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A Study on Compressive Strength of Concrete by Partial Replacement of Cement with Dolomite Powder

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Abstract: ***The purpose of this project is to describe the effect of dolomite on compressive strength of concrete. Concrete is most widely used as a construction material. Dolomite has some properties similar to cement, therefore partial replacement of cement with dolomite is effective. Dolomite is calcium magnesium carbonate. It is obtain from sedimentary rock called dolostone and from metamorphic rock is called dolomitic marble. The use of dolomite is to reduce the carbon-dioxide gas emission from cement manufacturing and to gain compressive strength. The obtain result will be analysed to get optimum mix with maximum compressive strength.***
Keywords: Dolomite powder, Compressive strength, Replacement , Cement.

I. INTRODUCTION

With the increase in developments and innovations there is a huge demand of concrete. The main constituent is cement in concrete, which is manufacture by the process calcinations of calcareous and argillaceous compound at high temperature. In this process large amount of carbon-dioxide gas is release.

It was found that to manufacture 1 ton of cement there is 0.8 tons of carbon-dioxide gas is released. Dolomite has good resistance to weathering and good in dispersibility and wettability.

Dolomite is preferred due to its high surface hardness and density. M20 grade of concrete is made by partial replacement of cement with dolomite for 28 days of its compressive strength. Some investigations confirmed that dolomite powder can be used as a cementitious material to replace cement with dolomite. This paper examine the possibility to use dolomite as a partial replacement of cement.

II. LITERATURE REVIEWS

1) *S. Deepa Balakrishnan., and K. C. Paulose (2013):* "Studied the workability and strength characteristics of self-compacting concrete containing fly ash and dolomite powder". It has been examine that the use of dolomite impart viscosity to concrete, increase the strength and improves the segregation resistance of concrete.
2) *Deepthi C G, Shindon Baby:* "Study on Compressive Strength of Concrete with Dolomite Powder and Crushed Tiles ". It is found that the use of dolomite powder improves the strength of concrete. It also makes the low cost concrete, which is the half of cement comcrete.
3) *L. Ranjith Kumar, J. Kiran, P. Rangarajan:* "Properties of Concrete Incorporating Dolomite Powder". There is a improvement in the strength of concrete with the replacement of cement with dolomite. The optimum 5% of replacement is done and it is obsereved that 5.84% increase in compression strength and 2.73% increase in flexure strength of concrete. In case of split strength the increment strength is 2.74%.
4) *Kamal M.M, et al (2012):* "Evaluated the bond strength of self compacting concrete mixes containing dolomite powder". The fly ash is used along with the dolomite to increase the bond strength. Several mixes were prepared and test is carried out. The result showed that the bond strength is increased by the replacement of cement with dolomite. All SCC mixers containing dolomite increase the bond strength upto 30% , which is good for design purpose.
5) *Preethi G1, Prince Arulraj G2:* "Effect of Replacement of Cement with Dolomite Powder on the Mechanical Properties of Concrete" . the replacement of 10% of cement with dolomite give the efficient mix with M20 grade of concrete. Reduction in the use of cement will be cost effective and also reduce the emission of green-house gas.

III. CONCLUSION ON LITERATURE REVIEWS

It is found that partial replacement of dolomite with cement in concrete will increase its mechanical strength with optimum mix design. The use of dolomite is good, as it impart the similar properties that of cement. It occur in deposits that are large enough to mine. Since the cost of dolomite is less then cement and emission of carbon-dioxide gas reduce. Dolomite acts as a filler material which act as a volume matrix to reduce the porosity in the concrete. Therefore, it is found that the dolomite is economical and environment friendly if used as the partial replacement of cement with dolomite.

A. Problem Identification

Nowadays, there is a huge demand of concrete for construction work so, it is important that the material used should give effective result. The use of dolomite solve the problem regarding strength, cost and most important the reduction of greenhouse gas (carbon-dioxide).

B. Future Scope

The use of cement in construction work is to gain the compressive strength. Therefore it is required to make the concrete good enough bear maximum load with low cost and eco-friendly. In this paper the use of dolomite in different percentage (5%,10%,15%,20%) in concrete to determine the effect in compressive strength with its mechanism. It also deal with the factor affecting compressive strength.

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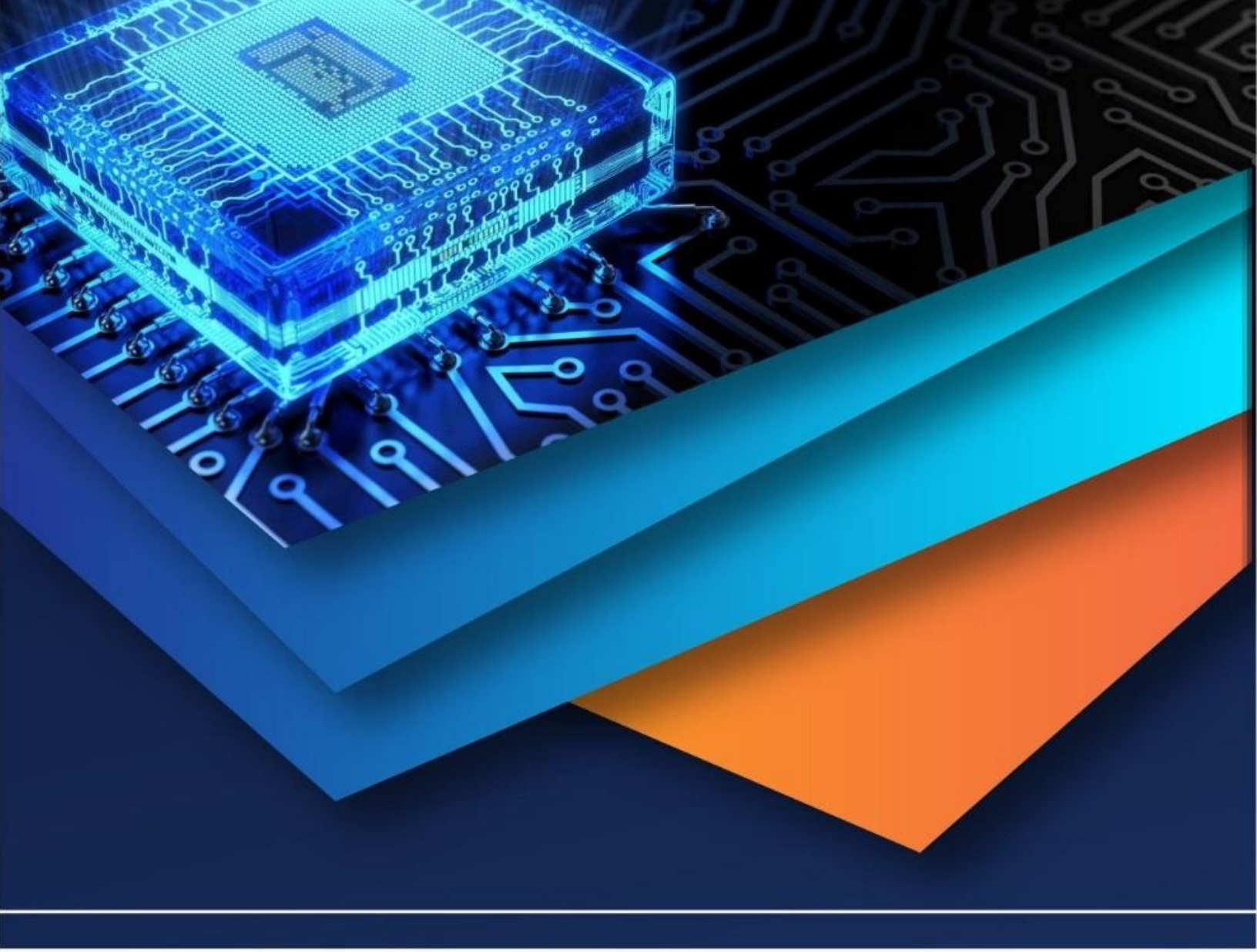

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