



FAIRWINDS TOWER*

North Carolina, USA, 2007

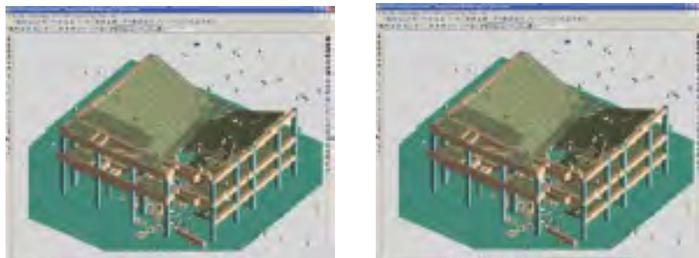
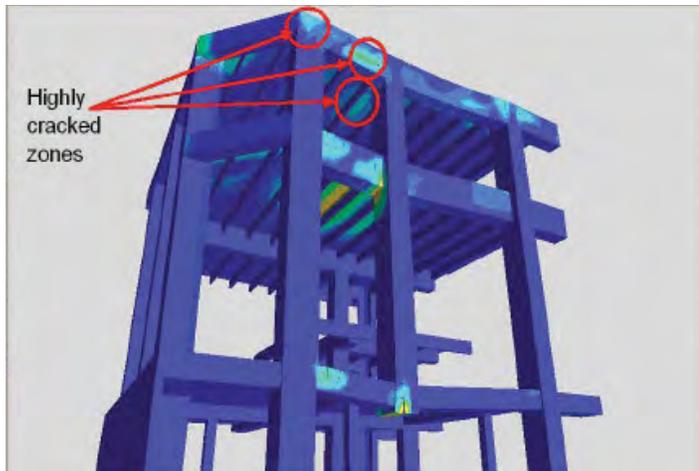
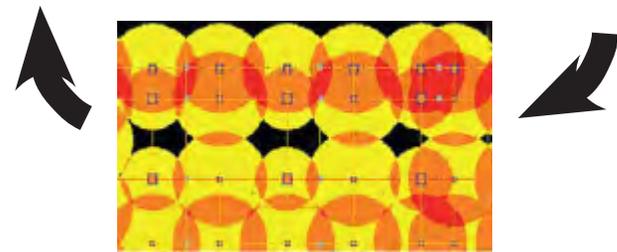
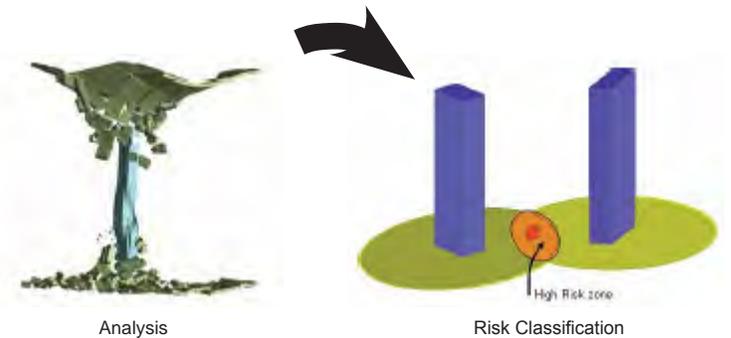
Blast & Progressive Collapse Vulnerability Assessment

Fairwinds Tower will be 48 stories, 800 feet tall, and have 1.5 million square feet of space and its price tag will be about \$880 million when it gets completed. The building consists of a high-rise tower and a podium. It was announced that it would become the official headquarters building for an international bank upon its completion in 2009.

In the light of post 9-11 building code requirements, the overall vulnerability of the structure has to be assessed to determine its safety relevant to both man-made and natural hazards. Security Management Consultants reviewed the possible threat scenarios to the structure and determined that there is a risk of an explosives-laden vehicle.

Applied Science International (ASI) was tasked with assessing the structure's vulnerability in several scenarios with different positions for the blast inside and outside the building with different weights for the explosive charge, taking into consideration vertical loads inherent in the structure.

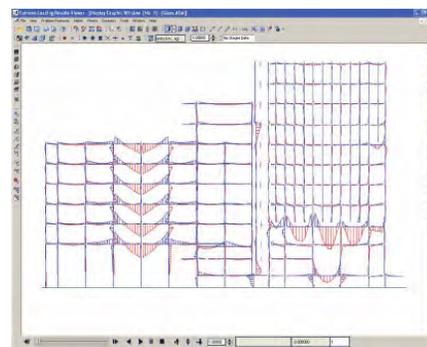
Using an iterative approach of analysis, ASI was able to identify High Risk Zones where damage of more than one structural element occurred and recommended for hardening.



Wind Analysis Performed on the Weakened Structure

ASI was able to:

- Identify risk zones for each column in the structure
- Determine the effect of blast on masonry walls and concrete slabs of the security control rooms
- Determine the probability of progressive collapse for different scenarios
- Determine the effect of impact of a projectile on the glass facade



Bending Moment Diagram After Column Failure

* This code name is used for this project for security

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