



# LOS ANGELES DOWNTOWN NEWS

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photo by Gary Leonard

Engineer Nabih Youssef has led some of Downtown's most notable retrofits, including the Coliseum, City Hall and the Old Bank District lofts.

## Shaking Up His Field

Earthquake Engineer Nabih Youssef Puts  
Downtown on Solid Ground

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**N**abih Youssef, one of the world's leading earthquake engineers, counts the catastrophic failure of the Olive View Hospital and Sanitarium during the Sylmar temblor of Feb. 9, 1971, as one of the most important early influences on his career.

At the time, Youssef, a graduate student in structural engineering at California State University in Los Angeles, had never felt an earthquake, having arrived in California just two years earlier from his hometown of Cairo, Egypt. While completing his degree, he was working part time for architectural firm Welton Becket & Associates. The firm had just completed work on the Olive View Hospital when the 6.5 quake hit.

"It was my first awareness of the severity of Mother Nature," Youssef recalls. The structural failure of the hospital, where two of the 14 fatalities in the Sylmar quake occurred despite the facility's state-of-the-art design, underscored the fact that earthquake engineering was, "an open field and earthquake codes were not fully developed. That's what caught my creative interest and led to my decision to immerse myself in the field," Youssef said.

He picked up his master's degree four months after the Sylmar quake, earned a post-graduate diploma in earthquake engineering from UCLA three years later, and stayed with Welton Becket until 1982. Then he and a team of co-workers jumped to AC Martin Partners. In 1989 they left to start Nabih Youssef & Associates.

The Downtown-based firm now has more than 60 employees and offices in Irvine, San Luis Obispo and San Francisco. The company's crowning achievement was the design of the earthquake protection system for the \$200 million Cathedral of Our Lady of the Angels, which is the heaviest building ever set on base isolators. The system of 149 rubber bearings, together with a separate set of 47 steel sliders, was designed to isolate the building from the movement of the earth in a quake so effectively that if a service is underway when the Big One hits, congregants at Temple and Grand theoretically won't have to leave their seats. In keeping with Cardinal Roger Mahoney's exacting demands, the cathedral, its thin concrete walls and alabaster windows unscathed, in that situation would become a place of refuge in a devastated city.

Nabih Youssef & Associates has also worked on several dozen other notable Downtown projects including seismic work at the Coliseum, City Hall and the Old Bank District complex near Fourth and Main streets.

"Nabih is definitely one of the great leaders in the retrofit movement with historic buildings," said Linda Dishman, executive director of the Los Angeles Conservancy. "He is very creative in his approach."

### Lasting Contributions

While Youssef has made his name working on Downtown buildings, his most lasting contributions could ultimately come through work that takes place out of public view. Youssef is seeking to transform the entire philosophy on which earthquake codes

have traditionally been based.

As chairman of the Seismic Safety Committee of the State Buildings Standards Commission, and as a member of many other panels over the last decade, Youssef has investigated the performance of earthquake codes during the 1994 Northridge quake. The effort led to the rather shocking revelation that even modern steel-framed structures built to the most demanding specifications were not immune to catastrophic failure during a big quake.

That finding, in turn, has added momentum to an ongoing shift away from prescriptive codes that lay out a list of features that every building must have. In their place, at the urging of Youssef and others, regulatory agencies are beginning to adopt performance-based standards, which set goals starting with the minimum objective of collapse prevention and moving up through various levels of property protection.

California's State Historical Building Code is one example of a set of standards that incorporates performance-based guidelines, Youssef said. "While not compromising life safety, it still allows alternative, creative methods of interventions which limit the intrusion and help protect the historic fabric of old buildings," he said.

This transformation in thinking about earthquake safety deserves a good deal of credit for the renaissance in Downtown's long-neglected Historic Core. Indeed, Youssef is widely regarded as one of the leading new thinkers among structural engineers.

"I don't view Nabih as the first or only engineer to understand how to reinforce and reuse historic buildings. But he's the best at it," said Bill Delvac, a lawyer at Latham & Watkins and a preservation consultant.

The latest high-tech analytical tools have been a boon to new thinking about earthquake safety, Youssef said. Studies at earthquake research centers have demonstrated that riveted steel skeletons filled in with brick walls, the technique used in tens of thousands of buildings constructed in California before World War II, perform much better in earthquakes than previously believed.

"The common view 15 years ago was that masonry walls had no value. Retrofitting them required tons of sheer walls and foundations, which was not feasible," Youssef said. In fact, the intrusive intervention required under old codes in some cases did more harm than good, he added, not only to the historic character of old buildings but to their structural integrity.

A better way to retrofit historic buildings, Youssef says, is to supplement the inherent strength of masonry walls with reinforced concrete frames, carbon fiber mats and other unobtrusive, lightweight materials. Those also happen to be the most cost-effective methods.

Youssef sees a bright future for Downtown, where the firm is currently involved in more than 30 projects. Youssef's team is working on everything from renovations of the former St. Vibiana's cathedral and the Subway Terminal Building, to the new Ralphs supermarket project. They are all, he says, developments that are possible because of an improved partnership between business people and city officials who have been receptive to new approaches to earthquake safety.

"I wouldn't use 'flexible' to describe their approach. Building officials feel guilty about that word," Youssef said. "But I would say we now have much better collaboration between the city and leading engineering firms and practitioners. That has allowed us to implement cost-effective, elegant solutions, and in a timely manner, too."