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Comparative Study of Concrete Filled Steel I-Girder Bridge with Conventional Type of Bridge

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Abstract : Steel and concrete composite bridge with concrete filled steel I-girder (CFIG) was proposed and FEM and laboratory tests were conducted to analysis bending and shear behavior. The proposed form of structural steel I-section is mainly used at the intermediate support zone by placing infilled concrete into the top and bottom flanges of steel I-section to resist negative bending moment. The bending and shear tests were carried out to find out the significance of CFIG section. The result for test showing that the bending and shear capacity of proposed CFIG is at least 3 times and 2 times greater than conventional steel I-section (IG) respectively. Finite element study was also carried out to ensure the result for laboratory tests due to bending and shear behavior and load transfer behavior of proposed structural form. Finite element result result agreed the test result. A design example was carried out for a four-span continuous highway bridge and design method was established.

Keywords : bending strength, concrete filled steel I-girder, steel I-girder, FEM, limit states design and shear strength
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