

FINITE ELEMENT MODELLING OF FLEXURAL MEMBERS SUBJECTED TO ELEVATED TEMPERATURE

ANAND N., PRINCE ARULRAJ G. AND XAVIER OLI ELAVAN. P.

Abstract

Structural concrete is one of the most commonly used construction materials in the world. Civil and structural engineers are often not familiar with fire safety issues and fire protection design of concrete structures. Even after the devastating effect of WTC collapse, fire safety aspects are still being ignored by structural consultants in structural design. The code of practice for plain and reinforced concrete IS 456:2000 recommends nominal cover and minimum dimensions for structural elements to enhance the fire resistance. But fire resistance of structural member depends on many other material properties of concrete. A study was carried out to understand the behaviour of self compacting concrete beams exposed to elevated temperatures under flexural loading. The beams were exposed to durations of 30minutes, 60minutes and 90minutes at temperatures of 600⁰C and 900⁰C. The cover thickness adopted was 20mm for all the cases. This analytical study was carried out using the finite element package ANSYS 11. The deflection values of SCC beams exposed to elevated temperatures were found to be more than that of the reference specimen.

Key words: Room temperature, Time-temperature, Load-deflection, ANSYS, SCC

© <http://www.ascent-journals.com>