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PRACTICALITY OF CONSUMPTION OF WASTE MARBLE DUST AS A SUBSTITUTION OF REAL SAND AS A CHANGER IN CONCRETE

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ABSTRACT
The modern increase in building construction sector is resulting in get larger production of fine sand. The marble industry of India is account one of the chief decorative building material industry. With the increase in production of marbles it increases the waste that get from it. Marble dust creates environmental problems. Due to environmental problems, it affects Human health as well as nature. As marble dust is the waste product, get during the sawing and polishing of marble by parent marble block and about 20-25% of the processed marble is turn into dust form. The production of cheaper concrete using waste marble dust can solve to some extent the ecological and environmental problems.
Therefore this paper aims to study the effect of using marble dust as partially replace of fine sand on concrete.
Keywords: Marble Dust, Fine Sand, Cheaper Concrete

I. INTRODUCTION

Concrete is the chief construction material. Its main components are cement, fine aggregate, coarse aggregate and water in required quantity. As there are various wastes coming from the marble industry. We can use those wastes in concrete as a fine sand to substitute real sand either partially or completely without adjustment the quality of concrete. In developing countries marble are still one of the most popular and decorative construction material. India is the largest producer of waste marble dust. India is estimated to have 3,172 thousand tons of marble dust was produced in year 2009-10.
A marble dust is generated during the cutting process. Leaving these waste materials to the environment directly can cause environmental problem. Therefore, usage of the marble dust in various construction industry would help to protect the environment. In addition to this, due to fineness of the marble dust, it will easily mix, with aggregate so that excellent bonding is possible. Marble dust will fill the voids present in concrete and will give sufficient compressive strength when compared with the ordinary concrete. These days the cost of building material is increasing so if we use the waste material in the production of the concrete so we decrease the price. The present study is aimed to review the published literature on building materials with waste marble dust as raw material.

II. LITERATURE REVIEW

B.V.Bahoria, Dr. D.K. Parbat, Dr. P.B. Nagarnaikr [1]

Presented in his paper that replacement of natural sand by quarry dust & waste plastic in concrete. It is observed from that the compressive strength of concrete at 7 days using quarry dust and waste plastics is consistently higher than the conventional concrete using natural sand. It has been observed that the compressive strength increase upto 50% replacement of natural sand.

J Bhattacharjee [2]

Presented need for improvement in concrete construction and maintenance for sustainable development in India. The paper also highlights the construction technology, utilization of new materials and the use of special types of concrete and various types of admixture.

Aalok D. Sakalkale, G.D Dhawale, R.S. Kedar [3]

In this experimental study is aimed at utilizing waste marble dust. Construction industry itself as fine aggregate in concrete replacing natural sand and to study the effect of use of waste marble dust on the mechanical properties of concrete. To compare the compressive, flexural and tensile strength using waste marble dust with the given design mix to establish alternative for sand with partial use of waste marble dust in concrete.

Noha M. Soliman [4]

Till date everyone has been using marble as a decorative building material. This research paper gives us other aspects of marble and its waste dust like its severe effect on environment, health and other economical uses. In the above study it has been found that the waste marble dust can be replaced by sand resulting the improvement, workability & performance of concrete. This waste marble dust is produced during the process of cutting, moulding and enhancing.

Bahar Demirel [5]

Marble has been commonly use as a building material since the ancient times. Marble dust is the by product during production of marble and creates environment pollution on large scale. Marble blocks are cut into smaller block to provide smother shape as desired. During this cut process nearly 25% of the original marble mass is lost in the form of dust which replaces the fine sand (Passing .25 mm sieve) in concrete mixture. Therefore it may be possible to prevent the environmental pollution in those reasons where marble production is excessive. For determining the effect of waste marble dust on compressive strength, the sample are recorded and checked on 3rd, 7th, 28th & 90th days.

M. Shahul Hameed [6]

In proper grading and excess silt of natural sand results in less popularity of find sand. Because of its non desired fineness and gradation. Due to this marble dust powder came in consideration and importance. Due to its fineness it is used as filler and helps in reducing the total void content in concrete.

Baboo Rai, Khan Naushad [7]

In this paper the effect of marble dust was studied by replacing it partially with mortar and other components of concrete. By partial replacing the components of concrete it came to know that waste marble dust increases the compressive strength, flexural strength and workability of mortar and concrete.

Prof. Veena G. Pathar, Prof. MD. Gulfam Pathan [8]

Marble waste is a solid waste material generated by processing the marble. It is than can be used as a filler material in cement concrete. Adding the waste marble dust upto 10% replace by weight of fine sand can increase the tensile strength and compressive strength of concrete and also save the environment and economy. Ecological and environmental problems can be solved to some extent by producing the cheaper and durable concrete using waste marble dust.

III DISCUSSION

The investigation revealed that replacing of sand with marble waste dust in concrete production gives similar strength as of concrete mixes with 100% sand both at early and later ages. According to the researches, it shows that replacing of sand with marble dust upto a limit reduces the slump of concrete mixes, but when it replace with sand upto limit, it enhances the slump of the concrete mixes. Earlier experimental studies says the unit weight of concrete can be increased when waste marble dust is added into the concrete because the specific gravity of waste marble dust is extremely high. Marble dust also helps in increasing the physical and Mechanical properties of the cement when mixed in proper ratio. It also contributes in decreasing the porosity of concrete, whereas marble dust works as catalyst in hydration process. Which makes it playing an important role in it.

IV CONCLUSION

1. According to earlier experimental studies, it concludes that use of wastes as a partial replacement of concrete constituents had a great prospective.
2. As per the study it, marble dust when replacing with sand upto certain percentage shows almost same strangth.
3. Marble dust is easily available so it might be cost effective.
4. Use of waste as aggregates has greater potential because 75% of concrete is composed of aggregates.
5. Investigation show that these industrial wastes are capable of improving hardened concrete performance.
6. Thus, we found out the optimum percentage for replacement of sand with marble dust in concrete is almost 50%.

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