

# Making AutoCAD Software Better for Architects

If you're an Architect using AutoCAD® software for project design and drafting, there is a product from Autodesk built just for you that can dramatically increase your productivity.

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## **1.0 Why AutoCAD Architecture is the best productivity tool for Architects and Designers who use AutoCAD.**

### **1.1 AutoCAD Architecture is better for Architects**

Today's clients increasingly demand more productivity, greater accuracy and additional building data. Although AutoCAD® has done a superb job of increasing the productivity of 2D drafting in Architecture, Engineering and Construction (AEC), AutoCAD Architecture further enhances productivity by automating many common tasks. The result is faster Construction Document (CD) production with increased accuracy and coordination. AutoCAD Architecture exploits the user's familiarity with the AutoCAD working methods and user interface, so there is little down time when beginning to use the new application. AutoCAD Architecture is software that is designed for architects, having AutoCAD functionality, plus new tools for automating architectural drawing and design.

### **1.2 How much productivity gain?**

Results of a recent study commissioned by Autodesk and performed by a third party compared times required to complete a set of typical tasks. Results indicated that an AutoCAD® user with limited experience in AutoCAD Architecture could improve architectural design and drafting productivity by over thirty percent using the AutoCAD Architecture software. The full study can be viewed at [www.autodesk.com/building](http://www.autodesk.com/building).

### 1.3 How quickly can one be up and running?

Because AutoCAD Architecture is built on AutoCAD® software, users familiar with the AutoCAD interface can begin working immediately with minimal training. Mastery of new productivity features can be added incrementally at a pace that is comfortable for the user. Although AutoCAD Architecture is a complex, dedicated, architectural documentation program, even new users can achieve “out of the box” productivity on day one, by implementing the **Detail Components** routines and basic automated **Walls, Doors and Windows**. The **Project Navigator**, which can usually be mastered in a matter of hours, adds even more productivity. A key benefit of migrating to AutoCAD Architecture is the exponential increase in productivity that occurs in tandem with the user’s implementation of new features within the program.

## 2.0 AutoCAD Architecture’s Detail Components

### 2.1 Detail Components feature provides immediate productivity boost

Two of the architect’s most time consuming tasks are creating details during the development of CDs and verification that materials and components are properly called out on the drawings. AutoCAD Architecture’s detail creation tool, **Detail Components**, considered the best in the industry, can drastically reduce the time involved in these efforts.

**2.1.1 Detail Components** are highly automated 2D building details that allow you to create detailed assemblies. They are cataloged in the Construction Specification Institute (CSI) 16 division format, and can be accessed from the Detail Palette of the standard AutoCAD Architecture Tool Palette set. Clicking on any tool will take you to a point within that CSI division. Right-clicking on any tool provides access to the entire catalog.

The default database contains an extensive library of automated components for all 16 divisions. You can develop custom components or tailor the standard database to contain only those components needed for use on a given project.

The standard components offer the user a great deal of flexibility. Because they are 2D, they can be easily edited with standard AutoCAD® tools. The new AEC Modify tools, available only in AutoCAD Architecture, allow for more complex editing (such as replacing one component with another). Of course, one can always add specialized components to increase productivity. Because these components are intelligent, you do not have to manually create leaders and annotation.

To annotate these detail components, one need only point to the component, and then point to where the annotation should be placed; the name and description of the component (brick, CMU, bar joist, etc) will automatically be placed on the drawing. In AutoCAD Architecture, you can no longer draw a 2x6, and accidentally label it as a 2x4. Additionally, the Detail Component feature is so intuitive and simple to learn that little instruction is necessary. Any competent AutoCAD user will immediately understand how to implement this highly productive feature.

## 3.0 AutoCAD Architecture's Automated Walls, Doors and Windows

### 3.1 Save considerable time using just wall, door and window objects

How often are elements such as Walls, Doors and Windows changed during a typical design project? In AutoCAD® Architecture the creation of Walls, Doors and Windows is automated, compared to the manual creation of these in AutoCAD.

#### 3.1.1 How walls, doors and windows are created in AutoCAD

In AutoCAD, walls are typically drawn in 2D plan view, using time consuming offset lines or using the AutoCAD Multiline command. The Multiline feature does not offer graphical hatches and the Multiline spacing can only be changed manually once it has been placed. Windows and doors are also typically drawn in 2D plan view, with lines and arcs, or placed as previously created "Blocks". Placing of windows and doors into 2D drafted walls requires several steps to trim the lines where the doors and windows are placed. If doors and windows are removed from walls, the resulting empty space must be manually healed.

#### 3.1.2 How Walls, Doors and Windows are created in AutoCAD Architecture

By contrast, in AutoCAD Architecture, walls, doors and windows behave as "intelligent" objects. Intelligent objects relate to each other as if they were real-world objects. Intelligence has many benefits. Changing the size of doors and windows is as simple as entering dimensions in a dialogue box. Because walls, doors and windows are style-based, any or all of them can be changed by selecting from options in a tool palette. When one places a door or window in a wall, the wall is automatically trimmed to accept that object and the appropriate openings such as wrapped brick, etc., are automatically created. Because of the intelligent nature of architectural objects in AutoCAD Architecture, it is easy to create elevation, section or perspective views from 2D designs. Additionally, walls, doors and windows can be linked to schedules on any page and any changes, removals or additions can be reflected in the schedules, with the click of a button.

## 4.0 AutoCAD Architecture's Project Browser and Project Navigator

While AutoCAD Architecture's **Detail Components** and automated **Walls, Doors and Windows** features provide an instant productivity boost, the **Project Navigator** provides additional productivity through the use of advanced file management. In this feature, every building is considered a separate project, and the Project Navigator links all the drawings (which are standard DWG files) in the project together. You need only to select the project on which you wish to work, and all the associated drawings, building components, and tool palettes for that project appear. You can be confident that all the drawings associated with a particular project will be electronically connected, and the appropriate digital tools will be available. Since AutoCAD Architecture is built on AutoCAD® software, there is also the flexibility to use the full AutoCAD feature set.

In AutoCAD, there is no standard methodology for organizing a project. Currently, users edit standard drawing files and all coordination and linkage between files is done manually. Manual coordination of drawings can lead to errors when a referenced drawing is changed.

#### **4.1 How XREFs are implemented in AutoCAD**

An important feature of AutoCAD® that has been around for many years is XREF. XREF stands for External Reference, or electronically linked file. Using this feature, the user imports linked drawings into a main working drawing, and any changes to the linked drawings appear in the working drawing. While an excellent AutoCAD feature, a great deal of organization and expertise by the user is required to maintain the linkages. XREF implementation can be accomplished in many different ways, therefore, the addition of a new user or absence of clear office standards can cause confusion.

#### **4.2 How AutoCAD Architecture's Project Navigator easily automates XREF operations**

AutoCAD Architecture's Project Navigator automatically creates a separate file that links all drawing files of a project together. As a result, the user can simply "drag and drop" drawing files from the Project Navigator interface into the drawing, creating a totally XREF linked project. By automatically linking all the drawings in AutoCAD Architecture, any changes to drawings in a project set are automatically transferred downstream to the final, plotable Construction Document. The result is an immediate and perceptible increase in productivity over standard AutoCAD or AutoCAD LT® XREF organization. The Project Navigator transparently and automatically systematizes, or "standardizes" the linkage method.

#### **4.3 How PaperSpace is implemented in AutoCAD**

In AutoCAD, drawings are created in Model Space, and then viewed in PaperSpace. PaperSpace is used to organize and scale drawings so that they can be printed correctly. While this feature is an industry standard, because it requires a thorough knowledge of AutoCAD drawing and text scaling, many users are unable to fully implement PaperSpace, diminishing their productivity.

#### **4.4 How PaperSpace is easily implemented in AutoCAD Architecture's Project Navigator**

Using the Project Navigator in AutoCAD® Architecture facilitates the coordination of drawings and reduces potential linkage errors. One simply drags a view (created from a drawing) onto a Plot sheet, causing a new PaperSpace viewport, with automatically set dimensions and annotation sizes, to be created on the Plot sheet. Dragging the View from the Project Navigator palette into the Plot sheet also automatically establishes all the XREF linkages from the base or "Constructs" drawing to that sheet. It is this automatic linkage that gives AutoCAD Architecture a significant advantage over AutoCAD. Once Views are organized onto a Plot Sheet, all subsequent changes to drawings, details, sections, etc will be coordinated on the Plot sheets.

### **5.0 Sections and Elevations in AutoCAD Architecture**

Creating different views of a design can be a time-consuming, error prone and tedious task. Because AutoCAD Architecture was designed for architects, it can automate some of these tasks, increasing drafting speed and accuracy.

#### **5.1 How sections and elevations are implemented in AutoCAD**

In AutoCAD software, sections and elevations must be created using conventional drafting techniques, requiring measurement or projection from one view to another. There is no coordination feature so the user must manually keep track of their placement on drawings.

## **5.2 How Sections and Elevations are easily created in AutoCAD Architecture**

In AutoCAD Architecture, sections and elevations can be created automatically by simply dragging a Callout icon from the toolbar, and either placing it in front of the building to create an Elevation view, or through the building to create a Section view. These views, when dragged onto a Plot Sheet will update automatically whenever changes are made. Because sections and elevations can be coordinated, there is a reduced chance of inaccuracy in the plans. Drawing time to create sections and elevations is greatly reduced, and because the plans, elevations and sections can be coordinated, one gains productivity while increasing accuracy.

## **6.0 Scheduling with AutoCAD Architecture**

As previously mentioned, instead of drawing lines, arcs and circles to represent real-world components, in AutoCAD® Architecture, you create building objects to represent elements such as walls, doors and windows. AutoCAD Architecture also has the ability to create and manage spaces for compelling graphical displays. The use of these objects increases drafting speed and improves the accuracy of scheduling, providing real dividends.

### **6.1 How Walls, Doors, Windows and spaces are coordinated into schedules in AutoCAD**

AutoCAD is a general-purpose drafting solution and has no built in feature for coordinating walls, doors, windows and spaces into schedules. One can use the AutoCAD attribute features to apply information to blocks, but this requires a knowledgeable and sophisticated user.

### **6.2 How Walls, Doors, Windows and Spaces are coordinated into schedules in AutoCAD Architecture**

Because AutoCAD Architecture has been designed specifically for architecture, a number of automated functions are at your disposal for placement and annotation. Walls, Doors, Windows and Spaces, and many other building objects have been pre-programmed into the software. Doors can be automatically numbered, windows, walls, and spaces can be automatically labeled, and all these objects can be reviewed and totaled automatically in schedules that can be placed on a title page. Besides numbering, a wide range of information concerning these objects can be listed in the schedules. A variety of customizable schedule templates come with the program.

## **7.0 Beyond Drafting**

### **7.1 Collaboration**

Because AutoCAD Architecture is built on AutoCAD® software, and utilizes the DWG drawing format that is considered an industry standard, information transfer to extended design team members and building professionals is seamless and accurate.

### **7.2 Visualization and Rendering**

AutoCAD Architecture comes with integrated tools for rendering and animation. No longer does one need to outsource rendering, it can quickly be created from the construction document files.

### **7.3 Engineering Analysis**

Both Autodesk Building Systems and Autodesk Revit Structure, which are used by engineers for mechanical, electrical and plumbing (MEP) and structural analysis, will work seamlessly with AutoCAD Architecture.

## 8.0 Conclusion - Moving from AutoCAD Software to Autodesk's AutoCAD Architecture makes good business sense

Design and drafting productivity are the backbone of the architectural and building design professions. AutoCAD Architecture is a powerful solution for boosting architectural design and construction documentation productivity, while facilitating seamless coordination and reducing costly errors.

AutoCAD® is the world-wide, industry-leading CAD program, having the largest user base and educational network. Its drawing format, DWG, has the largest assembly of third party applications of any CAD program.

AutoCAD Architecture takes AutoCAD to a whole new level. AutoCAD Architecture substantially increases productivity over standard AutoCAD, while allowing a user to transition smoothly and effortlessly with little or no downtime. Firms adopting AutoCAD Architecture, gain the benefit of automation of tedious drafting tasks, better coordination with other design professionals, and the flexibility of working in the familiar AutoCAD environment. Add to this, the ability to generate high quality presentations and the availability of add-on applications from a large number of third party providers, and you have an architectural design and drafting solution that's hard to beat.

With AutoCAD® Architecture one gets a complete Architectural software solution at a modest cost increase over basic AutoCAD.

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Mr. Goldberg has written four books on AutoCAD Architecture, versions 3.3 through 2006, and is a Contributing Editor for CADALYST Magazine, a post he has occupied for nine years. For the past four years he has also been writing a bi-monthly tutorial on AutoCAD® Architecture (formerly Architectural Desktop) for the subscription-only newsletter, "Inside AutoCAD". Other venues to which Ed has contributed include ARCHITECTURE Magazine, "World Architecture" and "Architecture Business & Economics. Ed has lectured at various industry conferences including the AIA National Convention, Architecture Exchange East, AEC Systems and Computers for Construction. He is a regular presenter at Autodesk University.