

Advances in the Canadian Highway Bridge Design Code for Analysis and Design of Bridge Superstructure

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Extended Abstract

The Canadian Highway Bridge Design Code, CHBDC, is based on limit states design principles and defines design loadings, load combinations and load factors, and detailed design criteria for the various materials and bridge types. CHBDC specifies simplified method of analysis of slab-on-girder bridges in lieu of conducting detailed refined analysis of the bridge structure. The 2019 version of CHBDC addressed the need for simplified method of analysis for prefabricated bridge systems for use in accelerated bridge construction and replacement. These bridges include the following shear-connected adjacent precast beam types: box beams, voided slab units, T-beams, Double-T beams, and Inverted-U beams. A summary of an experimental work on developed joint details between adjacent beams will be presented and compared to the specified transverse factored applied vertical shear force between shear-connected beams for shear key design. A method for the design of deck slab cantilever overhang due to (i) truck loading conditions and (ii) vehicle collision loads applied to concrete barriers mounted integrally with the deck overhang. A design methodology for a concrete section subjected to combined bending moment and axial force will be presented. Finally, a new simplified method of analysis is provided for determining the factored flexural resistance of steel-reinforced concrete barrier to transverse traffic barrier load based on a trapezoidal yield-line failure pattern.