

Center for Infrastructure Engineering Studies (CIES)

University of Missouri at Rolla and North Carolina State University
Dr. Antonio Nanni, Director
Phone: 573-341-4497
E-mail: nanni@umr.edu

Method of Building Reinforcement



CIES research has produced a cost-effective, simple-to-implement method of upgrading thousands of buildings that have a great probability of failing and taking human life when subjected to seismic loading, high winds, or blast loading. The concept has been proven to work and is ready for implementation as a direct result of the work sponsored and encouraged by the NSF. This research on near surface mounted reinforcement systems for strengthening unreinforced masonry walls has been conducted by center director Tony Nanni and Gustavo Tumialan. The work has been extended by the U.S. Army Corp of Engineers and resulted in Federal Guidelines for strengthening government-owned buildings. Army Corp research based on full-scale and half-scale masonry buildings has validated the concepts and is leading towards commercial adoption of the UMR techniques. The key researchers are extending their work toward adobe masonry and masonry construction typical of third-world countries, realizing that most of the world's population lives in less than ideal masonry structures. The advantages of this technology rest in the rapid and clean method of application. This translates into cost savings and less inconvenience for the building occupants. The use of composites also allows for the strengthening technique to be applied on exterior surfaces without corrosion concerns and maintaining the original aesthetics of the wall. For more information, contact Dr. Antonio Nanni, 573-341-4497; e-mail: nanni@umr.edu.

Bridge Rehabilitation

The Repair of Buildings and Bridges with Composites (RB2C) is an I/UCRC based at the University of Missouri-Rolla and NC State University. The RB2C center has been contracted by the Missouri Department of Transportation to rehabilitate five aging concrete bridges throughout the state. The bridges will be strengthened using fiber-reinforced polymer (FRP) materials. They will then be instrumented and monitored biennially over five years. The data, information, and understanding gained from this project will be used to draft specifications for future FRP-related bridge-strengthening projects. Alongside these specifications, guidelines will also be written, documenting how bridges should be selected for various FRP-strengthening procedures, providing associated cost estimates of competing schemes, and predicting the life expectancy of strengthened bridges. For more information, contact Dr. Antonio Nanni, 573-341-4497; e-mail: nanni@umr.edu.

