

Properties of self Consolidating concrete for Prestressed Members

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Abstrak

Self-Consolidating Concrete (SCC) mixtures for use in Prestressed Concrete applications are evaluated in this paper. Twenty one SCC mixtures were made under laboratory conditions with varying water to cementitious materials ratios, sand to total aggregate ratios, and cementitious materials combinations (type III cement, class C fly ash, ground-granular blast-furnance slag, and silica fume). The SCC mixtures archived prestress transfer compressive strengths between 5470 and 9530 psi (38 and 66 MPa). The moduli of elasticity of the SCC Mixtures were in reasonable agreement with the elastic stiffness assumed during the design of conventional slump concrete structures. The long term drying shrinkage strain for all the SCC mixtures were approximately the same or less than those measured for the control mixtures. A change in sand to total aggregate ratio had no significant effect on the long term drying shrinkage. At later ages of 56 and 112 days, the measured drying shrinkage corresponded reasonable well to those predicated by the ACI 209 procedure.