EVALUATION OF SELF COMPACTING CONCRETE BY USING FLY ASH BASED GEOPOLYMER CONCRETE:- A REVIEW

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ABSTRACT

In recent years, Self-Compacting Concrete (SCC) has gained wide use for placement in congested reinforced concrete with difficult casting conditions. Self-Compacting Concrete (SCC) is a innovative concrete that does not require vibration for placing and compaction. It is able to flow under its own weight, fully filling formwork The material variation of self-compacting concrete contains 100% cement replace by fly ash and lime powder. The water binder ratio is maintained by 0.45 and coarse aggregate content 590 kg / m3 and fine aggregate content 910 kg / m3. To reduce the exposure The water is replaced by chemical like Sodium hydroxide (NaOH) and sodium silicate (Na2SiO3). The self-compacting concrete develops power up to the 82 Mpa and it's economical for construction. The material variation for self-compacting mixtures cement replaced by 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100% by class F fly ash and after cement replaced by byelection by moon powder and fly ash.

KEYWORDS: - *Geopolymer SCC, Lime powder, Sodium hydroxide, Sodium Silicate.*

INTRODUCTION

Self-compacting concrete (SCC) is an innovative concrete that does not require vibrations to keep and combine. SCC was developed in Japan in the 1980s, so that it is mainly for highly condensive reinforced structures in seismic regions. In Europe this was probably used in civil works for transportation in Sweden in 1990 in the UK. It is able to flow under its own weight, filling formwork completely and obtaining a complete treaty. To ensure high flow capacity of this type of concrete, there should be relatively low yield value, there should be a moderate stickiness to resist separation and bleeding, and transport, maintenance and treatment, adequate structural performance and its symmetry during long term stability. Should be maintained. SCC has a fast rate of concrete placement, there are many advantages of using SCC with fast construction time, especially when the material costs are reduced, high levels of SCC liquidity and dissociation resistance uniformity, minimum solid viades and uniform concrete Ensures strength, giving ability to eliminate structure and better level of stability. SCC is often produced with less water cement ratios which provide the potential for high initial strength, early use and quick use of elements and structures. In 2002, EFNARC published its "self-compacting concrete for specification and guidelines", which is known as fresh concrete, some physical properties

RESEARCH REVIEW

This paper presents the effects of some admixtures including silica nanoparticles, silica fume and Class F fly ash on different properties of high performance self-compacting concrete (HPSCC). For this purpose, A fraction of Portland cement with the aim of cement content reduction is different fractions of pozzolan admixtures. The results also showed that mechanical and transport properties improved in the mixtures containing admixtures, specifically blend of silica nanoparticles and silica fume. (Mostafa Jalal et al, 2015)

In this paper, is a blend of self Compating concrete. Relative components of the main components have been designed for a simple device self-Compating concrete (SCC) mix design which roughly Overall 2 9% replacement of cement with Metkaolin and Class F Flaas, both the combination and control SCC mixes 0.36 water / cimentitias ratio (weight) and 388 liter / m3 cement paste volume sub granite stones the size of 16 mm and 12.5 mm Industry is in a mixture of 60:40 of total coarse aggregate percentage weight. (Krishna Murti N et al, 2008).

This letter presents experimental studies on the properties of self-compacting concrete (SCC). Portland cement (PC) was changed to the rate of different ratios with fly ash (FA), granulated blast furnace lag (GBFS), limestone powder (LP), basalt powder (BP) and marble powder (MP). The degree of sulfate attack was evaluated using visual examination and a reduction in compressed power. The results of the test show that between the mineral reagents used by FA and GBFS, the efficiency of SCC blends increased and the compressed power. On the other hand, the best resistance to sodium and magnesium sulphate attack was obtained from the combination of 40% Gbf with 60% PC. (Machiu Yussel et al, 2011).

This paper, presenting a new blend design method for the design of self-compacting GGBS concrete based on the concept of efficiency. GGBS is being used as semiconductor material along with the formation of high-performance concrete (HPC), roller compact concrete (RCC), and the production of self-compacting concrete (SCC). (P. Dinkar, Kali et al, 2012). Paper itself presents an experimental process for the compacting concrete mix design. Test results for the slow down flow of self-compacting concrete such as; J-ring, V-funnel and L-box are presented. Apart from this, infectious power was also determined at the age of 7, 28, and 90 days. (Paratibha Agarwal et al, 2008)

Self-compacting concrete (SCC) has been described as "the most revolutionary development in solid construction for many decades" has been originally developed to fill the growing shortage of skilled labor, including the following: fast construction , Site manpower reduction, easy placement, better stability (EFNARC) (Self-Compacting-Concrete -2002 for Specifications and Guidelines)

Different presentations of high performance self-compacting concrete (HPSCC) are used for some reagent, including silka nanoparticles, silica fume and class f fly ash. For this purpose, a portion of Portland cement is different parts of Pozzolanic edicts for the purpose of decreasing the content of cement. The rheological properties of fresh concrete were observed through slowdown flow time and diameter and V-Funnel flow time. Thermal properties were tested through thermo gravimetric analysis (TGA) testing. Transport properties evaluated by water absorption, capillary absorption and chloride ion penetration tests. The results indicated that fly ash material improved as the rheological properties of HPSCC's development. It has also been found in the results that synthetic mixture has improved in the mechanical and transport properties, especially a mixture of silica nanoparticles and silica fume. It can also be concluded that in combination with small portions of nanopoders, high amounts of mineral composite can be committed to high performance concrete, in which energy saving in construction and manufacturing technology as an important material. (Mustafa Jalal July 2015)

This papers are the main focus on finding a total concentrated composite composite or the optimization of the ratio of a certain thick volume of self-compacting concrete (SCC). To improve the effect of the fresh properties of SCC, granite stones of 20 mm and 10 mm are crushed. In all SCC blends, a mixture of 35% replacement of cement with class F fly ash and 0.36 water / centimeter ratio (W / cm) by weight is a mixture. Studies have shown that specialized consolidated combination plays an important role in achieving specific SCC blends. Rheological properties of SCC include recession flow, V-funnel and L-box tests. It has been observed that both 28% and 35% are mixed with the course

METHODOLOGY

SCC MIX DESIGN:-

We have the three cube by using 30% fly ash, 70% cement, sand, coarse aggregate and the superplasticizer, water etc. In which we have used 2.31 kg of fly ash, 5.4 kg of cement, 12.700 kg of sand, 8.239 kg of ca, 1.140 gm of super plasticize and 3.31 kg of water. By using the mixture. We have made a three cubes And hold for 7 days after that testing a compressive strength test which is 22.3 KN. We have changed proportion of fly ash as 35%, 40%, 20%, 10% With each ratio of fly ash are taken and made three cubes for strength testing We have been able to cube for 7 days as well as 28 days. And testing of each cube, so 7 days cube was the result of power is more than 70%, and 28 days cube result was 100%. After that the cube was immersed in the water for curing. Now we are also the geopolymer concrete In this geopolymer concrete we have used fly ash, cement, sand, coarse, aggregate, viscocity, modify agent (VMA), sodium silicate, sodium hydro-oxide and extra water etc. Firstly we have made six cubes in these cube we have used material as 60% of fly ash, 40% of cement, sand, ca, sodium hydro-oxide, and then this cube put in oven for curing at 900 C and after 7 , 28 days we take crushing strength In this geopolymer concrete we take the different properties of fly ash, which is 70%, 80%, 90%, 100%, these whole cube are put in oven 7, 28 days, for cure, hence the results are 70%, 100% Respectively. Now we are taking the 10%, lime, 80% fly ash, and 10% of cement, and the remaining content sand, CA, VMA, NaOH, Na2SiO3, and extra water. After that cube is put in the normal room

temperature. Change different proportion as 85% of fly ash, 5% of cement, 10% of lime, and 95% fly ash, 5% cement, 10 lime, and 95% fly ash, 5% cement, 10%, lime, these Full cubes were put in normal room temperature After 7 days and 28 days Hence the results on these cubes were recorded as 70% and 100% respectively.

CONCLUSION

1. In terms of mix design cost, economical self-compacting concrete that achieved a 7-days compressive strength of approximately 22 to 75 Mpa was made with 10 to 100% replacement of cement by fly ash, and water-binder ratios of 0.45.
2. Test results on fresh concrete are within the limits, and follows EFNARC guidelines. Reduction of W / P ratio increases compressive strength Optimum dosage of chemical admixture is 1.5-2%. Dosage of SP below 1.5% affects workability, overdose Dosages Of plasticizers require maintaining the self-compatibility of concrete, increased linearly by weight of cementation materials.
3. If the total content is to be increased, the volume of maximum size has to be reduced in a specific coarse aggregate blending. If the volume of maximum size is to be increased, In other words, a change in the peculiar aggregate blending plays a vital role and reflects the new properties of SCC for a particular coarse aggregate content.
4. Although the absorption increases with increasing fly ash content, the initial absorption values of all SCCs were below 3%. SCC with 90% replacement of fly ash and 10% lime power exhibited the highest water absorption.
5. Thus, the optimum fly ash percent was 90% which resulted in higher compressive strength.

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