THE INFLUENCE OF RIVER AND VOLCANIC SAND AS COATINGS ON POLYPROPYLENE WASTE COARSE AGGREGATE TOWARDS CONCRETE COMPRESSIVE STRENGTH

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Abstract	One of the most important factors used to determine the compressive strength of concrete is its aggregate and matrix adhesion. This study examines the surface properties of polypropylene (PP) waste coarse aggregate (PWCA) to determine the influence of sand. The PWCA was made from the PP waste and different types of coating such as PWCA-R (river sand) and PWCA-V (volcanic sand), with experimental tests conducted on the physical properties of sand and PWCA, while the compressive strength, FESEM and density of polypropylene waste coarse aggregate concrete (PWCAC). Concrete specimens were prepared by replacing natural coarse aggregate with PWCA in percentages of 0%, 25%, 50%, 75%, and 100%, varying the water-cement ratio by 0.3 and 0.42 and using polypropylene (PP) waste coarse aggregate (PWCA-R and PWCA-V) as the coating material. The results showed that fineness modulus (F.M) and water absorption of the river sand was higher compared to volcanic sand. The PWCA-V had higher density and specific gravity compared to PWCA-R. On the other hand, water absorption of the PWCA-V was lower than PWCA-R. The PWCA concrete had density which varies from 1740 kg/m(3) to 2074 kg/m(3). For both, the PWCA concrete compressive strength at 28 days with a 100% replacement ratio was reduced by 43% to 55% compared to the natural coarse aggregate (NCA) concrete with 0.3 and 0.42 water-cement ratios. Also, the structural efficiency of PWCAC decreased with an increase in replacement ratio. River sand adhered to the PWCA surface resulted in a better compressive strength value compared to the volcanic sand.
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