University of Nevada, Reno

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Deconstructible Column Structures (14002)

Background

Conventional reinforced concrete buildings and bridges are not resilient. That is they suffer severe damage during moderate and strong earthquakes and have to undergo extensive repair or be replaced. Another common practice is that when reinforced concrete structures can no longer serve the necessary function, the entire structure is often demolished and sent to a dump, even though the structure and its components are in good shape and could be useable in another location with a different need. For example, approximately 10% of US bridges are obsolete and many are often demolished to be replaced with new bridges. Innovative methods, systems, and devices that are damage free and resilient while being deconstructible can save or eliminate repair time after earthquakes and can also allow for deconstruction of the structure to be used in a different location. This could save on the repair cost and reduce the material use, which, in turn could reduce the impact on the environment.

Description

Our researchers at the University of Nevada Reno have developed interchangeable and replaceable resilient components for integration in columns. These column structures comprise a base portion having a top surface, a column portion having a bottom surface, and a removable portion comprising an engineered cementitious composite or rubber with novel reinforcement. The component may be used at both the top and bottom of columns that support bridges, buildings, or other structures. Our technology will benefit industry because of their many advantages described below.

Advantages

- Our deconstructible support column structures reduce the cost of maintenance, repair, replacement, salvage, and reuse of structural components.
- Because the production of cement is a highly greenhouse gas intensive process, our technology can reduce greenhouse gas emissions since it allows structures to be disassembled and recycled rather than building entire structure. This could make the structure qualify as a "green" structure.
- Our invention can both greatly reduce the overall damage caused by extreme loading event; thus, greatly reducing the cost of repairing that damage.

Related Documents

- Patent 9,677,274: Deconstructable Support Column Structures
- Resilient Deconstructable Columns for Accelerated Bridge Construction in Seismically Active Areas

Please contact **Shannon Sheehan**, Technology Commercialization Manager, University of Nevada, Reno — Research & Innovation at (775) 784-7721 or ssheehan@unr.edu to inquire about licensing options. Review additional technologies developed at the University of Nevada, Reno at http://unr.testtechnologypublisher.com/

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