

A Fundamental Study on the Anchor Performance of Non-Surface Treated Multi CFRP Tendons

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Abstract : CFRP (Carbon Fiber Reinforced Polymer) is mainly used as reinforcing material for degraded structures owing to its advantages including its non-corrodibility, high strength, and lightweight properties. Recently, dedicated studies focused not only on its simple bonding but also on its tensioning. The tension necessary for prestressing requires the anchoring of multi-CFRP tendons with high capacity and the surface treatment of the CFRP tendons may also constitute an important issue according to the type of anchor. The wedge type, swage type or bonded type anchor can be used to anchor the CFRP tendon. The bonded type anchor presents the disadvantage to lengthen the length of the anchor due to the low bond strength of the CFRP tendon without surface treatment. This study intends to overcome this drawback through the application of a method enlarging the bond area at the end of the CFRP tendon. This method enlarges the bond area by splitting the end of the CFRP tendon along its length and can be applied when CFRP is produced by pultrusion. The application of this method shows that the mono-CFRP tendon and 3-multi CFRP tendon secured the anchor performance corresponding to the tensile performance of the CFRP tendon and that the 7-multi tendon secured anchor performance corresponding to 90% of the tensile strength due to the occurrence of buckling in the steel tube anchorage.

Keywords : carbon fiber reinforced polymer (CFRP), tendon, anchor, tensile property, bond strength

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