

SIMPLIFIED MODEL FOR REINFORCED CONCRETE BEAMS

UNDER CATENARY ACTION

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ABSTRACT

The purpose of this research is to develop simplified models to predict the load displacement behavior for any reinforced concrete beam on the basis of material, geometric, and design parameters. The proposed simplified model includes a beam element and a system of springs that represents the load extension behavior and moment rotation behavior of a reinforced concrete beam element. Spring properties are based on material, geometric, and design parameters. The tensile definition of the axial extension spring is approximated by a steel stress-strain curve modified to account for uneven stress in the steel along the length of the beam. The commercial finite element code ANSYS is used to analyze the models. The results of the models are then compared with experimental tests on reinforced concrete beams, and good agreements are found.