International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 06 | June-2018 www.irjet.net p-ISSN: 2395-0072

CHARACTERISTIC STUDY ON BEHAVIOUR OF INTEGRAL CRYSTALLINE WATER PROOFING CONCRETE

R Vijayalakshmi[1], D. Dinesh Babu[2], M. Mathivanan[3], J. Sandeepkumar[4], V. Boopathiraja[5]

1.Assit. Professor, 2,3,4,5. UG Student, Civil Dept., Nadar Saraswathi College of Engineering and Technology, Theni, Tamil Nadu, India.

Abstract - *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, Silica Fume, Fly Ash and Rice Husk ask with addition of CWP agent. This characteristic strength is analyzed by compressive, split tensile and flexural strength of conventional concrete compared by replacement concrete.*

Key words: *Crystalline Waterproofing Agent CWA, Ground Granulated Blast Furnace Slag GGBS, Silica Fume SF, Fly Ash FA, Rice Husk Ash RA*

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 materials. To overcome this, by total replacement of concrete with different material which is not convenient in terms of required properties. The limitation of unavailability of material which plays the vital role of concrete. So we have only choice of partial replacement of concrete ingredients by waste materials. The partial replacement of cement with desirable properties that we can save natural material and reduce emission of CO2 in the atmosphere. The industrial wastes dumping to the nearest site which spoils the land and atmosphere. It also affects the aesthetics of urban environment and so the use of this waste material in concrete is cost effective as well as environment friendly.