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STRENGTH ANALYSIS OF CONCRETE EMBEDDED WITH SUGARCANE BAGASSE ASH AND CLASS-F FLY ASH

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ABSTRACT
The main aim of the work to determined the variation of characteristics strength of M-30 concrete replace the cement by 5%, 10% and 20% by fly ash and sugar ash badges. In this work the behavior of characteristics strength of concrete is further enhanced by mixing of fly ash and sugarcane ash by replacing cement in variable percentile. In this work conventional concrete mixed with fly ash as well as concrete mixed with sugar ash and made a composite concrete cube of size 150mmX150mmX150mm were used for testing machine of capacity about 2000 kn in these cube load applied at the rate 315kn/min .when cube tested load applied in such a way where two opposite side of the cube are compressed. The load when cubve start breaking that load is noted. The average of three cube is taken.

Key words - Compressive strength, Sugar Cane Ash, Mix design, Cube, Fly Ash.

1. INTRODUCTION

The needs of our country about structural changing day by day and concrete is the Main part of building any structure and also in terms of material for the structural system therefore it is necessary to improve the properties and characteristics in terms of durability strength work ability and serviceability and the need of making a structure economical . We can make a structure economical by By saving cost by the use of administer such as silica for fumes coconut fiver fly as sugar cane bags etc as the partial replacement of cement.

Points to be understood

1.1 Fly ash-

1-It should be understood that fly ash is a highly potential it is not just wast material
2- Fly ash has slightly properties to enhance the durability of concrete.
3- It should be mandatory the use of fly S as per the government directives.
4- Using fly as the cost of building material decrease.

Innovative as well as commonly produced building products are available in India
1- CLC cellular lightweight concrete blocks
2- Polymer composite as wood sustain based on the Fly ash
3- Portland cement based on fly ash
4- Ready mix RMC fly ash concrete
5- Fly ash-based blocks and bricks material.

1.2 Sugarcane Ash

The sugar can Big acid consist of approximately 25% of hemi cellulose 50% Cellulose and 25% of lignin. In sugar can assist factory when sugar cane enter approximately each tone of sugar cane generated approximate26% of baggage's with 50% of moisture content and 0.62% of residual ash. After combustion residue present a chemical composition dominates by the silicon dioxide.

2. Methodology and experimental program

2.1 Observational – arrangement

The aim of the work is to study the variation in characteristics of concrete for the proportion of M 30 grade. In each mix concrete cement is replaced by fly ash and sugar cane bank this respectively in the proportion of 10% 5% 20%. The specimen or samples are tested for
1-work ability by slum contest and compaction factor test
2- Compressive strength

Sl. No.	Particular	Mix Design	Code	No. of Specimen	Curing period in days	Percentage of fly-ash	Percentage of Sugar Cane Ash
1	Cube,150mm	M 30		6	7, 14,28	5%	0
2	Cube,150mm	M 30		6	7,14,28	10%	0
3	Cube,150mm	M 30		6	7,14,28	20%	0
4	Cube, 150mm	M 30		6	7,14,28	0	5%
5	Cube, 150mm	M 30		6	7,14,28	0	10%
6	Cube, 150mm	M 30		6	7,14,28	0	20%
7	Cube,150mm	M 30		6	7,14,28	0	0
8	Cube,150mm	M 30		6	7,14,28	0	0
	Cube,150mm	M 30		6	7,14,28	0	0

2.2 Testing of Materials

Cement
The cement using this work is 53 grade of ordinary Portland cement confirming to IS8112–1989.
Cement is the most important part of concrete which poses very good adhesive and cohesive properties which make possible to material for making a bond bond.

Fly ash

Fly ashThat use in this project of 10 from Satna thermal plant MP are Fly ash that use in this work opt in from Satna thermal power plant MP with specific gravity 2.3.

Find Aggregate FA

Theaggregate in Sieve analysis passed through 4.75 sieve is known as fine aggregate in this work locally available rivers and free from all type of impurities is used in this work send which is passed through 4.75MM sieve and retain on 150 µm IS sieve is used.

The sample that is going to use in this work should be in air dry condition before waiting this may be achieved by drawing a sample at room temperature or by heating a temperature of about hundred degrees Celsius to11 0°C in furnace. For sieve analysis and weighted the air dried sample are appropriate. Before sieve analysis sieves shouldbe clean and care shall be taken before test. The whole procedure of testing as per IS – 2386–91975. Here the physical properties of fine aggregate and result of sieve analysis shown below.

3. Result and Analysis

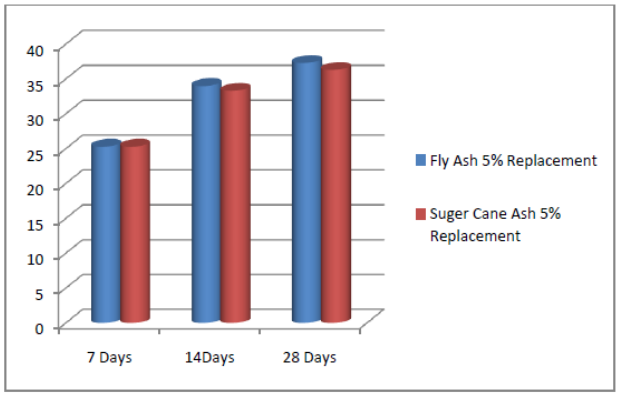
Compressive strength of grade I am 13 30

Compressive Strength after 7 days						
	Fly Ash 5% Replacement	Fly Ash 10% Replacement	Fly Ash 20% Replacement	Suger Cane Ash 5% Replacement	SugerCaneAsh 10% Replacement	Suger Cane Ash 20% Replacement
Cube 1	26	24	19	25	23	20
Cube 2	25	23	20	26	22	19
Cube 3	25	23	19	25	23	19
Avg	**25.3**	**23.3**	**19.3**	**25.3**	**22.3**	**19.3**

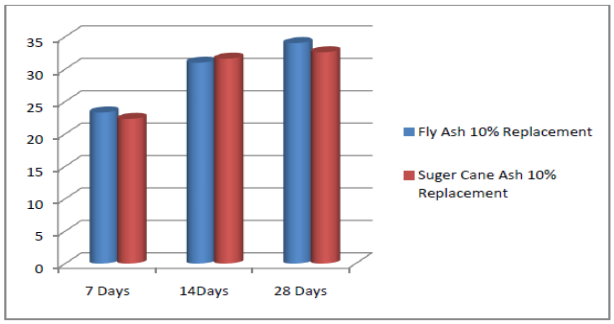
Compressive Strength after 14 days						
	Fly Ash 5% Replacement	Fly Ash 10% Replacement	Fly Ash 20% Replacement	Suger Cane Ash 5% Replacement	SugerCaneAsh 10% Replacement	Suger Cane Ash 20% Replacement
Cube 1	34	31	29	34	32	30
Cube 2	35	31	28	32	32	31
Cube 3	34	30	27	34	31	29
Avg	**34**	**31**	**28**	**33.3**	**31.6**	**30**

Compresive Strength after 28 days						
	Fly Ash 5% Replacement	Fly Ash 10% Replacement	Fly Ash 20% Replacement	Suger Cane Ash 5% Replacement	SugerCaneAsh 10% Replacement	Suger Cane Ash 20% Replacement
Cube 1	37	34	33	36	33	31
Cube 2	38	34	32	37	32	32
Cube 3	37	34	32	36	33	31
Avg	**37.3**	**34**	**32.3**	**36.3**	**32.6**	**31.3**

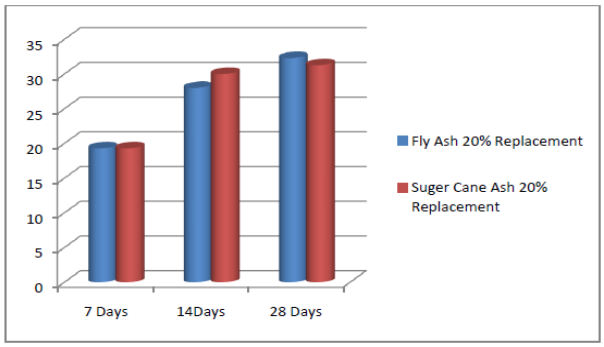
Compressive Strength with Replacements-



Compressive Strength with 5% Replacement



Compressive Strength with 10% Replacement



Compressive Strength with 20% Replacement

Results and Discussion of compressive strength

In this investigation which is about the compressive strength of concrete while cement replaced by fly Ash and sugar cane Ash respectively by 5% 10% and 20%. After working whole procedure we found out the result of concrete cubes at seven days 14 days and 20 days 28 days of curing the test results are shown in figure graph and table the maximum compressive strength.

The maximum compressive strength of concrete after replacing cement with fly Ash by 5% at 28 days 31.99, as well as cement replaced by 10% with fly as the compressive strength of concrete came 27.06 N per MM Square and also when cement replaced by 20% with fly as the compressive strength of cube cube comes out 24.55 N/MM Square paragraph change.

After cement replaced by fly S we replace the cement with sugar can S and perform the test to determine the characteristics strength of concrete. The characteristics of

strength of concrete when cement replaced by 5% sugar cane is the strength came out 30.51 N/MM Square as well as cement replaced by 10% with sugarcane ash characteristic strength of concrete after performing test came out to 6.16 Newton/MM Square also when cement replaced by 20% with sugar cane is compressive strength of concrete cube found to be 20.33 Newton/Mm.

After test we found out the difference between compressive strength of concrete with different different material replaced by to cement. The couple has a strength of each mix of concrete shown in figure table and graphs it is clear that the replacement of cement with fly ash and sugar ass with 5% it increase the strength of concrete but when it continuously increase we see that after 10% of replacement of cement the Compressive strength of concrete degrees respectively in this mix design and 30 grade B perform placement of cement by 5% 10% and 20%

4. References

1. Experimental Study on Use of Sugar Cane Bagasse Ash in Concrete by Partially Replacement with Cement *International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429 Volume 9 Issue XII Dec 2021- Available at www.ijraset.com.*

2. Comparative Study on the Use of Stone dust and Bagasse Ash as Filler in Hot Mix Asphalt *International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 7 Issue III, Mar 2019- Available at www.ijraset.com.*

3. Partially Replacement of Cement by Bagasse Ash *International Journal for Research in Applied Science & Engineering Technology (IJRASET)* ISSN: 2321-9653*; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 5 Issue III, Mar 2019- Available at www.ijraset.com.*

4. Utilization of Sugarcane Bagasse Ash as a Partial Replacement by Cement with Normal Concrete *International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177 Volume 8 Issue II Feb 2020- Available at www.ijraset.com.*

5. Experimental Study on Partial Replacement of Various Wastes in Concrete *International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 13.98 Volume 4 Issue* V *Feb 2020- Available at www.ijraset.com.*

6. Strength and Durability study on Steel Fibers Reinforced Self Compacting Concrete incorporating Sugarcane Bagasse Ash *International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 6 Issue IV, April 2018- Available at www.ijraset.com.*

7. Experimental Investigation on the Use of Bagasse Ash in the Construction of Low Volume Traffic Roads *International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor:6.887 Volume 5 Issue X, October 2017- Available at www.ijraset.com.*