

A REVIEW PAPER ON USE OF MARBLE SLURRY AS FILLER AND BINDING MATERIAL IN MAKING OF INTERLOCKING BLOCK

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ABSTRACT

The extraction of marble slurry from the industries is huge problem we are facing now days. Around 90% of the world marble comes from India but marble waste is highly dangerous for environmental, agriculture as well as human being. The only industry which consume marble slurry on large is construction. Replacement of fine aggregate by marble slurry in cement mortar and concrete gives the good, acceptable strength and durability as same as standard mix design concrete. Replacement of fine aggregate by marble slurry can be done up to 10-40% according to present papers. Hence use of marble slurry in cement mortar and concrete lead to produce less carbon foot print or we can say sustainable and balanced environment.

INTRODUCTION

In today's modern world rapid growth in infrastructure, result in the depletion of available limited natural resources. To utilize various waste materials in concrete and mortar produce sustainable product, the purpose of sustainability is that life on earth can be sustain for coming future and there are 3 segment of sustainability: environment, economic system and society

Marble widely available in India, approx 90% of the world's marble production done by India and approx 80-85% of India's production is done in Rajasthan. Rajasthan has more than 4000 marble mines and about 1100 marble gang saw in 16 districts. As marble processing industry continues

to expand, large amount of waste in the form marble slurry are generated which affect environment adversely. Large quantity of waste stone dust is available near crusher plant as it is kept in abundance, so to reduce such amount of waste we can use marble slurry as partially replacement of fine aggregate and cement in making of interlocking block which shows equal or high strength as compare to original mix design.

LITERATURE REVIEW

Vandana Lall[1] has studied on Antarctica of Kishangarh: Boon or Bane. When marble slurry dump in yards it causes air pollution, soil fertility reduces and also causes affect to human health at the same time this dumping yards of marble slurry use as a picnic spot and film shooting locations. Author also says that when marble slurry added in cement mortar and concrete it shows good and acceptable strength. Utilization of marble slurry can be beneficial for environment as well as economical, it reduces cost of construction.

Narendra Chaubisa and Shantilal Patel [2] have published a paper on influence of marble waste and crusher dust on properties of cement mortar. From available studies it can be concluded that at minimum 10% replacement of sand by marble waste enhance the compressive strength of cement mortar mix, depending upon the cement sand ratio and crusher dust as partial replacement of cement decrease the strength properties of cement mortar.

Hence utilizing marble waste in cement mortar lead to produce low cost mortar.

Puneet Jain and Dr.S.S.Sankhla [3] have studied on determining of mix proportional using marble powder as partially replacement of fine aggregate. Author have concluded that marble slurry waste are directly producing from processing units of marble cutting which cause harm to environment. So, author did some experiment to compare the strength of M20 cube and workability of freshly prepared before adding marble powder and after adding of waste. Slump value decreases as they increase waste content up to 20%, slump value is 35 which is low then 0% mix which is 40, it means need of more water during mixing process so that mix become workable and easy to use .And Compressive strength come all most equally or high when they mix marble powder up to 0-20% .So, in this way use of waste by partially replacement with fine aggregate makes construction economical and waste can be reduce from land.

Ankit Kumar Gupta, Raj Kumar Mandiya, Vinod Kumar Kumawat, Ramveer Saini, Prashant Sharma and Manish Nagar[4] have published a paper on use of waste marble slurry in cement concrete as replacement of cement. In this paper it was found that marble slurry replace the cement in concrete mortar up to 12% and reduced the amount of cement in concrete mortar. The use of marble waste increases the compressive strength by 10.98%. In this study various tests are done to analysis that for each per cubic meter of concrete 371kg cement can be save amount upto 2100rs per m³.

Bhupendra Singh Kalchuri, Dr. Rajeev Chandak and R.K.Yadav[5] have studied on concrete using marble powder waste as partial replacement of sand. Author found that after replacement of fine aggregate by marble slurry up to 10-20%, compressive strength of M20 cube is increases but 30%-40% replacement gives low strength. Result shows use of marble slurry up to

20% is beneficial in construction and reduce problem of their disposal.

Er.Raj.P.Singh Kushwah, Prof.(Dr.) Ishwar Chand Sharma and Prof.(Dr.) PBL Chaurasia[6] published a paper on utilization of marble slurry in cement concrete by replacing the fine aggregate by 30% which shows equal strength as design mix concrete for M20. Due to marble slurry contamination of air, river, water bodies and top fertile soil cover, all this are major issue / problem for environment. By result we can conclude that marble slurry can be use up to 30% in place of fine aggregate in concrete.

Devesh Meena [7] has studied on behaviour of marble dust in concrete pavement. Devesh said that marble waste generation is harmful which should be utilizing as much it can. Author replace sand by marble waste by various ratio 0%, 10%, 20%, 30%, 40% and 50% and analysis the change in strength, workability and physical properties. In final result it is found that initially compressive strength increase up to 20% of replacement and further decrease but up to 50% waste can be replace in case of pavement which shows enough increase in compressive strength. Workability decrease by increase in waste percentage because marble waste has large surface area so there is need to add more water.

CONCLUSION

In our living period there are many resources which we are using unlimitedly and are easily available like cement and sand for construction work but we have to make sustainable environment so that our future generation also able to use these material. Our main focus of this review paper is to utilize waste as much we can in construction. And from above review it is clearly conclude that marble slurry can be used up to 30-50% by partially replacing fine aggregate and cement which enhance

strength of material, reduce cost of construction and make environment sustainable.

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