

THE NEW ORLEANS ARENA

Reinforced Concrete Tied-Arch Truss

Rising steel prices and long-lead times were critical conditions considered by structural engineer Walter P. Moore as it developed a creative structural solution for the New Orleans Arena roof. By applying proven bridge technology in a completely new way, structural engineers employed a reinforced-concrete, tied-arch bridge concept to create a clear-span roof of 327 feet over a modern arena. The roof system utilizes a combination of traditional structural steel elements with site-cast concrete top chords. *This is the first time the concept has ever been applied to an arena roof.*

At the project's inception, two initial trials were faced: structural steel prices were rising and lead times for steel orders were longer than usual in the region. To avoid delays, designers elected to minimize the structural steel tonnage by finding a creative, lower-cost alternative.

By adapting a proven, 19th-century bridge technology to a completely new application, structural engineers employed a reinforced concrete, tied-arch bridge concept to create a clear-span roof of 327 feet over a modern arena. Concrete is not usually chosen for long-span roof designs because of its heavy dead load. On this project, however, the reinforced-concrete arch bridge took advantage of the best properties of both steel and concrete, while performing like a reinforced-concrete arch bridge. The roof system's concrete components carry the large compression loads of an arch, while the steel tie resists the thrusts.

This innovative application saved the owner considerable time and money. Construction cost savings were achieved through the use of reinforced concrete box girders in compression that are six to eight times more economical than structural steel sections when carrying large compression loads. Plus, the hollow shape of the box girders enabled the contractors to save money by using conventional cranes during erection rather than specialized lifters. Pricing during conceptual design showed a \$430,000 savings over structural steel in the final erected cost of the roof system.

The reinforced-concrete tied-arch bridge concept used in the New Orleans Arena is the latest step in the continuing evolution of long-span roofs. Walter P. Moore's design was a creative, practical, functional and cost-effective improvement over most of the long-span roof systems commonly used today. And, the Arena clearly meets the needs of the city of New Orleans, providing a premier top-notch facility for sporting and entertainment events and making the city a year-round national sporting center.

**Contact: Lawrence Griffis, P.E. • Walter P. Moore • 3131 Eastside • Houston, TX 77098
713-630-7300 • Fax 713-630-7386 • lgriffis@walterpmoore.com • www.walterpmoore.com**

