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Experimental study on light weight foamed concrete

Aswathy M*
Department of Civil Engineering, Bharath University, Chennai-600073
***Corresponding author: E-Mail:aswathy_m@mail.com**

ABSTRACT

Smoldered Brick is one of the imperative development material in the nation. The nation is presently more on looking for natural answers for greener environment. Froth (foam) has great warm and acoustic properties and is additionally ice safe. Foamed cement is the most well-known of all low-thickness cements in creating nations.. The utilization of Light-weight Concrete squares gives an appropriate answer for development industry alongside natural conservation. It is created by at first making slurry of Cement + Fly Ash + Water, which is further blended with the expansion of pre-frothed stable froth in a customary solid blender under surrounding conditions. In this paper endeavor to made configuration blend are readied for 4", 6", and 8" of solid piece. This paper demonstrates the outcome on advancement of concrete.

KEY WORDS: Experimental, Foamed, Greener Environment.

1. INTRODUCTION

Concrete is a standout amongst the most broadly utilized development materials as a part of the world today. It is made by blending little bits of common stone (called total) together with a mortar of sand, water, Portland bond and potentially other cementation materials. Appropriately outlined and built, solid structures contrast positively with respect with economy, strength and usefulness with structures produced using other auxiliary materials, for example, steel and timber. One of the upsides of cement is that it is promptly formed into for all intents and purposes any required shape. Cement is the picked constructing material for a huge scope of structures, scaffolds and structural designing structures. Rather than standard cement permeable lightweight total of low particular gravity is connected in this lightweight cement. High porosity is one of the primary normal for this lightweight total which brings about a low particular gravity.

2. MATERILAS AND METHODS

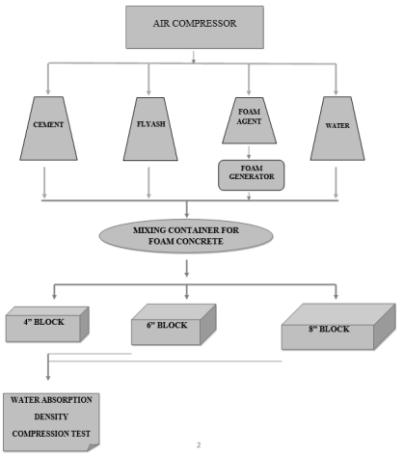


Figure.1. Flow chart showing the formation of foam concrete


Figure.2.Water absorption test


Figure.3. Density test

The following test were carried out for testing block

Block test: First mould should be prepared and lubricant oil is applied in a slender layer to the internal surface of the mould to avoid reaction between the mould and the sample. Then the mould is overfilled with sample in three layers. Sample should be compacted using steel rod with 35 strokes. Compaction should be done continuously. Continue with the third layer and repeat the same compaction step. After that, smooth off by drawing the flat side of the trovel (with the leading edge slightly raised) once across the top of each cube. Loading is aggrevated at a uniform increment; 15 Mpa/min (2200Psi/min) – BIS 1881: Part 4: 1970.

Absorption test: The samples ought to be dried at 105°C ± 5°C for 72 ± 2 hr and example is cooled for 24 ± ½hr in an impenetrable vessel. Water over the top surface is inundated for 30 ± ½ minutes. In the wake of uprooting the example, it is dried utilizing a fabric to evacuate free

Density test: Weight of the sample is taken using weighting scale and average weight of the 3 samples is taken.Density of the sample is the ratio of average weight of the sample to the volume of the sample.[22]

Design Mix For Foam Concrete Block is as follows Ratio (1:2.5:0.25:1.2)

4” block	=	Length - 0.5 m, Breath - 0.2 m, Depth - 0.10 m
6” block	=	Length - 0.5 m, Breath - 0.2 m, Depth - 0.15 m
8” block	=	Length - 0.5 m, Breath - 0.2 m, Depth - 0.20 m

Figure.4. Block arrangement

These are the various steps for the process of foam concrete block

STEP 1: Initially prepare the mould for concrete block to pouring, this process depend upon the sizes of concrete blocks.

STEP 2: To avoid the combination of concrete with sheet mould using the chemical of mould releasing agent.

STEP 3: To set the air compressor for the percentage of cement and fly ash for the mixing proportion.

STEP 4: To set the foam percentage in seconds to the fender panel and its dilute with water in ratio of (1: 40 to 50) in using of foam generator foam getting complete mix.

STEP 5: Then the cement, fly ash, foam and water completely mixed in the mixing container up to 3 to 5 minutes.

STEP 4: Then the mixing foam concrete is prepared for pouring blocks.

STEP 5: Prepared foam concrete produce to the mould.

STEP 6: Finally level the poured concrete on mould using the rubber pad.

STEP 7: After leveling the concrete block.

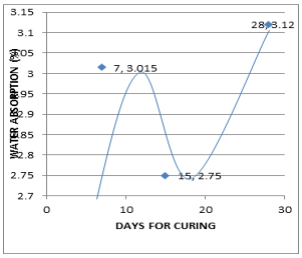
STEP 8: During the demoulding process to remove the all sheets in mould. Then the blocks are arranged seriously.

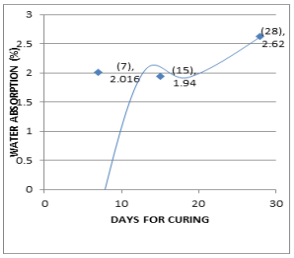
STEP 9: The block is ready to test procedure.

Figure.5.Container


Figure.6.Demoulding process

3. RESULTS





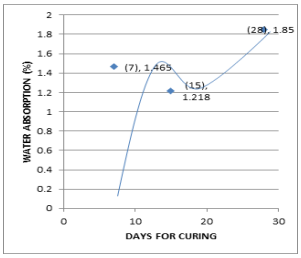
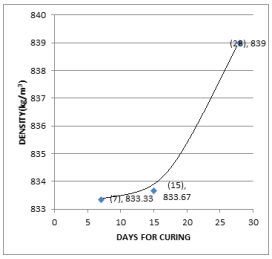


Figure.7,8,9.Water absorption test for 4"6" 8" block



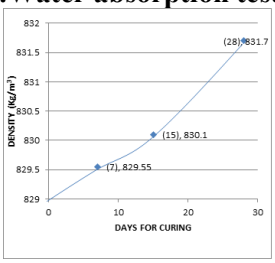


Figure.10,11.Density Test For 4, 6" Block

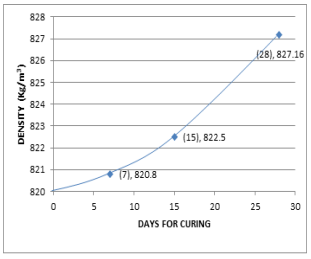
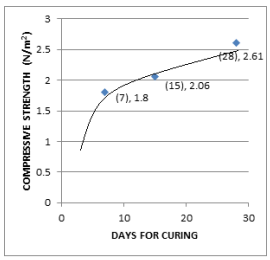


Figure.12.Density test For 8" Block



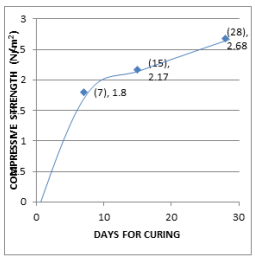


Figure.13,14.Compressive Strength OF 4" BLOCKS

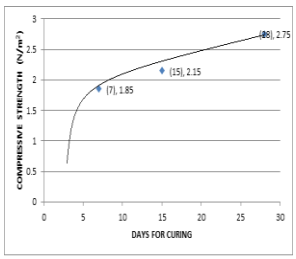


Figure.15.Compressive Strength OF 4" BLOCKS

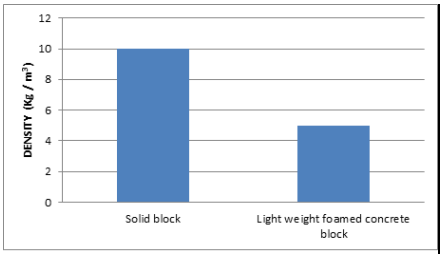


Figure.16. Comparison between solid block and foamed concrete block

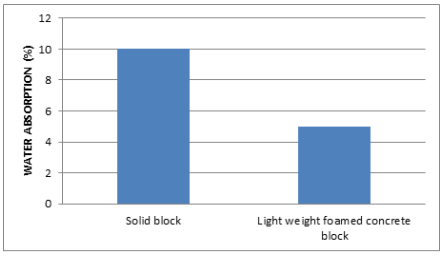


Figure.17.Comparison between solid block and foamed concrete block water absorption

DISCUSSION

In the density of the foam concrete blocks generally varies with the different sizes. The conclusion block density results, 4", 6", 8" blocks have weight respectively 8.33 kg, 12.44 kg, and 16.42 kg. The design load of concrete prepared by the 2.5 N/m. Therefore the compressive strength of the concrete also depends on the loads and sizes of the blocks. The loads verify the strength of the concrete block using area of the blocks. In the optimum moisture content is mainlyless than 5 percent in the foam concrete block. The moisture content varies from the different sizes of the concrete blocks.

Before tecting the sample specimen, it is to be cures at different time durations namely 7,28,90 days respectively. The foam required for three densities of foamed concrete 800, 1250 and 1500 kg/m3. For a given density, an increase in fly ash content of the mix results in increased strength. The water absorption for the 4" block leading with their days of curing 7, 15, 28 days respectively 3.015%, 2.750%, 3.120 %.6" blocks having the days of curing 7, 15, 28 respectively 2.016 %, 1.940 %, 2.620 %.8" blocks having the days of curing 7, 15, 28 respectively 1.465 %, 1.218 %, 1.850 %.The density for the 4" block leading with their days of curing 7, 15, 28 days respectively 833.33 kg/m^3,833.67 kg/m^3,839.0 kg/m^3.The density for the 6" block leading with their days of curing 7, 15, 28 days respectively 829.55 kg/m^3,830.1 kg/m^3,831.7 kg/m^3.The density for the 8" block leading with their days of curing 7, 15, 28 days respectively 820.8 kg/m^3,822.5 kg/m^3,837.16 kg/m^3.The compressive strength of 4" block leading with their days of curing 7, 15, 28 days respectively 1.80 N/m^2, 2.06 N/m^2, 2.61 N/m^2.The compressive strength of 6" block leading with their days of curing 7, 15, 28 days respectively 1.8 N/m^2, 2.17 N/m^2, 2.68 N/m^2.The compressive strength of 8" block leading with their days of curing 7, 15, 28 days respectively 1.85 N/m^2, 2.15 N/m^2, 2.75 N/m^2. The solid block density of 4" block is 1800 Kg / m^3 higher than the foamed concrete block density 833.33 Kg / m^3.And the water absorption capacity of solid block is 10% but the foamed concrete block has less than 5%.

4. CONCLUSION

Increase of strength by day by day process of curing gives better thermal insulation. It have the low labor cost. Foam concrete have an easy handling and low workmanship. It helps in reduction of dead load; increase the progress of building, and lower transport and handling cost. Therefore foam concrete block is environmentally better than the other ordinary concrete blocks.

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