

DURABILITY STUDY ON BEHAVIOUR OF INTEGRAL CRYSTALLINE WATER PROOFING CONCRETE

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ABSTRACT:- Concrete is most commonly used building materials. Concrete is considered as a micro porous and permeable material. Porosity refers to the amount of voids present in concrete, is expressed in terms of percentage of the total volume of a material. Therefore, these qualities result pathways to form that allow the ingress and movement of water into, and through, along with the cracking that occurs due to shrinkage.

Integral Crystalline Waterproofing blocks the movement of water through the concrete by plugging or blocking the natural pores, capillaries and micro cracks, and concrete its own waterproofing barrier. This stands in contrast to more conventional means of waterproofing, which usually involves applying a coating or coated to the concrete surface. The process is sometimes also attempted through densification of the concrete Crystalline waterproofing systems rely on a technology that turns porous concrete in to an impermeable barrier.

The result of these technology the structure with reduced cracking, self-sealing and waterproofing abilities which provides a powerful defense against water and resist corrosion of reinforcing steel. In this paper the water crystalline formation is arrested by the partial replacements of cement by GGBS (20%), Silica Fume (10%), Fly Ash (10%) and Rice Husk ash (25%) with addition of CWP agent. This characteristic strength is analyzed by compressive strength of concrete where the replacement is compared with Conventional concrete.

The use of integral waterproofing agent deals with determining how much amount of chemical resistance, moisture penetration and CO₂ absorption by conducting durability test on 14 days.

Key words: Crystalline Waterproofing Agent CWA, Durability, CO₂ absorption

1. INTRODUCTION

1.1 Waterproofing

Concrete is currently the most used human made material in the world, used twice as much as all other materials combined. The concrete degradation is the root cause of the issue in the presence of moisture or water within the concrete. The ingress of deleterious substances into concrete

takes place through the pore system in the concrete matrix, or through micro cracks.

To ensure a concrete structure's durability, which leads to a longer lifespan and a more sustainable building, the concrete must be waterproofed.

1.2 Integral Crystalline Water Proofing

Integral Crystalline Waterproofing (ICW) technology is based on principles that are very similar to the processes that occur during concrete hydration. These admixtures are added or applied to concrete, crystalline chemicals facilitate a reaction with cement to form long, narrow crystals and filling the pores, capillaries and hairline cracks of the concrete mass. The moisture content remains present, till the crystals continue to grow throughout the concrete. Once the concrete has dried, the crystalline chemicals sit dormant until another dose of water (such as through a new crack) causes the chemical reaction known as crystallization to begin again. The ability to reactivate in the presence of water gives crystalline-treated concrete the ability to improve self-sealing. When cracks form due to drying shrinkage, settling, seismic activity, etc., water entering through them causes new crystals to form and grow, blocking and filling the cracks. Improving the self-sealing ability of concrete is one of crystalline technology's most unique and useful features, and can help to dramatically reduce the long-term maintenance and repair costs of a concrete structure.



Fig :1 Crystalline Water Proofing Agent

1.3 Partial Replacement of Cement in Concrete

Concrete is a family of different material like binding material (cement+ fly ash), fine aggregate, coarse aggregate and water. Nowadays, cost of construction is very high with usage of conventional materials due to unavailability of natural