البحث الأول

عنوان البحث (باللغة التى نشر بها) :

Behavior Of Recycled Concrete Beams With Openings In Shear Region: Experimental And Numerical Study

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Abstract:

The current paper presents an experimental and numerical investigations to study the shear behavior of simply supported natural and recycled coarse aggregate concrete beams. A total of eight beams using two different types of aggregate ‘‘natural and recycled” were cast and tested. The beams were divided into two groups, the first group consists of four solid beams, while the second one consists of four beams with openings in the shear zone. The beams were subjected to a symmetric two-point loads for this purpose, four different replacement ratios of natural coarse aggregates (NCA) by recycled coarse aggregates (RCA): 0% (reference mix), 25%, 50%, and 100%. Subsequently, Numerical results were compared with the experimental ones to check the validity of the model. Afterward, a total of 18 numerical models were conducted to study the different parameters that not covered by the experimental program such that, shape of openings, dimension and location of openings along the shear span. The results indicated that compressive, tensile, and flexural strengths decreases as the recycled coarse aggregate increase. It was found that the shear behavior and the shear strength of the RCA beams were very similar to that of the corresponding natural aggregate concrete beams. The experimental results showed that a reduction in the shear strength of RC beams with openings ranged between 22 % and 30% in comparison to the corresponding control beam without opening.