

Utilizing Construction And Demolition (C&D) Waste In New Construction

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Abstract- As a developing country, constructing new buildings is an integral part. As we are developing the demand for new construction is increasing, so is the need. And for that more and more resources like sand, aggregate, cement, steel etc. are being exploited in an irresponsible & haphazard manner.

At the cost of development and construction we are leaving a whole lot of C&D Waste behind unattended and unresolved. C&D waste has always been imposing a problem to our environment, so it is needed to be tackled in a smart way, by recycling & reutilising the C&D waste & cutting the cost.

Keywords- construction, demolition, waste, recycling, concrete, material, building, reusing, utilizing, innovation, comparison, engineering

I. INTRODUCTION

India recycles just 1.58% of its construction and demolition (C&D) waste, a report released by Delhi-based non-profit, Centre for Science and Environment (CSE) on August 25, 2020, has shown.

The country generates an estimated 4.11 Lakh tonnes of C&D waste every day, according to the Building Material Promotion Council. But the official recycling capacity is a meagre 6,500 tonnes per day — just about 1.58%.

The Bureau of Indian Standards has allowed the use of concrete made from recycled material and processed C&D waste. The Construction and Demolition Waste Rules and Regulations, 2016 have mandated reuse of recycled material.

II. POSITIVE IMPACT

- Collection-processing-utilization of C&D Waste to reduce dumping zones.
- Processing of C&D waste will produce Fine aggregate, Coarse aggregate, Fillers, wood chipping for Light concrete, segregation of reinforcement for proper Recycling.

- IS-383:2016 Table-1, Allows use of Recycled concrete Aggregate (RCA)

Up to 25% for Plain Cement Concrete & Up to 20% for Reinforced Cement Concrete ($\leq M25$) & up to 100% In Lean Concrete ($\leq M15$)

- Using of Recycled concrete aggregate will cut costs for sites where old building is going to be demolished for new building construction.
- Using RCA up to an extent gives same quality as conventional concrete.
- The RCA can also be obtained by heating the old concrete so it loses its bond and Stone aggregate can come out easily, by this almost new like stone aggregate is ready to use.
- RCA within limits can give good results both in Strength and Cost.
- Recycling the Concrete is beneficial to environment, decreasing landfill & decreases cost for new construction.

Table – M25 Concrete Compressive Strength with RCA

Concrete Compressive Strength With RCA			
Use of RCA in %	7D	28D	56D
0	23.56	28.48	31.27
10	21.90	27.31	29.90
20	21.01	26.84	29.30
30	19.80	26.11	28.56
40	19.48	25.13	27.74
50	18.51	24.41	27.34
60	18.25	23.77	26.87
70	17.41	22.93	26.43
80	16.67	21.81	26.12
90	15.99	21.01	25.14
100	15.30	20.77	24.94

III. NEGATIVE IMPACT

- The compressive strength was lower by 11.3 percent for M30 grade and 7.1 percent in case of M40 grade at 28

days, when 20 percent of natural sand was replaced by recycled aggregate

- There is no uniformity among cities to quantify and characterise C&D waste to know what and how to segregate. Methods have not been updated to bring in new-age construction materials.
- We cannot design High Strength Concrete from RCA.
- Improper processing of C&D waste may result in high construction cost.

IV. CONCLUSION

Apart from having negative impact it is more advantageous in mass construction projects and also to reduce C&D debris spread around cities.

By recycling C&D waste we are also saving natural resources used in construction like Stone aggregate & fine aggregate and also saving landscape from being exploited and used as quarries. Also reduces solid waste and utilizing in good ways which save environment and also reduce construction cost. Currently Germany & Europe like nations are using this method of recycling C&D waste in mass volume. Scientists are proposing to change RCA use recommendations to greater percentage in concrete production.

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