

To Assess the Appearance of Concrete by using Waste Glass as Aggregate

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Abstract - The increasing awareness of glass recycling speeds up inspections on the use of waste glass with different forms in various fields. One of its significant contributions is to the construction field where the waste glass was reused for value-added concrete production. By adding glass aggregate we can reduce the waste and lower the construction cost and helping the environment. When adding color to the concrete, the concrete gets an aesthetic appearance and also further finishing works like painting can be avoided. Through this project we are aiming to make a table tops using colored glass aggregate.

Key Words: Concrete, Recycled Glass, Aggregate.

1. INTRODUCTION

1.1 Explanation

The transformation of concrete into decorative concrete is achieved through the use of a variety of materials that may be applied during the pouring process or after the concrete is cured. The increasing awareness of glass recycling speeds up inspections on the use of waste glass with different forms in various fields. One of its significant contributions is to the construction field where the waste glass was reused for value-added concrete production. Glass can be recycled many times without changing its chemical properties. Due to low cost, availability, and simple process to recycle, glass concrete application are significantly applied in the construction industry. Glass concrete applications are generally defined as the concrete products which are prepared by the use of the recycled glasses by replacing the natural aggregate that extract from the environment.

1.1 Problem Statement

Availability of commonly used coarse aggregates, which is the one of the constituent used in production of conventional concrete has become highly expensive and insufficient for construction industry and also cause bad impact on nature during its manufacturing process. If we use waste glass as replacement material to the coarse aggregate in decorative concrete, it becomes economical and gives good aesthetic appearance.

1.2 Scope of work

It can use as replacement of expensive material such as marble or granite. It can be use in various shape as decorative panels in the architectural cladding works. It can be helpful to reduce waste glass material in future.

2. Materials -

The detail of various materials used in the experimental investigation are following-

- Coarse Aggregate - Crushed angular aggregate of maximum size of 10 mm conforming to IS 383-1970 was used. The specific gravity of 10 mm size aggregate was found to be 2.926.
- Fine Aggregate (Sand) - The fine aggregate used in this investigation was river sand passing through 4.75 mm sieve with specific gravity of 2.716.
- Cement - OPC Ultra tech 53 grade cement was used.
- Fresh Water - Ordinary clean potable water free from suspended particles and chemical substances was used for both mixing and curing of table top slab.
- Glass-Recycled glass is used.

2.1 Quantity of material

- Cement-1.971 kg
- Water-0.985 kg
- Fine aggregate-4.864 kg
- Coarse aggregate-6.075 kg
- Glass-1.875 kg

2.2 Methodology -

This project was divided in two parts. The first part was studying the impact of presence of waste recycled glass as coarse aggregate replacement on plastic and hardened properties of concrete. In the second studied the substitution of aesthetic glass concrete to expensive architectural items such as granite and marble.

2.2.1 Specimen size- 50X50X2 cm was casted.

2.3 Discussion

1. Mix proportion of M20 grade concrete for specimen (1:1.5:3).
2. 25% of coarse aggregate was replaced by waste glass.
3. Pictures of specimen-



CONCLUSIONS

- The paper presents the necessity of sustainable construction in present world and the possibility of waste glass recycling and using into concrete production.
- The study focuses on practical use of glass as coarse aggregate in concrete.
- It replaces the costly material such as granite and marble.
- It can be said that waste glass may open a new path of economic and pollution free decorative concrete construction.

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