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Reuse of Building Waste in Construction Industry

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ABSTRACT: The number of people is increasing day by day and with the increase of human needs and development facilities (such as roads, bridges, buildings, etc.), we know that the availability of naturally available materials and other building materials on earth is limited, so the demand for the material is high. Compared to the supply, and this is the main reason, the amount of building materials today is very large.

however, demolition of old structures creates many issues and for the solution. for those issue one and only the better option of reused of construction & demolition waste as in concrete. The view of the several author and construction industry are the utilization by consuming it in new concrete in various ways. replacement of fine aggregate, coarse aggregate in some percentage dosage with coarse Granite aggregate and waste mortar sand obtained from demolished old concrete or demolished waste which was suggested by the several authors. use of Granite aggregate and waste mortar sand has not much effect on the basic properties (Specific gravity, water absorption) of granite coarse aggregate and waste mortar sand comparison with natural coarse aggregate and Fin natural Sand. therefore, the use of this waste in a new concrete not only helps in reducing the waste management issues but also help protecting the environment greatly

KEYWORDS: Reuse waste Material.

I. INTRODUCTION

Cement, sand and aggregates are important needs of the construction industry. Sand is an important material used to make mortar and concrete and plays the most important role in the design of mixes. The consumption of natural sand is usually high due to the high use of concrete and mortar. Therefore, the demand for natural sand in developing countries is very high to meet the rapid growth of infrastructure. In developing countries like India, there is a lack of high-quality natural sand, and especially in India, natural sand deposits are being eroded and pose a serious threat to the environment and society. Rapid removal of sand from the river bank causes so many problems such as loss of water bearing soil deposits, deepening of river courses and landslides, loss of vegetation on river banks, disturbance of aquatic life and agriculture due to river subsidence. . water level River sand or pit sand is generally used as a fine aggregate in mortar and concrete. Fine and coarse aggregate together make up approximately 75-80% of the total volume of concrete, and therefore it is very important to have a suitable type and good quality aggregate nearby (Hudson 1997). Recently, natural sand is becoming a very expensive material, due to its condition, there was a demand in the construction industry for a cheap and easily available alternative material, natural sand..

II.MIX PROPERSION

In addition to the composition of the mixture, the strength of the concrete depends on other factors, such as environmental temperature, mixing method, curing etc. Therefore, the Target strength (F_{ck}) of the concrete should be higher than the Characteristic strength(f_{ck}) for protection.

The Target strength for m20 grade concrete can be found from the formula given in the code book.

$F_{ck} = f_{ck} + 1.65S$. The Standard Deviation (S) value for M20 grade concrete is given in Table 1 of IS10262.

Mix Calculations of M20 Grade

Here we are going to look ow to calculate fine aggregate and coarse aggregate from aggregate ratio, cement



content and water content.

A	Volume of concrete	=1 cu.m
B	Total volume of cement	= Cement/(S.G*1000)
		= 348/(3.15*1000)
		= 0.1104 cu.m
C	Volume of water	= water (S.G*1000)
		= 191/1*1000
		= 0.191 cu.m
D	Total aggregate requirement	= A-(B+C)
		= 1-(0.1104+0.191)
		= 0.6986 cu.m
E	Coarse aggregate (C.A)	= F*C.A ratio * S.G*1000
		= 0.6986*0.477*3.02*1000
		= 1006 kg
F	Fine aggregate (F.A)	= F*F.A ratio*S.G*1000
		= 0.6986*0.542*2.66*1000
		= 1006 kg/m ³

III. RESULT AND DISCUSSION

The collected questionnaire and observed data has been analyzed and its results have been discussed in this chapter

Test Result of Workability of Concrete

Compressive Test on Concrete

Compressive Test on Concrete is done by Compressive Testing Machine. For each mix 12 cubes are tested for 7 days and 14 days with oven curing of 70° C and without curing.

Table .1 Compressive Test on Concrete Of M20 Grade

Cube No.	Mix No.	Days After Casting	Compressive Strength (Mpa)
1.	Mix 1(50% Aggregate,50% Granite Aggregate)	7	17.6 Mpa
2.		14	20.1 Mpa



Table .2 Compressive Test on Concrete Of M20 Grade

Cube No	Mix No	Days After Casting	Compressive Strength (Mpa)
1.	Mix 1(75% Aggregate,25% Granite Aggregate)	7	21.3 Mpa
2.		14	22.2 Mpa

Table 3. Compressive Test on Concrete Of M20 Grade

Cube No.	Mix No	Days After Casting	Compressive Strength (Mpa)
1.	Mix 1(50% Natural Sand,50% Mortar sand)	7	12.1Mpa
2.		14	17 Mpa

Table 5.1 Compressive Test on Concrete Of M20 Grade

Cube No.	Mix No	Days After Casting	Compressive Strength (Mpa)
1.	Mix 1(75% Natural Sand,25% Mortar Sand)	7	17.8 Mpa
2.		14	20.1 Mpa

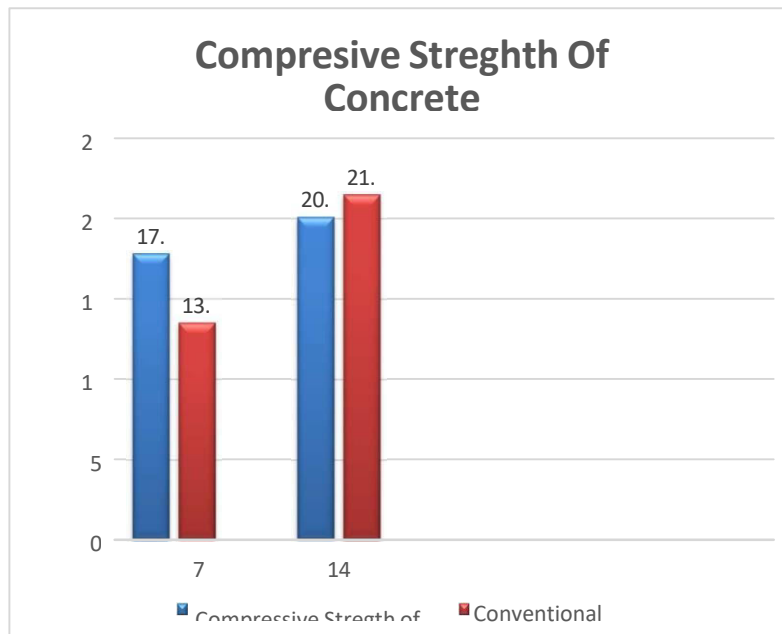


Figure 5.1 Compressive Strength of Concrete In 7,14 Days

Discussion: After replacing 50% aggregate by granite aggregate.

From above figure we get the compressive strength after 7 days curing is 17.6 Mpa And after 14 days curing, we get 20.1 Mpa

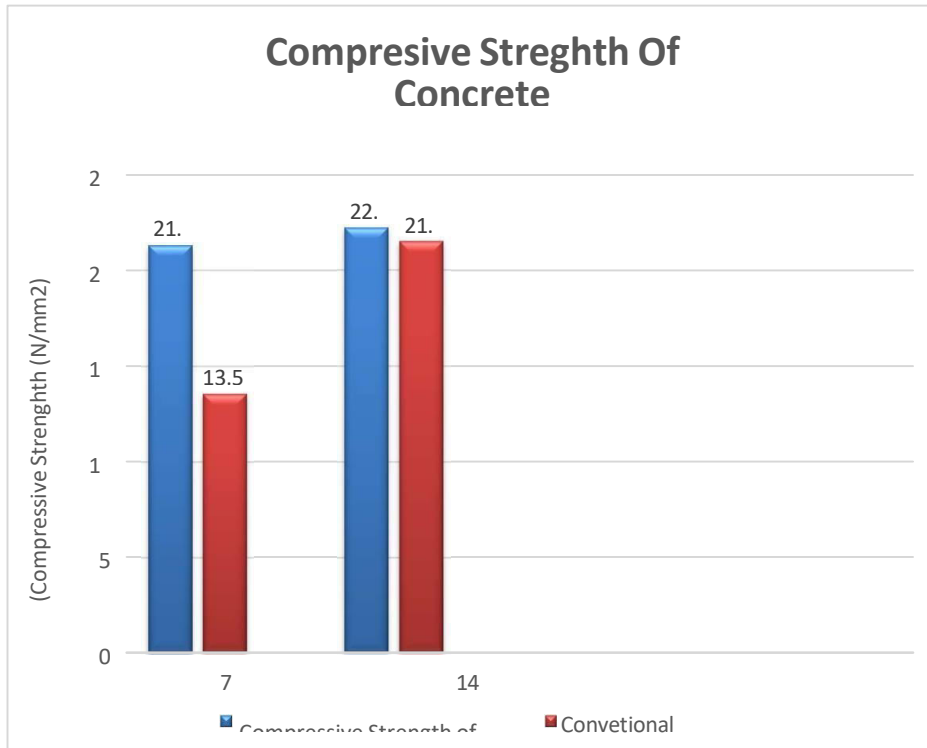


Figure.2 Compressive Strength of Concrete In 7,14 Days

Discussion: After replacing 25% aggregate by granite aggregate.

From above figure we get the compressive strength after 7 days curing is 21.3 Mpa And after 14 days curing, we get 22.2 Mpa.

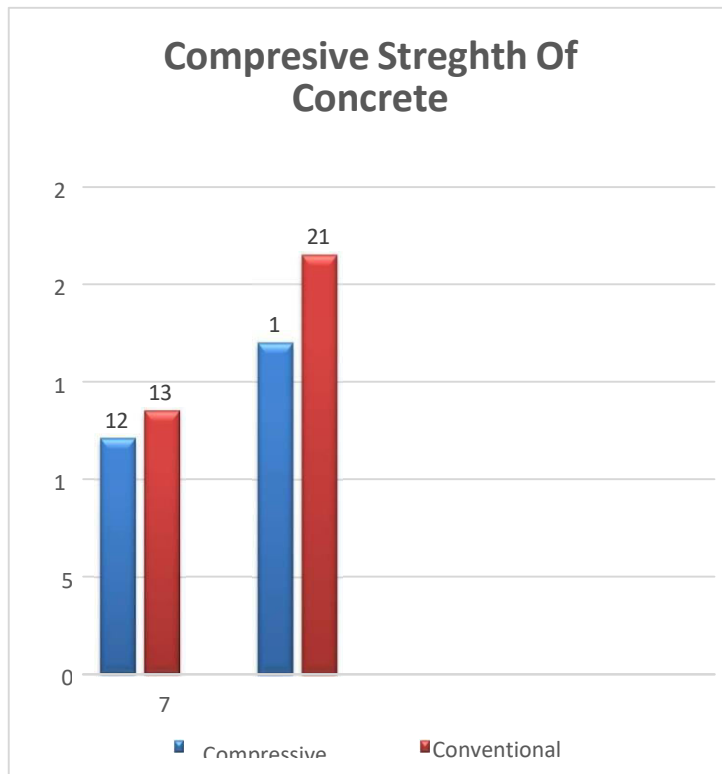


Figure .3 Compressive Strength of Concrete In 7,14 Days

Discussion: After replacing 50% natural sand by mortar crush and
From above figure we get the compressive strength after 7 days curing is 12.1 Mpa And after 14 days curing, we get 17 Mpa.

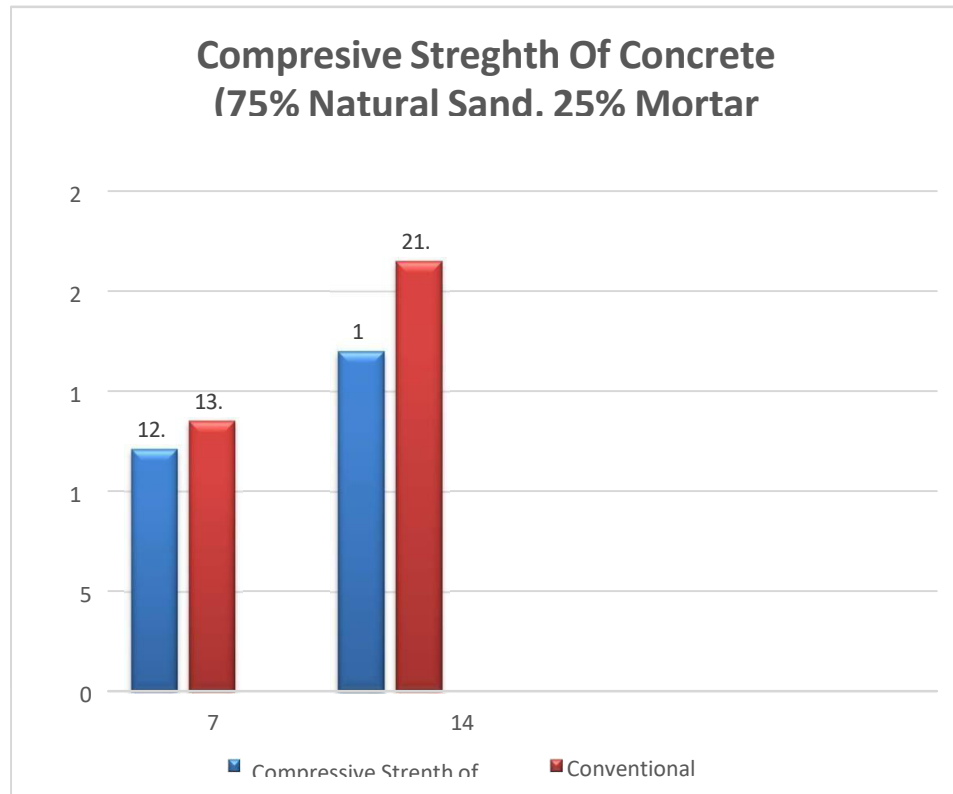


Figure.4 Compressive Strength of Concrete In 7,14 Days

Discussion: After replacing 50% natural sand by mortar crush sand.
From above figure we get the compressive strength after 7 days curing is 12.1 Mpa And after 14 days curing, we get

IV. CONCLUSION

This study investigates the compressive strength of concrete made up of granite aggregate & mortar waste sand from this the following conclusion can be drawn:

1. When we replace granite with aggregate it has been observed that after 7 days curing compressive strength of concrete is 3% more than conventional concrete, after 14 days curing compressive strength of concrete is approximately equals to conventional concrete.
2. We can proffer replacement of 25 to 50% aggregate with granite.
3. Partial replacement crush waste mortar sand results in 5 to 10 % decreased in compressive strength of concrete therefore it is not recommended.

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