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An Overview Study on Transparent Concrete

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ABSTRACT–
Transparent concrete is a very high technical method. Transparent concrete is a concrete based building material with light-Tran missive properties due to embedded light optical elements usually Optical fibres. Light is conducted through the stone from one end to the other. Therefore the fibres have o go through the whole object Transparent concrete is also known as the translucent concrete and light transmitting concrete because of its properties. t 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 fibber, for developing transparent concrete by arranging the high numerical aperture Plastic Optical Fibres (POF) or big diameter glass optical fibber 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 fibber to sense the stress of structures and also use this concrete as an architectural purpose for good aesthetical view of the building.

Keywords: Transparent concrete façade material,optical fibre

I. INTRODUCTION

Just a few decades ago concrete was often misunderstood, disliked and captured by its image fixed due to the rapid urbanization of the 1960s. But since that time, concrete has made considerable progress, not only in technical terms, but also in aesthetic terms. It is no longer the heavy, cold and grey material of the past, it has become beautiful and lively. By research and innovation, newly developed concrete has-been created which is more resistant, lighter, white or collared, etc. Concrete has learned to adapt to almost all new challenges that appeared. In 2001, the concept of transparent concrete was first put forward by Hungarian architect AronLosonzi, and the first transparent concrete block was successfully produced by mixing large amount of glass fibber into concrete in 2003, named as LiTraCon. Joel S. and Sergio OG. developed a transparent concrete material, which can allow 80% light through and only 30% of weight of common concrete. It is worth mentioning that Italian Pavilion in Shanghai Expo 2010 shows a kind of transparent concrete developed by mixing glass into concrete in 2010. While the transparent concrete mainly focuses on transparency and its objective of application pertains to green technology and artistic finish. Therefore it is imperative to develop a new functional material to satisfy the structure in terms of safety monitoring (such as damage detection, fire warning), environmental protection and energy saving and artistic modelling Transparent or translucent concrete

MATERIAL USED FOR TRANSPARENT CONCRETE

There are two basic materials used for making transparent concrete, one is from construction field and another from sensing field. First, concrete is one of the most important civil engineering materials with the advantages of rich raw materials, low cost and simple production process and second the optical fibber has good light guiding property which can be arrange to transmit the light and the sun light transmit according to predesigned road without light-heat, light-electrical or photochemical process, and photo elastic effect which can be used to study the stress distribution of structures. Combining the advantages of the

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concrete and optical fibber, developing a novel functional material called transparent concrete has an important value in the application of construction and sensing. Transparent concrete is manufactured by using combination of fibber optics and fine concrete These fibbers blend into the concrete like any other aggregates. These optical fibbers can transmit light from natural and artificial sources into spaces enclosed by the translucent concrete panels. The main reason for using optical fibber in concrete is that it can transmit light even an incident angle greater than 60 Optical fibber consists of three layers called as core, cladding and buffer coating or jacket. The light is transmitted through the core of the optical fibber.

MANUFACTURING PROCESS

The manufacturing process of transparent concrete is almost same as regular concrete. Only optical poured on top of each other and infused with the fibbers and are then connected. Thousands of strands of optical mixture fibbers are cast into concrete to transmit light, either natural or artificial Lighttransmitting concrete j produced by adding 4% to 5% optical fibers by volume into the concrete mixture. The is made from fine materials only it does not contains coarse aggregate. Thickness of the optical fibers be varied between 2.5 mm and 2 mm to suit the particular requirements of light transmission. Automatic concrete production processes use woven fibres fabric instead of single filaments. Fabric and concrete are alternately inserted into moles at intervals of approximately 2 mm to 5 mm.Smaller or thinner layers allow an increased amount of light to pass through the concrete. Following casting, the material is cut into panels er blocks of the specified thickness and the surface is then typically polished, resulting in finishes ranging from semi-gloss to high-gloss

II. CONCLUSION

Transparent concrete is produced out of fine-grain concrete and translucent fabric which is layer cast in prefabricated mould. Because of relatively small amount of fabric, solidity and consistency of transparent concrete are the same as the high-strength concrete. Almost free energy loss light penetration through optic fibres makes it possible to see light, shadows and even colours through concrete even by very thick walls. It can be produced as prefabricated building blocks and panels.

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