

## The Replacement of Recycle Concrete

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### ABSTRACT

The concrete is the construction material which is most widely used civil engineering and is prime constituent in most infrastructure. In the probable future, there seems to be no alternative to concrete as a construction material. Although strength of concrete is most important, It is also necessary that the concrete is durable, workable and provide a good service life. On technical frontage, in this thesis work the natural fine aggregate are reinstated by recycled fine aggregate in numeral proportions.

**Keywords:** Ordinary Portland cement, coarse, fine aggregate, Different Curing Condition.

### INTRODUCTION

With increase in number of structure coming up and demolishing of older structure, it has become the need of hour to recycle concrete. Also due to increase in demand and decrease in supply of aggregate for the production of concrete it is necessary to identify new sources of aggregate. Fine aggregate used in the concrete is collected from rivers as the properties of fine aggregate are very suitable for the concrete. The properties of fine aggregate are matched according to the requirement of the concrete. The shape of particles of fine aggregate is good with which the strength of the concrete is fit for the new structure and the gradation of the river fine aggregate is superior to all other fine aggregate if compared it while adding into the new concrete. The fineness modulus is as per the requirement of concrete, so there will be no requirement of modulation in fine aggregate to make a new concrete. This fine aggregate is available in huge amount and there will be no cost for its processing. But the river fine aggregate deposition is a natural process and it takes millions of year. Due to above mentioned reasons river fine aggregate is widely used in production of concrete and day by day deposits of fine aggregate is more utilized. This exploitation results in scarcity of fine aggregate. More over some state government banned on sand mining as this cause some serious environment issues listed below.

1. By the sand mining the ground water is affected and level of the ground water also goes down.
2. Erosion of the near by areas due to the excess use of the deposits of fine aggregate.
3. Sub structure of the bridge is unwrap to environment by way of wearing away the covered fine aggregate paper along the river through which the fractures are development at that point or the structure is get worsted. So due to all above condition we have to try recycle the construction waste as maximum as possible like coarse aggregate and fine aggregate. As we know concrete is at number second material which is used on the earth after waster. So with increase in demand the natural resources are going to be decreased day to day. Concrete is the mixture of cement, coarse aggregate and fine aggregate. By crushing the disposal concrete we can recycle the coarse and fine aggregate and in my thesis I am going to recycle the fine aggregate and replaced it with fresh fine aggregate and study the different properties of that concrete.

**Material** These is lots of con fusion to find out the difference between the natural and recycle aggregate,

**Cement** The ordinary Portland cement was used in this work 43grade.

**2.1 Fine aggregate** The portion from 4. 75mm to 150 microns are named as fine aggregate the water ways and is utilized in blend as fine aggregate adjusting to the prerequisites. The stream sand is washed to kill malicious materials and particle

**2.2 Course Aggregate** The aggregate is obtained because of regular assignment of and rock and manually smashing of the stone. Size basically 10mm to 1.18mm

## LITERATURE REVIEW

G.muail et.al.(2012)The proposed the outcome of an experiment study on recycled aggregate concrete. This research aims to recycle of construction and demolition wastes which has been used in production to decrease the use of natural recourses and to increase the consumption of waste material. This study reveals that the compressive strength was found 27.45N/mm<sup>2</sup> of natural aggregate and 22.3N/mm<sup>2</sup> recycled aggregate which clearly shows that strength was decreased. Flexural strength was also decreased by 0.60N/mm<sup>2</sup>.the compressive strength , flexural ,split tensile strength of recycled aggregate was found to be less than the natural aggregate.

R.J. Collins et.al (1996) Increasing the use of recycled aggregate in construction reveals some aspects of a fill scale demonstration project on the use of recycled materials in construction work at building research establishment, uk, it was concluded that in case of recycled aggregate trail mixes may required some quality control and for higher strength mixes higher cement content needed than that of natural aggregate.

Tawakoni M.et.al.(1995) Suggested the strength of recycled aggregate concrete were less than the original concrete after the change of coarse aggregate and fine aggregate into the fresh concrete. This study shows that the water absorption of recycled aggregate was more than the natural aggregate and los angles abrasion test also shows that the recycled aggregate have more abrasion than the natural aggregate and due to this less control on water cement ratio.

## RESULTS AND DISSCUSSION

### A. coarse aggregate

- 1 .Fineness modulus =6.88
2. Specific gravity =2. 8
- 3 .Water absorption =0.52
4. Nominal maximum aggregate size =20mm

### B. Fine aggregate

1. Fine modulus = 1.42
2. Specific gravity =2.56
3. Water absorption =2.10%
4. Free surface moisture =2%

### C. Cement 1. Initial setting time =70 min

2. Final setting time =220,,,
3. Soundness = 7. 62 mm
4. Fineness = 2. 8m squire/ kg

Table 1. Compressive strength test result 7&28 days in M30

S. NO	M30 (COMPRESSIVE STRENGTH) 7 & 28 days				
		7 days	% decrease NAC	28day	%decrease NAC
0	--				
1	0%	36.24	-----	39.57	-----
2	25%	32.46	10.43	37.24	5.88
3	50%	30.38	16.16	35.44	10.43
4	75%	25.84	28.69	33.49	15.36
5	100%	22.64	37.52	30.10	23.93
6	00	00	00	000	000

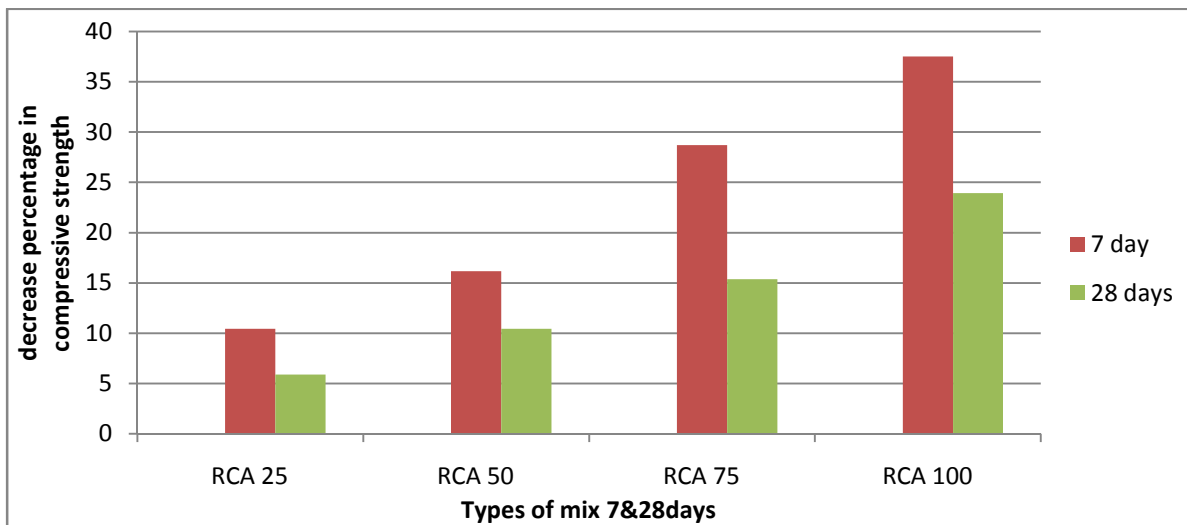
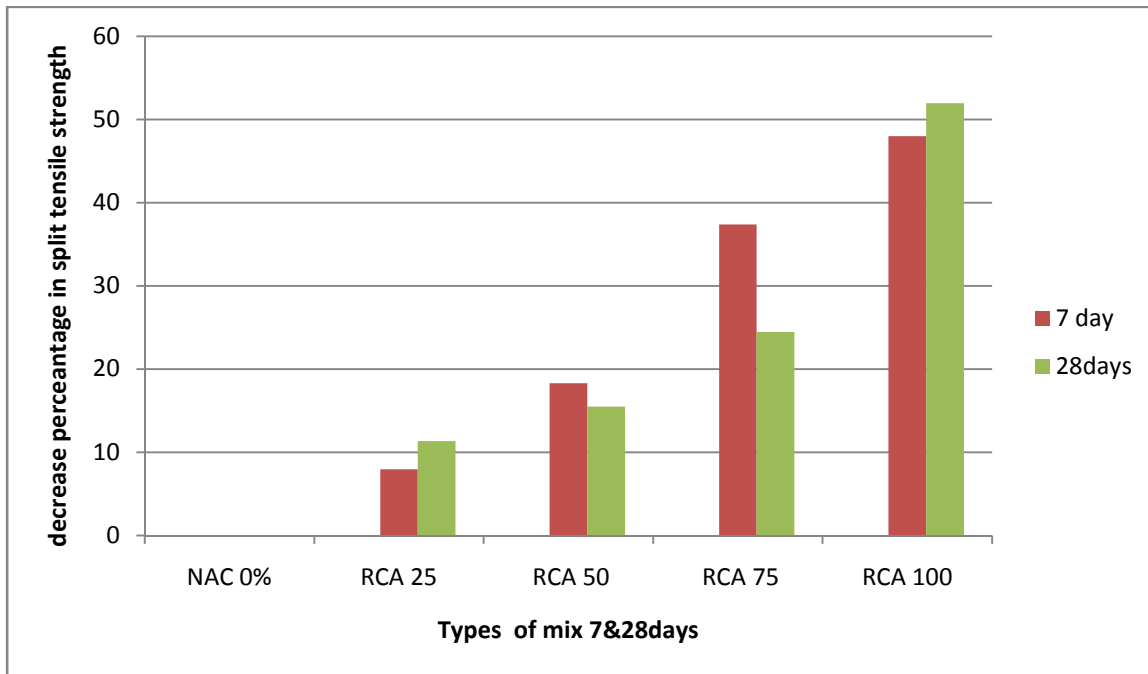


Figure 1. Compressive Strength Graph Variation in m30 after 7&28 days

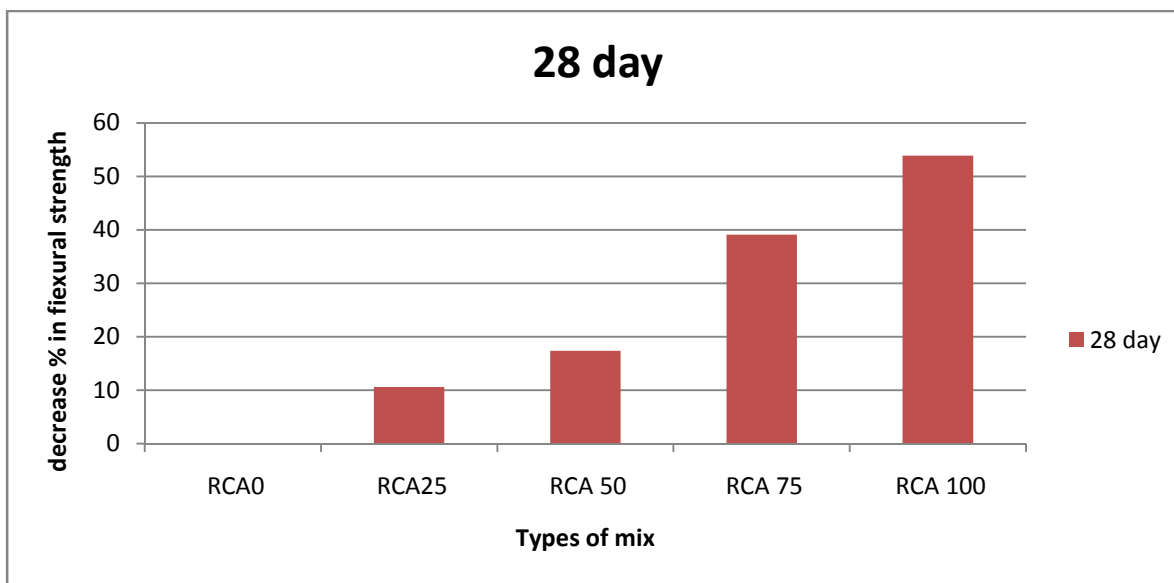
**Split tensile strength in NAC for M30**

Types of mix NAC	Split tensile strength 7day	Split tensile strength 28 days	% decrease strength NAC	
0%	3.77	4.58	----	-----
25%	3.47	4.06	7.95	11.35
50%	3.08	3.87	18.30	15.50
75%	2.36	2.75	37.40	24.45
100%	1.96	2.20	48.01	51.96



**Flexural tensile strength 28days**

Types of mix in M30	Flexural strength	%decrease in strength NAC
NAC0%	11.5	----
RCA25	10.5	10.58
RCA50	9.5	17.39
RCA75	7.0	39.13
RCA100	5.3	53.91



## **CONCLUSIONS**

Recycled fine aggregate is considered to be a worthy substitute for natural f/a. This chapter shows the various test conducted on recycled fine and natural f/a. In addition to that , investigation have been evolved by mixing the different proportion of aggregate into the concrete. The following salient point are remarks in respect to the comparative analysis of natural f/a and recycled f/a.

### **Test on recycled f/a**

Various test are performance on recycle f/a compared with the natural f/a is 1.42%, The result of both are nearly equal to each other. The water absorption of recycled f/a is 7.65% and natural f/a is 2.10% which is show that the water absorption is more for recycled f/a. the specific gravity of recycled f/a is 2.13% natural f/a is 2.56%

### **Compressive strength**

In this research work compressive strength is decrease with the increase of recycled f/ a in the place of natural f/a in a concrete. After the 7day of cube casting for M30 mix, decrease percentage in compressive strength for the 25% recycled f/a replaced in the place of natural f/a is 10.43%,25% recycled f/a for 50% replaced in decrease by 16.16% for 75% replace in strength decrease by 28.69%. 100% replaced the strength is decrease by 37.52% after 28days of cube casting for m30 mix decrease percentage in compressive strength for 25%replaced in the natural strength f/a is 5.88% for the 50% replaced the strength is decrease by 10.43 for the 75% replace strength is decrease by 15.36% and the 100% replaces the strength decrease by 23.93%

### **Split tensile strength**

Is decrease with the increase of recycle f/a in the place of natural f/a in a concrete. After 28% days cylinder casting for M30mix decrease percentage in split tensile strength for 25% recycle f/a replaced in the of natural f/a is 11.35% for the 50% replaced the strength is decrease by 15.50% for 75% replaced the strength is decrease by 24.45% and the100% replace the strength is decrease by 51.96%, split tensile strength of recycled f/a concrete up to 25% replaced is close to the split tensile strength of the natural f/a concrete.

### **Flexural strength**

In this research work, flexural strength is reduced with the increase of recycled c/a in the place on natural c/a in a concrete. After 28 day of beam casting for m30 mix decrease percentage in flexural strength for 25% recycled f/a replaced in the place of natural f/a is 10.58% for 50% is replaced 17.39% for 75% replaced the strength decrease by 39.13% for 100% replaced the strength is decrease by 53.91%, The flexural strength of recycled f/a concrete up to 25% replaced is near to strength of natural f/a concrete, but after25% replaced the flexural strength reduces considerably.

## **FUTURE SCOPE**

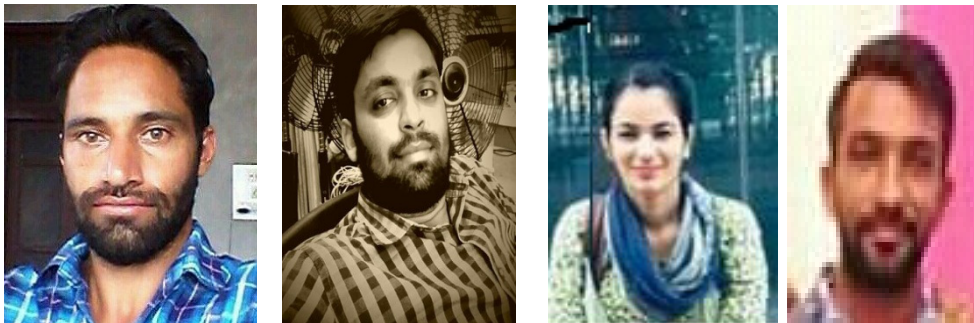
This study contributes in the area of recycled f/a and describes the efficiency of recycle f/a than the natural f/a .No one discover the future. The future is not a discovery neither it is density. The future is a decision based on the continuous efforts starting from the past, motivated by the present which certainly lead success .

- In this research work are termed as a future scope of this work which can be out line as- mix design has been made by use M30 in this work. In further research work the value may be extended to other mix design.
- In the present work the effect of 25%,50%,75% 100% recycle f/a were investigated. In further research work is suggested to take the different proportions

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