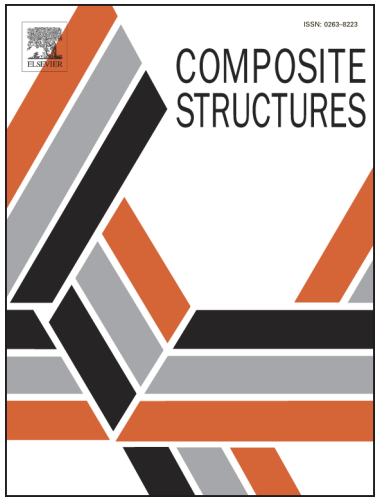


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# Experimental investigation on the mechanical properties of a novel anchorage for carbon fiber reinforced polymer (CFRP) tendon

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**Abstract** Carbon fiber reinforced polymer (CFRP) has the advantages of light weight, high tensile strength, superior corrosion resistance, and anti-fatigue properties. However, its low transverse compressive strength and inner-laminar shear strength render it difficult to be anchored through traditional anchorages for steel cables. This study proposes a novel composite anchorage for CFRP tendon and validates its novelty by finite element (FE) method. Then the mechanical performance of this novel anchorage was experimentally compared with that of traditional inner cone anchorage. The effects of parameters such as pre-tightening force, embedded length, inclination angle of the barrel, and grouted material on the anchorage performance of the novel composite anchorage are further studied. Results reveal that this novel composite can increase the load-carrying capacity by 60.4% and exhibits an ideal anchorage efficiency above 0.9, largely reduce the slip of the CFRP tendon under both ultimate and short-time sustained load, and prevent stress concentration at the loaded end. For further design of this novel anchorage, an empirical embedded length of 35*d*~40*d* is proposed. Besides, the anchorage performance of this anchorage does not always increase with the dosage of the sand. The optimum dosage of sand should not exceed 10%. This study provides insights into the mechanical properties of the novel