

## AISI Steel Bridge Seismic Design Manual

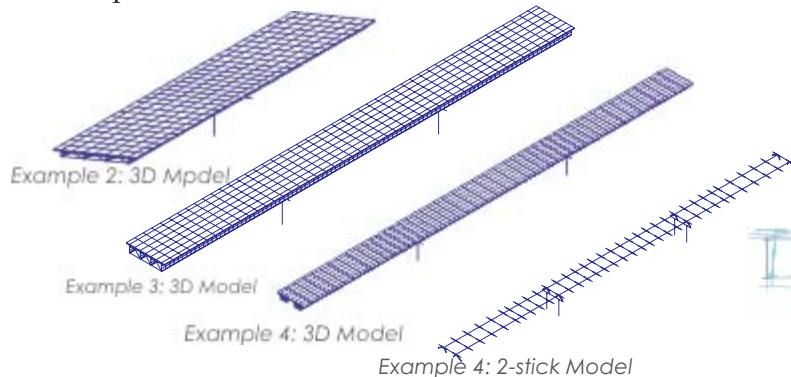
### Finite Element Analysis and Methodology Development

**Location: U.S**

**Owner: American Iron and Steel Institute**

SC Solutions responsibilities for this project included investigation of the behavior of several different types of steel bridges under seismic loads. As a part of this project a two- and three-span steel plate girder bridge and a three-span steel double-box girder bridge were examined. Additionally, 45-degree skews at the bent and abutment locations were introduced, and their effects were investigated as a design alternative of the two-span plate girder bridge structure. Static, frequency, response spectrum, nonlinear pushover, and time-history analyses were performed to study the seismic behavior and performance characteristics of these

Following the linear analysis a series of nonlinear pushover analyses were conducted to study behavior of the system under lateral loading. Consequently, a time history analysis was performed to evaluate nonlinear response of these steel bridges to seismic loads. Nonlinearities in the system included representation of column plastic hinges, buckling, and post-buckling characterizations of bracing elements.



Comparisons of the results of the seismic analyses of three-dimensional detailed and stick models were made and summarized.

