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EXPERIMENTAL STUDY OF MARBLE POWDER ON THE PERFORMANCE IN CONCRETE

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ABSTRACT

Concrete is the vital issue used inside the production enterprise in the course of the universe, in which the high-quality mixture is herbal sand. The use of sand in creation sports effects in the acute mining. Due to extreme mining, natural assets have become exhausted; consequences in increase in scour intensity and every now and then flood opportunity. Thus, its miles turning into inevitable to apply opportunity cloth in concrete. Marble is important substances used in the creation enterprise. Marble powder is constructed from processing flowers at some point of the sprucing and sawing of marble blocks and about 20 - 25% of the processed marble is become powder form. Destroying of the marble powder cloth from the marble enterprise is one of the environmental problems worldwide today. This observe is meant to making use of Waste marble powder production industry itself as best aggregate in concrete, substitution herbal sand. The alternative is accomplished fractional and fully in the percentage 10% 15% and 20% and its effect on houses concrete have been calculated.

INTRODUCTION

As we understand concrete is the maximum common fabric used now a days in creation which having as components of cement , best aggregates , coarse aggregates with a few quantity of water for making paste , right here pleasant aggregates (sand) is natural sand . But an massive quantity of use of sand, affects the assets of earth due to which those type of material have become involves be exhausted. Sometime absence of sand close to approximately plant and placement increase the price of construction. So right here is the motive of saving natural resources by using the usage of another material and changing with sand at a few amount without affect the ratio of concrete and there electricity.

SCOPE AND OBJECTIVES

To set up alternative for sand with partial use of waste marble dirt. To have a look at the compressive, flexural and tensile electricity the use of waste marble powder with the given design blend. To study the impact of use of waste marble dust on the mechanical homes of concrete.

Material

(A)Cement - The maximum common cement applied in an normal portland cement forty three (OPC 40 3) modified into used, that is used for fashionable concrete shape. The severa check had been led on bond to decide last putting time, fineness, soundness, specific gravity, famous consistency and compressive high-quality, precise gravity 3.15 3

(B)Coarse Mixture - in coarse aggregates maximum of which might be retained on the four.75mm IS sieve and incorporate most effective quite a few coarse material as is permitted by way of the specification are termed coarse aggregates. The grading of coarse aggregates must be as in step with specification of IS 383 – 1970

(C)Water – According Portable water was used for the schooling of all concrete specimens. The water used inside the concreting artwork as well curing purpose changed into the transportable water that's unfastened from impurities.

(D)Marble powder – Marble is a popular fabric now a days in sculpture and in homes , thought out which marble powder amassed from marble slicing and dressing . After reducing and grinding the marble waste form present in



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moist circumstance so with the assist of installing sun rays it became be dry and sieved with the aid of IS-ninety micron sieve earlier than replacing in sand at a few certain quantity

(E)Chemical Admixture – Superplasticizers is a kind of admixture which is used for having exceptionally water reducing sellers in it and such belongings be top for making controlling for segregation. According to marketpoint of view AURAMIX 400 changed into maximum famous as a notable plasticizer admixture for concrete. Synthetic admixture having particular gravity.

METHODOLOGY

In this research in concrete the marble became changing with sand 10%, 20% and 30%. Coarse combination of 2.66 and high-quality combination ratio 1.5 and water ratio 0.38 with chemical admixture of 0.06% became utilized in experiment. Each series having beam, cylinder and cubes as in line with IS code. This check is carried out for compressive take a look at, flexural check and split tensile take a look at of 7 days, 14 days and 28 days to find out the satisfactory effective aggregate in following of power characteristics of concrete mix.

COMPRESSIVE STRENGTH

Concrete cubes confirming to IS: 516-1964 of size 150*150*150 mm was solid for warranty of compressive energy. After 24 hours the concrete dice have become be positioned for water curing for 7 days, 14 days and 28 days respectively. Before trying out, the cubes had been air dried for 2hours, breaking 100 had been referred to for 7days, 14days and 28 days.

S.NO	% of marble powder	Water absorption	Compressive strength		
			7DAYS	14DAYS	28DAY
1	0	0.38	16.85	21.42	23.81
2	10	0.38	22.45	23.22	24.67
3	20	0.38	23.88	24.38	25.31
4	30	0.28	20.51	21.65	23.21

SPLIT TENSILE STENGTH TEST

Tensile energy is 2d main properties for concrete. Size of check sample of 15cm diameter, 30cm peak and 0.3cm thick cylindrical mould is used inside the take a look at. The cylinder is located left and proper among the 2 plates of the compressive checking out and the weight is carried out on it. The load at which the sample in the long run fails is cited and break up tensile energy is calculated.

S.NO	% of marble powder	Water absorption	Split Tensile strength		
			7DAYS	14DAYS	28DAY
1	0	0.38	1.98	2.64	3.23
2	10	0.38	2.41	2.85	3.65
3	20	0.38	3.62	3.11	3.76
4	30	0.28	2.40	2.76	3.50

FLEXURAL STRENGTH TEST



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The beam is tested to test the flexural conduct of the hardened concrete. The check is accomplished in a conventional trying out machine of 60T load potential. Standard beam of size 10cm*10cm*50cm have been tested beneath one point loading to examine the flexural strength of concrete. The most tensile strain discover on the failure of beam is known as modulus of rupture and is calculated. It is calculated that at 10% and 15% substitute of concrete via marble powder flexural strength improve over 0% of marble powder. It suggests the maximum replacement of sand by using admixture marble powder is 10% and 15% flexural electricity boom.

S.NO	% of marble powder	Water absorption	Flexural Strength		
			7DAYS	14DAYS	28DAY
1	0	0.38	1.86	2.35	2.68
2	10	0.38	2.03	2.57	3.20
3	20	0.38	2.40	3.09	3.70
4	30	0.28	1.95	2.56	3.10

CONCLUSION

The purpose of this studies is to apply useless cloth as marble in a beneficial way. After the practically carry out the subsequent conclusion pop out –

- 1) Upto 10-20% alternative of first-class combination with marble growth the compressive energy
- 2) Further increasing the proportion of marble lower the compressive power of concrete
- 3) Upto 10-20% replacement of quality aggregate with marble increase the tensile power.
- 4) Further growing the share of marble lower the tensile energy of concrete
- 5) Using waste marble in concrete make a prime position in cost-slicing.
- 6) Due to use of marble powder in concrete the water absorption have become be much less, the amount of permeability have become lessen which make an vital role to make concrete solid for a longer time.

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