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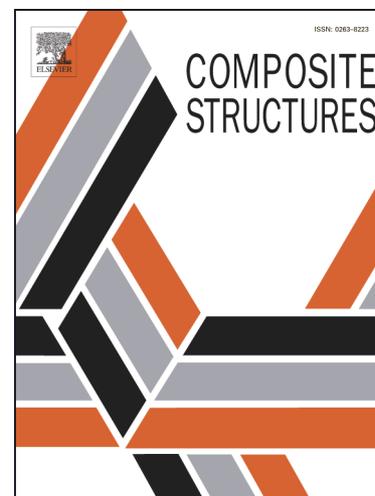
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Structural behaviour of an all-composite road bridge

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Abstract

Fiber reinforced polymer composites have become an integral part of the bridge industry because of their versatility, high strength-to-weight ratio and enhanced durability. The novel idea of an all-composite structural system for road bridges has been proposed for the first time in Poland. The FRP bridge is a simply supported structure with 10.0 m long span and 7.66 m wide deck. The superstructure consists of four U-shaped girders bonded with sandwich deck slab, fabricated by means of a vacuum infusion. The bridge configuration, a finite element model developed for design and the proof test results are described in this paper. The test has shown that an all-composite bridge can meet the relevant strength and deflection design criteria. To develop an understanding of the long-term performance of the FRP bridge, a monitoring scheme utilizing distributed fibre-optic sensors was implemented to assess any changes in the bridge structural behaviour.

Keywords

FRP bridge, all-composite superstructure, FEM model, proof test, monitoring, DFOS

Declarations of interest: none

Info: All changes according to review we marked in red.

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