

Experimental Studies on Utilize the Dry Precipitate as Fine Aggregate in Concrete

B. Sivanandhini
Assistant Professor
CK College of Engineering
and Technology
Tamil Nadu, INDIA
sivanandhini.structural@gmail.com

K. Krishna Devi
Assistant Professor
CK College of Engineering
and Technology
Tamil Nadu, INDIA
Krish18111988@gmail.com

Abstract:-In recent decades, disposal of dry precipitate have been an important problem of sewage treatment plants due to environmental restrictions. Some investigations performed on application of these materials in construction materials especially concrete mix designs. Dry precipitate is regarded as the residue produced by the wastewater treatment process, during which liquids and solids are being separated. The constituents removed during treatment include grit, screenings and precipitate. The dry precipitate is by far the largest in volume, it is handling methods and disposal techniques are a matter of great concern. To Study the compression behavior of concrete by replacing of 0, 5, 15 and 20% in M₂₅ grade of concrete to analysis this thesis on effect of concrete at various category tests with respect to compressive strength, flexural test and tensile strength at different stages of curing 7 and 28 days will be analyzed.

I. INTRODUCTION

Waste is an inevitable consequence of human activity. The most important problem related to waste is pollution of environment. Dry precipitate is generated from the industries. In India, there are many industries produced waste material, resulting in an increasing of precipitate which in turn increases problems to disposal. There are three methods for disposal of dry precipitate including landfill, incineration and to use as fertilizer. Since land is limited, alternative technologies to dispose of treated precipitate are essential. Incineration may be a profitable alternative technology of disposal but the final disposal of a huge quantity of dry precipitate ash would pose another problem. Environment Organization prohibited the use of dry precipitate as fertilizer due to dangers of heavy metals is presents. Due to these limitations, high volumes of dry precipitate have been produced and collected. Therefore, this study was conducted to investigate the feasibility of using the treated precipitate for making concrete. In recent decade, disposal of dry precipitate by applying in concrete proposed by some researchers.

II. NEED FOR STUDY

The experimental investigations are planned to use effluent treated dry precipitate as fine aggregate as it will reduce the cost of construction. Usage of huge amounts of waste material places strain on landfill site .To minimize the concrete industry uses vast amounts of natural sand as fine aggregate. To present preliminary laboratory experiments as well as the future research to be performed to investigate the performance of dry precipitate. On the basis of identified knowledge, an initial laboratory investigation was conducted, to provide an economical concrete. Minimize the maximum demand for sand.

III. METHODOLOGY

The properties of the materials that were used for casting the specimens, various laboratory tests were performed according to the codes IS 2386:1963 and IS 383:1970. Design mix concrete of M₂₅ grade was prepared with conventional concrete specimens and mixing is done manually. Concrete cubes of 150x150x150mm with 0, 5, 15 and 20% replaced by treated dry precipitate were prepared.

IV. TEST RESULT

The cube compression test conducted on the concrete cubes shown in Table.1 and test results graphically shown in the Fig.1

S. No	Replacement of Dry Precipitate (%)	Compressive Strength N/mm ²	
		7 days	28 days
1	0	17	25
2	5	18.3	25.47
3	15	14.48	22.61
4	20	14.71	21.91

Table.1 Compression Test Results

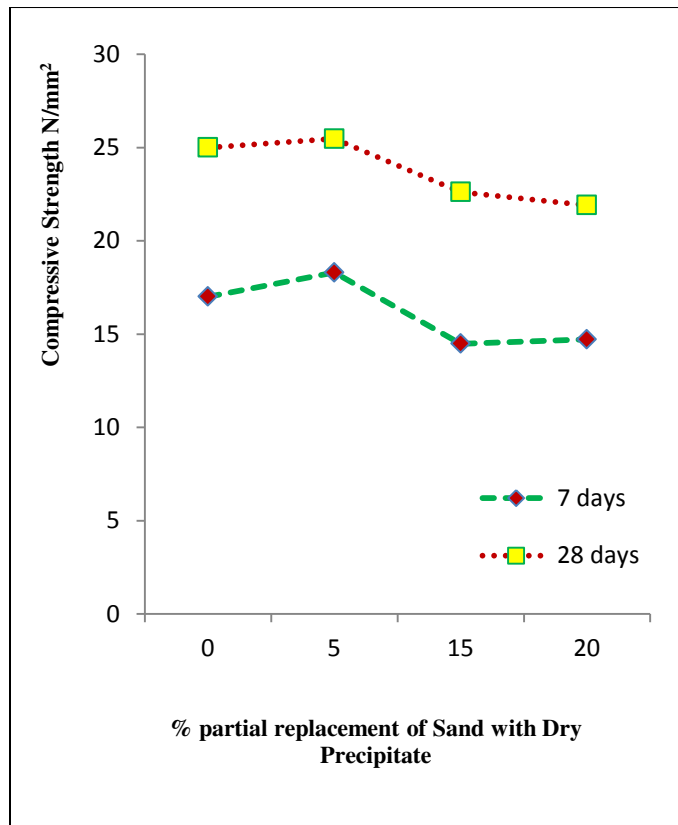


Fig.1 Compressive Strength of Dry Precipitate in Concrete

V. CONCLUSION

Based on the test results of compressive strength, the following conclusions were given. The research analysis experimentally establish by means of used as a partial substitute for natural source in concrete, studied the compression behavior of concrete by replacing of 0, 5, 15 and 20% in M₂₅ grade of concrete to analyze in this thesis on effect of concrete tests with respect to compressive strength at different stages of curing 7 and 28 days will be analyzed. It was resulted that using dry precipitate decreases considerably concrete strength. However, due to importance of disposal of this hazardous material, the method seems to be valuable for more considerations. It has been observed that, slightly increased the compressive strength when compared to control concrete and decreased were added. This studied aims to evaluate the effects of adding the dry precipitate to mass concrete on the basis of economical, technical and environmental issues was selected.

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