Department of Structural Engineering
University of California, San Diego
SE 290 Seminar

Kevin Legenza
Thornton Tomasetti

"The Las Vegas T-Mobile Arena: Structural and Tuned Mass Damper Design"
Wednesday, November 14, 2018
12:00 pm - 12:50 pm, Pepper Canyon Hall, Room 122

https://structures.ucsd.edu/seminars

Abstract

Thornton Tomasetti provided structural engineering and tuned mass damper (TMD) design services for a 20,000-seat multipurpose event center located west of the Las Vegas Strip. The 650,000-square-foot facility can accommodate a variety of events, including NBA and NHL games, concerts, boxing, mixed martial arts programs and award shows. The arena design features an expansive glass façade with an LED overlay. Constructed primarily of structural steel with composite concrete floors, the design includes 7,000 individual steel beams with a combined weight of 7,100 tons. A long-span roof, which covers the 350-by-450-foot seating bowl without columns, affords unobstructed views. An expansive rigging grid is capable of supporting the equivalent of two Boeing 737 airplanes. A cantilevered balcony angles across the arena's façade, rising from the main concourse to the club level. The multiuse space – used as a VIP area for club members, a venue for private parties or a viewing area for performances on a two-acre plaza below – has a slender, tapering profile that is an important architectural feature. To minimize the amount of structural steel needed to control vibration caused by crowd activities, we designed five TMDs to hang from the balcony floor system between its cantilevering primary trusses. Our acoustics, noise and vibration consulting team also performed site supervision of installation and commissioning, and provided the specification, supervision and data analysis of the testing. This solution reduced the truss steel by over 50 percent, a financial and sustainability win for the LEED Gold certified project.

Biography

Kevin Legenza, the San Diego Office Director for Thornton Tomasetti, Inc. has more than 10 years of structural design, project management and research experience. Kevin's primary focus is on signature sporting venues and complex specialty structures. His project portfolio also includes a considerable number of residential, commercial and mixed-use high-rise buildings. He has overseen all phases of project delivery, from conceptual design through construction administration, and has worked in positions from structural designer to multidisciplinary project manager / integrator.

Sponsored by Professor Benson Shing
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