Public Abstract
First Name:Shuang
Middle Name:
Last Name:Ma
Adviser's First Name:Vellore
Adviser's Last Name:Gopalaratnam
Co-Adviser's First Name:
Co-Adviser's Last Name:
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Department:Civil Engineering
Degree:MS
Title:BRIDGE APPROACH SLAB ANALYSIS AND DESIGN INCORPORATING ELASTIC SOIL SUPPORT

The development of equations necessary for the analysis of finite bridge approach slabs (BAS) on elastic soil support is reported in this thesis. Results are compared for moments and shear forces governing the design for a wide range of values of soil elastic modulus ranging from dense sand to very loose sand. Results from systematic studies assuming wash out of soil support are also presented using a customized uniaxial finite-difference model. The influences of wash-out length and location have been discussed. Moreover, the functions of sleeper slab at the pavement end of the conventional design are studied. It is replaced by a modified end-section reinforcement detailing to provide enhanced local two-way action, providing increased flexural rigidity in the direction transverse to the traffic direction. An Excel-based VBA program is developed for application of designing bridge approach slab incorporating partial elastic soil support. Additionally, a biaxial finite-difference model is developed using MATLAB for better understanding the performance of BAS in both longitudinal and transverse directions. Results from uniaxial and biaxial solutions are compared and discussed. Initial construction cost of this new design alternative is computed and presented to demonstrate that the BAS designed with consideration of elastic soil support results in a cost-effective design. Life cycle costs too are competitive if only agency costs are included, for rural traffic demands, this design is the most cost-effective alternatives among those considered.