

LIGHT TRANSMITTING CONCRETE

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ABSTRACT

There is more and more development in the civil engineering field the construction of tall building, underground structure, landmark building, etc. The concrete is currently used in water, aggregate. As it is well known traditional concrete has greyish colour. The invention of new building materials is the need of time. In this concrete there is a new material is used to transmit a light through the concrete.

INTRODUCTION

In the ancient time when the concrete was discovered it was a great innovation in the field of construction but it had a dull appearance. To make a concrete aesthetically beautiful it was a great challenge for engineers. . This challenge of energy saving was overcome by the scientist Aron Losonzi. In 2003 he successfully made light transmitting concrete.

In this he used a new material by using optical fiber in the concrete. It is highly used in a building for interior decoration and he prove that how this concrete is very much efficient than conventional concrete. In this concrete we can use the green energy or renewable energy for illuminating the concrete.

BACKGROUND

Up to the year of 2001 many scientist look towards the improvement of structural properties of concrete but no one focus on the dull appearance of concrete. In 2001 the concept of improve the appearance of concrete was introduced by "HUNGARIAN ARCHITECT, ARON LOSONCZI".

And in 2003 he successfully put forward the transparent concrete block in front of the people. He successfully produces by mixing the optical fiber in to it and he gave the name "LITRACON". The hope is that this light transmitting concrete electricity in a day time and with the help of green energy concept it makes it eco friendly. MATERIALS USED 1.1 OPTICAL FIBERS

CEMENT

Ordinary Portland cement: normal cement since its setting is normal when mixed with water. It is general-purpose cement suitable for using general concrete construction work, which required no special consideration. It should satisfy all the requirement as described in IS: 269-1967 and 1975.

APPLICATIONS

1) Interior walls 2) In stair case 3) Ceiling 4) Tiles 5) To make decorative panel 6) Front gate 7) Artsy reception desk:- 8) Making A Design:- Test performed on light transmitting concrete. 1.1 Illumination test by lux meter. Digital lux meter is used for measuring the light passing through the concrete. a photo cell is used to capture the light.

PROCEDURE TO FIND THE ILLUMINATION THROUGH THE CONCRETE

The lux meter consists of digital display, module, interface, rather, photo detector, range select button, turn off, turn on button. In the photo detector there is a sensor which sense the light this light can converted into

the electric current capture. Select a required range from lux meter from range selection button. Then hold the photo detector below the end of the fiber. This photo detector detects the light which is coming from natural light source through the optical fiber. The light is detected by the photo detector. This electrical energy represented on the digital display which has a unit lux or lumen. Take this reading from the digital display and note it down.

Adopt the same procedure as stated earlier to find the illumination in 2%, 3%, 4% optical fiber by the weight of cement.

MATERIAL REQUIRED FOR MAKING THE SAMPLE WITH 4%, 3%, 2% OPTICAL FIBER

Size of specimen: 15cmx15cm x5cm

Volume of the specimen: $0.15 \times 0.15 \times 0.05 = 0.01125m^3$

Amount of cement required for given sample

Weight of cement = $0.57375kg = 573.75gm$

Weight of fiber required for given content of cement 4% of fiber for given content of cement = $4\% \times 573.75 = 22.95gm$

3% of fiber for given content of cement = $3\% \times 573.75 = 17.21gm$

2% of fiber for given content of cement = $2\% \times 573.75 = 11.47gm$

Sand required in this above sample = $0.00393m^3$.

COST COMPARISON

Detailed estimate block:-

1) Size block: - 15cmx15cmx5cm.

a) Cement content: - 573.75gm. Rate of cement is 350 RS per 50kg. Rate of cement for given content: - 4.01RS.

b) Quantity of sand required :- Quantity of sand: - 0.003937m³. Rate of sand is 800 per m³. Rate of sand for given quantity: - 3.14 RS.

c) Quantity of fiber :- 4% fiber by weight of cement: - 22.95gm. Rate of fiber Rate of optical fiber: - 40RS.

d) Other material :- 50RS TOTAL COST REQUIRED FOR MAKING THE BLOCK OF SIZE 15cm X 15cm X 5cm is RS.97.15

COST OF PLYWOOD

a) Size of plywood in market 1.21mx2.433m x0.012m. Rate for given size of plywood is RS. 2800 per sq.m.

b) Rate for making the size of 15cmx15cmx5cm of plywood is RS.84

COST OF PLASTER OF PARIS SHEET

a) Size of POP sheet available in market is 914mx1.828m Rate of given size of POP sheet RS.150

b) Rate for making the size of 15cmx15cmx5cm is RS.32.20

COST OF GLASS

a) Rate of glass having a size of 0.304m x 0.304 m is RS.36

b) Rate of glass having a size of 15cmx15cmx5cm is RS.87.6

CONCLUSION

1. With increasing amount of optical fiber in the concrete the illumination increases.

2. Due to the optical fiber the appearance of concrete improves.

3. Using light transmitting concrete we can save energy.

4 it is totally environment friendly.

5. With the help of semi automation process we can make panel easily.

6. While casting the panel it opposite manner so that after the demoulding the bottom portion use as a front portion to reduce the effort of finishing.

7. Special skilled labour is required for casting the light transmitting concrete.

8. It is the factory product.

9. It's initial cost is high but low maintenance cost.

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