

Cooper River Bridge

Seismic Evaluation

Location: Charleston, SC

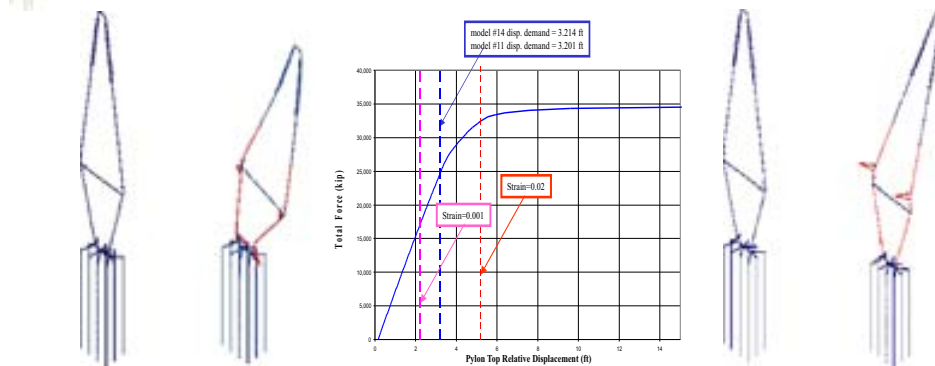
Owner: South Carolina DOT

The new bridge is a replacement of two smaller truss bridges over the Cooper River to provide access between Charleston on the north and Mount Pleasant on the south. The new bridge carries eight lanes of traffic and a 12-foot-wide walkway/bikeway. The main span is 1,546 feet with an overall structure length of approximately 3 miles. In addition to the river crossing, there is a smaller crossing over Town Creek providing a 300-foot-wide navigation channel. SC Solutions performed nonlinear seismic analysis of the new Cooper River Bridge Main Span structure and its high level approaches. SC Solutions participation also included development of the modeling methodology and analysis of the global bridge model as well as investigation of tower behavior under seismic loads.



ADINA Global Main Span Model

Local models for towers with distinctive geometric configurations were created. Detailed foundation models of both towers consisting of plasticity based hysteretic soil elements and moment-curvature beam elements representing tower legs, in both the local and global models. Pushover analysis of the towers was conducted to determine their behavior-under seismic loading. These analyses were also used to optimize tower leg sections.



Tower Pushover Analysis

**Awarded:
NCSEA 2005 Excellence
in Structural
Engineering,
Outstanding Project
Award (Bridges &
Transportation
Structures)**