



A comparison between the bond strength of ribbed steel bars and GFRP bars in the application of new materials in the construction of coastal structures

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Abstract

The aim of this research is the comparison of bond resistance of steel round bar and GFRP. since that most of structures expose danger environment such as marine structures which are exposed to steel round bar erosion and with regarding this reason that the erosion finally leads to destruct concrete and also FRP round bars have non magnetic property without erosion so most researchers want to use steel round bar instead of FRP round bar as concrete reinforce material. But due to bond properties of FRP round bars rather than different round bars in this research the effect of round bars properties and the bond behavior of steel and GFRP round bars are studied perfectly . In this research a cubic sample with steel and GFRP grooved round bars has been used perfectly. The results show that: bond resistance average of steel grooved round bars is 4 times of GFRP round bars.

Introduction

since that the bond between concrete and round bar is considered as the most important mechanism for resistance of reinforced structure against loads generally the effective parameters on this variables are emphasized . After conducting related tests we find that generally bond behavior between concrete and steel is function of concrete aspect of aggregate stone rate in the concrete , round bar geometry, loading conditions respected to making details .But so far any bond theoretic model which includes the effect of different factors with regarding to geometric properties groove round bars has been presented yet. On the other hand the bond properties for each material as concrete reinforce factor are considered important. About FRP composite bars , also in primary studies, weak bond resistance had been reported for composite made of GFRP fiber glass but recent researches report proper bond resistance for GFRP composite bars. Since that the mechanical behavior of GFRP round bars differs with steel round bar behavior so in this research the effect of properties of grooved round bars with bond behavior of steel and GFRP round bars are emphasized perfectly .

methodology

providing test samples

In this test some 15×15×15 cm cubic samples have been used .All samples were provided in unique conditions and 28 days was considered.due to existing high standard violation so 3 sample were made and tested. in each sample the length of round bar was considered 16cm and length of insertion in concrete as 15cm . In making sample we tried to put the round bars inside