A Review Study On Brick Manufacturing By Using Waste Plastic & Sand

Ujjval Yadav[1], Ayush Chaudhary[2], Utsav Yadav[3], Nivedita Verma[4], Khushboo Tiwari[5]
[1, 2, 3, 4] Dept of Civil Engineering
[5]Assistant Professor, Dept of Civil Engineering
[1, 2, 3, 4, 5] Bansal Institute of Engineering & Technology , Lucknow (UP)

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 tracking 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 non-degradable pollutant. This alternatively saves the quanta 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 Coloring 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- Plastic Waste, Bricks, Clay, Non-biodegradable, Environment, Sand, Water, Durability.

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 attempts made to manufacture the plastic sand bricks by utilizing the waste plastic.

II. LITERATURE REVIEW

The use of plastic waste in bricks would open a solution for the disposal issues regarding plastic wastes. Many research works have been done in the area of the use of plastic waste in manufacturing of bricks.

1) Miss. P. Subhadra et al: Volume- 5, Issue-01, Jan.-(2022): - 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 the compressive strength was reduced significantly by15% when replacing of west plastic. Its bonding strength

2) Mr. Aman Kumar et al (2020): 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 (1.5%), bulk density(1.497Kg/L), and apparent porosity when compared with those of normal clay bricks. Sand plastic bricks have near same compressive strength(5MPA) than normal clay bricks (4.3 to 6.9) Plastic brick have low weight compression to normal brick. 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) Mr. C. Selvamani et al (2019): Present a report on preparation of brick using sand and plastic bottles, 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. Compressive strength of plastic sand brick (8.6N/mm2) is more than compression to the normal red brick (5.58N/mm2) they perform the test at different - different ratio (1:3) is very good for high compressive strength ratio.
4) Prof. A. S. Moon et al issue 4 April (2022): Present Ecological brick by use of west plastic & sand, 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. it reduces the weight of brick compression to normal brick. 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.

III. OBJECTIVE

The main objective of this project is to produce plastic bricks from plastic wastes-

1. Plastic pollution involves the accumulation of plastic products in the environment that adversely effect wildlife, wildlife habitat, or humans.
2. The prominence of plastic is correlated with plastics being inexpensive and durable, which lands to high levels of plastic used by humans.
3. It is slow to degrade.
4. More than 5 million tons of plastics are consumed each year, of which an estimated were 24% makes its into recycling systems, that leaves a remaining 3.8 million tons of waste, destined for landfills.
5. To reduce the disposal problem of plastics.

IV. 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. And we found that the plastic brick has the high compressive strength compression to nominal brick and the zero-water absorption capacity. The plastic bricks are more economical and eco-friendlier.

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