

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELGAUM-590 018**



A project report on

**“EFFECT OF VARIOUS TREATMENT METHODS ON RECYCLED
COARSE AGGREGATES AND ITS ROLE IN RECYCLED
AGGREGATE CONCRETE”**

In partial fulfilment of the requirement for the award of degree of

**MASTER OF TECHNOLOGY
IN
CONSTRUCTION TECHNOLOGY**

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Abstract

The Construction industry is consuming large amount of natural resources. Among them one of the most consumed natural resource are the aggregates. The over usage of natural aggregates for manufacturing of concrete results in depletion of natural resources and environmental damage from quarrying activities. At the same time the construction and demolition waste generated from the industry is simply being sent to valuable landfill space. Management of this waste has become a serious concern over the world. All these factors are attributable to find an alternative to natural aggregates. In that context, Recycled Coarse Aggregates (RCA) obtained from hardened concrete waste reduces the consumption of natural resources and also reduces the usage of landfills. However the usage of RCA is primarily limited to non-structural applications such as sub-base of road pavements, backfilling etc. Its application in regular structural members such as beams, columns and slabs is found very limited. The major hindrance in usage of RCA is the low standard which is because of the old cement mortar adhered to it and the micro cracks developed on its surface during crushing process. This adhered mortar being loose and porous, is responsible for the higher water absorption. This is also responsible for poor fresh and hardened properties of concrete made out of RCA. However researchers have found out two different approaches to improve the quality of RCA, viz. Removal of adhered mortar approach and Surface modification approach.

In the present study an attempt has been made to treat the RCA obtained by crushing the laboratory concrete specimens piled up as waste after testing in the Concrete laboratory, at BMS College of Engineering, Bangalore. Two treatment methods namely the acid soaking method and heating-scrubbing method aim at the removal of the adhered mortar. Treatment methods such as coating with cement slurry, coating with cement slurry and silica fume or alccofines or fly ash, and impregnation of silica fume solution aim at modifying the cement mortar matrix adhering the aggregates. The properties of treated and untreated RCA are determined and compared with Natural Coarse Aggregates (NCA). The fresh and hardened properties of Recycled Aggregate Concrete (RAC) made out of treated and untreated RCA are determined and compared with the concrete made out of NCA. It is found that the properties of RCA have improved with the treatment methods. Among all the methods, heating and scrubbing technique was found the best. The compressive strength of concrete made with treated aggregates by both the approaches exceeded the target strength set for the concrete mix.