

Project Title: W-Beam Guardrail Post Installation in Rock
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Project Contract Period: 2/19/2007-2/18/2008
Reporting Period: 7/1/2007-9/30/2007

Project Objective

The objective of this project is to develop cost effective guidelines for placement of W-beam guardrail posts in rock by optimizing current placement guidelines and by investigating sensitivity of W-beam guardrail performance to post embedment depth.

Work Performed to Date

In the previous quarter, TTI researchers performed 12 pendulum tests with guardrail posts embedded at various depths in soil. The objective of these tests was to evaluate the performance of W-beam guardrail posts at reduced embedment depths.

In this quarter, the researchers started developing the component level finite element models of the guardrail post in soil at various embedment depths. The researchers have also developed some components of the system level finite element model of the standard W-beam guardrail.

Results of Work Performed

Figure 1-a shows the finite element model of the post in soil. Calibration of the soil properties to attain post-soil response observed in the pendulum tests is currently underway. Figure 1-b shows finite element model of the steel guardrail, splice connection, and the blockout that have been developed for use in the full-scale model of a W-beam guardrail system.

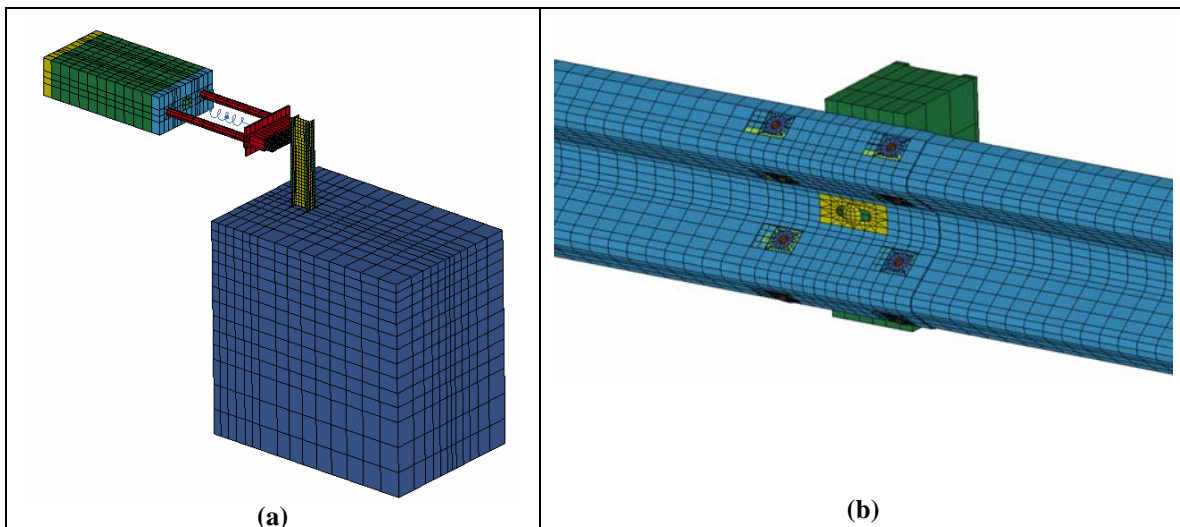


Figure 1: Finite elements models developed for W-beam guardrail system.

Work Remaining to be Completed

Once the post-soil model has been adequately validated against the pendulum test data, it will be incorporated into the full-scale W-beam model. Parametric simulations will then be performed to evaluate the performance of W-beam guardrail when embedment depth of one or more posts is compromised by the presence of rock. Simulation results obtained from the parametric study will be used to develop guidelines for installation of guardrail posts when rock is encountered.