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Project Report on

"Experimental Study On Resistance of Self Compacting Concrete To Elevated Temperature and Verification of Ratio of Compressive Strengths of Cube to that of Cylinder for SCC"

Submitted in Partial Fulfillment of the Requirements for the Award of Degree of

BACHELOR OF ENGINEERING
(CIVIL ENGINEERING)

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SYNOPSIS

Recognizing the lack of uniformity and complete compaction of concrete by vibration, researchers at the University of Tokyo, Japan, started in late 1980's to develop SCC. By the early 1990's, Japan had developed and used SCC that does not require vibration to achieve full compaction. By the year 2000, the SCC had become popular in Japan for prefabricated products and Ready Mixed Concrete.

Self compacting concrete had been described as "the most revolutionary development in concrete construction for several decades. The use of self-compacting concrete (SCC) is spreading world wide because of its very attractive properties in the fresh state as well as after hardening. The use of SCC will lead to a more industrialized production; reduce the technical costs of in situ cast concrete constructions, improve the quality, durability and reliability of concrete structures and eliminate some of the potential for human error. It will replace manual compaction of fresh concrete with a modern semi-automatic placing technology and in that way improve health and safety on and around the construction site.

A literature survey is conducted to study the details of investigations that have been carried out worldwide on hardened properties (mechanical & durability aspects) of SCC.

The fundamental objective of this project work is to provide information on effect of elevated temperature on compressive strength of Self-Compacting Concrete. And also to study ratio of Compressive strength of cube to that of cylinder for a constant h/d ratio of 2, for different Cementitious contents per cubic meter of SCC. The SCC produced is tested as per the codal provisions for the evaluation of its compressive strength.

In this experimental study tests are conducted on **62** standard cubes (150 X 150 X 150) mm, and **62** cylinders for Compressive strength of SCC at 3days, 7days, 28days, and 56days curing period.

Also experiment was conducted on 9 cubes and 9 cylinders for resistance to elevated temperature of 250 °C (452 °F) for 3 hr duration.

A design mix with a Cementitious Quantity of - 500kg/cum, of SCC (Cement 70% + Pulverized Fly Ash 30%) has been considered with constant quantity of 200 litres water per cubic meter of SCC for the coarse aggregates ratios considered. A required dosage of superplastisizer is added to satisfy the rheological properties of SCC.

The chapter division of this report reflects the work carried out in this investigation.

Chapter 1 gives brief introduction to Self Compacting Concrete (SCC) and the Rheology of self compacting concrete.

Chapter 2 summarizes the literature survey carried out on the earlier studies conducted on various aspects of SCC.

Chapter 3 presents the aims and scope of the present investigation.

Chapter 4 condenses the details of characteristics of materials used in self compacting concrete, various methods of mix design procedures & the method adopted for the study.

Chapter 5 deals with the details of experimental programme consisting of material testing, specimen casting, curing, instrumentation, test setup and test procedure as per codal procedures.

Chapter 6 presents the test results of this investigation and discusses about parameters contributing /affecting the compressive strength of SCC. Also condenses the above discussions in to rational conclusions.

Chapter 7 provides the details of scope for future investigation.