BOND STRENGTH OF POST- INSTALLED REBAR IN HIGH STRENGTH CONCRETE WITH DIFFERENT TYPES OF RECYCLED AGGREGATE

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1. Introduction

Post installed rebar working was a complex task. The reinforced concrete structures to become weak with the flow of time mainly according to the deterioration of their strength and serviceability so that to increase the strength, stiffness, adaptability, retrofitting of the existing structure for post installed rebar work is one of the alternative solutions without demolishing and the whole structure. And one of the best solutions to meet fastening forces between concrete and steel was chemical adhesive [1]. Due to the developing of the technology, in adhesives such as high-strength polyester, vinylester, ultra-high performance self-compacting concrete and epoxy coating, chemical anchors had been used widely after 1990s [2]. Moreover, how much load can be applied on the rebar are the essential role of the pull out test. Due to the increasing diversity of materials and the improved awareness of waste products, it had become to produce different types of concrete with various characteristics. Recycled concrete aggregate (RCA) and recycled brick aggregate (RBA) are more sustainable, eco-friendly, and cost-effective as compared to natural aggregate (NA) [3,4].

2. Methodology

This research presented the 10 mm diameter deformed adhesive bar was tested at 130, 160, 190 mm embedded [5] to 40 MPa with three different types of concrete made of RCA, RBA and NA respectively as shown in fig.1. A total of 9 specimens with different types of aggregate were tested under monotonic tension test.

3. Conclusion

In this study, the bonding performance of post-installed deformed rebar embedded in concrete is investigated through pull-out tests. The key parameters used in the pull-out tests with replacement of recycled aggregate, embedment length of rebar. The key findings from the study are briefly presented as follows: Most of the specimens showed concrete rapture, splitting, or rebar rapture failure and none of them showed pull-out failure. Based on experimental observation, it can be concluded that epoxy resins are very much effective as bonding chemicals at the rebar-concrete interface. Bond strength of steel-adhesive-concrete was observed to decrease with the increase of embedded length to rebar diameter ratio as well as with the different aggregate replacement.

RCA RBA NA

Figure 1. Type of aggregates.

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