

Comparison of Strength Between Conventional Paver Block and Fly Ash Paver Block

Chandahas Rawale¹, Rushi Katta¹, Pratiksha Bhute¹, Kanchan Kueya¹, Prachita Dahikar¹, Nikita Khadse¹,
Prof. Laxmikant Vairagade²

¹U.G. Student, Civil Engineering Department, G.H.R.A.E.T Nagpur, Maharashtra, India

²Assistant Professor, Civil Engineering Department, G.H.R.A.E.T Nagpur, Maharashtra, India

ABSTRACT

Now a days we will conclude cement replace by fly ash and adding gypsum and super plasticizer with various percentages in the construction of concrete block pavement. As we know dumping of fly ash is the biggest issue now days in India in due to fly ash environmental pollution and human hazard increasing day by days. The aim this research is make economic and environmental friendly paver block, and solve the disposal problem fly ash.

Keywords: Concrete, Dust, Fly Ash, Super Plasticizer, Hardener, Compressive Strength

I. INTRODUCTION

Paver Block: Block paving also known as brick paving is a commonly used decorative method of creating a pavement or hard standing. The main benefit of bricks over other materials is that individual bricks can later be lifted up and replaced. A concrete brick has to be allowed to set. There are two basic types of paving blocks – concrete and clay. Concrete Paving Blocks: Concrete blocks are mass manufactured to standard sizes. This makes them interchangeable. Typical concrete paving blocks have one smooth face and one rough, although some paving blocks so come with reversible surfaces (can be used both sides). The performance characteristics of concrete paving blocks make it suitable for the heaviest duty applications, able to support substantial loads and resist shearing and braking forces. These blocks come in different colors. The colors typically come from metallic oxides. However, these colours tend to fade over a period of time, so it is helpful to exercise caution while selecting them. Concrete

paving blocks are the most preferred choice for laying of pavements, driveways, etc.

Clay Paving Blocks: Clay paving blocks (also called as bricks or cobbles) are generally available as typical, rectangular bricks, although custom shapes can be made for specific projects. Unlike the concrete paving blocks, both the surfaces of most clay blocks are fully useable and interchangeable. Clay bricks do not use any dyes to impart colour; they come in natural colour. Consequently, the colour of these blocks does not usually fade with time. Clay paving blocks are more difficult to cut than their concrete counterpart. The paving blocks are most suitable for walls or pillars.

Materials utilize: Cement: As per availability of cement in market we have use 43 grade OPC as per IS code. Material Admixture :Mineral admixture are used to replace the OPC with various percentage to find strength of concrete blocks. The fly ash can be used in different following quantities. Aggregate: For casting of paver block we have use 6mm to 10mm aggregate

Table 1

Sr. No.	Size of Aggregate	IS recommended Code
1	6 mm	IS 383
2	10 mm	IS 383

- Dust:** Sand is replaced from dust. Dust is nothing but aggregate. The IS Code for dust is HS 7105. It has same properties like sand and hence it can be used as substitute.
- Admixture:** Admixture which is used in construction of concrete block pavement should be conforming to IS 9103, it is not affecting the property of concrete block pavement.
- Water:** The water used in production of paving block should be potable and having minimum PH value of 7 to 8 as per IS 456. The water cement ratio is 0.45.

Results

- Comparison of compressive strength

Table 2

Sr. No.	Conventional block	Fly Ash block
	7 days(N/mm ²)	7 days(N/mm ²)
1	50.83	47.22(50% fly ash)
2	49.20	Fail (100% fly ash)

II. CONCLUSION

From experimental results we conclude that compressive strength of both conventional as well as fly ash blocks are similar. Therefore fly ash paver blocks can replace conventional blocks.

III. SCOPE OF THE FUTURE

Fly ash is cheaply and readily available. Fly ash as produced on large scale it leads to attain economy.

IV. REFERENCES

- [1]. Radhikesh P Nanda, Amiya k Das, Maharana N.C., "Stone crusher dust as a fine aggregate in concrete", International Journal of Civil & Structural Engineering, volume 1, No 3, 2017.
- [2]. Ms. Deshmukh Anuja A, Mr. Nikam Rohit S, Gite Asha., " Utilization of Basalt fiber", International Conference on recent trends in civil Engineering, Science & management,(ICCSM-17) ISBN-978-93-86171.
- [3]. Koli Nishikant, Aiwale Nachiket, Inamdar, Abishek Sangar., "Manufacturing of concrete paving block by using waste glass material", International Journal of Scientific and Research Publications, Volume 6, Issue 6, June 2016 61.
- [4]. Dinesh W. Gawatre, Akshay S Ghaytadhkar, Nikhil N Gage Sumit D bhar shubham.S.Deare., "To improve Mechanical properties of concrete paver block", IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE).
- [5]. Kewal,Sanjay K Sharma and Himmi Gupta., "Development of paver block by using foundry sand based geopolymer concrete", Author(s) 2015 the Article is published with open access at www
- [6]. Surta Rai Nurliana Panjaitan., "Influence of Lime Addition Compressive Strength Against Increasing Paving Block", Department of Civil Engineering, Institute Technology Medan, Indonesia.
- [7]. Chethan Kumar N.T., "Hypo sludge paver blocks., ",Assistant professor, civil engineering department, PACE Mangalore , Karnataka(India).
- [8]. Tung-chai Ling., Hasanan Md Nor., "Granulated waste tyres in concrete paving block",

- Department of Geotechnics and Transportation, University Teknologi Malaysia, Malaysia, Skudai, 81300, Malaysia.
- [9]. Patel V. V., Dr. Pitroda J. R., Prof. Bhavsar J. J., "A Critical literature review on gain full utilization of industrial waste in rubber mould paver block", International Journal of emerging technologies application in engineering technology and sciences. 0974-3588 | JAN 2016 | Volume 9 : Issue 1.
- [10]. R. C. Yeole., Dr. M. B. Varma., "Comparison of Mix Designs of Paver Blocks using Waste Rounded Steel Aggregates and Rubber Pad", International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 4, Issue.
- [11]. Shyam Prakash Koganti., Kommineni Hemanthraja Satish Sajja., "Replacement of Fine Aggregate by using Recyclable Materials in Paving Blocks", IOP Conf. Series: Materials Science and Engineering 225 (2017) 012157 doi:10.1088/1757-899X/225/1/012157.
- [12]. B.A.V .Ram kumar ,J Venkateshwar Rao., "Effect of Inclusion Of Glass Fiber and GGBS in concrete Paver block", IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN:2278-1684,p-ISSN: 2320-334X, Volume 12, Issue 5 Ver. III (Sep. - Oct. 2015).
- [13]. Shivkumar Hallale, Shinde swapnil &Vikas Londhe., " Recycled Plastic and Coconut Fiber Used in Concrete Paver Block", UG scholar Assistant professor Department of Civil Engineering Sethu Institute of Technology, Madurai, Tamilnadu, India.
- [14]. Ritesh Mall , Saurabh Dubey&Sharda Sharma., " Study the properties of paver blocks by using material like fly ash ", M.Tech Structural Engineering Department of Civil Engineering Madan mohan malviya University of Technology,Gorakhpur (U.P) India.
- [15]. S. Ismail And Z.Yaacob., " Properties of Bricks Produce with Recycled fine Aggregate ", World Academy of Science, Engineering and Technology 43 2010..chitkara.edu.in/publication