

Autodesk Revit Building for AutoCAD Users

The Autodesk® Revit® platform for building information modeling¹ is a complete design and documentation solution supporting all phases of design, drawings and schedules required for a building project. From massing and conceptual studies through the most detailed construction drawings and schedules, Autodesk Revit delivers a competitive advantage, better coordination and quality, and higher profitability to architects, designers, and other building industry professionals.

Many building industry professionals are familiar with AutoCAD® software and use it today for their work. This white paper will help those who are familiar with that tool understand how Autodesk Revit Building works on their terms, introducing some of the main features and concepts in Autodesk Revit Building and comparing them to those you may be familiar with in AutoCAD.

If you are a current AutoCAD user interested in Autodesk Revit Building and building information modeling, the Autodesk® AutoCAD® Revit® Series may be right for you. It couples the industry-leading AutoCAD software with the state-of-the-art Autodesk Revit Building software for building information modeling—an unbeatable combination that protects your investment in current technology and training investment, delivers the competitive advantage of building information modeling, *and* gives you the flexibility to move to new ways of working on your own schedule. For more information on the AutoCAD Revit Series please visit us on the web at www.autodesk.com/autocadrevitseries.

True 3D design

A major difference between Autodesk Revit Building and AutoCAD is that you work with true architectural models rather than geometry. This translates to increased design productivity because it allows you to switch from plan to 3D rendered view to schedule as you like. Because you are creating a parametric building model when designing in Autodesk Revit Building, you can quickly make changes to your design and all dependencies automatically update, increasing the accuracy of your work as your design evolves.

¹ For more information about building information modeling and Autodesk's strategy for the application of information technology to the building industry please see our white paper on the subject at www.autodesk.com/bim.

Autodesk Revit Parametric Components

Autodesk Revit Building is a true parametric architectural building modeler. The modeling engine in AutoCAD contains primitive 3D objects and requires that all custom shapes be created manually. Autodesk Revit Building contains 3D parametric building elements. Autodesk Revit Parametric Components are an open, graphical system for design thinking and form making, a powerful way of expressing design intent at increasingly detailed levels. Parametric Components can be used to generate the most elaborate assemblies—including intricate iterative, algorithmic, and behavioral characteristics—as well as the most elementary building parts. No programming language or coding is required to drive this powerful system. And any and all relationships are available to be expressed directly in the system; nothing is assumed other than that you are thinking about a building design.

Revit Parametric Components carry information about their relationships to other objects in the building in contrast to the blocks and solids used in AutoCAD. For example, in Autodesk Revit Building, a wall's properties can state that it should rise to the next level or roof. After you set this property, Autodesk Revit Building ensures that your wall will retain its relationship to the next level or roof no matter what changes you make in the building.

Dimensions always correspond to the actual size of the building elements. Updating a dimension automatically updates the parametric components and their relationships to other components. Locking a dimension allows you to embed your design intent. After a dimension is locked, Autodesk Revit Building ensures that this dimensioned relationship is maintained.

Dimensions in schedules behave the same way. You can change width and height values in a schedule and the revised size will be reflected in the elements in the model. Coordination of dimensions and graphics is assured everywhere.

Families vs. Blocks

AutoCAD users are accustomed to storing symbols as blocks in individual DWG files. Autodesk Revit stores similar parametric components in family files. Family files can contain many styles of components allowing for easier organization and data sharing. These customizable families used by Autodesk Revit Building offer more placement options than the single insertion point used by AutoCAD's blocks and Xrefs. Autodesk Revit Building comes with the most common components built right into the product, including walls, doors, windows and stairs. There are commonly referred to as "objects" in products such as Autodesk® Architectural Desktop software. The families in Autodesk Revit Building offer higher levels of customization and functionality. You can modify alignment planes and add subcategories to your objects. Another unique capability in Autodesk Revit Building is the ability to create your own intelligent parametric objects or quickly and easily customize the ones included with Autodesk Revit Building.

Alignment vs. Osnaps

Autodesk Revit Building offers AutoCAD users new sketching tools like Temporary Dimensions and Alignment Guides. Alignment guides are similar to the Object Tracking feature in AutoCAD®. Temporary line and arc extensions as well as other useful snap points relative to your current position in the model appear to aid you as you design. Whether you are sketching new objects or inserting components, the appropriate dimensions and guidelines assist placement in the Autodesk Revit Building model. This is a contrast from the osnap feature of AutoCAD which snaps to any entity that fits the current osnap settings. With Autodesk Revit Building, the designer can quickly place doors, windows and other components correctly with the option to easily modify the design later. Doors open in the

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desired direction and windows are placed at the correct height on the wall. You can place these components in either 2D views or 3D views, whichever is easiest.

Multiple Design Views

Autodesk Revit Building makes extensive use of various views of the parametric building model. Autodesk Revit Building allows the designer to work with components in any view, be it plan, elevation, section, perspective or from within a schedule. Each type of view may be opened at the same time and any changes made in one are immediately updated in all other views. Seeing the effects of a design change everywhere at once makes Autodesk Revit Building a valuable tool for experimenting with design changes. Plan and 3D views can be opened side by side so you can verify that moving a component in one level does not violate any dimensioning, alignment constraints or design intent in another.

No Command Line or Layers

The user interface changes that will be most noticeable to the AutoCAD user are the absence of a command line and the layer control feature. In Autodesk Revit Building, all building tools and components are presented on a single, easy-to-use toolbar. And the user interface in Autodesk Revit Building is designed to look and work like other familiar Windows applications, making Autodesk Revit Building easy to learn and fun to use on a daily basis. Designers stay more focused on the model rather than the keyboard and command line. Layers are not needed to control the visibility of components. Visibility is controlled through the Category Visibility feature in Autodesk Revit Building, which works on a per-view basis, comparable to the AutoCAD Freeze/Thaw/On/Off by viewport feature. Color and line type are also controlled by category. Another advantage Autodesk Revit Building offers is components that know how to display themselves depending on the view in which they are seen. In Autodesk Revit Building, components know to only display a footprint in plan view, while all geometry is shown in the 3D isometric view, for example.

Single file, Multi-User projects

AutoCAD users are accustomed to storing and retrieving project data from multiple files. In Autodesk Revit Building, all project data is stored in the single Autodesk Revit Building project file. This eliminates the need to work with external block and Xref management. Autodesk Revit Building allows multiple users to work on the same project file and merge their changes with every save, or work on their own versions of the file and then merge changes at any point in the design.

Intelligent Components

Dimensioning and alignment locking in Autodesk Revit Building allow the designer to place building components in relation to others - and keep it that way throughout the design - thereby preserving design intent. Components may be locked together in more than one place to preserve wall alignments, room areas, and door and window placements while the model is being altered in other areas. Component relationships may be constrained and overridden at the designer's discretion. Dimensions may be locked or editable while the parent objects behave accordingly. Because objects can be aligned and locked into place, many repetitious editing commands are eliminated, allowing for faster work and fewer errors.

Read/Write DWG

Autodesk Revit Building provides industry-leading DWG compatibility using the Autodesk ObjectDBX™ toolkit, and is interoperable with AutoCAD software. Autodesk Revit Building can import and export models to DXF™ and DWG formats. When exporting, Autodesk Revit Building matches its components and their subcategories from the current view to either industry standard or user defined layer names. Autodesk Revit Building can also import these formats into 2D or 3D views. This allows for smooth coordination and exchange of information among project team members, whether they use Autodesk® Building Systems or another software tool. If you would like to know more about how architects using Autodesk Revit Building and MEP engineers using Autodesk Building Systems work together, please see our white paper on “Autodesk Revit Building and Autodesk Building Systems Workflow” at www.autodesk.com/revitbuilding.

Producing Paper Drawings

Because drawings are the critical output of the design process, the parametric change technology in Autodesk Revit Building enables fast and accurate plotting. With Autodesk Revit Building, all drawings are produced from the same, single parametric building model used to create the design. Any changes to your design along the way are always updated in your drawing sheet views. Changes to elevations, sections, and callouts are immediately updated in all reflected views. Any view you have created of the model can be added to a sheet and properly scaled. Once placed on the sheet, Autodesk Revit Building has the ability to allow the designer to work just as easily in a sheet view as in a model view to perform any last minute placements. Scale-dependent line-weight and scale-independent annotation size allow reuse of information in views without complex reformatting. This greatly reduces management overhead. The WYSIWYG display also lets the user see the final result before output for fewer plotting errors. Finally, the plotter hardware support in Autodesk Revit Building is only limited by the operating system. If there is a Microsoft® Windows® driver for your plotter, Autodesk Revit Building can use it.

Thank you for your interest in Autodesk Revit Building. Autodesk Revit Building will allow you design and document your building projects more productively, with better coordination, and with better quality. If you have any further questions about Autodesk Revit Building or would like to know more please visit us on the Web at www.autodesk.com/revitbuilding.



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