

Flexural Behavior of Light-Gauge Steel Box Sections Filled with Normal and Recycled Aggregates Concrete

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Abstract : The flexural behavior of light-gauge steel box sections filled with recycled concrete was assessed through an experimental program involving 15 composite beams. Recycled concrete was obtained by replacing natural aggregates (NA) with recycled concrete aggregate (RCA) and recycled asphalt pavement (RAP) with replacement levels of 20%, 40%, 60%, 80%, and 100% by the total weight of NA. In addition, RCA and RAP were incorporated in the same mixes with replacement levels of (1) 20% RCA and 80% RAP; (2) 40% RCA and 60% RAP; (3) 60% RCA and 40% RAP; and (4) 80% RCA and 20% RAP. A comparison between the experimental capacities and the theoretically predicted values according to Eurocode 4 (EC4) was made as well. Results proved that the ultimate capacity of composite beams decreased with the increase of recycled aggregate (RA) percentage and EC4 was conservative in predicting the ultimate capacity of composite beams.

Keywords : flexure, light gauge, recycled asphalt pavement, recycled concrete aggregate, steel tube

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