

Flexural static energy of steel fiber rubberized concrete beams with layered distribution

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ABSTRACT

In this study, an investigation on the effect of crumb rubber aggregate on flexural performance of plain and steel fiber concrete was presented. Two replacement volumes of sand by crumb rubber were selected as 5% and 15%. The content of steel fiber in fibrous concrete was 0.5% (39 kg/m³). The flexural performance of the concrete mixtures was evaluated in terms of flexural energy under static load. For each mixture, three beams were prepared for flexural test under three points loading. In addition, for each batch three beams with same mix proportion were prepared using the layered distribution of concrete. A bottom layer was prepared using plain concrete, while the top layer was prepared using rubberized concrete. For the layered steel fiber rubberized concrete beams, the bottom layer was prepared with steel fiber concrete while the top layer has varied rubber content. The inclusion of rubber aggregate in plain and steel fiber concrete showed a decline in the mechanical strength while an improvement in static the flexural energy was observed in comparison with reference mixes (plain and steel fiber concrete). The layered distribution of rubberized concrete also showed good synergy with steel fiber concrete. The utilization of rubberized concrete is required to enhance the energy absorption capacity as well as a solution of problem of discarded tire.