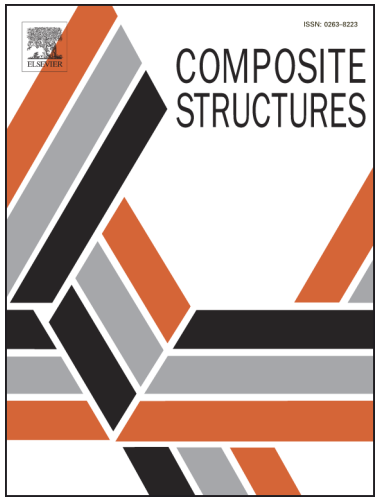

Emergency Repair of an RC Bridge Column with Fractured Bars using Externally Bonded Prefabricated Thin CFRP Laminates and CFRP Strips

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Abstract:

An emergency repair technique for a reinforced concrete (RC) bridge column that had buckled and fractured longitudinal bars was developed and assessed through an experimental study. The repair technique involved removing loose concrete, casting grout, cutting a trench around the base of the column in the footing, embedding carbon fiber reinforced polymer (CFRP) strips for flexural reinforcement, building a jacket from a prefabricated thin CFRP laminate, lowering the jacket into the trench bonding the CFRP composites to the column and the footing with pressurized epoxy, and restoring the strength of footing with externally bonded CFRP sheets. The repaired column was tested to failure under constant axial load and cyclic lateral load resulting in combined flexure, shear, and torsional moment loading. Test results showed that the repair method was successful in restoring the seismic performance of the column in terms of lateral strength and deformation capacity.