

ARBA Studios

Customer Success Story

Autodesk® Revit® Architecture
Autodesk® Ecotect® Analysis
Autodesk® Green Building Studio®

Autodesk Revit Architecture and Autodesk Ecotect Analysis software bridge communication gaps and improve efficiencies, particularly on projects involving integrated, multidisciplinary teams. This integrated BIM process continues to help improve energy performance on the broad scope of our projects.

—Tomislav Zigo
Director of Virtual Design
and Construction
Clayco
Founding Partner, ARBA Studios

Visualize. Simulate. Save.

ARBA Studios develops energy-saving strategies with Autodesk BIM and sustainable analysis tools.



Independence Center: Lighting Analysis for Cardio Workout Room. Courtesy of ARBA Studios.

Project Summary

As concern about rising energy costs, sustainability, and global warming continues to rise, many organizations are seeking practical, cost-effective ways to limit energy usage, reduce utility costs, and keep greenhouse gas emissions to a minimum. Architects can help businesses accomplish these objectives by conducting comprehensive energy analysis studies with building information modeling (BIM) software tools, such as Autodesk® Revit® Architecture software and Autodesk® Ecotect™ Analysis software, which provides Subscription customers with access to the Autodesk® Green Building Studio® web service technology. Recently, ARBA Studios—a small architectural consulting firm specializing in sustainable design for the residential and commercial markets—demonstrated how this approach can be effective for the Independence Center, a nonprofit organization in St. Louis, Missouri. Using BIM sustainable design and analysis tools, ARBA Studios accurately simulated the facility's actual annual energy usage and successfully developed practical usage and design strategies for minimizing future energy consumption.

The Challenge

ARBA Studios originally served on the Independence Center project team, assisting in the renovation of a 1924 warehouse and industrial building eligible for an historic renovation tax credit from the state of Missouri. The new facility consolidates the organization's operations in one location and helps staff better serve their primary clientele, adults with serious and persistent mental illness, seeking to live and work in the community, independently and with dignity.

The objective of the renovation project was to provide a functional, efficient, and low-maintenance facility that adhered to the requirements of the tax-credit program. "Although the client wanted to incorporate sustainable design elements—such as abundant daylighting—whenever possible, limited resources prevented them from conducting an energy study at this point," says Tomislav Zigo, partner at ARBA Studios and director of virtual design and construction at Clayco. During a post-construction follow-up meeting, however, the client complained of cold spots around the perimeter walls and excessive glare within the facility. "That is when we suggested conducting a postoccupancy energy study."

Using Ecotect Analysis, ARBA Studios simulated results for gas usage to within 0.33 percent of real-world values.

The Solution

Using the integrated BIM process for design, visualization, and simulation, ARBA Studios was able to evaluate the accuracy of the BIM analysis tools in depicting building performance and recommend a series of usage and design strategies for reducing the facility's overall energy consumption and carbon footprint.

Because the original renovation did not employ a full BIM approach, ARBA Studios used Revit Architecture software to create a new model composed primarily of basic building elements. The power of the BIM process helped ARBA Studios to integrate the data and simplify its analysis. "Many detailed design elements have little or no impact on a building's energy performance," says Zigo. "By working with a simpler model, we are able to complete analysis faster and with fewer errors."

Working directly within Revit Architecture software, Zigo exported the model to Ecotect Analysis using the green building extensible markup language (gbXML) open schema, and began evaluating multiple design options. "We immediately saw that adding new glazing would be prohibitively costly," says Zigo. "But by using the software's dynamic shading device tool, we were able to examine animations for a variety of shading device configurations and identify those that best reduced glare."

"We also explored integrating a green roof that would provide additional insulation for the building and help treat rainwater," says Zigo. "Using Ecotect Analysis, we determined that increased rooftop insulation levels would actually prevent adequate nighttime cooling and reduce energy performance."

The Result

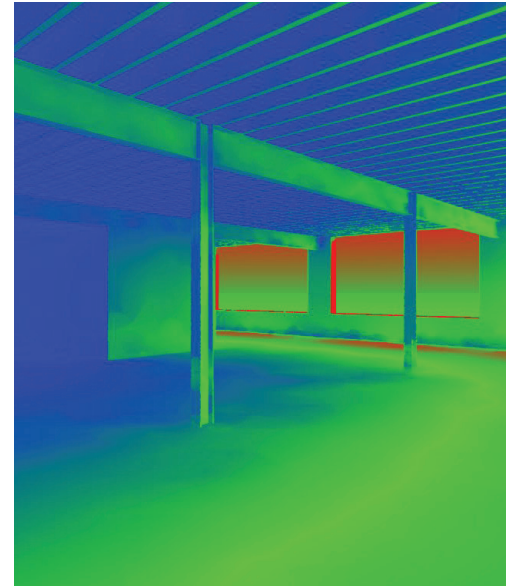
"Because we crafted the model carefully and received accurate information about the building's utility costs and operational schedule, there was minimal discrepancy between the real-world data and what we saw in the model," says Zigo. In fact, the simulated results for electrical usage fell within 3.58 percent of the actual numbers, and those for gas usage within 0.33 percent.

Immediate Action

Using Ecotect Analysis software in conjunction with the Green Building Studio web service, ARBA Studios conducted a whole building analysis and discovered that most of the building's cooling loads are the direct result of lighting, plug-in loads, and occupancy-related activities. "In these situations, the best approach is conservation," says Zigo. "That's why the client committed to making several immediate changes, including switching to fluorescent light fixtures and applying daylight and occupancy sensors. They are also exploring some of our longer-term recommendations, such as application of exterior shading devices."

A Bright Future

After completing a dozen energy analysis projects with ARBA Studios, Zigo joined an integrated design team conducting similar work at Clayco, where he has already helped perform speculative energy analysis on one million square feet of office and residential space. "We believe expertise in these tools helps provide a strategic advantage—whether we're designing something new or working on a retrofit or renovation."



Independence Center: Without Shades.
Image courtesy of ARBA Studios.

Learn More

For more information, visit
www.autodesk.com/revitarchitecture,
www.autodesk.com/ecotect-analysis,
autodesk.com/sustainabledesign, or
autodesk.com/bim.

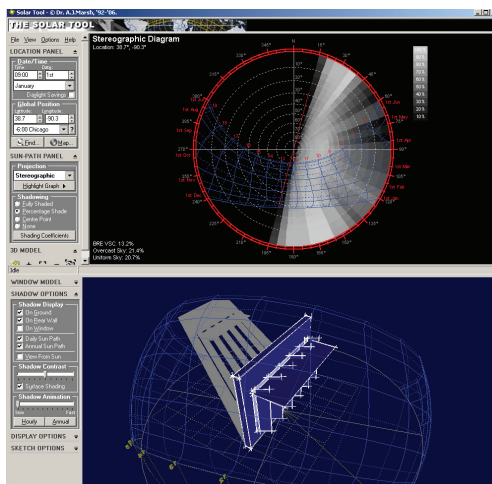


Image courtesy of ARBA Studios.

The primary value of using Autodesk Ecotect Analysis to facilitate the achievement of sustainable design goals is in its ability to help predict the impact of a new or renovated facility on its immediate surroundings before beginning construction. It also helps enable us to design and build in a more environmentally and socially responsible fashion.

—Tomislav Zigo
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