



White Paper

Autodesk Revit for AutoCAD Users

The Autodesk® Revit® platform for building information modeling¹ is a complete architectural design and documentation solution supporting all phases of design and all the architectural drawings and schedules required for a building project. From massing and conceptual studies through the most detailed construction drawings and schedules, Autodesk Revit delivers competitive advantage, improved coordination and quality, and higher profitability to architects, builders, 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 works on their terms, introducing some of the main features and concepts in Autodesk Revit and comparing them to those you may be familiar with in AutoCAD.

The Autodesk Revit software can be used alone or together with AutoCAD. If you would like to know more about how Revit can be used together with your existing computer-aided drafting (CAD) tools such as AutoCAD software, please see our white paper on “Autodesk Revit Interoperability with CAD” at www.autodesk.com/revit.

If you are a current AutoCAD user interested in Autodesk Revit and building information modeling, the Autodesk® AutoCAD® Revit® Series may be right for you. It couples the industry-leading AutoCAD software with the powerful Autodesk Revit building information modeling system—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 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, 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.

Parametric Objects

Autodesk Revit 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 contains 3D parametric building elements. These 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, a wall's properties can state that it should rise to the next level or roof. After you set this property, Autodesk Revit 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 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 offer more placement options than the single insertion point used by AutoCAD's blocks and Xrefs. Autodesk Revit 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 offer higher levels of customization and functionality. You can modify alignment planes and add subcategories to your objects. Another unique capability in Autodesk Revit is the ability to create your own intelligent parametric objects or quickly and easily customize the ones included with Autodesk Revit.

Alignment vs. Osnaps

Autodesk Revit 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 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, the designer can quickly place doors, windows and other components correctly with the option to easily modify the design later. Doors open in the 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 makes extensive use of various views of the parametric building model. Autodesk Revit 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 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, all building tools and components are presented on a single, easy-to-use toolbar. And the user interface in Autodesk Revit is designed to look and work like other familiar Windows applications, making Autodesk Revit 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, 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 offers is components that know how to display themselves depending on the view in which they are seen. In Revit, 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, all project data is stored in the single Autodesk Revit project file. This eliminates the need to work with external block and Xref management. Autodesk Revit 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 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 provides industry-leading DWG compatibility using the Autodesk ObjectDBX™ toolkit, and is interoperable with AutoCAD software. You can download a white paper on "Autodesk Revit Interoperability with CAD" from www.autodesk.com/revit. Autodesk Revit can import and export models to DXF™ and DWG formats. When exporting, Autodesk Revit matches its components and their subcategories from the current view to either industry standard or user defined layer names. Autodesk Revit can also import these formats into 2D or 3D views. This allows for smooth coordination and exchange of information among project team members, whatever their software tools.

Producing Paper Drawings

Because drawings are the critical output of the design process, the parametric change technology in Autodesk Revit enables fast and accurate plotting. With Autodesk Revit, 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 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 is only limited by the operating system. If there is a Microsoft® Windows® driver for your plotter, Autodesk Revit can use it.

Thank you for your interest in Autodesk Revit. Revit 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 Revit or would like to know more please visit us on the Web at www.autodesk.com/revit.

autodesk

Autodesk, Inc.
111 McInnis Parkway
San Rafael, CA 94903
USA

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