

DOUBLE-LAP SHEAR TESTS TO DETERMINE THE BOND CHARACTERISTICS BETWEEN CFRP AND STEEL PLATES

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ABSTRACT

Advanced composite materials offer remarkable potential in the upgrade of civil engineering structures. The evolution of CFRP technologies and their versatility for applications in civil constructions require comprehensive and reliable codes of practice. Guidelines are available on the rehabilitation and retrofit of concrete structures with advanced composite materials [Refs. 1-3]. However, there is a need to develop appropriate design guidelines for CFRP strengthened steel structures [Ref. 4]. Studied herein is the bond strength of carbon fiber reinforced polymer to structural steel plate in order to develop the composite structure of steel plate and fiber reinforced polymer. A series of double lap shear tests loaded in tension were carried out to investigate the bond strength and debonding failure under tension. Strain gauges were mounted to capture the strain distribution across the CFRP layers and along the CFRP length. The interface slip was measured using displacement transducers. Load transfer model was developed to estimate the bond strength between CFRP and steel plates.

References

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