

# Self Compacted Concrete

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**Abstract:** Concrete is vital ingredient in infrastructure development with its versatile and extensive applications. It is most widely used material because of its mouldability into any required structural form and shape due to its fluid behavior at early ages. Self compacted concrete is a recently development concept in which the ingredients of the concrete mix are proportioned in such a way that it can flow under its own weight to completely fill the framework and passes through the congested reinforcement without segregation and self consolidate without any mechanical vibration

**Keywords:** Concrete, Self compacted concrete

## I. INTRODUCTION

The concrete is able to flow under its own weight and completely fill the form work, while maintaining homogeneity even in the presence of congested reinforcement, and then consolidated without any use of vibrating compaction. Development of self compacted concrete is a desirable achievement in the construction industry in order to overcome problems associated with casting the concrete in place. Self compacted concrete is not affected by the skills of workers, the shape and amount of reinforcement bars or the arrangement of a structure and due to its high fluidity and resistance to segregation it can be pumped to longer distance.

## II. USE OF SELF COMPACTED CONCRETE

The self compacted concrete is widely used in pre or post tensioned sections. It has good ability to mould in any shape with the help of mould. This is used where the reinforcement is in a way that there are very congested areas in which the compaction equipments i.e. vibrating machine are not able to function,. And with the help of this we can reduce the compaction cost those equal to the one tenth of the over all cost of the structure.

## III. HISTORICAL BACKGROUND, DEVELOPMENT AND PROSPECTS IN INDIA

Self compacted concrete in principle is not new. Special applications such as underwater concreting could be placed without the need of compaction. In such circumstances vibration was simply impossible. Early self compacting concrete relied on very high contents of cement paste.

The introduction of "modern" self leveling concrete or self compacted concrete is associated with the drive towards better quality concrete pursued in Japan around 1983, where the lack of uniform and complete compaction had been identified as the primary factor responsible for poor performance of concrete structure by Dehn in 2000. The self compacted concrete was under trade names, such as the Non Vibrated concrete (N V C) of Kajima Co., Super quality concrete (S Q C) of Maeda Co. Simultaneously with the Japanese development in the self compacted concrete area,

research and development continued in mix design and placing underwater concrete where new admixtures were producing self compacted concrete mixes with performance matching that the Japanese self compacted concrete in 1999. Due to the developing nature of the Indian economy the problems faced here are not as alarming as compared to the already developed west. It is not far off when India will have to seriously consider the use of Self Compacted Concrete.

## IV. ADVANTAGES OF SELF COMPACTED CONCRETE

Some of the main advantages of self compacted concrete are as below:-

1. Industrialized production of concrete.
2. Significant reduction in the cost of cast in situ concrete construction by eliminating compaction needed during the concreting, labour and equipment wear and tear cost related to compaction.
3. Reduction in the construction time by accelerating the construction process.
4. Promote the development of more rational concreting production.
5. Improve the quality, durability and reliability of concrete structures.
6. Improve the working environment at construction sites by reducing noise pollution
7. Easily placed in thin walled elements with limited access.
8. 'White figure syndrome' a serious injury from vibration equipment is prevented
9. SCC can be placed at a faster rate with no mechanical vibration and less screenings, resulting in savings in placement costs.
10. Improved and more uniform architectural surface finish with little to no remedial surface work.
11. Ease of filling restricted sections and hard-to-reach areas. Opportunities to create structural and architectural shapes and surface finishes not achievable with conventional concrete.

12. Improved consolidation around reinforcement and bond with reinforcement.
13. Improved pumpability.
14. Improved uniformity of in-place concrete by eliminating variable operator-related effort of consolidation.
15. Labour savings.
16. Shorter construction periods and resulting cost savings.
17. Reduction or elimination of vibrator noise, potentially increasing construction a hours in urban areas.
18. Minimizes movement of ready mixed trucks and pumps during placement.
19. Increased jobsite safety by eliminating the need for consolidation.

## V. CONCLUSIONS

Research on the usage of self compacted concrete is very important for the congested area where the normal mix are not properly fill the gaps and it is also good in fill the edges. Concrete is a vital ingredient in infrastructure development with its versatile and extensive applications. It is the most widely used construction material because of its mouldability into any required structure form and shapes due to its fluid behavior at early age. It is also reduce the cost of the vibration machines and labour and it was shocking results given by Japans researching team i.e. the self compacted concrete reduce the 10% to 15% cost of the overall cost of the structure. Following conclusions have been drawn based on the observations and discussion of test results:

1. The compressive strength of different water cement ratio.
2. The compressive strength of different mixed proportions.

It can be said that it is a creative and environment friendly solution to use self compacted concrete.

## VI. SCOPE FOR FURTHER STUDY

The strength is not affected by the self compacted concrete can be further studied by taking into account the following parameters:

1. We can use admixtures for the setting time decrease.
2. Using different grades of cement i.e. 33 and 53 grade.
3. With different type and grading of sand.
4. Varying the mix proportion and water cement ratio.

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