



*Steven Schaefer Associates, Inc.*

Consulting Structural Engineers

## **Carle Foundation Hospital Gets More Building for the Money Patient Tower & Heart Vascular Institute**

Carle Foundation Hospital (Urbana, IL) has embarked on a remarkable campus modernization in the past five years. As part of that plan, they recently began construction on the \$120 million Carle Heart & Vascular Institute (HVI) – a nine-story 390,000 square foot patient bed tower. Construction started in March 2011 and will be completed in June 2013, with two remaining floors planned for some time in the future (which has already been vetted with regulatory agencies, saving time and money when they are constructed).

Savings created by our team's dedication to designing the most efficient structure allowed for reinvestment into other portions of the building, including the addition of a full basement. The original seismic design category was determined using data from an adjacent site and would have required extensive bracing of MEP components and a higher level of seismic detailing for the structure. After we reviewed the soil boring data for the HVI site and compared it to the data from the adjacent site, we recommended that the owner discuss performing shear wave velocity testing with the geotechnical engineer. Results from that test led to a more beneficial seismic design category.

Performing a response spectra analysis in lieu of the Equivalent Lateral Force Procedure (ELFP) permitted a reduction in the size of seismic joints between the new HVI building and the adjacent tower. Selectively using light weight concrete at the upper patient floors allowed for the use of a shallow foundation system. Lightweight concrete also significantly reduced the building weight. These design directives, in combination with the lower seismic category, led to a reduction in the thickness of reinforcing in the building's shear walls.

"Hospitals require significant attention to thousands of details" according to Robert Rogers, Steven Schaefer Associates' Senior Project Manager – and Carle's new tower was no exception. For example, there are areas where major HVAC equipment is sitting on a floor and sensitive medical equipment is hanging from the underside of the same floor. "It was decided by the team to have an independent vibrations consultant confirm our solution to this tricky design situation – and they confirmed our approach" says Rogers

Throughout the design process, changes resulting from aesthetic considerations, better use of space, or budget considerations were routinely encountered – adaptability and communication were essential. Through the frequent exchange of building information models, regular video / telephone conferencing, in person team meetings, or old fashioned phone calls – every team member provided regular project and design updates. We expect the same type of collaboration during construction. Pepper Construction, the Construction Manager, has been utilizing the architectural and structural models throughout the project. We all recognize the value of faster trade coordination and construction.

Steven Schaefer Associates' involvement with this project, from design to construction completion, is noteworthy. With a seven-member structural project team dedicated to this project for the last year and a half, we'll be excited to see this building finished and benefiting the community it serves.

© Copyright Steven Schaefer Associates, Inc.