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Cost Optimization Analysis of Composite Beam

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Abstract

This work presents exact solution model for the cost optimization of composite beams based on the load and resistance factor design (LRFD) specifications of the AISC. The model formulation includes the cost of concrete, steel beam, and shear studs. Forty eight designs were analyzed in order to validate the proposed model, and to demonstrate its capabilities in optimizing composite beam designs. The results obtained show that the model is capable of achieving substantial cost savings for composite materials. Hence, it can be to produce software for practical design to structural designers. A parametric study was also conducted to investigate the effects of IPE and UNP size on the cost optimization of composite beams.

Keywords: Beam, Composite Floor, Cost Optimization, Sensitivity Analysis.