

CRACKING AND TORSIONAL DUCTILITY BEHAVIOUR OF MSC AND HSC PLAIN BEAMS

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Abstract

An experimental investigation was carried out to study the torsional behavior of Medium strength concrete(MSC) and High strength concrete(HSC) Plain beams with the mix proportion of M80 and M100 grade of concrete. The mix proportion was obtained without the use of mineral admixtures such as (silica fumes, fly-ash...). Eight MSC and eight HSC beams with varying width (75, 100, 150 mm), and varying depth (75, 100, 150, 200 mm) with varying effective span (600, 800, 1200 mm), to study the size effect in torsion were cast, cured and tested. The main objective of the present investigation was to understand the torsional behavior of the MSC and HSC Plain beams in terms of cracking, rotation, torsional strength and size effect. The beams were tested under standard torsional loading procedure. A special arrangement was fabricated to apply the torque to the beams. The parameters studied in this investigation are, cracking torsional strength, ultimate torsional strength, failure pattern, torsional stiffness, aspect ratio and size effect. The results obtained from the experiment were compared with the different theories and codal equations. A parametric analysis was done for the 52 data collected from previous investigation. It was observed that plastic theory and skew bending predicts the torsional strength better than the elastic theory.

Keywords : HSC, MSC, Crack, Failure, Ductility, Torsion, Strength, Deformation.