



# **iJRASET**

International Journal For Research in  
Applied Science and Engineering Technology



---

# **INTERNATIONAL JOURNAL FOR RESEARCH**

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

---

**Volume: 7      Issue: V      Month of publication: May 2019**

**DOI: <https://doi.org/10.22214/ijraset.2019.5631>**

**[www.ijraset.com](http://www.ijraset.com)**

**Call: ☎ 08813907089**

**E-mail ID: [ijraset@gmail.com](mailto:ijraset@gmail.com)**

# Effect of Recycled Aggregate on Concrete

Vikas Kumar<sup>1</sup>, Surender Bishnoi<sup>2</sup>, Shashank Gupta<sup>3</sup>

<sup>1</sup>Postgraduate student, Structural Engineering, Department of Civil Engineering, Dr K N Modi University Newai, Rajasthan.

<sup>2,3</sup>Assistant Professor, Department of Civil Engineering, Dr K N Modi University Newai, Rajasthan.

**Abstract:** *The utilization of reused solid total (RCA) in concrete as fractional substitutions of regular coarse total is developing enthusiasm for the advanced development industry.*

*As it lessens the interest of for virgin aggregate.*

*In expansion, the utilization of RCA prompts conceivable answer for the earth issue brought about by solid waste and diminishes the negative ecological effect of the total extraction from the regular resources. This trial concentrates introduces a complete survey on the utilization of reused coarse totals (RCA) are talked about in this report. Be that as it may, more accentuation has been given to talk about the impact of RCA on new concrete and solidified solid properties and toughness of cement.*

**Keyword:** *Fractional, Ecological, Utilization, Toughness, Prompts.*

## I. INTRODUCTION

Development totals make up more than 80 % of the all out total market, and are utilized basically for structure developments and asphalts.

By the development exercises expanding massively, and we missing the mark concerning development totals it has turned out to be important to locate a substitute hotspot for the material. Projections for structure material need for the lodging area show an insufficiency of totals to the degree of around 55,000 million m<sup>3</sup>. Around 750 million m<sup>3</sup> extra totals would be required for accomplishing the objectives of the street area. At this stage the idea of usage reused total has demonstrated to be a decent fundamentally unrelated.

## II. OBJECTIVE OF THIS STUDY

The study taken up for this dissertation has been covered

- A. Road construction;
- B. Laying of flooring and approach lanes;
- C. In sewerage structures and sub-base course of pavement;
- D. Besides drainage layer in highways and retaining walls

## III. LITERATURE REVIEW

Ahmed et al. in 2013 conclude that there was a decrease in tensile strength of 10.66%, 18.18%, 24.76% and 34.79% for the concrete specimens with 20%, 40%, 60% and 80% recycled coarse aggregate respectively

N.Sivakumar et al. (2014) [23] conclude that when the percentage of RAC replacement was increased, compressive strength gets decreases. Still when water/cement ratio of mix was decreased, the compressive strength increases.

Pinal C. Khergamwala et al. (2013) conclude that RAC up to 50% is satisfactory for structural use and can be used effectively as a full value component for new concrete.

R. Kamala et al. (2012) studied the behavior of compressive strength and split tensile strength of concrete cubes and cylinders at the end of 7, 28, and 56 days that The compressive strength of the ceramic concrete has been varied from 32.88-46.88MPa and the split tensile strength is varied from 2.47-3

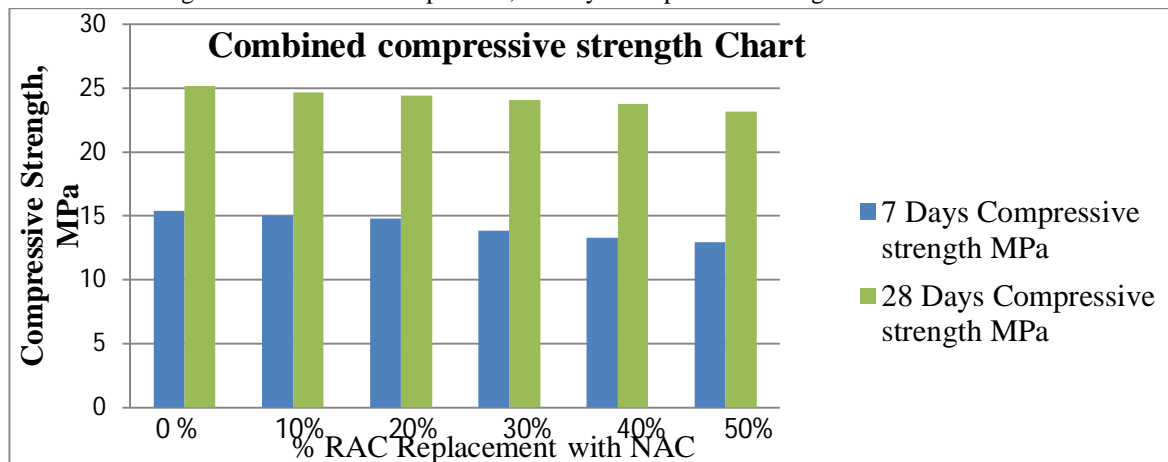
Yang et al. (2008) observed that the normalized splitting tensile strength of recycled aggregate concrete decreased with the increase of relative water absorption and it was less than 0.53 for most specimens having relative water absorption larger than approximately 2.25%.

## IV. RESULTS

### A. Compressive Strength

Three cubes of 150mm x 150 mm x 150mm size from each batch of concrete mix were casted and cured for 7 and 28 days in order to determine compressive strength of recycled coarse aggregate concrete in compression testing machine.

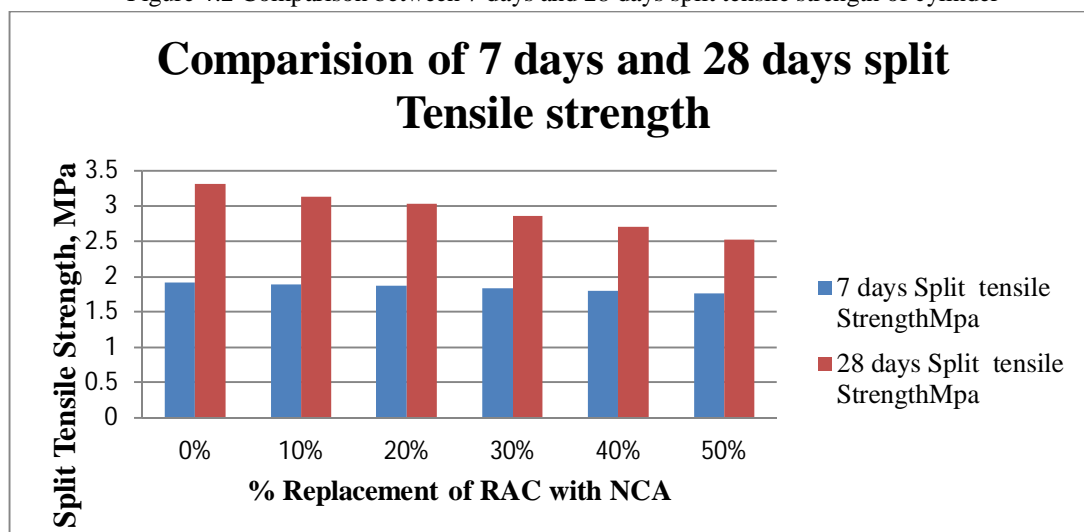
Figure 4.1 Combined Graph for 7, 28 Days Compressive Strength of Concrete Cube



#### B. Split Tensile Strength

Two cylinders of 150mm diameter and 300 mm in length from each batch of concrete mix were casted and cured for 7 days and 28 days in order to determine compressive strength of recycled coarse aggregate concrete in compression testing machine. The w/c ratio was taken as 0.50. Average compressive strength of two cylinders was taken in account for accuracy purpose.

Figure 4.2 Comparison between 7 days and 28 days split tensile strength of cylinder



### V. CONCLUSION

#### A. Main conclusion of the Experiment

- 1) The compressive strength of concrete cube decreases as the proportion of recycled aggregate increases.
- 2) It was seen that at 7 days compressive strength of concrete specimen were 15.41, 15.02, 14.78, 13.86, 13.31, and 12.92 MPa, at replacement of 0%, 10%, 20%, 30%, 40%, and 50% recycled aggregate the compressive strength decreases 2.53%, 4.09%, 10.06%, 13.62%, and 16.16% relative to conventional concrete cube.
- 3) And for 28 day these were found as 25.15, 24.66, 24.44, 24.11, 23.75, and 23.18 MPa. These strength were decrease by 1.94%, 2.83%, 4.13%, 5.57% and 7.83% relative to conventional concrete cube.
- 4) in case of split tensile strength of concrete cylinder the test was conducted for 7 days and 28 days. Here we find at the replacement of 0%, 10%, 20%, 30%, 40%, and 50% recycled aggregate the split tensile strength were calculated as 1.95, 1.89, 1.87, 1.84, 1.80, and 1.77 MPa decreases by for 7 days as 3.08%, 4.10%, 5.64%, 7.70%, and 9.23% relative to conventional concrete cylinder.



## REFERENCES

- [1] K C Panda et al. (2013) Properties of self-compacting concrete using recycled coarse aggregate, Procedia Engineering Vol.no.No.5 , pp.159-164
- [2] Katrina McNeil et al. (2013) Recycled Concrete Aggregates: A Review, International Journal of Concrete Structures and Materials .Vol.no.7, Issue no.1, pp.61-69
- [3] Ms. Manjushree G. Shinde et al.(2013), - Effect Of Physical Properties Of Recycled Aggregate On The Strength Of Concrete, (IJERT) ISSN: 2278-0181, Vol.no. 2 Issue no. 4, pp.1655-1659
- [4] Hiren A. Rathod et al.(2013), - A Study on Recycled Aggregate as a Substitute to natural aggregate for Sustainable development in india vol.no.2 Issue no. 2 issn no 2277 – 8160
- [5] Manish Kumar Singh et al. (2014) Utilization of Demolished Concrete and Construction Waste as Coarse Aggregate in Concrete (IJESRT), Vol.no.3, Issue No.11, pp.85-87
- [6] Jitender Sharma et al. (2014) Study of Recycled Concrete Aggregates, International Journal of Engineering Trends & Technology (IJETT) Vol.no.13 Issue no..3, pp.226-227
- [7] D.V. Prasada Rao et al. (2014)- Experimental investigations of coarse aggregate recycled concrete, International Journal of advances in Engineering & Technology.(IJAET) Vol.no. 7, Issue no. 5, pp. 1522-1530
- [8] Kanawade Bhimaji Dashrath et al.(2014)- Effect of Aggregate Types on Flexural Strength of Concrete, (IJSET),ISSN : 2277-1581, Vol-3 Issue no.7, pp : 906-909
- [9] Parthasai Reddy (2014) - Determination of mechanical properties of recycled aggregate Concrete with fly ash. International Journal of Advancements in Research & Technology, Vol.no. 3, Issue no. 2, pp.37-39
- [10] Mahendra Ramchuriter et al. (2014) -Use of Recycled Concrete Aggregates in Structural Concrete in Mauritius, Research Institute Journals, Vol.no. 6 Issue no.1, pp. 71- 81
- [11] Miss. Divya Sasi et al.(2014)-Strength Properties of Concrete with Partial Replacement of Cement by Granite Quarry Dust (IJERT) ISSN: 2278-0181 Vol.no. 3, Issue 9, pp.344-348





10.22214/IJRASET



45.98



IMPACT FACTOR:  
7.129



IMPACT FACTOR:  
7.429



# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24\*7 Support on Whatsapp)