

COMPANY

Gensler/Glumac

LOCATION

San Francisco, California USA

SOFTWARE

Autodesk® Ecotect® Analysis**Autodesk® Inventor®****Autodesk® Green Building Studio®****Autodesk® Navisworks®****Autodesk® Revit®****Autodesk® 3ds Max® Design**

We met every goal we set for ourselves on this project—from lighting load reductions to ventilation and thermal comfort. Through software like Revit, Ecotect Analysis, and Green Building Studio, Autodesk Sustainability Solutions have helped us integrate our building design teams and energy analysis teams to provide a more coordinated product to our clients. Our ability to make innovative use of these tools will enable us to stay in the forefront of the industry and provide exceptional service to our clients.”

—**Bob Schroeder**Principal
Glumac

- 100 percent powered by renewable energy
- LEED® Platinum certification for Commercial Interiors
- Use of BIM to analyze and compare different design scenarios early in the project
- Lighting loads more efficient than ASHRAE requirements
- Ventilation 30 percent more efficient than baseline levels

Build it anew—and better.

Design team completes green build-out of eye-catching new San Francisco office for Autodesk.



The team designed the above-ground tunnel with Autodesk Revit. Image courtesy of Glumac.

Visionary design firm committed to sustainability With more than 10 million users globally in 187 countries, Autodesk is a world leader in the 3D design, engineering, and entertainment software used to create everything from elevator buttons and massive skyscrapers to Academy Award winning films. The company is also deeply committed to energy efficiency and sustainability—both in the products its customers design and in its own facilities. In fact, Autodesk strives to use its own offices around the world as a testing ground for new ideas, workflows, and sustainable design solutions, as well as an opportunity to demonstrate the strengths of Autodesk software. “This approach helps us build our own expertise and create valuable knowledge that we can share with our customers,” says Jenny Lum, senior program manager, global projects, in the Corporate Real Estate Facilities, Travel, Safety, and Security (CREFTS) division within Autodesk. CREFTS is charged with reducing the company’s carbon footprint and showcasing the capabilities of Autodesk products.

square-foot office space on the fourth floor of the Steuart Tower, located at One Market Plaza in downtown San Francisco. Autodesk set ambitious goals for the project. “To demonstrate our commitment to the environment, we wanted the new office to achieve LEED® Platinum, the highest possible LEED certification, for Commercial Interiors,” says Lum.

For help creating the new office, Autodesk selected Gensler, a global architecture, design, and consulting firm with expertise in green design and Building Information Modeling (BIM). As an enterprise licensing customer, Gensler has access to the complete portfolio of Autodesk products, including its design tool of choice, Autodesk® Revit® software. Gensler commonly uses a variety of other Autodesk software as well, including Autodesk® Navisworks®, Autodesk® Ecotect® Analysis, Autodesk® Green Building Studio®, and Autodesk® Inventor® software. Since adopting BIM, Gensler has used it on over 1,000 projects encompassing more than 100 million square feet.

A compelling challenge— a strong team

To accommodate increased hiring in the company’s San Francisco offices, Autodesk recently initiated the interior build-out of a 36,000-

Revit helped the team simulate and compare different sustainable design scenarios early in the design process.

"We used Autodesk software to create an attractive, environmentally friendly office that encourages collaboration among the employees," says Eric Scavetta, the project architect from Gensler. "Our goal was to showcase Autodesk solutions, as well as Autodesk itself. Ultimately, Autodesk wanted to maximize occupancy in the new office, while creating energy and interaction within the space."

Autodesk also wanted the new office to visually harmonize with recently completed Autodesk offices in the adjacent Landmark Tower. "From a technical standpoint, our goals were to create a distinct floor plan that coordinates with Autodesk office space on the fourth floor of the adjacent Landmark Tower," says Kelly Dubisar, an interior designer at Gensler. The project included the creation of a tunnel connecting the two offices.

Most of the obstacles to achieving LEED® Platinum certification were associated with the base building's constraints. Chief among these was an interior that faces a long and narrow indoor atrium on one side and a brighter, outdoor view on the other. Although the atrium receives natural light during the day, it is still dark relative to the outdoors. "In fact, for much of the day it sits in the shadow of the nearby Spear Tower," says Scavetta. These atrium windows are also tinted bronze, which further reduces visible light entering the space. "That made it challenging to both minimize lighting wattage levels and still create a consistently bright, functional workplace throughout the floor."

Another significant LEED certification challenge was coordinating the floor's existing mechanical and plumbing systems—which Autodesk shares with two other tenants—with the office's low and angled wood ceilings, deep beams, and extensive ductwork. To meet this challenge, Gensler added Glumac to the design team. Glumac specializes in engineering green buildings that work, and has completed hundreds of advanced technology, healthcare, institutional, and commercial facilities worldwide. "Our biggest challenge was providing a comfortable workplace, while coordinating the complex ceiling plans and partitions with the other trades," says Bob Schroeder, principal at Glumac.

The solution

To overcome these and other challenges, Gensler, Glumac, and the other consultants and subcontractors involved in the project relied heavily upon BIM. "Using BIM helped us to perform coordination up front to avoid clashes between the space's architecture, mechanical systems, and structure in this really tight space," says Scavetta. "We wanted to provide the most cost-effective, energy efficient solution—from the building systems down to the last little day lighting control sensor in the building," says Schroeder. "The only way you're going to create that roadmap in an effective manner is to do it very early on in the project and make systematic solutions. With BIM, we were able to analyze our options and compare different scenarios early in the design process."

Autodesk software allowed us to quickly create design iterations early in the process, make better informed decisions, and, ultimately, verify our solutions before beginning construction. Those kinds of capabilities help us make sure that the green buildings we design really work.

—**Marianna Jacobsen-Gruenwald**
CAD Manager
Glumac

That helped us to look at sustainable strategies and provide a full integrated package in a much earlier timeframe."

One significant area that benefited from the coordination and collaboration that BIM helped facilitate was the office's HVAC system. "It was a challenge to keep the exposed HVAC ducts clean and aesthetically pleasing, while providing adequate comfort and coordinating with the other trades," says Glumac CAD manager Marianna Jacobsen-Gruenwald. During the initial design process, Gensler would work on the architectural model created with Revit software and pass it to Glumac engineers, who would save it on top of their model.

"That allowed us to almost instantly see clashes—such as a newly positioned wall hitting a duct—between the architectural model and the long duct runs in the exposed areas," says Jacobsen-Gruenwald. As the architectural model changed, Glumac engineers were able to update their model. "Autodesk software allowed us to quickly create design iterations early in the process, make better informed decisions, and, ultimately, verify our solutions before beginning construction. Those kinds of capabilities help us make sure that the green buildings we design really work."



Meeting room in Stuart Tower. Created with Autodesk Revit. Image courtesy of Glumac.

This iterative approach helped the team enhance the energy efficiency of the new office. “We used Revit to set up HVAC zones and integrate them into the model,” says Jacobsen-Gruenwald. “As the architectural model changed, we automatically updated the mechanical model. That was a key factor in driving design efficiency.”

Navisworks played an important role in the coordination of the architectural and mechanical models, especially in areas with less visibility than the exposed duct runs, which received frequent scrutiny. In weekly meetings, Gensler used Navisworks to overlay all of the models created by the design team members. “Navisworks functioned as a safety net that helped us catch most of the clashes between models,” says Scavetta. “Used in conjunction with Revit, Navisworks helped us to create a high, open ceiling space that contained exposed structure and mechanical systems, but still appeared clean and open. We couldn’t have done that as efficiently without Autodesk BIM solutions.”

Gensler also used Revit to calculate the occupied floor area with direct, line-of-sight views to the exterior, helping the team achieve the LEED daylight and views credit.

Harmony by design

One of the most interesting aspects of the project was the creation of a tunnel connecting the fourth floor of the Steuart Tower office to newly reno-



Meeting room in Steuart Tower office. Image courtesy of Autodesk.

vated Autodesk offices on the fourth floor of the historic Landmark Tower. “This tunnel is the first above-ground connection between the Steuart and Landmark Towers,” says Scavetta.

“In 1999, the original exit stairwell of the Landmark Building was abandoned and sealed off with a concrete wall in order to do a seismic upgrade to the building,” says Scavetta. “With this project, we essentially cut a hole through that concrete wall and stairwell to connect the two buildings.”

The tunnel presented numerous challenges. “Meeting the timeline was quite difficult, in part because the two buildings have different owners,” says Scavetta. “Whenever you create an opening between two buildings on a property line, the city requires extensive study and documentation to make sure the changes won’t have a negative impact on fire safety.” Additionally, the existing documentation revealed nothing about how the two buildings aligned. “We only had separate drawings for each building.”

The team designed the tunnel with Revit software and then exported the model to a third-party consultant, who used 3ds Max Design software to create photorealistic renderings of the tunnel to help Autodesk understand how the finished space would appear. In conjunction with the tunnel addition, Autodesk opened up the stairwells for access from its second and fifth floor offices so that employees from those locations could move between the buildings without having to pass through the shared lobby. “The tunnel is very popular now,” says Scavetta.



Meeting room in Steuart Tower office. Image courtesy of Autodesk.

Lighting energy usage in the new office is 30 percent below the maximum allowable ASHRAE limit.

To further harmonize the two offices, Gensler chose to incorporate reclaimed wood in the space's elaborate, angled wood ceiling to match the reclaimed wood common throughout the Landmark Tower office. "We used Revit to create 3D views of the ceiling," says Dubisar. "That not only enhanced the decision making process, but also helped the builder better understand the finished product and optimize materials usage." The team also reused much of the existing building, including its cherry wood doors, wall panels, and wood posts.

The result

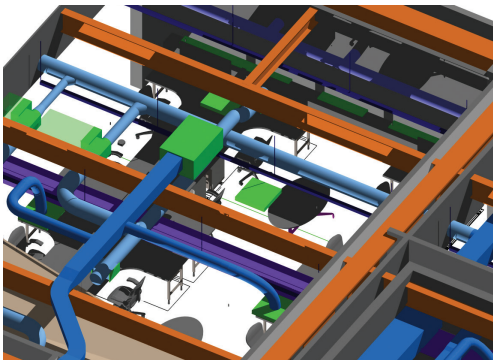
The new office has achieved LEED Platinum certification—the highest LEED certification level—for Commercial Interiors. "We met every goal we set for ourselves on this project—from lighting load reductions to ventilation and thermal comfort," says Schroeder. Lighting loads in the new office are more efficient. Ventilation in the new office is 30 percent more efficient when measured against baseline levels. "Through software like Revit, Ecotect Analysis, and Green Building Studio, Autodesk Sustainability Solutions have helped us integrate our building design teams and energy analysis teams to provide a more coordinated product to our clients. Our ability to make innovative use of these tools will enable us to stay in the forefront of the industry and provide exceptional service to our clients."

Scavetta and the Gensler team feel equally strong about the benefits of Autodesk BIM solutions. "BIM was integral to the successful completion of this project," says Scavetta. "It is definitely a part of our long-term strategy." Gensler has offices around the world. "A key component of our culture is sharing work across our network of 43 offices. BIM and the breadth of Autodesk tools definitely facilitate that culture."

Autodesk applied many of the lessons learned on this project to other building projects. "Around the world, Autodesk is trying to increase the percentage of its facilities that are LEED certified," says Lum. "This project was an important step toward that goal. We have already used some of what we learned about sustainable design and workplace productivity on other new facilities, including our new office in Farnborough, England."

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Project Architect
Gensler



Model of ductwork above ceiling. Created with Autodesk Revit. Image courtesy of Glumac.