

Experimental Investigation on Replacement of River and Its Alternatives

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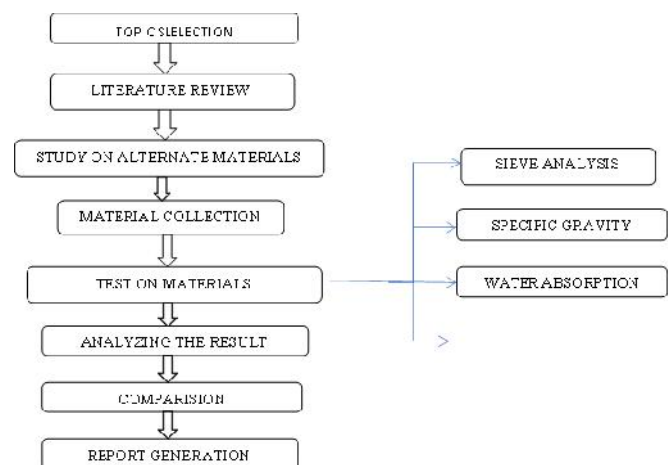
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Abstract- Concrete is the largely utilized construction material. The fine aggregates used in the production of concrete is twice the consumption of cement. But restriction on sand mining has created a need to replace the same by industrial by products which are threat to environment if disposed unscientifically. M sand ,sea sand ,foundary sand ,GGBS ,quarry dust are used as the alternatives for river sand. They are tested with the physical properties such as specific gravity ,sieve analysis ,bulk density and mechanical properties such as compressive test on mortar for 7th,14th and 28th day.

I. INTRODUCTION

Sand researchers world over are in continuous search for the alternatives to sand. River sand is becoming a scare material. Sand mining from our rivers has become objectionably excessive .The availability of natural sand for concrete production is facing challenges, while the so-called waste stockpiles at fine aggregate. This means that the industry has a huge need to solve this challenge by finding suitable technology for usable crushed sand production. It has now reached a stage where it is killing all our rivers day by day. So as to save the rivers. As natural sand deposits become depleted near some areas of metropolitan growth, the use of alternatives to sands as a replacement fine aggregate in concrete is receiving increased attention. As a solution for this, various alternatives are explored and used in many parts of the world. The construction industry is growing with major trust on infrastructure and the demand for sand is also increasing. The overuse of river sand for construction has many undesirable environmental and social consequences. The natural sand deposits are depleting and illegal sand mining is becoming uncontrollable issue. In-stream sand mining has become a common practice and resulted in a mushrooming of river sand mining activities which have given rise to various problems that require urgent action by the authorities. These include river bank erosion, river bed degradation, river buffer zone encroachment and deterioration of river water quality and groundwater availability. sand is not readily available, it is transported from a 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.

II. METHODOLOGY



III. MATERIALS USED

- M-sand
- Ground granulated blast furnace slag(GGBS)
- Sea sand
- Foundry sand
- Quarry dust

IV. COMPRESSION TEST

Compression strength is the capacity of a material or structure to withstand loads tending to reduce size, as opposed to tensile strength, which withstands loads tending to elongate. In other words, compressive strength resists compression . Whereas tensile strength resists tension



Fig.1.Compressive test machine

V. RESULTS AND DISCUSSION

Table.1.Specific gravity analysis

S.No	Specimen	Specific gravity	
1	M-sand	2.4	Specific gravity of river sand is 2.565
2	Sea sand	2.642	
3	Foundry sand	2.147	
4	Quarry dust	2.812	
5	GGBS	3.55	

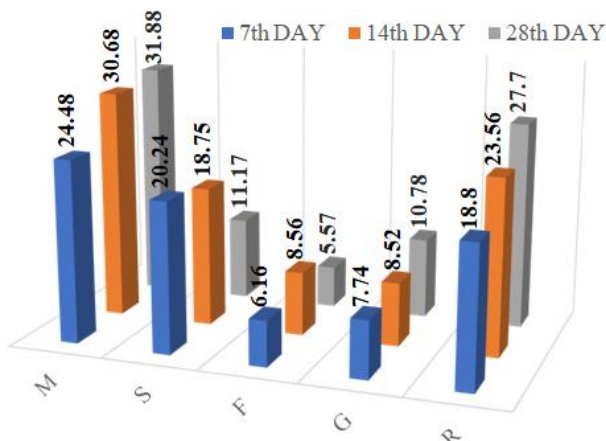
Table.2.sieve analysis

S.No	Specimen	Fineness modulus	
1	M-sand	3.71%	Fineness modulus of river sand is 4.114%
2	GGBS	5.521%	
3	Sea sand	3.332%	
4	Foundry sand	3.725%	
5	Quarry dust	4.375%	

Table.3.Bulk density analysis

S.No	specimen	Bulk Density	
1	M-sand	20%	Bulk density of river sand 2.564%
2	Foundry sand	25%	
3	GGBS	20%	
4	Sea sand	5%	

VI. COMPARISON OF COMPRESSIVE STRENGTH OF MATERIALS



.2.Compressive strength of materials

VII. CONCLUSION

By analysing the results ,the sea sand and foundry sand does not attains the peak stress when compared to the

manufactured sand(M-SAND) and ground granulated blast furnace slag(GGBS).hence the manufactured sand and ground granulated blast furnace slag is good to use as an alternative for river sand in future.

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