

Modelling of Composite Steel and Concrete Beam with the Lightweight Concrete Slab

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Abstract : Well-designed composite steel and concrete structures highlight the good material properties and lower the deficiencies of steel and concrete, in particular they make use of high tensile strength of steel and high stiffness of concrete. The most common composite steel and concrete structure is a simply supported beam, which concrete slab transferring the slab load to a beam is connected to the steel cross-section. The aim of this paper is to find the most adequate numerical model of a simply supported composite beam with the cross-sectional and material parameters based on the results of a processed parametric study and numerical analysis. The paper also evaluates the suitability of using compact concrete with the lightweight aggregates for composite steel and concrete beams. The most adequate numerical model will be used in the resent future to compare the results of laboratory tests.

Keywords : composite beams, high-performance concrete, high-strength steel, lightweight concrete slab, modeling

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