Research Assignment - 2009

Title of research assignment

Progressive Collapse of Reinforced Concrete Structures

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Research abstract

The extent of initial damage to the World Trade Center Towers and the Pentagon during the September 11, 2001 terrorist attacks was beyond what was perhaps practical to be considered for progressive collapse resistant design. The extreme assaults and the tragic outcomes have initiated wide spread interest and research in progressive collapse of structures under more moderate initial damage scenarios. As part of an on-going research on progressive collapse of structures at Northeastern University, experimental and analytical studies will be conducted on potential collapse of reinforced concrete (RC) structures due to loss of columns. Following loss of columns, the beams bridging over these columns will need to dynamically redistribute the gravity loads to other parts of the structures. In order to reliably model the behavior of these critical beams and its effect on the response of the buildings, analtical and edperimental models of RC buildings will be evaluated.

Research activities/experience

Research activities include:
Analtical evaluation of response of structures following explosions
Experimental work including use of different types of sensors
Evaluation of computer program Arcade (http://www.arch.virginia.edu/arcade)

Expectations of RET

To be actively involved in both analytical and experimental program

Special skills or interests that would help a RET participant with this assignment (i.e., an interest in physics, experience with specific laboratory equipment, etc.)

Interest in physics and hands on experience

Lab safety/issues unique to this laboratory. A general Lab Safety Overview will be presented by Environment Health and Safety to both RET and YSP participants prior to the beginning of lab assignments.

Many safety measures will be in place during construction of models and during the experimental tests.

Suggested literature to be reviewed prior to beginning this research assignment.

Visit:
http://www.civ.neu.edu/people/faculty/mehrdad_sasani_phd
http://www.pcrc2007.neu.edu
http://911research.wtc7.net/mirrors/guardian/WTC/WTC_ch3.htm
http://www.serendipity.li/wot/pentagon/spencer05.htm#Damage_and_Debris
http://www.architectureweek.com/2003/0219/news_2-1.html

Research/Lab Summer Hours 9:00 a.m. – 5:00 p.m.
☐ Monday through Thursday
☐ Monday through Friday

Scheduled Research/Lab Meetings 1:00 p.m. – 2:30 p.m.
☐ Daily ☐ Wednesday ☐ To be determined
☒ Monday ☐ Thursday
☐ Tuesday ☐ Friday

Lab/research project URL

Visit: http://www.pcrc2007.neu.edu

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