

# Experimental Study of Laterite Bricks

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**Abstract:** Bricks are essential construction materials in structural field. Quality of bricks defines the strength of the bricks. If the quality of brick used in the structure is not good then it can lead to serious damages to the structure. Therefore, it is essential to check the quality of brick before using it in any construction activities. Quality of bricks is determined by knowing the properties of bricks. The properties of bricks depend on their mineralogical compositions, manufacturing process and firing temperature. Physical properties are the quantitative characteristics of brick and its behavior to external influences other than applied forces. Observing physical properties is important because they can significantly influence the performance and strength of bricks used in structural purposes. Mechanical properties are the characteristics of different materials in response to externally applied loads. They consist of different properties including elastic properties, which describe resistance to deformation and distortion, and strength properties, which describe resistance to any applied loads.

**Key Words:** —Bricks, Structural Field, Construction, Quality.

## I. INTRODUCTION

Laterite bricks are natural stones so they have cooling properties hence they keep the home cool during summers which is a great benefit for hot regions. Due to its natural properties, laterite brick has good thermal insulation properties and they easily adapt and adjust with the weather.

The construction industries preferably use locally available and sustainable materials for structural building applications. It is opined that sustainable building is an essential aspect to achieve ecologically responsible world. Therefore, the building materials should be chosen and used without any adverse effects on the environment.

In our project we are going to add some quantity of crush of chira brick. In Kokan region of Maharashtra and some parts of Southern India, chira stone are traditionally used for construction of buildings and other works.

The texture of chira stone being rough, it requires more quantity of cement plaster to get uniform leveled plaster that's why we are not used whole chira stone we use the crush of the chira stone in brick to analyze how bricks are behave.

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## II. OBJECTIVES

The objective of these tests was to analyze and investigate the physical properties, mechanical properties, water absorption and soundness of the laterite bricks.

- To prepare bricks from locally available laterite crush.
- To compare the strength of laterite brick with locally available cement bricks.
- To investigate compressive strength of laterite bricks.
- To find out water absorption of laterite bricks.
- To check the soundness of the laterite bricks.



Fig.1. laterite bricks

### III. COMPRESSIVE STRENGTH

Determination of compressive strength has received a large amount of attention because the concrete is primarily meant to with stand the compressive stresses. Generally, cubes are used to determine the compressive stresses. The cubes are usually of 100x100x100 or 150x150x150mm size. In the present investigation 120x80x60mm size cubes are used.

We take compressive test on the blocks after 14 & 28 days and we have following test results,

Table.1. Concrete Bricks Compressive Strength

SAMPLE 1	85.15 MPa
SAMPLE 2	79.40 MPa
SAMPLE 3	83.47 MPa
SAMPLE 4	80.20 MPa
SAMPLE 5	84.27 Mpa

Table.2. Laterite Bricks Compressive-Strength

SAMPLE 1	105.20 MPa
SAMPLE 2	118.40 MPa
SAMPLE 3	100.57 MPa
SAMPLE 4	115.34 MPa
SAMPLE 5	108.12 Mpa

### IV. COMPRESSIVE STRENGTH RESULT

The compressive strength of laterite bricks and concrete bricks are shown in above table no from above chart we make following conclusions The compressive strengths of laterite bricks of sample 1, sample 2, sample 3, sample 4, and sample 5 are 105.20Mpa, 118.40 Mpa, 100.57 Mpa, 115.34 Mpa, 108.12 Mpa. The compressive strength of concrete brick 86.15 MPa is greater than other bricks.

From above results it is clear that the laterite bricks achieve more compressive strength than the concrete bricks.

The laterite bricks achieve 20% more strength than concrete bricks.

### 4.1 Advantages

Laterite bricks are natural stones so they have cooling properties hence they keep the home cool during summers which is a great benefit for hot regions.

Due to its natural properties, laterite brick has good thermal insulation properties and they easily adapt ad adjust with the weather.

As these are easily available in hot tropical regions so these are cost-effective as well.

As these have a larger size than standard brick a smaller number of bricks are required in the overall construction process which is an added advantage in the overall cost of construction.

As these are mostly cast-in-situ they produce no greenhouse gas also helps in reducing the emission of carbon-di-oxide.

As they are cut by a machine, they are mostly uniform in sizes so further plastering of walls is optional, as they look clean and smooth without plastering as well.

It can gain strength over a period of time due to weather conditions.



### 4.2 Future Scope

Now a day's construction material become very costly so it is required to make it easy to get for every person to make construction cost less which will be affordable for everyone.

To make affordable bricks.

To make environment free from carbon dioxide which is coming from production of cement industries.

Easy casting process.

## V. CONCLUSION

The important findings of this research are summarized below which shows the enhancement in strength parameters of laterite bricks.

- The compressive strength of laterite bricks of sample 1, sample 2, sample 3, sample 4, and sample 5 are 105.20 Mpa, 118.40 Mpa, 100.57 Mpa, 115.34 Mpa, 108.12 Mpa.
- The compressive strength of concrete bricks 85.15 Mpa, 79.40 Mpa, 83.47 Mpa, 80.20 Mpa, 84.27 Mpa.
- From above results it is clear that the laterite bricks achieve more compressive strength than the concrete bricks.
- The laterite bricks achieve 20% more strength than concrete bricks.
- In water absorption test laterite bricks absorb water avg. 12.99%,12.60%,8.35% and concrete bricks absorb water avg.7.62%,5.23%,6.02%.
- Due to high compressive strength the laterite brick can be used as a load bearing walls.
- Constructions of these bricks are easy and feasible process.

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