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Time-Dependent Analysis of Composite Steel-Concrete Beams Subjected to Shrinkage

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Abstract : Although the shrinkage of the concrete causes undesirable parasitic effects to the structure, it can then harm the resistance and the good appearance of the structure. Long term behaviourmodelling of steel-concrete composite beams requires the use of the time variable and the taking into account of all the sustained stress history of the concrete slab constituting the cross section. The work introduced in this article is a theoretical study of the behaviour of composite beams with respect to the phenomenon of concrete shrinkage. While using the theory of the linear viscoelasticity of the concrete, and on the basis of the rate of creep method, in proposing an analytical model, made up by a system of two linear differential equations, emphasizing the effects caused by shrinkage on the resistance of a steel-concrete composite beams. Results obtained from the application of the suggested model to a steel-concrete composite beam are satisfactory.

Keywords : composite beams, shrinkage, time, rate of creep method, viscoelasticity theory
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