

A REVIEW ON RECYCLING OF DEMOLISHED WASTE AS AN AGGREGATE IN CONCRETE

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Abstract

There is an oversized quantity of dismantled waste generated each year in Republic of India and alternative developing countries. In present era demolished concrete waste handling and management is the new primary challenging issue in the world. The recycling demolished waste materials in order to reduce construction cost and resolving many major problems faced by the low income people of the world.it is necessary to use demolished concrete as new liner recycled aggregates for new concrete to make this technology feasible,a significant new line amount of experimental work have been carried out worldwide previous new line investigations were mainly engaged in the processing of demolished concrete , the mix new line design. This paper is review of comprehensive program where in experimental work have been carried out of the effect of partial replacement of coarse aggregate by demolished waste (dismantle concrete) and Fly ash with Admixes on workability and compressive strength of recycled concrete for further advanced study.

Keywords: DAC, Demolished, Dismantled, Compressive strength

I. INTRODUCTION

Concrete is one of the most consumed materials in the world. Everywhere the construction industry faces problem and challenges regarding the materials.However, in developing countries like India, these difficulties and challenges are present for all community. Traditionally in India materials like clay,gravel,cement,brick,block,tiles,paint, timber , steel are the majorly used building components in construction sector.

The use of recycled aggregate is in practice since the end of World War II and is used in stabilizing the base course of the roads. The wastes derived from demolished concrete structures and construction works are of large quantity and goes on increasing with time. To reduce the excess of waste material it is good step to use recycled aggregates in construction work. In upcoming days the problem of material will rise as the report of Global construction 2030 forecasted,that the volume of construction in the world will grow by 85% by 2030, with three countries – india,U.S. and china.

All the natural materials used for construction worldwide have been produced from the existing natural materials and will have intrinsic distinctiveness for destroying the nature and environment. The cost of construction work is increasing rapidly. it is required to find functional substitutes for conventional building materials in the construction industries .

Construction Aggregate

construction material (aggregate) is the strengthening material of medium grained particulate material used in construction, including, slag ,sand, gravel, stone, recycled concrete and geosynthetic aggregates. In the world Aggregates are the most mined materials for construction purpose.

Other than building construction the Aggregates are also used as base material under foundations, roads, and railroads. The most low cost material is used for all type construction for base work is aggregates.

Dismantle Aggregate

In the terms of construction the Dismantle aggregate and waste reduction both are extremely important, because they help to preserve mainly the natural resources, environment and reduce demand for valuable landfill space, Utilization of such waste as dismantle aggregate in concrete can be useful both for environmental protection and economical aspects in the construction industry worldwide. In india the Successful use of recycled aggregates in regular concrete works would lead to a considerable reduction in demand of natural aggregates and to preserve them.

II. LITERATURE REVIEW

O.A.U Uche et al. (2008)the work is mainly focused on Recycled Aggregate Concrete (RAC) as a substitute for virgin coarse aggregate in the compressive strength of plain concrete. Recycled aggregate concretes were produced together with virgin coarse aggregates and subjected to empirical tests which include grading, specific gravity, bulk density, water absorption, Aggregate Impact Value (AIV) and Aggregate Crushing Value (ACV) to ascertain their performances. The test results showed that the use of Recycled Concrete Aggregate (RCA) reduces the compressive strength and this

reduction increases with the increase in percentage of the RCA. This result will not only eliminate the development of waste stockpiles of concrete as recycled material but also elicit the use of RCA in concrete work, thus providing environmentally friendly and economically viable solution as substitute for virgin aggregate as well as provide savings in the final cost of projects.

Gupta Arundel et al. (2011)an experimental investigation was conducted to study the change in direct compressive strength and elastic modulus of recycled aggregate concrete in presence of fly ash (as replacement of cement). Concrete cubes, cylinder and prisms were prepared as test specimens with varying percentage of fly ash using natural aggregate and recycled aggregate. These specimens were tested at different age of concrete to have compressive strength, elastic modulus, split tensile strength as well as flexural strength and their changes were noticed. . MIP (Mercury Intrusion Porosimetry) test was conducted to estimate the percentage of micro voids in recycled aggregate concrete and also to appreciate the change of these micro voids due to presence of fly ash. Empirical formulas involving major parameters such as fly ash content, water cement ratio, age of concrete etc., have been developed to predict elastic modulus and compressive strength of recycled aggregate concrete.”

Asif Husain et al. (2013)—in recent years demolished concrete waste handling and management is the new primary challenging issue faced by the countries all over the world. In this research paper an experimental study is carried out to investigate the feasibility and recycling of demolished waste concrete for new construction. The present investigation to be focused on recycling demolished waste materials in order to reduce construction cost. This research shows that the recycled aggregate that are obtained from site make good quality concrete. The compressive strength test results of partial replacement and full recycled aggregate concrete and are found to be higher than the compressive strength of normal concrete with new aggregate.

Mohd monish et al.(2013)Huge quantities of comprehensive program investigation have been carried out to assess the effect of partial replacement of coarse aggregate by demolished waste on workability and compressive strength of recycled concrete for the study at 7 and 28 days. Tests result showed that compressive strength of recycled concrete up to 30% coarse aggregate replacement by demolished waste at the end of 28 days has been found to be comparable to the conventional concrete.

Prof. Chetna M Vyas et al.(2013) The work is mainly focused on the use of Recycle product is increasing with innovation in present scenario. The utilization of waste product in the manufacturing of new product is a challenging job. The Natural Resource decreases in a short period and therefore the use of waste product is necessary. There are a number of old buildings and structures are demolished today. The reuse of that demolished debris is a good solution to the problem of an excess of waste material. The studies on the use of Recycled Aggregates have been going on for few years. Aggregates play important role in strength characteristic of concrete. This paper focuses on the possibility of the use of Recycled Coarse Aggregate Concrete as a new structural material. The aim of this research project is to determine the strength characteristic of recycled coarse aggregate concrete by using different percentage of Recycled Aggregates in M45 Grade.

MirjanaMaleses et al.(2014) the Following an example of the world's great powers that developed the recycling industry after natural disasters and wars, the paper points to the possibility of using large quantities of construction and demolition waste, generated as a result of the recent floods in the Serbia. Based on the years of extensive experimental research, and the research conducted by eminent experts, an overview is provided of the most basic properties and application of recycled aggregate concrete. It has been shown that the application of coarse recycled concrete aggregate, as the component materials in the concrete mixtures, it is possible to produce structural concrete that can be satisfactory and even with high quality, which primarily depends on the characteristics of crushed demolished concrete.

SalimKhosro et al. (2015) In this experimental work demolished road aggregate and sugarcane bagasse ash (SCBA) which are large disposal landfill materials are used as replacement materials in concrete. SCBA obtained from sugar mills is used. cubes and cylinders were cast with 100% coarse aggregate replaced with dismantled road aggregate whereas the cement replacement was in the percentages by weight for curing period of 7, 14, 28 and 56 days. Compressive and tensile strength tests were done and the result showed that the concrete specimens made by replacing 10% of cement by SCBA at curing period of 7 and 14 days gave an unpredictable increase in test results that compete and almost reach the strength of traditional concrete.

PrabhatKumar et al. (2016)the studies aboutthe recycling of concrete aggregate has been accepted to preserve natural aggregate for other important use. RCA (Recycle concrete aggregate) follow 3R i.e. Reduce, Reuse, Recycle. In many developed country it is used as a substitute of natural aggregate. Also many practical experiments tell that natural aggregate can be replaced by recycle aggregate and can be used for construction purposes. This paper deals with the review of existing literature work for understanding thoroughly about RCA.

Gowtham et al.(2017) this study may be a part of the impact of the partial replacement of coarse mixture by dismantled waste on compressive strength and workability of DAC (Demolished Mixture Concrete). For the study seven, fourteen and twenty-eight day's compressive strengths were recorded. Compressive strength for that DAC and also the result obtained art found to be comparable the traditional concrete.

ManikGoyal et al.(2018)It is work being the have been carried on the mechanical properties, durability and structural performances of Recycled Aggregate Concrete (RAC). The application of recycled aggregate to use in construction activities have been practice by developed. It is say that concrete is the main construction material across the world and

the mostly used in all types of civil engineering works. In this paper a study has been made on the past researches carried out by the different scholars and their results have been studied.

III. CRITIQUES

On the basis of literature reviewed Concrete is now a days widely used material in construction or it can be said that without concrete no one can even think about construction. Concrete is made up of mainly water, cement, sand and aggregate. Aggregate in concrete can be replaced by other material like sugarcane baggage ash, Dismantle Aggregate etc. to increase strength, lighten the structure or to save money according to requirement.

It is clear that the replacement of Dismantle Aggregate at the place of conventional aggregate concrete reach the target strength.

There are minor disadvantages of using Dismantled Aggregate in place of conventional aggregate that the addition of Dismantled Aggregate decreases the workability of concrete which can be regained by using some admixtures.

There is no major disadvantages of using Dismantled Aggregate and they are good to get proper compressive strength, flexural strength, easy to mix, economical and to reduce pollution.

IV .CONCLUSION

In the terms of construction field The use of Dismantled Aggregate in making fresh concrete will also help in reduction of solid waste dumping on existing landfill sites and to provide the environment a better place.

The reuse of Dismantled Aggregate will help in improvement of overall environment of the region of the world. Firstly by reduction in mining and secondly reduction in air pollution resulting from production of aggregates (dust pollution) and transportation of aggregate from mining to consumption point (vehicular pollution) and in reduction of the high pricing of the construction materials.

By using Dismantle Aggregate made of original concrete with higher compressive strength than the target value of strength of the new concrete, in general, concretes that are made are of the same and often better performance compared to the same natural aggregate concrete

The use of dismantle Aggregate waste material in order to reduced construction cost.

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