

STUDY OF CONSTRUCTION & DEMOLITION WASTE

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ABSTRACT

This research aims to study feasibility of incorporation of fine fraction of recycled aggregates coming from construction and demolition waste in cement-based masonry mortar fabrication. The recent trend in construction industry is to use the alternative source of construction materials which can substitute the use of virgin materials in order to reduce environmental impact in terms of energy consumption, pollution, waste disposal and global warming. On the other hand, the waste generated from the demolition of old structure and construction activity is a matter of concern all over the world. Thus, recycling and reuse of these wastes may reduce the usage of natural resources and it can also serve towards the demand of environment. It also attempts to elucidate the approaches for the better performances, identifies the gaps in the existing knowledge and underlines the reasons why this promising technology has not become widely accepted by the construction industry. The practical problems with application of recycled aggregate in concrete are also discussed.

Keywords: Institutional framework , sustainable , amplitude , construction and demolition.

1.Introduction

Concrete is a composite material, basically consisting of different constituents such as binding materials, water, aggregates and admixtures. Among these ingredients, aggregate plays a very crucial role in concrete which occupy the largest volume of about 60–75% of total concrete volume [1]. It is indispensable for any construction work. The versatility of concrete as a construction material for large construction work lies in its high strength, low maintenance cost, resistant to weathering effect, economical over other construction materials and its excellent structural performance. From the forecast of the research group of Fredonia, it was mentioned that the global consumption of aggregate used in construction may exceed 26 billion tons by 2012 [3]. With this increase in rate of consumption, it is expected that the demand of aggregates will be doubled in the next two to three decades [4]. Amongst different countries, India has occupied a place in the top ten users of the leading countries to use natural resources. The composition of construction and demolition waste (CDW) is dictated by different construction types and their components; in general, CDW is composed of concrete, asphalt, brick and ceramic materials [1]. The problems related to waste dumping have dramatically increased with the growth and development of large cities. In the UK, for example, over 50% of landfill waste comes from construction use [2] and the US alone produces around 200– 300 million tons of CDW annually [3]. The exhaustion of natural sand deposits close to large urban centers necessitates the initiative to use CDW as a potential raw material.

2.Experimental Work

Specific gravity	
Common symbols	SG
SI unit	Unit less
Derivations from other quantities	

Specific gravity is the ratio of the density of a substance to the density of a reference substance; equivalently, it is the ratio of the mass of a substance to the mass of a reference substance for the same given volume. Apparent specific gravity is the ratio of the weight of a volume of the substance to the weight of an equal volume of the reference substance. The reference substance is nearly always water at its densest (4°C) for liquids; for gases it is air at room temperature (25°C). Nonetheless, the temperature and pressure must be specified for both the sample and the reference. Pressure is nearly always 1 atm (101.325 kPa).

Crushing Value Test

This test helps to determine the aggregate crushing value of coarse aggregates as per IS: 2386 (Part IV) – 1963. The apparatus used is cylindrical measure and plunger, Compression testing machine, IS Sieves of sizes – 12.5mm, 10mm and 2.36mm

Sample: - Recycled Aggregate Sample.

Test Result

S. No.	Name of Test	Test Method	Result	Unit
1)	Crushing Value	As per IS : 2386 Part-4-1963	36.88	%
2)	Impact Value	As per IS : 2386 Part-4-1963	27.89	%
3)	Water Absorption	As per IS : 2386 Part-3-1963	4.90	%
4)	Loss Angeles Abrasion Value	As per IS : 2386 Part-4-1963	35.04	%
5)	Specific Gravity	As per IS : 2386 Part-3-1963	2.53	%
6)	Flakiness Index		6.39	%

7)	Elongation Index	As per IS : 2386 Part-1-1963	6.29	%
8)	Gradation of Aggregate	As per IS : 2386 Part-1-1963	Sieves nos.	% passing
			40mm	100.00
			20mm	28.42
			10mm	0.68
			4.75mm	0.11
			2.36mm	0.00

3. References

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