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# Experiment Study on Self Compacting Concrete with Mineral Admixtures

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***Abstract:*** ***Self Compacting Concrete (SCC) is an advanced type of concrete that can flow under its own weight and completely fill the formwork without the need for mechanical vibration. SCC improves construction quality, reduces labor cost, and enhances durability. The use of mineral admixtures such as Fly Ash, Silica Fume, and Ground Granulated Blast Furnace Slag (GGBS) enhances the mechanical and durability properties of concrete while reducing cement consumption. This study focuses on the behavior, properties, advantages, and applications of SCC with mineral admixtures. Fresh concrete tests such as Slump Flow Test, V-Funnel Test, and L-Box Test are conducted to evaluate flowability and passing ability. Hardened concrete tests such as Compressive Strength Test are performed to determine strength characteristics. The results show that mineral admixtures improve workability, reduce segregation, and increase long-term strength. SCC with mineral admixtures is environmentally friendly and suitable for modern construction practices.***

***Keywords: Self Compacting Concrete, Mineral Admixture, Fly Ash, GGBS, Silica Fume, Workability, Durability***

## I. INTRODUCTION

*1) Background*

Self Compacting Concrete was first developed in Japan in 1988 to overcome problems related to poor compaction in concrete structures. SCC is a highly flowable concrete that spreads into place, fills formwork, and passes through reinforcement without segregation.Mineral admixtures are supplementary cementitious materials added to improve strength and durability. These materials reduce environmental impact by decreasing cement usage.

*2) Need for SCC with Mineral Admixture*

- Conventional concrete requires vibration for compaction.
- Improper compaction leads to honeycombing and voids.
- High labor and noise during vibration process.
- Need for sustainable and eco-friendly construction materials.
- Using mineral admixtures improves performance and reduces $CO_2$ emissions.

*3) Objectives of the Study*

- To study properties of Self Compacting Concrete.
- To analyze the effect of mineral admixtures on strength.
- To compare SCC with conventional concrete.
- To promote sustainable construction materials.

*4) Properties of SCC (In Points)*

- High flowability
- Passing ability
- Resistance to segregation
- Self-leveling nature
- Improved surface finish
- High durability

*5) Role of Mineral Admixtures*

- Improve workability
- Increase long-term strength

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- Reduce heat of hydration
- Enhance durability
- Reduce cement content
- Improve resistance to chemical attack

*6) Materials Used*

- Ordinary Portland Cement (OPC)
- Fine Aggregate (River Sand)
- Coarse Aggregate
- Fly Ash
- GGBS
- Silica Fume
- Superplasticizer
- Water

Table -1: Sample Table format

| Sr. No. | Component | Estimated Cost (₹) |
|---|---|---|
| 1 | Cement | 480 |
| 3 | Fine Aggregate | 310 |
| 4 | Coarse Aggregate | 390 |
| 7 | Fly Ash | 220 |
| 8 | Superplasticizer | 630 |
| 10 | Testing Charges | 650 |
| | Total estimated cost | 2680rs |

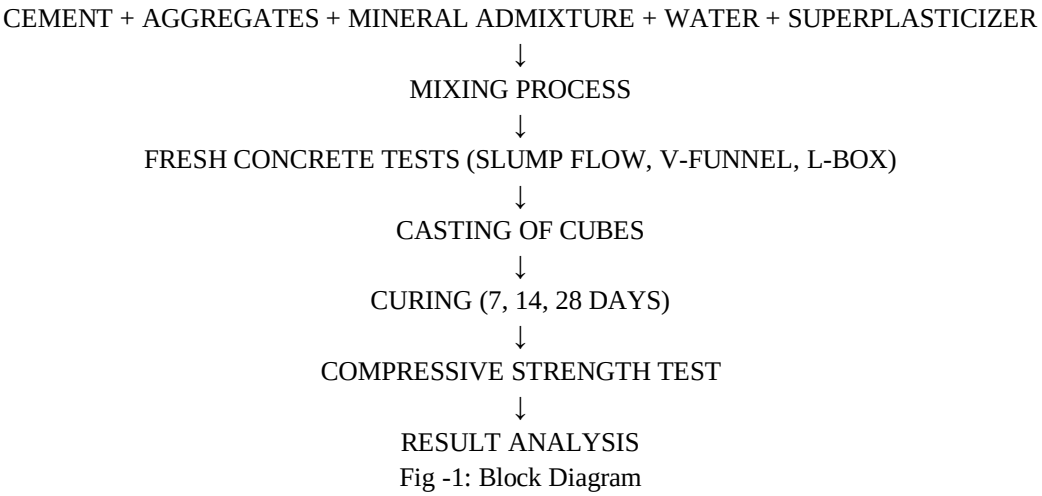


Fig -1: Block Diagram

The process of preparing Self Compacting Concrete starts with proper selection of materials. After mixing, fresh concrete tests are performed to check flowability and passing ability. Specimens are cast and cured for required days. Compressive strength is measured and results are analyzed to evaluate performance.

## II. CONCLUSIONS

The study concludes that Self Compacting Concrete with mineral admixtures provides better workability, improved durability, and higher strength compared to conventional concrete. The elimination of vibration reduces labor cost and noise pollution.

Mineral admixtures reduce cement usage and make the concrete environmentally friendly. SCC is highly suitable for heavily reinforced structures and modern construction practices. Proper mix design and proportioning are essential to achieve optimum performance.

## III. ACKNOWLEDGEMENT

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## REFERENCES

[1] Okamura, H. and Ouchi, M. (2003). Self Compacting Concrete. Journal of Advanced Concrete Technology.
[2] EFNARC (2005). Guidelines for Self Compacting Concrete.
[3] IS 10262:2019. Concrete Mix Proportioning Guidelines.
[4] IS 456:2000. Plain and Reinforced Concrete Code of Practice.



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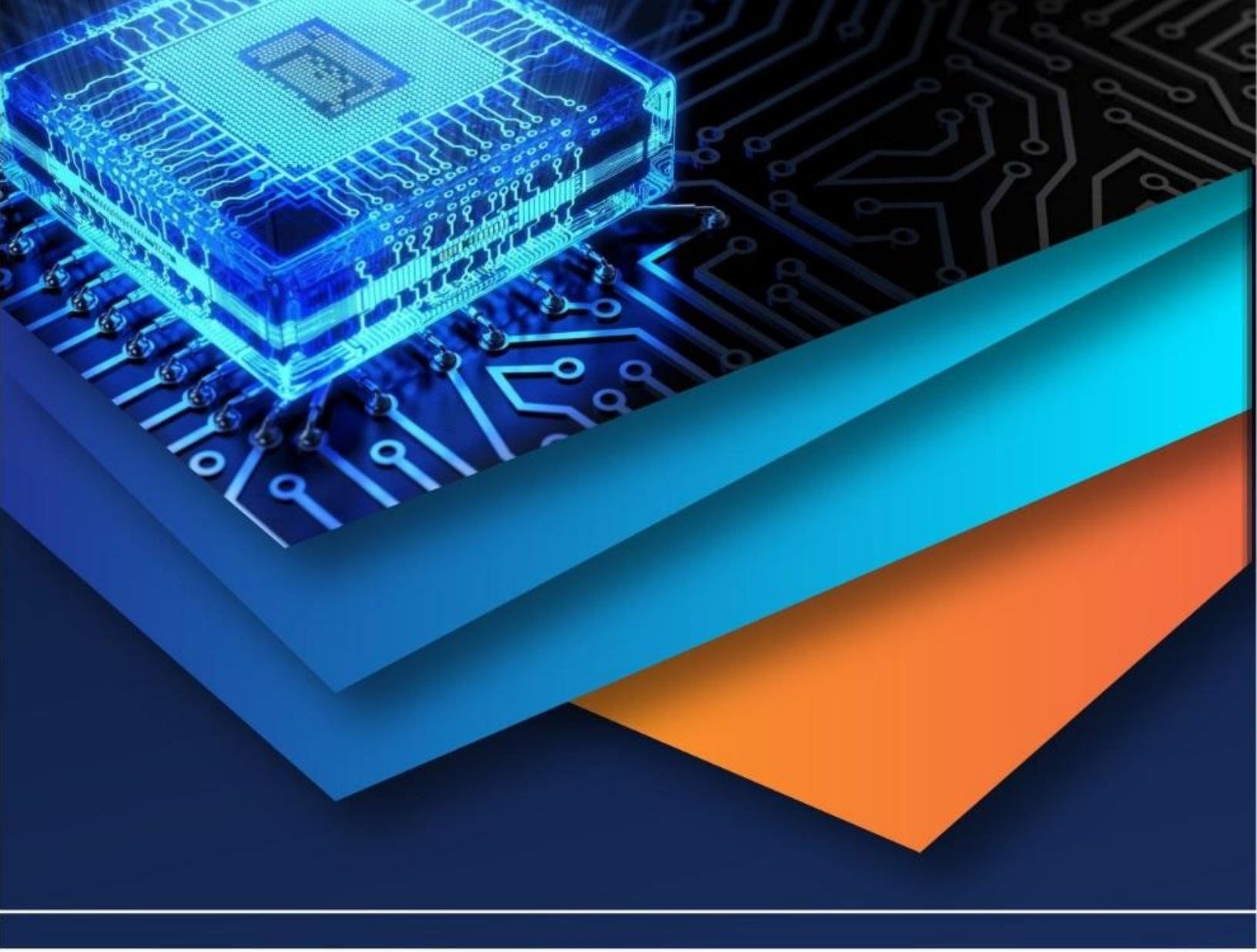
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