

structural STEEL



HEALTHCARE STRUCTURES IN STEEL

Mission Hospital Acute Care Tower
Mission Viejo, CA

Project Highlights

- Award-winning result of patient-centered design and project team partnering
- Use of BIM and 3D modeling for planning coordination activities
- Striking architectural features that suggest the modern technology and services offered within while clearly revealing structural elements that contribute to seismic performance
- On-time completion under the challenges of additional scope

Structural steel played a key role in both the striking architecture of the Mission Hospital Acute Care Tower and the advanced services this new facility provides to the community. The \$153 million critical care addition houses medical, surgical and ICU beds, advanced equipment for diagnostic imaging and nuclear medicine as well as ancillary patient services.

Form Follows Function

Location of the Acute Care Tower in an area of high seismicity made seismic performance a key requirement. An exteriorly expressed, special concentric steel brace-frame lateral system was selected to provide the needed seismic performance. RBB Architects Inc of Los Angeles chose the exterior expression of the frame in its design as a means of conveying the state-of-the-art services provided in the facility.

Partnering, Coordination, and BIM

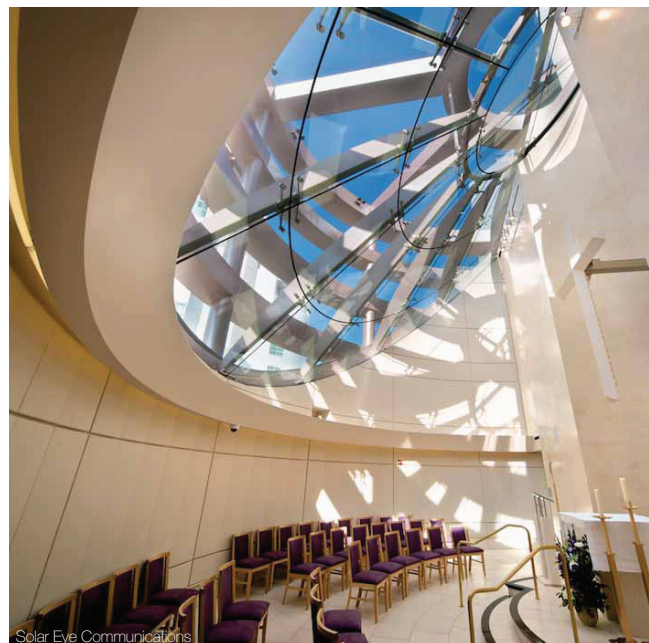
Project team leader, McCarthy Building Companies, coordinated the team's efforts to effectively meet the project's requirements overcoming a number of complex challenges.

Building Information Modeling (BIM) was effectively used to coordinate the architecture, structural framing and mechanical systems. The structural model developed by Schuff Steel using Tekla™ software was a critical component of the BIM effort and was used with a model of the exterior façade to overcome the complexities of the exposed braces and metal panel covers.

The modeling process also contributed to the architectural statement the architect was able to express in both the structure of the chapel and the entrance canopy. The chapel is a 35-foot-tall cylindrical-shaped structure comprised of structural steel framed rings intersected by a 45-degree inclined glass roof. Unique steel connections allowed the inclined glass roof to be supported on the tube steel compound curve rafters.

The entrance canopy adjacent to the chapel is 12 feet tall and constructed of exposed steel pipes supported on two 12-inch-diameter pipe columns cantilevered from the footings. The pipe columns support an intricate elongated V-shaped steel pipe truss which uses spiders to support glass panels.

The project team's use of BIM was so successful that the owner, St. Joseph Health System, was awarded the Gold Constructech Vision Award from *Constructech Magazine* for the use of technology to promote innovation in the construction industry.



Schedule

The complexities of expanding an operating hospital were addressed by the project team through early and continual coordination even as the project scope expanded. This challenge fell in large part to the steel fabricator and erector who were responsible for reducing the amount of time existing areas of the hospital would need to be vacated during the installation of a new bridge to connect the new tower to the third floor of the existing facility. The 158-foot bridge is comprised of a 135-foot-span tube steel truss and a 23-foot cantilevered section. Schuff Steel worked closely with KPFF, the structural engineer, to coordinate the structural design to maximize off-site fabrication and reduced the erection to one day.

Awards and Recognition

Constructech Magazine
Gold Constructech Vision Award

Associated General Contractors of America
2009 Marvin M. Black Excellence in Partnering Award

AIA Design Award 2009

California Construction
2010 Best of California Award of Merit – Healthcare

Project Details

Location:	Mission Hospital Acute Care Tower 27700 Medical Center Road Mission Viejo, California 92691 949.364.1400 mission4health.com
Client:	St Joseph Health System
Completion date:	November 15, 2009
Gross square feet:	106,465
Number of stories:	4
Number of patient beds:	68
Architect:	RBB Architects Inc
Structural Engineer:	KPFF Consulting Engineers, Inc.
General Contractor:	McCarthy Building Companies, Inc.
Fabricator:	Schuff Steel Company, Inc.
Erector:	Schuff Steel Company, Inc.
Detailer:	Schuff Steel Company, Inc.

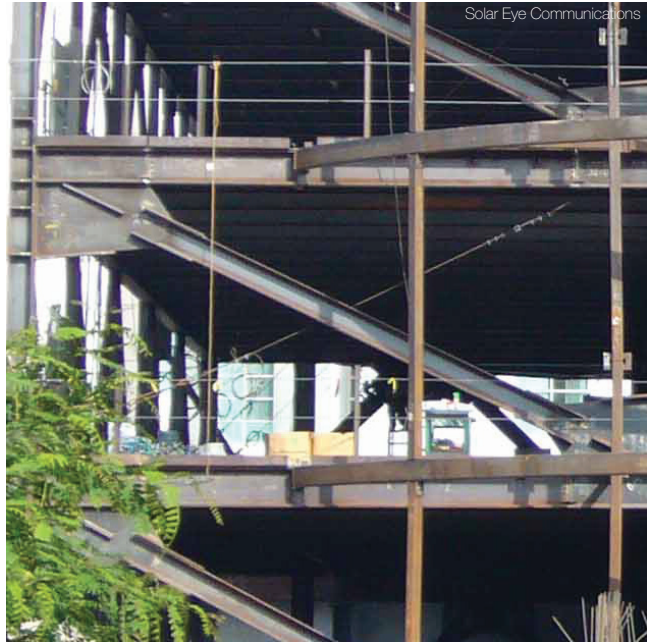
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"This level of COMMITMENT AND PARTNERSHIP on the Mission Hospital Patient Care Tower project has set a new precedent for excellence and is a model for partnering on future projects."

—James Ho, Regional Director of Construction
St. Joseph Health System

