

Use of Sugarcane Bagasse Ash from Sustainability Point of View in Fly Ash Bricks

Suresh Buram¹, Rakesh Bore², Shreyash Bodkhe³, Vaibhav Garmode⁴,
Basudev Kundu⁵ Milind Khamagaonkar⁶

^{1,2,3,4,5} Students: Department of civil Engineering

⁶ Professor : Department of Civil Engineering Tulsiramji Gaikwad Patil of College of Engineering and Technology
,Mohgaon ,Nagpur ,Maharashtra (India)

Abstract: As we all know that the India is the second largest country in the world in production of sugarcane. According to data have been released by the department of Agriculture, cooperation and farmer welfare on 3rd june 2019. The total sugarcane production in india during 2018-2019 is 400.37 million tonnes. It is expected that sugarcane production in future may increase. The Bagasse is sugarcane fibre waste left after juice extraction. Sugarcane bagasse ash mainly contains silica(Sio₂), Alumina (Al₂O₃) and calcium. Use of sugarcane bagasse ash waste in bricks can save the fertile land and the sugarcane industry disposal cost. The bricks prepared with various amounts of bagasse ash and fly ash are tested for the compressive strength, water absorption, efflorescence test and other properties. The main aim of this research is to make economical and light weight bricks so as to decrease the dead load of the structure. Use of sugarcane bagasse ash is sustainable solution for solid waste management also.

Keywords: Sugarcane Bagasse Ash, Fly Ash, Compressive Strength, Light weight, Bricks, sustainable.

I. Introduction

India as the largest area under sugarcane cultivation the world and the world's second largest producer of sugarcane next only to Brazil. Sugarcane belongs to bamboo family of plants and is indigenous to india. It is long duration crop and requires 10 to 15 and even 18 months to mature, depending upon the geographical conditions. It requires hot and humid climate with average temperature of 21° to 27°C. and 75-150 cm rainfall is favorable for sugarcane cultivation. Sugarcane today plays a major role in the global economy and Brazil is the leading producer of sugar and alcohol, which are important international commodities.

Nowdays, it is commonplace to reutilize sugarcane bagasse as a biomass fuel in boilers for vapour and power generation in sugar factories. Depending on the incenerating conditions, the resulting sugarcane bagasse ash (SCBA) may contain high levels of Sio₂ and Al₂O₃, enabling its use as a supplementary cementitious material (SCM) in blended cement systems. Sugarcane bagasse ash (SBA) is a multi- process by-product produced from the milling of sugarcane. Bagasse is the fibrous material remaining after removing the sugar, water and other impurities from the sugarcane delivered to the mill. Use of sugarcane bagasse ash waste as a construction material can save the land disposal cost and fertile land.

II. What Is Bagasse Ash?

The Bagasse is sugarcane fibre waste left after juice extraction.

III. Literature Review

1. Vignesh Kumar, B. Jai Vignesh Experimental investigation on replacement of bagasse ash in brick, In this research paper found that the coal ash can be utilized in bulk only in engineering applications such as construction of embankments as backfill material, as a sub material. A better measure by an innovative construction material is formed through this research.
2. Mangesh V. Madurwar, Sachin A. Mandavgane, Rahul V. Ralegaonkar. Use of sugarcane bagasse ash as brick material, in this research paper we found as the weight percentage of SBA present in the mix increases, the density of the decreases.
3. Muhammad Azhar Saleem, Syed Minhaj Saleem Kazmi. Clay bricks prepared with sugarcane bagasse and rice husk ash, in this research, Lighter brick can be produced after addition of RHA and SBA in burnt clay bricks. Brick specimens after incorporating RHA and SBA showed less compressive and flexural strength.
4. D. Kishore, S. Kotteswaran. Review on bagasse ash an effective replacement in fly ash brick, Form the

experiment they have noted that decrease in bagasse ash increase the strength of fly ash brick. Upto 50% addition of bagasse ash there is no crack formation and has a great bonding in it.

5. Bhavya Rana, Prof. Jayeshkumar Pitroda. Sugar cane bagasse ash for eco-friendly fly ash bricks, In this research, An innovative supplementary cementitious construction material is formed through this study. Uses of sugarcane bagasse ash in a brick can save the agriculture industries disposal cost and produce greener brick for construction.
6. Manish C. Detroja. Bagasse ash brick, The aim of this research was to make economical and green brick to maintain environmental balance and avoid problem of ash disposal. A measure by an innovative construction material through this research.
7. Balasubramanian P, Manimuthu.K, Venkateshan G, Experimental investigation on brick by replacement of sugarcane bagasse ash for the cement usage, In this research maximum compressive strength can be obtained. This study helps in converting the non-valuable bagasse ash into bricks and makes it valuable.
8. Ravi Kumar, Deepankar Kr. Ashish, Najia L. Properties of non conventional (Fly ash) brick, The main Objective of this experiment programme was to study and compare the compressive strength, water absorption and efflorescence test of non conventional brick with conventional brick. Being light weight in compression with conventional brick, dead load of structure is reduced and hence saving overall cost of structure.

IV. Conclusion

Use of sugarcane bagasse ash from sustainability point of view in fly ash brick is to make economical and light weight brick so as to decrease the dead load of structure. This study helps in converting the non-valuable bagasse ash into bricks and makes it valuable. Compressive strength goes on decreases with increase in percentage of bagasse ash as compare to fly ash. Use of bagasse ash in brick can solve the disposal problem; reduce cost and produce a 'greener' ecofriendly bricks for construction.

References

- [1]. A.P Sing and P. Kumar, "Light Weight Cement Sand and bagasses ash bricks ," International Journal of Innovative Research in Science and Technology ,vol .1, no .12 pp.284-287 M.V. Madhurwar ,S.A.Mandavane ,and R.V.Ralegaonkar
- [2]. Jayraj Vinodsinh Solanki, Ronak prakashkumar patel, prof. Jayeshkumar Pitroda (2013), A study on Low Quality Fly ash an Opportunity for sustainable and Economical concrete , IJSR international Journal Of Scientific Research Volume 2 Issue 2 Feb 2013
- [3]. IS 12894:2002 Pulverized Fuel Ash Lime Bricks Specification (First Revision)
- [4]. IS 456:2000 Plain And Reinforced Concrete Code of Practice (Fourth Revision)
- [5]. Shruthi H R1, Dr.H Eramma2 yashwanth M K3 Keerthi Gowda B .S .international journal of advance technology in engineering and science volume no .2 issue no 08.
- [6]. Review on bagasse ash an effective replacement in fly ash brick ,D.Kishore,S.Kotteswaran Department civil engineering Anna University,Chennai
- [7]. K.C.P. Faria R.F. Gurgel, J.N.F Holanda Recycling of sugarcane bagasse ash waste in the production of clay bricks(2012)
- [8]. Mrs. U.R.Kawade ,Mr.V.Rathi ,Miss Vaishali D Girge Effect of Bagasse ash on strength of bricks
- [9]. Manish Kumar Sahu,Lokesh Sing ,Critical review on type of bricks type 2:Fly ash brick,civil engineering department,G.D.R.C.E.T.Bhilai.
- [10]. Ravi Kumar,Deepankar Kr.ashish,Najia L.,Properties of non conventional (fly ash) brick: An Experimental Study.Swami Devi Dayal Institute of Engineering and Technology,Haryana, India.
- [11]. M.Narmata ,R.Aruna,M.Sarswati,strengthening of fly ash bricks by ironite, Department of civil engineering ,pavai college of technology namakka.india.
- [12]. M.Mohankumar,G.A.Motilala Tendulkar ,P.Ganeshkumar, T.Arunkumar,bagasse ash as an effective booming in fly ash bricks review.
- [13]. Ravikumar,Vandana patyal,Balwinder Lallotra,Deepankar kumara shish,study of properties of light weight fly ash brick.