EXPERIMENTAL INVESTIGATION ON WASTE FOUNDRY SAND WITH RECRON FIBRE IN REINFORCED CEMENT CONCRETE.

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ABSTRACT

The consumption of natural resources in construction has increased from decades, which is the result of high cost. , construction industries have already identified alternatives like manufactured sand, robo sand, rock dust etc. Another alternative to this can be use of waste material in concrete to overcome the use of natural resources use of waste material like foundry sand in concrete could be make possible to achieve the low cost construction. This paper is based on the Experimental investigation on waste foundry sand with recron fibre in Reinforced Cement Concrete. The detail study about the waste foundry sand is a waste material obtained from ferrous and non-ferrous metal casting industries. and properties of the materials are determined by various tests and the mix proportion standard specimens will be casted and cured for 28 days to get the compressive strength, flexural strength and split tensile strength. In this process Recron fibre is comonomer special for(improved holding of cement aggregates ,Tensile strength :4000-6000 kg/cm2, Melting point > 250oC) also fibres are uniformly dispersed which has better properties to resist internal stress due to shrinkage. Also reduces segregation and bleeding Then the final result is evaluated by comparing the above strengths of reinforced concrete filled with waste foundry sand and Recron fibre

KEYWORD *: waste foundry sand, compressive strength test, split tensile test, flexural strength test*

1. INTRODUCTION

The utilization of sand as fine aggregate in the construction industry has increased by an alarming rate construction industries have identified alternatives like manufactured sand, robo sand, rock dust etc. Another alternative to this can be use of waste material in concrete. Waste foundry sand is a waste material obtained from ferrous and non-ferrous metal casting industries. In foundry industries sand is recycled and reused many times for the purpose of casting .The incorporation of such material in concrete can help to reduce the disposal concerns of waste foundry sand, and also makes concrete production economical .The raw sand is normally of a higher quality than the typical bank run or natural sands used in fill construction sites fibres are uniformly dispersed which has better properties to resist internal stress due to shrinkage. Also reduces segregation and bleeding . This leads to better strength and reduced permeability which improves durability

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1.1 LITERATURE REVIEW

Experimental study of , "Go-Recron fibre Reinforced concrete with foundry sand as a partial replacement of fine aggregate "by Basil Kanneth et.al. (2018)

Experiment is carried out on M25 grade concrete.The value of compressive strength obtained maximum on the addition 50% replacement of foundry sand and Recron fibre in 1% the strength obtained on 7 days was 33mpa and 28 days 46.2mPa. In replacement of 50% foundry sand and recronfibre in 1% the split tensile strength obtained 7.24N/mm2 for 28 days and 2.24N/mm2 for 7days.In replacement of 50% foundry sand and recronfibre in 1% the flexural strength obtained for 28days 9N/mm2 and 6.2N/mm2 for 7days.

A study on "Partial replacement of sand by wastefoundry sand". by KrishnaB Dave et.al.(2017),

Experiment is carried out on M20 grade concrete. maximum compressive strength is obtained at 10% and 20% replacement of fine aggregate by waste foundry sand

Experimental study of A Review study on Utilization of Wastefoundry sand by Gurpreet Singh et.al., (2011)

This paper performed experimental investigations to evaluate the strength and durability properties of concrete mixtures, in which natural sand was partial replaced with (WFS). From the results, it was found that 28 days compressive strength increased by 8.25%, 12.25%, 17% and 13.45% for mixtures M-2(5% WFS), M-3(10% WFS), M-4(15% WFS) and M-5(20% WFS) respectively than control mixture M-1(0% WFS)

2. PHYSICAL PROPERTIES

Table-1:

S.NO	MATERIALS USED	SPECIFIC GRAVITY
1	Fine Agregate	2.6
2	Coarse Aggregate	2.7
3	Waste foundry sand	2.58
4	Cement	3.15

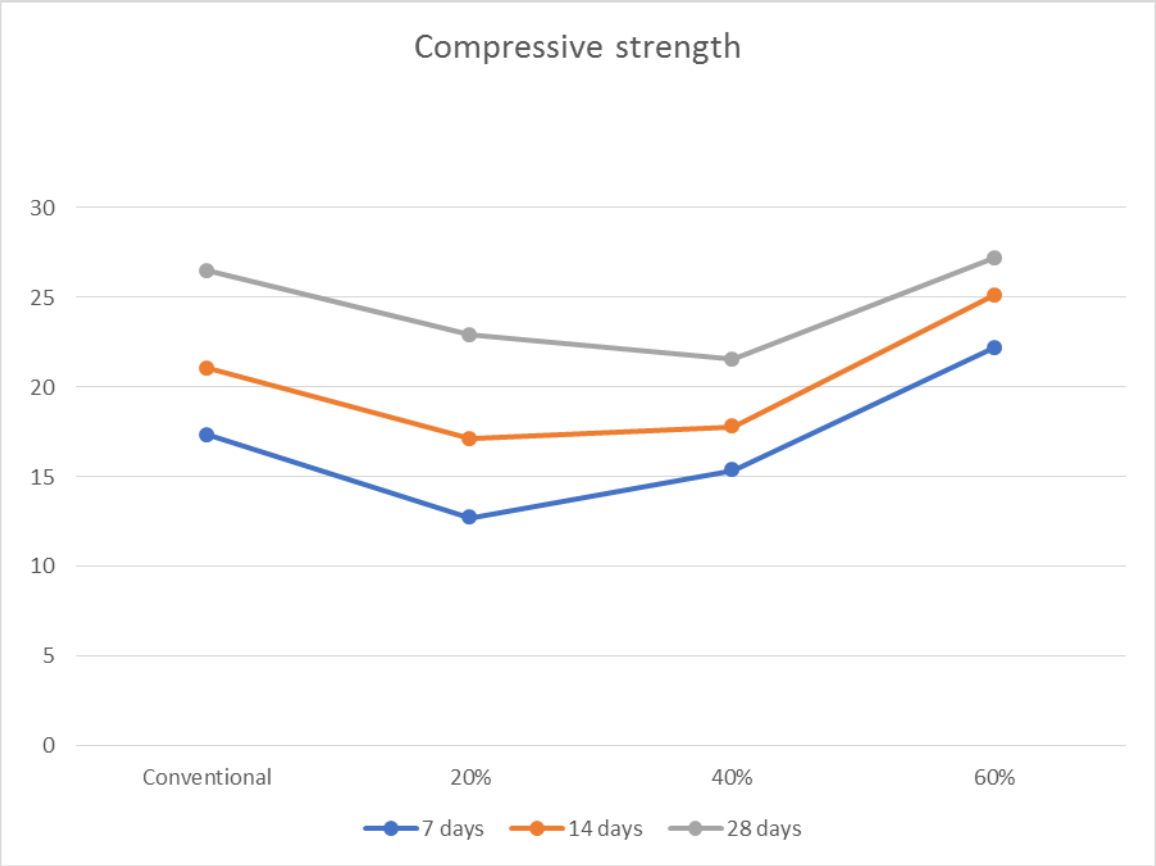
3. EXPERIMENTAL AND TESTING

- Compressive strength test
- Split tensile test
- Flexural test

3.1 COMPRESSIVE STRENGTH ON CUBE TEST

There are four proportions used in the mixing of concrete. Compressive test is carried out on specimen cubical in shape. The cube specimen is of size 150mm *150mm*150mm is used.

3.1.1 Comparison b/w 7 days, 14 days & 28 days & Graphical Representation

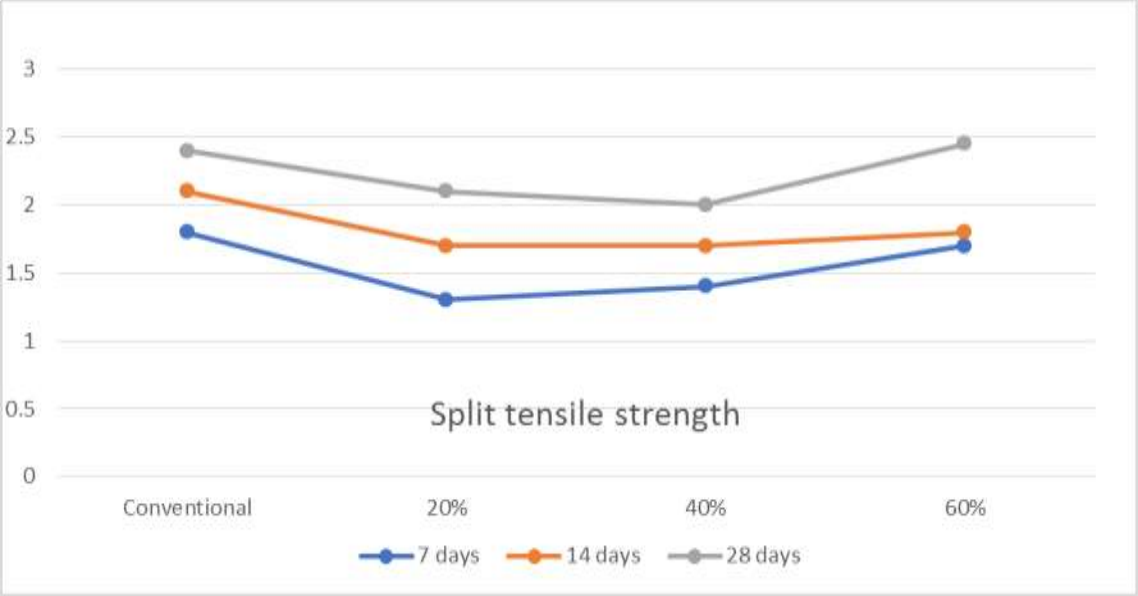


Maximum compressive strength @ 60% replacement

3.2 SPLIT TENSILE TEST

There are four proportions used in the mixing of concrete. Spilt tensile is carried out on specimen cylindrical in shape. The cylindrical specimen is of size 150mm *300mm is used

3.2.1 Comparison b/w 7 days, 14 days & 28 days & Graphical Representation

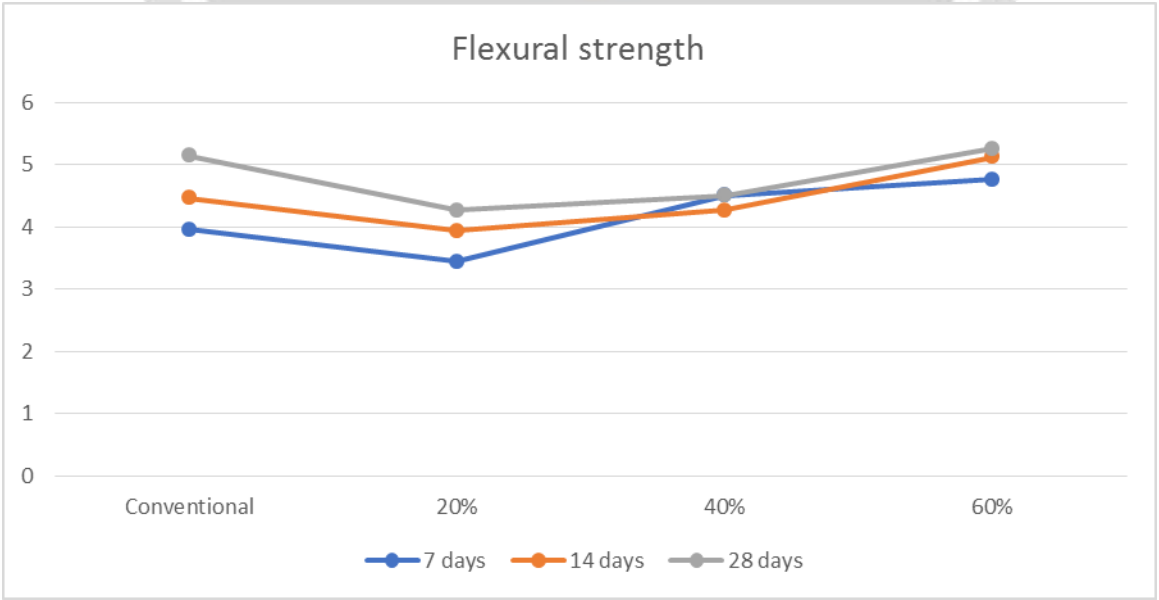


Maximum split tensile strength @ 60% replacement

3.3 FLEXURAL STRENGTH TEST

Similarly it is found that the flexural strength is also in the phase of 60% replacement of waste foundry sand. The maximum strength has been achieved at 60% replacement with waste foundry sand and conventional concrete

3.3.1 Comparison b/w 7 days, 14 days & 28 days & Graphical Representation



Maximum flexural strength @ 60% replacement

4. CONCLUSIONS.

From the above test results it is concluded that the Compressive strength, Split tensile strength and Flexural strength of the Conventional concrete with waste improved holding of cement aggregates, Tensile strength . . Hence in future it is advised to use 60% replacement of wastefoundry sand and 1% of Recron fibre for M30 grade concrete to get good results also reduce environmental disposal problems of waste foundry sand.

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