below-par results with the addition of cow dung. The porosity level and the water absorption capacity also increased which is due to the burning of cow dung in the bricks.

### 4. METHODOLOGY

Cow dung has been used in building construction as a building material from Vedic period in India.

Flow chart as below

I. Collection Of Raw Material

II. Testing Of Raw Material

III. Preparation Of Clay

IV. Mixing

V. Moulding

VI. Testing

VII. Result

#### 4.1 Raw Material –

##### A) Cow Dung Ash

One promising avenue for maximizing the potential of cow dung is by converting it into cow dung ash, which can serve as a valuable building material. Cow dung ash has been shown to possess properties that make it suitable for construction purposes

##### B) Wooden Ash

Wood ash has the potential to serve as a viable alternative to sand and clay in the manufacturing process of clay bricks. By incorporating wood ash as a partial replacement for these traditional materials

#### 4.2 Material Testing Result –

##### 4.2.1 Specific Gravity On Material

**Table 1 -:** Results Of Specific Gravity

Sr No	Material	Specific
1.	Cow Dung Ash	1.05
2.	Wooden Ash	1.40
3.	Clay	1.334

##### 4.2.2 Sieve Analysis On Material

**Table 2 -:** Results Of Sieve Analysis

Sieve Sizes	% Retained
4.75 mm	5
2.36 mm	10
1.18 mm	20
600 micron	30
300 micron	25
150 micron	10

#### 4.3 Mixing :-

**Table 3 - :** Mixing Proportion

Sr No	Clay	Cow dung	Wooden
1.	2000	300	300
2.	2000	500	500
3.	2000	600	600

#### 4.4 MOULDING

The dimensions of a typical clay brick, excluding mortar, are 190 mm in length, 90 mm in width, and 90 mm in height. However, the nominal size of bricks is slightly larger, measuring 200 mm in length, 100 mm in width, and 100 mm in height.



**Fig -1 :** Standard Mould Of Brick

#### 3.4 Drying :-

The duration necessary for the complete drying of bricks typically ranges from 5 to 6 days.



**Fig 2 - :** Drying Of Bricks

#### 3.5 Testing :-

##### 3.5.1 Compressive strength on Brick

**Table 4 -:** Results Of Compressive Strength

Sr No	Ratio	Compressive Strength
1.	20%	6.50 Mpa
2.	25%	6.65 Mpa
3.	30%	6.80 Mpa
4.	Standard Brick	7.00 Mpa



**Fig 3 - :** Compressive Strength Testing Machine

##### 4.5.2 Water Absorption Test On Brick :-

**Table 5 - :** Result Of Water Absorption

Sr.No	Ratio	Water Absorption
1.	20%	12.2
2.	25%	13.5
3.	30%	14.8
4.	Standard brick	14

## 5. CONCLUSION

The use of these bricks offers a cost-effective solution for construction projects.

Compared to conventional bricks, they contribute significantly to reducing CO2 emissions by 90%.

Absorbing moisture, these bricks help maintain a healthy indoor environment.

The conclusion drawn from the tests is that the 30% brick satisfies the necessary criteria for a standard brick.

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