Seeing the Big Picture—on the Big Screen

BY BRENDA ASCHLIMAN

"Think of it as an IMAX theater for the entire design team."

TO JIM JACOBI, P.E., senior principal and chief information officer at structural engineering firm Walter P Moore, being able to visualize engineering plans is the key to understanding the final product. But it is often difficult for stakeholders to get a sense of the design from two-dimensional drawings. His vision of the ideal design review environment is one that uses technology to give all players—not just the design team—the big picture.

"One of the biggest issues in our industry for end users or facility owners is developing clear mental images of what their architects and engineers are talking about when showing the drawings," Jacobi says. "Drawings are hard to read and conceptualize."

Sometimes it isn't until construction has begun that end users/owners realize what's being built isn't what they had envisioned. Jacobi wanted to leverage technology to enroll those stakeholders in a meaningful way early in the design process. Among the other advantages is the ability to avoid the complications and expense of having to redo designs.

"The capability for visualization has proven to be the key," he says. "People 'get it' when they can see the digital imagery, when they can 'walk' through the facility, when they can experience it from different angles and interrogate it."

As Walter P Moore began to design its new Houston office space, which opened early this year, Jacobi's idea took shape. The completed result, the Visionarium, gives participants a sense of total, visual 3D immersion. Think of it as an IMAX theater for the entire design team. Shown onto the 25-ft screen are images from a three-tier projection system. Special imaging hardware renders a single surround-image without distortion. Three projectors can independently display images from up to three separate computer systems in any combination and from digital video and cable TV transmissions and DVDs. A digital conferencing system allows voice and data sharing with participants in remote locations. In the ceiling is an echo-canceling audio system. The 600-sq.-ft conference space seats up to 25. According to Jacobi, the cost of the project system components for the custom-built system, including the screen, came in at under $10,000.

"We now have a cost-effective, immersive design review environment where we can not only bring in project team members to do this multi-disciplinary review using a virtual, digital model, but where we can also bring together stakeholders in an informative, participatory environment," Jacobi says.

Stakeholders who have experienced the virtual environment include other design team professionals, owners, end users, and public officials.

For the design team, building information modeling (BIM) is extremely valuable for bringing models together from all the disciplines to detect physical clashes and deter-

mining how to best remove them. Jacobi has found that the virtual environment also allows the team to find functional clashes that they didn't recognize before, such as layout or positioning of different architectural components, or a better way to zone air conditioning and other building systems.

"It allows us to build these digital mock-ups of our projects, just like General Motors is building digital mock-ups of automobiles and Boeing is building digital mock-ups of

Mark Scheve

aircraft," explains Jacobi. By building things virtually, we can discover any potential problems and optimize the design."

"When a structure designed using BIM gets constructed, it is a much smoother and time- and cost-effective process."

Walter P Moore staff also use the Visionarium as a multipurpose conference room, taking advantage of the 25-ft-wide desktop for work sessions.

"The Visionarium functions not just as a big design review environment," Jacobi explains. "[In addition] you can have an infrastructure simulation model on the screen at the same time you're looking at sections and profiles in Civil 3D Design. The large field of view is beneficial."

"Because of our experience using BIM with the design team, we saw that clients could also benefit from seeing projects virtually. It's equally important that stakeholders—including the owner or end user, who is often our client's client—get the big picture, too. The Visionarium has exceeded our expectations." **MSC**

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