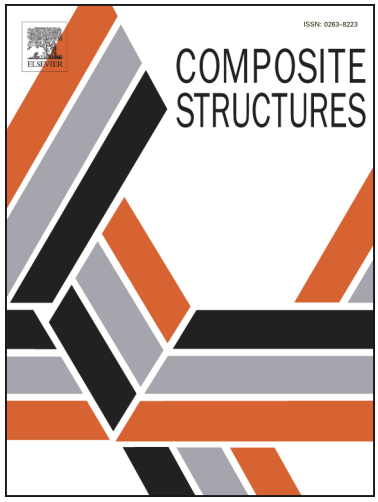

Straight FRP anchors exhibiting fiber rupture failure mode

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Straight FRP anchors exhibiting fiber rupture failure mode

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Abstract

The purpose of the work was to characterize the behavior of FRP anchors installed at the end of FRP sheets and develop a methodology to calculate the capacity when the anchors exhibited the fiber rupture failure mode. To do so an extensive experimental program was undertaken and the force transfer mechanism between the anchor and the structure was studied in depth. A theoretical model and then an adapted simplified model were developed and empirically calibrated with the experimental results, which yielded a number of design equations. The main observation from the experimental results is that the anchor was weaker when the fanning angle increased and the efficiency dropped as the anchor increased in size. The final contribution to the knowledge is a method to calculate the capacity of anchors installed at the end of FRP sheets when exhibiting fibre rupture failure mode.

Keywords: FRP anchors, FRP, strengthening, anchorage, premature debonding, fiber rupture

1. Introduction

The use of Fiber Reinforced Polymer (FRP) materials in combination with the Externally Bonded Reinforcement (EBR) method is a strengthening system that is commonly deployed to increase the load-carrying and/or ductility capacity of structural members, with comprehensive overviews of the utilization of FRP being available in the literature[1, 2, 3]. EBR-FRP systems incorporating FRP anchors