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Partial replacement of cement with rice husk ash and fly ash in Manufacturing of brick

[1st] Prof. R. S. Bute, [2nd] Miss. Snehal S. Sahare, [3rd] Mr. Arshil H. Sheikh, [4th] Mr. Fardeen A. Sheikh, [5th] Mr. Chetan A. Sawankar, [6th] Mr. Shubham V. Katole

[1] Department of Civil Engineering Priyadarshini J.L. College Of Engineering, Nagpur Nagpur, Maharashtra India
[2] Department of Civil Engineering Priyadarshini J.L. College Of Engineering, Nagpur Nagpur, Maharashtra India
[3] Department of Civil Engineering Priyadarshini J.L. College Of Engineering, Nagpur Nagpur, Maharashtra India
[4] Department of Civil Engineering Priyadarshini J.L. College Of Engineering, Nagpur Nagpur, Maharashtra India
[5] Department of Civil Engineering Priyadarshini J.L. College Of Engineering, Nagpur Nagpur, Maharashtra India
[6] Department of Civil Engineering Priyadarshini J.L. College Of Engineering, Nagpur Nagpur, Maharashtra India

ABSTRACT —

Brick production is an important source of greenhouse gas emissions, particularly through the use of energy-intensive materials such as sound and concrete. To mitigate these emissions, researchers looked at alternative materials for brick production, including industrial and agricultural waste. Industrial waste such as flying ash, and agricultural waste such as rice shell ash (RHA). It can also be used as a complementary material in brick production. These wastes have been shown to improve the resulting brick properties, such as pressure resistance and durability, and at the same time reduce the energy savings required for production. Overall, using industrial and agricultural waste and brick production increases greenhouse gas emissions and sustainability in the construction industry. However, further research is needed to optimize the use of these wastes and ensure that brick results meet the required quality standards.

Introduction:

Generally there are bricks that are heavy in size. The bricks are placed on a horizontal course, sometimes dry, and sometimes mortar. When the term is used in that sense, bricks can be made from clay, lime, sand, concrete, or shaped sounds. If you have little clinical or colloquial sensation, bricks are usually made up of dry soil from a surface containing clay. In the case of Adobe, bricks just dry out. Often, they are fired in some way to form the actual ceramic. Bricks are blocks or individual unit ceramic materials used in the construction of masonry. As a rule, bricks are either bundled together or assembled as masonry with different types of mortars to form the bricks together forever. Bricks are usually produced in bulk sizes, either corn or standard size. They were considered one of the longest and strongest building materials. Generally there are bricks that are heavy in size.

Literature Survey :

1) **Varun Yadav, Nitinin Rajput, "Developing Bricks Using Industrial and Agricultural Wastes", International Research Journal of Engineering and Technology (IRJET), July 2021, Edition:** Wasser Absorption increases with increased absorption of engraved pairs of density and bricks Cytzigram is easy. The increased proportion of rice straw reduces pressure resistance. The pressure strength test is code 516-1459.

2) **Yasodha T.** "The agriculture industry is discarded as a sustainable resource for brick production." India Ministry of Biotechnology, PGPCAS. September 17th Vol. Increased the shooting temperature and reduced the amount of brick ash, resulting in reduced water absorption**.**

Raw Materials :

Material collections are the fundamental and important steps of every project. Furthermore, the materials used in the project do not cause environmental damage. In our project we used cement, flight ash and rice shell ash. Rice shell ash was produced by burning the rice shell.

- **Rice Husk Ash (RHA)**

Rice shells, also known as rice hull, are coatings of seeds or rice grains. It is formed from hard materials containing silica and lignin to protect seeds during vegetation periods. Free-of-of-art Each Ig of white rice leads to approximately 0.28 kg of rice shells as the production of rice production during the meal. Rice shell (RHA) fillers are derived from rice shells, which are usually considered agricultural waste and environmental risks. When burned outside the rice mill, the rice shell supplies two types of ashes that act as fillers for plastic materials .

- **Cement**

Cement is the only bonding material used throughout the project by mixing sand. 43 Notes (ACC) of regular Portland cement is used in the project. The cement state is fresh, and the lumps prove that John Aspidine's Portland cement was invented. This is a problem for each powder and is most frequently used in various types as a bonding material. It is a mixture of chalk or limestone along with clay. It is a binder, a substance that is affected by the structure that hardens, hardens, retains and ties other materials together. In India, three OPC classes are created. In other words, it's 33 classes, 43 classes, and 53 classes. According to the standard testing process, the pressure resistance of the cement is pushed out after 28 days. 43 grades of OPCs have been used in research.

- **Fly Ash**

Flying ash in the most thermal power plants is a resource material for the cement industry and construction products. It is also used as a building material on the streets and flies over embankments, saving the earth and contributing to the deterioration of good farmland. Using flight ash on concrete improves the processability of plastic concrete and the strength and durability of hardened concrete. Flying ash is also inexpensive. When flight ash is added to concrete, you can reduce the amount of Portland cement. Airtock concrete is resistant to acidic and sulfate attacks. Flight ash concrete shrinks very little.

Methodology :

The process and method of brick production using flight ash and rice shells was determined and carried out after a deep literature overview. Below are steps to achieve the formation of eco-friendly bricks

1. .1. Literature review on "Utilization of industrial and agricultural waste to produce eco-friendly.
2. Deciding the method to perform the making operations and test.
3. Collection of raw materials.
4. Specimen making (19cm x 9cm x 9cm).
5. Preliminary Test.
6. 6 Manufacturing of bricks
7. Basic test on BIAW bricks.
8. Performance and analysis of test on bricks sample.

Type of Test

- **Water Absorption**

The absorption test is performed on bricks to determine the amount of moisture content absorbed under extreme conditions of bricks. This test involves taking samples of dried bricks and measuring them. After measuring, these bricks are placed in water 24 hours. Next, weigh the wet bricks and write down their value. The difference in weight between dry and wet bricks leads to water absorption. With quality bricks, water intake should not exceed 20% of the weight of dry bricks.

- **Compressive Strength test**

The shredded strength of the brick is determined by placing the brick on a compression texting machine. After placing the bricks in the compression test machine, you can charge them until the brick burner breaks. Pay attention to the fault load value and ensure that the minimum strength value for brick bricks is 3.50 n/mm². This test was conducted by a compression tester after 7, 14, and 28 DE from the date of Gasvia-W-ziegel. Biaw bricks have Brinle behavior as the structure first showed some cracks and then collapsed, causing the Biaw brick to fail under higher loads.

- **Soundness Test**

Two stones were placed and stacked together for this test. The bricks were not broken and a transparent bell was created. Therefore, bricks are operated safely.

- **Hardness Test**

The surface of the brick has a scratch created on the surface of the brick, with its hard components. If this doesn't affect the bricks, then a good first gra de brick.

Future Scope :

1. The use of green waste materials such as plastic, flight ash, and rice straws can avoid any problems associated with disposal.
2. By changing the brick-changing tone, you can significantly reduce the lack of fertile soil and an agricultural environment.
3. Traditional techniques for producing bricks pollute the air. Air pollutants can be reduced by forcing new, unfree brick technology.

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