

Bond-Slip Response of Reinforcing Bars Embedded in High Performance Fiber Reinforced Cement Composites

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Abstract : This paper presents the results of an experimental study undertaken to evaluate the local bond stress-slip response of short embedment of reinforcing bars in normal concrete (NC) and high performance fiber reinforced cement composites (HPFRCC) blocks. Long embedment was investigated as well to gain insights on the distribution of strain, slip, bar stress and bond stress along the bar especially in post-yield range. A total of 12 specimens were tested, by means of pull-out of the reinforcing bars from concrete blocks. It was found that the enhancement of local bond strength can be reached up to 50% and ductility of the bond behavior was improved significantly if HPFRCC is used. Also, under a constant strain at loaded end, HPFRCC has delayed yielding of bars at other location from the loaded end. Hence, the reduction of bond stress was slower for HPFRCC in comparison with NC. Due to the same reason, the total slips at loaded end for HPFRCC was smaller than NC as expected. Test results indicated that HPFRCC has better bond slip behavior which makes it a suitable material to be employed in anchorage zone such as beam-column joints.

Keywords : bond stress, high performance fiber reinforced cement composites, slip, strain

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