



Review Paper on To Find peak proportion of Replacement of Natural Sand with Artificial Sand

KEYWORDS

Artificial Sand, Natural Sand, Compressive Strength, Concrete, Properties, Environmental Protection.

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ABSTRACT

This experimental study show that maximum proportion of replacement of natural sand with artificial sand so as to give maximum strength when replacing natural sand with artificial sand varies from 40% to 80% with increasing 4%. M25 grade of concrete is taken for the study of variation in compressive, tensile and flexural strength. Scarcity of natural sand due to depletion of resources and restriction and due to environmental consideration. It will help to find viable solution to the declining availability of natural sand to make eco-balance. Fine particles below 600 microns must be at least 30% to 50% for making concrete will give good results. Normally particles are not present in river sand up to required quantity. Digging sand, from river bed in excess quantity is hazardous to environment. The deep pits sand lifting. In order to fulfill the requirement of fine aggregate, some alternative material must be found. A well processed artificial sand as partial or full replacement to river sand is the need of the hour as a long term solution in Indian concrete industry until other suitable alternative fine aggregate are development are developed.

INTRODUCTION

Sand is used as fine aggregate in mortars and concrete. Natural river sand is the most preferred choice as a fine aggregate material. River sand is a product of natural weathering of rocks over a period of millions of years. It is mined from the river beds and sand mining has disastrous environmental consequences. Rapid increase in construction activities leads to acute shortage of conventional construction materials. It is conventional that sand is being used as fine aggregate in concrete. For the past some years, the escalation in cost of sand due to administrative restrictions in India, demands comparatively greater cost at around two to three times the cost of quarry dust even in places where river sand is available nearby. Artificial sand offers viable alternative to natural sand and it is purpose made fine aggregate produced by crushing and screening or further processing i.e. washing, grading, classifying of quarried rock, cobbles, boulders or gravels from which natural fine aggregate had been removed. Approximately 80% of total volume of concrete is made up of aggregates. Aggregates characteristics (size, shape, texture, grading) influence the workability, finish ability, bleeding, and segregation of fresh concrete and durability of hardened concrete. Fine aggregates may be one of the following types; Natural sand, crushing natural gravels, artificial sand.

LITERATURE REVIEW

- 1] Rajendra P. Mogre, Dr. Dhananjay K. Parbat & Dr. Sudhir P. Bajad "Feasibility of artificial sand in reinforced concrete" has concluded that replacement of natural sand with 60% to 80% by artificial sand.
- 2] Priyanka A. Jadhav, Dilip K. Kulkarni "Effect of replacement of natural sand by manufactured sand on properties of cement mortar" has concluded that replacement of artificial sand in concrete amount of 50%.
- 3] Mahendra R. Chitalange, Prakash S. Pajgade "Strength appraisal sand as fine aggregate in SFRC" they concluded that the cost of artificial sand in range of 40% to 70% to the natural sand.
- 4] Priyanka A. Jadhav, Dilip K. Kulkarni "An experimental investigation on the properties of concrete containing manufactured sand" they concluded that 60% replacement of natural sand by manufactured sand reveals higher strength.
- 5] P. M. Shanmugavadiv, R. Malathi "Durability properties of concrete with natural sand and manufactured sand." They suggest that 70% of manufactured sand in concrete is the optimum replacement for natural sand.
- 6] Chandana Suresh, Katakam Bala Krishna "Partial Replacement Of Sand With Quarry Dust In Concrete" research concluded that replacement of sand with quarry dust is 55% to 75% in case of compressive strength.
- 7] Dr. S. Elevenil, B.Vijaya "Manufactured sand A solution and alternative to river sand and concrete manufactur-

ing" they concluded that compare to concrete made from river sand high fines concrete generally had higher flexural strength improved abrasion resistance and higher unit weight and lower permeability due to filling the pores with micro fines.

- 8] Prof.B.V.Venkatarama Reddy "Suitability of manufactured sand (M-sand) as fine aggregate in mortars and concrete." they conclude that the present investigation shows that the characteristics of mortars and concrete using.
- 9] Dr. P. Perumal,Prof.-G. Balamargan" Behaviour of concrete on the use of quarry dust to replace sand-An experimental study." they conclude that concrete acquire max increase in compressive strength at 50% and replacement.
- 10] J.Karthick, T.Rama, N.ManiBharathi It was observed that the density of concrete increase with increase in % of dust content. As the expected compressive strength increase with increase in density of concrete."

3.0 PROPERTIES OF MATERIAL AGGREGATES

Property	Natural Sand	Artificial Sand	Coarse Aggregate
Specific Gravity	2.65	2.77	2.61
Fineness Modulus	2.83	2.89	-
Water Absorption	5.3%	6.4%	3.1%
Grade	Grade-I		

CEMENT

Sr. No.	Description	Value
1.	Normal Consistency	27%
2.	Initial Setting Time	35 min
3.	Final Setting Time	255 min
4.	Specific Gravity	3.1
5.	Fineness	3%

CONCLUSION

After studying of review papers we are expecting that the peak proportion of artificial sand with natural sand will come in between 65%-75%. The cost of artificial sand is less than that of natural sand and also having good strength. Hence artificial sand can be recommended to competitive substitute for natural sand.

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