عنوان مقاله:

Torsion Improvement of Reinforced Self-Compacting Concrete Beams Using Epoxy Injection and CFRP

محل انتشار:

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خلاصه مقاله:

Few researchers have investigated the internal torsional reinforcement of box beams, So, this study aims to find out the possibility of adding a certain percentage of RCA to the NC mixtures, as well as verifying the success achieved in repairing the cracks that occurred as a result of torsion with CFRP or injecting with epoxy, which has not been addressed in previous research and literature reviews. This study reinforces reinforced SCC box columns subjected to complete torsion with CFRP sheets and epoxy resin injections. Four types SCC specimens (the first beam with ۰%, the second beams with ۳۳.۳%, the third beams with ۶۷.۷%, and the fourth beams with ۱۰۰% RCA by weight) were subjected to pure torsion until failure. The dimensions and reinforcement of every specimen are identical. In addition, the applied torque-twist angle relationship at the midspan and end span was investigated. Bending experiments were performed to establish load-deflection curves and assess failure modes. After structural rehabilitation, all beams exhibited increased rigidity values, according to the results. Epoxy resin and CFRP sheet contributed to the specimens' increased ultimate load. The ultimate strength of RCA beams strengthened with CFRP and injected with epoxy increased. The specimens' flexural strength was considerably enhanced by the combination of surface roughness and fracture injection, and the effectiveness of using RCA was very good; it could be replaced with NCA in concrete mixtures, according to the ratio and need. Doi : ۱۰.۲۸۹۹۱/CEJ-۲۰۲۳-۰۹-۱۱-۰۵ Full Text : PDF

کلمات کلیدی:

Reinforced Concrete; Carbon Fiber Reinforced Plastic; Self-Compacting Concrete; Natural Coarse Aggregate; Recycled Coarse Aggregate; Cracking Torque; Ultimate Torque; Cracking Load; Ultimate Load.