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STRENGTH PARAMETERS OF PAVER BLOCKS WITH WOOD DUST AND RUBBER PIECES

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ABSTRACT
The presently paver block is used in outdoor versatility application and also it is used in street road and other places. Concrete paving blocks are ideal materials on the footpaths and roads for easy laying, better look and finish. Paver block has low c maintenance and easily replace with a newer one at the time of breakage. There are various types of Industrial Waste availability in local markets, and certain of it can be used in the construction industry for utilization of waste material and eco-friend conditions .Various paper and research works based on fine aggregate (sand) replaced by various percentages of other industrial waste material and cement replaced by various percentage of other slurry base material and for that increased in strength, durability and reduction in cost and utilization of waste material. Various waste material are us like Wood dust, Rubber Pieces Various fibres use for improving strength of paver block.

INTRODUCTION
This paper documents existing literature on the subject matter, different material and ad mixer add Paver is first introducing in European countries in 1925.The reason behind this invention is that the brick pavers were to much less durable and broken easily. Concrete pavers also give different shape and design for attractive outdoor appearance. A paver is a paving stone, tile, brick or brick-like piece of concrete commonly used as exterior flooring. The paver block chose for this project was “Basil” (250x200x55mm).In this project, we are adding waste materials like wood dust and rubber pieces in the various percentage of total volume of the concrete paver for property enhancement.
use in mix design of concrete for making rubber pieces Paver Block so changes in the physical property of Paver Block, Paver Block become eco-friendly, view of the cost paver block become economic. Literature published in various national, international, other online and local journals and other conferences, various reports the various standards published by various authorities have been studied and their small important contents have been beneficially use for make Rubber pieces Paver Block in the construction industry. The producing useful shape of stone the various stone wastes are coming out from the various processes in stone industries. From the preliminary waste named as stone chips, due to minimum cost it is taken out to replace the natural basaltic coarse aggregate utilization in concrete. In current time natural basaltic aggregate are using and as it is costly, so it’s required to replace by stone waste such as stone chips conserves basaltic aggregate reduces the impact on landfills and for sustainable development. Decreases energy consumption and can provide cost savings also. Stone waste as aggregates are the materials for the future.

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Objective

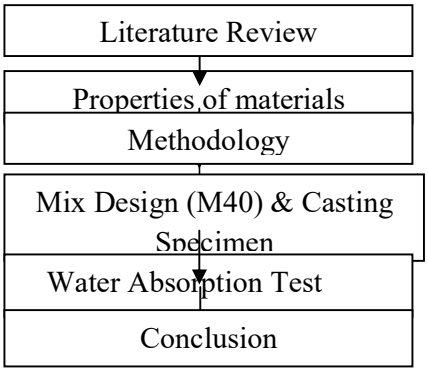
The objective of this project is to study the betterment of effect of different inhibitors that are used for resisting the corrosion of steel rebar in the reinforced concrete. The project aims to achieve the following:

- ✓ To provide steel rebar in concrete from early corrosion.
- ✓ To study the influence of the copper slag on various strength properties of the concrete mix.
- ✓ To study the influence of the corrosion inhibitors on stated here. Then, major findings have been stated, describing the most important findings of this literature review stating various factors become

Social Relevance of the Project

Copper slag is the waste product from an industry and it is highly difficult to dispose it at a same time it also has relevant properties compared to fine aggregate which is highly in demand and so because of the usage of copper slag we can able to reduce the demand over the fine aggregate. By using

Methodology



Material Properties

Those particles passing the 4.75mm sieve, and predominantly retained on the 75µm sieve are called fine aggregate. The conventional sources of fine aggregate for paving blocks are river sand, artificial sand by crushing rocks.

Wood Dust

Fine Aggregates (M-Sand)

- ➢ Sawdust (or) wood dust is a by product of durability properties of the structural component.
- ➢ To study the efficiency of different inhibitors (inorganic inhibitors and green inhibitors) over corrosion. Increase in strength and durability percentage on addition of various corrosion inhibitors is need to be noted and they can be used in according percentage

Rubber Pieces

The rubber pieces used in this project is rubber produced from automotive and truck scrap tyres. Natural rubber is made from a runny, milky white liquid called latex that oozes from certain plants

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when you cut into them. Common dandelions, for example, produce latex; if you snap off their stems, you can see the latex dripping out from them.

Physical Properties of Wood Dust

S. No.	Properties	Value
1	Specific gravity	3.2
2	Weight of empty pycnometer	635 g
3	Shape	Uniform Angular
4	Weight of pycnometer + wood dust	790 g
5	Weight of pycnometer + water	1455 g
6	Specific gravity of wood dust	1.192

Properties of Fine Aggregates

S. No.	Properties	Value
1	Specific gravity	2.69
2	Fineness Modulus	2.79
3	Water Absorption (%)	0.24
4	Bulk Density	2.78

Coarse Aggregate

Aggregates are the important constituents in concrete. They give body to the concrete, reduce shrinkage and affect economy. The aggregates used for production of paver blocks are sound and free from honeycombed practices. Those particles that are predominantly retained on the 4.75mm(no.4) are called coarse aggregate.

Properties of Cement

Properties	Value
Specific gravity	3.18
Fineness (m2 / kg)	6.95
Initial setting time (minutes)	45
Final setting time (minutes)	585
Standard Consistency (%)	30

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Inhibitors used

- FINE AGGREGATE
- COARSE AGGREGATE
- WOOD DUST
- RUBBER PIECES

Mix proportions ratio (M40)

Cement	Fine aggregates	Coarse aggregate	Water
1	1.4	2.5	0.40

BULK DENSITY TEST

The bulk density measurement should be performed at the soil surface and/or in a compacted zone (plow pan, etc.) if one is present . Measure bulk density near (between 1 and 2 feet) the site of the respiration and infiltration tests. To get a more representative bulk density measurement of the area,

Properties of Coarse Aggregates

S. No.	Properties	Value
1	Specific gravity	2.71
2	Fineness Modulus	7.55
3	Water Absorption (%)	0.24
4	Impact Value (%)	14.88
5	Crushing Value (%)	14.55
6	Particle Shape	Angular

The density of a continuously solid article, such as a metal bar, is simply its volume divided by its weight. Such an item is considered incompressible, and as such, its density is essentially constant. On the other hand, there are empty spaces between the solid particles of granular materials. These materials are sometimes referred to as divided solids. Such materials can be compacted or expanded depending on the forces applied to them, and the space between the solid particles can vary. Bulk density, therefore, is not inherent to the material itself, but varies depending on the space between the particles and the substance present in that space. It depends on a number of variables such as the measurement method, the amount of moisture in the material, how the material is handled, and others. Most typically, this property is expressed on what is known as an “oven-dry” basis thereby excluding additional weight contributed by moisture mixed into the substance.

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Water absorption is the amount of water taken up by flour to achieve the desired consistency and create a quality end-product. It is the optimal amount of water you can add to a dough before it becomes too sticky to process. Water absorption is usually defined by flour weight.

WATER ABSORPTION

water-absorption test A test to determine the moisture content of soil as a percentage of its dry weight (British Standard 1377, 1967). The sample is weighed, dried in an oven, then reweighed under standard conditions. It is calculated as the moisture content, which is equal to: (weight of the container with wet soil minus the weight of the container with dry soil) divided by (weight of the container with dry soil minus the weight of the container), then multiplied by 100 to express it as a percentage.

Water absorption gives an idea of strength of aggregate. Aggregates having more water absorption are more porous in nature and are generally considered unsuitable unless they are found to be acceptable based on strength, impact and hardness tests.

Specific Gravity and Water Absorption Tests on Aggregates. Specific gravity test of aggregates is done to measure the strength or quality of the material while water absorption test determines the water holding capacity of the coarse and fine aggregates. To measure the strength or quality of the material.

Water absorbed by cement reacts with it chemically to form compounds. There's no standard test as water absorption test for cement unlike aggregates where there is physical absorption and the process can be reversed to determine absorbed water content using oven drying or any other method.

Water absorption is the amount of water taken up by flour to achieve the desired consistency and create a quality end-product. It is the optimal amount of water you can add to a dough before it becomes too sticky to process. Water absorption is usually defined by flour weight.

Consistency Test For Cement

A standard consistency test of cement is performed to find out the water content required to produce a cement paste of standard consistency. Consistency is referred to as the ability by a flow of a freshly mixed cement paste or mortar.

Impact Test For Coarse Aggregate (10mm)

A relative measure of the resistance of aggregate due to the sudden shock or impact on it is called aggregate impact value.

Based on the impact value, we can decide whether the coarse aggregate is suitable for construction or not. This test is performed to ensure the aggregate toughness, which is used in road construction to work as a base layer, sub-base layer.

It has been estimated that tensile strength of concrete equals roughly about 10% of compressive strength. To determine the tensile strength, indirect methods are applied due to the difficulty of the direct method. Noting that the values obtained of these methods are higher .

Results and Discussion

Compressive strength test results

Compressive strength is the maximum compressive stress that, under a gradually applied load, a given solid material can sustain without fracture. Compressive strength is calculated by dividing the maximum load by the original cross-sectional area of a specimen in a compression test.

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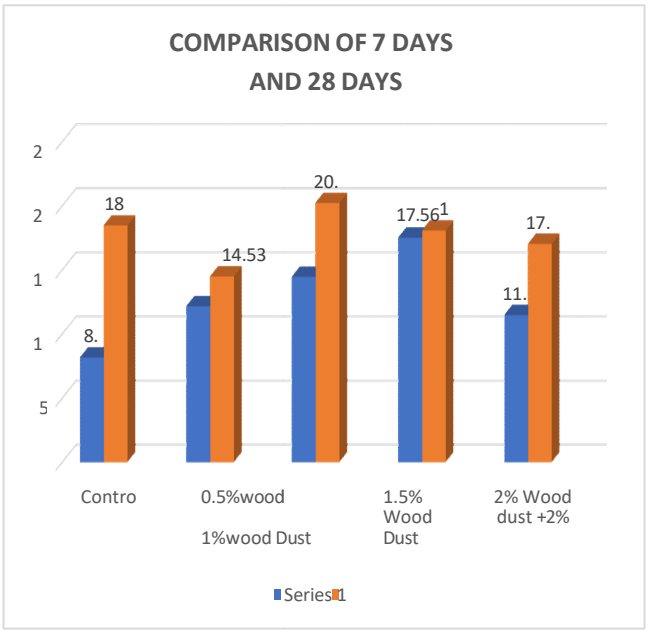
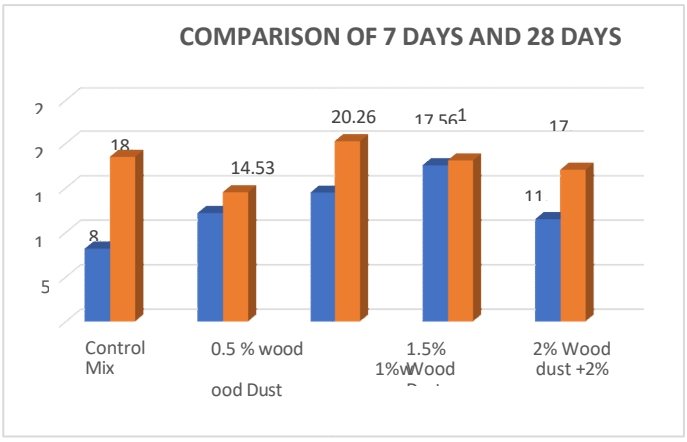


Split tensile strength test result

One of the important properties of concrete is "tensile strength" as structural loads make concrete vulnerable to tensile cracking. Tensile strength of concrete is much lower than its compressive strength (that's why steel is used to carry the tension forces). It has been estimated that tensile strength of concrete equals roughly about 10% of compressive strength. To determine the tensile strength, indirect methods are applied due to the difficulty of the direct method. Noting that the values obtained of these methods are higher .



Flexural Strength

Flexural strength, also known as modulus of rupture, or bend strength, or transverse rupture strength is a material property, defined as the stress in a material just before it yields in a flexure test. The transverse bending test is most frequently employed, in which a specimen having either a circular or rectangular cross-section is bent until fracture or yielding using a three-point flexural test technique.

The most common purpose of a flexure test is to measure flexural strength and flexural modulus. Flexural strength is defined as the maximum stress at the outermost fiber on either the compression or tension side of the specimen. Flexural modulus is calculated from the slope of the stress vs. strain deflection curve.

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CONCLUSION

Based on compressive strength attained in this study, the paverblocks developed can be used for light and medium traffic applications. Concrete paving block containing rubber pieces seem to provide better skid resistance. Wood dust is used in the paver blocks, it gives the light weight concrete blocks and reduces the environmental effects. It was clearly observed that at 1% addition of waste materials, the compressive strength was high. It was observed that at 1% addition of waste materials, the flexural strength was high and can be concluded that the best usage of waste materials can be used for 1%. On comparing the 7 days and 28 days test, better results was obtained in the 28 days strength

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