



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 5, May 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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Influence of Fly Ash and Coir Fibre in Paver Block

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ABSTRACT: In this experiment the partial replacement of fly ash (grade F) with the cement content and the coir fibre used as addition portion on M-sand are investigated on paver block. There are three main mix proportions on coir fibre they are 0.05% to 0.15% and the proportions of replacing fly ash as 5% to 15% with the paver block. In this experimental investigation the mechanical properties of cement, coarse aggregate and addition material are checked, and also the compressive strength, water absorption of paver block checked with 7, 21, and 28 days.

KEYWORDS: Compressive Strength, fly ash, coir fibers, Water Absorption, Paver Block

I. INTRODUCTION

In this experiment the concrete are mixed with various raw and additive materials like cement, sand, water, aggregates, fly ash and coir fibre are mixed for the proportions in paver block. The nominal paver block are in the shapes like zig zag, I shaped and pentagonal shaped paver block are applied for ground surface which are fully compacted with compaction materials and laid with the thickness of 60mm, 70mm, 80mm, etc.. to lay the paver block with the compacted surface. In the paver block project's grade is M20 and the minimum thickness is 80 mm. These concrete paver block is cost effective, attractive, functional and its very easy to manufacture. Recently in concrete paver block fibres are introduced to increase strength, durability and reduction in fly ash. It sounds like you're discussing the benefits of using fly ash and coir fiber in concrete paver blocks.

II. SCOPE

- To Reduce Consumption Of Cement In spite Of Fly ash
- By Adding Coir Fibre To Improve Porosity In Paver Blocks
- To Achieve The Expected Strength For The Actual Grade Of Concrete
- To Improve The Usage Of Fly Ash To Create Less Economical Platforms In Paver Blocks
- By Adding Of Coir Fibre Improves The Stability Of Paver Block.

III. METHODOLOGY

- Collection of Literature
- Study of Literature
- Abstract
- Mix Design for M₂₀ grade of Concrete
- Fly ash, Coir Fibre, Cement, Fine & Coarse Aggregate
- Fine and Coarse Aggregate- Sieve, Specific gravity

IV. EXPERIMENTAL RESULTS

Cement

It sounds like you're discussing a project that involves experimental study using indeed a common type of cement used as a binding material in concrete. The "43 grade" designation refers to its compressive strength after 28 days of curing. This grade of cement is suitable for a variety of construction applications, including residential and commercial projects. If you need any further information or assistance regarding your project, feel free to ask!

Water

Using portable drinking water from an industrial company for mixing and curing paver blocks can indeed be a viable option, especially if it meets the quality standards outlined in IS 456-2000 for water used in concrete production. Ensuring that the water meets these specifications is crucial for maintaining the desired properties and durability of the paver blocks.



M Sand

It typically consists of rounded grains which can result in better quality concrete compared to angular grains. Additionally, avoiding sea sand due to its salt and impurity content helps ensure the durability and strength of the concrete.

Coarse Aggregate

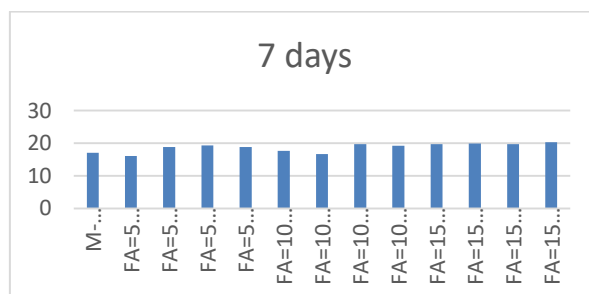
Absolutely, using locally available crushed stone aggregates of nominal size 10mm can be a practical and efficient approach for paver block production

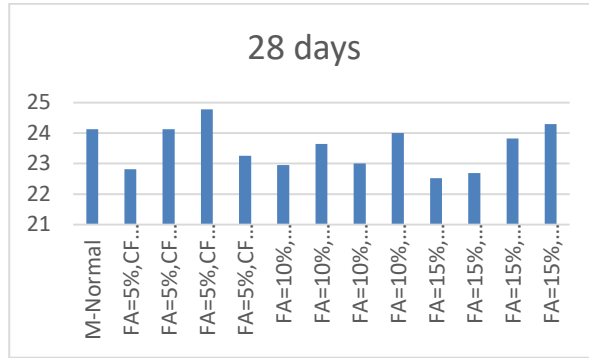
Mix proportion

It seems like you're describing a study where different mix designs were experimented with for paver blocks, including variations in coir fiber and fly ash content. Each mix proportion was tested for 13 paver blocks, with adjustments in coir fiber and fly ash percentages to evaluate their effects on the properties of the paver blocks. If you need assistance with analyzing the data or understanding the results, feel free to provide more details, and I can help you with that.

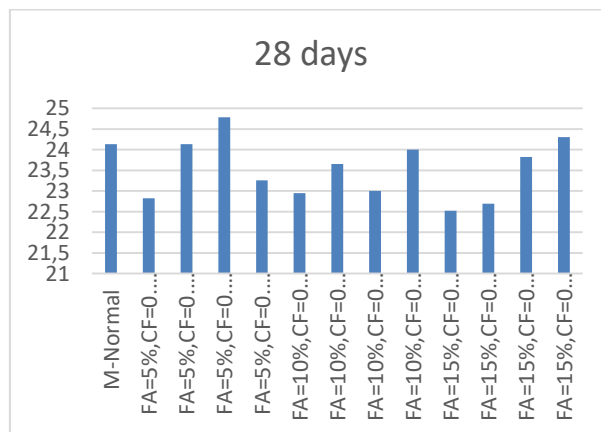
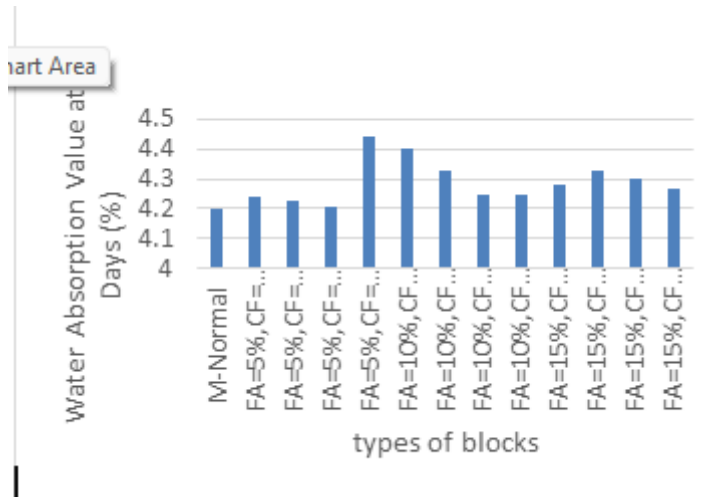
Materials	Cement (kg)	Fine Aggregate (kg)	Coarse Aggregate (kg)	Water (liters)
M	400	674	1118	2.221
FA=5%,CF=0.05%	400	674	1118	2.221
FA=5%,CF=0.1%	400	674	1118	2.221
FA=5%,CF=0.15%	400	674	1118	2.221
FA=5%,CF=0.05%	400	674	1118	2.221
FA=10%,CF=0.1%	400	674	1118	2.221
FA=10%,CF=0.15%	400	674	1118	2.221
FA=10%,CF=0.05%	400	674	1118	2.221
FA=10%,CF=0.1%	400	674	1118	2.221
FA=10%,CF=0.15%	400	674	1118	2.221
FA=10%,CF=0.05%	400	674	1118	2.221
FA=15%,CF=0.1%	400	674	1118	2.221
FA=15%,CF=0.05%	400	674	1118	2.221
FA=15%,CF=0.1%	400	674	1118	2.221
FA=15%,CF=0.15%	400	674	1118	2.221

Compressive strength test





Water Absorption Test



V. CONCLUSION

It sounds like you're discussing improvements in concrete paver blocks. Increasing water absorption might indicate a change in material composition or production process.

That's valuable information from the research. It seems like replacing up to 15% of cement with fly ash and adding 0.05% to 0.15% coir fibers consistently yields the highest strength in concrete paver blocks.

Absolutely, mix design and testing are essential for achieving the desired performance characteristics of paver blocks.

Coir fiber's potential to enhance workability and reduce water absorption can indeed lead to better compaction and improved durability.

It's worth noting that while the addition of coir fiber can enhance certain properties like strength and durability, it may also slightly increase water absorption compared to conventional paver blocks.

Since it has shown good resistance to compression and water absorption. It can be used for pavement purpose.

Designating the paver blocks for medium traffic category aligns with the requirement for durability and strength. Using the recommended grade designation of M20 ensures that the blocks meet the necessary standards for load-bearing capacity and performance under traffic conditions.

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