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Scope of Utilization of Recycled Aggregates in Construction Sector

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Abstract: ***This paper highlights the results of case studies undertaken in Raipur city wherein detailed estimates of material quantities are carried out and scope of utilization of recycled aggregates from construction and demolition waste concrete rubbles is justified. Plans of residential buildings were studied and material quantities are evaluated which suggests the scope of percentage generation and utilization of recycled aggregates in fresh concrete. This study recommends the recycling of waste concrete rubbles and effective utilization of those in fresh concrete.***

Keywords: Recycling, Recycled aggregates, rubbles, concrete

1. Introduction

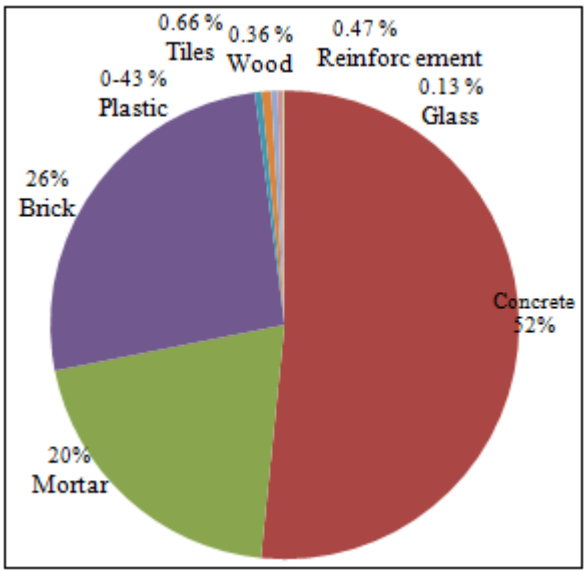
Construction and demolition waste comprises of sand, gravel, concrete rubbles, stones, bricks, wood, metal, plastic etc; Concrete rubbles waste can be recycled and recycled aggregates can be extracted for effective utilization in fresh concrete which will eventually reduce the demand of virgin natural aggregates in new construction. Effective utilization will also reduce landfill space. With the growth of construction activity, construction and demolition waste is also increasing day by day. So its very important to use recycled aggregates effectively in fresh concrete production which will protect environment and will reduce the exploitation of natural resources in the production of virgin aggregates. Residential projects Imperial Heights and building near Tatibandh was taken for detailed estimate and material quantities are published in this paper. Research paper clearly states the percentage composition of materials like concrete, mortar, bricks, plastic, tiles, wood, reinforcement/steel and glass.

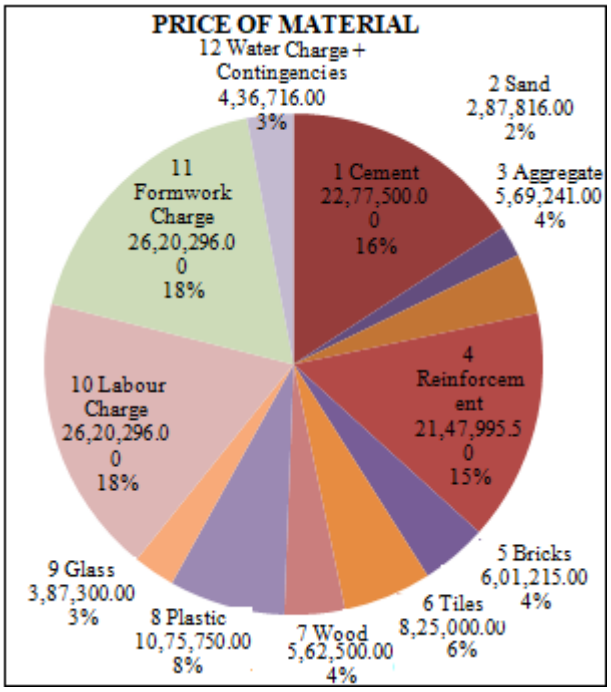
2. Quantification of materials

Architectural and structural drawings are used to evaluate the quantities for the project Imperial Heights and quantities are tabulated below:

S.No.	Materials	Quantity (Cu.m.)	Percentage (%)
1	Concrete	720.75	51.61
2	Mortar	282.83	20.25
3	Brick	364.37	26.09
4	Reinforcement	6.515	0.47
5	Tiles	9.25	0.66
6	Plastic	6	0.43
7	Wood	4.92	0.36
8	Glass	1.8	0.13

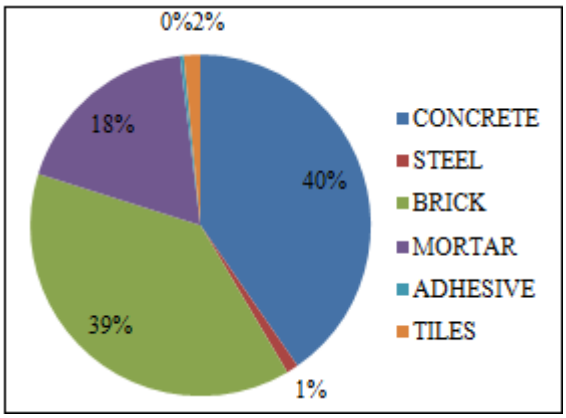
Quantities in percentage are shown below in Pi-Chart:

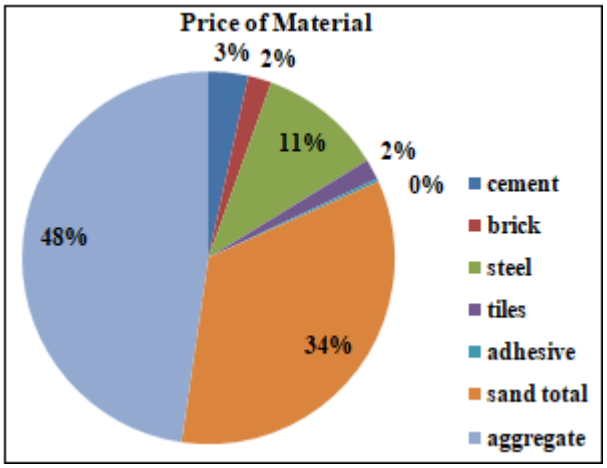




Same study is carried out for residential project near Tatibandh in Raipur city and percentage quantities calculated are tabulated and shown in Pi-Chart below.

S.No	Material	Quantity (Cu.m)
1	Concrete	1339.156
2	Steel	37.819
3	Bricks	1274
4	Mortar	603.44
5	Adhesive	12.21
6	Tiles	52.23





It is well observed from the calculated quantities that the percentage of concrete rubbles in both the residential projects is 51.6% and 40% .These concrete rubbles after crushing can fetch a recycled aggregate which has good potential to be used in fresh concrete. Rest other materials quantified can also be reused. Scope of this paper is restricted to recycled aggregates only and in every residential project approximately 50 % of concrete rubbles exists which can be good source of recycled aggregates.

3. Conclusion

Residential projects have average service life of 60 years. Projects need to be demolished after their service period and dumping of construction and demolition waste has created severe problems across the globe. Approximately 50% of concrete rubbles are produced from the demolished residential sites which can be further reused in production of recycled aggregates and reusing them in production of fresh concrete which will protect environmental hazards and burden of backfill on land. Recycling and reusing concrete rubbles as a source of recycled aggregates will help in sustainable infrastructural development of India.

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