

PARCIAL REPLACEMENT OF SAND BY GLASS POWDER

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Abstract - Concrete is an essential building material which is widely used in the construction of infrastructure such as building, bridges, highway, dams & many other facilities. The main natural and cheapest resource of sand is river. Dams are constructed on every river hence these resources are erasing very Fast. Now a day's good sand is not readily available, it should be transported From long distance. Those resources are also exhausting very rapidly. So it is A need of the time to find some substitute to natural river sand. The artificial Sand produced by proper machines can be a better substitute to river sand. The Sand should be sharp, clean and course. The grains should be of durable

Material. The grain sizes must be such that it should give minimum voids. In this project we have make around 27 blocks having size 15*15cm. In that we replace Sand by fine crushed powder of glass by percentage method (10 , 20 & 30%) which is waste product from industries, land, general waste Resources. Because of that there is lots of saving in the sand amount & we Know that the glass is solid waste material which is available in large Quantities in nature. So that we can minimize at least some amount of solid Waste from nature . So that this project is Eco-Friendly because the material Which we are using is easily available in nature.

Key Words: Bitumen, Plastic, Aggregate, Economical, Pavement, etc

1. INTRODUCTION

As a result of industrialization and urbanization it has been estimated that several million tons of waste glasses are generated annually worldwide. The prime sources of waste glasses are window screen, window glasses, tube lights, bulbs, electronic equipment, medicinal bottles and liquor bottles.

Most of the waste glass is sent to landfill because of impurities which are difficult to remove, prohibitive shipping costs to glass manufacturing plants, o mixed colour waste streams which are difficult to separate into useful raw glass stocks. As glass is not biodegradable, the wastes produced today will remain in the environment for hundreds and perhaps thousands of years. Waste glasses do not decompose easily by itself therefore do not provide environmental friendly solution and social impact after disposal. The use of the waste glass in the construction industry is among the most attractive option because it can consume a significant

quantity of these materials.

Now-a-days Government have put banned on dragging of sand from the river bed. Source of natural sand are very less so, By partial replacing natural sand to waste glass in concrete we are able to achieve waste material in a effective use. In this concrete, glass is used which is waste material from glass industries with cement, sand & aggregate in minimum proportion. The glass is being used for partial sand replacement in proportions 10%, 20%, 30%.

Therefore we have decided to recycle this waste product from civil engineering point of view as the construction material. Therefore we used concept "Best From Waste".

Several Research works have been carried out to examine the possibility of reusing waste glass in concrete & construction industry as alternative solution to reduce the generated bulk of mixed color waste recycled glass.

2. OBJECTIVE

- The body of the paper consists of numbered sections that To study the mechanical properties of concrete by addition of glass powdering concrete.
- To determine the optimum percentage of glass fiber in concrete for maximum strength.
- To compare normal concrete with glass mix concrete.

METHODOLOGY.

The methodology describes the detailed procedure used to carried out analysis and experimental work to be done for successful achievement of objects of this project work. Since, from literature review to the concluding remark is included. In this we explained the basic information required for mix design and concept of experimental work.

Research –

The information was collected from national and international journals, technical magazines and reference books and also through the internet. From all this collected information we get clear idea about what to do and how to do?? About partial replacement of glass powder in cement.

• Advantages of mix design-

Mix design aims to achieve good quality concrete at site economically.

Quality concrete mix.

- Better strength
- Better durability
- Dense and homogenies concrete

Economy.

- Economy in cement consumption
- Better use of industrial waste product
- Other properties such as to achieve from finish, high early strength for early de-shuttering

What is mix design??

Concrete is always designed for strength ranging from M10 to M100 and workability ranging from 0mm slump to 150 mm slump. Usually the basic ingredients of concrete are the same, but their relative proportioning that makes the difference.

Materials for concreting

Cement- this is the basic binding material.

Water – this hydrates cement and makes concrete workable.

Coarse Aggregate– this is also and building Material of concrete. Fine Aggregate- fine aggregate along with cement Paste and forms mortar, grout and fill voids in coarse aggregate.

Properties desired from concrete in plastic state-

- Workability
- Cohesiveness
- Setting time

Properties desired from concrete in solid state

- Strength
- Imperviousness
- Durability

CONCLUSION

- 1) Using glass powder can reduce the use of cement and the associate energy demand and impact on air pollution and CO2 emission. The slump of concrete seems to increase with the increase in glass powder in the concrete mix. At 10% and 20% glass powder content the compression strength of concrete is higher then that of the control. Above 30% glass powder the strength substantially decrease.
- 2) The experiment shows that saving a cost.
- 3) As compared to normal concrete the glass mix concrete has high strength.
- 4) Glass mic concrete is used where high strength is required such as in metro cities.
- 5) An environmental solution has been achieved using the glass mix concrete.

FUTURE SCOPE

Efforts are being made in the field of concrete technology to develop such type of concretes which have special

characteristics: -

Sr. No	% Replacement of Fine Aggregates by Glass Powder	Compressive strength for 7days			Average compressive strength (N/mm ²)
		1	2	3	
1	10%	11.52	11.40	11.38	11.43
2	20%	12.20	12.02	12.42	12.21
3	30%	9.03	8.99	9.22	9.08

1) The strength of both fresh and harden state concrete should be desirable and according to requirement.

2) Behavior of glass mix concrete should be more than conventional concrete and hence Glass mic concrete can be used in certain structural members.

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