

Experimental Investigation of Durability of Recycled Concrete

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Abstract- *With the rapid development of the construction industry which requires an excessive consumption of natural resources and may result in the deterioration of the natural environment, the conflicts between the desire to achieve sustainable development of the construction industry and the shortage of resources will become more and more serious, especially in developing countries like India. At the same time, a large amount of concrete waste is produced from both the construction of new buildings and demolition of old buildings every year. Today, the possibility of recycling construction waste, in particular concrete, has become a major issue around the world. The use of recycled aggregate concrete (RAC) is considered to be an effective measure to develop green ecological concrete and achieve sustainable development in the construction industry. As a result, RAC has attracted increasing interest in both academia and industry. A number of studies have been conducted on RAC especially in relation to understanding the mechanical properties of RAC. The objective of this study was to enhance the understanding of the properties that are associated with concrete and different application areas of RAC.*

Keywords- Compressive Strength, Concrete, Creep, Recycled Aggregate Concrete (RAC), Shrinkage, Tensile Strength

I. INTRODUCTION

Aggregates for the production of new concrete must meet a number of requirements. Firstly, they must be sufficiently strong for the grade of concrete required and possess good dimensional stability. Secondly, the aggregate must not react with cement or reinforcing steel. Finally the aggregate should have a suitable particle shape and grading to produce a mix with acceptable workability. Based on the results of laboratory investigations and field trials, Hansen (1986), it has been found that clean brick and concrete aggregate can produce a concrete with acceptable workability and strength. In a previous study by Mulheron (1986) the physical mechanical properties and durability of dry lean concretes manufactured with recycled aggregates were investigated. The results showed that recycled aggregates were capable of producing lean concretes meeting the compaction and strength requirements of current specifications. In the

experiments reported here, the aim was to extend this initial investigation and compare the performance of conventional mass concrete mixes made from natural and recycled aggregates

II. OBJECTIVES

- To investigate the effect of RCA And OPC Properties on Reinforced Concrete Structure Performance
- To Develop Guideline For Effective Use of RCA for Reinforced concrete Structure
- Increases the durability of Recycled Concrete Aggregate.
- Develop guidelines for the effective use of RCA for reinforced concrete structure

III. METHODOLOGY

At first, in the recycling process it is important to control the quality of the concrete which is going to be recycled. The next step is the crushing, and it is several crushing methods. Most common is the jaw crusher.

But there are also cone crushers and large impact crushers. Sometimes the concrete needs to be crushed more than ones, to get a satisfying consistence. After crushing, the concrete is screened. A scalp screen removes dirt and foreign elements. When the wet redundant concrete is mixed with Re-Con Zero new aggregates can be made. According to Mapei this aggregates has the same properties as natural aggregates. Using Indian standard recommended guidelines, design a concrete mix for a structure to be subjected to the model exposure conditions for the following requirement.

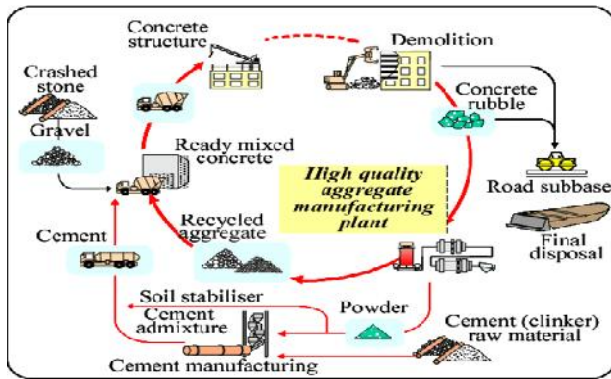


Fig. 1 Schematic flow of concrete recycling system.

IV. LITERATURE REVIEW

The recycling of Construction and Demolition Wastes has long been accepted to have the possible to conserve natural resources and to decrease energy used in production. In some nations it is a standard substitute for both construction and maintenance, particularly where there is a scarcity of construction aggregate. The use of recycled aggregate weakens the quality of recycled aggregate concrete which limits its application. For improving the quality of recycled coarse aggregate, various surface treatment methods such as washing the recycled aggregates with water and diluted acid were investigated. Strength properties of the treated and untreated coarse aggregate were compared. The results indicated that the compressive, flexure and split tensile strength of recycle aggregate is found to be less than the natural aggregate.

The test results showed that the flexural, compressive and split tensile strength of the recycled aggregate concrete is found to be lower than the natural aggregate. However the strength of recycled aggregate concrete can be improved by the water and acid treatments. Furthermore Recycled aggregate treated with nitric acid displayed the decent result compared to the hydrochloric and sulphuric acid and from economical point of view; water and acid treated recycled aggregates can be used in place of natural aggregates for temporary structures

V. CONCLUSION

From this project we conclude that the because of making six lane road for wagholi to shikrapur traffic of pune-ahmednagar road is reduce and accidents are also control. Also the economic The concrete made of concrete rubble and sanitary ceramics was characterized by high and similar strength parameters (the CR compressive strength is equal to 62.2 MPa and SC to 62.7 MPa, the tensile strength under bending for CR was 1.8 MPa and for SC 2.7 MPa). All tested

concretes fit into water absorption class W12 and frost resistance class F25. The features of concrete composed on the basis of aggregates from building ceramics proved to be relatively weak (compressive strength 30.5 MPa and tensile strength under bending 0.6 MPa). ally increment in transportation is achieved.

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