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BUBBLE FILLED CONCRETE

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Abstract – *Bubble-filled concrete is a special type of Concrete filled with bubbles. This project aims to reduce the quantity of concrete and reduce the self-weight of structural elements. It also reduces the load from structure members to the foundation, So that the foundation size will be reduced. The cost of the project also will be reduced. The 7, 14, 28 days compressive strength of conventional concrete will be compared with bubble –filled concrete.*

***Key Words*: Bubble-filled, self-weight, quantity, foundation, size cost**

1. INTRODUCTION

From the olden days has been used in the manufacture of cement, sand and coarse concrete. This type of concrete is heavier. In addition, steel will increase the weight of the concrete. The load coming from the structural elements to the foundation will be higher. The foundation will be designed for that high load. Due to which the size of the basement will increase. The cost will increase. Bubble-filled concrete reduces the amount of usage of concrete. Due to that, the self-weight of concrete will be reduced. Foundation size and construction cost will be reduced.

1.1 OBJECTIVE

Foremost objective of this paper is

1. To reduce the self-weight of concrete.
2. To attained the same strength of the conventional concrete or higher than the conventional concrete.

2. MIX DESIGN

M30 grade of concrete (0.45: 1: 1: 3)

2.1 MATERIAL REQUIRED

1. Cement
2. Fine aggregate
3. Coarse aggregate
4. Water
5. Bubbles

a. Cements: - The cement used for the experimental investigation was ordinary Portland cement of 53 grades has sieved by 90µ. Specific gravity of cement is 3.07.

b. Fine Aggregate: - 4.75mm sieved fine aggregate was used. Specific gravity of fine aggregate was 2.60.

c. Coarse Aggregate: - crushed coarse aggregate 20mm size was used. Specific gravity of coarse aggregate was 2.62 and water absorption was 1.835.

d. Water: - Acid free and no organics presented water has used.

e. Bubbles: - 42mm size polyethylene balls were used.

Fig -1: polyethylene balls

2.2 PREPARATION OF S SPECIMENS

The 150*150*150 mm specimen was used for compressive strength test. Totally 3no's of cubes were casted.

Fig -2: Mixing of concrete

The materials were taken as per mix Propotion and miexd well in dry condition.The required amout of water is added gradually. 150mm mould were greased well. The concrete was placed in three layers.At the end of each layer, the polyethylene balls were placed. Each layer has 9 polyethylene balls.

Fig -3: polyethylene balls placed in cube and finishing of cubes

2.3 CURING:

The cubes were placed on the curing tank for 7, 14, 28 days curing process.

2.4 TESTING:

2.4.1 COMPRESSION TEST:

After 7, 28 days curing the cubes were tested in a compression testing machine.

Fig -4: Compression testing

Fig -5: Compression testing

Fig -6: Compression testing

Table -1: Compressive strength of conventional cube

Compressive strength		
Days	Compressive strength	
	kN	MPa
7 days	500	22.22
14 days	625	27.77
28 days	710	31.55

Table -2: Compressive strength of bubble-filled cube

Compressive strength		
Days	Compressive strength	
	kN	MPa
7 days	580	25.77
14 days	660	29.33
28 days	770	34.11

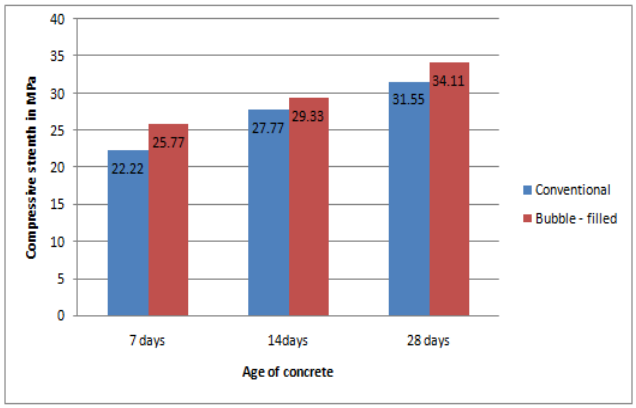

Chart -1: compressive strength comparison

3. CONCLUSIONS

From this experimental investigation, the compressive strength of bubble filled concrete has higher strength than the conventional concrete. And also reduce the weight of concrete by 6.2%.

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