

SERVICE LIFE ESTIMATION OF SELF CURING SELF COMPACTING CONCRETE

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Abstract: The service life is estimated based on the assumption that the corrosion of reinforcement bar begins when the passivity layer of concrete is broken down either by physical (cracking and disintegration) or chemical changes (reduction in alkalinity due to carbonation and depassivation due to chloride ion ingress). The major factors that influence the service life of a structure are concrete cover thickness, diffusion coefficient of cover concrete, chloride content at the surface and critical chloride content at the level of steel. The diffusion coefficient of cover concrete can be modified by adopting sustainable construction materials and technologies which can modify the strength and durability of concrete and further enhance the service life of concrete by making concrete highly dense and impermeable. The diffusivity cell method developed by Norway can be used in determining the diffusion coefficient of the concrete. Using Life 365 software and as per ACI 365, the service life of concrete structures can be predicted.

An extensive research work was carried out on service life estimation of Self Curing Self Compacting Concrete by adopting the parameter as grade of concrete (Mixes A, B and C), type of curing regime (Conventional water curing, no curing and self curing), type of self curing agent (Polyethylene Glycol – 200 and 4000, Liquid Paraffin Wax Light and Heavy) and dosage of self curing agent (0.1%, 0.5% and 1.0% by weight of cement). The research concluded that the addition of self curing agents enhanced physical, mechanical and durability properties along with service life of concrete.

Keywords: *Self Compacting Concrete, Self curing agent, service life, diffusion coefficient, chloride ion*