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Ascendancy of Granite Powder on Tensile Strength of Concrete

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Abstract – *This Paper Aims to Study Experimentally, the Effect of Partially Replacement of Cement by Granite Powder on Tensile Strength of Concrete By Using M25 Grade of Concrete By Replacing Granite Powder by Varying Percentage (i.e. 5% 10% 15% 20%) to cement. And comparing the 28th Day Tensile Strength with Normal Concrete and Find out Optimum Percentage of Replacement.*

***Key Words*: Granite Powder, Varying % Replacement, 28 days Curing, Tensile Strength, Comparison of Results.**

1. INTRODUCTION

Day By Day the Demand for Cement has Been Increased this Will Results in Some of Good and Some of Bad Impact on Environment and Human Health. Hence there is Need of Eco-Friendly and Economical Materials. Granite Powder are Obtained from Cutting, Polishing and Grinding of Granite and releasing this Granite Powder in Environment Causes very Serious Effect on Plant and Human Health. Hence there is also Necessity of Effective Disposal and Utilization of Granite Powder. By Using Granite Powder in Concrete the Cost of Concrete also reduces. And by Using Granite Powder the Strength of Concrete also increased and hence there is Effective Utilization of Such Waste Materials. For this Investigation we tested sum of 15 Specimen for 28 days of Curing. And Compare the Results with Conventional Specimen.

1.1 Objectives

1. To Check the Effect of Granite Powder on Tensile Strength of Concrete.
2. To Analysis the Normal and Granite Powder Concrete.
3. For Effective Utilization of Granite Powder.
4. To Increase the Strength of Harden Concrete at Minimum Cost.
5. For proper Disposal of Granite Powder.
6. To Find the Amount of Tensile Strength Increase or Decrease with Varying % of Granite Powder.
7. To Fine Optimum % of Replacement.

1.2 Scope of Project Work

1. To Increase Strength of Concrete with Minimum Cost.
2. To Reduce Cost of Concrete.
3. To Reduce the Amount of Cement Required.
4. For effective Utilization of Granite Powder.

2. METHODOLOGY

Prepare mix design of m25 grade concrete by using is method

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Normal Concrete

Granite Powder Concrete

Using Granite Powder (5% replacement to Cement)

Using Granite Powder (10% replacement to Cement)

Using Granite Powder (15% replacement to Cement)

Using Granite Powder (20% replacement to Cement)

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Casting of cubes (with varying of % of Granite Powder)

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Curing of these cubes for 28 days

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Testing of these cubes

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Comparing normal and Granite Powder concrete result

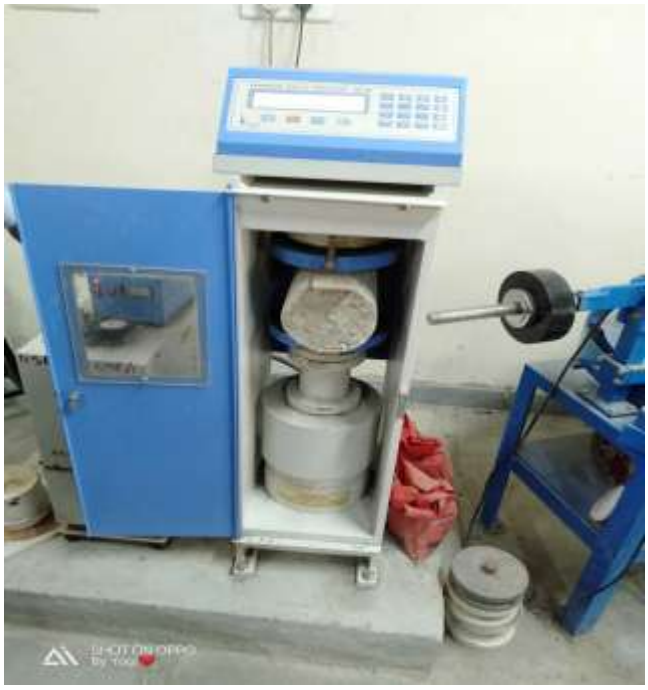

Fig -1: Set Up of Tensile Test

3. RESULTS

Table -1: Normal Pull out Strength (N/mm²)

Sr. No.	Days	Load (KN)	Tensile Strength (N/mm²)	Avg. Tensile Strength (N/mm²)
1	28	240.8	3.40	3.42
2	28	241.3	3.41	
3	28	243.4	3.44	

Table -2: 5% Replacement to Cement (N/mm²)

Sr. No.	Days	Load (KN)	Tensile Strength (N/mm²)	Avg. Tensile Strength (N/mm²)
1	28	250.2	3.5	3.5
2	28	248.6	3.51	
3	28	258.3	3.6	

Table -3: 10% Replacement to Cement (N/mm²)

Sr. No.	Days	Load (KN)	Tensile Strength (N/mm²)	Avg. Tensile Strength (N/mm²)
1	28	230.2	3.25	3.28
2	28	225.8	3.19	
3	28	241.1	3.41	

Table -4: 15% Replacement to Cement (N/mm²)

Sr. No.	Days	Load (KN)	Tensile Strength (N/mm²)	Avg. Tensile Strength (N/mm²)
1	28	176.2	2.49	2.52
2	28	192.3	2.72	
3	28	167.9	2.37	

Table -5: 20% Replacement to Cement (N/mm²)

Sr. No.	Days	Load (KN)	Tensile Strength (N/mm²)	Avg. Tensile Strength (N/mm²)
1	28	164.6	2.32	2.42
2	28	176.8	2.50	
3	28	172.9	2.44	

Fig -2: Failure of Specimen

4. CONCLUSIONS

1. By Considering above Results it is found that By Using 5% Replacement of Cement Increases Tensile Strength.
2. But Further Increasing Percentage Replacement the Tensile Strength Goes Decreasing.
3. By Using 10% of Replacement to Cement the Tensile Strength Decreases by 0.14 N/mm² than Normal Concrete.
4. By Using 20% of Granite Powder Replacing to Cement the Tensile Strength Decreases Significantly.
5. By Above Results the Optimum % of Replacement is 5% to cement.

REFERENCES

[1] M. Vijayalakshmi, A.S.S. Sekar, G.G. Prabhu Strength and durability properties of concrete made with granite industry waste
Constr. Build. Mater., 46 (2013), pp. 1-7.
[2] A. Arivumangai[1], T. Felixkala[2]

Strength and Durability Properties of Granite Powder Concrete Journal of Civil Engineering Research p-ISSN: 2163-2316 e-ISSN: 2163-2340 2014; 4(2A): 1-6

[3] Arivumangai Anbu Strength and durability properties of granite powder concrete Journal of Civil Engineering Research 2014, 4(2A): 1-6 DOI: 10.5923/c.jce.201401.01

[4] T. Felix Kala, ME and P. Partheeban MBA, PhD Study on the effect of granite powder on concrete properties Journal of Civil Engineering Research 2014, 4(2A): 1-6 DOI: 10.5923/c.jce.201401.01

[5] K.Chiranjeevi reddy1* , Y.Yaswanth Kumar1 , P.Poornima1 Experimental Study on Concrete with Waste Granite Powder as an Admixture Int. Journal of Engineering Research and Applications www.ijera.com ISSN : 2248-9622,Vol. 5, Issue 6, (Part -2) June 2015, pp.87-93

[6] T. Felixkala1 and P. Partheeban2 Granite powder concrete Indian Journal of Science and Technology Vol. 3 No. 3 (Mar 2010)