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Experimental Study on Strength of Pervious Concrete by Using Fine Aggregate

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Abstract: ***Pervious concrete is a special type of concrete, which consists of cement, coarse aggregates, water and if required and other cementations materials. As there are no fine aggregates used in the concrete matrix, the void content is more which allows the water to flow through its bodyThe main aim of this project was to improve the compressive strength characteristics of pervious concrete. But it can be noted that with increase in compressive strength the void ratio decreases. Hence, the improvement of strength should not affect the porosity property because it is the property which serves its purpose. In this investigation work the compressive strength of pervious concrete is increased by a maximum of 18.26% for 28 days when 8% fine aggregates were added to standard pervious concrete***

Keywords: W/C ratio, pervious Concrete, sugarcane bagasse's ash, rice husk ash compressive strength, fine aggregates

I. INTRODUCTION PERVIOUS CONCRETE

Pervious concrete is an exceptional sort of cement with high porosity. It can utilized for solid flatwork applications that permits water from precipitation and different sources to go legitimately through, in this way lessening the overflow from a site and permitting ground water energize. The solid glue at that point coats the totals ,Pervious concrete, utilized in penetrable clearing, contains a system of openings or voids,to enable air or water to travel through the solid. This enables water to deplete normally through it, and can both expel the ordinary surface-water waste foundation, just as permit recharging of groundwater when regular cement does not. It is framed by forgetting a few or the majority of the fine total (fines). The staying extensive total at that point is bound by a generally little measure of Portland concrete. Whenever set, regularly somewhere in the range of 15% and 25% of the solid volume is voids, enabling water to deplete at around 5 lady/ft²/min (70 L/m²/min) through the solid



Porosity of Concrete Cubes

II. LITERATURE REVIEW

Tennis, P. D, Leming, M. L., and Akers, D. J. (2014). Pervious concrete is a combination of Portland cement, controlled amounts of water, coarse mixture and little or no sand. The thick cement paste bonds the coarse combination collectively but lets in good enough void formation of approximately 15% to 35%.

Tennis, P.D., M.L. Leming, and D.J. Akers The EPA Storm Water Phase II Final Rule has regulations to manage the quantity of pollutants entering bodies of water. Contaminants may include oils, grains, grease, sediment, anti-freeze, fertilizers, and pesticides. The partially-filtered water is able to percolate into the soil and be further filtered by the soil structure,

Malhotra, V. M. (2020). Exhibited in his proposal that to make a pervious solid shape with principal penetrability and compressive quality, the measure of water, amount of concrete, type and length of total, and compaction should all be considered, A wide variety of experiments were formerly performed at some stage in the past few a long time by way of a spread of researchers comparing some or all of those factors.

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III. OBJECTIVE

A. To study the properties of Pervious Concrete.
B. To study the properties of Pervious Concrete with addition of fine aggregates.
C. To study the properties of Pervious Concrete with addition of Sugarcane Bagasse Ash
D. To study the properties of Pervious Concrete with addition of Rise husk Ash .
E. To study the properties of Pervious Concrete with the combination of Sugarcane bagasse ash and Rise husk ash

IV. METHODOLOGY

FLOW CHART OF PROPOSED METHODOLOGY

Collection of required materials such as Artificial sand , Cement Fine aggregate, Coarse aggregate and Water

Concrete Mix Proportions

Preparation of Concrete Mix

Casting of Samples for Testing

Curing of Concrete Samples

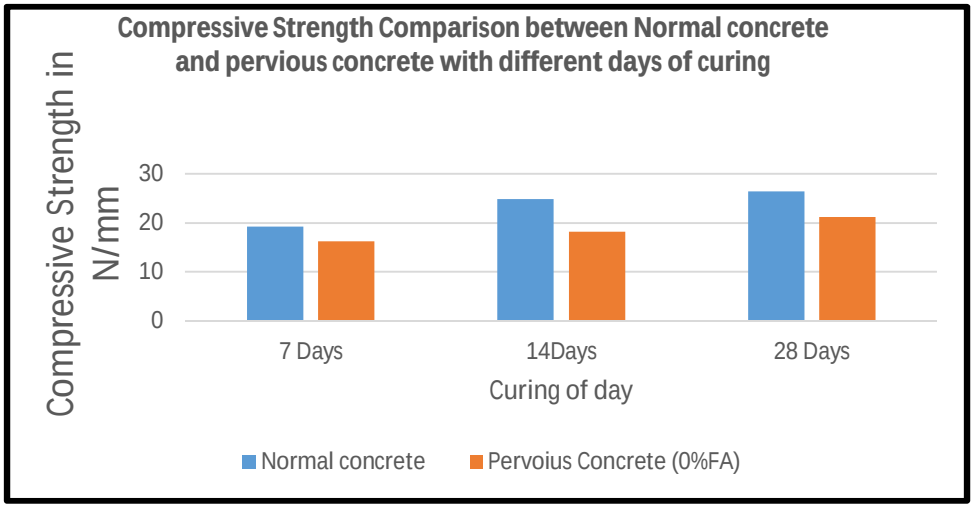
Testing of Specimens

Analysis of Results

V. EXPERIMENTAL RESULT.

A. Compressive Strength Test

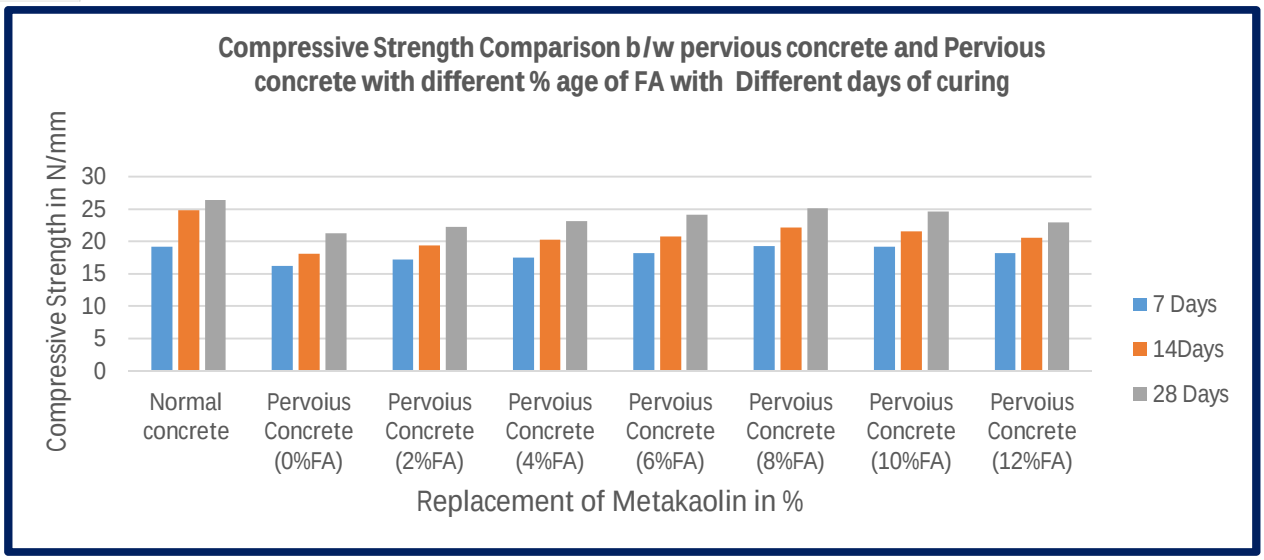
Compressive Strength Comparison b/w Normal concrete and pervious concrete of M20 (MPa)



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Compressive Strength of pervious concrete with different %age of fine aggregate

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Compressive Strength of pervious concrete with different % age of fine aggregate

The compressive strength of pervious concrete is less than the everyday conventional concrete because of the absence of high-quality aggregates or presence of voids. It must be cited that the everyday conventional concrete is absolutely impermeable in nature

VI. CONCLUSION

A. The compressive strength of pervious concrete is increased by 3.87% for 28 days when 2% fine aggregates were added to the standard pervious concrete

B. The compressive strength of pervious concrete is increased by 8.79% for 28 days when 4% fine aggregates were added to the standard pervious concrete.

C. The compressive strength of pervious concrete is increased by 12.77% for 28 days when 6% fine aggregates were added to the standard pervious concrete.

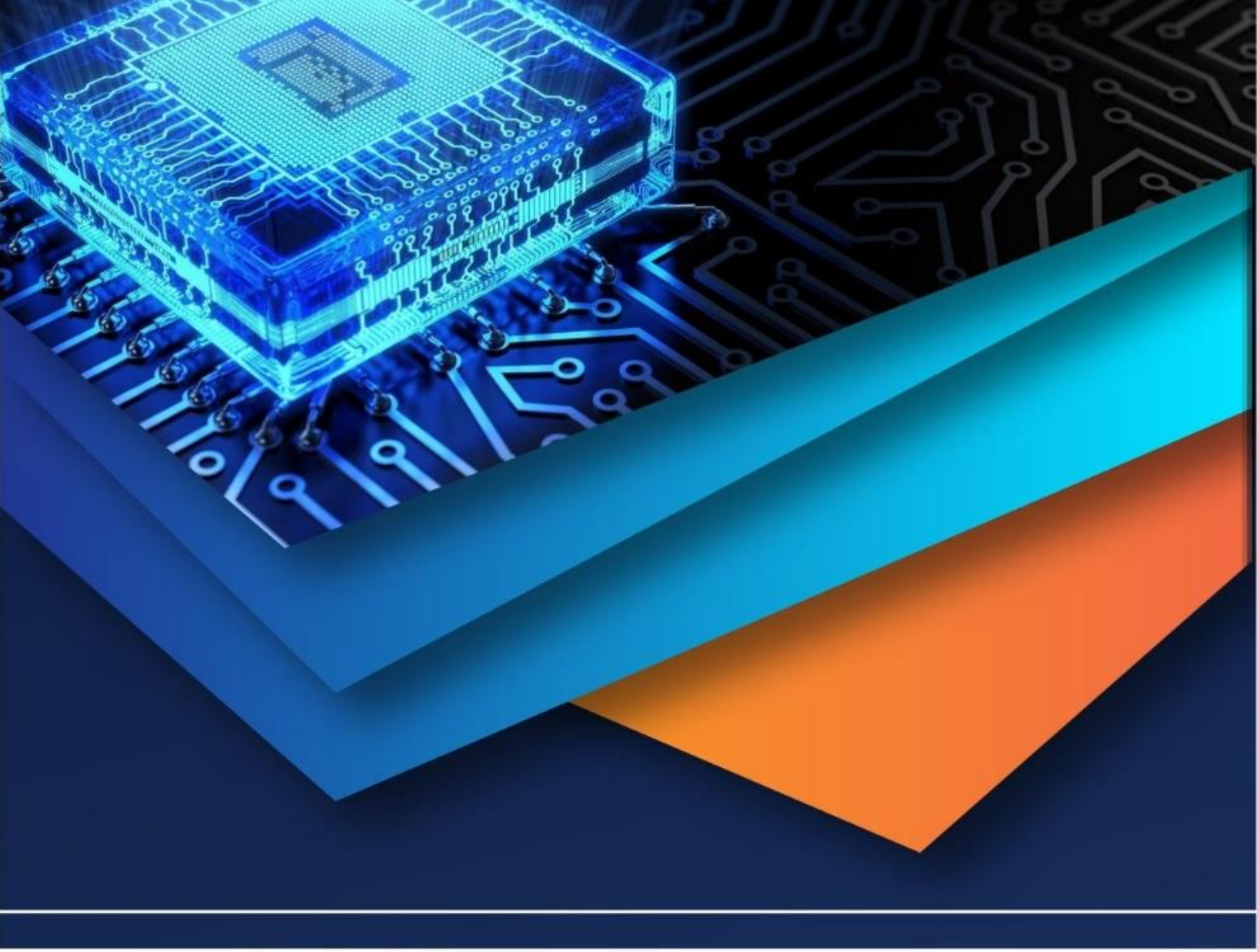
D. The compressive strength of pervious concrete is increased by a maximum of 16.10% for 28 days when 8% fines were added to standard pervious concrete.

E. The compressive strength of pervious concrete is increased by 12.30% for 28 days when 10% fine aggregates were added to the standard pervious concrete.

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