

## EXPERIMENTAL RESEARCH ON PAVER BLOCK WITH POLYSTYRENE

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### ABSTRACT

Now a day's more number of waste materials are disposed in the environment. The reuse of waste materials for construction are emerging trend today. We can reuse the polystyrene waste by partial replacement in paver block materials. This will increase the insulation properties and reduce the radiation emission. The solution is to mix the concrete mix with the puffed polystyrene beads. Then these puffed beads make the material becomes lighter by displace the other components of the concrete mix. If we add more beads, then the strength of the concrete will be less, so the final portions of puffed beads are governed by the application of the concrete.

**KEYWORDS:** Polystyrene beads, Paver Block, Reuse, Insulation.

### I. INTRODUCTION

In the construction industry now a day's the interlocking concrete paver blocks (ICPB) are playing an essential role. Pedestrian footpath, Exterior landscapes, petrol bulk and roads were now filled with the paver blocks. Due to its reliability, it is widely preferred in many places and also it provide aesthetic view. But in past these blocks were made by clay, natural stone. We have using the concrete pavers from the past six decades only. The main benefits of using paver blocks, were it should avoid cracks by maintaining the good strengthen properties and it can be flexible. Numerous studies have been going on in paver blocks by replacing the aggregate and by reusing the aggregate. Clay, Tiles, Foundry sand, GGBS(Ground granulated blast-furnace slag ) and M-sand has been replaced the common materials used in paver blocks. Abrasion, strengthen characteristics and skid resistance test of the pavers has been done by the researchers. This paper aims to deliver the fundamental materials that suit for making the paver with good strength.

### II. METHODOLOGY

#### a) Material used for paver block

- **Cement-** The cement used mainly paver block strength of cement concrete and high durable as well as dimensional etc.
- **Sand-** sand particles will range in diameter from 0.02 to 2 mm
- **Sikament Chemical-** The admixtures may be used are natural or manufactured chemicals or it may be an additive which is added during mixing of a concrete to improve specific properties of the fresh or hardened concrete, such as, durability, workability, early and final strength.
- **Coarse aggregates**
- **Water**

### III. LAYING OF PAVER BLOCK

#### a) Construction of Interlocking Concrete Block Pavement

The sequencing processes for the construction of paver block pavement should be as follows

- 1) Fixing of sub-surface drainage constructions.
- 2) the sub-grade must be Flattening and compacted.

- 3) where needed, the Provision and compaction of sub-base course should be provided.
- 4) Provision and compaction of base-course and checking for correct profile.
- 5) Fixing of edge restraints.
- 6) Provision and compaction of coarse bedding sand.
- 7) Placing of blocks and interlocking.
- 8) Application of joint sealing sand and compaction.
- 9) Cleaning of surface.
- 10) Filling any remaining empty portions in the block layer especially near edge restraint blocks with in situ concrete.

#### IV. RESULT AND DISCUSSION

Five different mixes are prepared by partial replacement in volume of materials. The Polystyrene beads are added at varying percentage such as 2, 3, 3.5, 4.5,5. To find the compressive strength of paver block with polystyrene, the specimen were air cured for 7days.

**Table-1:** Percentage of Polystyrene in Paver Block

S. No	Total Weight Of Paver Block With Polystyrene (Kg)	Polystyrene Added (%)	Polystyrene Adding Taken (G)
1.	5.625	2	0.132
2.	5.625	3	0.168
3.	5.625	3.5	0.196
4.	5.625	4.5	0.253
5.	5.625	5	0.280

**Table -2:** Compressive Strength Test For Concrete Paver Block

S. No	Paver Block Area (Mm <sup>2</sup> )	Maximum Load (N)	Compressive Strength (N/Mm <sup>2</sup> )
1.	(250x125)	880000	28.16
2.		832000	27
3.		995000	32.84
4.		750000	24
5.		680000	21.8



**Fig-1:** Paver Block with Polystyrene beads

## V. CONCLUSION

So, these concrete paver blocks can be used at habitation areas and rural roads. It will give a good aesthetic view as compare to cast in situ concrete roads. The aim of the study was to determine the better design mix for paver block's durability. In this study we determined the design mix for our requirements and defects occurring in the lifespan of the blocks are then identified. If these blocks are used at habitation areas of rural roads then their construction cost, maintenance cost & other easiness difficulties can be visualized for future use in different situations.

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