

Customer Solution Success Story

Autodesk® Revit® Building
Autodesk® Revit® Structure
Autodesk® Revit® Systems
AutoCAD®
Autodesk® 3ds Max®
Autodesk® Buzzsaw®
Autodesk® Constructware®
Autodesk® Design Review
Autodesk Consulting



Architect: Skidmore, Owings & Merrill LLP
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“The Autodesk Revit platform absolutely provides us with a competitive business advantage. There’s no doubt about it.”

Charles Guerrero
Vice President
WSP Cantor Seinuk

Using the Autodesk Revit platform and other Autodesk productivity tools, the Freedom Tower project team is able to

- *Significantly reduce the back and forth that goes on between the disciplines*
- *Enable multiple project team members and disciplines to work on the model simultaneously*
- *Communicate complex design changes with speed and clarity using Autodesk® Design Review*
- *Improve communication through centralised, on-demand project information and construction processes via Autodesk collaborative project management solutions*
- *Rapidly visualise complex designs and create 3D renderings and animations with Autodesk® 3ds Max® software*

Revolutionary design.

Skidmore, Owings & Merrill LLP and prominent engineering firms adopt the Autodesk® Revit® building information modeling (BIM) platform to deliver maximum accuracy, coordination, and value on the 1,776-foot Freedom Tower project.

Project Summary

Skidmore, Owings & Merrill LLP (SOM) is one of the world’s leading architecture, urban design, and engineering firms. Since its founding in 1936, SOM has completed over 10,000 projects around the world and won more than a thousand awards for quality and innovation. “SOM is best known for our design of super high-rise buildings based on innovative integration of architecture and engineering systems in projects such as the Sears Tower and John Hancock Center in Chicago, the Jin Mao Tower in Shanghai and the Burj Dubai in Dubai,” says SOM Partner Carl Galioto.

That level of innovation is why owner/developer Silverstein Properties picked SOM to design the Freedom Tower, the first building to rise on the site of the former World Trade Center. At 1,776 feet, this elegant structure of shimmering glass will contain more than 2.6 million square feet of commercial and public space, including world-class restaurants, observation decks and a state-of-the-

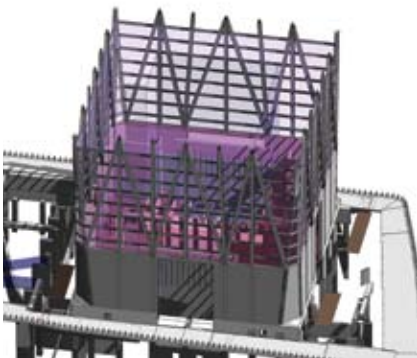
art broadcast facility. Everything in the new tower will incorporate the highest standards of design, safety, sustainability and quality. To realise such a large and symbolically important project, SOM and engineering firms WSP Cantor Seinuk and Jaros Baum & Bolles (JB&B) worked closely with Autodesk Consulting to implement the Autodesk Revit building information modelling platform.

The Challenge

Since the construction of the original World Trade Center, much has changed in the building industry. Advances in design technology and project workflow integration have enabled architects and engineers to create buildings faster and more efficiently than ever before. Yet, because each discipline typically relies on its own design tools—and proprietary formats—sharing those designs with other disciplines and reusing the data they contain often involve time-consuming duplication of work and needless errors.

“As a direct result of using Autodesk Revit Systems, we anticipate a drastic reduction in change orders. That’s where MEP engineers typically lose the most time—and that’s where the Revit platform will offer us the greatest advantage.”

Tim Fu
Mechanical Engineer
Jaros Baum & Bolles



Courtesy of WSP Cantor Seinuk and Skidmore, Owings & Merrill LLP

“Revit Structure has helped us dramatically improve project co-ordination,” says Cantor Seinuk’s Charles Guerrero.



Courtesy of Skidmore, Owings & Merrill LLP

Autodesk® Design Review provides all stakeholders—even non-CAD users—with custom markup and approval tools.

High-Stakes Building

On a project as complex as the Freedom Tower, these potential challenges are magnified by fast-track schedules, a heightened need for security, and the vast number of architects, engineers and builders involved. In addition, other stakeholders—who lack access to CAD software—need an easy way to access accurate and current project information for quick approval of key decisions. At every step, there is little room for errors or costly delays.

The Solution

“We needed the right tool for working on this extraordinary project,” says Galioto. After a competitive software selection process, SOM chose Autodesk® Revit® Building software as the project’s primary architectural design tool. One important factor in the decision was the software’s seamless integration with the other two components of the Revit building information modeling platform, Autodesk® Revit® Structure and Autodesk® Revit® Systems software applications. “Revit helps fulfill a dream we’ve had since the 1980s—architects, engineers, and builders all working from a single, integrated digital model that contains all project information,” says Galioto.

Keep Everyone Up to Date

At the heart of the Revit platform is building information modeling, a digital approach to building design, delivery, and management. Designers, architects, engineers, and production teams all use industry-specific tools while working on the model. As they design, Revit

automatically creates all other corresponding project information, including accurate floor plans, elevations, sections, quantity takeoffs, area calculations, schedules and more. And once they update the model, all the other disciplines have access to accurate and complete information about the entire project.

Outperform Expectations

“We started off cautiously,” says Galioto. “Our initial plan was to use Revit Building—complemented by AutoCAD—to model only the building’s complex subgrade levels. But because Revit performed so well, we quickly expanded its use to the entire project.” Currently, the Revit-trained team consists of 30 architects from SOM, 10 MEP engineers from JB&B and a team of structural engineers from Cantor Seinuk.

Learn from the Source

Right from the start, Autodesk Consulting provided invaluable help to all team members. “We had three weeks of specialised training, not only with the base platform but also with building custom content in the early phase,” says Jay Conti, Technology Manager at JB&B. “Autodesk Consulting helped us get up and running quickly.”

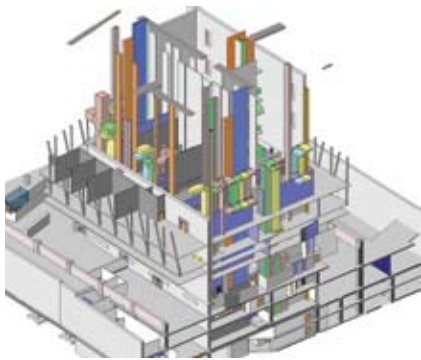
Get More Done—Faster

Because all of the disciplines are working from the same data, time wasted on translation is virtually eliminated. “Revit Structure has helped us dramatically improve project co-ordination,” says Charles Guerrero, Vice President at Cantor Seinuk. “The model really co-ordinates itself, so to speak. It’s a tremendous time-saver.”





Lobby Rendering Architect: Skidmore, Owings & Merrill LLP
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Courtesy of Jaros Baum & Bolles and Skidmore, Owings & Merrill LLP

JB@B used Revit Systems to model building systems content for improved co-ordination with all disciplines.



West Plaza Architect: Skidmore, Owings & Merrill LLP
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Vastly Improve C-ordination

That savings has been particularly apparent in co-ordination meetings. “When we had to co-ordinate very complex or tight-fitting areas of the building, such as the lobby or mechanical room, we used to gather around the drawings on the table with a box of red pencils,” says Galioto. “Now, we can open the model on a plasma screen and zoom right in to whatever area we’re working on.”

Catch Errors Before Construction

For example, when inserting columns into the tower, project team members were able to drop a virtual camera into the model to see if the new columns obstructed crucial views. “The results were simply amazing,” says James Vandezande, Digital Design Manager at SOM. “Instead of highlighting the issue in red marker and getting an answer in a week, we got real-time results.”

“When designing the structure for a unique glazing condition on one level, the 2D plans didn’t show us the full scope of the surrounding areas,” continued Galioto. “With Revit Building, we were able to generate instant sections and camera views clearly showing that the proposed structural solution would have placed columns right down the middle of a critical access corridor.”

Easily Make Changes

With Revit, fixing such situations is easy. “When we need to make changes—anywhere in the model—the Revit parametric change engine coordinates the entire set of drawings,” says Guerrero. “Using traditional software, we would have to pick up all those changes manually. It’s very easy to miss a few when you’re working with a large set of drawings. You don’t have that problem with Revit.”

Get Organised—From the Ground Up

“Implementing this new technological paradigm posed unique challenges,” says Vandezande. “But

Autodesk Consulting helped us work through them and organise the entire project much more efficiently.” That’s why the firm decided to split it into five separate projects—base, tower core and structure, base enclosure, main tower enclosure and spire—in addition to the MEP and structural models. This division helped define a clear interdisciplinary workflow and also made it easier for the design teams to meet deadlines for separate bid packages.

The Result

Today, construction is on track for the 2011 completion goal. Autodesk’s expertise in design software, project collaboration and consulting services has been a significant factor in helping SOM and its engineering partners reach this point. “The Revit platform helps us visualise the project as it will really be constructed,” says Galioto. “It’s nothing short of a revolution.”

Industry-Leading Consulting from Autodesk

Throughout the entire process, Autodesk Consulting has been an integral part of the team. “Autodesk is an internal partner and a consultant in this process,” says Galioto. “They’ve been great.”

Significant Competitive Advantage

“The industry in general is going this direction,” says Guerrero, “The Autodesk Revit platform absolutely provides us with a competitive business advantage. There’s no doubt about it.”

For more information about Autodesk Revit-based building information modeling software, visit www.autodesk.co.uk/revitbuilding, www.autodesk.co.uk/revitstructure, or www.autodesk.co.uk/revitsystems.