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USE OF JHAMA BRICK DUST AS A PARTIAL REPLACEMENT OF SAND IN CONCRETE

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ABSTRACT

India is a developing country. Developing infrastructure leads to consumption of concrete. Sand have big value in concrete. But natural sands are limited resources. River sand is most common fine aggregates in concrete. Due to excessive production of the river sand, it is banned by the government of India. Thus replacement of sand becomes need in last decays and the partially replacement will contribute to a good point to the research area.

The main objective of this experimental investigation is to find out the strength and permeability characteristics of with addition of different percentages such as 10%,15%and 20% and replacing Fly ash as partial replacement to cement at 20% respectively.

I. INTRODUCTION

River sand is most common fine aggregates are used in concrete. River sand is most suitable fine aggregates in concrete. Due to the excessive production of the river sand is banned by government in India. Thus replacement of sand becomes need in last two decays. Number of researches occurring in world on replacement of sand by number of material like waste glass powder, spent fire bricks, crushed brick fine aggregates, crushed coarser aggregates, fly ash, etc. Brick aggregates are very easily available at very low cost. It may be recycled from destroyed buildings, bridges, and any other destroyed structures.

Researcher has tested the aggregates bricks the got the higher compressive strength at 20% partially replaced the fine aggregate of bricks with fine aggregates of concrete. But some researcher found the decrease in the strength up to 40%. That is why is its great success to find the advantage of brick aggregates in concrete.

Bricks are found in number of types because it is common usable material. The types of bricks aggregates like common burnt clay bricks aggregates, calcium silicate bricks aggregates, engineering bricks aggregates, concrete bricks aggregates, fly ash clay bricks aggregates, crushed spent fire bricks aggregates, fired brick aggregates, recycle bricks aggregates. Brick aggregates directly affects the concrete properties when concrete are in fresh state and hardened state.

II. METHODOLOGY

Concrete Mix for M30 Grade:

Cement: 450 kg/m^3

Fine Aggregate (Sand): 650 kg/m^3 (Control mix)

Coarse Aggregate: 1150 kg/m^3

Water: 180 liters (Water-cement ratio: 0.40)

Jhama Brick Dust Mixes:Replacement Percentages: 10%, 15%of sand replaced by Jhama brick dust.

For each mix, the total amount of sand was reduced, and an equal weight of Jhama brick dust was added as a substitute.

Mix Consistency:All mixes were designed to maintain similar workability and strength parameters.

Research on the use of Jhama Brick Dust (JBD) as a partial replacement for sand in concrete has been gaining attention as part of efforts to reduce the environmental impact of conventional concrete production and address the shortage of natural sand. Jhama brick dust, which is a byproduct of the crushing of fired bricks (typically from brick kilns), has been explored for its potential to substitute for river sand in concrete mixtures.

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III. RESULTS AND DISCUSSION

Table 1. AVERAGE COMPRESSIVE STRENTH FOR CONCRETE10% OF DUST CURING: -

SR.NO	TYPE OF CONCRETE	CURING START	CURING END	DAYS OF CURING	STRENGTH OF CONCRETE
1	NORMAL	23\02\25	01\03\25 07	07 DAYS	605KN
2	MIXED	23\02\25	01\03\25	07 DAYS	804 KN
3	NORMAL	23\02\25	21\03\25	28 DAYS	1148KN
4	MIXED	23\3\25	21\03\25	28 DAYS	1283KN

Table 2: AVERAGE COMPRESSIVE STRENGTH FOR CONCRETE15%OF DUST CURING: -

SR.NO	TYPE OF CONCRTE.	CURING START	CURING END	CURING DAYS	STRENGTH OF CONCRETE.
1.	NORMAL	23\02\25	01\03\25	07 DAYS	850KN
	MIXED	23\02\25	01\03\25	07 DAYS	965KN
	NORMAL	23\02\25	21\03\25	28 DAYS	1300KN
	MIXED	23\02\25	21\03\25	28DAYS	1460KN

IV. CONCLUSION

The exploration of Jhama Brick Dust as a partial replacement for sand in concrete offers a promising pathway toward more sustainable construction practices. By utilizing a waste material like JBD, the construction industry can help mitigate the environmental challenges associated with sand extraction. Furthermore, Jhama Brick Dust may improve the strength and durability of concrete, contributing to the development of longer-lasting infrastructure. This study represents a step forward in the search for alternative materials that can contribute to more sustainable, cost-effective, and environmentally friendly construction practices.

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