

An ASI Success Story

Old Humana Building Louisville, July 2008



The Riverview Square building, owned by Humana in Louisville, Kentucky was removed, In July 2008, to make way for a new basketball arena. The 12-story structure contained more than 20,000 tons of reinforced concrete and was demolished in 12 seconds using 550 pounds of explosives.

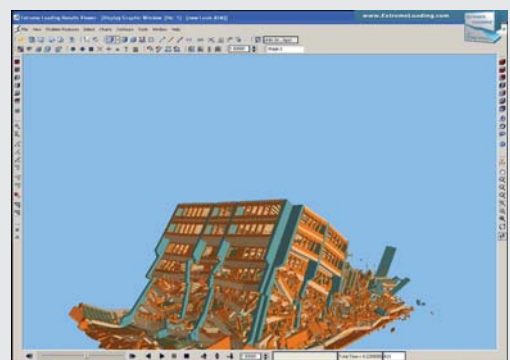
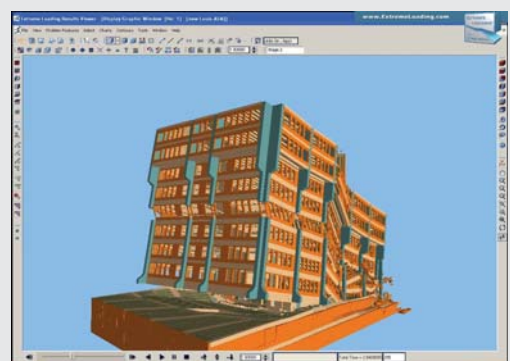
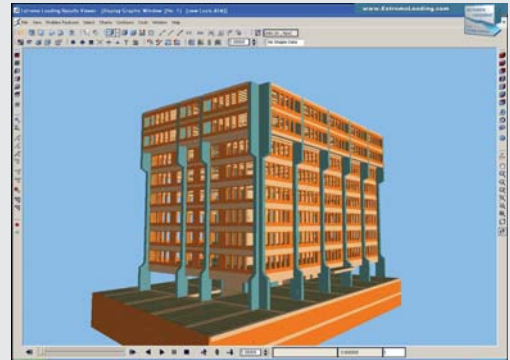
O'Rourke Wrecking Company, which was responsible for the demolition effort, took everything out of building, leaving the concrete shell, then drilled 800 holes into the structure and filled them with explosives. Since the structure is in the middle of an urban environment, the building had to fall within its own footprint. A lot of preparation work and precautions were required to make sure neighboring structures are not affected. As a precaution before the blasting, a company called Pro-Tec inspected nearby buildings to document what they look like before the implosion, just in case there's a problem afterwards.



A crew from the Discovery Channel shot the preparation and implosion for a show expected to air in 2009 about structural detonations. Discovery channel tasked ASI to prepare a structural model for this demolition event to verify the demolition method used by the contractor and compare it to the actual behavior of the structure after demolition. ASI used its advanced nonlinear dynamic analysis software Extreme Loading® for Structures (ELS) to model the demolition event.

The ASI team took all structural details into consideration, in addition to the details of the explosive charges. The flooring system consisted of reinforced concrete ribbed slabs supported on prestressed concrete beams. This flooring system leads to a fewer number of columns than a “regular” reinforced concrete structure. Using original construction plans, the structure was modeled taking all the structural elements into consideration. Explosive charges were placed on five levels of the building — the first, fifth and seventh floors and on two levels of underground parking. The amount, location, and delay of explosives were all taken into consideration by ASI engineers.

The ELS model of the implemented scenario showed a perfect match to the real-life case. The analysis demonstrates the ability of ELS to simulate the actual failure of such a structure taking into consideration the precise timing of element removal and the impact forces between different structural components and the flying debris. After the dust settled, the actual footprint of the debris of the structure agreed nicely with that predicted by the ASI team.



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