

عنوان مقاله:

Bond-Slippage Characteristics between Carbon Fiber Reinforced Polymer Sheet and Heat-Damaged Geopolymer Concrete

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خلاصه مقاله:

The present study investigates the behavior of bond slip between carbon fiber reinforced polymer (CFRP) sheets and heat-damaged geopolymer concrete specimens that have been exposed to various elevated temperatures (20°C , 200°C , 400°C , and 600°C). The research aims to address the challenges posed by elevated temperatures on the bond strength and to highlight our original achievements in understanding and mitigating these effects. To assess the effect of different CFRP bonding widths and lengths, geopolymer concrete specimens were cast and bonded to sheets of CFRP. A total of 32 samples were tested under double-shear tension, examining the mechanical properties of geopolymer concrete, failure modes, bond force-slip curves, ultimate bond force and slip, stiffness, energy absorption, and scanning electron microscopy (SEM) analysis. The study found that temperatures up to 200°C caused a slight decline in mechanical properties and bond-slip behavior, with a 5% decrease in bond force and slippage. At 400°C , bond force and slippage reduced by 16%. Exposure to 600°C led to a significant 42% reduction in bond-slip behavior. The developed bond slippage model showed good agreement with experimental results, providing a valuable tool for predicting bond behavior under high-temperature conditions. Doi: 10.28991/CEJ-2024-010-07-03 Full Text: PDF

کلمات کلیدی:

Bond-Slip Behavior; Heat-Damaged Geopolymer Concrete; Carbon Fiber Reinforced Polymer (CFRP) Sheet; Elevated Temperatures

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