Healing Power of Nature Elevates San Diego Hospital Design

TOP DESIGN FIRMS OF 2010 • STANTEC’S STRATEGIC PLAN
Engineering Firm Embraces BIM Frontiers

The $7 million Las Vegas Fire and Rescue/CSN Fire Station/Instructional Center may seem like a relatively straightforward project that incorporates today’s strong demand for form, fit and sustainability. The 15,500-sq-ft, multi-use facility, shared by the City of Las Vegas and College of Southern Nevada, incorporates an operational fire station with adjoining college classrooms. Designed to obtain LEED Silver certification, the station even includes a rooftop solar system to power everything from water to lights.

However, for JBA Consulting Engineers, the engineer-of-record for the project, the fire station, fully designed and constructed using building information modeling (BIM) technologies and practices, characterizes a welcome new norm for the industry.

Dwayne G Miller, CEO, JBA Consulting Engineers, says, “From our firm’s perspective, BIM is one of the most exciting technology developments for the current generation of building engineers, offering opportunities to innovate with speed and clarity.”

Over the last five years, JBA has firmly embraced BIM. With a little help, JBA has adopted BIM tools and techniques as an integral part of the firm’s workflow and collaborative business practices in order to facilitate projects like the Las Vegas fire station.

BIM Shift
As an international engineering firm, JBA provides mechanical, electrical and plumbing (MEP) engineering services as well as telecommunications, acoustical, audio-video, security systems and fire protection/life safety engineering services. As the building and construction industry struggled through the financial and economic downturn, the firm sought ways to improve workflows, save money and drive efficiency.

James Chun, JBA’s former BIM manager and currently software architect for JBA’s sister company, BDO Resources Group, says, “We started to see more owner interest in BIM processes and models. We also quickly realized that BIM was not the next CAD, and in fact, had far more potential. We knew we had to get out in front of the technology to position ourselves for the future.”

Backed by the firm’s executive management team, JBA made the commitment to BIM technology in 2006.

The firm purchased 30 Autodesk Revit licenses in early 2007. After some training, JBA put BIM to work on several projects including the design of the main data center serving the $4.5 billion Echelon Resort in Las Vegas. The model included details about the MEP audio visual, telecommunications and sprinkler systems.

Chun says, “The Echelon model worked well for conflict detection, space allocation, data center security and similar design coordination efforts, but did not transition to the construction process. As we assessed the potential of BIM to the complete building lifecycle, we wanted to implement it effectively into our workflow. We leveraged U.S. CAD as a resource to help us achieve our goals.”

JBA partnered with U.S. CAD, an Autodesk Reseller, in 2009 to assist in further development of the firm’s existing BIM technology platform and processes. At U.S. CAD’s recommendation, JBA bought additional licenses for Autodesk Revit and Navisworks Manage and began advanced training for engineers in its Las Vegas office.

Not long after, JBA won a contract to provide engineering services on the Las Vegas fire station project—a project that required the team to use BIM as a design, delivery and potential operations platform.

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Digital Ignition
Per the City of Las Vegas and State of Nevada, all project team members on the Las Vegas Fire and Rescue/CSN Fire Station/Instructional Center project were required to use Revit and coordinate design concepts with Navisworks Manage. JBA Architecture developed a model of the building envelope while JBA modeled the MEP technology and fire protection systems. Wright Engineers modeled the structural systems while the contractor developed a model for field coordination and shop fabrication.

JBA’s role was to coordinate and review the building envelope with the architect and perform calculations to verify compliance with the applicable energy conservation codes. The firm prepared MEP and technology systems as well as the associated construction documents including detailed engineering, design and drawings for the photovoltaic-based renewable energy component of the project.

Over the course of the design and preconstruction processes, the architects and engineers posted design models to a site for viewing in Navisworks Manage.

Ramon Juarez, a mechanical designer for the project, recalls, “Every week we’d bring all the updated models together at arcitectural software to perform clash detection. The contractor would join the meetings at various milestones. In terms of modeling, everything went pretty smoothly.

The construction documents were probably the most complete and coordinated that we’d ever produced.”

Once the project was complete, the leadership of JBA bought a comprehensive assessment of what worked—and what did not.

Fanning the Flames
JBA calls in U.S. CAD’s BIM experts to assess the firm’s progress in adopting and applying BIM technology on the fire station project. Over the course of a month, U.S. CAD evaluated JBA’s work processes and talked to engineers and project managers about the BIM implementation and any technology challenges.

The final report included an overall assessment of the JBA BIM adoption and offered advice on ways to better leverage the features, functionality and processes to gain greater value.

BIM is fast-becoming JBA’s technology of choice. Since initial BIM adoption, the firm has performed over 20 projects of all sizes and scopes around the world. Daron Sperry, current BIM manager for JBA, says, “And we’re using it to model everything from MEP systems to fire protection, telecommunications, audio visual, security, acoustics and data center systems.”

The firm has fully launched Revit and Navisworks Manage in its Nevada and California offices and has begun implementation in its Louisiana office and four international offices.

Miller concludes, “Our commitment to embrace BIM in 2006 mandated that we reach out to industry partners who were experts in BIM software deployment and delivery. U.S. CAD was a valuable partner in our shift to BIM as a project deliverable, helping us achieve our goal to be at the forefront of technology. Innovation is the key to a sustainable competitive advantage. . . and U.S. CAD has helped us maintain competitive edge in the leaner times through the tools and guidance they provided.”

About U.S. CAD
U.S. CAD is a BIM and manufacturing industry consultant and the largest Autodesk Authorized Value Added Reseller on the West Coast. U.S. CAD specializes in helping its customers integrate BIM, sustainable design and digital prototyping technologies within their organizations by incorporating a variety of Autodesk solutions along with implementation, training, BIM modeling and production, and configuration services.

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