

The flexural behavior of RC beams with sand-coated polypropylene waste coarse aggregate at different w/c ratios

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Abstract	<p>The aim of this study was to investigate the effect of water/cement (w/c) ratio on the flexural behavior of reinforced concrete (RC) beams which contain polypropylene waste coarse aggregates (PWCA) coated with sands subjected to concentrated monotonic load. The process involved the experimental manufacturing of three RC beams with sand-coated PWCA concrete using 0.30, 0.35, and 0.36 w/c ratios at a width of 80 mm, a height of 160 mm, and a length of 1600 mm. The flexural performance, including load-deflection relationship, flexural strength, ductility index, stiffness, as well as toughness was investigated and discussed. Moreover, the analytical approach was verified using the Response-2000 program by comparing the analytical and experimental results. The sand-coated PWCA RC beams were discovered to have the ability to sustain the loads applied effectively by producing a flexural performance which is considered acceptable and reasonable. In addition, the variations in the w/c ratio were observed to have effects on the parameters of the beams investigated. Finally, the ultimate loads recorded for these beams confirmed their acceptability in the analytical investigation.</p>
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