Comprehensive Study of High Strength Concrete Beams with Confinement Shear Reinforcement under Cyclic Loads

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Abstract : Concrete off late has transcended into many forms depending upon the application. In the present paper, the flexural and the shear resistance of high strength reinforced concrete (HSC) beams with longitudinal bars and confinement of transverse stirrups [1] is analyzed both theoretically and experimentally. An experimental program has been made in order to study the confined concrete behaviour when its strength changes from traditional values to high strength values. Six HSC beams of span 3m with constant width 150 mm and depth 250 mm by varying (i) transverse shear reinforcement spacing -100 and 200mm c/c and (ii) the longitudinal reinforcement ratio (1.0%, 1.25% and 1.5%) were casted and tested under cyclic loading to understand the flexural behavior of the beams. The details of the beam specimens, material properties, instrumentation and the testing procedure used are carefully described in this paper. Furthermore, mathematical modeling using regression equations are proposed to study the effect of confinement reinforcement obtained from the experimental results. Test results are also compared with predicted results for various reinforcement ratios and finally, conclusions are drawn.
Keywords: High strength concrete, reinforcement ratio, cyclic loads, confinement.

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