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ACCEPTED MANUSCRIPT

Utilization of Dates Palm Kernel in High Performance Concrete

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Abstract

The utilization of agricultural dumps as ingredients in concrete has been studied by several researchers. One of which is the Palm Kernel Shells (PKS), which are a by-product in factories that produce date molasses (date honey). The aim of this study is to investigate the ability to produce high performance concrete by using Palm Kernel Shells (PKS), Crushed Palm Kernel (CPK) and Palm Kernel Ash (PKA) as replacement of concrete contents. The compressive strength, flexural strength, air dry density and absorption were tested in this investigation.

The (PKS), (CPK) and (PKA) were replaced individually by weight of the course aggregate, fine aggregate and cement respectively using different percentages ranging from 5% to 20%. Also, they were mixed together in single mixes using different replacement percentages. The physical and mechanical properties of each replacement were evaluated at 7, 28, and 56 days. Although the compressive strength has dropped around 28%-40% for all replacement ratios, still, it remained within acceptable limits. On the other hand, the density was decreased considerably reaching a value of 1850 Kg/m³ for mixture with (20%, 10%, 10%) (PKA), (CPK) and (PKS) replacement respectively and with compressive strength around 45 MPa at 28 days of age.

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