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A Review on Study and Manufacturing of Transparent Bricks

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ABSTRACT: Transparent concrete is the new type of concrete which carries special property of light transmitting due to presence of glass rods or optical fibers & is also known as translucent concrete or light transmitting concrete. It is lighter than conventional concrete. The main aim of the study is to design translucent concrete blocks with the use of glass rods & optical fibers with sand & cement.

I. INTRODUCTION

Transparent brick, also known as litracon glass block, is an architectural element made from litracon. The appearance of transparent blocks can vary in color, size, texture and form. Transparent bricks provide visual obscuration while admitting light. The modern transparent block was developed from pre-existing prism lighting principles in the early 1900s to provide natural light in manufacturing plants. Today transparent blocks are used in walls, skylights, and sidewalk lights.

Objectives-

1. To cast a special type of concrete with light transmitting properties.
2. To study their characteristics.
3. Light passes through concrete to make it a viable material for reducing power consumption.
4. To increase aesthetic value of a structure.

II. METHODOLOGY

1. Preparation of the Mould
2. Fixing the Fibers
3. Concreting
4. Removing the Mould
5. Cutting and polishing
6. Light transmittance tests on LiTraCon

III. LITERATURE REVIEW

1. State-of-the-art developments in light transmitting concrete

Shwan H. Said, 2020

The author states that, as the population grows rapidly, many tall buildings have been established in crowded areas creating huge obstacles for transmitting the natural sunlight into these buildings.

After numerous experiments conducted by engineers, it understood that, to imbue new and modern features of concrete, an innovative, smart and novel construction material called "light transmitting concrete" (LiTraCon) has emerged in the last decade, manufactured by embedding optical fibers in concrete.

The new material is characterized by allowing the light to pass through itself. LiTraCon has smart properties such as energy saving, decorative and aesthetic appearance, and enhancing the daylight indoor quality of buildings.



2. Critical evaluation of modern concrete applications

Jarosław Malara and Justyna Szafraniec, 2018

The authors focused first of all on transparent concrete - LiTraCon. The article mainly analyzed its technical parameters. The modern and innovative applications of concrete mix have been critically analyzed.

It understood that, another modern way of using the concrete mix, which has been included in the publication, is paving stone absorbed in daylight. This material description is primarily, focused on its serviceability. Another material presented is white concrete, its advantage is the ease of colour choice.

The authors also described the possibilities of using properly shaped architectural concrete as well as its unusual use in the form of doors.

3. An Experimental Study on Light Transmitting Concrete

P.M. Shanmugavadivu, V. Scinduja, T. Sarathivelan, C.V. Shudesamithronn, 2014

The author states that, Light transmitting concrete is one of the fibre reinforced concrete which is used for aesthetic application by incorporating the optical fibres in concrete. Optical fibres are one which helps for transmission of light through fibre.

It understood that, the end-lite type of fibre is used to increase the aesthetic appearance of the concrete. The concept of light transmitting concrete is like a transparent concrete.

When it is used in ceiling or side wall, it is exposed to direct sun light which transmit the image but not completely transparent. The investigation is not constrained only with the decorative purpose but the effect of fibre application in the strength aspect is also discussed.

4. A Study On Transparent Concrete: A Novel Architectural Material To Explore Construction Sector

Dr. Jayeshkumar Pitroda, 2013

Author states that, transparent concrete is a concrete based building material with light-Transmissive properties due to embedded light optical elements usually Optical fibres.

It understood that, light is conducted through the stone from one end to the other. Therefore the fibres have to go through the whole object. Transparent concrete is also known as the translucent concrete and light transmitting concrete because of its properties. It is used in fine architecture as a facade material and for cladding of interior walls.

In this paper, to integrate the merits of concrete and optical fiber, for developing transparent concrete by arranging the high numerical aperture Plastic Optical Fibres (POF) or big diameter glass optical fiber into concrete. The main purpose is to use sunlight as a light source to reduce the power consumption of illumination and to use the optical fiber to sense the stress of structures and also use this concrete as an architectural purpose for good aesthetical view of the building.

5. Transparent Concrete

Georgia Alexandra COVALEOV, 2019

The author states that, reinforced concrete was invented and developed simultaneously by several people in the mid-nineteenth century. Besides versions "classical" fiber reinforced concrete (by using steel bars, whatever "style" of them), there are new ways to further concrete strength.

It understood that, transparent concretes (translucent) is gaining much ground in the construction of the West Europe. "Light Transmitting Concrete" is a concrete-like product, which is translucent due to the mixture of fiber glass, plus a combination of finely divided crushed stone, cement and water.

After the strengthening of composition, blocks of various shapes are obtained, with features of concrete and glass. Transparent concrete is a translucent material created by the combination of concrete and thousands of optical fiber wires acting as a filler.

6. Transparent Concrete; An Experimental Study

Riya. A. Gite, Shilpa Kewate, 2017

The author states that, Natural light in the building is obstructed by development of high rise buildings and sky scrapers. In order to overcome this problem, use of artificial light has increased in large amount. Thus, it becomes necessary to decrease the amount of artificial light consumption in structure.

From this it understood that, this leads to the introduction of innovative concrete, Transparent concrete. Fiber reinforced concrete i.e., Transparent concrete is used for aesthetical application by placing the optical fibers in concrete.

Artificial and natural both the light passes through the transparent concrete due to the addition of optical fibers in concrete.



IV. CONCLUSION

1. Litracon achieve utilization and optimization of light, and is independent of the thickness.
2. The light transmission may decrease with usage of Plastic optical fibers but it is economical when compared to glass optical fiber.
3. The light transmission of litracon block increases with the increase in the percentage of optical fiber.

REFERENCES

1. Shwan H. Said, Paper published on, "State-of-the-art developments in light transmitting concrete, ELSEVIER, Volume 33, Part 4, 2020, Pages 1967-1973
2. Jarosław Malara and Justyna Szafraniec, 2018, Paper published on, "Critical evaluation of modern concrete applications", MATEC Web Conf. Volume 219, 2018 2nd Baltic Conference for Students and Young Researchers (BalCon 2018)
3. P.M. Shanmugavadivu, V. Scinduja, T. Sarathivelan, C.V. Shudesamithronn, 2014, Paper published on, "An Experimental Study on Light Transmitting Concrete", IJRET: International Journal of Research in Engineering and Technology eISSN: 2319-1163 | pISSN: 2321-7308
4. Dr. Jayeshkumar Pitroda, 2013, Paper published on, "A Study On Transparent Concrete: A Novel Architectural Material To Explore Construction Sector", International Journal of Engineering and Innovative Technology (IJEIT) Volume 2, Issue 8, February 2013
5. Georgia Alexandra COVALEOV, Paper published on, "Transparent Concrete" Revista Română de Inginerie Civilă, Volumul 10 (2019), Numărul 4
6. Riya. A. Gite, Shilpa Kewate, Paper published on, "Transparent Concrete; An Experimental Study", International Journal of Engineering Applied Sciences and Technology, 2019 Vol. 3, Issue 12, ISSN No. 2455-214



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