

VISVESVARAYA TECHNOLOGICAL UNIVERSITY BELGAUM



PROJECT REPORT ON:

“A STUDY ON THE BEHAVIOUR OF CONCRETE FILLED TUBULAR COLUMNS”

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ABSTRACT

Composite columns composed of concrete filled steel tubes (CFT) have become increasingly popular in structural applications around the world. Concrete-filled steel tubes (CFST) have many advantages over conventional steel and reinforced concrete columns due to their high resistance to compression because the occurrence of the local buckling of steel tube is delayed by the restraint afforded by the concrete, and the strength and ductility of concrete is enhanced by the confining effect provided by the steel tube a high energy absorption capacity.

In recent years, the possibility of using thin-walled HSS columns filled with self-consolidating concrete (SCC), or self-compacting concrete, in practical engineering has been of interest to structural engineers. Hence an attempt is made to study use of SCC with steel fibers in CFT columns to study the physical parameters and mechanical behaviour on load carrying capacity of a column.

Self-compacting concrete was developed by Japanese in 1980's to when lack of uniform and completer compaction was identified as the primary factor responsible for poor performance of concrete structures.

Self compacting concrete (SCC) is identified as "highly flowable" stable concrete, that can spread readily into place and fill the formwork without any vibration and without undergoing any significant segregation.

The use of SCC has steadily increased in recent years which are an alternate to conventional concrete for high density or intricate reinforced sections and placement in narrow moulds. SCC can also be pumped from the bottom of a form or dropped from the top with a recommended maximum fall height of 6 feet.

The design of concrete mix is not a simple task on account of widely varying properties of the constituent materials and many factors affect its target value. In mix design cohesive strength, desired durability, workability is achieved by choosing its proportion of cement, coarse aggregate, fine aggregate, water and admixtures. In this, view Nan-su method is adopted to prepare the mix design of compressive strength of concrete i.e., M70 strength of SCC.

The experimentation includes the tests on properties of fresh and hardened concrete on SCFRC to know the characteristic behaviour like passing ability, filling ability and segregation and study the behaviour of CFT columns subjected axial load with variation of D/t and L/D ratio.