A Review on Experimental Investigation On Self Compacting Concrete By Using Mineral Additives

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***Abstract*- This paper on review on experimental investigation on self-compacting concrete by using mineral additive such as Fly ash, Micro silica & Metakaolin. Self-Compacting concrete is a concrete that exhibit the high flow ability and avoid the segregation and bleeding. The industrial waste such as fly ash use in this project as a partial replacement of cement to produce concrete, thus minimizes the amount of cement and reducing the cost**

***Index Terms*- Material, self-compacting concrete, Cost optimization**

I. INTRODUCTION

Self-compacting concrete (SCC) is a flowing concrete mixture that is able to consolidate under its own weight. The highly fluid nature of SCC makes it suitable for placing in difficult condition & in selections with congested reinforcement. Use of SCC can help in hearing related damages on the worksite that are induced by vibration of concrete, another advantages of SCC is that the time required to place large section in consider ability reduced. When the construction company in Japan experienced a decline in the availability of skill labour in the 1930's a need for felt for a concrete that could overcome the problem of defective workmanship.

SCC mainly used in highly congested reinforced concrete structure in seismic region and to overcome the problem of storage of skilled labours for the efficient compaction of concrete. Review of literature indicates that durability of SCC largely depends on the type of mineral admixtures.

The application of concrete without vibration in highway bridge construction is not new. For examples, placement of seal concrete, mass concrete and shaft concrete can be successfully placed without vibration. These seal, mass and shaft concretes are generally of lower strength, less than 34.5 MPa and difficult to attain consistent quality. Modern application of self-compacting concrete (SCC) is focused on high performance and more reliable quality, dense and uniform surface texture, improved durability, high strength, and faster construction.

By the early 1990's, Japan has developed and used SCC that does not require vibration to achieve full compaction. More and more applications of SCC in construction have been reported in Japan. As of the year 2000, the amount of SCC used for prefabricated products (precast members) and ready-mixed concrete (cast-in-place) in Japan was about 400,000 m3.

II. LITERATURE REVIEW

M. Collepardi in the paper entitled “Self Compacting Concrete: What is new?” summarizes the results on flowing and cohesive super plasticized mixtures studied and placed in the 1970’s and 1980’s with properties very close to those of Self Compacting Concrete (SCC) presently considered to be the most advanced cementatious material. Case histories (from Hong Kong, Newyork and Trieste, Italy) concerning placing of super plasticized self-leveling concrete without any vibration at all, published in the 1980’s are re-examined to compare them with the present SCCs. In particular, the paper deals with the ingredients of these mixtures (super plasticizer, cement, fly ash, ground lime stone, silica fume, etc.) by examining their specific role in determining the main properties of these concretes, such as fluidity, on the one hand, and the resistance to segregation, on the other. Some interesting new material, such as ground fly ash or powder from recycled aggregates, appear to be very promising for manufacturing SCC in agreement with the requirements needed for sustainable progress.

M. Collepardi, S. Collepardi, J.J. Ogoumah olagot and R. Troli presented in there paper entitled “Laboratory-test and field experiences of high-

performance SCC" described that during the last decades new cementatious material were available. This represents a sort of technical revolution with respect to the traditional concrete. The most important innovative "High Tech" materials are self-compacting concretes (SCCs) in this present paper composition, the performances and some practical applications of high-performance SCCs are shown. The test methods L-box test, U-box test, V-funnel test, Slum-flow test and cube compressive strength test. The most important basic principle for flowing and unsegregable concrete including SCCs is the use of super plasticizer combined with a relatively high content of powder in terms of Portland cement, mineral additions, ground filler, and very fine sand. A partial replacement of Portland cement by fly ash was soon realized to be the best compromise in terms of rheological properties, resistance to segregation, strength level, and crack-freedom, particularly in mass concrete structures exposed to restrained thermal stresses produced by cement heat hydration.

III. CONCLUSION

Following are conclusion are made

1. In place of fly ash, micro silica and metakaolin to use rice husk ash, GGBS (Ground Granulated Blast Furnace slag), stone powder or any other materials. In stone powder finely crushed lime stone, dolomite or granite may be used to increase the amount of powder.
2. There are various new admixtures available in the market which can be used for improving or developing SCC.
3. Fiber reinforced SCC can also be prepared to enhance the flexural strength.
4. Mainly steel or polymer fiber may be used for SCC.
5. In SCC, ground glass filler can also be used for further work. This filler is usually obtained by finely grinding recycled glass.

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