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AN EXPERIMENTAL STUDY OF PARTIAL REPLACEMENT OF CEMENT BY WOOD PULP

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Abstract – *The use of wood pulp in concrete formulations was investigated as an alternative to landfill disposal. The cement has been replaced by waste wood pulp accordingly in the range of 10% to 30% by weight for M50 mix By using adequate amount of wood pulp in replacement of cement in concrete and tested for various test*

As a result compressive splitting tensile and flexural strength are optimum at 10% replacement at 28 days curing period..

Key Words: **wood pulp, cement replacement, M50 mix, landfill disposal, compressive strength etc.**

1. INTRODUCTION

Chemical and agricultural industrial processes produces over 300 million tones of industrial waste per annum in India. This material produces health hazards and many other problems . The raw wood pulp contains silica and calcium oxide followed by alumina and magnesium oxide . Wood pulp used in partial replacement with cement exhibit a smaller reduction than the control cement.

1.1 WOOD PULP

Wood pulp behaves like cement because of silica and magnesium properties and improves the setting of the concrete. Wood pulp provide adequate strength to concrete.

It saves costs when used partial replacement with cement in concrete. It reduces the problem of landfill disposal when used in concrete.

1.2 MATERIALS AND MIX PROPORTIONS

Ordinary Portland cement, wood pulp, fine aggregate, coarse aggregate, water, admixture.

The coarse aggregate used were crushed stone passing through 20mm and retaining on 12.5mm IS sieve with a specific gravity of 2.67.

2. CASTING AND TESTING

Before casting moulds are oiled then concrete is filled into moulds and compacted in three layers so as to remove voids. Then moulds are placed on vibrator for proper compaction and for filling the voids.

After curing for 3 days, 7 days , 28 days the various tests are taken for compressive strength , split tensile strength, and flexural strength.

Table -1: COMPRESSIVE STRENGTH

COMPRESSIVE STRENGTH N/mm2			
DAY	**WP 10%**	**WP 20%**	**WP 30%**
3 D	25.36	21.36	19.36
7 D	32.18	31.24	28.36
28 D	49.18	46.67	42.13

Above are the results of the compressive strength of cube which was taken at three days, seven days, and twenty eight days.

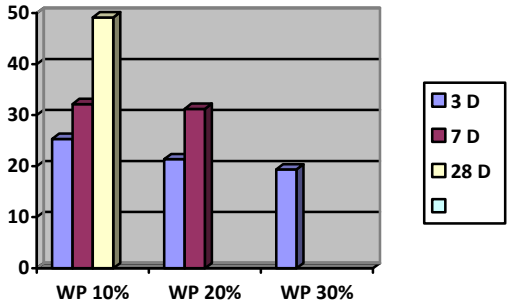

Chart 1 – compressive test

FIG 1 –COMPRESSIVE TESTING MACHINE

3.CONCLUSIONS

1. Optimum results are obtained at 10% replacement of cement by wood pulp.
2. Compressive strength decreases when cement replaced by wood pulp.
3. As wood pulp percentages increases compressive strength and split strength decreases.
4. Use of wood pulp in concrete can save the paper industry disposal costs and produces a 'Greener' concrete for construction.

REFERENCES

1. I. Demir, M.S. Baspinar , and M. Orhan, Utilization of kraft pulp production residues in clay brick production, *J. of Building and Environmental*, *Vol. 40*, 2005, pp. 1533–1537.
2. A. Hassani, H. Ganjidoust and A.A. Maghanaki, Use of plastic waste (polyethylene terephthalate) in asphalt concrete mixture as aggregate replacement., *J. of Waste Management and Research*, *vol. 23*, 2005, pp. 322-327.