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# A REVIEW PAPER ON EXPERIMENTAL STUDY FOR RECYCLE CONCRETE

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**Abstract –***The recycling of concrete aggregate has been accepted to preserve natural aggregate for other important use. RCA (Recycle concrete aggregate) follow 3R i.e. Reduce, Reuse, Recycle. In many developed country it is used as a substitute of natural aggregate. Also many practical experiments tell that natural aggregate can be replaced by recycle aggregate and can be used for construction purposes. This paper deals with the review of existing literature work for understanding thoroughly about RCA.*

***Key Words***: Recycle Aggregate, Natural Aggregate, Cement, Replacement, Compressive Strength.

## 1. INTRODUCTION

Construction and demolitions are the procedures that work simultaneously. The demolished building rubble in India generally goes to waste in landfills. After few years building and demolition waste will be more than half of the National total waste in most nations of the world so recycling of these concrete waste materials from building demolition can provide a solution to this problem.

In construction field concrete is main construction material across the world and is mostly used in all types of civil engineering works. An aggregate represents about 70-80% of concrete components so it will be beneficial to recycle the aggregate for construction works and also to solve the environmental problems. To minimise the problem of excess of waste material it is a good step to utilize the recycled aggregates provide that the desired final product will meet the standards. The Cost of Recycled Concrete Aggregate may be less than 20 to 30 % less than natural aggregate in some Regions.

Protection of environment is a basic factor which is directly connected with the survival of the human race. Parameters like environmental consciousness, protection of natural resources, sustainable development, play an important role in modern requirements of construction works. Due to modernization, demolished materials are dumped on land & not used for any purpose. Such situations affect the fertility of land.

### 1.2. NECESSITY FOR THE RE-USE OF RCA

Due to issue relating to sustainability and limited natural resources, it is clear that the use of recycled and secondary aggregates (RSA), for example crushed concrete and asphalt and industrial by products such as fly ash and blast furnace slag, will grow. Due to need of sustainable development and limited natural resource we need to put 3R concept into use. We have to follow the concept behind it that is Reduce, Reuse and Recycle. This will promote sustainable development.

Sustainability is generally recognized as a foundation for resource and energy – saving technology developments in many fields including that of construction. The term sustainable construction materials has increasingly been adopted throughout the concrete industry; but usually incorrectly as a synonym for recycled materials.

## 2. Review of Literature

**Akansha Tiwari** studied about water absorption of RCA and founded that water absorption is higher than the natural aggregate also the compressive strength of concrete containing 50% of RCA has strength approximately to that of normal concrete.

Also her study tells that Concrete has good tensile strength when replaced up to 25-30%.

**Vinod Sunhere and Rajesh Joshi** studied and their test results suggest that as the percentage of Natural Aggregate decreases by replacing the Recycled Concrete Aggregate, the corresponding strength goes on decreasing, yet up to 60% replacement it achieves target mean strength.

**N.Sivakumar** et al studied the percentage of RCA replacement and founded that when RCA replacement increases, its compressive strength gets reduced. However when water/cement ratio of mix was decreased, the compressive strength increases.

In their study results show that compressive strength (40MPa) can be achieved for 30 to 40 % of RCA replacement by decreasing the water cement ratio and adjusting the admixture content of mix.

**Prof. Dharmesh K. Bhagat** et al from their study it can be concluded that, RCA exhibits comparatively less specific gravity than NA. As the water absorption of RCA was found greater then NA, because of adhering mortar and cement paste. Also their result for compressive strength tells that, the use of RCA up to 40% affect the functional requirements of concrete structure.

**Vaishali.G.Ghorpade** found that considerations of both shear strength and workability, it is recommended to limit the replacement of natural coarse aggregate with recycled coarse aggregate up to 20% limit.

**Prof. Chetna M Vyas and Prof.(Dr.) Darshana R Bhatt** in their studies the experimental results show that 0% to 40% replacement of Recycled Coarse Aggregate with the Natural Coarse Aggregate give enough compressive strength as per required and also full fills the requirement.
In their studies 0% to 40% replacement can take place with recycle aggregate.

## 3. CONCLUSIONS

Following conclusions can be drawn:

1. From various study it is clear that recycled aggregate can be used with natural aggregates.

2. Natural aggregate can be used with Recycle aggregate with a ratio of 80:20 and 70:30.

3. Higher ratio of Recycle aggregate can worsen the properties and strength of mix.

4. Due to use of recycled aggregate in construction industry it can slow the impact of waste on environment.

5. It will promote sustainable growth.

6. It will reduce burden on natural aggregate i.e. natural aggregate can be used for other important purpose.

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## BIOGRAPHIES


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