An Experimental Study on Coir Fly Ash Bricks

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Abstract:-

- The aim of this study is to investigate the effect of coir fibre on physical properties of bricks
- The objectives of this work are:

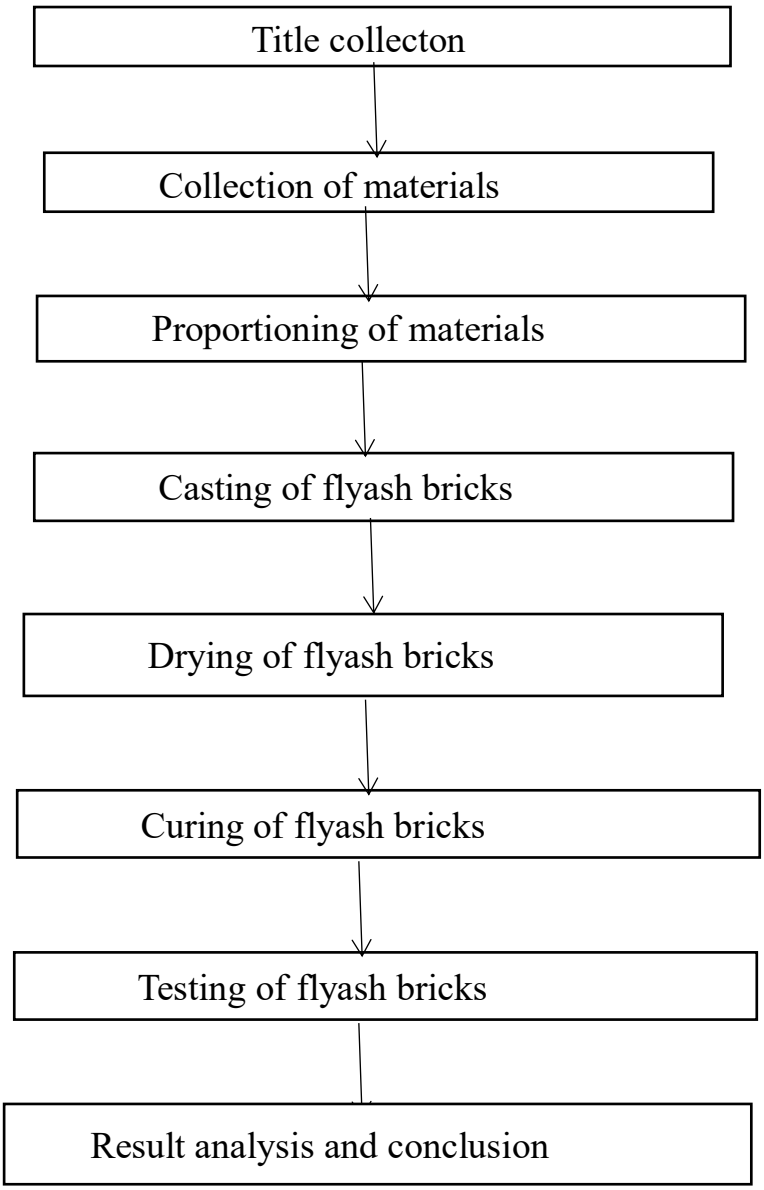
1. To find out variation in compressive, tensile and flexural strengths of coir bricks using fibre strands and raw fibre meshes at varying fibre contents and to compare it with that of flyash bricks

2. To determine the influence of shape of fibres on strength of bricks

Introduction:

- The construction industry is revolutionizing in two major ways. One way is the development of construction techniques, such as using automated tools in construction.
- The other is the advancement in high-performance construction materials, such as the introduction of high strength concrete. Among these high- performance materials, fibre reinforced concrete (FRC) is gradually gaining acceptance from Civil Engineers.
- In recent years, research and development of fibres and matrix materials and fabrication process related to construction industry have grown rapidly. Their advantages over other construction materials are their high tensile strength to weight ratio, ability to be moulded and potential resistance to environmental conditions, resulting in potentially low maintenance cost.

Methology:



WET WEIGHT OF FLY ASH BRICKS:

Bricks	Trial 1	Trial 2	Trial 3
Control bricks	4.10kg	4.00kg	4.055k
Bricks with 0.5% coir	3.95kg	3.85kg	3.75k
Bricks with 0.75% coir	3.60kg	3.67kg	3.69k
Bricks with 1% coir	3.56kg	3.60kg	3.55k

MOISTURE CONTENT:

$$\text{moisture content \%} = \frac{\text{wet weight} - \text{dry weight}}{\text{dry weight}}$$

$$= \frac{3.56-3.10 \times 100}{3.10}$$

$$= 14.38\%$$

COMPRESSION TEST ON BRICKS:

At 14days	Trial1	Trial2	Trial3
Control bricks	200kN	210kN	205k
Bricks with 0.5% coir	160kN	170kN	160k
Bricks with 0.75% coir	160kN	155kN	155k
Bricks with 1% coir	150kN	145kN	150k

STRESS IN BRICKS:

Control bricks $= \frac{\text{Average load}}{\text{Area}}$

$= \frac{0.205}{110 * 230}$

$= 7.15 N/mm^2$

Bricks with 0.5% coir $= \frac{\text{Load}}{\text{Area}}$

$= 6.82 N/mm^2$

Bricks with 0.75% coir $= \frac{\text{Load}}{\text{Area}}$

$= \frac{0.138}{110*230}$

$= 6.24 N/mm^2$

Bricks with 1% coir $= \frac{\text{Load}}{\text{Area}}$

$= \frac{0.145}{110*230}$

$= 5.92 N/mm^2$

SHAPE AND SIZE FACTOR TEST:

In this test bricks are randomly selected and measured along lengthwise ,heightwise and widthwise.

This test is done to identify strong edges.

Bricks are closely viewed to check if its edges are sharp and straight.

A good quality brick should have bright and uniform colour throughout.

CONCLUSION:

Comparing the experimental results with the results of normal flyash bricks it is concluded that, the compressive strength of flyash was not too decreased.

These are hand-made bricks so the strength may vary as the bricks are molded manually by using rough estimations.

Further research is needed to analyze the influence of coirs on the compressive strength of flyash bricks.

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