

# Building Information Modeling for Sustainable Design

Building Information Modeling facilitates complex processes and analyses that were previously too laborious or expensive to perform. Revit® Architecture, Autodesk's purpose-built BIM solution, supports key aspects of sustainable design and "green" certification.

Over the last 20 years information technology has revolutionized the design and production of movies and music, airplanes and toasters, machinery and holidays. The design of manufactured items in particular has benefited from design software that enables the engineering and analysis of every conceivable characteristic of an assembly, from physical and operating characteristics to thermal behavior and fabrication requirements. The adoption of digital prototypes in manufacturing has made products more efficient and suitable to their purpose, less costly, and more stylish.

Architects and engineers are now applying similar tools to building design. The most sophisticated of these tools deliver continuous and immediate feedback on a far greater range of characteristics than conventional design tools. Material quantities and properties, energy performance, lighting quality, site disturbance, and what-if comparisons between new construction and renovation are some types of information that are easily available from these tools. This approach to building design is so different from using conventional CAD software that the industry has a new name for it: *building information modeling* (BIM).



*Information for documentation is captured during design.*



*Revit radiosity view showing daylight only.*

This is great news for sustainable design professionals. Building information modeling makes much of the information for energy and environmental design, and information required to support certification under the LEED (Leadership in Energy and Environmental Design) Green Building Rating System®, much easier to obtain. In fact it makes possible analyses that were previously too laborious or expensive to perform, and may eventually open up new building characteristics such as embodied energy and complete lifecycle costing for evaluation and optimization.

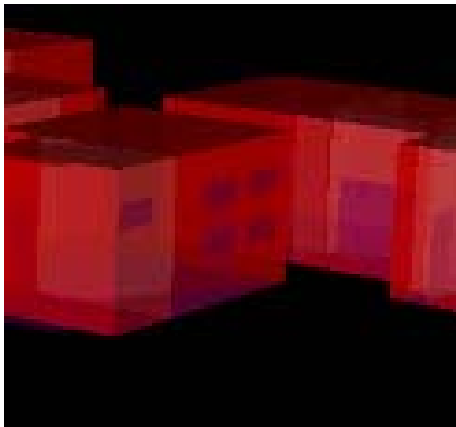
Here are some of the things you can do today using state-of-the art building information modeling provided by Revit Architecture:

#### Visualization and quantification of solar access and shading

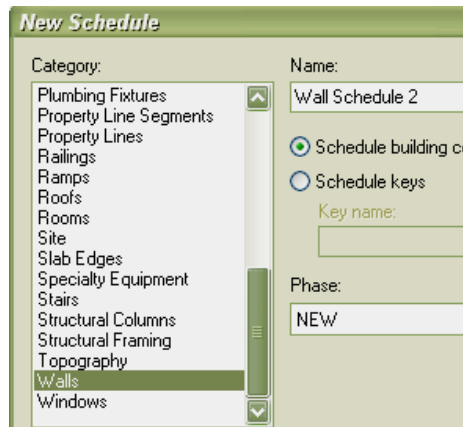
- Parametric conceptual design tools for accurate solar access, shading studies, and analysis
- Modeling, measurement, and documentation of complex interior daylighting designs
- Radiosity tools for analysis and quantification of solar “bounce-light,” and design model used for detailed daylighting design analysis
- Calculations for LEED documentation are easily derived from daylighting analysis

#### Computation of material quantities

- Computation of material quantities for sustainability analysis and LEED certification
- Schedules of building components including quantities available live from the model
- Efficiently determine percentages of reuse, recycling, or salvage directly from the model
- Study and track various design and sustainability options in the model with live reporting for best decision making



View of 3D energy model in DOE2 or eQUEST



BIM is all about coordinated, useful information

#### Energy Analysis

- Building information model linked to Green Building Studio™ for energy analysis
- Green Building Studio web service outputs file for input to DOE-2 or eQUEST® energy modeling
- Elimination of manual input of geometry for energy analysis can save hundreds of hours of labor, reducing the cost of performance-based design

To find out more about Autodesk's building information modeling solutions, visit [www.autodesk.com/bim](http://www.autodesk.com/bim).

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