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SELF COMPACTING CONCRETE WITH USE OF FLYASH AS MINERAL ADMIXTURE

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Abstract: **Self compacting concrete has ability involves not only high deformability of paste or mortar, but also resistance to segregation between coarse aggregate and mortar when the concrete flows through the confined zone of reinforcing bars. The production of such mixes often used less expensive admixtures and very low quantity of cement. self-compacting concrete is the use of mineral admixtures suchas silica fume, ground granulated blast furnace slag and fly ash, which is finely, divided materials added to concrete during mixture procedure. Compacting increases the strength of structure. Designing of a Self compact concrete mix having 29% of coarse aggregate content and 388 litre /m3 of paste volume, 5%, to 20% replacement of cement with Metakaolin and10% to 30% replacement with class F fly ash and 0.36 water/cement ratio (by weight). This section discusses the effect of mineral admixtures on self compacting concrete's durability, strength and fresh properties which were considered from the previous research studied in literature.**

I. INTRODUCTION

Concrete is the most utilized construction material globally, also the second largest material used world over. Concrete structures are durable, possesses thermal mass efficiency and aesthetically too pleasing. These qualities make concrete a versatile building material. Apart from being so advantageous over other construction materials, it has numerous limitations, out of which depletion of natural resources in the form of aggregates is very serious. Moreover in high-rise buildings, the reinforcement at joints gets congested to the level that it affects the flow of concrete, thus making concrete construction difficult.

All these with conventional concrete lead to the development of self-compacting concrete (SCC). Self-compacting concrete is fluid mixture that can flow very easily It does not require any vibration or tamping after pouring and is thus able to consolidate under its own weight without undergoing any significant segregation.

II. MATERIALS AND METHODS

The flow chart below is prepared to understand the thorough methodology. Methodology: Litrature survey and testing of materials like water absorbtion test and slump flow test has been done which results in increment of strength of SCC using flyash.

III. REVIEW OF LITERATURE

Payal painuly, Dinesh Ak , Satish Raja Presented that resource management in construction projects a case study, they focussed on the study has been carried out in two phases. The first phase was the strength test of the material and second phase was the sustainibility test.

IV. RESULTS AND DISCUSSION

The slump flow represents the mean diameter of the mass of concrete after release of a standard slump cone (Diameter is measured in two perpendicular directions).In slump test, the cone is filled with concrete and then vertically lifted and the time measurement is started. The effectiveness of flow i.e the flowability of SCC under congested reinforcement can be studied through the slump test. A slump flow ranging from 650mm to 800mm is considered as the slump required for a concrete to be self-compacted. After performing the Slump test it is seen that replacement of 30% fly ash is better than other ratio. The slump values for different mixes are given in Table

4.1 Results of Slump flow test

Fig. slump flow test in progress

Sl no	% of cement	% of flyash	Slump value in mm
1	100	0	40
2	90	10	38
3	80	20	35
4	70	30	32
5	60	40	30
6	50	50	27

Table 4.1 Results of Slump Flow Test

V. CONCLUSION

The present experimental study was carried out to describe the effects of agro industrial by product i.e fly ash on SCC using various percentage replacement levels of fly ash to determine the best performance of fly ash. The search shows that it is possible to design SCC mixes with fly ash content up to 30%. The main conclusion drawn from the results are summarized below:

1) Slump flow of SCC mixes were in the range of 650-710, flow time for all the mixes was lessthan 4.8secs , V funnel time was in the range of 8.35 – 11secs and L box ratio was greater than 0.8 for all the mixes.

2) The fresh properties for 30% fly ash replacement were observed to be better as compared to the other replacement levels (10%, 15%, 20%, & 25%).

3) The strength properties have shown significant performance differences and thus it is perceptible from the test results that the compressive strength increases with the increase in the percentage of fly ash content.

4) After five trial mixes, a mix with 30% replacement of cement with fly ash was found more compatiable with high strength.

5) The SCC mixes developed compressive strength ranging from 33.4 to 39.16 Mpa at 7 days and 45.8 to 53.21 Mpa at 28 days.

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