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Production of Interlocking Tiles using Marble Slurry

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Abstract— *The waste of the marble industry is the cause of many environmental problems because 70% waste and the acquisition of only 30% of the main product contributing to the high non-corrosive spill. Dump sites give a dirty look. Contaminate the top fertile soil cover, and the rivers / bodies of water that touch it irrigation and drinking water and air resources and the loss of plants and animals. The most effective solution for utilization of marble slurry is to apply to Bulk. The only sector that saves eat marble slurry at such a high level only in the construction industry. Concrete is an important building material and is used in construction industry due to its high compression strength and durability. Now a different day concrete workshops were conducted with the intention of reducing costs and unavailability of common items. This paper scans the file for strong areas of various types of concrete used using marble dumps as replacement of good integration. The pieces of marble are finely ground into powder and gradation is compared to a good standard combination of Various marble slurry structures determined in the laboratory. Sp. gravity 2.61, Fineness modulus 0.91 and the use of The marble slurry in Cement Concrete instead of Sand is 30% showing the same strength as Control i,e. 1: 2: 4. Cement Concrete 0% Marble slurry. Marble slurry can be easily used in the construction industry in preparation Cement Concrete.*

Keywords— ***Cement Concrete, Fineness modulus, Marble slurry, Specific gravity, Interlocking Tiles.***

I. INTRODUCTION

Marble has been widely used as building materials in the engineering industry. During the mining process and polishing of marble, marble dust is regarded as waste. These products exist in the environment and contribute to pollution. Use of marble dust. reduce the cost of cement production and reduces the cost of to remove it from nature Marble occurs mainly in nature. It has been used and opened up in many parts of the world since ancient times.

About 90% of marble production comes from India and about 85% is from India the product is sourced from Rajasthan and almost all mining and processing operations are available focuses on **Makrana**, where the study is planned. Rajasthan has more than 4000 marble mines and 1100 marble saws (processing units) At the same time leads to the growth of many processing units in the right places. These two jobs in Rajasthan has been extended for 20-25 years and plays an important role in the economy of the state provides direct and indirect services to most people and as a result also expands their standard of living.

Marble slurry generation:

Marble Slurry is generated during processing and polishing of marble etc.

Environmental Hazards due to waste:

Due to the presence of fine particles in the marble slurry air is also contaminated. Marble slurry fines flew through the airways causing a serious health problem with breathing. Fine particles of marble slurry apply over grass leaves, plants and trees that cause beauty problems.

(a) Air pollution

This is a very dangerous impact on the marble industry. Slurry is produced almost regularly performance is also a major problem. When dry, we cause air pollution and related problems.

(b) Water pollution

Like any other industry, the marble industry needs water for its various cutting operations, cooling and cleaning. In these works the water is contaminated with marble mud.

(c) Dry Slippery road

Due to the dumping of mining debris and the softness of the marble on the side of the road causes dust in the air (polluting air) and to create less visibility, due to the lower visibility of the number of accidents that occur.

(d) Wet slippery road

During the rainy season the marble slurry flows over the road. Due to marble slurry road becomes slippery and many accidents takes place.

II. UTILIZATION UPDATE OF MARBLE SLURRY

The use of Marble slurry in two ways can reduce the cost of cement production and reduce the cost of removing it from the environment.

Utilization of marble slurry:

Marble occur abundant in nature. It is used and mined many places in the world since early time. Marble slurry can be easily utilized in construction industry in preparing cement concrete. The areas where the utilization of marble waste and marble slurry needs to be explored as a substitute for conventional raw materials are as follows:

1.As a filler material for roads and embankments

2. For manufacture of bricks

3. Manufacture of Portland Cement

4. Manufacture of Ceramic Tiles

5. Manufacture of Thermoset Resin Composites

6. Manufacture of lime

7. Manufacture of Activated Calcium Carbonate

8. Hollow Blocks and Wall Tiles

9. Manufacture of Ground Calcium Carbonate

10. Making Cement mortar (Partially replacing sand) and

11. Making Cement concrete (Partially replacing sand).

Utilization of marble slurry in manufacturing of Interlocking tiles.

III. LITERATURE REVIEW

According to a comprehensive review of the literature, the following critical observations were made:

1. Mehta Jitesh at, al in their research critical literature review on effective utilization of kota stone sludge as replacement of marble slurry waste in bricks published in International journal of trade in research and development Volume3(1) ISSN: 2394-9333. The focus of the study has so far been on the impact of WMD on concrete, with a view to understanding / identifying ways to address concrete structures. Upto 30% of kota stone slurry was replaced with marble slurry. Very few studies reported the effect of WMD on concrete and studies were conducted under room conditions.
2. Vignesh pandian at, al in their research on utilization of waste marble dust as find marble aggregate in concrete the focus of study has been Most of the reported studies on the effect of WMD have been performed in laboratory conditions and experimental studies for M30 grade concrete have not been conducted on a regular basis. However, such studies are important in better understanding the WMD effect of M30 grade concrete. The effect of WMD on concrete features is a more complex approach such as stiffness separation and compression testing.

IV. METHODOLOGY

In this research preferred to manufacture Dumble Shape Interlocking Tiles using PVC Mould. M15 grade cement having ratio 1:2:4 was used. In which 30% fine Aggregate was replaced by marble slurry and preparing 6 tiles from it. Then we perform compressive strength test on them. At the end we compare its compressive strength from normal tiles which are manufactured by cement only.

V. MATERIAL

5.1 Cement

Cement used PPC of grade 53. The specific gravity of cement is 3.15

5.2 Marble Waste Dust

Pollution in the marble industry is declared and used as a Waste Marble Dust.

5.3 Graded Fine Aggregate

Sand grains that pass through a filter of 4.75 mm are called fine aggregates. Natural sand is well used included. The river sand available in the region corresponding to zone II is well used a combined gravitational force of 2.54.

5.4 Graded Coarse Aggregate

Standard measurements, available in the area with dimensions greater than 4.75 mm and smaller than

12.5mm are used as composite composites. ACI Design Process: crushed stone 20 mm and 10 mm size, taken from a local specific gravity of 2.68.

5.5 Water

The portable water available from the university college is used to prepare the concrete throughout the project.

VI. MIX PROPOSIYTION

Concrete mixing was designed for M15 grade concrete and assembly the ratio was 1: 2 : 4 with a W / C ratio of 0.65. We prepared mould from cement, fine aggregate and coarse aggregate. We used material by percentage of volume by weight.

Mix Proposition

Sr. No.	Description	Mass (kg/m3)
1	Cement	1.248
2	Fine Aggregate	1.7
3	Marble Slurry	0.73
4	Coarse Aggregate	4.87
5	W/C ratio	0.65

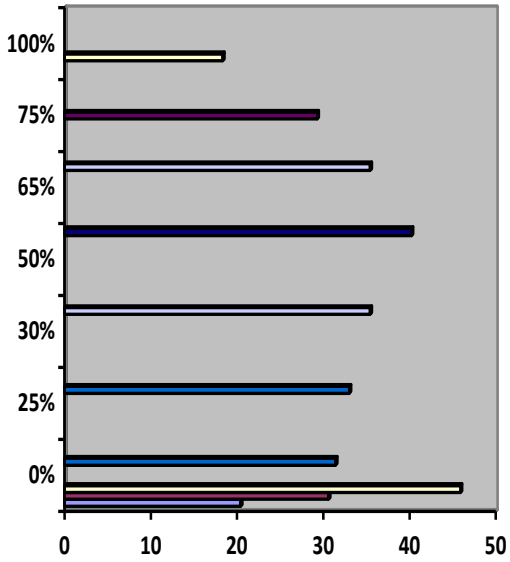
VII. RESULT AND DISCUSSION

Test results for different types of WMD mutations are compared with the results provided examples of regulatory spies. The table provides a 28-days compressive strength of given mould.

For Fine Aggregate

At 0% replacement of fine aggregate with marble powder the compressive strength will be 31.42 N/mm2 and at 25% replacement of fine aggregate with marble powder the compressive strength will be 33.02 N/mm2 at 30% and 65% replacement of fine aggregate with marble powder the compressive strength will be 35.42 N/mm2 at 50% replacement of fine aggregate with marble powder the compressive strength will be 40.22 N/mm2, at 75% replacement of fine aggregate with marble powder the compressive strength will be 29.28 N/mm2 while at 100% replacement of fine aggregate with marble powder the compressive strength will be 18.32 N/mm2

Sr. No.	Percentage of sand replacement	Compressive strength (N/mm2)
1	0%	31.42
2	25%	33.02
3	30%	35.42
4	50%	40.22
5	65%	35.42
6	75%	29.28
7	100%	18.32



According to this study marble slurry two mixes may get same strength at 30% and 65% replacement. For more confirm results at lower side replacement taking 30% replacement of fine aggregate by WMD.

Properties

1. Colour	White.
2. Texture	Powder.
3. Taste	None
4. Particle Size	4.75mm-75micron
5. Fineness Modulus	0.91
6. Natural moisture content	0% (if under roof)
7. Solubility in Water	Totally in soluble.
8. Densification	Lesser (Compare to Cement)
9. Specific gravity	2.56

VIII. CONCLUSION

This project work is aimed at exploring the feasibility of using marble dust as a substitute for good integration. It offers the unique advantage of having plenty, which is easily accessible and cost effective. Test results show that the use of this Waste Marble Dust has the potential to improve the performance of solid concrete. The core strength of all concrete and marble powders was 5-10% higher than the corresponding. The compressive strength

of concrete has increased with increasing percentage of marble dust. By using marble dust the quality of the concrete decreases. From the above results, the use of marble dust is recommended for up to 30% in composite blends. The result of the flexural strength test shows the normal behavior and the results of the pressure strength test.

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