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Experimental Studies on Strength of Confined Concrete

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Abtracts: ***Concrete is a construction material composed of Cement, fine aggregate, coarse aggregate, and water with or without admixtures. The concrete industry is one of the heaviest consumers of natural resources due to which sustainability of concrete industry is under threat. The biggest problem facing the concrete industry is the environmental and economic concern. In this research Paper I work on waste utilization on concrete , Use of waste and by-products as cement replacement, not only makes the concrete economically viale but also solve the problem of dumping the waste product which is a major problem in India.***
Keywords: Cement, Concrete, Pozzolanic Material, Strength, Waste Material , Stone Dust

I. INTRODUCTION

Structures for a lifetime normally 80-100 years are planned and designed. Time-based effects or circumstances, such as a change of use, fire, earthquake, etc., may require an adjustment according to the state of the art during operation. Concrete is the world's most commonly used building material. This popularity of concrete has a huge environmental cost.

Fiber Reinforced Polymer

Fiber Reinforced Polymer (FRP) composites have been utilized in car, hardware, and advanced plane design for quite a few years, yet their application in solid building as a fortifying material is moderately later in root. Other than the advances in the field of improvement of new strands,

II. OBJECTIVE

To Analyze Compressive strength by wrapping & coating 1.0 mm thick FRP. Considering coating length by 25%, 50% & 75% for different grades (M-20, M25, M-30).

III. LITERATURE REVIEW

Emon et al. (2017) In Bangladesh, a case study has been carried out using methods for fiber reinforcement of low-cost, Galvanized Iron (GI) cable cables, with the aim of improving concrete performance. GI cable is actually a gentle, zinc-coated metal cable. A variety of characteristics of GI cable fibers, e.g. tensile strength, bending capability etc. have been explored and comparable with the features of metal fibers in light of the appropriate ACI and ASTM rules to evaluate the suitability of GI cable fibers in addition to metal fibers

Praganya et al. (2016) The resistance of galvanized iron (G.I), the layer encased in concrete and sorptive force are determined in this document. G.I pipe in concrete was researched extensively over the last few years. Two different thicknesses are used for G.I plates. Beton has generally strong resistance characteristics, but due to its porous nature it has suffered harm even though it is of elevated power.

IV. EXPERIMETAL SETUP

List of Materials use in this Experiment

1) Cement
2) Fine Aggregate
3) Course Aggregate
4) Water

V. METHODOLOGY

The following laboratory tests were performed on aggregates as per relevant IS code and mix design of M25 and M30 grade of concrete.The laboratory test programmedis Summarized below.

A. Physical Properties Of Coarse Aggregates (20mm And 10mmsize)

1) Sieve analysis
2) Specificgravity
3) Waterabsorption

B. Physical Properties Of Cement

1) Fineness
2) Specificgravity

C. Physical Properties Of Fine Aggregates

1) Sieve analysis
2) Specifi cgravity
3) Water absorption

D. Mix design(m30grade) as per is10262:2009.
E. Mix design (M25grade)as perI S10262:2009
F. Preparation Of Specimens

1) Concrete Cube of size150x150x150
2) Concrete Cylindrical column s of Dia150mm and length 300mm.
3) Concrete beams 0f size150x150x700mm.

G. Testing of cubes for compressive strength.
H. Testing of beams for flexural strength.
I. Testing of cylindrical columns for Split tensile strength.

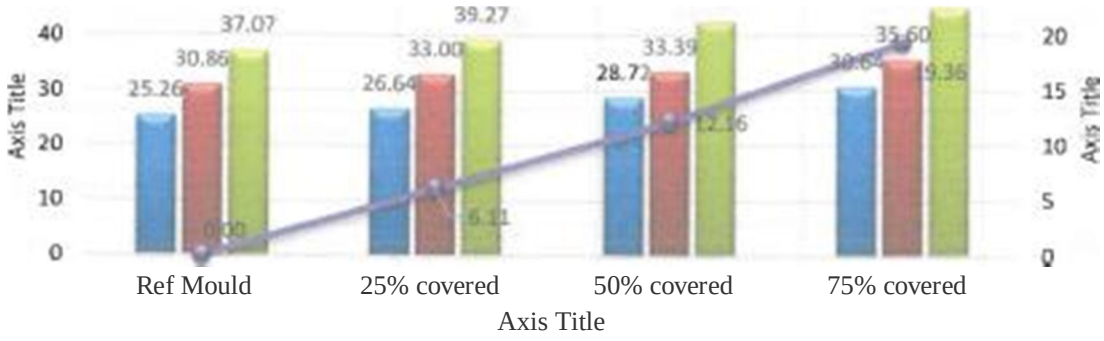
VI. RESULT

Compressive Strength Of Concrete Cubes

Concrete crushing strength is measured by rupturing different concrete cubes with CTM at a standardized loading speed. At the end of seven days the treatment was done and three cubes tested at the end of the 28 days the treatment was carried out for each set of concrete

Compression Test Results on Different cylinders after 28 days

Sr. No.	Description	M20	M25	M30	Avg variations (%)
1	Specimen without confinement for compression test	25.26	30.86	37.07	0
2	Compression in 25% coverage	26.64	33.00	39.27	6.10
3	Compression in 50% coverage	28.72	33.39	42.49	12.20
4	Compression in 75% coverage	30.64	35.60	45.01	19.40



M20 M25 M30 -^—Strength variation *(%)* Pictorial representation of compressive strength of concrete cylinder in different conditions and grades.

VII. CONCLUSION &DISCUSSION

Effect of confinement on compressive strength,

1) For M-20 grade of concrete the Compressive strength increase by 5.50%, 13.7% & 21.3 % for confinement of 25, 50 & 75 respectively.
2) M-25 grade the Compressive strength increase (%) wrapping & coating by 6.90, 8.20 & 15.3 for length coverage in (%) 25, 50 & 75 respectively.
3) M-30 grade the Compressive strength increase (%) wrapping & coating by 5.90, 14.60 & 21.40 for length coverage in (%) 25, 50 & 75 respectively.

Thus, it can be concluded that the compressive strength increases with respect to confinement increment.

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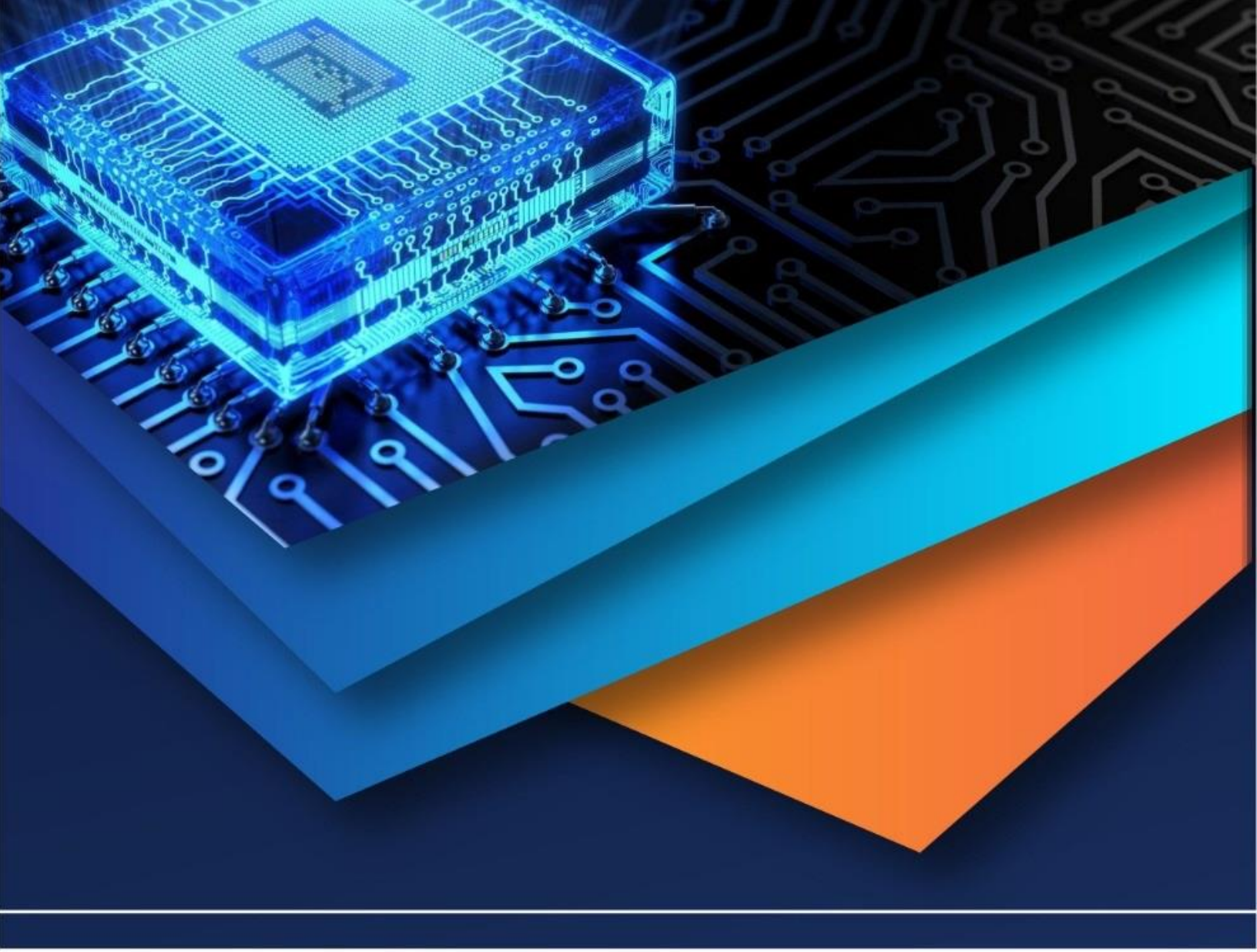

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