World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:8, No:01, 2014

Effect of Steel Fibers on Flexural Behavior of Normal and High Strength Concrete

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Abstract : An experimental study was conducted to investigate the effect of hooked-end steel fibers on the flexural behavior of normal and high strength concrete matrices. The fiber content appropriate for the concrete matrices investigated was also determined based on flexural tests on standard prisms. Parameters investigated include: Matrix compressive strength ranging from 45 MPa to 70 MPa, corresponding to normal and high strength concrete matrices respectively; Fiber volume fraction including 0, 0.5%, 0.76%, and 1%, equivalent to 0, 40, 60, and 80 kg/m3 of hooked-end steel fibers respectively. Test results indicated that flexural strength and toughness of normal and high strength concrete matrices were significantly improved with the increase in the fiber content added; Whereas a slight improvement in compressive strength was observed for the same matrices. Furthermore, the test results indicated that the effect of increasing the fiber content was more pronounced on increasing the flexural strength of high strength concrete than that of normal concrete.

Keywords : concrete, flexural strength, toughness, steel fibers
Conference Title : ICCET 2014 : International Conference on Concrete Engineering and Technology
Conference Location : Zurich, Switzerland
Conference Dates : January 14-15, 2014