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HUMAN ASH AS A REPLACEMENT FOR CEMENT IN CONCRETE

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ABSTRACT

Concrete is generally used as a construction material today in any structure. Increase in construction activities has lead to an increase in demand for various raw materials in concrete. This lead to researchers to focus on the use of alternate materials as ingredients in the concrete that is in no way inferior to the normal materials used in concrete. By partially replacing the ingredients with different proportions the strength of concrete can be determined. In recent years there has been a great deal of interest and support worldwide in utilizing Environmental pollutant material as a replacement for cement so that they can reduce the environmental pollution the ingredients like Fly Ash, Silica fume, Quartz dust and Risk husk are used but in our current project we are using Human ash as a replacement for cement for known percentage for the grade of M_{20} grade concrete.

Keywords: *Human Ash, concrete and Compressive strength.*

I. INTRODUCTION

The growing concern of resource depletion and global pollution has challenged many researchers to seek and develop new materials relying on renewable resources. These include the use of by-products and waste materials for building construction. The high cost of regular building materials is a central point influencing development in India. In creating nations where plentiful rural and modern Waste are released these include the use of by-products and waste materials for building construction. Therefore an attempt has been made in this study to utilize the Human Ash as a partial replacement for cement and also to reduce the environmental pollution.

Why use of human ash

The Ash obtained after the burning of Human body is called Human Ash. The (National green turbinal) the green panel said the traditional means of cremation caused adverse impact on environment and dispersal of ashes in the river led to water pollution. The NGT was hearing a plea by advocate DM Bhalla who had said that cremation of humans by conventional methods added to air pollution, therefore, alternative modes of cremation needed to be used.

Bhalla contended that cremation of human remains by traditional method involving wood has serious impact on the environment as 'the forest cover is sacrificed and obnoxious gases emanated from the burning of human mortal remains pollute the air'. So Electronic cremation is used to reduce air pollution but the main thing is disposal of Human ash and it can not be disposal in water which lead to water pollution so the other alternative is to dispose by burying ashes but it is also consider as un safe due to the following reason we learned that burying ashes in concentrated amounts will have harmful effects on the environment. This is due to the fact that the pH level of the cremated ashes is extremely high and will not allow for the natural release of the good nutrients within the cremated ashes.

In addition, cremated ashes also contain sodium in amounts that range from 200 to 2000 times what plant life can tolerate. We know the detrimental effects of sodium on the human body. Plant life is no different.

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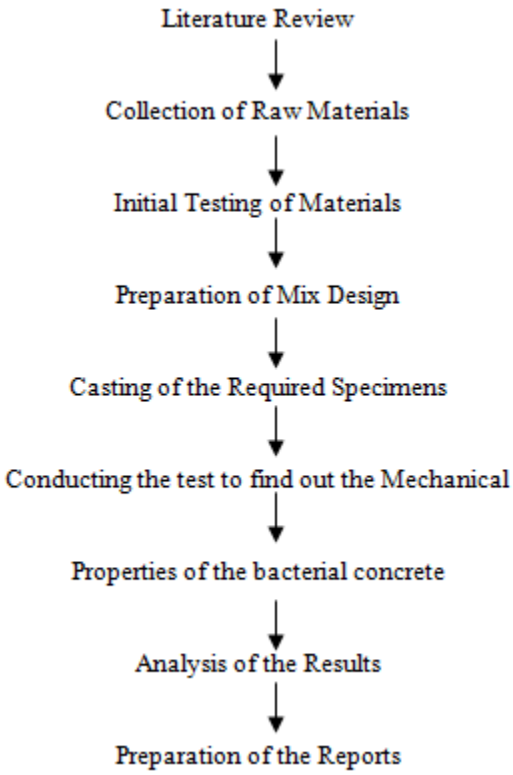
These high pH and sodium levels are the two main reasons why burying ashes is toxic to plant life. During research, it was discovered that regular soils and potting soils alone cannot address the toxic effects of cremated ashes. So we are using the ashes in concrete as an alternative ingredient to cement.

II. METHODOLOGY



III. MATERIALS

The following are the particulars of the materials used for concrete making.
3.1 Cement: The cement used has been tested for various properties as per IS: 4031-1988

Table 1. Physical Properties of O.P.C (Ordinary Portland cement)

S. No	Property	Test Method	Test Result
1	Initial Setting time	Vicat apparatus (IS 4031-Part 5)	42 min
2	Normal Consistency	Vicat apparatus (IS 4031-Part 4)	33 %
3	Fineness	Sieve test on sieve no.9 (IS 4031-part11)	7% Residue

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4	Specific Gravity of Cement	Specific gravity bottle	3.05
5	Final setting time	Vicat apparatus	308min

3.2 Coarse Aggregate : The coarse aggregate of 20mm and down size, having a specific gravity of 2.73 and a fineness modulus of 4.23, tested as per IS:2386-1963 is used.

Table 2 Physical properties of Coarse Aggregate (20mm)

S. No	Property	Test Method	Value
1	Fineness modulus	Sieve analysis (IS 2386-1963 Part 2)	4.23
2	Specific gravity	Pycnometer (IS 2386-1963 Part 3)	2.73
3	Bulk density (kg/m3)	(IS 2386-1963 Part 3)	1340

3.3 Fine Aggregate: Natural river sand with specific gravity of 2.63 and confirming to IS: 383 zone II is used. The sand was tested as per IS: 2386 (Part III) -1963.

Table 3.Physical properties of Fine Aggregate

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S. No.	Property	Test Method	Value
1	Fineness modulus	Sieve analysis (IS 2386-1963 Part 2)	3.13
2	Specific gravity	Pycnometer (IS 2386-1963 Part 3)	2.63
3	Bulk density (kg/m^3)	(IS 2386-1963 Part 3)	1830
4	Water absorption	(IS 2386-1963 Part 3)	1.02%

3.4 Water: Locally available portable water confirming to standards specified in IS: 456-2000 is used.

3.5 Human Ash: Human Ash is sieved and all the bones and waste material are removed. The powder form collected which is retaining in pan is used for the experiment.

IV. RESULTS AND DISCUSSIONS

Mix Design for M_{20} grade concrete (1:1.5:3)

4.1 Compressive Strength Test
The cubes are tested after 7 days, 14 days and 28 days and the compressive strength of the cubes have been carried out by using compression testing machine.

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Figure 1. Compression testing machine

4.2 Experimental Analysis

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S.NO	% of Human Ash replacement	Age of concrete		
		7days	14 days	28 days
1	0	15.28	20.60	23.54
2	5	15.39	21.05	23.48
3	7.5	16.41	21.96	24.15
4	10	15.23	21.19	23.86
5	12.5	14.53	20.09	22.73

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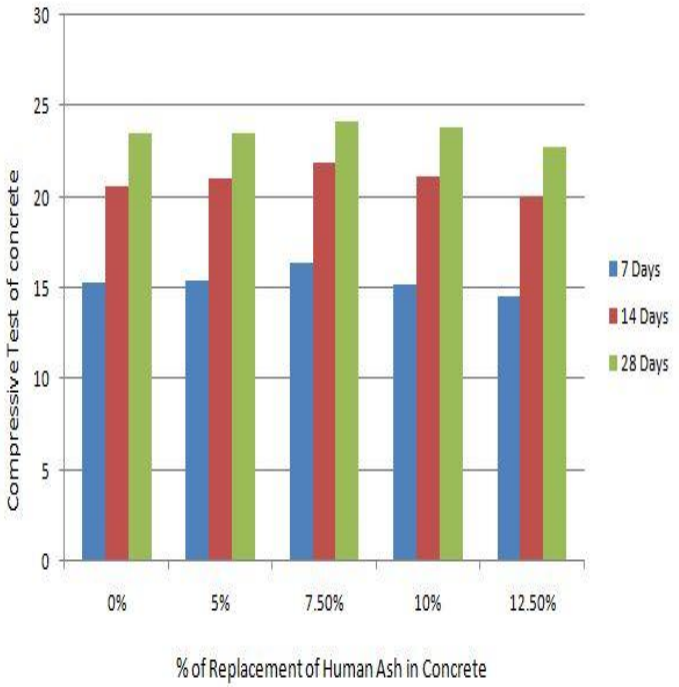

Figure 2. Graph showing the cube compressive strength

V. CONCLUSION

1. Human Ash is used as a replacement for cement
2. At 7.5 % replacement of Human Ash powder the strength of concrete is **24.15 N/MM^2** Which is higher than the Normal concrete.
3. Cementation by this method is very easy and convenient for usage. This will soon provide the basis for high quality structures that will be cost effective and environmentally safe but, more work is required to improve the feasibility of this technology from both an economical and practical viewpoints.
4. The greatest improvement in compressive strength occurs at % of Human Ash replaced cement.
5. Durability of the structure is maintained.

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