***Analysis of the influence of corroded reinforcing steel bars in the bond behavior of recycled aggregate concrete (HR)***

Concrete manufacturing has a great impact on the environment, as for its production is required a wide range of natural resources. For this reason the recycling of waste concrete from construction is considered as a measure to reduce the environmental impact related to concrete manufacture. Concrete waste recycling allows a more sustainable construction development, environment preservation and green products generation.

Recycled aggregates for concrete manufacture have been used in concrete with little structural responsibility, mass concretes and coatings. However, this analysis aims to determine the validity of these recycled aggregates so it can be used as structural concrete.

To enhance the use of recycled aggregate concrete for structural concrete this work focuses on the bond capacity between the concrete and the reinforcing steel bars depending on the amount of recycled aggregate used for concrete manufacture. Additionally it was believed interesting to analyze the influence of corroded reinforcing steel bars in the bond behavior of recycled aggregate concrete, since corrosion is one of the most important pathologies suffered by reinforced concrete.

To perform the analysis of the influence of recycled aggregates in the bond capacity of reinforced concrete four doses were designed with different percentages of replacement of natural aggregate by recycled coarse aggregate. With these dosages are made pull – out test with uncorroded bars and pull – out test with three different degrees of corrosion in the reinforcing steel bars.

A comparable bond strength ($\tau$) was obtained for all the concretes with none corroded bars, however, HR with 100% of recycled aggregates suffered a higher split. After subjecting the concrete specimens to induced corrosion, it was determined that for low corroded specimens, recycled aggregate concretes achieved a higher bond strength performance than conventional concrete, however, for high corrosion levels all concretes obtained minimal bond strength with a similar value.