Flow of Presentation

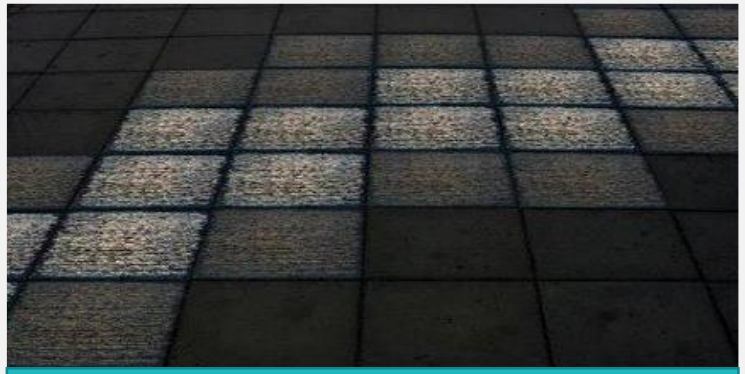
- What is transparent concrete ?
- Application
- Material used for transparent concrete
- Methodology
- Properties
- Advantages
- Conclusion

What is transparent concrete?

- Transparent concrete also called as translucent concrete or light transmitting concrete is achieved by replacing aggregates with transparent alternate materials.
- The bonding material in transparent concrete may be able to transmit light by using clear resins the concrete mix. Use of optical fibers and fine concrete also used as transparent concrete.
- Transparent concrete is produced by mixing 4% to 5% (by volume) optical fibers in the concrete mixture. This concrete has less weight compared to original concrete.
- The smart transparent concrete can be regarded as a “green” energy saving construction materials it is a promising technology for field applications in civil infrastructure.

Application

- Illuminate Your Walls
- Get Creative with Design
- Transparent concrete blocks suitable for floors
- pavements and load-bearing walls
- In furniture for the decorative and aesthetic
- Light fixtures
- Light sidewalks at night
- Increasing visibility in dark subway stations
- Partitions wall and it can be used where the sunlight does not reach properly



Pavement illuminated

Transparent concrete panels

Material used for transparent concrete

- The two basic material used for making transparent concrete :-

1. Fine concrete

Cement:-Ordinary port land cement is used for the preparation transparent concrete.

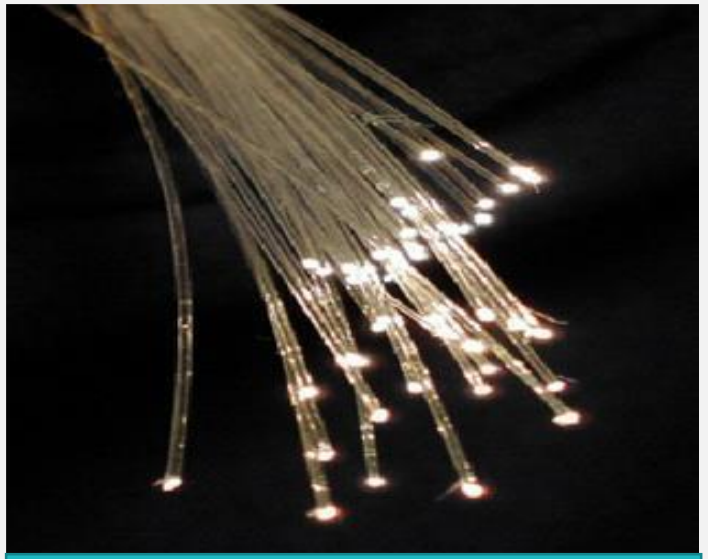
Sand:- Sand is naturally available material which is composed rock and mineral particles. Size of sand should pass through 1.18mm sieve. It should be free from impurities and organic matters.

Water:-The role of water is important because the water to cement ratio is the most critical factor in the concrete. It should be of drinking water quality. It should be free from all impurities.

Material used for transparent concrete

2. Optical fiber

- Flexible, transparent fiber made up of glass or plastic. It transmits light between two ends of the fiber.
- Optical fiber transmits light so effectively that there is almost no loss of light conducted through the fibers. The thickness of optical fiber should be varied from 2 μm and 2 mm nearly equal to diameter of human hair.
- Concrete is produced by adding 4% to 5% optical fiber by volume in concrete mix.



Optical fiber

Methodology

1
Preparation of the mould

2
Optical fiber

3
Fixing the fibers

4
concreting

5
Removing the mould

6
Cutting and polishing

Properties

Product	Light Transmitting concrete
Form	Prefabricated blocks
Ingredients	96% concrete, 4% optical fiber
Density	2100-2400Kg/m3
Block size	150mmx150mm
Thickness	10-400mm
Color	White, Grey & Black
Fiber Distribution	Organic
Finished	Polished
Compressive Strength	50N/mm2
Bending Tensile strength	7N/mm2

Properties

Other properties

- It permits the light,colors,shapes and outlines which are seen to through it.
- Water absorption capacity of this concrete is 0.35%.
- Maximum oxygen index of transparent concrete is 25%.
- Thermal conductivity is 0.21 W/m C°.
- Elastic limit of this concrete is greater than 60 MPa
- Having a Density from 2100 to 2400 kg/m3
- Young's Modulus ranges from 2750 MPa to 3450 Mpa

Advantages

- Energy saving can be done by utilization of transparent concrete in building.
- It has very good architectural properties for giving good aesthetical view to the building.
- We can use fewer lights in the house during daylight hours.
- Where light is not able to come properly at the place transparent concrete can be used.

Conclusion

- A architectural material called transparent concrete can be developed by adding optical fiber or large dimeter glass fiber in the concrete mixture.
- The transparent concrete has good light guiding property.
- The transparent concrete not looses the strength parameter when compared to regular and also it has very vital property for the aesthetical point of view.

Thank you