

Concrete Paver by Using Plastic Waste with Zero Percent Cement

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Abstract: The main aim of this project is to reduce the production of plastic and to use waste plastic effectively and efficient manner so this work will help the society to grow day by day without impact the society and maximum use of natural resources. The brick paver block firstly replaced by concrete paver Holland in the fifties, concrete paver block is having many benefited than brick-like heavy load-bearing capacity, water-permeable, maximum resistance against weathering effects, maximum longer life etc. In our work we are using zero amount of cement which is reducing the cost of concrete paver block and effective way to reduce the plastic waste After completing the work I have reached on the final conclusion that due to less bonding property of plastic than cement concrete paver block with zero amount of cement cannot be used for the heavy loaded surface covering but theses paver block can be used for pedestrian, Garden, lightweight vehicles, pitching of sloping ground or on the embankment. With the help of this work, we are able to reduce the demand for cement and able to control the global warming effects. The final compressive the strength of sample after 7, 14 and 28 days is 8.95 N/mm², 9.67 N/mm², 9.89 N/mm².

Key Word: Plastic waste, Cement, Paver block

1. INTRODUCTION

A combination of a wide range of synthetic or semi-synthetic organic compounds with high molecular weight at high temperature will result the formation of plastic. Due to easy in manufacturing, low cost, versatility, water tightness etc character now a day its demand is increasing day by day for the production of various types of domestic, medical field and industrial things, approximately 42 percentage plastic is going to use for the packing of

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refreshment product in India which results a lots of waste product in the form of plastic which is non Biodegradable. The waste produced in the form of plastic mainly consists of Polyethylene terephthalate and Polystyrene. Brick paving /block paving is effective method to get the hard and decorative surface. There are many industries throughout the India which is producing the number of styles, shapes, tones and chemical resistance with high strength concrete paver block. Now day concrete paver block is going to use for different purpose like driveways, pedestrian distinguish roads from footways, to fix parking bays and to decide the public and private sector etc. Firstly concrete was used by roman approximately 6500BC on large scale for the construction of concrete floors, housing structures, and underground cisterns.

There are many industry are using a different by product waste material to improve the property of concrete paver block like fly ash, silica fume, copper slag, iron slag, rice husk ash etc. To improve the tensile strength, decrease the micro cracks, increase impact resistance of concrete, compressive strength, tensile strength we can use small amount of fiber but the actual cost will increase. In our work we have prepared that two type of concrete paver block sample one with hexagonal shape and other rectangular with standard dimension equal to concrete paver block with zero percent cement and tested in lab after 2 days, 7days. A paver block with plastic having most efficient benefits is that no need to wait for curing on the other hand due to zero percentage use of cement there is no chance of cementitious chemical reaction which results to reduce the micro cracks for concrete and paver block strength will increase

Our project is help full to decrease the plastic waste which is producing now days approximately 56 lakh tones per year in India

2. EXPERIMENTAL PROCEDURE**2.1 MATERIAL USED**

(1) Plastic Waste: For making concrete block with plastic , plastic waste collected from nearby surrounding are , domestic waste , some of from industry with well graded size approximately 40 -50 micron

Table 01 Property of Plastic

Sr. No.	Property of Plastic	Value
1	Melting Temperature	150 – 200 °C
2	Density	0.82-0.890
3	Thermal co efficient of expansion	100-200 X10 ⁻⁶



Figure 01 Plastic waste

(2) **Quarry dust:** A quarry dust selected from crushing plant with well graded size less than 4.75 mm which is already having approximately 1-2 percentage of moisture. The sand belong from grade zone III with water absorption 1.78 .

(3) **Coarse Aggregate:** Local available course aggregate used for concrete paver block with passing through 12mm sieve and retained on 10mm sieve. There is no separate tests were performed for aggregate

2.2 Mix Ratio: The ratio prepared as per the mix design code IS 10262:2009 and sample were tested after 2 day and7 day

2.3 Preparation of Test Specimens: Plastic is heated at melting temperature as a result of melting producing many types of toxic gasses. In melted plastic waste the material course

aggregate and quarry dust mixed properly with temperature of 150 – 200 °C then prepared mix poured in already oil coated cube and leave for 24 hours for curing purpose .



Fig.02 Heating of Plastic



Fig.03 Casting and prepared sample

2.4 Testing of Specimens: A plastic paver block tested for compressive strength test after 2 day and 7 days

3. RESULT AND DISCUSSION

Total four types of test performed on concrete paver block with plastic

- (1) Slump Value Test
- (2) Compressive strength

(3) Water Absorption

(4) Sieve analysis on aggregate



Figure 04 Compressive strength test

Table 02

Days	Plastic waste	Quarry dust	C. A.	Compressive stress (N/mm ²)
7	1	0.75	0.75	8.95
14	1	0.75	0.75	9.67
28	1	0.75	0.75	9.89

As results it is concluded that the compressive strength of concrete paver block with zero percentage cement is no depending upon number of days and curing period 90 % strength achieved within 24 hours.

4.CONCLUSION

(1) The use of waste plastic underway of paver has profitable method for transfer of plastic squander.

(2) The expense of paver square is diminished when analyzed to that of cement paver square.

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(3) Paver square made utilizing plastic waste, Zero cement, coarse total and artistic waste have appeared better outcome.

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