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—Kevin Bredeson
  Director of Virtual Construction
  Gilbane Building Company

BIM saves millions.

Gilbane uses BIM solutions from Autodesk to help reduce construction costs and shorten schedules.
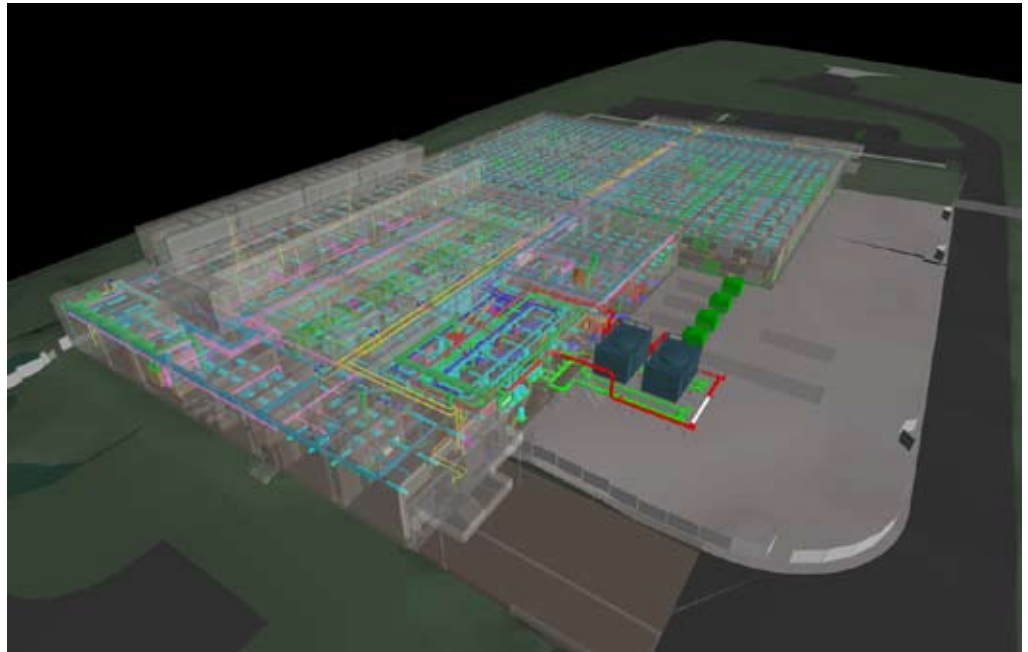
Project Summary

Founded in 1873, the Gilbane Building Company (Gilbane) is the 19th largest contractor and the 6th largest construction manager in the United States, according to *Engineering News Record*. As a non-self-performing construction firm, Gilbane has long delivered value to clients through exceptional team, cost, and schedule management. Supported by its Virtual Construction Group, Gilbane uses model-based design and construction technology to help achieve leading-edge project efficiency. With assistance from building information modeling (BIM) solutions from Autodesk, including Autodesk® Navisworks®, Autodesk® Revit® Architecture, and Autodesk® Revit® MEP software, Gilbane has been able to:

- Identify and resolve thousands of design clashes before construction
- Decrease the number of RFIs and change orders by up to 70 percent
- Save clients more than $1 million on typical projects
- Accelerate project schedules by as much as 10 percent
- Increase the use of cost-effective prefabricated materials

The Challenge

Even with the most proactive management, large-scale construction projects have traditionally been hampered by cost-overruns, delays, and miscommunication. That's in part because these projects are typically complex and involve many players. And for large projects, it's not uncommon for designs to unwittingly include thousands of clashes between the building systems. For example, duct work for ventilation systems might conflict with plumbing. In addition, managing complex dependencies between tasks assigned to different contractors is extremely difficult, with seemingly small delays potentially derailing well-planned work and material delivery schedules.

Kevin Bredeson, Gilbane's director of virtual construction, explains how unanticipated issues can impact projects, "Whether they are major or minor, each clash uncovered on a job site means the contractor must send a request for information (RFI) to the design team. This can potentially result in delays and a costly change order for the owner. We try to foster communication, collaboration, and clarity on our projects to prevent problems—and BIM is an important part of our success in doing so."

Autodesk

Using BIM solutions from Autodesk, Gilbane accelerates project schedules by as much as 10 percent.

The Solution

To overcome the challenges that have traditionally slowed construction projects, Gilbane's team no longer simply follows 2D designs delivered by architects and engineers. Instead, they use BIM solutions from Autodesk to drive projects in 3D. It all begins with Autodesk Revit Architecture and Autodesk Revit MEP software. Gilbane uses Revit®-based software to develop intelligent models of buildings and building systems, and then uses those models to help construction teams and clients visualize the design and explore constructability issues.

To plan and coordinate the construction process, Gilbane loads its 3D models into Autodesk Navisworks software to help detect clashes and further review the design. The company also uses Navisworks to optimize time management on projects, developing 4D schedules that link tasks to elements within 3D models.

"BIM facilitates better project coordination and collaboration because virtually every aspect of a project is clearer with 3D models," says Bredeson. "When constructability issues surface early in a project, we collaborate with the architect to resolve them quickly. With BIM, we can simulate the completed building and understand what it will take to finish it."

Facilitating Clash Detection and Prefabrication

A recently completed operations center for a large financial institution illustrates how model-based construction and BIM software have enhanced Gilbane's projects. Before breaking ground on the $51 million, 96,000-square-foot facility, Gilbane created a precise model of every aspect of the building. Then, it identified and addressed clashes among all systems, from the ventilation to the walls and electrical systems. Finally, the team sequenced the construction process, creating a detailed schedule aligned to the building's 3D model.

According to Bredeson, BIM enhanced the project from planning through construction. He says, "The visualization capabilities of Navisworks and Revit-based software allowed us to conduct our weekly project meetings virtually, helping to reduce travel time and expense. We identified and resolved more than 1,500 clashes during planning. And with clash resolution and 4D scheduling, it was easier to coordinate the arrival and production of more cost-effective prefabricated materials. In fact, about 85 percent of all the materials on that project were fabricated offsite."
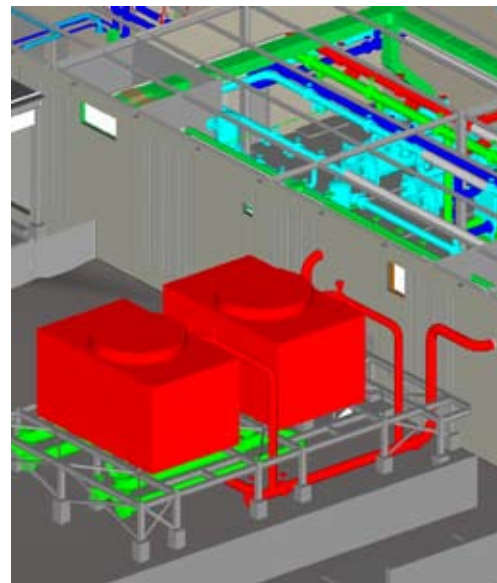
Mitigating Risks

On another current Gilbane project—the Project Honor—BIM helped improve the construction process, before the design even began. Gilbane's client, the SC Johnson Company, engaged Gilbane before hiring an architect and asked the company to bring its BIM experience to the project from the earliest stages. When complete, the Project Honor building will be the centerpiece of the SC Johnson campus, and it will include a company museum, an assembly hall, dining facilities, and a fitness center.

"During design and planning, we maintained a full 3D model of the architecture, structural elements, building systems, and site," says Bredeson. "The team found and resolved 2,400 clashes well before they impacted the project or required RFIs. By including BIM from the beginning, SC Johnson has mitigated many cost and schedule risks that often accompany impactful architecture."

The Result

While Gilbane knew that BIM was saving time and money by preventing problems on construction projects, it didn't have concrete metrics until it undertook a cost/benefit analysis. Gilbane compared several quantifiable factors, such as schedules and numbers of RFIs, on projects that did and did not use BIM. Then it estimated the potential cost impact of those factors.
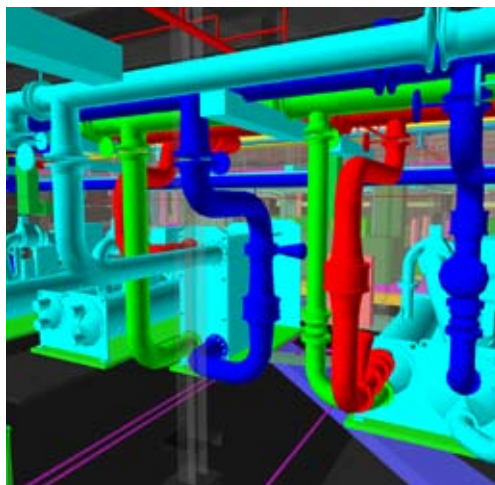
Bredeson says that the numbers are striking. "Compared to traditionally managed construction, BIM projects generate 50 to 70 percent fewer RFIs, which also means fewer change orders," he reports. "We've shortened project schedules by as much as 10 percent. And the cost impact is just as dramatic. On the financial institution project alone, we estimate that the client saved more than $1 million. At every stage of the construction process, BIM helps us improve the way we manage projects and deliver value to clients."

For More Information

To find out more about how Autodesk BIM software helps save time and money on construction projects, visit **www.autodesk.com/powerofbim.**

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