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Reinforcing Fibre Reinforced Polymer (FRP) Bridge Decks with Steel Plates

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Abstract : Fibre reinforced polymer (FRP) bridge decks have become an innovative alternative, and they have offered many advantages, and this has been increasing attention for applications in not only reinforcement of existing bridges decks but also construction of new bridges decks. The advantages of these FRP decks are; lightweight, high-strength FRP materials, corrosion resistance. However, this high strength deck is not ductile. In this study, the behaviour of hybrid FRP-steel decks are investigated. All FRP decks was analysed with the commercial package ABAQUS. In the FE model, the webs and flanges were discretised by 4 nodes shell elements. A full composite action between the steel and the FRP composite was assumed in the FE analysis because the bond-slip behaviour was unknown at that time. The performance of the proposed hybrid FRP deck panel with steel plates was evaluated by means of FE analysis.

Keywords : FRP, deck, bridge, finite element
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