

Sustainable and Cost Effective Housing using Recycled Aggregate Based Concrete

Broad Area

Design and Development

Need for the Study in the Context of Future of Cities

The construction industry worldwide is using natural resources and disposing of construction and demolition waste to landfill sites in very large quantities. Both practices are damaging to the environment and are no longer considered sustainable at their current levels. One of the most environmentally responsible and economically viable ways of meeting challenges of sustainability within the construction industry is the use of recycled concrete and demolition waste as aggregate in new construction. Whilst this is recognized as a potential outlet and technologies and standards required for such use are being researched and developed, a great deal of work is needed before Recycle Aggregate (RA) can be realized as a valuable resource. For example, technical data and guidance document that covers production through performance is needed to assist construction industry in the context of future of cities.

Objective and Scope of work

Overall, proposed work aims to prepare technical data associated with the use of recycle aggregate in concrete, therefore it may help to reduce the inhibition of the specifiers towards using this material in concrete production. Such information could also encourage demolition contractors to direct demolished debris to the production of recycle aggregate for use in new concrete, while reducing disposal to landfill. Thereby maximizing the use of recycled aggregate in concrete production is a positive step towards preservation of natural resources and environmental protection. ***Produce practical and simple guidance document for the use of recycled aggregate in building sustainable and cost effective houses.***

Methodology/Activities

Activity	First Year		Second Year		Third Year		Fourth Year	
	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half
Literature Review								
Collection of Recycled Aggregate from Demolition sites								
Study on physical and mechanical properties of recycled aggregate								
Mix design of recycled and natural aggregate based concrete								
Fresh/hardened concrete properties study on influence of recycled aggregate based concrete								
Carry out structural element based experiments								
Construct the prototype cost effective house using recycle aggregate based concrete, Life Cycle Assessment Study								
Documentation Report Preparation/ Paper preparation, presentations etc.								

Outcomes/Deliverables

Demonstrative sustainable and cost effective house along with practical and simple guidance document for the use of recycled aggregate in building houses

Team Composition

Principal Investigator	
Dr. Sudhir kumar Barai	Professor, Department of Civil Engineering, IIT Kharagpur
Co Investigator	
Dr. Shailendra Kumar	Professor, Department of Civil Engineering, Guru Ghasidas Vishwavidyalaya (CU), Bilaspur