

A Review Study On Plastic Brick By Using Waste Plastic Material

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Abstract- *Plastics are key resources in circular economy and recycling after the end of useful life with economic value creation and minimal damage to environment is the key to their stream of researches have explored impregnating waste plastics in concrete and reported encouraging results with multiple benefits. The present study makes a critical review of some of these findings and gleans some common useful trends in the properties reported in these studies. The study also presents results of experimental work on bricks made of non-recyclable waste thermoplastic granules constituting 0 to 20% by weight, 4kg of fly ash, cement and sand making up the remainder. The bricks were cured under water for 28 days and baked at temperature ranging from 90oC to 110oC for 2 hours. The key characteristics of these bricks are found to be lightweight, porous, of low thermal conductivity, and of appreciable mechanical strengths.*

I. INTRODUCTION

Plastic is a very common material that is now widely used by everybody in the world. Plastic plays a predominant role in reusable in this era, as it is compact and light in weight. Common plastic items that are used are covers, bottles, and food packages. The great problem with plastic is its decomposition. Plastic is made of polymer chemicals and they are non-biodegradable. This means that plastic will not decompose when it is placed in earth. Though plastic is a very useful material that is flexible, robust and rigid they become waste after their use and they pollute the air and land. Recycling is processing use waste materials into new products to prevent waste of potentially useful materials. The increase in the popularity of using eco-friendly, low cost and lightweight construction materials in building industry has brought about the need to investigate how this can be achieved by benefiting to the environment as well as maintaining the material requirements and their standards. From the advantages of plastic recycling procedure is used. For the production of plastic bricks is an optimal method for controlling the problem by decomposition of plastic waste and also it costs economical for the production of building materials. In this study, plastic waste from factories will be used to incorporate with cement and sand to produce sand bricks. The bricks will then be tested to study the compressive

strength, efflorescence and water absorption. In the recent past research, the replacement and addition have been done with the direct inclusion of polyethylene, polyethylene terephthalate (PET) bottles in shredded form, chemically treated polyethylene-fiber, PET in small particles form by replacing natural coarse aggregate. Most of replacements have been done by volume calculation, and showed the decreased in compressive strength as the increased plastic waste. In this study, recycled plastic waste have been introduced in the form of crushed. The replacement of plastic waste material has been done by weight.

LECTURE REVIEW

According to a technical newsletter “ focus on pet”, poly ethylene terephthalate belongs to the polyester family of polymers ,one of the largest and most diverse of the polymer families .This family of polymers is linked by the common feature of having an ester (-COO-) link in the main chain , but the range of polyester materials is probably the largest of all the polymer families.And also the chemical structure of the PET is having only atomic species that are carbon , hydrogen and oxygen. Therefore the melting point of PET would not results in result that a melting temperature of 260 degree is required. Also its properties of the PET it can be understood that it has got good chemical resistance and better resistance to UV rays (9). In paper an review on waste plastic utilization in asphaltting of roads.

The techniques to use plastic waste for construction purpose of roads and flexible pavements, which were developed by various researchers has been reviewed. And collectively emphasises the concept of utilization of waste plastic in construction of flexible road pavement . In the construction of flexible pavement, bitumen plays role of pending the aggregate together by coating over the aggregate. Its also helps to improve strength and life of road pavement . But its resistance towards water is poor. A common method to improve the quality of bitumen is by modifying the rheological properties of bitumen by blending synthetic polymers like rubber and plastic.

III. MIX DESIGN OF PLASTIC BRICKS

In order to find the plastic bricks that they possess high compressive strength with various mix proportions are made and they are tested using compressive testing machine (CTM). The mix proportions were in the ratio of 1:2, 1:3 and 1:4. These are the ratio which represents the plastic, river sand respectively.

IV. METHODOLOGY

- A. *Collection of Materials.*
- B. *Batching.*
- C. *Melting.*
- D. *Mixing.*
- E. *Moulding.*
- F. *Curing.*

A. COLLECTION OF PLASTIC MATERIALS

The plastic material should be collected from the factories waste and hospital waste and industries waste and also food packages and plastic bottles this will come under the LDPE plastic type

B. BATCHING

Batching of plastic Measurement of materials for making brick is called batching. After collection of materials we separate the types of plastic and remove any other waste presented in the collected material and check that any water content in in sample collected ten proceed for burning.

C. MELTING

Burning of waste plastic After completion batching the plastic waste were taken for burning in which the plastic bags are drop one by one into the container and allowed to melt. These would be done in closed vessel because to prevent the toxic gases released into atmosphere. These will be at the temperature of 90-110 degrees centigrade.

D. MIXING

Mixing of materials is essential for the production of uniform and strength for brick. The mixing has to be ensure that the mass becomes homogeneous, uniform in colour and consistency. Generally, there are two types of mixing, Hand mixing and mechanical mixing. In this project, we adopted hand mixing. until the entire plastic content required for making plastic brick of one mix proportion is added into it.

then these plastic liquids thoroughly mixed by using trowel before it hardens. The mixture has very short setting bags are turned to molten state; the river sand is added to it. The sand added is mixed time. Hence mixing process should not consume more time.

E. MOULDING

After completion of proper mixing we place mix into required mould. In these projects we use the normal brick sizes (19x9x9 cm). after 2 days remove the brick from the mould and then done curing.

F. CURING

The test specimens after moulding were allowed to dry for a period of 24 hours. The specimens were kept in curing tank and allowed to cure for a period of 28 days .

V. MATERIALS

Plastic.→ Cement.→ Sand.→ Water.→ Fly ash→

VI. CONCLUSION

From above discussion and study of all literature review and implementing proper methodology we can justify that plastic will be more reliable , durable and suitable than other bricks. We can also conclude that plastic bricks are more stronger than other bricks.

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