

## Creep Effect on Composite Beam with Perfect Steel-Concrete Connection

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**Abstract :** In this paper, the influence of the concrete slab creep on the initial deformability of a bent composite beam is modelled. This deformability depends on the rate of creep. This means the rise in value of the longitudinal strain  $\epsilon_c(x,t)$ , the displacement  $D_{flec}(x,t)$  and the strain energy  $E(t)$ . The variation of these three parameters can easily affect negatively the good appearance and the serviceability of the structure. Therefore, an analytical approach is designed to control the status of the deformability of the beam at the instant  $t$ . This approach is based on the Boltzmann's superposition principle and very particularly on the irreversible law of deformation. For this, two conditions of compatibility and two other static equilibrium equations are adopted. The two first conditions are set according to the rheological equation of Dischinger. After having done a mathematical arrangement, we have reached a system of two differential equations whose integration allows to find the mathematical expression of each generalized internal force in terms of the ability of the concrete slab to creep.

**Keywords :** composite section, concrete, creep, deformation, differential equation, time

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