Experimental Study Steel fiber Reinforced concrete

ABSTRACT

This paper presents an experimental study to the effectiveness of steel-fiber concrete in combination with the confinement in the compression zone of a flexural member. A range of stirrup configurations functioning as confining elements, were evaluated. The study was aimed to analyze the effect of these confining reinforcement variations to the load carrying capacity and cracking moment of a simply supported beam loaded in pure bending. Additionally, steel-fibers were added to the concrete mix to improve the mechanical properties of the material. Five steel-fiber beams were evaluated, having a variation in confining reinforcement configurations. The variations in confining reinforcements were especially, but not exclusively, concentrated in the compression zone of the beam. To monitor the influence of the steel-fibers, a controlling element without the use of steel-fiber (conventional concrete) was also produced, and tested in the laboratory. The beam test set up was designed to undergo a state of pure bending by the use of a two-point loading system. The testing methodology under increasing monotonic loading was deformation controlled. The results showed that the variation in configuration of the confining reinforcement in the compression zone played an important role to the ultimate moment capacity of the beam. The experiments also demonstrated that the type of confinement has major impact to the cracking moment of the element. The addition of steel-fibers influenced the cracking moment positively.