

Title: Influence of Steel Fiber and Superplasticizer on Crumb Rubberized Concrete

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Abstract: In recent years, the substantial disposal of a large volume of scrap tires has posed a significant environmental solid waste problem. Crumb rubber (CR) generated from these waste tires can serve as a partial replacement of normal aggregates to make crumb rubberized concrete (CRC). Therefore, to investigate the properties of CRC, CR was used as 5%, 10%, and 15% replacement of sand in this study. In addition, steel fiber (SF) by 1% volume fraction of concrete and superplasticizer (SP) by 1% weight of cement were added individually to compare the improvement of concrete strength. Slump, unit weight, compressive strength, and split tensile strength tests were conducted to investigate and compare the properties of CRC. The experimental findings revealed that, as the amount of SF increased, unit weight, compressive strength, and split tensile strength increased. However, SP showed a greater improvement in CRC than SF. The addition of SF increases the compressive strength approximately from 11% to 16% and split tensile strength from 7.6% to 16.3%, while SP showed an increase from 21.1% to 24.5% and 12% to 25%, respectively. Therefore, it can be stated that the 1% SP has better strength improvement quality in comparison with 1% SF.

Keywords: Crumb rubber (CR), Crumb rubberized concrete (CRC), Waste tire recycling, Steel fiber (SF), Superplasticizer (SP), Compressive strength

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