

Student Scientist Examines Ways to Use Seismic Base Isolator Technology to Increase Structural Resilience of Buildings and Bridges



Above: Chandler Harris conducting structural integrity test using shake table

When an earthquake occurs, the shockwaves can cause massive damage to buildings, bridges and infrastructure. In March 2011, the earthquake that occurred off the coast of Japan and the resultant tsunami, killed thousands of people and damaged the Fukushima Daiichi Nuclear Power Plant, causing radiation to escape into the atmosphere.

Could this disaster have been avoided? Chandler Harris, a sophomore at Detroit Edison Early College of Excellence and a research scientist at Ecotek Lab, is investigating ways to make buildings more structurally resistant to earthquakes.

As part of this project Chandler has built an earthquake tower and a shake table along with a seismograph. A shake table is used to simulate movement of the earth's surface, while a seismograph is used to record seismic waves.

In order to learn more about the concepts of structural resilience Chandler conducted several field visits. On April 27, 2013 he attended the International Bridge Design Competition at the Illinois Institute of Technology. While there he learned about the interdependency of bridge efficiency and structural design. Bridge efficiency is the ratio of the total weight of a bridge to the total load that it can support. On November 23, 2013 Chandler traveled to the Multidisciplinary Center for Earthquake Engineering Research (MCEER) at the University of Buffalo. While there he met with Dr. Andrew Whittaker, Director of the MCEER to discuss the use of base isolators to protect structures from the effects of damaging earthquakes.



Chandler Harris on the campus of the University of Buffalo at the Structural Earthquake and Engineering Simulation Lab (SEESL)



Dr. Andrew Whittaker at the SEESL explaining the science of structural resilience to Chandler Harris, Dhareus Franks and Damon Rogers



Chandler Harris at Ecotek Lab testing his earthquake tower for structural resilience.

About the Ecotek Science Program

Ecotek is a science research lab program for young inventors and researchers in grades 5 thru 12. Student scientists work on projects aligned with the issues being addressed by world leaders at the United Nations. To learn more about Ecotek Lab go to <http://www.ecotek-us.com>