

EXPLORATORY RESEARCH ON TRANSPARENT CONCRETE

Dr.V. Murugesh Ph.D¹, Dr.Harikumar Pallathadka², Prof. Rajesh. P. Chinchewadi³

Assoc.Prof, JCTCET and Post-Doctoral Research Fellow, Manipur International University, Imphal, Manipur¹

Vice-chancellor and Professor, Manipur International University, Imphal, Manipur²

Dean and Professor, Manipur International University, Imphal, Manipur³

Abstract: As everyone looks to the future, more attractive, stronger, and energy-efficient construction materials are needed. Engineers are experimenting with various building materials all around the world. Transparent concrete is shown in this project as a smart building material with improved strength, a pleasing look, and the ability to transmit light. Energy conservation and safety assessment are the two most crucial concerns for infrastructure or structures. In this instance, the concrete specimen is created by mixing various amounts of optical plastic fibres with regular concrete and embedding them. Different tests, including as compressive strength, split tensile strength, and light intensity flowing through it, were performed on the specimens. The investigations' findings demonstrate that an optical In comparison to normal concrete, the specimen with a high concentration of optical plastic fibre demonstrated a greater compressive strength test result. It unequivocally shows that the concrete's ability to transmit light is unaffected by the light passing through it.

Keywords: Split Strength Test, Compressive Strength, Transparent Concrete, Optical Plastic Fibres

I. INTRODUCTION

In today's society, energy conservation has grown in importance. According to one study, by 2050, buildings that are residential, commercial, and institutional would produce 3800 tonnes of carbon dioxide, accounting for 38% of the world's energy use. in an effort to lower the energy used by buildings and the forthcoming development of new buildings. The creation of novel building materials with extremely low energy consumption drew the attention of several scientists and experts. Concrete that is transparent is one of these newly discovered materials. The fundamental component or substance needed for all sorts of building is concrete. This kind of translucent concrete is cutting edge because it allows light to flow through it. In today's society, energy conservation has grown in importance. According to one study, by 2050, buildings that are residential, commercial, and institutional would produce 3800 tonnes of carbon dioxide, accounting for 38% of the world's energy use. in an effort to lower the energy used by buildings and the forthcoming development of new buildings. The creation of novel building materials with extremely low energy consumption drew the attention of several scientists and experts. Concrete that is transparent is one of these newly discovered materials.

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II. MATERIALS

Cement: Ordinary Portland cement, 53 grade confirming to Is1269-1987.

B. Fine aggregate: Locally available river sand confirming to grading zone II of nominal size 1.18 mm as per IS:383-1970.

C. Coarse aggregate: Locally available crushed blue granite stones confirming to graded aggregate of nominal size 10 mm as per IS :383 -1970.

D. Water : Portable water E. Optical fibre : Plastic optical fibre Optical fibre is a flexible transparent fibre made by drawing glass or plastic to a diameter slightly thicker than that of human hair. Optical fibre are used most often as a means to transmit light between the two ends of fibre and light find wide usage in fibre optic communication. The diameter of optical plastic fibre was 1mm.



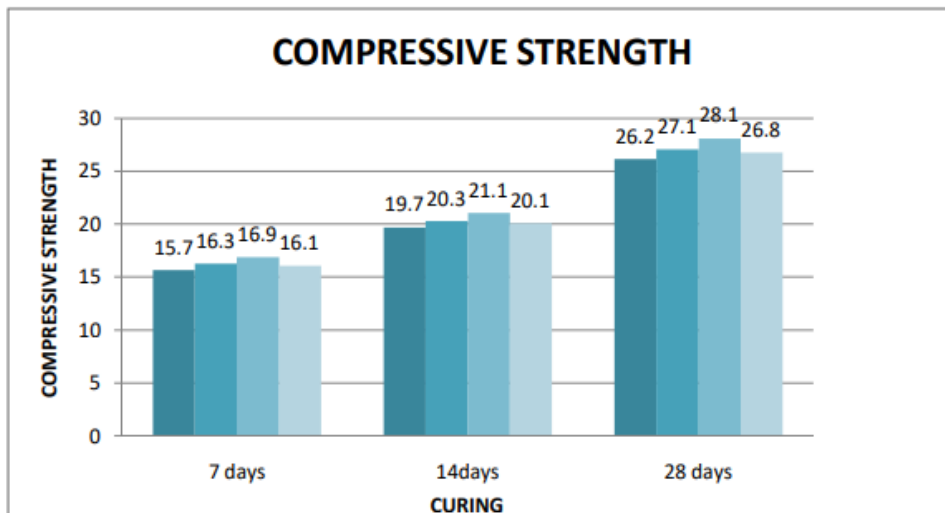
III. EXPERIMENTAL PROGRAM

In today's society, energy conservation has grown in importance. According to one study, by 2050, buildings that are residential, commercial, and institutional would produce 3800 tonnes of carbon dioxide, accounting for 38% of the world's energy use. In an effort to lower the energy used by buildings and the forthcoming development of new buildings. The creation of novel building materials with extremely low energy consumption drew the attention of several scientists and experts. Concrete that is transparent is one of these newly discovered materials. The fundamental component or substance needed for all sorts of building is concrete. This kind of translucent concrete is cutting edge because it allows light to flow through it.

IV. RESULTS AND FINDINGS

Compressive Strength Test On Cube For 7, 14 And 28 Days

MIX	MIX %	COMPRESSIVE STRENGTH		
		7 days (N/mm ²)	14 days (N/mm ²)	28 days (N/mm ²)
M1	0	15.72	19.65	26.2
M2	0.2	16.26	20.33	27.1
M3	0.4	16.86	21.08	28.1
M4	0.6	16.08	20.10	26.8



The table and graph displayed the compressive strength data. A Universal Testing Machine (UTM) and a Compression Testing Machine (CTM) were used to test the cubes. Seven, fourteen, and twenty-eight-day compressive strengths were measured. The highest compressive strength attained by adding 0.4% of optical plastic fibre to the concrete cube may be found in the table.

CONCLUSION

A. Every experiment's data indicates that adding optical fibre enhances the qualities of hardening. According to this study, translucent concrete can save power costs without sacrificing the structural integrity of the structures. Research has demonstrated that:

B. The test findings shown that the is greater in every way, and the effectiveness of the use of optical fibre is investigated by comparing the strength with the nominal M30 grade concrete.

C. A 0.4% addition of optical fibre is the optimal amount.

D. By adding more optical fibre up to 0.4%, the concrete's compressive strength gradually increases; however, as more optical fibre is added, the strength characteristics fall.

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