

A REVIEW PAPER ON GREEN CONCRETE

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ABSTRACT

Due to day to day increasing population and scarcity of resources, countries like India faces numerous difficulties. In order to overcome this hurdle many ideas are implemented in different fields respectively. Since, India is a developing nation and huge amount of concrete is manufactured in order to fulfill the need. To overcome the need and avoid pollution caused due to manufacturing of raw material Green Concrete is used. It is a type of concrete similar to conventional concrete and its production and usage as compared to other concrete requires less amount of energy and resources which results in less harm to environment. Green Concrete is generally made from recycled waste materials like fly ash etc. With the use of Green Concrete many benefits are obtained. Green Concrete as made from recycled or reused products has chances of failure if not prepared properly. Production of Green Concrete is quite economically high. By overcoming the above demerits it can be used potentially as environmentally friendly.

Keywords: Green Concrete, Raw Material, Recycled Waste, Conventional Concrete, Potentially.

I. INTRODUCTION

"Green Concrete" is just a term which is not related to the color of concrete. It just emphasizes on using eco-friendly materials in concrete. It was first designed in Denmark in 1998. It is a concrete that uses less energy in its production and produces less carbon dioxide than normal concrete. Thus, it helps to combat global warming. Therefore it is called Green Concrete. It is cheaper to produce because waste substituent are used as partial substituent. There is a vital need of Green Concrete because size of construction industry is boosting rapidly, so availability of aggregate which is main constituent of concrete is declining rapidly. So, there is a need to find alternative substituent for it. Green Concrete saves energy and it also has greater resistant to corrosion because it is alkaline and provides protection layer. It can be used for different construction works. Green Concrete reduces dead load of structure because recycled waste material is used. In India, there is a vital need for adoption of this technology because of its huge population and so many construction requirement as India is a developing country.

II. LITREATURE REVIEW

- There are many research papers available on internet about Green Concrete. They are basically emphasized on partial replacement of cement by fly ash. They replaces cementitious materials by 20%, 40% & 60% respectively.
- The effect of replacing with fly ash on various factors such as workability, setting time, density, air content, compressive strength, modulus of elasticity are considered.
- According to the values of above mentioned factors compressive strength vs w/c curves were plotted. So, concrete mixes of different grades with distinct percentage of fly ash can be designed.

III. METHODOLOGY

Concrete cubes are molded in order to check the durability and workability of the concrete. Initially the loading range is suitably adjusted. A concrete cube is placed on its smooth surface side, centrally on the lower press plate of the compression testing machine. Then, the upper press plate is lowered by some length until the length between the press plate and the top surface of the specimen is approximately 5 mm. The lower press

plate is slowly raised hydraulically by operating the controlling lever, until both the press plates does not come in contact with the specimen's surface. A uniform load is applied. After the concrete cubes are crushed, the lower press plate is hydraulically lowered and the crushed specimen is removed from the machine. Then compressive strength is calculated by dividing the value of maximum load(N) with cross-sectional area(mm²).



The average value of compaction factor for different mix prepared for coating of testing specimens are shown in table.

AVERAGE VALUE OF COMPACTION FACTOR FOR DIFFERENT MIX

S.NO	MIX	COMPACTION FACTOR
1	WFA- without fly ash	0.82
2	FA10- fly ash 10%	0.83
3	FA20- fly ash 20%	0.84
4	FA30- fly ash 30%	0.86
5	FA40- fly ash 40%	0.87

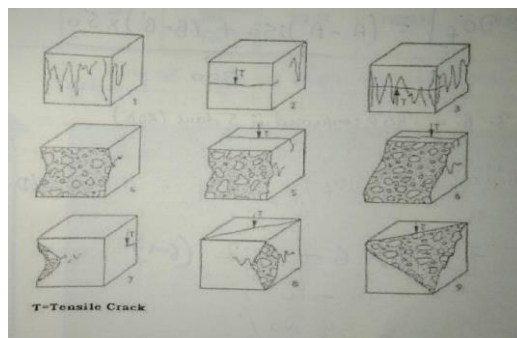
TYPE OF FAILURE:- Record any unusual feature in type of failure.

Satisfactory failures

Unsatisfactory failures.

Calculation

Calculate the cross-section area of the cube face from the check, then compressive strenght is calculated of each cube by dividing maximum obtained load . Calculate the average for the three cubes.



NORMAL CEMENT CONCRETE

Grade of concrete	Day	Crushing load(kN)	Average crushing load(kN)	Area(mm) ²	Crushing strength (N/mm ²)
25	7	538	554.0	150*150	24.67
		576			
		548			

25	14	631 601 611	614.72	150*150	27.30
25	28	741 708 744	732.74	150*150	32.56

5% FLY ASH MIXED CEMENT CONCRETE

Grade of concrete	Day	Crushing load(kN)	Average crushing load(kN)	Area(mm) ²	Crushing strength (N/mm ²)
25	7	538 576 548	554.0	150*150	24.67
25	14	631 601 611	614.72	150*150	27.30
25	28	741 708 744	732.74	150*150	32.56

10% FLY ASH MIXED CEMENT CONCRETE

Grade of concrete	Day	Crushing load(kN)	Average crushing load(kN)	Area(mm ²)	Crushing strength (N/mm ²)
25	7	489 502 523	504	150*150	22.40
25	14	464 491 437	464.46	150*150	20.64
25	28	430 466 412	436.00	150*150	19.38

IV. CONCLUSION

From the analysis it has been found that Green Concrete is adopted worldwide, the application of Green Concrete is very effective and efficient in terms of executing large scale construction project like commercial and constitutional buildings. Its use results in better quality work and is capital friendly. The fresh fly ash based concrete is easily handled up to 120 minutes without any sign of setting and without any degradation in the compressive strength. The initial investment in it is very high but it also provides benefit to environment. Further research should identify possible applications of fly ash technology. This would lead to research areas that are specifically oriented towards applications. The fly ash technology has the potential to go beyond making concrete; there could be possibilities in other areas of infrastructure needed by the community.

V. REFERENCES

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