

EXPERIMENTAL INVESTIGATIONS ON PROPERTIES OF CONCRETE WITH PAPER SLUDGE AS SELF CURING AGENT

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ABSTRACT

In the past, most of the structures were made either in masonry, steel, or timber depending on the availability of material and the nature of work. Concrete is a homogeneous mixture of cement, sand, gravel, coarse aggregate and water. Concrete is strong in compression and weak in tension and also it is very strong in carrying flexural force. By the judicious use of available concrete materials and their proportions in the fresh and hardened stages, concrete maintains their strength and durability due to adding various admixtures and curing agents.

Keywords : Paper Waste, Paper sludge, concrete maintains their strength and durability, admixtures and curing agents.

1.CURING AND SELF CURING

Curing of concrete can be compared with a baby as follows, when concrete is born? When you place fresh concrete? Where you want it to live out its life? - It's like a baby; concrete is very sensitive and easily ruined. If you take good care of it, when it's young it will grow up to be a strong and reliable adult. Curing is all of the things that we do to keep our concrete wet and durable during the first week; maintain the proper temperature and dampness. I know, most babies prefer to be dry but, concrete likes being difficult. Curing is easy to skip in the instant but that will have a major impact on the quality of your finished work.

1.1 PAPER WASTE

Wastes are important from different points of view. It helps to save and sustain the natural resources which are not replenished; it decreases the pollution of the environment and it also helps to save and recycle energy in production process. The productive use of waste material represents a way of solving some problems of solid waste management. Wastes and industrial by-products could be valuable materials as alternative resources for building and construction and other applications.

1.2 PAPER SLUDGE

The produced wastes are of organic and inorganic origin, some of them with re-use potential. Two of these wastes, named as dregs and grits, are still sent for landfill disposal. Different salts are presenting their composition coming from the pulp and paper mill process. Paper mill sludge is a major economic and environmental problem for the paper and board industry. The material is a by-product of the de-inking and re-pulping of paper. The main recycling and disposal routes for paper sludge are land-spreading as agricultural fertilizer, incineration in CHP plants at the paper mill, producing paper sludge ash, or disposal to landfill.

2. LITERATURE REVIEW

Concrete with self curing agents is an innovative one in recent years. Attempt was made to collect the available literature on concrete with various self curing agents. A brief review of the same is presented in this chapter.

2.1 STUDIES ON CONCRETE WITH VARIOUS SELF CURING AGENTS

K. Kovler et al (1999) in there experiment a statistical approach was employed to develop formulation which could adequately describe the relations between splitting tensile strength and the concrete composition, when cured in two different regimes: water curing at 20⁰C and sealed curing at 30⁰C autogenously shrinkage was induced in the second type of curing but was largely eliminated in the first one.

3. METHODOLOGY

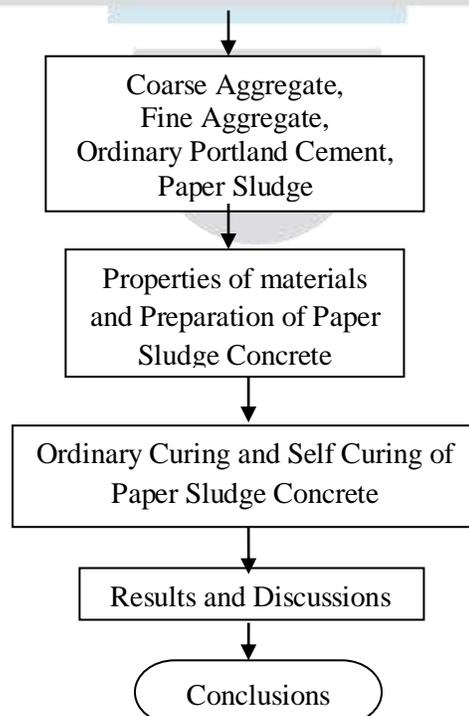


chart representation of paper sludge concrete

4. RESULTS AND DISCUSSIONS

COMPRESSIVE STRENGTH

The compressive strength of concrete with paper sludge as a self curing agent by means each normal curing and self curing specimens were tested at the age of 3days, 7days and 28 days. The results were shown in Table 5.1.

Sludge ratio	Compressive Strength (N/mm ²)					
	Normal Curing			Self Curing		
	3 days	7 days	28 days	3 days	7 days	28 days
1:7	9.20	15.82	18.30	6.67	12.90	15.90
1:9	9.84	16.28	22.05	6.69	13.26	17.85
1:11	11.38	16.90	25.60	7.75	15.80	21.73
1:15	12.36	19.70	29.19	10.97	16.34	23.66

5.

CONCLUSION

- ❖ Utilization of paper sludge as internal curing agents results in good strength.
- ❖ The compressive strength of 1:11 and 1:15 was effective than the other two ratio. The result of 1:15 ratio gives result for self curing at a maximum of 23.66 N/mm² compared to the other two ratios the consistency and initial setting time of 1:7 and 1:9 has been increased in the paper sludge concrete and also there is a minimum strength loss.

6. REFERENCES

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