

A Laboratory Investigation of Recycle Aggregate Concrete in Concrete

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Abstract— This has the potential to significantly reduce the need for mining new aggregates and also at the same time reduce disposing costs. To make this technology feasible, a significant amount of experimental works have been carried out worldwide. The use of recycled materials derived from construction is growing everywhere the world. The use of ordinary aggregate use in concrete compressive strength will get 29.47 N/mm². The use of waste aggregate use in concrete compressive strength will get 24.48 N/mm².

Keywords: Recycle Concrete, Aggregate, Recycling

I. INTRODUCTION

The buildings which are over their serviceability state are demolished for safety reasons. The waste generated from demolition was earlier used for landfills of ditches and trenches. Many large project sites have heaps and piles of construction and demolition waste lying around on roads and highways causing inconvenience and accidents to traffic movement. It is estimated that in India construction industry generates nearly 10-12 million ton of waste annually (Thomas and Wilson 2013). Future predictions for use of aggregates in building and road construction indicate of shortage of 55,000 million cum and 750 million cum. Recycling of aggregates from construction and demolition waste may be helpful to bridge some of the gap. While wood, plastic, glass and glass is individually recycled.

A. Recycled Aggregate Concrete (RAC):

Recycled concrete aggregate is a broad term used to denote both fine and coarse aggregate reused in various engineering applications. The properties of those recycled aggregates vary on several factors such as characteristic strength of recent concrete, the dimensions of gravel used, the % of sand and gravel fraction in the concrete mix, amount of lime in the sand fraction of the old mix, etc. They can be substituted with varying percentages of replacement for fine and coarse aggregates in new mixes. The use of recycled concrete mixture started early in west but remains not quite common in India. The potential of using recycled concrete aggregate as the simplest way to mitigate environmental pollution is tremendous.

II. COMPARISON PROPERTIES OF RECYCLE AGGREGATE

S.N.	EXPERIMENT	RECYCLE AGGRIGATE	FRESH AGGRIGATE
1	Impact Test	13.25%	31.82%
2	Crushing Test	15.46%	28.69%
3	Sieve Test	2.18%	2.69%
4	Abrasion Test	16.27%	24.46%
5	Specific Gravity Test Specific Value	1.96	2.64
6	Water Absorption	2.45%	1.62%

III. CONCRETE MIX DESIGN WITH ORDINARY AGGREGATE AND WASTE AGGREGATE M-20

S. No.	% of Recycle Aggregate	Compressive Strength (N/mm ²)	
		7 days	28 days
1	0	13.93	26.07
2	20	13.19	24.44
3	40	12.3	22.96
4	60	11.56	20.89
5	80	10.96	19.56
6	100	10.22	18.96

IV. CONCLUSION

Construction industry will contribute towards its commitment to protection of atmosphere by encouraging use of recycled concrete stones and bricks. The use of recycled materials derived from construction is growing everywhere the globe. The most objective of the study is to analyze the impact of using recycled aggregates in replace of natural aggregate on strength and bond strength of concrete. The observations from this study area unit as below. Which may be due to the strength drop with the recycled be able to be attributed to the remained mortar on the surface of the recycled aggregate, cracks in the aggregates itself.

- Use of aggregate in concrete mix design with recycle aggregate get sufficient strength prove as compare to ordinary aggregate at 60% replacement of recycle aggregate.
- The use of ordinary aggregate use in concrete compressive strength will get 26.07 N/mm².
- At 60% replacement of recycle aggregate use in concrete compressive strength will get optimum value of 20.89 N/mm².

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