

Large-Scale Validation of Seismic Performance of Bridge Columns

This investigation will obtain, interpret and disseminate the first shake table results for full-scale bridge columns detailed consistent with current Caltrans design practice. Under the auspices of the Pacific Earthquake Engineering Research Center (PEER) , the Federal Highway Administration (FHWA), the Department of Transportation of California (Caltrans) and the Network for Earthquake Engineering Simulation (NEES) program; and industry sponsorships from Skanska and the Concrete and Reinforcing Steel Institute (CRSI), this research project plans on testing a 1.2 m diameter bridge column with a mass of 250 ton placed atop, in order to mobilize inertial forces. The column will be densely instrumented to obtain high quality data and tested under various earthquake ground motions, including motions of severe intensity demanding large inelastic response. Results of the test program will be compared with results of recent shake table testing of full-scale bridge columns performed in Japan at the E-Defense test facility and with shake table results from reduced-scale tests to be carry out at the University of California at Berkeley. Combined with analytical simulations, the results will also provide a critically needed assessment of the adequacy of reduced-scale models and tests conducted at altered strain states. These will deliver the missing data required to increase the confidence in the current analysis methods and validate (or improve) present design practices. The testing will be carried out at the UCSD Large Outdoor Shake Table Testing Facility and is scheduled to run from July through September of 2010.