AN INCORPORATION OF FLY-ASH WITH M30 CONCRETE

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Abstract: As we live in the modern era the construction industry is developing fast. The newly things gained popularity in the sphere of construction industry .By the addition of mineral admixture not only improves the property of concrete like compressive strength ,split Tensile Strength and flexural strength but also improves the toughness and ductility of concrete as per the present investigation work is concerned we replace the cement content by Fly Ash and indirectly with this we reduce the co2emission, because during manufacturing of cement large amount of co is released into the environment which causes the global warming. We also know in the modern era, construction industry not only focused on many new things and technologies, and the concrete engineers tried to replaces the cement content consumption with some alternative material that will not decrease the strength of concrete and also in this work we replaced fine aggregate with fly Ash content and we found that the flexural strength increased by adding the Fly Ash Content By Dumping this Fly Ash it will also cause Problem .So if we utilize this fly Ash coming from Thermal Power Plant in the Concrete world it will be fruitful for the concrete engineers .The Fly ash Content was added with varying Percentages 0%,4 % ,8%,& 16% &20% , And the maximum Strength Was found at the dosage of 16%

Keyword: Fly ash, Mineral Admixture, Split tensile strength. Global Warming

I. INTRODUCTION

Concrete is the mixture of cement ,fine aggregate, coarse aggregate and water with or without an admixture which results in the hard mass concrete and widely used into the construction industry .in this world no other material has not still exit which will completely replaces the cement as we know the production of iron of Ordinary Portland cement releases equal amount of carbon dioxide and needs one ton of limestone etc. Thus causing problems to the green environment The Fly ash is the by product from the combustion of coal in the thermal power stations. Fly ashes are generated in large quantity in these thermal stations. If this Fly ash is not properly management and directly disposed off in landfills, ponds, river and streams etc also pollutes the environment thus if we utilize it in the construction industry it increases the properties of concrete and reduces the pollution level.

II. OBJECTIVES

The objective of this work is to improve the concrete strength, when the Fly Ash is added, it increases the compressive, Flexural and Split Tensile strength .The Fly Ash was added with Varying Percentages like 4%, 8%, 16% and 20% and the Maximum strength was achieved at the dosage of 16% By adding the Fly Ash Content with the Concrete it not only reduces the quantity of Cement Content but also reduces the cost of our project thus makes the project economical and also contributes towards the Green environment as we know during the production of cement large amount of co2 is released but by adding this product we will reduce the cement content and indirectly we will help in reducing the global warming

Experimental Work:

The materials used in this experimental work are as under. Each component plays an important role in this type of concrete .Hence selection of each component should be done properly

MATERIALS: Following materials were used in this experimental work.

1.1 CEMENT: A 53 grade of OPC was used. The properties of cement as per IS Code 4031 and IS 269-1967 are given in table.

Table 1 properties of cement

S.no	Test	Result
1	Fineness of cement	97.75
2	Initial setting time	35m
3	Final setting time	57m
4	Specific gravity of cement	3.15

1.2 SIEVE ANALYSIS: Sieve analysis is the process to form the particle size of aggregate of fine and coarse aggregate.

Fig .1 Set of sieves

1.3FINE AGGREGATE: The locally available sand passing through 4.75mm sieve used and the properties as per IS 2386-1968 are given in table below.

Table 2 Properties of fine aggregate

S.no	Test	Result
1	Bulk density	1785kg/m^3
2	Specific gravity	1.96
3	Void ratio	0.472
4	Fineness modulus	2.87

1.4 COARSE AGGREGATE: Coarse aggregates were taken from quarry and the size of aggregates was taken 20mm. The test was carried a coarse aggregate as per IS 2386-1968 and the results are given in table.

Table 3Properties of Coarse Aggregate

S.no	Test	Result
1	Bulk density	845kg/m^3
2	Specific gravity	2.29
3	Fineness modulus	6.4

1.5WATER: The water which was used in this experimental work was free from salts and other impurities. Usually tap water is used for the mixing of concrete as per IS Code 456-2000

1.6FLY ASH: The fly ash which was used in this experimental work in this experimental work was 2.91. The chemical of fly ash are given in table.

Fig 2.Fly Ash

Table 4Chemical Properties of Fly Ash

Chemical properties (minimum % by mass)	IS :3812-1981	Fly ash sample
Sio_2+ Al_20_3+Fe_203	70	85
Sio_1	35	56
Cao	5	4
So_3	2.75	1.9
Na_2o	1.5	2.1
MGo	5	1

III. CONCLUSION

From the results .the conclusion are as follows

- The experimental work that the properties of M30 concrete incorporation with fly ash
- The experimental work showed that the compressive strength increases up to 12%
- Flexural strength and split tensile strength increases up to 16% & 20% respectively
- The experimental work showed that the maximum strength gains the concrete at the dosage of 16%

FUTURE STUDY

As per the present investigation work is concerned the flexural ,Split & Compressive Strength was gained at the dosage of 16% ,when we increase the dosage ,it shows the decline in the results the graph goes down again and it needs future investigation

REFRENCES

[1] A Guerrero, S Gonail, and A. Macoa, "Durability of fly ash –belite cement mortors in sulfated and chloride medium ,"cement and concrete Research vol.30, pp 1231-1238,2007.

[2] Alhozainay, P. soroushian and F. Mirza, "Effects of curing conditions and age on chloride permeability of fly ash mortar," ACI Materials journal vol.93, issue 1, pp. 87-95, 1996.

[3] p. Arjunan M. R. Silsbee ,and D. M. Roy , "Chemical activation of low calcium fly ash – identification of suitable activators and their dosages ," Cement and Concrete Research, vol. 30,pp. 1231-1238,2001.

[4] A. AntiohosPapagerorgiou and S Tsimas, "Activation of fly ash cementitious system in the presence of quicklime," ACI Materials Journal, Vol.92, issue 2, pp.178-187, 2006.

[5] B. Rouge, "Alkali activated class C fly ash cement ," ACI Materials Journal , Vol. 84, issue 3, pp.286-295,1987.

[6] A. Bisaillon, M. Rivest, and V. M. Malhotra, "Performance of high volume fly ash concrete in large experimental monoliths," ACI Materials Journal, Vol.91, issue 2, pp.178-187, 1994.

[7] F. Blanco, M. P. Garica, J. Ayala, and G. Mayoral, "The effect of mechanically and chemically activated fly ashes onmortor properties," Cement and Concrete Composites, vol. 28, pp.673-680, 2006.

[8] C. shi, "Early microstructure development of activated lime –fly ash pastes," Cement and Concrete Research, vol. 26, no. 9, the American Ceramic Society, vol. 87, issue 6, pp. 1141- 1145, 2005.

[9] IS 456: 2000-plain and Reinforced Concrete Code of W.-k. Chen, linear Networks and Systems , Belmont, CA: Wadsworth, pp, 123-135, 1993

[10] G .Yamini , P.S.Banupriya, Dr.S.Siddirahju, "Experimental Investigation on strength of concrete by the fly ash and nanosilica as a partial replacement of cement" International Research Journal of Engineering and Technology IJCIET, Volume 03,issue 08,Aug-2016,

