

Bond Strength of PCC Pavement Repairs Using Metakaolin-Based Geopolymer Concrete

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Abstract

In order to use geopolymer concrete as a pavement repair material due to its better durability, a splitting test is performed to characterize the bond strength of the geopolymer and Convention concrete interfaces. Effect of curing time, degradation of the pavement concrete under different acid conditions on the bond strength of Geopolymer with conventional concrete, and comparison of the Metakaolin Geopolymer with other pavement repair materials are analyzed. It was found that curing time affects the interface bond strength greatly. Metakaolin Geopolymer reaches 80% of its final strength in 3 days curing, but shows low strength in 24 hours curing. Curing temperature affects the strength of Metakaolin Geopolymer, however Metakaolin Geopolymer cured in ambient temperature and the bond strength reaches 3.63 MPa in 3 days. Degradation of concrete negatively affects the bond strength of Geopolymer and conventional concrete. From the research results, it is feasible to adopt Metakaolin Geopolymer in accelerated pavement repairs.