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A Project Report on
“BEHAVIOUR OF RECYCLED CONCRETE AGGREGATES USING
GEOPOLYMER”
(SPONSERED BY KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY)

Project Report submitted in partial fulfillment of the requirement for the
Award of the degree of
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Civil Engineering

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ABSTRACT

Nowadays, because of the more exigent legislation regarding the environment and the market demand for environmentally friendly product, manufactures are concerned to develop studies aimed at reducing the environmental impact, through lowering the amount of residues or treating those that are inevitably generated during production processes. High costs associated with raw material extraction, as well as the damage that the extraction causes to the environment, are also important reasons to motivate the use of industrial process residues. Depletion of re-liable trustable raw material reserves and conservation of non-renewable sources also contribute to such reuse of waste materials.

Geo-polymers and Geo-polymerization have been studied for the last two and a half decades. Before 1995, the study of this technique was focused on the production of geo-polymeric products and their industrial application by using either kaolinite or meta-kaolinite as the sole reactants. Since 1995 more and more waste materials have been used in the geo-polymerization process. The practical application of geo-polymer and geo-polymers related products have been greatly diversified through the years, from the initial fire proof thermal insulation panel and coatings to slab, roof tiles fire resistant mineral resins, toxic waste immobilization, and many other construction related products.

In many aspects, the uses of geo-polymer as mineral binders are compatible with those of Portland cement, if not better.

The study is aimed at evaluating the Behaviour of recycled concrete aggregates (RCA) using geo-polymer. An experimental investigation will be carried out on RCA prepared by replacing variable amounts of "virgin" aggregates with recycled concrete aggregates (RCA) deriving from building demolitions. The water cement ratio (W/C) has been kept constant in all specimens. The recycled concrete aggregates specimens are compared to the corresponding ones obtained for a conventional concrete, geo-polymeric concrete with 25,50,100% of natural aggregates with the aim of assessing feasibility and suitability of a recycled concrete aggregates for structural use.