

Application of Black Cotton Soil Brick in Construction Industry

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ABSTRACT:

Over a past few years, there are widely ranges of alternatives bricks available in the field of construction with the changing in the raw material for the product. Now we are using black cotton soil as a raw material in bricks & also using some admixture to change the properties of the black cotton soil. This research study describes the feasibility of using black cotton soil as a raw material with some additional stabilizer in the brick production as partial replacement of clay in Indian context.

Keywords:- Adhesive Material - Brick - Black Cotton Soil - Rice Husk ash - Salt - Sugar cane bagasse - Fly ash

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I. INTRODUCTION:-

A brick is a construction material used in the construction of structure. The bricks and mortar are stacked tighter and make the wall and any type of the structure. The standard size of bricks is (19cm *9 cm*9cm).he nominal size of bricks is (20 cm*10 cm* 10 *cm) . The standard size of bricks and specification of bricks is given in the IS code:52012(199).in the bricks various material are used like clay, silica,alumina,etc.normally bricks are made from the clay material .in the which area there is shortage of the clay soil and only black cotton soil is available . The cost of the bricks is high and the transportation of clay cost become very high .so by the research and test we decided that the black cotton soil is used instead of the clay. But there are the different properties of the black cotton soil like shrinkage and have highly expansive nature when large amount of water content in the soil strata .so we decided that uses of various admixture and the adhesive material mixed with the black cotton soil and made a bricks and measures the different properties of the bricks like compressive strength and water absorption test. Using the black cotton soil instead of clay in brick may directly affect in the compressive strength and water absorption test.to utilize the various admixture in the black soil brick increase the compressive strength and decrease the water absorption ratio. There are various admixture used in the black cotton soil bricks are fly ash , rice husk ,lime, adhesive material ,small particles of the marble and salt and sugarcane bagasse.

II. LITERATURE REVIEW

Production of bricks from waste materials Lianyang Zhang (department of civil engineering & engineering mechanics, university of Arizona, Tucson, AZ 85721, USA) Construction & building materials |www.elsevier.com 10 June 2013.

Comparison of Fly ash & rice husk ash stabilized black cotton soil Laxmikant yadu, Rajesh Kumar, dharamveer Singh. International journal of earth sciences & engineering ISSN 0974-5904, volume 04, No 06 SPL, October 2011, PP 42-45:

Problems

- The clay brick are very costly.
- The clay is not easily available so the production of bricks comes expensive.
- The cost of transportation of bricks is more because the brick is produced where the clay is easily available.
- In between the transportation of bricks there is effect on the bricks, some bricks are collapse and damage so the quantities of bricks are decrease.
- The process of burning brick produced some hazardous gases. So this is directly effect on the human-life.
- The clay brick are very costly for low rise structure & low loading condition.

III. METHODOLOGY

- **Manufacturing of bricks**
 - Preparation of bricks material soil
 - Molding of bricks

- Drying of brick
- Burning of bricks

Molding

There are two type of molding

- 1) Hand molding
- 2) Machine molding

Drying of bricks

- ▶ The prepared bricks from the molding contains 7 to 30 percentage moisture content so the process of drying of bricks is required
- ▶ most of drying of bricks is done by heat of sun at atmospheres temperature.
- ▶ the drying of bricks are contently supervised by labor or supervisor.

Burning of bricks

it is very important step in manufacturing of bricks , it removes water from the earth completely and provide hardness and strength to bricks

The bricks are burnt by two methods:

- 1) Clamp burning
- 2) Kiln burning

Preparation of bricks soil material

▶ Removal of loose soil

upper Layer of the soil contains lots of impurities ,waste- material, organic matter, etc.so it should need to taken out this type of material from the soil.

▶ Digging and spreading :

the soil which is free from impurities is dug out and spread into heaps about 50 to 100 cm.

▶ Weathering:

the soil is then exposed to atmosphere for softening. The period require for weathering is few weeks.

▶ Blending and tempering:

the soil is the mixed with different suitable ingredients. The material are properly mixed with soil then it became used soil

IV. CONCLUSION:-

From the compressive strength test we found the black cotton soil brick compressive strength is 7.92 KN/mm² from the water absorption tests, we find the water absorption of black cotton soil brick is 11.90%. By use of black cotton soil instead of clay in brick we reduce cost of brick. Black cotton soil brick may be proved one of the economical solutions for the construction where soil locality is basically black cotton. The

use of black cotton soil in making of brick production can generate better employments in local areas and play an important role for the development of local area.

V. RESULTS & ANALYSIS :-

Materials	Compressive strength(KN/m ²)
black cotton soil +rice husk	4.53
purely black cotton soil brick	5.93
black cotton soil +rice husk -lime	5.5
black cotton soil-lime+rice husk +salt	6.9

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