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A Literature review on reuse of plastic bottles

Ramya Raju

[1]Department of Civil, Mumbai University
Email: ramyaraju5616@gmail.com

Abstract-*Plastic are produced from oil that is considered as non-renewable resource. Because plastic has that insoluble property. About 500 years in nature, it is considered as a sustainable waste and environmental pollutant so reusing or recycling of it can be effectual in mitigation of environmental impacts related to it. Building construction using plastic bottle is of low- cost and ecofriendly*.

Keywords—plastic bottles, rebound hammer, cube test

I. INTRODUCTION

The packaging and production of plastic bottles is at a large scale. About 100 million ton of plastic waste is generated per year in whole world. It is said globally, PET is the most recycled plastic and the current rate of PET bottles recycling in India is around 80 per cent. They comprise a large portion of the waste to form greenhouse gasses all around the world. So the reuse of plastic waste is more important rather than recycling and is more efficient. This reuse applied to building projects have gained popularity. The plastic bottles, now can be treated as a building block material similar to bricks for small scale construction. This hence will form a secondary function of bottles, to keep them rid from throwing into landfills.

II. OBJECTIVES

- To use these bottle as replacement of bricks.
- To solve the disposal problem of plastic waste as the generation of plastic waste is on a largescale.
- To compare some characteristics between plastic bottles and brickblock.
- To construct bio-climatic structure with plasticbottles.

III. LITERATURE REVIEW

- **SitiAishah Wahid (January 2015)-**The comprehensive strength decreases with increasing waste plastic ratios. The virgin (0% plastic waste) sand brick showed the highest value of compressive strength. It seems that the bonding between the plastic particles and the cement paste is weak. However, the mixes of sand bricks and plastics waste seems possible because water absorption less than 15% for all ratio. The reduced compressive strength values of waste plastic bricks mixes show that it can be used only in situations that required low- degree workability.

- **Yogesh Singh, Shubham Papal, Pravin Dhumal3, Bhaskar Kunjeer4, Prof. SavitaJangale (March 2018)-** Leads to green building construction, innovative use of material with sustainable application. The waste materials which are fine in size, if handled in controlled condition will provide sustainable development. Walls constructed using plastic bottle blocks have been less costly as compared to the regular bricks and also they provide greater strength than bricks.

- **Andrew J. Grattinger, Philip Johnson, PramodhSunkari, Matthew Duke and Jonathan Effinger (June 2016)-** Lightweight recycled plastic bottle fill has geo-environmental advantages over geofoam such as reusing a waste material. Not contributing to ground-level ozone, & compatibility with petroleum products. The density is similar to geofoam at approximately 2% of density of soil. Results are encouraging and show the new lightweight fill is

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approximately half as strong as geofoam, which is similar to strength of softsoil.

- **Ali (November 2014)**- The block of air filled bottles showed slightly higher strength than different types of bottle filling, and has proved to have structural stability with high factor of safety.

- **Z Muyen, TN Barna, MN Hoque (March 2016)-**The bottle bricks were found to be stronger than conventional bricks and concrete cylinders. These are cheaper than conventional bricks. The strength and relatively low cost can lead this material a successful next construction material. The compressive strength increased with increase in size of thebottle.

- **MojtabaValinejadshoubi, MasoudValinejadshoubi, AzinShakiba (January 2013)-**Use of innovative material with sustainable application, lightweight structure.

- **Himanshu Sharma (April 2017)**- The study comprises of methodology, material used, selection of bottles, strength parameters, sound insulation, light ttansmission, structural wall stability, thermal strength, cost analysis. The overall result is safe and economical and high strength withdurability.

IV. CONCLUSION

Use of plastic as a replacement shall be done at a larger scale, with this the pollution caused from plastic and the problem of disposing the plastic will be solved.

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