NSF NHERI
EARTHQUAKE SHAKE TABLE

NHERI at University of California San Diego

NSF Award CMMI-2227407

NHERI at the University of California San Diego provides access to the world's largest outdoor earthquake simulator. The Large High-Performance Outdoor Shake Table, LHPOST6, simulates realistic earthquake motions with 6 degrees of freedom, moving north-south, east-west, up and down, back and forth, as well as in roll, pitch, and yaw rotations.

RESEARCH IMPACT

- 39 large-scale structures constructed in real-world conditions and tested
- Data gleaned informs building codes and standards, helps validate computer models
- Shake table operations and enhancements supported by NSF
- Projects leverage university-industry research partnerships

MAKING INFRASTRUCTURE SAFE FROM EARTHQUAKES

SHAKE TABLE EARTHQUAKE SIMULATOR

→ 10 stories and higher
→ 2,000-ton capacity
→ Powered by 5,000 PSI of hydraulic pressure

SHARED-USE MODULAR TESTING PLATFORM →

Reconfigurable, reusable resource for low-cost testing at large to full-scale

73 undergraduate, graduate students involved in construction, testing, analysis

FULL-SCALE STRUCTURE TESTING CAPACITY

TRAINING THE NEXT GENERATION OF ENGINEERS

SETTING STANDARDS IN PERFORMANCE-BASED DESIGN

Local & national building design codes

Coastal & port codes

Material codes: timber, steel, concrete, masonry

CAPACITY TO SECURE THE ENERGY SECTOR

Electrical substations, transformers, transmission poles & lines, nuclear structures and waste, hydroelectric dams, wind turbines, solar arrays

EDUCATING STUDENTS & PROFESSIONALS

Student training & mentoring

Academia-industry & user-training workshops

Professional videos & media

INFORMING, ENGAGING THE GENERAL PUBLIC

Outreach to 18,000 local elementary & middle-schoolers

1.3M YouTube views

Featured on major TV networks, in the New York Times, and more

IMPACTS: UC San Diego Shake Table

SAFE SOFT-STORY BUILDINGS

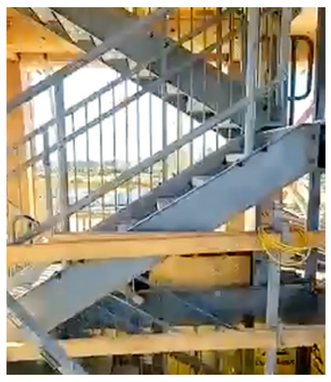
Thanks to full-scale testing of retrofit systems, approximately 6,000 soft-story, wood-frame buildings in Los Angeles and San Francisco have been retrofitted to withstand earthquakes.

EARTHQUAKE-PROOF PARKING GARAGES

New recommendations for building precast concrete floors into parking garages will prevent the deadly "pancake" collapse, which occurred during the 1994 Northridge earthquake.

RESILIENT TALL BUILDINGS

Full scale tests on 10-story timber and 10-story formed-steel structures validated computer models and are leading to new, codified designs for seismically safe structures up to 20 stories.



SECURE NON-STRUCTURAL COMPONENTS

Improvements to the seismic safety of non-structural building components, which have led to building code changes for elevators, stairs, ceilings, facades and fire suppression systems.

SEISMICALLY SAFE REINFORCED MASONRY

Improvements in the seismic safety of reinforced brick and block buildings in the U.S. Dozens of tests have validated computer simulations, and findings from multiple research projects have been incorporated into a variety of state, local, and national building code protocols.

More info about the NHERI at UC San Diego shake table simulator facility