



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 3, March 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijrset@gmail.com

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Ecofriendly Blocks by Using Plastic Waste and Crush Sand/Dust

Kalpesh Beldar, Vyanketesh Ingalwad, Rudra Binawat, Krutuja Rupnar, Aboli Jadhav, Mr.M.D.Thorat,

Diploma Student, Department of Civil Engineering, JSPM's Jayawantrao Sawant Polytechnic Hadapsar, Pune, India

Associate Professor, Department of Civil Engineering, JSPM's Jayawantrao Sawant Polytechnic, Hadapsar, Pune, India

ABSTRACT: This report outlines the utilization of municipal plastic waste (MPW) in construction industries. 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. One such effort is the efficient use of waste plastic and laterite quarry waste with a small quantity of bitumen, to develop an alternative building material such as bricks with negligible water absorption and satisfactory strength in comparison with Laterite stone to satisfy the increasing demand of conventional building materials. Utilizing MPW as construction materials especially in production of bricks is one of a promising step towards a sustainable resources and waste management. Plastic waste can substitute either partially or completely one or more of the materials in brick production. Further research based on recent research and a better understanding in utilization of plastic waste in brick is needed to produce a high durability and quality of bricks as well as to achieve the optimum balance in all aspects especially in terms of cost and functionality.

I. INTRODUCTION

Plastic is 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 package. The great problems 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 material into new product to prevent waste of potentially useful material. 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 block is an optimal method for controlling the problem by decomposition of plastic waste and also it cost economical for the production of building materials. In this study, plastic waste from factories will be used to incorporate with crush sand/dust blocks. The blocks will then be tested to study the compressive strength, efflorescence 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, in small particles from by replacing natural crush sand. Most of replacement have been done by volume calculation, and showed the decreased in compressive strength as the increased plastic waste.

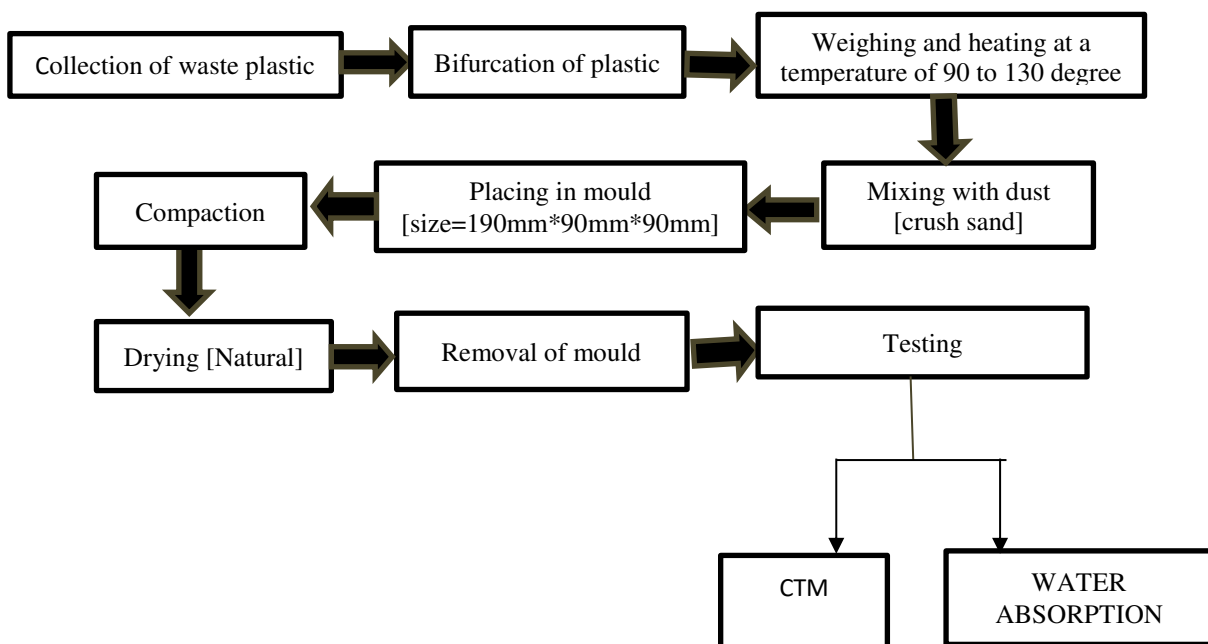
II. LITERATURE REVIEW

No.	Paper Title	Author Name	Key Points	Remark
1	Utilization of waste plastic in manufacturing of	Maneeth.D, Pramod K, Kishor kumar	Poly ethylene teryphthalate (PET), poly-propylene (PP) ,Laterite quarry waste, Bitumen, Plastic-soil bricks.	From the water absorption test results of plastic-soil bricks it is observed that the water



	plastic-soil bricks			absorption also decreases with increase in percentage of plastic content.
2	Study of plastic brick made from waste plastic	Rajarapu Bhushaiah , Shaik mohammad, D.Srinivasa Rao	Plastic waste, water absorption, compressive strength, efflorescence test, thermoplastic (LDPE).	Plastic brick can help to reduce the environmental pollution ,there by making the envornment clean and healthy
3	Production of Pavement Blocks from Plastic Waste	Owolabi,Wahab Folorunsho, Amadi.A.N.	Pavement Blocks, Geomaterials, engineering properties, Lagos, Nigria.	The present study has efficiently and effectively demonstrated the application of waste plastic into useful constructional materials as well as reducing its menace in our surrounding.
4	Utilization of Plastic Bottle Waste in Sand Bricks	Siti Aishah Wahid, Sullyfaizura Mohd Rawi, Norlia Md Desa	Plastic waste, compressive strength, water absorption, efflorescence, environmental issue.	The comprehensive strength decreases with increasing waste plastic ratios.
5	Utilization of Quarry Dust in Cement Concrete Paver Blocks for Rural Roads	Poonam Sharma , Manoj Sharma	Plastic bricks, Poly ethylene terephthalate (PET), Laterite quarry waste, Bitumen, M-sand, Gypsum, and Improvement of fire resistance capacity.	The water absorption, being the average of the three units, and water absorption of paver block shall not be more than 6% by mass and in individual samples, the water absorption should restricted to 7 percent.

III. METHODOLOGY



IV. EXPERIMENTAL RESULTS

PLASTIC BLOCKS	STRENGTH	AVERAGE
BLOCK -1 (1:1)	14.12 N/MM ²	12.4 N/mm ²
BLOCK-2 (1:1)	12.6 N/MM ²	
BLOCK-3 (1:1)	10.5 N/MM ²	

	Clay Brick	Plastic Block
1. Water Absorption	12% to 15%	0%
2. Weight	2.6 kg to 3.5 kg	3 kg to 3.6 kg
3. Strength	10N/mm ²	14.12N/mm ²
4. Use	Construction work & also use for temporary work and Permanent	I. Divider wall II. Footpath III. Garden and also use for temporary work
5. Cost	14 Rs	12 Rs

Comparison between clay brick & plastic block :



(a)



(b)



(c)



(d)

(e)

Testing Result

V.CONCLUSION AND FUTURE WORK

1. In this project we have conclude that we can manufacture plastic blocks by using. Plastic waste which can helps to reduce pollution upto 100% which is harmful to the nature.
2. From the obtained results it is clear that plastic block has almost equal compressive strength as that of ordinary one and water absorption of block is 0%.

FUTURE WORK

1. Hollow blocks/bricks
2. Tiles
3. Light weight blocks/bricks
4. Water proof concrete
5. Sandwich brick/block

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