عنوان مقاله:

Performance Flexural of RC Beams Without Concrete at Tension Cross-section

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خلاصه مقاله:

This study aims to analyze the flexural capacity of RC without concrete in a tension cross-section using an experimental method. The number of specimens is three pieces, namely a spiral reinforced concrete beam (SBC) and a vertical reinforced concrete beam (CBN); both of these blocks are without concrete in the cross-section of the reinforcement and ۶۰D tensile steel reinforcement in the support area, where D is the primary diameter, and a conventional concrete beam as the control beam (CB). The beam size is ۳۱۰۰×۱۵۰×۲۰۰ mm. The beams are supported by simple supports with a span of ۳۰۰۰ mm. The concrete in the structural beam elements, which work optimally to withstand the load, is the outermost fibre part of the side, while the concrete on the tension side does not have a direct role in determining the magnitude of the resisting moment. Therefore, the quality of the concrete in the concrete beam section must be optimized, while the concrete in the tension section must be minimized. Eliminating concrete in tension areas reduces the construction's self-weight and use of concrete-making materials. The main variables in this research are bending behaviour and crack pattern. The beam specimens were tested with two-point loading monotonically. By observing the crack pattern and failure mode, the results showed an increase in the capacity load of SBC by ۲۱.۵۸% CBN but a decrease of ۲۷.۵۷% compared to the CB control beam. Flexural cracks and beam failures resembled under-reinforcing. The flexural capacity was analyzed based on static analysis and then validated by calculating the ratio between the theoretical nominal moment and the experimental moment. This finding shows that changing the conventional shear reinforcement model to spiral can increase the flexural of the beam without concrete in the tension cross-section. Doi : ۱۰.۲۸۹۹۱/CEJ-۲۰۲۲-۰۸-۱۱-۰۱۴ Full Text : PDF

کلمات کلیدی:

.Flexural Capacity; Spiral Reinforced; Tensile Cross-Section; Tensile Reinforcement