



Research Organization:

Department of Civil and Environmental Engineering Department (CEE) at the University of Nevada, Reno, Nevada

Short Description of the Organization:

The University of Nevada, Reno (UNR), established in 1874, now ranks among the top 150 universities in the U.S. in research and development as a national Tier 1 university. The Department of Civil and Environmental Engineering (CEE) at UNR hosts the Center for Civil Engineering Earthquake Research (CCEER) which was established in 1984. CCEER comprises four research laboratories: two in geotechnical engineering and two in structural and earthquake engineering, including the Large-Scale Structures Laboratory (LSSL) and the Earthquake Engineering Laboratory (EEL). Approximately 15 academic and research faculty are affiliated with the Center and about 80 doctoral and masters students are engaged in research projects under the Center's umbrella.

The LSSL at UNR is a high-bay laboratory that has a 780 m² strong floor that measures 45.7 x 17.1 m. In addition, the EEL building hosts a 892 m² high-bay laboratory with control and instrumentation rooms. The laboratory complex is equipped with three identical, biaxial, 50-ton shake tables, mass rig and an additional high-performance, 6-DOF shake-table with 180 kN payload, capable of being relocated on the strong floor. The biaxial tables are 4.25 m square and may carry up to a 445 kN payload at 1g acceleration. Other peak performance characteristics include 1,000 mm/sec velocity and +/-300 mm stroke. Maximum velocity in continuous operation is 625 mm/sec. The laboratory also has eight MTS servo-controlled actuators ranging in size from 98 kN @ ±300 mm stroke to 3,113 kN @ ±610 mm stroke. These actuators are used for large-scale experiments on structural and nonstructural components that are unsuitable for shake table execution and are mounted directly on the floor.

The Department of Civil and Environmental Engineering has been in a leading position in research on nonstructural components and systems since 2000. Over 60 seismic qualification tests of various nonstructural components and systems have been completed successfully and CCEER has published over 30 reports with a special report series "Civil Engineering and Nonstructural Testing." These tests include wall-mounted TV monitor arms, mobile shelving units, radiography and fluoroscopy systems and components (e.g. patient tables, control units, ceiling-mount tube suspensions), CT scanners, gantry, surgical lighting, main frame servers, monitoring panels, battery boxes, antenna extrusions, generators, chillers, and air handling units. In addition, various mitigation strategies such as isolated floor implementations for nonstructural systems have been experimentally evaluated using the shake tables. Furthermore, major research projects funded by private industry as well as the National Science Foundation were conducted at the LSSL and EEL facilities. The most recent investigation was concluded in 2014 that developed simulation capability and implementation process for enhancing seismic performance of ceiling-piping-partition nonstructural systems. As part of a comprehensive experimental program, system-level experiments were carried out on a full-scale 2-story test-bed structure mounted on the three biaxial shake-tables.



Website: <http://www.unr.edu/cee>