

## EFFECT OF FLY ASH ON THE PERMEABILITY OF CONCRETE

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**Abstract:** *The modern era is the era of technology .in this era the construction industry is developing fast, The newly things are now a days used in the zone of construction industry , By the addition of mineral admixture ,it can not only improves the property of concrete like compressive ,flexural and split tensile strength but also increases the toughness and ductility of concrete .As we take present investigation into consideration .we not only replace the cement content into our work ,but indirectly reduce the CO<sub>2</sub> emission .As we know during the manufacturing of cement large amount of CO<sub>2</sub> is released into environment which leads to global warming .*

*The concrete engineers focusing to an alternative things ,which can be used in concrete technology . In this work Fly Ash was used which we have taken from thermal power plant .as we also know large amount of Fly Ash is generated daily in thermal power plants ,if we incorporate this waste with concrete ,it not only improves the strength of concrete, impacts on the permeability on concrete as well as reduces the cement content indirectly reduces our cost .The Fly Ash was used in this work with varying percentages of 0% ,3%, 6%, 9% & 12 %The maximum strength was seen at the dosage of 9 % .*

### I. INTRODUCTION

As we know the the concrete is the mixture of cement ,fine aggregate , coarse aggregate and water with or without an admixture and this type of material is widely used in the construction industry .The concrete engineers fail to introduce any other alternative material in the construction industry which will show results like this .As we know during the production of OPC ( Ordinary Portland cement ) large amount of carbon dioxide is released into environment ,which causes various problems to the green environment .In this work we utilize the Fly Ash which is the by product of thermal power station, which were collected after the combustion takes place . Fly Ash generates in huge quantity from these stations .if we will not properly manage this it will cause problems in dumping and causes the severe problems into environment .Thus we have to utilize it in a proper manner in order to save our green environment ,but on the other hand when we incorporate it with concrete it reduces the cement content thus saves the cost and makes our project economical

#### 1.1 MATERIAL USED:-

**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.

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

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

#### 1.2 Properties of fine aggregate

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

**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.

#### Properties of Coarse Aggregate

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

**WATER:** 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

**FLY 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.



Fly Ash

**CURING:** Using may be defined as providing the additional moisture to the concrete in order to carry out the reactions in concrete and in order to gain strength. The Pozzolanic reaction of fly ash in concrete is slower than that of hydration of cement, thus delaying the setting time and early age strength. Thus this type of concrete requires proper method of Curing.



## II. 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 12% & 16% respectively
- The experimental work showed that the maximum strength gains the concrete at the dosage of 9%

### 2.1 FUTURE STUDY

As per the present investigation work is concerned the flexural ,Split & Compressive Strength was gained at the dosage of 9% ,when we increase the dosage ,it shows the decline in the results the graph goes down again and it needs future investigation

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