

A Review Study on Brick Manufacturing By Using Waste Material and Plastic

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Abstract— Plastic waste which is increasing day by day becomes eyesore and in turn pollutes the environment, especially in high mountain villages where no garbage collection system exists. A large amount of plastic is being brought into the tourist trekking regions are discarded or burned which leads to the contamination of environment and air. Hence, these waste plastics are to be effectively utilized. High-density polyethylene (HDPE) and polyethylene (PE) bags are cleaned and added with sand and aggregate at various percentages to obtain high strength bricks that possess thermal and sound insulation properties to control pollution and to reduce the overall cost of construction, this is one of the best ways to avoid the accumulation of plastic waste which is an on-degradable pollutant. This alternatively saves the quantity of sand/clay that has to be taken away from the precious river beds/mines. The plastic waste is naturally available in surplus quantity and hence the cost factor comes down. Also Colouring agents can be added to the mixture to attain desired shades. Hence in this thesis, an attempt is made to study regard the properties of the brick which is manufactured using plastic wastes.

Keywords: Brick Manufacturing, Waste Material, Plastic

I. INTRODUCTION

Plastic is a non-bio-degradable substance which takes thousands of years to decompose that creates land as well as water pollution to the environment. The quantity of plastic waste in municipal solid waste is expanding rapidly. It is estimated that the rate of usage is double for every 10 years. The plastic usage is large in consumption and one of the largest plastic wastes is polyethylene. The utilization of earth based clay material resulted in resource depletion and environmental degradation. As amount of clay required for brick is huge, in this project these waste plastics are effectively utilized in order to reduce the land space required to dump these wastes. This creates the prevention from various harmful diseases. Polyethylene bags are cleaned and added with fine aggregate at various ratios to obtain high strength bricks that possess thermal and sound insulation properties. This is one of the best ways to avoid the accumulation of plastic waste. It also helps to conserve energy, reduce the overall cost of construction and hence in this project, an attempts made to manufacture the plastic sand bricks by utilizing the waste plastic.

II. LITERATURE REVIEW

- 1) Manish Kumar Sahu et al: Volume- 5, Issue-11, Nov.-2017):- Brick is one of the most common masonry units used as building material. Due to the demand, different types of waste have been investigated to be incorporated into the bricks. There has been a

considerable imbalance between the availability of conventional building materials and their demand in the recent past. On the other hand the plastic waste is abundantly available and the disposal of waste plastics is a biggest challenge, as repeated recycling of PET bottles poses a potential danger of being transformed to a toxic material and only a small proportion of plastic wastes are being recycled. Because of costly conventional recycling techniques, there has been an increased demand for more scientific and innovative technologies to effectively recycle these materials. This paper deals with recycling and manufacturing process, materials used as well as the testing method of plastic sand bricks.

- 2) Larenlakpam Billygraham Singh et al(2017):Present a report on Manufacturing Bricks from Sand and Waste Plastics,this report concludes that,Making bricks from sand and waste plastics can be an alternative to the available traditional clay bricks. Sand plastic bricks have lower water absorption, bulk density, and apparent porosity when compared with those of normal clay bricks. Sand plastic bricks have higher compressive strength than normal clay bricks. Waste plastics which is available everywhere may be put to an efficient use in brick making. Sand plastic bricks can help reduce the environmental pollution thereby making the environment clean and healthy.
- 3) Dr. Omprakash Netula et al (2018): Present a report on utilization of plastic waste in manufacturing of plastic sand bricks, this report concludes that. Waste plastic, which is available everywhere, may be put to an effective use in brick/tiles making. Plastic sand bricks/tiles can help reduce the environmental pollution, thereby making the environment clean and healthy. Plastic sand bricks/tiles reduce the usage of clay in making of bricks/tiles. Plastic sand bricks/tiles give an alternative option of bricks/tiles to the customers on affordable rates. Water absorption of plastic sand brick is zero percent. Compressive strength of plastic sand brick is 5.6 N/mm² at the compressive load of 96 KN.
- 4) Rajarapu Bhushaiah et al (2019): Present a report on study of plastic brick from plastic waste, this report concludes Waste plastic, which is available everywhere, may be put to an effective use in brick. Plastic bricks can help reduce the environmental pollution, thereby making the environment clean and healthy. Plastic sand bricks reduce the usage of clay in making of bricks. Plastic sand bricks give an alternative option of bricks to the customers on affordable rates. Water absorption of plastic sand brick is zero percent.
- 5) R. S. Kognole et al (2019): Present a report on Utilization of Plastic waste for Making Plastic Bricks, this report

concludes that . Waste plastic, which is available everywhere, may be put to an effective use in brick making. Plastic sand bricks can help reduce the environmental pollution, thereby making the environment clean and healthy. Plastic sand bricks reduce the usage of clay in making of bricks. Plastic sand bricks give an alternative option of bricks to the customers on affordable rates. Water absorption of plastic sand brick is zero percent. We conclude that the plastic sand bricks are useful for the construction industry when we compare with Fly Ash bricks and 3rd class clay bricks.

- 6) Mr.N.Thirugnanasambantham et al: Plastic is a non-bio-degradable substance which takes thousands of years to decompose that creates land as well as water pollution to the environment. The quantity of plastic waste in Municipal Solid Waste (MSW) is expanding rapidly. It is estimated that the rate of usage is double for every 10 years. The Plastic usage is large in consumption and one of the largest plastic wastes is polyethylene (PE). The utilization of earth based clay material resulted in resource depletion and environmental degradation. As amount of clay required for brick is huge, in this project these waste plastics are effectively utilized in order to reduce the land space required to dump these wastes. This creates the prevention from various harmful diseases. Polyethylene (PE) bags are cleaned and added with fine aggregate at various ratios to obtain high strength bricks that possess thermal and sound insulation properties. This is one of the best ways to avoid the accumulation of plastic waste. It also helps to conserve energy, reduce the overall cost of construction and hence in this project, an attempt is made to manufacture the plastic sand bricks by utilizing the waste plastics.
- 7) S S Chauhan et al (2019):Present report on Fabrication and Testing of Plastic Sand Bricks, this report concludes that,Plastic Sand Bricks made of plastic waste which otherwise would have created pollution, possess advantages of cost efficiency, resource efficiency, etc. It leads us towards our sustainable development goal. The bricks made have less porosity and light weight with more compressive strength. Further research might improve the quality and durability of Plastic Sand Bricks.
- 8) Mohammad sultan et al (2020):Present report on Utilization of Waste Plastic in Manufacturing of Plastic Sand Bricks this report concludes that,Waste plastic, which is available everywhere, may be put to an effective use in brick. Plastic bricks can help reduce the environmental pollution, thereby making the environment clean and healthy. Plastic sand bricks reduce the usage of clay in making of bricks. Plastic sand bricks give an alternative option of bricks to the customers on affordable rates. Water absorption of plastic sand brick is zero percent. Compressive strength of plastic sand brick is 5.6 N/mm² at the compressive load of 96KN. We conclude that the plastic sand bricks are useful for the construction industry when we compare with Fly Ash bricks and 3rd class clay bricks.

A. Summary of Literature

In this literature study, the plastic and sand is used for preparing plastic bricks because of this pollution decreases and plastic is disposed and use of clay is reduced for bricks.

III. CONCLUSION

From above literature study we can determine the compressive strength of plastic brick. We can compare the strength of conventional brick to plastic brick. We can take the water absorption test on plastic brick. We will determine the cost and quality of plastic brick.

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