

Title Effective Modelling of Bridge Abutments for Nonlinear Static Analysis

Year 2010

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Abstract

The problem of soil structure interaction and non-linear response of bridge has been studied extensively by many researchers. However, there are not many references dealing with the overall response of the complete abutment system which includes the bearings, the abutment walls, the wing walls, the foundation components, expansion joints and the soil. This study presents and compares various modeling techniques to effectively capture the response of the abutment system in both longitudinal and transverse direction. The research considers range of the models including simple support, simple spring model, combination of simple support and linear link model, combination of simple support and nonlinear link model, and combination of shell element, springs and links. The modeling techniques from past research have been included for the purpose of comparison. The results show that the complete abutment model using shell element is the most effective modeling techniques for abutment. Gap element also has been found to significantly contribute in response due to nonlinear static analysis.

Keywords Abutment Modeling, Bridge Response, Soil Structure Interaction, Expansion Joint, Non Linear Static Analysis.