

## Validation of the AASHTO LRFD Live Load Distribution Provisions for Integral Abutment Bridges

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**Abstract** – Integral abutment bridges are structures that do not have discrete joints between the superstructure and substructure. Such bridges possess lower construction and maintenance costs, improved seismic performance, rapid construction procedures, and superior vehicular ride-ability. However, structural analysis of integral abutment bridges is not adequately covered in most bridge design specifications since the majority of the provisions address jointed structures. The purpose of this study is to check whether the current AASHTO LRFD bridge design specifications for live load effect are applicable to integral abutment bridges. To do so, typical single span monolithic bridges are modeled by finite elements with consideration of different girder spacing, free standing pile lengths and wing-wall lengths. The girder distribution factors for flexure and shear from the finite element investigation are compared with the corresponding formulas in the specifications. The approach utilized by AASHTO to compute the flexural live load effect in the deck slab by considering a unit strip of the slab on rigid supports is checked against the finite element results. In general, findings of the study showed that the AASHTO specifications can be safely used to compute the load effect in girders and slabs of integral abutment bridges.

**Keywords:** Bridges, deck slab, finite element analysis, girder distribution factor, integral abutment, live load, steel girders.