



Version 13

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# Chapter 1: Getting Started

## Welcome

Envisioneer is for anyone who wants to design, renovate, decorate or landscape a home. It can be used on a desktop, laptop, or touch-screen device. This multi-functional tool is easy to use and delivers professional and accurate results.

Possible uses include:

- Home design
- Floor plans
- Interior design
- Exterior design
- Remodeling
- Framing
- Panelization
- Landscaping
- 3D visualization & animations
- Photorealistic renderings
- Project estimate
- Cut list
- Quote generation
- Export to other file formats

Whether you are just experimenting with different design ideas, or preparing drawings for an actual building project, *Envisioneer* makes it quick and easy.

## About this Guide

The Envisioneer User's Guide covers basic concepts and procedures for the following products:

- Personal Architect
- Pro Architect
- Building Essentials
- Construction Suite
- Envisioneer Express

The User's Guide provides a general overview of all the features in Envisioneer. It does not cover every possible topic. However, you can find detailed information on just about anything in the online help (press **F1**, or select **Help > Program Help**).

Since the guide is designed for use with more than one product, some topics may not apply to your particular product. In the case where a topic applies to a specific product only, it will be clearly noted within the topic.

Take a few minutes now to familiarize yourself with the guide's content and layout so that you can find the information you need when you are working on your project.

## System Requirements

Your user account should be set to Computer Administrator (not Limited) to install the program. Prior to installing, make sure your system meets the requirements listed below. Note that Envisioneer is compatible with touch-screen devices.

### For Microsoft Windows

- Microsoft® Windows® 10, 8, 7, Vista\*
- 64-bit operating system (32-bit also available)
- 2.0 GHz or faster processor
- 6 GB RAM (4 GB minimum)\*\*
- 10 GB minimum available hard disk space
- DVD-ROM drive or internet connection for install
- 1024 x 768 display
- 2 GB dedicated video card (1 GB minimum)\*\*
- Windows-compatible mouse
- An Internet browser to view the online help
- Internet connection for online features\*\*\*

### VR System Requirements

#### HTC Vive

- Graphics Card: GeForce GTX 970 or AMD Radeon R9 290 or better
- CPU: Intel Core i5 4590 or AMD FX 8350 or greater
- RAM: 4GB or more
- Video port: HDMI 1.4, DisplayPort 1.2, or better
- USB port: 1 USB 2.0 or faster port
- Windows 7 SP1 or newer

For current recommendations and performance testing tools, go to <http://www.htcvive.com/us/product-optimized/>.

#### Oculus Rift

- Graphics Card: GeForce GTX 970 or AMD Radeon R9 290 or better
- CPU: Intel Core i5 4590 or greater
- RAM: 8GB or more
- Video port: HDMI 1.3
- USB port: 2 USB 3.0 ports
- Windows 7 SP1 or newer

For current system requirements and a compatibility testing tool, go to <https://support.oculus.com/1633938460220125/>.

### For Apple Macintosh

#### Boot Camp Option (recommended)

- Mac Book Pro or Mac Pro running Leopard OS X or newer with Microsoft® Windows® 10, 8, 7, Vista (SP2)
- Same system requirements as Windows

#### Virtual Machine Option

- VMware Fusion or Parallels (separate purchase of either required)  
**Note:** Fusion is recommended as it provides better rendering performance. However, both options will experience a decrease in performance compared to Boot Camp.
- Minimum system requirements for Fusion or Parallels
- Minimum requirements for the virtual machine (i.e. Windows) will be exactly the same as the Boot Camp Option requirements above

\* Windows® XP is no longer supported by Microsoft®



\*\*Additional system and video memory will improve speed and 3D RealView™ rendering capabilities.

\*\*\*User is responsible for all Internet access fees and phone charges.

## Uninstalling a Previous Version

If you currently have an older version of Envisioneer installed on your system, it is recommended that you uninstall your current version before installing the new version.

Note that the uninstallation will not remove your Projects folder. If, however, you have saved projects within the main Envisioneer program folder, make sure you move them out of the program folder before uninstalling.

### To uninstall a previous version:

1. At your Windows® desktop, select **Start > Control Panel**.
2. In the **Control Panel** window, double-click **Add/Remove Programs**.
3. In the **Add/Remove Programs** window, select the program to be deleted.
4. Click the **Remove** button.
5. When prompted, click **Yes** to remove the selected application and all its features.
6. To remove the entire program folder including all files related to catalogs, libraries and materials, click **Yes** when prompted. Otherwise, if you want to keep existing catalogs and libraries on your system, click **No**. If you have created custom catalogs, libraries or materials, it is recommended that you leave them on your system.
7. The uninstallation begins. Follow any remaining instructions.

**Note:** The Projects folder remains on your system even if you chose to remove the entire program folder. By default, the Projects folder can be found in the following location:

*In Windows 10, 8, 7 and Vista:*

*C:\Users\\*username\*\Documents\Envisioneer\Projects*

*In Windows XP:*

*C:\Documents and Settings\<Current User>\My Documents\Envisioneer\Projects*

## Installing the Program

Make sure you exit all other programs, applications and screensavers before installing.

### To install the program:

1. Begin at the Windows® desktop.
2. Insert the installation CD into your CD-ROM drive. The InstallShield Wizard screen appears and loads the setup. If it doesn't appear automatically, see the instructions after step 3.
3. Follow the on-screen instructions to complete the installation.

### To run the launch screen if it does not begin automatically:

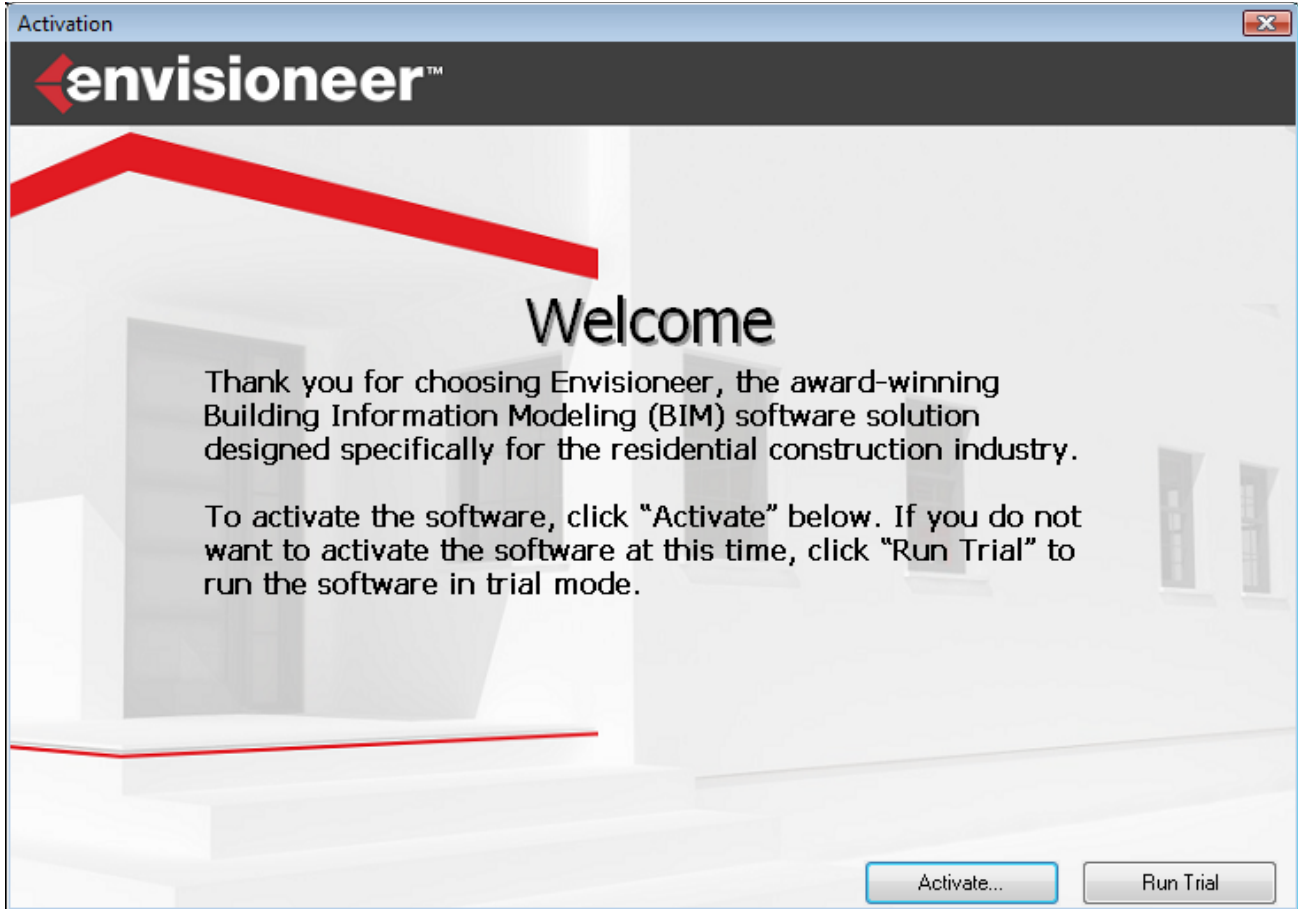
1. Make sure the installation CD is in your CD-ROM drive.
2. At the Windows® desktop, click the **Start** button, then select **Run**.
3. Type **D:\setup.exe** in the **Open** edit box. The letter D represents your CD-ROM drive. If you are installing from a different drive, substitute the correct letter for the letter D.
4. Click **OK**.

## Starting the Program

You can start your program by selecting **Start > All Programs > Cadsoft > Envisioneer**, or by double-clicking the Envisioneer icon on your desktop.

## Activating the Program

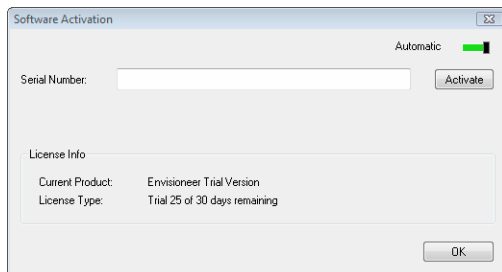
The Activation window appears when you start Envisioneer for the first time, and will keep appearing at startup until you have activated the program.



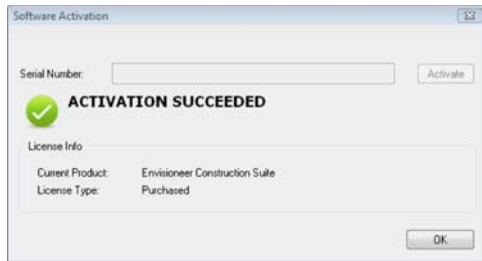
If you do not want to activate the program right away you can click the **Run Trial** button to run a trial version of the software. During the 30-day trial period you have full access to all features of the program except Print and Export. Once the trial period has ended, you need to activate the program to be able to run it. You can activate the program at any time during the trial period.

**To activate the program:**

1. Click **Activate** at the bottom of the **Activation** dialog. If the **Activation** dialog is currently not open, select **Help > Software Activation**.
2. In the **Software Activation** dialog, enter the software's **Serial Number**, then click **Activate**.



If the activation is successful, the following dialog appears:



3. Click **OK**.

## Starting a New Project

Personal Architect | Pro Architect | Building Essentials | Construction Suite


Every time you start the program, the Startup screen appears. You can start a new project directly from this screen by clicking **New** in the *Projects* pane. When the program is running, you can also start a new project using the **New** tool on the **File** menu.

By default, the **New** dialog box is displayed when you select the New tool, allowing you to select a drawing template on which to base your new project. Templates contain settings such as Building Location definitions, view window configurations, and program preferences such as units of measure and precision. The program ships with a variety of pre-defined templates for your convenience. You can edit these templates to suit your needs, or create new ones.

### To start a new project from the Startup screen:

1. On the Startup screen, click **New** in the *Projects* pane.
2. In the **New** dialog, select the template on which you want to base your new project, then click **Create**. A new project is opened.

### To start a new project if the program is already running:

1. Select **File > New** or click  on the Standard toolbar.
2. In the **New** dialog, select the template on which you want to base your new project, then click **Create**. A new project is opened.

If the **Launch Wizard when Starting New Project** option is enabled in your program settings, the Wizard that is selected in your program settings (e.g. House Builder Wizard) launches automatically when you start a new project.

**Tip:** You can change your startup settings so that the New tool launches new projects based on a specific template every time, or no template at all. Selecting either of these options prevents the New dialog box from appearing and starts new projects right away.


**Tip:** You can create your own template by simply setting up a drawing with the desired settings and saving it in your Templates folder.


## Starting New Projects from a Specific Template

Personal Architect | Pro Architect | Building Essentials | Construction Suite

By default, every time you select the New tool, the New dialog box appears, allowing you to select the template that you want to use for your new project. If you tend to use the same template all the time, you can change your startup settings so that new projects are automatically based on that specific template. This prevents the New dialog box from appearing and starts your new project right away when you select the New tool.

### To start new projects from a specific template every time:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the **General** page, click the top drop box in the *Startup* area and select **Use Specific Template**.

3. Click  next to the edit box that is below the Use Specific Template option. In the **Open** dialog, locate and select the template that you want to use when starting new projects, then click **Open**. The template name is displayed in the edit box.
4. Click **OK**.


**Tip:** You can create your own template by simply setting up a drawing with the desired settings and saving it in your Templates folder.

## Starting New Projects Without Using Templates

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By default, every time you select the New tool, the New dialog box appears, allowing you to select the template that you want to use for your new project. If you do not want to use a template when starting new projects, you can change your startup settings so that new projects have no pre-defined settings. This prevents the New dialog box from appearing and starts your new project right away when you select the New tool.

**To start new projects without using templates:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the **General** page, click the top drop box in the *Startup* area and select **Use No Template**.
3. Click **OK**.

## Enabling Template Selection at Project Startup

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If you want to be able to select any template you want when starting a new project, you must enable the Prompt for Template option in your startup settings. When you enable this option, the **New** dialog box appears every time that you select the New tool, allowing you to select a template to use for your new project.

**To enable template selection at project startup:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the **General** page, click the top drop box in the *Startup* area and select **Prompt for Template**.
3. Click **OK**.

**Tip:** If you use the same template all the time, you can start new projects that are automatically based on that template. See Starting New Projects from a Specific Template on page 5.

## Opening a Project from an Older Version

You can open projects from any previous version of Envisioneer in the new version. When you open an older project, you have the option of converting it to a current-version project, or you can make a copy to work with, leaving the original intact.


**To open a project from an older version:**

1. If the Startup screen is currently displayed, click **Open Existing**. If the Startup screen is not currently displayed, select **File > Open**, or click  on the Standard toolbar.
2. In the **Open** dialog, select the project to open, then click **Open**.
3. To make a copy of the project and work with the copy instead of the original (recommended), enable the **Convert a Copy** radio button, and then click **Continue**. In the **Save As** dialog, type a name for the copy that is different from the original, then click **Save**. The copy is opened.
4. To convert the project to the current version, select **Convert the Original**, and then click **Continue**. The project is converted and opened. Note that when you convert a project, the original is overwritten and cannot be opened in older versions of the program.
5. To cancel the task without converting or opening anything, select the **Cancel** option and then click **Continue**.

## Viewing Sample Projects

To give you an idea of the things you can do with Envisioneer, you may want to view some sample projects. These projects are located in the program's Samples directory.

### To view sample projects:


1. Select **File > Open Samples**, or click  on the Standard toolbar.
2. In the **Open** dialog, select the project you would like to view, then click **Open**.

## Selecting a Unit of Measure

Personal Architect | Pro Architect | Building Essentials | Construction Suite

Units of measure determine how length, area and volume measurements are specified when you are creating your project, and how dimensions are displayed on the screen. You can select the units of measure that you want to use in your Program Settings, and select the level of precision that you want to use for each one.

### To set the units of measure for the current project:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Units of Measure** in the left column.
3. Select either **Imperial** or **Metric** units.
4. To select a unit for distance measurement, make a selection from the **Units** drop box. Choices for Imperial units are *Feet-Inches*, *Inches*, *Feet*, and *Feet-Inches-Sixteenths*. Choices for Metric units are *Millimeters*, *Centimeters* and *Meters*. Note that this setting does not apply to site boundary measurements.

If using Imperial measurement, it is important to understand the difference between the available options and how to enter measurements correctly.

**Feet-Inches.** Displays measurements in feet and inches. When entering a measurement, you must include the feet symbol (') after a value that you want to be in feet. Otherwise, it will be taken as inches. For inch values, you do not need to enter the inches symbol (") because inches are already assumed. For example, to enter a value of 6 feet 6 inches, you would type **6'6**. When entering values in inches, you can use decimals or fractions to specify the value if you want. For example, 6 feet 6 inches could be entered as **6.5'** or **6' 1/2**. Regardless of the method you use, the displayed result will be the same: **6'-6"**.

**Inches.** Displays measurements in inches. When entering measurements you do not need to include the inches symbol (") because inches are already assumed. You can still enter values in feet and inches when specifying measurements (e.g. 6' instead of 72"), but the displayed result will always be in inches. You can use decimals and fractions when specifying values. For example, to enter 4 and a half inches you would type either **4.5** or **4 1/2**.

**Feet.** Displays measurements in feet. When entering measurements you do not need to include the feet symbol (') because feet are already assumed. For example, typing **6** would mean 6 feet. You can use decimals and fractions when entering measurements. For example, to enter the value 6 feet 6 inches, you would type **6.5** or **6 1/2**. The decimal or fraction applies to 'feet value', and will appear in the displayed result if the level of precision permits it.

**Feet-Inches-Sixteenths.** Displays measurements in feet, inches, and sixteenths of an inch (e.g. **20-06-04**). The two rightmost digits represent sixteenths of an inch. The two digits to the left of that represent whole inches. All digits to the left of the first four represent feet. So, for example, entering **201108** or **20-11-08** would specify a measurement of twenty feet eleven and one half inches.

5. To select a unit for area measurements, make a selection from the **Area** drop box. Area measurements appear in the Area/Perimeter Calculator as well as room region calculations. Imperial choices are *Square Feet* and *Square Yards*. In Metric, area is measured in *Square Meters*.
6. To select a unit for volume measurements, make a selection from the **Volume** drop box. Volume measurements appear in room region calculations. Imperial choices are *Cubic Feet* and *Cubic Yards*. In Metric, volume is measured in *Cubic Meters*.
7. Select a level of precision for each unit of measure by making a selection from the appropriate **Precision** drop box. For example, selecting a unit precision of **#'-# #/16"** sets the level of precision to 1/16th of an inch when measuring distances in feet and inches.

8. To remove zeros from measurements that end in zero, enable the **Suppress trailing zeros** check box. For example, a measurement of 12'-0" would be displayed as simply 12'.
9. If you are working in Metric units and would like to hide the units for length/distance, volume, and area measurements shown in dimensions and dialogs, enable the **Suppress display of metric units** check box. For example, 1200 mm would appear as simply 1200.
10. To change the level of precision for angle measurements, which are displayed in decimal degrees, make a selection from the **Precision** drop box in the *Angles* area. The selection you make determines the number of decimal places used.
11. Once you've set your units of measure, click **OK**.


**Note:** The units of measure selected in your Program Settings are used for drawing and creating dimensions. They are not the units used for calculating and reporting material quantities in the project estimate. Each element has a unit of measure setting on its Quantity property page that determines how the element is quantified and reported in the estimate.

## Suppressing Trailing Zeros in Measurements

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can specify that you want to suppress trailing zeros in measurements by editing your program settings. For example, 12'-0" would be displayed as simply 12' in both onscreen and inserted dimensions. This setting applies to both Metric and Imperial units of measure.

### To suppress trailing zeros in the current project:


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click *Units of Measure* in the left column.
3. Enable the **Suppress trailing zeros** check box.
4. Click **OK**.

## Suppressing Metric Units in Dialogs

Personal Architect | Pro Architect | Building Essentials | Construction Suite

If you have chosen to work in Metric units, you can choose to suppress units for length/distance, volume, and area measurements shown in dialogs. For example, 1200 mm would appear as simply 1200.

### To suppress units in the current project:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click *Units of Measure* in the left column.
3. With *Metric Units* selected, enable the **Suppress display of metric units** check box.
4. Click **OK**.


## Adjusting Your Display Settings

To ensure proper performance you should set your screen resolution to at least 1024 x 768 pixels. Consult the documentation for your *Windows* operating system for information on changing your screen resolution.

## Videos and Tutorials

Go to <http://www.cadsoft.com/clients/reference.php> to view an extensive list of informative videos and tutorials that will help you familiarize yourself with the Envisioneer workspace and learn about its features.

### To access the videos and tutorials from Envisioneer:

1. Select **Help > Customer Care** or click  on the Help menu.
2. On the **Client Center** page, click **Tutorials**.

**Tip:** There are a number of "getting started" and support resources available on the Startup screen that appears when you start the program.


## Quick Start Guide

The Quick Start Guide is a short, step-by-step tutorial that teaches you the basics of the program through hands-on exercises. It is a great way to get up and running with the software as quickly as possible.

The Quick Start Guide can be found in the box or inside the DVD case if you have purchased a boxed version.

The Quick Start Guide is also available in PDF format, which can be read in Adobe® Reader®. Two versions are available: Imperial and Metric. The guide is also available in video format.


### There are two ways to view a PDF of the Quick Start Guide:

- Select **Help > Quick Start Guide > Quick Start Guide (Imperial - PDF)** or **Quick Start Guide (Metric - PDF)**, or click the down arrow next to  on the Help toolbar and select either **Quick Start Guide (Imperial - PDF)** or **Quick Start Guide (Metric - PDF)**.
- Click the **View the Quick Start Guide** link on the Startup screen, then select the version that you would like to view (Imperial or Metric).

## Online Help

The comprehensive online help system includes information about every feature in Envisioneer. The system includes Index and Keyword Search features so that you can quickly find what you're looking for.

### To access the online help file:

- Select **Help > Program Help**, or
- Press **F1**, or
- Click  on the Standard toolbar or Help toolbar

## Context-sensitive Help

Context-sensitive help is help for a specific dialog or element in your drawing.

### To get help for a specific part of your drawing:

1. Select the element you want help with.
2. Right-click and select the Tool Help option for that element (e.g. Walls Help). A list of topics related to the element is displayed — just click the topic you want to learn more about. You can also access the Tool Help from the **Edit > Modify Elements** menu.

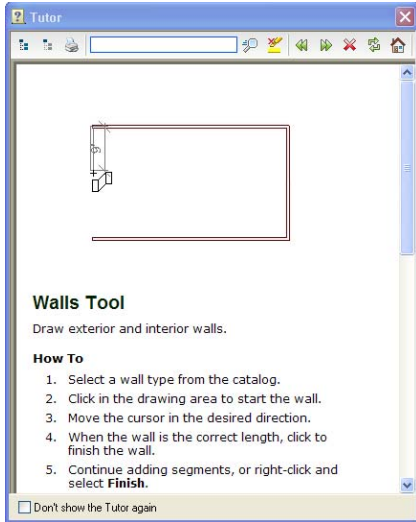
### To get help in a dialog:

1. Click  in the dialog. A window is displayed that describes the content of the dialog.

## Tutor


The Tutor is a context-sensitive help feature that displays "how-to" information about a tool when you select it. For example, if you select the Walls tool, the Tutor window displays a video and information on how to draw walls, handy tips and tricks, and links to other topics that may be of interest.





You can turn the Tutor on and off as needed. If the Tutor is currently displayed you can turn it off by enabling the **Don't show the Tutor again** check box at the bottom of the Tutor window.

**To turn the Tutor on or off:**

1. Select **Help > Tutor** or click  on the Help toolbar.

## Glossary of Terms

You can instantly access a glossary of technical and construction terms from the Help menu.

**To view the Glossary of Terms:**


1. Select **Help > Glossary of Terms**, or click  on the Help toolbar.

## Technical Support

### Online Support 24/7

Before contacting Technical Support, check out the Cadsoft web site, where you can find a variety of FAQs, white sheets, and videos. You can post questions on the Cadsoft Forum 24 hours a day, 7 days a week.

To access the Client Center, visit <http://www.cadsoft.com/clients/>. You can also access the site directly by selecting **Help >**

**Customer Care** in Envisioneer or clicking  on the Help toolbar.

### Technical Support

If you cannot find the answers you need in the Online Help or on the Cadsoft Support site, please contact Cadsoft's technical support team. Please remember that technical support cannot answer specific questions about your business project, only questions related to the features of your Envisioneer software.

When you contact technical support, be prepared to provide information about your computer name and model, and the brand name of the video card you are using. If possible, sit at your computer with the program running when you call. Be prepared to provide a detailed description of what happens when you try to run the program.

#### Cadsoft Customer Support

**Hours:** Monday to Friday, 8:30 AM - 5:00 PM, EST

**Toll-Free in North America:** 1-888-CADSOFT (223-7638)

**Corporate Phone:** (519) 836-3990

**Fax:** (519) 823-8821

**E-mail:** [support@cadsoft.com](mailto:support@cadsoft.com)



Customer Support Australia

**Phone:** (07) 3202-6366

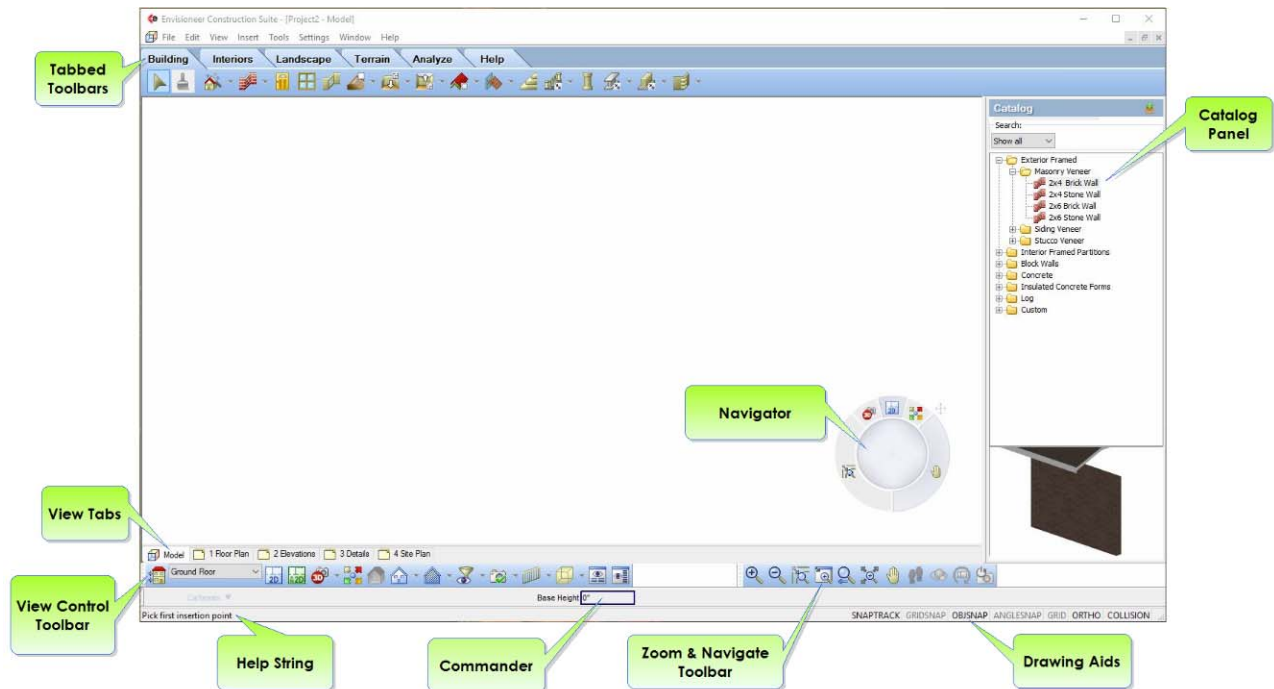
**Fax:** (07) 3202-6311

**E-mail:** [support@cadsoft.com.au](mailto:support@cadsoft.com.au)



# Chapter 2: Touring the Workspace

The Envisioneer interface contains a variety of user-friendly features that make it easy to create complete home designs. Depending on the product you have, your layout may appear slightly different than the one shown below. This chapter describes everything you see on the screen so you can become familiar and comfortable with your work environment.



## Title Bar

The title bar runs across the top of the screen. It displays the name of the program, the name of the current project, and the name of the current view.

You can minimize, maximize, restore or close the application window using the buttons at the right end of the title bar, or by clicking the Control menu button at the left end of the title bar.

You can also maximize or restore the window by double-clicking the title bar. If the application window is not maximized, you can move the entire window around on your desktop by dragging the title bar.

## Menus

The menu bar is located directly below the title bar. You can select menu items using either the mouse or keyboard.



### To select items with your mouse:

Click a menu name, then select an item from the menu that pops down. Menu items that have an arrow to the right display cascading menus when you place your pointer over them. When you highlight a menu item, a brief description is displayed on the status bar.

### To select items using keyboard shortcuts:

Type the underlined letter in the menu name, then type the underlined letter in the menu item name. If the menu item has a cascading menu, you need to type an additional letter. For example, to select the Walls tool you would type **I** (for the Insert

menu) and then **W** (for the Walls sub-menu) and then **W** (for the Walls tool). Pressing the **Alt** key on your keyboard toggles the underlining in the menu bar on and off.

You can also use the arrow keys on your keyboard to move through menu items and press ENTER to select one. You can use the ESC key to back out of the menu items one level at a time.


The most commonly used commands have quick key shortcuts assigned to them in your Program Settings, such as **CTRL + P** for Print, and **W, A** for Walls. You can specify custom keyboard shortcuts for any command in the program. Select **Settings > Program Settings > Keyboard** to view or edit keyboard shortcut assignments.

## Toolbars and Toolbar Tabs

A number of tabs are located just below the menu bar. Examples are Building, Interiors, Landscape, Terrain, Analyze and Help. These are actually toolbars displayed in tabbed format.

The view in the drawing window does not change when you switch to a different toolbar tab. The tabs simply provide you with instant access to the specific toolbars you need, when you need them. In addition to the toolbar tabs, there are two floating toolbars displayed just below the drawing area: View Control and Zoom and Navigate. Floating toolbars can be moved around on the screen.

There are more toolbars available for display in your program settings. Each one can be displayed in tabbed or non-tabbed format — the choice is yours. Note that you still have access to a complete set of Insert features on the Insert menu regardless of what toolbar tab you are on.

Some toolbar buttons have a down arrow next to them. When you click this down arrow, a list of tools is displayed. For example, if you click the down arrow next to the Walls button , two options are displayed: *Walls* and *Walls by Baseline*. Just select the one you want to use. Most toolbar buttons with drop lists display the button of the last tool used from the list. This can come in handy when you have a specific tool that you like to use repeatedly.

## Building Toolbar

The Building toolbar contains the tools you need to build a home or any architectural structure. It includes tools such as Walls, Doors, Windows, and Roofs.



## Interiors Toolbar

The Interiors toolbar contains the tools you need to furnish, decorate and equip the interior of your home. It contains tools such as Cabinets, Countertops, Appliances, Furniture, Lighting and Plumbing Fixtures.



## Landscape Toolbar

The Landscape toolbar contains all the tools you need to create a complete landscape plan for the exterior of your home. Tools include Plants, Fences/Gates, Decks, and Irrigation.



## Terrain Toolbar

The Terrain toolbar contains tools that you can use to design a realistic terrain for your model, which is especially important in 3D views. Tools include Hills/Valleys, Slopes, Paths, Retaining Walls, and Site Boundary. Alternatively you can import data from a site recorder file to create a TIN mesh, or convert the standard terrain to a TIN mesh and add spot points to it to create contours.



## Analyze Toolbar

The Analyze toolbar provides instant access to a variety of tools that help you estimate or calculate information. You can view a project estimate, generate a customizable quote, view schedules (door, window and member), and perform area and perimeter calculations for different levels, areas or rooms in your model. You can also upload data to an ERP system.



## Help Toolbar

The Help toolbar contains instant links to the Program Help, Glossary of Terms, Quick Start Guide, the Cadsoft web site, our Customer Care site, and the Green 3D Home site where you can find downloadable manufacturer catalogs. You can also control the display of the Tutor, which pops up when you use program tools, and the Start Page that you see when the program is started.



## View Control Toolbar

The View Control toolbar contains several essential view-related tools. The toolbar's building location drop box displays the current building location, which is important when inserting elements in your drawing. The toolbar also lets you quickly switch between 2D view and 3D view, and view and create elevations and sections. A display mode button lets you choose the current display type for the view (wireframe, hidden line, etc.). The View Control toolbar also provides instant access to the View Manager, where you can create new view windows if you want. Clicking the View Properties button displays the scale and print properties of the current view window.



## Zoom and Navigate Toolbar

Zoom tools on the Zoom and Navigate toolbar include Zoom In, Zoom Out, Zoom Realtime, Zoom Window, and Pan. The navigation features on the toolbar (Walk Around, Fly Around, Look Around, Reset Camera) are only active when you are in a 3D view. These tools let you change the view in real time using your mouse.



## Navigator

The Navigator contains the most common viewing and navigation tools. Resembling a video game controller, it lets you switch between 2D and 3D, zoom and pan, and navigate in 3D. Motion is controlled by clicking and dragging the central trackball.



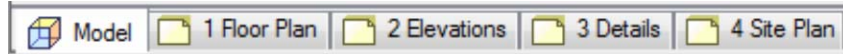
## Commander

The Commander lets you enter precise values when inserting or editing elements. Initially the Commander will look grayed out because it is inactive. It will become active when you insert or edit elements.



## View Tabs

By default, each project has a number of pre-defined view tabs displayed below the drawing area. The *Model* view window is where you build and edit your 3D model. There are some numbered view tabs beside the Model view tab, such as *1 Floor Plan* and *2 Elevations*. These are Worksheet View windows, where you can create your construction documents. View tabs help you easily switch between view windows. If you create new view windows, the tab display updates automatically.



**Note:** Worksheet View tabs are not available in *Personal Architect*.

## Model View vs. Worksheet View

When you open a new project, the *Model* view window is displayed. This is where you build, edit and view your 3D model. There are some numbered view tabs beside the Model view tab, such as *1 Floor Plan* and *2 Elevations*. These are Worksheet View windows. When you switch to a Worksheet View window, you go directly into 2D drafting mode. The Worksheet View interface contains a number of different drafting tools that help you create professional-looking working drawings.

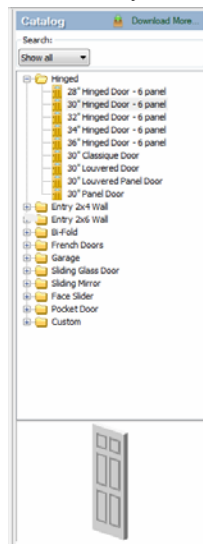
**Note:** Worksheet View is not available in *Personal Architect*.

## Scroll Bars

There are scroll bars on the right side and bottom of the drawing area. They let you scroll back and forth and up and down in the drawing area. The program also contains an Auto Scroll feature. If you are inserting elements in Model View, and hover near the edge of the drawing area, your cursor changes to a multi-directional arrow, and the drawing area will automatically scroll.

## Catalog Panel

The catalog panel, located on the right side of the screen, displays the elements contained in the program's Master Catalog, or whatever catalog is currently open. This is where you select elements to insert into your drawing. The content of the catalog panel changes depending on which Insert tool is currently selected, or was last selected. For example, if you select the Doors tool, you will see doors displayed in the catalog panel.



The top pane of the catalog panel displays a list of groups specific to the currently selected tool. For example, if Doors is the current tool, you will see groups such as *Hinged*, *Entry* and *Bi-Fold*. Listed under each group are all the element types and

sizes available in the currently selected group. For example, if the Hinged door group is currently selected, you will see a long list of hinged door sizes. You can expand or collapse a group by double-clicking it.

The lower pane of the catalog panel displays a 3D rendered preview of the currently selected element. You can rotate the image around by clicking and dragging with your mouse. Note, however, that the preview is for viewing purposes only within the catalog panel. The orientation of the element in the preview window has no effect on the orientation of the element when you insert it in your plan.

You can also right-click in the preview window and select a different display mode for the image, such as wireframe, or switch the preview to a 2D plan view.

You can use the catalog panel's *Search* feature to find a specific element in the catalog. You can search by keyword or Part Number.

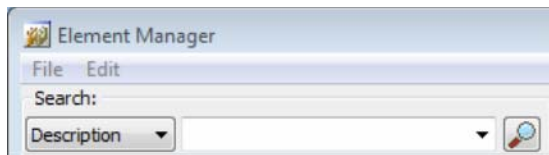
You can add and edit elements in the catalog using the Element Manager. You can also download content from the Green3DHome web site by clicking the Download More link in the catalog panel.


## Searching the Catalog

The catalog panel includes a Search feature that you can use to quickly find a specific element in the catalog. You can search by keyword or by part number. If you do a keyword search, the feature will look at element names. If you do a part number search, it will look at the Part No. values assigned to elements on their Quantity property page. Search terms are saved for your convenience so that you can activate them again in the future.

### To search the catalog:

1. At the top of the catalog panel, click the drop box in the **Search** area and select either **Description** to search by keyword, or **Part No.** to search by part number. An edit box appears next to the drop box.



2. In the edit box, enter the keyword(s) or part number to search for, then press Enter or click . If you enter one or more keywords, the search function will search all element names throughout the catalog for the specified text string. The search is not specific to any one type of element, and will display any match that contains the specified text string, even if the string is part of a word. For example, if you enter "wood" in the search field, you may see results such as Wood Siding, Wood Rail Edging, Solid Wood Door, Hardwood Floor, and Japanese Dogwood.

Note that if you enter two or more keywords, the keywords must appear consecutively in an element's name in order for the element to appear in the search results. For example, if you enter the keywords "wood edging", an element named Wood Rail Edging would not appear in the search results.

Once search results are obtained they are displayed in the main window of the catalog panel.

3. To return the catalog to its default state, where all elements are displayed, select **Show All** from the **Search** drop box.
4. Search terms that you have used are saved in the **Search** window. To activate a search that you performed previously, select the desired search term from the search drop box.

## Status Bar

The Status bar is located at the bottom of the screen. It displays helpful prompts while you are working on your design project. For example, if you are inserting a wall, it may display "Pick first insertion point". The Status bar also includes a selection of drawing aid buttons such as ORTHO and OBJSNAP.

## Auto Scroll


When an insertion tool is active in in Model View, the Auto Scroll feature will automatically scroll the drawing when you hover your cursor near the edge of the drawing area. When the Auto Scroll feature is active, your cursor changes to a multi-directional arrow at drawing area edges. The drawing will scroll in the direction in which you move your cursor.

Auto Scroll is particularly useful when you are drawing an element such as a wall and discover that you need to scroll the drawing area to be able to continue drawing it. Auto Scroll permits uninterrupted drawing and is an excellent alternative to using scroll bars.

Auto Scroll settings are defined in your program settings. You can choose to have it active all the time, or active only when you press the CTRL key on your keyboard. You can also adjust the scrolling speed so that it is slower or faster. You can also disable Auto Scroll completely if you want.

**Note:** By default, the **Active with CTRL key** option is enabled in your program settings. This means that you must press and hold the CTRL key on your keyboard to activate and use Auto Scroll while inserting elements. If you disable this option in your program settings and simply have the **Enable** option selected, it will be active all the time and you do not have to press any other keys to activate it.

### To adjust Auto Scroll settings:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Drawing Aids** in the left column.
3. To turn Auto Scroll on or off, check or uncheck the **Enable** check box in the *Auto Scroll* area.
4. If you would like Auto Scroll to be active only when you choose to use it (instead of all the time), enable the **Active with CTRL key** check box. If this option is enabled, Auto Scroll will only be active if you press and hold the CTRL key while inserting an element. This gives you precise control over its use and prevents unwanted scrolling.
5. To adjust scrolling speed, click and drag the **Speed** slider in the *Auto Scroll* area. To decrease the speed, slide left. To increase the speed, slide right.
6. Click **OK**.

### To use Auto Scroll when inserting an element:

- To scroll up, hover your cursor near the top edge of the drawing area.
- To scroll down, hover your cursor near the bottom edge of the drawing area.
- To scroll left, hover your cursor near the left edge of the drawing area.
- To scroll right, hover your cursor near the right edge of the drawing area.



# Chapter 3: Drawing & Editing Basics

There are three types of elements that you can insert — single-click elements, line-drawn elements, and area-drawn elements. Before starting a design, it may be helpful to familiarize yourself with the methods of inserting each of these element types.

By default, when you insert a single-click element, such as a door, you remain in Insertion mode until you right-click and select **Finish**. You then go into Selection mode, which means you can select elements for editing. If you prefer you can select the Single Insertion Only option in your program settings so that you automatically go into Selection mode after inserting an element, eliminating the need to right-click and **Finish**.

By default, when you insert line-drawn elements such as walls, you simply pick points to define the element's end points. If you are more familiar with "clicking and dragging", you can select the Pick and drag option in your program settings.

If you want to edit an element that you have inserted, you need to select the element. When an element is selected it is highlighted. For many elements, editing grips are also displayed that let you move, rotate or stretch the element. Right-clicking your mouse when an element is selected displays a menu that contains editing commands specific to that element. You can also view this menu by selecting **Edit > Modify Elements** when an element is selected.

## Inserting Elements

When you select a tool from the **Insert** menu or one of the insertion toolbars, you are in Insertion mode. To insert an element, you select it in the catalog panel, then click in your drawing area.

Many elements can be inserted with a single mouse click. *Single-click elements* include doors, windows and stairs, and objects such as cabinets and furniture. *Line-drawn elements* such as walls and railings require that you select two points to define the element's start point and end point. The points you pick determine the element's length and angle. *Area-drawn elements*, such as manually inserted floors and ceilings, and fills and plateaus, are drawn by picking a series of points to define their outline.

In many cases, on-screen dimensions are displayed as you draw, making it easy to create line-drawn and area-drawn elements at the correct length or size, and insert elements like doors and windows precisely where you want them in a wall.

Once you insert an element in your drawing area, you can:

- Continue inserting the same element
- Select a different element in the catalog to insert
- Right-click and select **Finish** to end the command and return to Selection mode

**Tip:** When an Insert tool is active, double-clicking inserts the element and finishes the command at the same time. Note, however, that double-clicking after you've already inserted an element will, in most cases, insert another element.

**Tip:** If you are in Selection mode, you can insert any element currently accessible in the catalog by simply selecting the element in the catalog, then moving your pointer into the drawing area.


## Selecting an Insertion Method for Line-Drawn Elements

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Line-drawn elements, such as walls, are elements that are drawn by picking two or more points. By default, line-drawn elements use the **Pick Points** insertion method. With this method you do not have to keep your mouse button depressed to draw the element (i.e. you do not have to click and drag the mouse). Once you've selected the first point, you can simply move your mouse in the direction you want the element to run, then click to select the next point.

If you are more comfortable with the "click-and-drag" method, you can select the **Pick and drag** insertion method. With this method, you keep the mouse button depressed after clicking the first point, drag the mouse to draw the element, then release your mouse button to select the next point.

**To select an insertion method for line-drawn elements:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Drawing Aids** in the left column.


3. In the *Model View Insertion Method* area, select either **Pick Points** or **Pick and drag**.
4. Click **OK**.

## Selecting an Insertion Method for Single-Click Elements

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Single-click elements are things like doors, windows and staircases. By default, Insertion mode remains active after inserting a single-click element. This means you can keep inserting elements without having to re-select an Insert tool or element in the catalog. You can disable this behavior if you want to. If you do choose the Single Insertion Only option, you do not need to select *Finish* after inserting a single-click element. You will go directly into Selection mode.

**To select an insertion method for single-click elements:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Drawing Aids** in the left column.
3. In the *Model View Insertion Method* area, select either **Single Insertion Only** or **Repeat Insertion**.
4. Click **OK**.

## Repeating the Insertion of a Line-Drawn Element

When drawing elements such as walls, new segments are continually added as you pick more points. You can use the Repeat tool to finish drawing the current line-drawn element and start a new one if you want, without having to restart the tool.

**To repeat the insertion of a line-drawn element:**

1. When you are ready to finish the current element and start a new one, right-click and select **Repeat**, or select **Edit > Modify Elements > Repeat**. The current element is finished.
2. Pick a start point for the new element and continue drawing.


**Note:** The Repeat tool is available for line-drawn elements only.

## Using Space as Enter

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You can specify that you want the spacebar on your keyboard to act like the Enter key. This can speed up the way you work.

**To specify that you want to use the spacebar as Enter:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Drawing Aids** in the left column.
3. In the *Model View Insertion Method* area, enable the **Use Space as Enter** check box.
4. Click **OK**.

## Going into Selection Mode for Editing

When you have finished using an insertion tool, either by double-clicking or selecting **Finish** from the right-click menu, you automatically go into Selection mode. When in Selection mode, you can select elements in your drawing area and edit them.

You can also go into Selection mode by clicking  on any insertion toolbar, or by selecting **Select/Edit** from the **Edit** menu.

## Selecting Elements for Editing

When in Selection mode, you can select elements for editing. You can select individual elements, a group of elements, or all elements.

When an element is selected, it is highlighted in a different color (usually light green). One or more grips are also displayed on the element.

When you are in 3D view, all elements on all locations are selectable. When you are in 2D plan view, only elements on the current building location are selectable. However, you can change this if you want.

If multiple elements share the same edge, such as floors and ceilings, you can cycle through the different elements that share that edge so that you can accurately pick the one that you want to edit. To do this, select one of the element edges, and then hold down the Shift key while using the scroll wheel on your mouse.

If you are having trouble selecting the element you want, you may want to use the View Filter to make other elements non-selectable. This makes selection of the element much easier.

**Note:** Automatic floors cannot be selected in 2D Plan view unless the display mode is set to Rendered or Rendered Outline. They can be selected in 2D Designer's View, or in 3D view.

#### To select a single element:

1. Click on the element.

#### To select multiple elements by clicking:

1. Click the first element you want to select.
2. Hold down the Shift key and click on the rest of the elements you want to select. The most recent selection is green and prior selections are blue.

#### To select a group of elements by creating a selection window:

1. Going from either left to right, or right to left, drag a selection window around the elements you want to select. Any elements touching the selection window will be selected (they do not need to be totally enclosed).

#### To select all instances of a specific element:

1. Select one instance of the element in your project.
2. Right-click and select **Select All Similar**. All elements in the project that have the same definition as the chosen element become selected.

#### To select all elements on the current location:

1. Select **Edit > Select All**.

#### To re-select the elements you last selected:

1. Select **Edit > Select Previous**.

## Deselecting Elements

When you select elements, you can remove individual elements from your selection set. You can also deselect everything that is currently selected.

#### To deselect individual elements:

1. Hold down your Shift key.
2. Click the element you want to deselect.

#### To deselect everything in your selection set:


1. Select **Edit > Deselect All**, or right-click in the drawing area and select **Deselect All**, or simply click in a blank spot somewhere else in the drawing area.

## Making Elements on All Locations Selectable in 2D

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By default, only elements on the current building location can be selected in 2D plan view, even if elements on other locations are visible. If you want to make elements on all locations selectable, you need to change one of your program settings.

#### To make elements on all locations selectable in 2D plan view:


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Building Aids** in the left column.
3. In the *Drawing Assistance* area, uncheck the **Select elements on current location only while in plan view** check box.
4. Click **OK**.

## Enabling/Disabling Screen Tips

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By default, screen tips are displayed when you hover over elements in Model View telling you what the elements are. In 3D view, the element's building location is also displayed. This can help you when selecting elements, as it lets you know what you are about to select. On some systems, disabling screen tips can help improve program speed.

**To enable or disable screen tips:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Visual Aids* area, check or uncheck the **Enable Screen Tips in Model Views** check box.
4. Click **OK**.

## Accessing Edit Tools

Most elements in Model View can be moved once they are selected by simply clicking and dragging them. Some can also be stretched or rotated. You can access a full menu of edit tools in Model View by right-clicking in the drawing area, or by selecting **Edit > Modify Elements**.

Menus vary depending on the element selected. Typical tools are Properties, Move, Rotate, Duplicate, and Delete. If two types of elements are selected (such as a floor and a wall), only tools that are common to both element types are available.

# Chapter 4: Building Locations

When you insert an element in your drawing, it is inserted on the current building location. It is important to define your building locations before inserting elements, since building locations are the key to organizing elements and inserting them at the correct height in your model.

If you are drawing from scratch, the program's default drawing templates have a few pre-defined building locations. You can change the settings for existing building locations as well as add and delete locations.

If you use the House Builder Wizard to start your project, your main building locations are set up for you when you run the House Builder Wizard.

This chapter describes how to define your building locations, and identify the current building location when adding elements to your design.

## Defining Building Locations

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When you insert an element in your drawing, it is inserted on the current building location. It is important to define your building locations before inserting elements, since building locations are the key to organizing elements and inserting them at the correct height in your model.

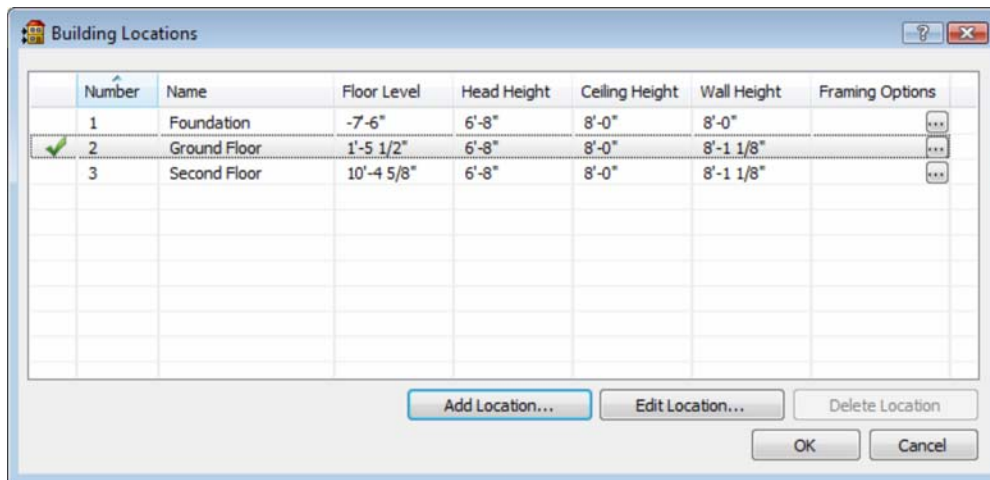
The program's default drawing templates have a few pre-defined building locations. You can change the settings for existing building locations as well as add and delete locations.

When you define building locations, you are basically doing two things:

- setting the wall height for each floor (level) in your model
- specifying where each floor is positioned relative to grade or another location

### To define building locations:

1. Select **Settings > Building Locations**, or click  on the View Control toolbar.



Below is a brief description of each building location property.

**Number.** A reference number for the location.

**Name.** The location's name (e.g. Ground Floor).

**Floor Level.** The level of the new location's floor relative to grade, and the level at which the wall bottoms will sit.

**Head Height.** Height of tops of windows and wall openings relative to the floor level.

**Ceiling Height.** Height of underside of ceiling surface relative to the floor level.

**Wall Height.** Physical height of the walls on the location.

**Framing Options.** Determines how the walls on the location are framed.

Floor levels are relative to the ground. As an example, if the Foundation location has a **Floor Level** of -8' (or -2440 mm), the base of the foundation is positioned 8' (2440 mm) below ground level. (In other words, it is a full basement.) In this case, if the **Wall Height** of the Foundation location is 8' (2440 mm), the top of the foundation wall will be situated at ground level.

**To change the properties of a building location:**

1. In the **Building Locations** dialog, click on the property you want to change. You can change location names or any of the numerical settings.
2. Type the value you want.
3. Press **Enter**.

**To add a new building location:**

1. In the **Building Locations** dialog, click the **Add Location** button, then follow the steps in Adding a Building Location on page 24.

**To delete a building location:**

1. In the **Building Locations** dialog, click on one of the location's fields to make it the current location.
2. Click **Delete Location**.


**Note:** You cannot delete a location if it contains any elements. Also, you cannot delete a location if it is the only one in the list.

## Adding a Building Location

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You can set up all building locations before starting a drawing, or you can add locations as needed.

**To add a building location:**

1. Select **Settings > Building Locations**, or click  on the View Control toolbar.
2. In the **Building Locations** dialog, click the **Add Location** button.
3. In the **New Location** dialog, specify where you want to calculate the new location from by selecting either **Calculate from existing location** or **Calculate from grade**. Typically, the foundation and ground- or first-level locations are calculated from grade, while upper floors are calculated from existing locations.
4. If you selected **Calculate from existing location**, specify the following settings in the **Location Calculator (From Existing)** dialog:

**Location Name.** The name of the location as it will appear in the **Building Locations** dialog and drop box.

**Top of Wall from Grade.** This value is calculated automatically based on the values you specify for the walls and floor, and the levels defined for the existing building location. It indicates the level at which the new location's wall tops will sit relative to grade.

**Wall Height.** How tall you want the walls to be on the new location.

**Ceiling Height.** Height of the underside of the ceiling surface relative to the floor.

**Head Height.** Height of tops of windows and wall openings relative to the floor.

**Sheathing.** The thickness of the floor sheathing.

**Structural.** The height of the floor's structural material (e.g. joists).

**Sill Plate.** The thickness of the sill plate.

**Floor Level.** The level of the new location's floor relative to grade. The new location's wall bottoms will sit at this level. This value is calculated automatically by adding the total thickness of the new location's floor structure (sill plate + joists + sheathing) to the existing location's **Top of Wall from Grade** height value.

**Top of Wall from Grade.** The level at which the existing location's wall tops currently sit relative to grade.

**Calculate from Location.** The existing building location from which the new one will be calculated. Typically this is the location on which the new location will sit.

- If you selected **Calculate from grade**, specify the **Wall Height**, **Ceiling Height** and **Head Height** in the **Location Calculator (From Grade)** dialog as described in the previous step. Additionally, specify the location's **Floor Level from Grade** to determine where the top of the floor (and base of the walls) will sit relative to grade.

The **Top of Wall from Grade** will be automatically calculated based on the specified wall height and floor level.

- Click **OK** to add the location to the list. To determine how walls on the location are framed, see *Defining Wall Framing Options for Building Locations* on page 139.

**Note:** When you add a location to your list, it does not become the current location unless you select it in the list or edit its properties.

## Making a Building Location Current

Before inserting an element in your drawing you should make sure that the building location you want to insert the element on is the current building location.

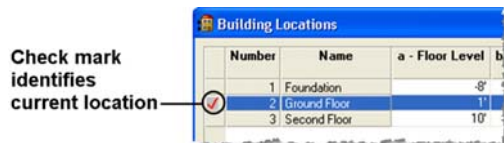
**To make a building location current:**

- Click on the building locations drop box on the View Control toolbar and select the desired location.



OR

- In the **Building Locations** dialog, click in the far left field of the location you want to make current. A check mark indicates the location is now current.




## Allowing a Different Current Location Per View Window

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By default, the location you select in one view window will be the one displayed when you switch to other view windows. By changing your program settings you can allow a different location to be current in each view window.

**To allow a different current location per view window:**

- Select **Settings > Program Settings** or click  on the Settings toolbar.
- In the **Program Settings** dialog, click **Workspace** in the left column.
- In the *Model View Behavior* area, disable the **Maintain Current Location Per View** check box.
- Click **OK**.


## Location Dimming

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When a particular location is current, elements on all other visible locations are dimmed. This makes it easier to insert and edit elements on the current location because it is more obvious which elements are part of the current location.

By default, elements on other locations are dimmed by 90%. You can adjust the dimming so that it is lighter or darker according to your preference.

**To change the dimming percentage:**

- Select **Settings > Program Settings** or click  on the Settings toolbar.
- In the **Program Settings** dialog, click **Workspace** in the left column.

3. Type the desired dimming percentage in the **Dimming Percentage** edit box, or use the arrows to scroll up or down through a list of values.
4. Click **OK**.



# Chapter 5: House Builder Wizard

The first question many people ask when they sit down with a new piece of software is, “Where do I start”? The House Builder Wizard is the perfect way to start a project, because it builds a house for you instantly! All you need to do is specify how many stories you want to create, select a general house shape, define the building dimensions, then select the general style for the walls, roof, floors and foundation. In a few mouse clicks, you’ll have a basic structure that you can edit and add to.

Once your basic model is built you can add things like interior walls, doors, windows and stairs. If you would prefer to start your project from scratch, you may want to start by drawing walls. (See Drawing Walls on page 33.)

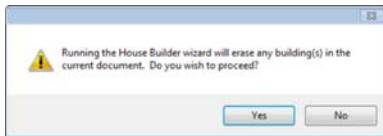
## Using the House Builder Wizard

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The House Builder Wizard is the perfect way to start a project, because it builds a house for you instantly! All you need to do is specify how many stories you want to create, select a general house shape, define the building dimensions, then select the general style for the walls, roof, floors and foundation. The resulting house includes exterior walls, footings and foundation walls (or concrete slab), a roof, and a floor. In a few mouse clicks, you’ll have a basic structure that you can edit in every way to suit your needs.

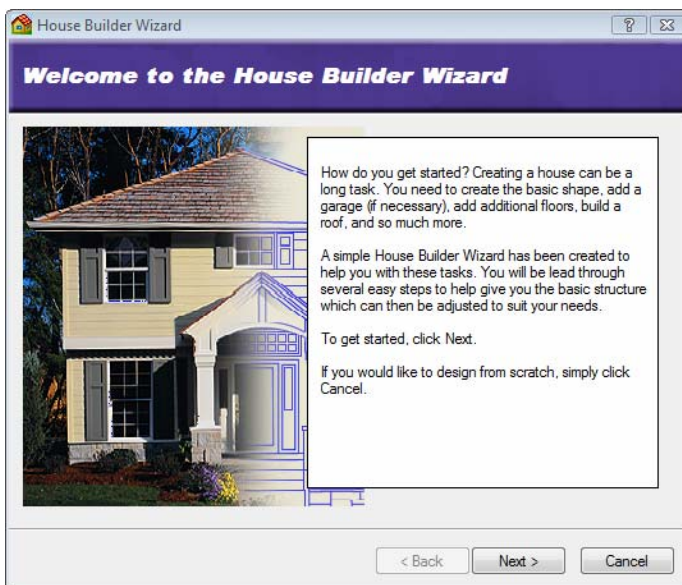
### To use the House Builder Wizard:

1. Select **Insert > Design Wizards > House Builder**, or click  on the Building toolbar.

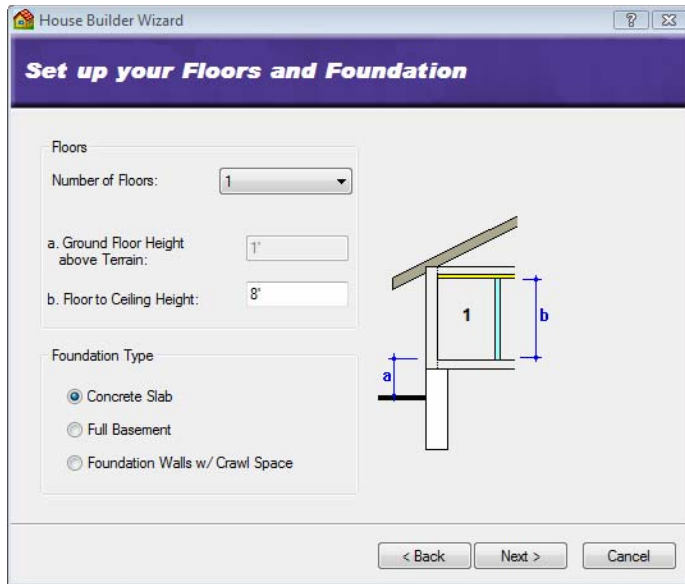


**Note:** Running the House Builder Wizard will delete all existing building elements in the current project. It will not, however, remove the terrain or any landscaping elements you have inserted.

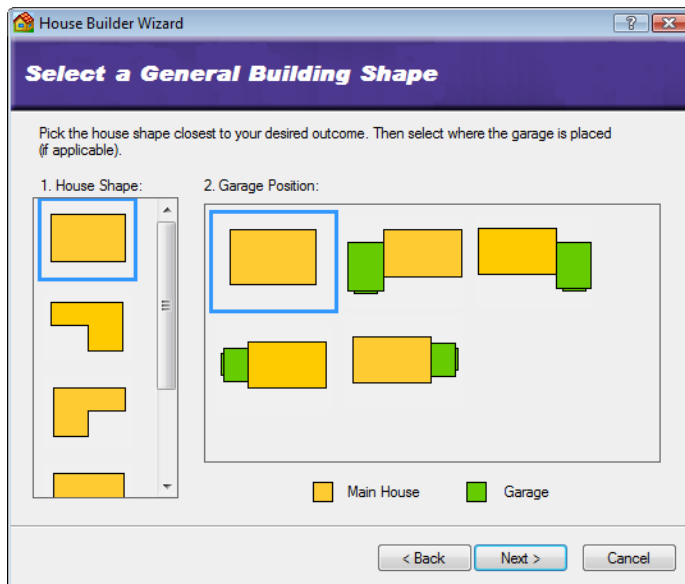
2. Click **Yes** in the warning dialog to proceed.



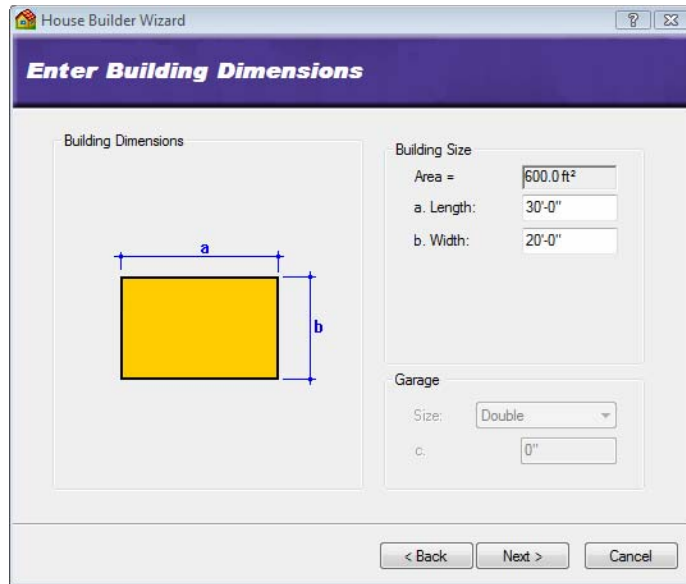
3. On the House Builder screen, click **Next**.



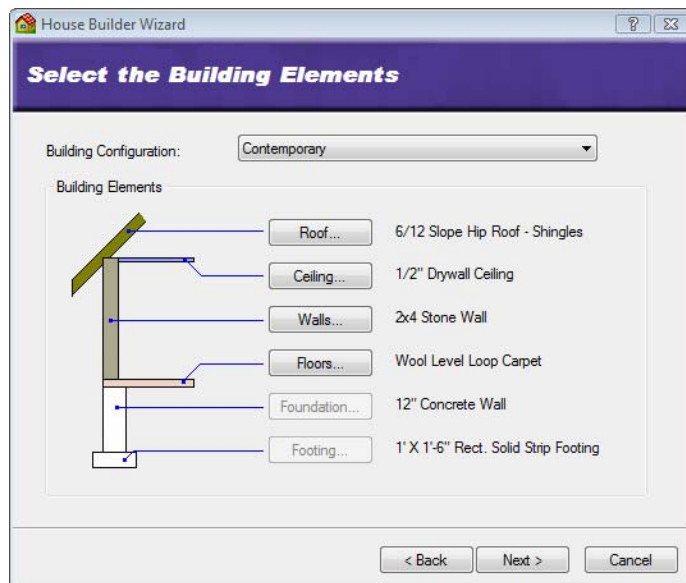
4. From the **Number of Floors** drop box, select the number of floors you would like the house to have (not including the basement level).
5. In the **Floor to Ceiling Height** edit box, type the desired wall height for each floor level.
6. In the *Foundation Type* area, select the type of foundation you want to create. Choose from Concrete Slab, Full Basement, or Foundation Walls w/ Crawl Space.
7. If you selected the Full Basement or Foundation Walls w/Crawl Space, specify the elevation of the ground floor relative to the ground in the **Ground Floor Height above Terrain** edit box.
8. Click **Next**.



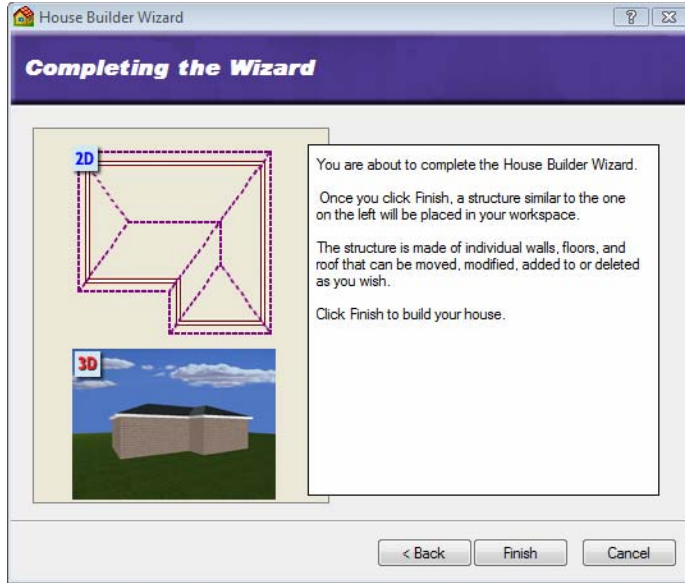
9. Select the general house shape by clicking one of the graphics in the *House Shape* pane.
10. Once you've selected a house shape, make a selection in the *Garage Position* pane to specify where you want to put the garage. If you don't want a garage, select the first option.
11. Click **Next**.



12. In the *Building Size* area, specify the desired dimensions for the house by entering values in the edit boxes. The edit box labels correspond to the labels on the image in the left pane.
13. In the *Garage* area, select either Single, Double or Triple from the **Type** drop box. Then, using the dimensioned graphic as an aid, specify the desired offset of the garage from the exterior wall corner.
14. Click **Next**.



15. From the **Building Configuration** drop box, select the general style for your home (contemporary, country or traditional). The pre-set material selections for the elements in your house are displayed in the lower pane. You can select different materials if you want — just click the button of the element you want to change and make a selection from the catalog.
16. Click **Next**.




17. Click **Finish** to build the house.

## Launching the House Builder Wizard Automatically at Startup

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If you want you can choose to launch the House Builder Wizard automatically every time you start a new project, instead of opening a blank drawing.

**To launch the House Builder Wizard automatically at startup:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **General** in the left column.
3. In the *Startup* area, check the **Launch wizard when starting new project** check box.
4. Select **House Builder** from the drop box.
5. Click **OK**.


## Creating a Custom House Builder Wizard Configuration

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A House Builder Wizard configuration determines what elements are used for exterior walls, roofs, floors, ceilings, foundation walls and footings. You are asked to select a configuration for your house when you run the House Builder Wizard.

You can edit any of the existing configurations that are available in the House Builder Wizard, or create your own. Customized configurations are saved automatically and will be available when you run the House Builder Wizard in the current project, or any other project.

**To access the building configuration library:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager** dialog, select **Libraries > Building Configuration**.

**To add a new configuration to the list:**

1. Select **Edit > Add Configuration**, or right-click in the Building Configurations window and select **Add Configuration**. An entry named 'New Configuration' is added to the list.
2. Select the new configuration in the list. If you want to rename it, select **Edit > Rename Configuration**, or right-click and select **Rename Configuration**. Then, type the new name and press ENTER.

**To edit a building configuration:**

1. Select the configuration in the list. The element selections for the configuration are listed in the center pane.
2. In the center pane, select an element type you want to specify a style for (e.g. Main Wall).
3. Click the **Select** button.
4. In the **Catalog Access** dialog, select the specific style you want to apply to the selected element type, then click **OK**.
5. Continue selecting styles for the remaining element types.

**To delete a configuration from the list:**

1. Select the configuration in the list.
2. Select **Edit > Delete Configuration**, or right-click and select **Delete Configuration**, or simply press the Delete key on your keyboard.



# Chapter 6: Walls

In most cases you will probably want to start your design by drawing the exterior walls, and then adding interior walls. Drawing walls is easy — just point and click!

Drawing walls is easy — just point and click. Envisioneer automatically displays dimensions as you draw, and connects corners for you. If the Object Snap is turned on, interior walls snap to other existing walls and create clean intersections with them.

Once inserted, any wall can be moved, rotated, lengthened, shortened, elevated, lowered, curved, deleted, and more. This lets you create the exact wall layout that you want.

There are two different tools available for drawing walls: the Walls tool, and the Walls by Baseline tool. The Walls tool draws walls on center. The Walls by Baseline tool lets you draw walls on any baseline, such as the exterior or interior wall line.

The catalog contains exterior, interior and foundation wall types. Once your walls are drawn, you can add paint, wallpaper, baseboards and other types of trim for a truly customized look. Walls also have a framing configuration in their properties which you can customize if you want.

## Drawing Walls

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You can draw walls by simply pointing and clicking with your mouse.


By default, every exterior wall in the catalog is defined as a composite wall. A composite wall is a structural wall (e.g. stud wall) and veneer wall (e.g. brick or stone wall) put together, with an air space in between.

Perimeter walls drawn with the Walls tool are drawn *on center*. If you want to draw walls with a different offset (such as on the outer face of the veneer), use the Walls by Baseline tool instead.

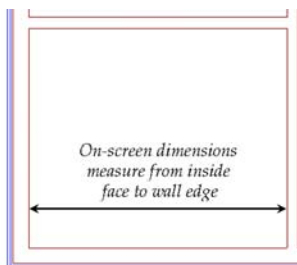
If automatic floors are turned on in your program settings, a floor is automatically inserted when you create a closed wall layout. You can change the floor properties after it has been inserted if you want.

Once you've created your exterior walls, you can start drawing interior walls. Walls snap to other walls automatically, creating clean corners and intersections.

### To draw walls:

1. Make sure the current location is the location that you want to insert walls on.
2. Select **Insert > Walls > Walls**, or click the down arrow next to the Walls button  on the Building toolbar and select **Walls**.
3. In the catalog, select the wall type that you want to insert.
4. Select a start point for the first wall.

**Note:** When selecting a start point for an interior wall, the on-screen dimensions measure from the inside face of the exterior walls to the adjacent face of the interior wall you are drawing.

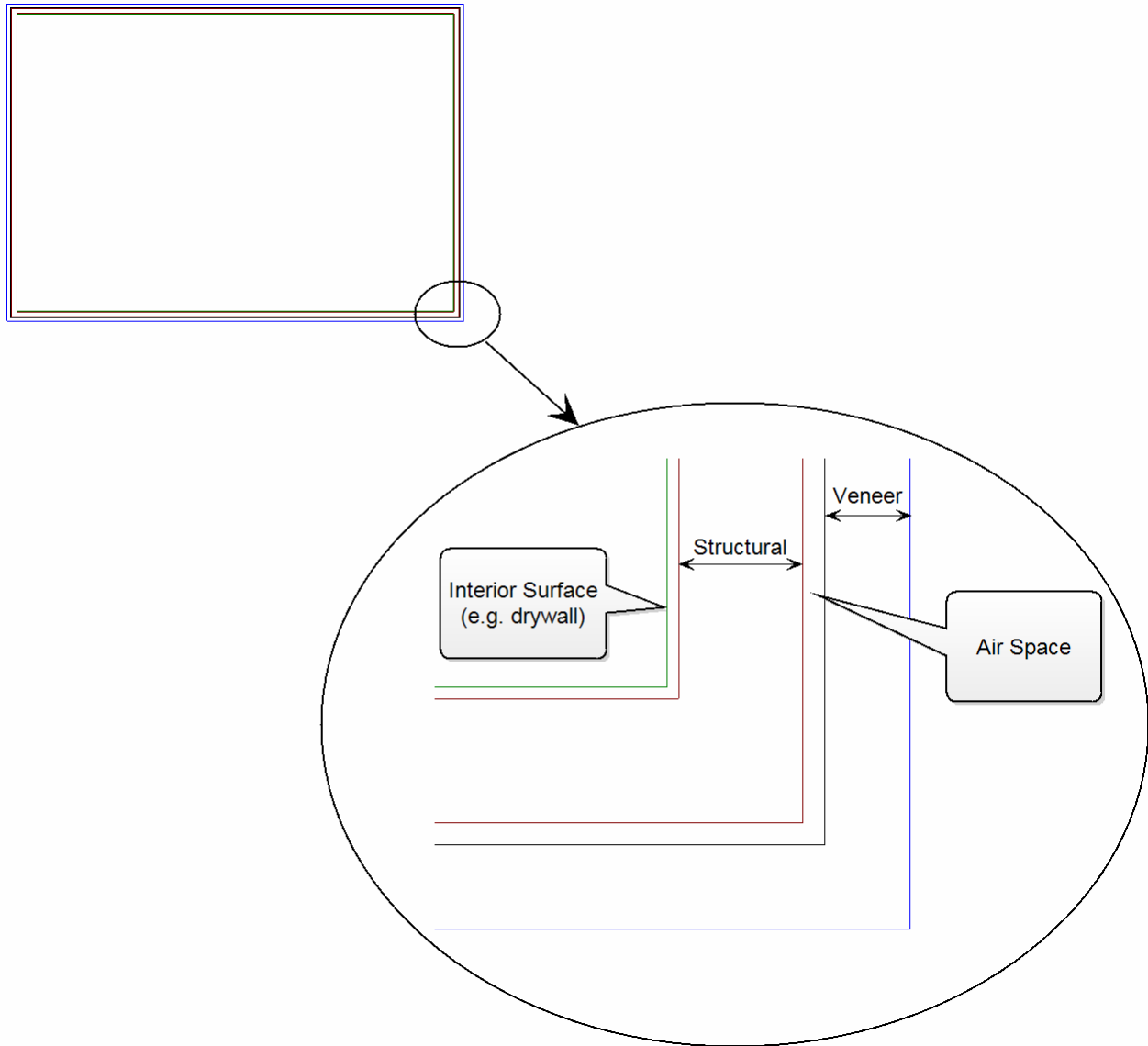


5. Without dragging, move your cursor in the direction you want your wall to run. Its length is shown as you draw the wall.

**Note:** By default, drawing is constrained to 15° angles. To release this constraint, turn off Angle Snap.

6. When the wall is the length you want, click to set its endpoint.
7. To add another wall to the one you have just drawn, move the mouse in the direction you want the new wall to run. When it is the right length, click to set its endpoint.
8. When you are finished drawing walls, right-click and select **Finish**.

If drawing exterior walls with a composite wall definition, you will see both the structural wall and veneer.



**Note:** If drawing composite walls, the veneer appears only if the walls connect to form a closed layout. Otherwise, only the structural wall is displayed.

## Drawing Walls from an Offset Baseline


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If you use the Walls tool to draw perimeter walls, the walls are drawn on center, which means they are drawn on a center baseline. You may prefer to draw your walls on a different baseline. For example, you may want your baseline to represent the inner or outer edge of the wall core. You can then offset the walls from that baseline in either direction by a specified distance, or have no offset at all.



You can draw walls from an offset baseline using the *Walls by Baseline* tool. Once you've drawn the perimeter baseline you can specify how you want to offset the walls from that baseline.

#### To draw walls from an offset baseline:

1. Select **Insert > Walls > Walls by Baseline**, or click the down arrow next to the Walls button  on the Building toolbar and select **Walls by Baseline**.
2. In the catalog, select the wall type you want to insert.
3. Pick points to draw the outline of your exterior wall layout, then right-click and select **Finish**. When considering your measurements, keep in mind that the walls will be offset from this outline.  
If you make a mistake while drawing the outline you can undo the last segment drawn by right-clicking and selecting **Step Back**.
4. In the **Walls by Baseline** dialog, select the wall face that you would like to serve as the offset baseline. You can choose either **Outer Face of Veneer**, **Outer Face of Wall Core or Stud**, or **Inner Face of Wall Core or Stud**.
5. In the *Offset* area, specify an offset distance in the **Distance** edit box, if desired.
6. If you have specified an offset distance, select the direction in which you want to offset the walls from the baseline, either **Towards outside** or **Towards inside**.
7. Click **OK**. The walls are created.

**Note:** When drawing the layout, do not select the start point again to create the last segment. The last point picked is continually connected to the start point.

## Adding a Story

Once you have created one level, such as the Ground Floor level, adding more levels to your design is easy. You can create a new story in one of the following ways:


- Use the Floor and Foundation Builder Wizard to automatically create perimeter walls on another location (see page 35)
- Use the Duplicate to Locations tool to copy the walls from an existing location to a new location (see page 225)
- Use the Walls tool to draw walls on a new building location using the walls on the previous location as a tracing footprint (see page 33)

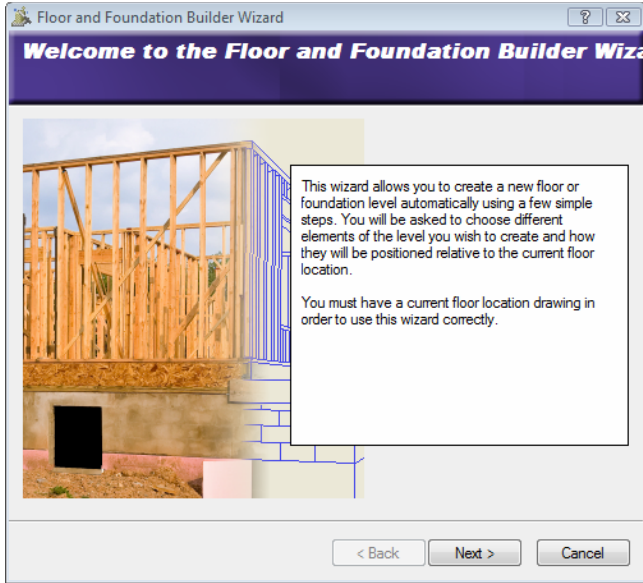
## Using the Floor and Foundation Builder Wizard

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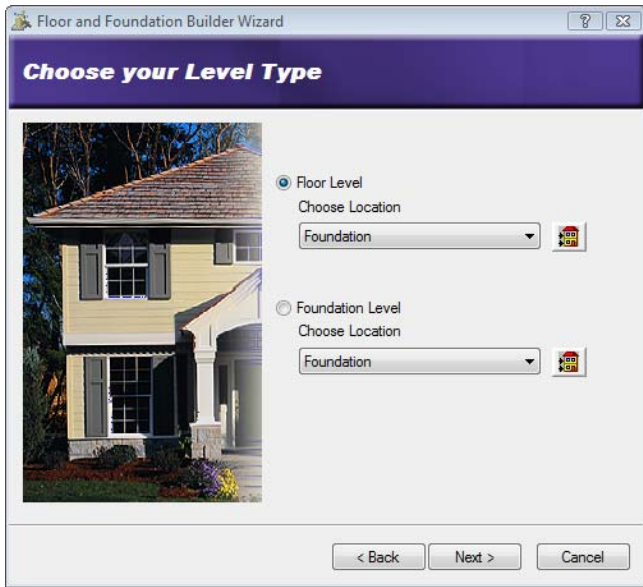
Once you have created a perimeter wall layout for one level in your design, you can use the Floor and Foundation Builder Wizard to automatically create a foundation level or additional stories. When stepping through the Wizard you define the element configuration and materials you want to use, and the relative position of elements. The Wizard then builds the new level for you automatically using the existing layout on another location as a tracing footprint.

#### To create a new level with the Floor and Foundation Builder:

1. Make sure you have drawn a perimeter wall layout for one building location in your model. The Wizard will use these walls as a tracing footprint for the new level.
2. Select **Insert > Design Wizards > Floor and Foundation Builder**, or click the down arrow next to the Design Wizards button  on the Building toolbar and select Floor and Foundation Builder.

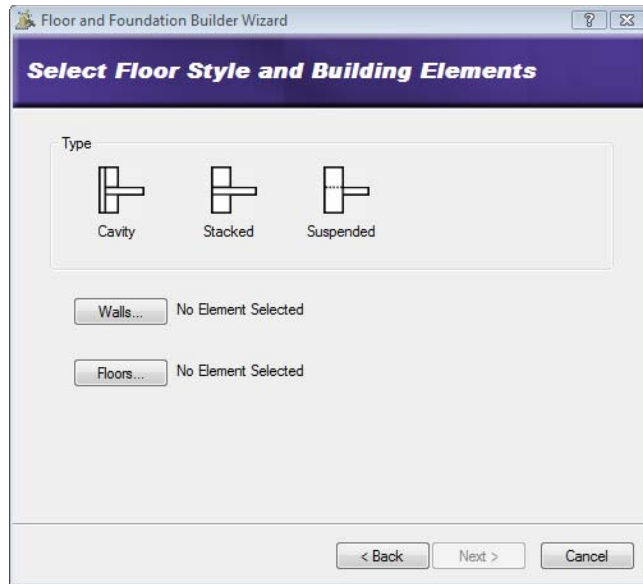


3. On the Welcome screen, click **Next**.

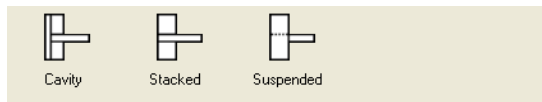


4. Select the type of level you want to create. To create a new story (comprising walls and a floor), enable the **Floor Level** radio button, then select a building location for the new level from the location drop box (e.g. Second Floor). To create a foundation level (which can include footings, or can be just a slab), enable the **Foundation Level** radio button, then select a building location for the foundation elements (e.g. Foundation). The building location you select determines the height of the new level's walls as well as the floor level.

5. Click **Next**.



- In the *Type* area, select the type of element configuration you want to create. For a floor level, this determines how the floor intersects with the walls. For a foundation level, this dictates what type of foundation will be created and what it will include.

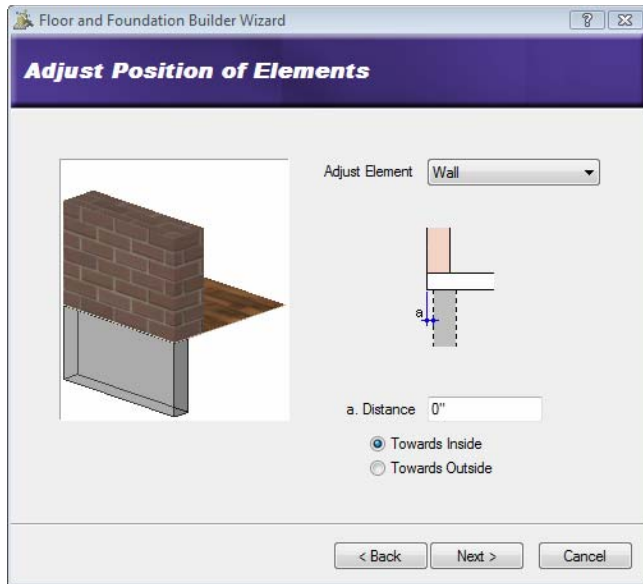


#### *Floor Level Options*



#### *Foundation Level Options*

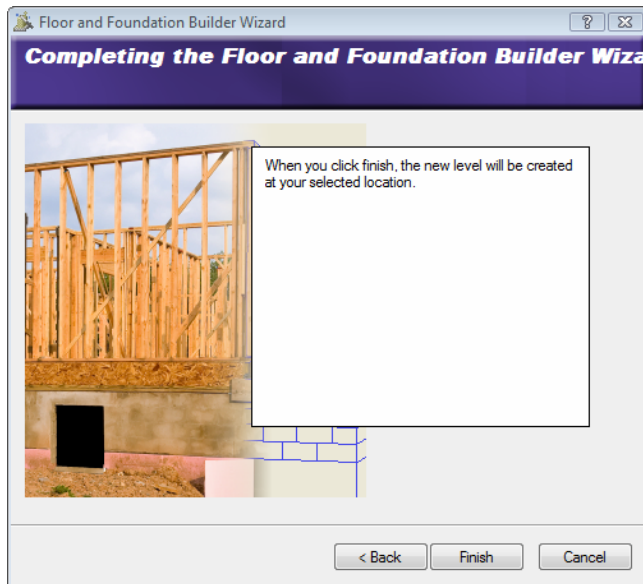
- If you selected a configuration that includes walls, click the **Walls** button, then select the type of wall you want created on the new level in the **Catalog Access** dialog.
- If the configuration you selected includes a floor, click the **Floors** button, then select the type of floor you want the new level to have.
- If you are creating a *Slab on Grade* or *Monolithic* foundation level but already have a floor slab in the drawing, you will probably want to enable the **I already have a floor slab, do not include another** check box. This prevents the creation of an additional floor slab.
- If you are creating a foundation level, click the **Footings** button, then select the type of footing you want to use.
- Click **Next**.



12. The **Adjust Position of Elements** screen lets you move the walls, floor or footing toward the inside or toward the outside of the layout. If you want to adjust any of these elements, select the element to adjust from the **Adjust Element** drop box, then enter the distance you want to move the element in the **Distance** edit box. Then, specify the direction in which you want to move the element by enabling either the **Towards Inside** or **Towards Outside** radio button.

The point from which the move distance is measured depends on the type of element you are adjusting and the floor style or foundation type you have selected. For more detailed information on adjusting elements, click the help button on the **Adjust Position of Elements** screen.

13. Once you adjusted your elements, click **Next**.



14. Click **Finish**. The new level is created automatically.


**Note:** The Floor and Foundation Builder will not launch if there is not a closed wall layout present in the drawing.

## Solid Filling Walls and Other Elements

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You can instantly apply solid fill to the walls or other elements in your 2D plan by enabling solid fill in your Program Settings. Any element that has solid fill enabled on its Appearance property page will be solid filled. These include walls, floors, surfaces, members, cabinets, paths, pads, and fills.

#### To enable solid filling:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, select **Building Aids** in the left column.
3. In the *Drawing Assistance* area, enable the **Enable Solid Filling** check box.
4. Click **OK**.

**Note:** Solid filling will only appear on elements that have solid fill colors assigned to them and have solid fill turned on in their Appearance properties.

## Editing Solid Fill Colors

Certain elements have a solid fill color assigned to them in their Appearance properties. These include walls, floors, surfaces, members, cabinets, paths, pads, and fills. You can edit the color assignment for these elements in your catalog or in your drawing.

#### To edit solid fill colors:

1. Select the element whose solid fill color you want to change, either in the catalog, or in your drawing. Note that editing solid fill in the catalog will affect only future insertions of that element type.
2. Access the element's properties.
3. In the properties dialog, select the Appearance tab.
4. In the *Components* list, select the component you want to change. For example, if the element is a wall you may want to select **2D Core** or **Airspace**. Other elements may have a 2D component as well.
5. In the *Solid Fill* area, make sure the **Enable** check box is checked.
6. Click the color swatch.
7. In the **Color** dialog, select the desired solid fill color, then click **OK**.
8. Click **OK** in the properties dialog.

## Disabling Solid Fill for Individual Elements

If you have enabled solid filling in your program settings, you can turn solid fill off for individual elements in your drawing by editing the element's Appearance properties.

#### To disable solid fill for an individual element:

1. Select the element whose solid fill you want to turn off.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the properties dialog, select the Appearance tab.
4. In the *Components* list, select the component whose solid fill you want to disable. For example, if the element is a wall, you may want to select **2D Core**.
5. In the *Solid Fill* area, uncheck the **Enable** check box.
6. Click **OK**.

**Note:** To turn off all solid filling in your drawing you need to disable solid filling in your program settings.


## Editing Dynamic Dimension Settings

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Dynamic dimensions are the dimensions that appear on the screen when you select a wall, door, window or wall opening. Editing these dimensions lets you resize a wall layout, or move doors, windows and openings within a wall.

In the case of a composite wall, dynamic dimensions measure to the outer surface of the wall by default (e.g. the veneer). You can choose to have them measure to the edge of the core wall instead (e.g. stud wall).

**To edit dynamic dimension settings:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Building Aids** in the left pane.
3. Select the desired option in the *Dynamic Dimensions* area.

**To outer surface.** Causes dynamic dimensions to measure to a composite wall's outer surface (e.g. veneer).


**To edge of core.** Causes dynamic dimensions to measure to the edge of the core wall (e.g. stud wall) in a composite wall.

4. Click **OK**.

**Resizing a Wall Layout**

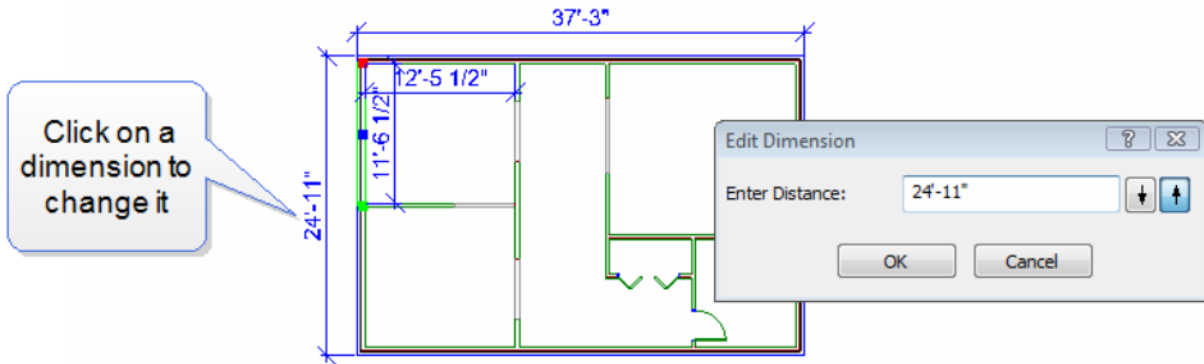
You can resize an exterior wall layout by moving a wall, or by editing its dynamic dimensions. All adjoining walls automatically stretch along with the wall you are moving or editing.

**To resize a wall layout by moving a wall:**

1. Select the exterior wall you want to move. All attached walls will stretch along with it when you move it.
2. Hover your pointer over the center grip to display the Move cursor. 
3. Click and drag the wall to resize the wall layout, then release your mouse button.

**To resize a wall layout by editing its dimensions:**

1. Select one of the walls. If you want to stretch the layout left or right, select a vertical wall. If you want to stretch the layout up or down, select a horizontal wall. Dynamic dimensions are displayed on the wall layout.
2. Click the dimension you want to edit. The **Edit Dimension** dialog appears.



3. Enter the new value in the **Enter Distance** edit box.
4. Specify the direction in which you want to move the walls by clicking one of the arrows to the right of the **Enter Distance** edit box.
5. Press **Enter** or click **OK**. The walls update automatically.

**Note:** If you select an interior wall and edit its dynamic length dimension, this will also resize the wall layout.

**Defining a Wall's Surfaces**

Every wall in the catalog has a set of properties that determine if the wall has interior and/or exterior surfaces applied to it. An exterior surface would be a veneer such as brick, stone or siding. An interior surface would be a material applied to the core wall (e.g. stud wall) on the interior of the model, such as drywall or plaster.

Defining a width for an exterior or interior surface results in the application of that surface to the core wall (e.g. stud wall). You can also control the air space between a surface and the core wall.

**To define a wall's surfaces:**

1. Select the wall whose properties you want to change. You can select multiple walls using Shift+click if you want. You can also define properties for walls in the catalog.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the Basic tab.
4. To apply an exterior surface (i.e. veneer) to the core wall, type the width of the surface in the **Width** edit box in the *Exterior Surface* area.
5. To define the space between the exterior surface and the core wall, enter a value in the **Air Space** edit box.
6. To drop the exterior surface below floor level, enter the desired extension value in the **Drop Exterior Face** edit box. This is typically done to cover an exposed floor system.
7. To apply an interior surface to the core wall, enter a width for the surface in the **Width** edit box in the **Left Interior Surface** or **Right Interior Surface** area.

The left or right side of a wall depends on the direction in which the wall is drawn. If you click on a wall in your drawing, you will see one end marked with a green marker, and the other end marked with a red marker. The green marker indicates the start point of the wall, or the point you started drawing from. The red marker indicates the end point. To determine the left or right side of the wall, picture yourself standing at the wall's start point (green marker) and looking toward the end point (red marker). For example, if a wall was drawn from left to right, the left interior side would be the side closest to the top of the screen.

8. To define the space between an interior surface and the core wall, enter the desired value in the appropriate **Air Space** edit box.
9. Click **OK**.

**Lengthening and Shortening Walls**

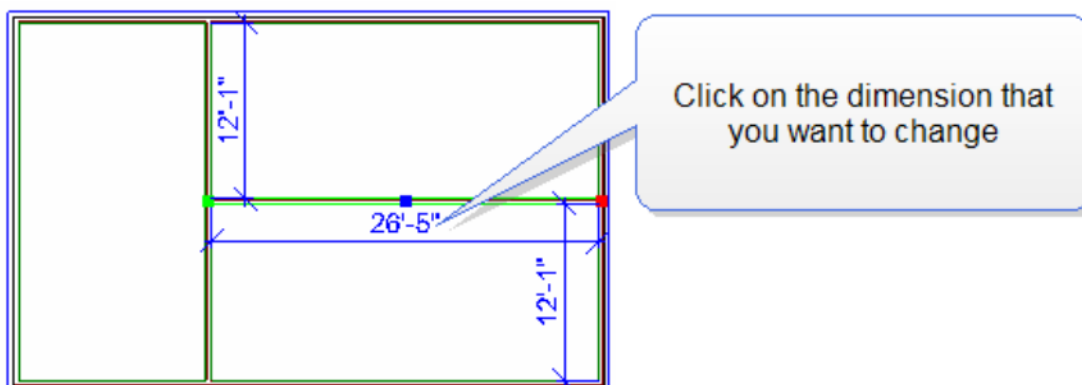
You can lengthen or shorten a wall by clicking and dragging one of the wall's ends, or by editing the dynamic dimension that appears along its length. If you choose to lengthen or shorten a wall by clicking and dragging, and that wall is attached to other walls, the attached walls will not move or change. However, if you choose to lengthen or shorten a wall by editing dynamic dimensions, and that wall is attached to other walls, the attached walls will move along with it.

**To lengthen or shorten a wall by clicking and dragging:**

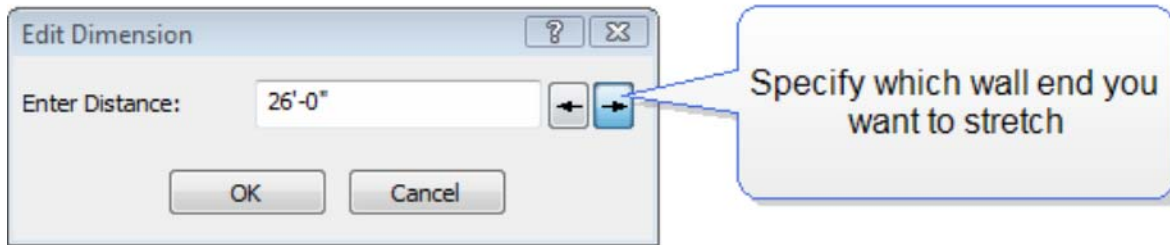
1. Select the wall. A grip is displayed at each wall end.
2. Hover your pointer over the wall end you want to stretch. The Lengthen cursor is displayed  $\rightleftarrows$ .
3. Click and drag the wall end until it has reached the desired length.
4. Release your mouse button.

**To lengthen or shorten a wall by editing dynamic dimensions:**

1. Select the wall.
2. Click on the dimension that appears along the wall's length.



3. In the **Edit Dimension** dialog, specify the desired length for the wall, then specify which end of the wall you want to stretch or retract by clicking one of the arrow buttons next to the length edit box.



4. Click **OK**.

## Editing the Width of a Wall

You can edit the width or thickness of a wall by making changes on the wall's Basic property page.

### To edit the width of a wall:

1. Select the wall. You can select multiple walls using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the Basic tab.
4. Enter the desired thickness in the **Width** edit box in the *Core* area. Note that the "core" is the framed structural wall (e.g. stud wall). The width you enter in the *Core* area should not include any interior or exterior surfaces. There are separate fields for defining the width of surfaces. See Defining a Wall's Surfaces on page 40.
5. Click **OK**.

## Editing the Height of a Wall

You can edit a wall's height on the wall's *Top and Bottom* property page.

### To edit the height of a wall:

1. Select the wall. You can select multiple walls using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the **Top and Bottom** tab.
4. In the *Wall Top* area, select the **Level** option.
5. In the **Wall Height** edit box, type the desired wall height.
6. Click **OK**.

## Lowering or Raising the Exterior Face of a Wall

You can extend the bottom and/or top of an exterior wall face in the wall's properties. For example, you may want to lower the bottom of the exterior face of a perimeter wall to cover the exposed floor structure below the wall.

### To raise or lower the exterior face of a wall:

1. Select the wall whose properties you want to change. You can select multiple walls using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the Basic tab.
4. To raise the top of the exterior wall face, enter an extension distance in the **Raise Exterior Face Top** edit box. To lower the bottom of the exterior wall face, enter an extension distance in the **Lower Exterior Face Bottom**.
5. Click **OK**.



## Forcing Wall Sides to be Exterior

You can force the left and/or right side of a wall to be an exterior surface by editing the wall's properties. This can be particularly useful when creating 3D RealView renderings. Sometimes when a single wall is drawn (to fill in a gable end, for example), it appears black when rendered because it is seen as an interior wall instead of an exterior wall. Forcing sides of the wall to be exterior ensures that the wall is rendered using proper materials.

### To force wall sides to be exterior:

1. Select the wall.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, enable the **Force Left Side To Be Exterior** and/or **Force Right Side To Be Exterior** check box. The left/right sides of a wall are determined by the direction in which the wall was drawn. If you click on a wall in your drawing, you will see one end marked with a green marker, and the other end marked with a red marker. The green marker indicates the start point of the wall, or the point you started drawing from. The red marker indicates the end point. To determine the left or right side of the wall, picture yourself standing at the wall's start point (green marker) and looking toward the end point (red marker). Turning your head left or right while in this position determines which side is left, and which side is right. For example, if a wall was drawn from left to right, the left interior side would be the side closest to the top of the screen.
4. Click **OK**.

## Making a Wall Invisible in 2D

You may find that you want to hide certain walls in 2D view, such as dormer walls and gable end walls, to improve the clarity of the view.

### To make a wall invisible in 2D:

1. Select the wall. You can select multiple walls using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the Basic tab.
4. Enable the **Invisible in 2D** check box.
5. Click **OK**.

## Raising or Lowering a Wall

You can raise or lower a wall using the Elevate tool on the wall's right-click menu.

### To edit the elevation of a wall:

1. Select the wall whose elevation you want to edit.
2. Right-click and select **Elevate**, or select **Edit > Modify Elements > Elevate**. The value shown in the **Elevate** dialog is the current elevation of the wall.
3. In the **Elevate** dialog, specify the desired elevation of the bottom of the wall above the floor.
4. If you are in a 3D or elevation view and would like to see what the wall looks like at the new elevation, click **Apply**. The Elevate tool remains active while the change is applied to the wall in your model.
5. To apply the change and close the dialog, click **OK**.

## Sloping a Wall

You can slope a wall by setting different heights for each end of the wall.

### To slope a wall:

1. Select the wall.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the Top and Bottom tab.
4. To slope the top of the wall, select the **Slope** option in the *Wall Top* area. To slope the bottom of the wall, select the **Slope** option in the *Wall Bottom* area.

5. In the **Start Point** edit box, type the distance from the floor to the start point of the slope. Note that the green wall end marker on the diagram corresponds to the green wall end marker on the wall in your drawing. This way you know which end is which.
6. In the **Stop Point** edit box, type the distance from the floor to the end point of the slope. Note that you do not need to enter a negative value to slope a wall bottom below floor level.
7. Click **OK**.

## Stepping a Wall

You can step the top or bottom of a wall by simply editing the wall's properties. For example, you may want to create a stepped foundation to accommodate a sloped building lot.

### To step a wall:

1. Select the wall.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the **Top and Bottom** tab.
4. To step the top of the wall, select the **Step** option in the *Wall Top* area. To step the bottom of the wall, select the **Step** option in the *Wall Bottom* area.
5. In the **Start Point** edit box, type the distance from the floor to the start point of the step. Note that the green wall end marker on the diagram corresponds to the green wall end marker on the wall in your drawing. This way you know which end is which.
6. In the **Stop Point** edit box, type the distance from the floor to the end point of the slope. Note that you do not need to enter a negative value to step a wall bottom below floor level.
7. Click **OK**.

**Note:** If you apply strip footings to stepped wall bottoms, the footings will automatically step also.

## Extending Walls to the Roof

By default, the tops of most walls in the catalog are set to be level (regardless of the roof type), and their height is determined by the Wall Height setting of the building location on which they reside. You can specify that you want a wall to automatically extend to the roof, regardless of the Wall Height setting in your building locations. This is particularly useful for filling in the pitched areas at gable ends.

### To extend walls to the roof:

1. Select the wall that you want to auto-extend to the roof. You can select additional walls using Shift+click.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the **Top and Bottom** tab.
4. In the *Wall Top* area, enable the **Auto Extend** option.
5. To rake the external side of the wall, check the **Exterior Wall Tops to Roof** check box. If you want to offset the wall a specific distance from the roof surface, enter a value in the **Offset below roof surface** edit box.
6. To rake the internal side of the wall, check the **Interior Wall Tops to Roof** check box. If you want to offset the wall a specific distance from the roof surface, enter a value in the **Offset below roof surface** edit box.
7. Click **OK**. The walls are adjusted.

**Tip:** If you want to use a different wall material within the pitched area of a gable end, set the wall shape to 'Level' in its properties and change the roof edge properties instead. In a roof's properties you can choose to display a separate wall in the pitched area by enabling the Display Gable option on the roof's Basic property page and selecting the desired gable Wall Type. This wall can then be selected independently of the main wall so that you can control its properties and framing separately.

## Making Walls Level

By default, most walls in the catalog are set to have level tops and bottoms, regardless of the construction above or below them. If a wall in your drawing has been stepped, sloped or extended to the roof, you can specify that you want it to be level

instead. As an example, you would do this if the wall were at a gable end and you wanted to display a separate material or wall within the pitched area of the gable end.


#### To make a wall level:

1. Select the wall that you want to edit, either in the catalog or in your drawing.
2. Right-click and select **Properties**.
3. In the **Walls** dialog, select the **Top and Bottom** tab.
4. Enable the **Level** radio button in either the *Wall Top* or *Wall Bottom* area depending on which part you want to level.
5. If you are leveling the top of the wall you can specify the desired height for the wall in the **Wall Height** edit box.
6. Click **OK**.

## Moving Walls

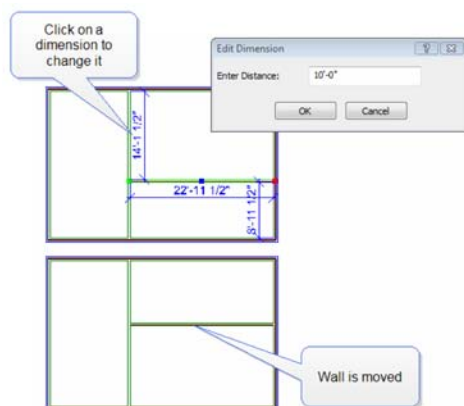
You can move one or more walls by clicking and dragging them, or by editing the dynamic dimensions that appear on and near walls when you select a wall in your plan. When you move a wall, any walls attached to that wall move with it for a stretching effect.

#### To move walls by clicking and dragging:

1. Click on the wall that you want to move. To move multiple walls, use Shift+click to select the remaining walls.
2. Hover your pointer over the center grip on the currently selected wall to display the Move cursor. 
3. Click and drag the wall to move it.
4. Release your mouse button.

#### To move walls by editing dynamic dimensions:

1. Click on the wall that you want to move. Dimensions appear on any walls that are attached to the selected wall, indicating the wall's distance from adjacent walls.
2. Click on the dimension that you want to change.
3. In the **Edit Dimension** dialog, type the desired value for the dimension, then click **OK**. The dimension updates, and the wall is moved.



## Rotating a Wall

You can use the Rotate tool to rotate a wall about a selected point.

#### To rotate a wall:

1. Select the wall.
2. Right-click and select **Rotate**, or select **Edit > Modify Elements > Rotate**.
3. Position your pointer over the point you want to rotate the wall around.
4. Click and drag to rotate the wall, then release your mouse button.

## Curving a Wall

You can curve a wall using the Curve tool. Once the tool is active, you can click and drag the wall to curve it, or select a point to curve to.

### To curve a wall by clicking and dragging:

1. Click the wall to select it.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Click and drag the wall to the desired curve.
4. Release your mouse button.

### To curve a wall to a selected point:

1. Click the wall to select it.
2. Right-click in and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Select the point you want to curve to. The wall automatically curves to the point.
4. Click to finish.

## Breaking a Wall

You can break a wall into two or more segments using the Break tool. The segments can then be edited individually.

### To break a wall:

1. Click the wall to select it.
2. Right-click in the drawing area and select **Break**, or select **Edit > Modify Elements > Break**.
3. Click the point where you want to break the wall. This divides the wall into two segments that can be moved, stretched or manipulated individually.

**Note:** If the wall is a composite wall (framed wall + veneer), only the framed wall is broken.

**Tip:** To break a wall into specific lengths, use the Auto Break tool.

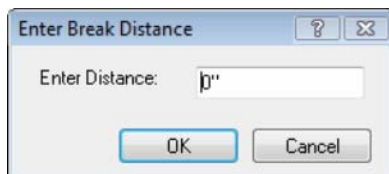
**Tip:** You can move a wall break by editing the wall's onscreen dimensions.

## Breaking a Wall into Specific Lengths

You can use the Auto Break tool on a wall's editing menu to break the wall into lengths of your choice. This is particularly useful if you are using panelized construction because it provides precise control over the length of your panels. By breaking down long walls you can also avoid exceeding your maximum panel length.

### To break a wall into specific lengths:

1. Select the wall that you want to break, then right-click and select **Auto Break**.
2. In the **Enter Break Distance** dialog, type the length that you want your wall sections to be, then press **Enter** or click **OK**.



The wall is broken into sections. The end at which breaking starts depends on the type of wall you are breaking. If you are breaking a framed wall, breaking begins according to the Framing Rule applied to that wall. In other words, the break direction coincides with the framing direction. If you are breaking a non-framed wall, breaking begins at the wall's start point. (When you select a wall in plan view, the end with the green grip is the start point.)

If the wall cannot be broken equally into the lengths you specified (due to its overall length), the last wall section will be shorter.

**Note:** If the wall is a composite wall (framed wall + veneer), only the framed wall is broken.

**Tip:** To break a wall anywhere by picking a break point, use the Break tool instead.

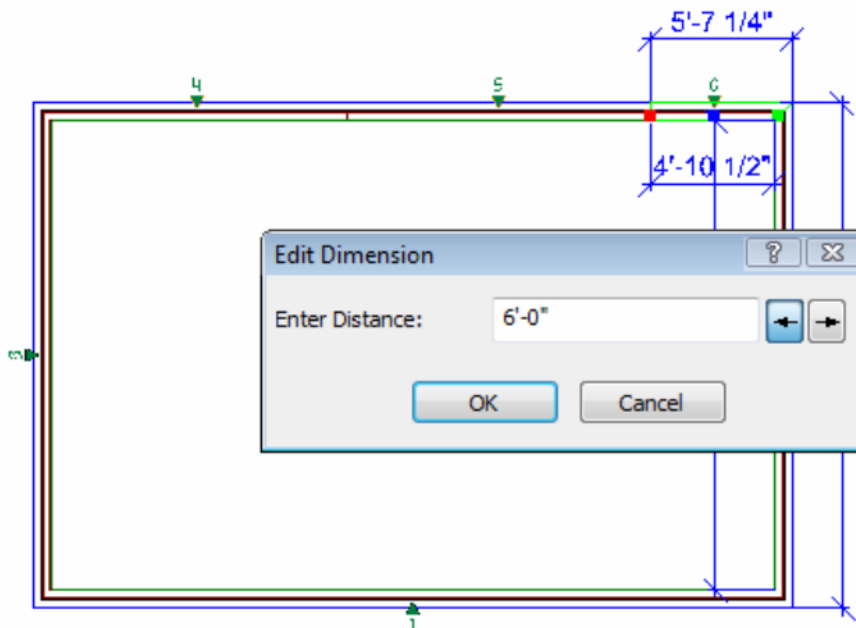
**Tip:** You can move a wall break by editing the wall's onscreen dimensions. This changes the length of the wall panels on either side of the break.

## Moving Wall Breaks

If you have broken a wall using the Break or Auto Break tool, you can move a wall break by editing the wall's onscreen dimensions. Moving a break changes the length of wall panels on either side of the break.

### To move a wall break:

1. Click on the wall segment whose length you want to edit. A dimension appears along the length of the wall segment.
2. Click on the onscreen dimension.
3. In the **Edit Dimension** dialog, type the length that you want the wall segment to have, then click one of the arrows next to the edit box to specify which end you want to move. In the example below, if we wanted to make the selected panel 6 feet long, we would type 6' in the edit box, and then click the left arrow button to move the left wall break to the left. The panel would then be resized to 6'.



4. Click **OK**. The wall break is moved according to the settings you defined.

## Deleting a Wall

You can delete a wall in a couple of easy steps.

### To delete a wall:


1. Select the wall to delete. You can select multiple walls using Shift+click.
2. Press the **Delete** key on your keyboard, or right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.

**Note:** If your model contains an automatic floor, the floor will be deleted if the wall you are deleting opens up the wall layout.

## Applying Different Materials to Walls

You can apply different finishes to your walls using the handy Materials Paintbrush. The materials catalog contains an excellent selection of brick, concrete, wood and stone finishes.


### To apply a material to a wall:

1. Display your model in 3D, and make sure the wall face you want to apply the material to is visible in the view.
2. Select **Edit > Materials Paintbrush**, or click  on any tabbed toolbar.
3. In the catalog panel, select the material you want to apply.
4. Click on the wall face that you want to apply the material to. The material is immediately applied.
5. Right-click and select **Finish**.

## Adding Paint and Wallpaper

You can use the Materials Paintbrush to quickly apply custom paint, wallpaper or wood paneling to a wall.

### To apply paint or wallpaper to walls:

1. Display your model in 3D, and make sure the wall face you want to apply the paint or wallpaper to is visible in the view.
2. Select **Edit > Materials Paintbrush**, or click  on any tabbed toolbar.
3. In the catalog panel, select the material you want to apply. You can filter the material list to display only wall finishes by selecting *Paint* or *Wall Material - Interior* from the **Filter** drop box.
4. Click on the wall face that you want to apply the paint or wallpaper to. The material is immediately applied. You can continue applying the material to other walls if you want.
5. Right-click and select **Finish**.

## Adding Trim to Walls

Trim types include baseboards, crown molding, chair rails, door/window trim, sills, cove molding, wainscoting and decorative wallpaper borders. You can add as many types of trim to a wall as you want, and even add different materials to either side of the wall.

Trim selections are made on a wall's Trim property page.

### To add trim to walls:

1. Select the wall you want to add trim to.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Walls** dialog, select the Trim tab.
4. From the **Application** drop box, select the wall side you want to add trim to. Choices are Exterior Side, Left Interior Side, and Right Interior Side.

The Exterior Side is the exterior side of an exterior wall.

The Left Interior Side or Right Interior Side of a wall depends on the direction in which the wall is drawn. If you click on a wall in your drawing, you will see one end marked with a green marker, and the other end marked with a red marker. The green marker indicates the start point of the wall, or the point you started drawing from. The red marker indicates the end point. To determine the left or right side of the wall, picture yourself standing at the wall's start point (green marker) and looking toward the end point (red marker). Turning your head left or right while in this position determines which side is left, and which side is right. For example, if a wall was drawn from left to right, the left interior side would be the side closest to the top of the screen.

5. In the list of trim types, select the trim you would like to select a member for (Crown, Chair Rail, Baseboard, etc.).
6. Click **Select**.
7. In the **Catalog Access** dialog, select the trim you want to use, then click **OK**. The trim list displays the member you selected.
8. To delete the member from the trim list, select it, then click **Delete**.
9. In the *Apply to* area, specify how you would like the trim applied to the wall. Different variables are available depending on the trim type.

**Gap.** For trim around door and window openings, this is the offset of the trim from the opening. For crown moldings, baseboards and chair rails, this is the offset of the trim from the wall face.

**Offset.** For crown moldings, this is the offset of the molding from the top of the wall. For baseboards and chair rails, this is the offset of the member from the bottom of the wall.

**Offset from wall.** If creating custom trim, this determines where the member is offset from when an offset is specified. Choose from *Wall Bottom*, *Wall Top*, *Ceiling* or *Floor*.

**Trim basepoint.** If creating custom trim, this determines which edge of the trim is used to measure the offset. Choose either *Top of Trim* or *Bottom of Trim*.

10. Once you've selected your trim, click **OK**. The walls are updated automatically.

**Note:** You cannot add sills to hexagon or octagon windows.

## Applying a Profile to Trim

By default, trim members in the catalog have a flat profile. To add interesting detail to your design, you can apply profiles to trim members by editing trim properties. You can select a pre-defined profile from the profiles library, or create your own.

### To apply a profile to trim:


1. Select the wall containing the trim that you want to edit, then right-click and select **Properties**.  
If the trim does not exist yet in your drawing, select **File > Catalogs > Element Manager**, then select the trim that you want to edit. Go to step 5.
2. In the **Walls** dialog, select the **Trim** tab.
3. In the *Trim* list, select the trim type (Crown, Chair Rail, etc.) that you would like to apply a profile to, then click **Select**.
4. In the **Catalog Access** dialog, select the specific member that you would like to use, then right-click and select **Edit Element**.
5. On the trim's Basic property page, click on the **Custom** option in the **Type** area.
6. Click the **Select Profile** button.
7. In the **Profiles** dialog, select the profile that you would like to use. You can also create a custom profile if you want.
8. Click **OK** in the **Profiles** dialog.
9. Click **OK** in any remaining dialogs. The wall's trim is updated to display the selected profile.

## Adding Corner Details to Walls

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For architectural detail you can use the Corner Details tool to add quoins or boards to exterior wall corners. Just click on a wall to apply.

### To add corner details to walls:

1. Select **Insert > Detailing > Corner Details**, or click  on the Building toolbar.
2. In the catalog panel, select the corner detail you would like to add. For quoins you can choose a staggered, mirrored or uniform pattern.
3. Click on the exterior wall corner you would like to apply the detail to.
4. Right-click and select **Finish**.

## Editing Corner Details

For quoins and corner boards, you can control properties such as base height, total height, offset, and number of courses to achieve the exact result you want.

### To edit corner detail properties:

1. Click on the corner detail to select it. This may be easier to do in 3D view. For quoins, clicking on one quoin selects the whole set.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.

3. Edit the properties as desired. Each type has different settings.

Corner Boards

**Width.** The width of one board.

**Thickness.** The thickness of the board material.

**Overall Height.** The overall height of the board.

**Base Height.** The offset of the board from the bottom of the wall.

Staggered/Mirrored Quoins

**Length.** The length of the long quoin in the pattern.

**Width.** The length of the short quoin in the pattern.

**Offset.** The thickness of the quoin material.

**Height.** The height of one quoin.

**Gap.** The distance between quoins.

**Base Height.** The offset of the quoining from the bottom of the wall.

**Number of Courses.** The number of quoins running up each wall.

**Overall Height.** The overall height of the quoining according to your settings. This value cannot be edited.

**Reverse Starter Course.** Reverses how the quoining starts at the bottom of the wall. For example, if the starter course is a staggered long/short combination, it will be flipped to a short/long combination.

Uniform Quoins

**Length.** The length of a quoin.

**Offset.** The thickness of the quoin material.

**Height.** The height of one quoin.

**Gap.** The distance between quoins.

**Base Height.** The offset of the quoining from the bottom of the wall.

**Number of Courses.** The number of quoins running up each wall.

**Overall Height.** The overall height of the quoining according to your settings. This value cannot be edited.



# Chapter 7: Footings, Columns & Members

A structure's support system is an extremely important consideration during all phases of a design project. Support elements carry the load of walls, floors and other bearing elements in your model, and can also be a factor in the interior design of your home.

Envisioneer provides the tools to accurately place footings, and columns, and members such as beams in your design.

You can automatically attach strip footings to selected walls, or draw them manually if you prefer. You can also automatically insert mono footings beneath columns, or insert them manually anywhere in your design with a click of your mouse.

Columns and members come in a variety of shapes and sizes, and are inserted with point-and-click simplicity. You can customize them on the fly to achieve the precise result you want.

This chapter covers the insertion and editing of strip footings, mono footings, and columns and members.


## Attaching Strip Footings to Walls

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Since foundation walls bear the weight of exterior walls above them, you need to insert footings beneath the foundation walls to transfer support for the vertical load.

Strip footings are easy to insert — just click on a wall and a footing is automatically inserted underneath the wall. Footings automatically shape themselves to the bottom of walls, so if your wall bottoms are curved or stepped, your footings will be curved or stepped also.

### To insert strip footings under walls:


1. Select **Insert > Footings > Strip Footings Attached to Walls**, or click the down arrow next to the Footings button  on the Building toolbar and select **Strip Footings Attached to Walls**.
2. In the catalog panel, select the footing you want to insert. Typically you would choose one that is wider than the wall you are attaching it to.
3. Click on the wall you want to attach the footing to. The footing is inserted automatically. In plan view, strip footings are usually shown using a dashed line.
4. Continue inserting footings underneath each exterior foundation wall.
5. Right-click and select **Finish**.

## Inserting Strip Footings by Picking Points

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You can insert strip footings manually by picking points in your drawing. Using this method you have precise control over the layout of your strip footings.

### To insert strip footings by picking points:

1. Select **Insert > Footings > Strip Footings by Picking Points**, or click the down arrow next to the Footings button  on the Building toolbar and select **Strip Footings by Picking Points**.
2. In the catalog panel, select the footing you want to insert.
3. Select the start point for the footing, noting that strip footings are drawn on center.
4. Select an end point for the footing. You can continue adding sections to the footing if you want.
5. Right-click and select **Finish**.

## Editing the Shape of a Strip Footing

Strip footing shapes include rectangular, tapered and filleted. You can also apply a custom profile to a footing.

### To edit the footing shape:

1. Select the footing whose properties you want to change. You can select multiple footings using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Select the Basic tab, then click on the appropriate graphic in the *Type* area. There are several profiles to choose from. Each profile has a unique set of variables in the *Properties* pane that you can customize. If you would like to select or create a custom profile, scroll over and select *Custom*, then click the **Select Profile** button.
4. Click **OK**.

## Editing the Size of Strip Footings

You can edit the dimensions of a footing on the footing's Size property page.


### To change the footing size:

1. Select the footing.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Strip Footing** dialog, select the Basic tab.
4. Edit the dimensions of the footing.
5. Click **OK**.

## Moving/Stretching Strip Footings

When you move a strip footing, all footings attached to it move with it for a stretching effect. You can move strip footings by just clicking and dragging.

### To move/stretch strip footings:


1. Select the footing to move. You may need to make walls non-selectable to be able to select the footing.
2. Position your pointer over the center grip to display the Move cursor. 
3. Click and drag the footing to move it.
4. Release your mouse button.

**Note:** When you move a strip footing, it becomes detached from the wall. Therefore, if you move or stretch the wall, the footing will not go with it. If you want to re-attach a footing to a wall, you will need to delete the footing, then insert a new one.

## Lengthening and Shortening Strip Footings

You can lengthen or shorten an individual footing by clicking and dragging one of the footing's ends.

### To lengthen or shorten a footing:

1. Select the footing. A grip is displayed at each end.
2. Hover your pointer over the end you want to stretch. The Lengthen cursor is displayed .
3. Click and drag the footing end until it has reached the desired length.
4. Release your mouse button.

## Breaking Strip Footings

You can break a footing into two or more segments using the Break tool. The segments can then be edited individually.

### To break a footing:

1. Click the footing to select it.
2. Right-click in the drawing area and select **Break**, or select **Edit > Modify Elements > Break**.

3. Double-click the point where you want to break the footing.

## Attaching Mono Footings to Columns


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Since support columns in your basement bear loads at a concentrated point, the load should be transferred to a proper footing.

Using the Mono Footings Attached to Columns tool you can insert a single mono footing beneath a selected column. All you have to do is select the column.

If you have multiple columns that require the same footing, you can automatically attach footings to all columns of the same type in one easy step.

### To insert footings under columns:


1. Select **Insert > Footings > Mono Footings Attached to Columns**, or click the down arrow next to the Footings button  on the Building toolbar and select **Mono Footings Attached to Columns**.
2. In the catalog panel, select the footing you want to insert. Typically you would choose one that is wider than the column you are attaching it to.
3. If you want to simultaneously insert the footing under multiple columns of the same type, right-click and select **Attach to all similar**.
4. Click on a column to which you want to attach a footing. The footing is inserted automatically. If you selected **Attach to all similar** in the previous step, a footing will be automatically inserted under each similar column found on the current location.
5. Right-click and select **Finish**.

## Inserting Mono Footings by Picking Points

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You can insert a variety of mono footings in your drawing with point-and-click simplicity.

### To insert mono footings by picking points:

1. Select **Insert > Footings > Mono Footings by Picking Points**, or click the down arrow next to the Footings button  on the Building toolbar and select **Mono Footings by Picking Points**.
2. In the catalog panel, select the footing you want to insert.
3. Position the footing where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Editing the Mono Footing Type

Mono footing types include rectangular, tapered, cylinder and cylinder tapered. The footing type determines the footing's general appearance.

### To edit the footing type:

1. Select the footing whose properties you want to change. You can select multiple footings using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Select the Basic tab, then click on the appropriate graphic in the *Type* area.
4. Click **OK**.

## Editing the Size of Mono Footings

You can edit the dimensions of a footing on the footing's Size property page.

### To change the footing size:

1. Select the footing.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.


3. In the **Mono Footing** dialog, select the Basic tab.
4. Edit the dimensions of the footing.
5. Click **OK**.

## Inserting Columns

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You can use the Columns tool to insert a variety of wood, concrete, steel, brick and gypsum columns in various shapes and sizes. You may, for example, want to insert steel posts in the basement to support an I-beam, or add decorative columns to a room to create a sense of elegance.

### To insert a column:

1. Select **Insert > Columns**, or click  on the Building toolbar.
2. In the catalog panel, select the column you want to insert.
3. Position the column where you want it, then click to insert it.
4. Right-click and select **Finish**.

**Tip:** You can apply different profiles to columns in their properties, and even create and apply your own custom profiles.

## Editing the Shape of a Column

You can choose from a wide variety of column profiles, such as circular, rectangular, W-shape and C-shape, or create your own.

### To edit the column type:

1. Select the column whose properties you want to change. You can select multiple columns using Shift+click if you want.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Select the Basic tab, then click on the appropriate graphic in the *Type* area. There are several profiles to choose from. Each profile has a unique set of variables in the *Properties* pane that you can customize. If you would like to select or create a custom profile, scroll over and select **Custom**, then click the **Select Profile** button.
4. Click **OK**.

## Editing the Dimensions of a Column

You can edit the dimensions of a column (e.g. height, width and depth) to suit your needs.

### To edit the size of a column:

1. Click on the column to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the properties as desired. Different column shapes will have different dimension variables. Examples are *dy1*, *dx1* and *Height*.
4. Click **OK**.

## Editing the Elevation of a Column

You can edit the elevation of a column by editing the Base Offset setting in its properties.

### To edit the elevation of a column:

1. Click on the column to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the value in the **Base Offset** edit box. This is the offset of the base of the column from the floor.
4. Click **OK**.

## Inserting Members

You can insert both timber and steel members in your model to provide structural support where necessary. For example, you may want to insert an I-beam in the basement.

You can use the Members tool to insert a horizontal or sloping member.

You can also insert members using custom settings that you specify in advance. When you select the Advanced Members tool, you can specify settings such as slope, number of members, rotation, usage, and phase prior to inserting the member. You can insert a sloping member or a member that matches the slope of an existing surface using the Advanced Members tool.


You insert a member by picking a start point and end point on your screen. This gives you complete control over the length, position and direction of the member. You can choose to break members at walls, columns and other members if you want.

**Tip:** You can insert multiple members simultaneously by specifying a value in your member insertion settings prior to insertion. When you insert a single member you can use the Offset tool on the right-click menu to create multiple copies of a member in a set pattern. For example, you could array a floor joist to create a framed sub-floor.

## Inserting Members with Custom Settings

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Using the Advanced Members tool you can define a number of custom member settings prior to inserting the member. For example, you can predefine its slope, justification, rotation or offset, and attach a specific phase and usage if desired.

1. Select **Insert > Members > Advanced Members**, or click the arrow next to  on the Building toolbar and select **Advanced Members**.
2. In the **Advanced Members** dialog, specify the settings for the member:

**Slope Type:** If sloping the member, choose the method for specifying the slope value. Choices are *? in 12*, *1 in ?*, *Degrees*, *Percent*, and *Select Plane*. For the *Select Plane* option, click the browse button in the **Select Plane** field that is created and then click on the surface whose plane you want to match. The name of the surface element will be reported in the **Slope Plane** field.

**Slope Value.** Enter the slope value according to the selected **Slope Type**. If the *Select Plane* option was selected, this field is labeled **Select Plane** instead.

**Offset.** To offset the member from the insertion line, enter an offset value here. By default, members are inserted on center.

**Associate With.** Associates the member with a specific type of element. The member will then be included when filtering that element in the **View Filter** dialog. Choose either **None**, **Roof**, **Floor**, **Ceiling**, **Deck**, or **Structural Floor**. If **None** is selected, the member will be filtered along with standard **Members** in the **View Filter** dialog.

**Member.** Click the browse button in this field to select a member from the catalog.

**No. of Members.** To insert multiple side-by-side members simultaneously, enter the number of members that you wish to insert.

**Reference Point.** By default, members insert with their topmost face at the insertion point. This face also serves as a baseline when rotating a member's profile. You can edit a member's insertion point so that it is at the center or bottom of the member.

**Justification.** The alignment of the member relative to the insertion line.

**Rotation.** Rotates the member about its insertion baseline. This ensures that the member is structurally correct and displayed properly in 2D and 3D.

**Shift.** Offsets the member from the picked start and end points. A positive or negative value can be entered depending on the desired shift direction.

**Use usage from.** To use the usage that is applied to the member in its properties, select *Member Properties*. To select a different usage from the Usages library, select *Library*.

**Usage.** If *Member Properties* was selected in the previous field, the member's current usage is reported in this field. If *Library* was selected, click the browse button in this field to select a usage from the Usages library.

**Use phase from.** To use the phase that is applied to the member in its properties, select *Member Properties*. To select a different phase from the Phases library, select *Library*.

**Phase.** If *Member Properties* was selected in the previous field, the member's current phase is reported in this field. If *Library* was selected, click the browse button in this field to select a phase from the Phases library.

3. Click **Insert**.
4. Proceed with inserting the member.


**Tip:** If you have already launched the standard Members tool and have selected a member in the catalog, you can activate the **Advanced Members** dialog from the right-click menu prior to inserting the member.

## Inserting a Horizontal Member

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You can insert a horizontal member in your drawing using the Members by Picking Points tool.

**To create a horizontal member:**

1. Select **Insert > Members > Members**, or click  on the Building toolbar.
2. In the catalog, select the member you want to insert.
3. Select a start point for the member, then move your mouse in the direction you want the member to run.
4. Once the member is the desired length, click to select its end point. You can continue adding sections to the member if you want.
5. Right-click and select **Finish**.


## Inserting a Sloping Member

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The Advanced Members tool provides an easy way of inserting a sloping member in your drawing. When using the Advanced Members tool, you can predefine the slope value along with other settings before inserting the member.

Alternatively you can insert a sloping member with the Members tool. With this method you define the slope of the member by entering the heights of each end in the Commander.

**To create a sloping member with the Advanced Members tool:**

1. Select **Insert > Members > Advanced Members**, or click the arrow next to  on the Building toolbar and select **Advanced Members**.
2. In the **Advanced Members** dialog, select the desired method for specifying the slope value from the **Slope Type** drop box, then specify the desired slope value in the **Slope Value** field. By default, the start point of the member will be inserted at floor level. To offset the start point so that it is higher or lower, specify a value in the **Offset** field.
3. Click **Insert**.
4. Select the member's start point and end point, then right-click and select **Finish**.

**To create a sloping member with the Members tool:**

1. Select **Insert > Members > Members**, or click the arrow next to  on the Building toolbar and select **Members**.
2. In the catalog, select the member you want to insert.
3. The **Base Height** edit box is displayed in the Commander. Type the desired height for the first end (start point) of the member, then press ENTER.
4. Select a start point for the member.
5. Move your mouse to stretch the member to the desired length, or enter a value in the Commander's **Distance** edit box.
6. Press the Tab key twice to move to the Commander's **Z** edit box.
7. Type the desired height for the other end of the member, then press ENTER.
8. You can continue adding segments to the member if you want.
9. When the member is complete, right-click and select **Finish**.


**Note:** If you want to insert a member that matches the slope of an existing surface, choose **Select Plane** from the **Slope Type** drop box when specifying the member's insertion settings. See Inserting a Member by Matching a Plane.

## Inserting a Member by Matching a Plane

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You can use the Advanced Members tool to insert a member that matches the plane of an existing roof, floor or ceiling surface.

**To insert a member by matching a plane:**

1. Select **Insert > Members > Advanced Members**, or click the down arrow next to the Members button  on the Building toolbar and select **Advanced Members**.
2. In the **Advanced Members** dialog, click the **Slope Type** drop box and choose **Select Plane**.
3. Click in the newly created **Select Plane** field, then click the browse button that appears in the field. This takes you out to your drawing.
4. Click on the edge of the surface whose plane you want to match the member to. (Selecting the surface defines the plane.) The name of the surface is displayed in the **Select Plane** field in the **Advanced Members** dialog.
5. Select a member type and specify any other settings that you want the member to have.
6. Click **Insert**.
7. Select a start point for the member, then move your mouse in the direction you want the member to run. Note that the member does not need to be drawn on the surface. It can be anywhere in space.
8. Once the member is the desired length, click to select its end point. You can continue adding sections to the member if you want.
9. Right-click and select **Finish**.


**Note:** You can use the Adjust to Plane tool on the right-click menu to match any existing member to the slope of an existing surface.

## Inserting Multiple Members Simultaneously

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Prior to inserting a member you can specify that you want to insert multiple copies of the member at the same time. For example, you may want to do this in areas where a member needs to be doubled or tripled for extra stability.

**To insert multiple members simultaneously:**

1. Select **Insert > Members > Advanced Members**, or click the arrow next to  on the Building toolbar and select **Advanced Members**.
2. In the **Member Insertion Options** dialog, specify the desired number of members to insert in the **No. of Members** edit box. Members will be inserted side by side. Specify any other desired settings, such as the member type.
3. Click **Insert**.
4. Proceed with inserting the members. As you draw, the specified number of members are created.

## Inserting Trusses and Portal Frames

Building Essentials | Construction Suite

You can use a **Timber Frames** tool to add trusses or portal frames to your model.

Truss types include the scissor truss, tray truss, and attic truss.


A portal frame is a simple structure comprising rafters connected to a pair of columns. Portal frame construction is typically found in single-story or low-rise structures with large open spaces, such as barns and warehouses.

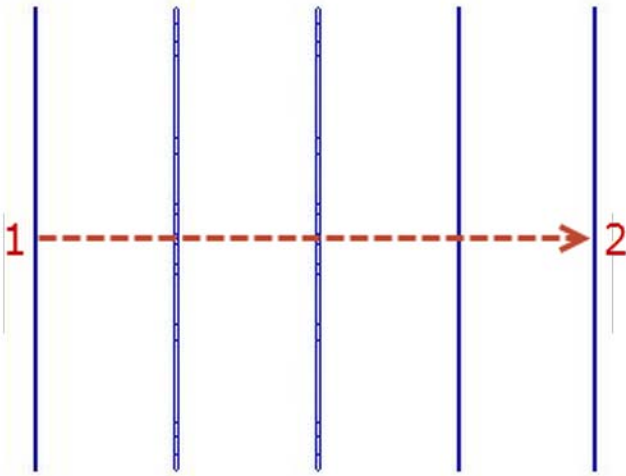
When inserting timber frames, you can insert a single frame, or a series of frames that span a specified distance. The catalog contains a variety of trusses and portal frames that you can customize to suit your needs.

**Note:** You can use the Truss Run tool to insert truss profiles under an existing roof surface.



**To insert a series of trusses or portal frames:**


1. Select **Insert > Members > Timber Frames > Insert Timber Frames**, or click the down arrow next to the Members button  on the Building toolbar and select **Insert Timber Frames**.
2. In the catalog panel, select the truss or portal frame that you would like to insert. If you would like to specify the spacing between frames, double-click the element in the catalog, then specify the spacing properties in the **Timber Framing (Catalog)** dialog. You can specify the select **Maximum Spacing** between frames, and whether or not they need to be evenly spaced. You can also specify the **Support Height** of the frames, and various sizing and design settings.
3. Select an insertion point for the first frame, then select a second point to define the length of the span. Frames will be inserted along this span at the spacing specified in the element's properties.



4. Initially, the frames will be centered on the insertion line. To keep them centered on the insertion line, press Enter, or right-click and select **Center**. To offset the frames to either side of the insertion line, move your cursor in the desired direction until the frames have flipped to that side of the insertion line, then click to anchor them in place. Or, right-click and select either **Left** or **Right**.



**To insert a single truss or portal frame:**

1. Select **Insert > Members > Timber Frames > Insert Single Timber Frame**, or click the down arrow next to the Members button  on the Building toolbar and select **Insert Single Timber Frame**.
2. In the catalog panel, select the truss or portal frame that you would like to insert.
3. Select two points to define the length of the frame.

**Editing Truss and Portal Frame Properties**

Truss and portal frame elements are inserted using Timber Frames tools. You can customize the properties of trusses and portal frames in the catalog, or ones that you have already inserted. For example, you may want to edit the support height of the element, the spacing between frames, or the length of members that compose the truss or frame.



To edit the properties of truss or portal frame properties in the catalog, double-click the element in the catalog, or right-click and select **Edit Element**.

To edit the properties of an inserted timber frame element, select the element, then right-click and select **Properties**.

Properties are defined on two tabs in the **Timber Framing** dialog:

#### General tab:

**Type.** Choose either *Cathedral Truss*, *Attic Truss*, *Half Truss*, or *Portal Frame* to define the general shape and layout of the element.

**Support Height.** The height at which the bottom chord sits. For a portal frame, this also determines how long the lower vertical supports will be.

**Maximum Spacing.** The maximum distance that can exist between frames when inserted as a series (using *Insert Timber Frames*).

**Space Evenly.** If enabled, frames inserted in a series will be evenly spaced across the span, meaning that the distance between frames may be less than the Maximum Spacing value. If disabled, the tool will insert frames at the maximum spacing until it runs out of space within the specified span. This could result in a gap at the end of the span, but will maintain the maximum spacing value between inserted frames.

#### **Bottom Chord Position. I.**

**A.** The length of the top chord.

**A1 - Slope value.** The pitch of the top chord measured using the Slope Type method selected below.

**Slope Type.** The method used to measure the pitch of the top chord. Choose from Degrees, ? in 12, 1 in ?, or Percent.

**B.** The length of the bottom chord.

Depending on the type chosen, additional properties (such as **C** and **D**) may be available. Use the diagram as a guide when specifying these properties.


**Specify Framing.** Click to select the desired member type for the truss/frame members.

#### Detail tab:

#### **Member Groups**


For each member type that makes up the truss or portal frame (e.g. Top Chord, Bottom Chord, Bracing), you can specify the following parameters:


**Use member from.** To use the Framing Member assigned to the element on the General property page, select **Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection on the General property page.

**Name.** If *Properties* is selected in the 'Use member from' field, the Name field displays a generic description, 'Timber Frame Member', indicating that the member to be used is the one selected on the element's General property page. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the member about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°).

**Number of Members.** Specify the number of members of this type to include: 1 or 2.

**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

**Top Extension.** The distance the inner webbing members (if present) project into the top chord.

**Bottom Extension.** The distance the inner webbing members (if present) project into the bottom chord.

**Bottom Cut.** Specify how the member ends are cut by selecting either *Square*, *Flush*, or *Plumb*.

#### **Individual Members**

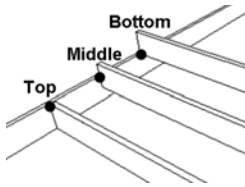
For individual members within each member group, you can specify the following parameters:

**Name.** The name of the member as it appears in the left pane.

**Offset from centerline.** The offset of the member from the centerline of the frame. A positive value brings it forward, while a negative value pushes it toward the back.

### Editing a Member's Insertion Reference Point

By default, members insert with their topmost face at the insertion point. This face also serves as a baseline when rotating a member's profile. You can edit a member's insertion point so that it is at the center or bottom of the member. You can do this before or after inserting a member.



**To edit a member's insertion reference point:**

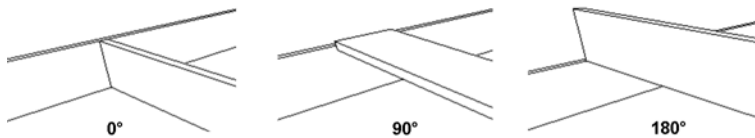
1. Select the member.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Members** dialog, select the *Details* tab.
4. In the *Insertion Reference* area, select either the top, center or bottom **Reference Point**.
5. Click **OK**.

### Rotating a Member's Profile

Editing a member's Profile Rotation setting rotates the member about its insertion baseline. This ensures that your members are structurally correct and displayed properly in 2D and 3D.

**To rotate a member's profile:**

1. Select the member.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Members** dialog, select the *Details* tab.
4. In the *Insertion Reference* area, edit the rotation in the **Profile Rotation** edit box.




5. Click **OK**.

### Lengthening or Shortening a Member

You can lengthen or shorten a member by clicking and dragging one of its end points. Note that if your member has multiple segments, you can lengthen/shorten the individual segments.

**To lengthen or shorten a member:**

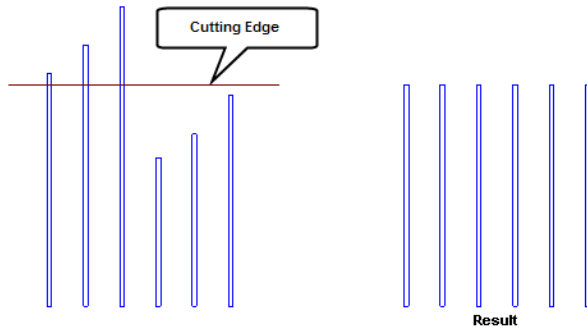
1. Select the member. A grip is displayed at each end of the member.
2. Hover your pointer over the end you want to stretch. The Lengthen cursor is displayed .
3. Click and drag to stretch the member to the desired length, then release your mouse button.

### Extending/Trimming Members to a Cutting Edge

You can use the Lengthen to Fence tool to lengthen or shorten multiple members to a cutting edge that you define.

**To extend/trim members to a cutting edge:**

1. Select the members that you want to extend/trim. The quickest way to select a group of members is to click and drag a selection window through them.
2. With the members selected, right-click and select **Lengthen to Fence**, or select **Edit > Modify Elements > Lengthen to Fence**.
3. Select a start point for the cutting edge, then select the end point. The cutting edge is simply a line to which the ends of members will be extended or trimmed.



**Note:** The member end that is closest to the cutting edge will be the end that is extended/trimmed.

**Breaking a Member**

You can use the Break tool to divide a member into independent segments. These segments can then be edited individually if desired.

**To break a member:**

1. Select the member.
2. Right-click and select **Break**, or select **Edit > Modify Elements > Break**.
3. Click the point on the selected member where you want to break it. The member is automatically broken into two segments.

**Breaking Members at Other Elements**

You can force a member to break at the center line of walls, columns, and other members.

**To break members at other elements:**

1. Select the member.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Members** dialog, select the Details tab.
4. Enable the appropriate check boxes — **Break at Walls**, **Break at Columns** or **Break at Members**. When a check box is enabled, the member will be broken when it encounters that element.
5. Click **OK** in the **Members** dialog.
6. Adjust the member slightly by stretching or moving it. This forces the break into place, and updates the grip display.

**Offsetting a Member**

You can use the Offset tool to offset a member a set number of times in a set direction.

**To offset a member:**

1. Select the member.
2. Right-click and select **Offset**, or select **Edit > Modify Elements > Offset**.
3. In the **Offset** dialog, type the distance you want to offset the member in the **Offset Distance** edit box.

4. In the **Number of Copies** edit box, type the number of copies you want to create, or use the arrow keys to increase or decrease the number.
5. Click **OK**.
6. Click on the side you want to offset to. The member is offset.

## Adjusting a Member to a Plane

You can use the Adjust to Plane tool to match any member to the slope an existing roof, floor or ceiling surface.

### To adjust a member to a plane:

1. Select the member.
2. Right-click and select **Adjust to Plane**, or select **Edit > Modify Elements > Adjust to Plane**.
3. In the **Adjust to Plane** dialog, click in the **Select Plane** field, then click the browse button that appears in the field. This takes you out to your drawing.
4. Click on the edge of the surface whose plane you want to match the member to. (Selecting the surface defines the plane.) The name of the surface is displayed in the **Select Plane** field.
5. To offset the member vertically from its current position, enter a value in the **Offset** field.
6. Click **OK**. The member takes on the slope of the selected plane.

## Extending a Member to a Plane

You can use the Extend to Plane tool to automatically extend a member to the plane of a selected surface. The end of the member will be mitered accordingly.

### To extend a member to a plane:

1. Click on the member, then right-click and select **Extend to Plane**.
2. Click on the surface whose plane you want to extend the member to.
3. Click on the member end that you want to extend. The member is automatically extended to the selected plane.

## Editing the Shape of a Member

You can choose from a wide variety of member shapes, or create your own profile.

### To edit a member's shape:

1. Select the member.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Members** dialog, click on the appropriate graphic in the *Type* area. There are several profiles to choose from. Each profile has a unique set of variables in the *Properties* pane that you can customize. If you would like to select or create a custom profile, scroll over and select *Custom*, then click the **Select Profile** button.
4. Click **OK**.

## Editing the Dimensions of a Member

You can edit the dimensions of a member (e.g. width and depth) to suit your needs.

### To edit the dimensions of a member:

1. Select the member.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the dimensions in the *Properties* window. The variables in this window vary depending on the shape chosen. Clicking on a dimension variable in the dimensioned graphic automatically highlights the corresponding dimension in the *Properties* window, and vice versa.
4. Click **OK**.

## Defining the Ends of a Member

You can specify whether you want the ends of a member to be plumb or square. Each end can be different.

### To define the ends of a member:

1. Select the member.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Members** dialog, select the *Details* tab.
4. In the *End Conditions* area, select either **Plumb** or **Square** for each end of the member.
5. Click **OK**.

## Mitering Members

You can specify whether or not you want each end of a member to miter when it is connected to another member. By default most members in the catalog (except gutters) are not set to miter.

### To miter members:

1. Select the member(s) that you want to miter.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Members** dialog, select the **Details** tab.
4. In the *End Conditions* area, enable the **Miter if Possible** check box for each end that you want to miter.
5. Click **OK**.

**Note:** Members that you want to miter must be on the same plane, and must be connected (i.e. share a node).

**Note:** In order for two members to miter, both must have the Miter if Possible option enabled. Currently you can only miter two members. In a situation where there are three members or more, you need to disable the Miter if Possible option for the third member if you want the other two to be mitered.



# Chapter 8: Doors, Windows & Openings

Once you've drawn walls, you can insert a variety of doors, windows and openings in them to create the exact design you want. Like all elements in Envisioneer, doors, windows and openings are intelligent. They know that they can only be inserted in walls. As soon as your pointer gets close to a wall, they snap into place. All you have to do is position it where you want it along the wall, then click to insert it.

Dimensions are displayed as you are positioning the element so you can get the precise placement you want. Even though doors, windows and openings automatically become associated with the walls they are inserted in, you can edit them independently if you want.


## Inserting Doors

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The catalog contains a wide variety of doors for you to insert, including hinged, bi-fold, pocket, sliding glass and garage doors. You can point and click to insert a door anywhere inside a wall, automatically center the door in the wall, or offset the door a specific distance from the end of the wall.

Doors are inserted at floor level. You can raise or lower a door after you have inserted it if you need to.

### To insert a door:

1. Make sure the location you want to insert doors on is the current location in the building locations drop box.
2. Select **Insert > Doors**, or click  on the Building toolbar.
3. In the catalog, select the door you want to insert.
4. If you want the door to be automatically centered on the wall, right-click and select **Center on wall**. Go to step 6.
5. If you want to offset the door a specific distance from the end of the wall, right-click and select **Enter insertion offset**. Enter the offset distance in the **Enter insertion offset** dialog, then click **OK**.
6. Position the door in the receiving wall. If you are using an insertion offset, position the door close to the end you want to offset it from. The door will snap inside the wall. Dimensions are displayed that show you the distance on either side of the door.
7. With your door positioned where you want it, click to insert it.
8. Right-click and select **Finish**.

## Moving a Door

You can move a door by clicking and dragging it inside the wall, or by editing the dynamic dimensions on either side of the door. You can move a door in both 2D and 3D.

### To move a door by clicking and dragging:

1. Click on the door to select it.
2. Click and drag the door to move it, then release your mouse button. If you are moving a door in 3D, make sure that you select the center grip.

### To move a door by editing dimensions:

1. Click on the door. Dynamic dimensions appear on either side of the door.
2. Click on the dimension you want to edit.
3. In the **Edit Dimension** dialog, enter the new value, then press **Enter** or click **OK**. The door position updates automatically.

## Flipping a Door

You can use the Flip Opening tool to flip an entire door around. If the door originally opened out, it now opens in; if it was hinged on the left, it is now hinged on the right (and vice versa).

### To flip a door:

1. Click the door to select it.
2. Right-click in the drawing area and select **Flip Opening**, or select **Edit > Modify Elements > Flip Opening**.

## Flipping a Door Swing

Use the Flip Swing tool to flip only the swing of a door. The door will be hinged on the opposite side, but it will still open in the same direction, either in or out.

### To flip a door swing:

1. Click the door to select it.
2. Right-click in the drawing area and select **Flip Swing**, or select **Edit > Modify Elements > Flip Swing**.

## Editing Door Swing Properties

You can specify the direction of a door swing as well as the extent of the swing in 2D and 3D.

### To edit door swing properties:

1. Select the door whose swing properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, edit the settings in the *Swing* area of the Basic page.
  - Swing Type.** Choose from *Left*, *Right* or *Double*. A door with a left door swing will have its hinges on the right.
  - 3D % Open.** How much the door is shown swung open in 3D view. By default, doors are shown closed in 3D view.
  - 2D % Open.** How much the door is swung open in 2D plan view.
4. Click **OK**.

**Tip:** You can quickly flip a door swing using the Flip Swing tool on the right-click menu.


**Tip:** To specify how door swing direction is represented in your region, see Specifying the Definition of a Right-hand vs Left-hand Door on page 66.

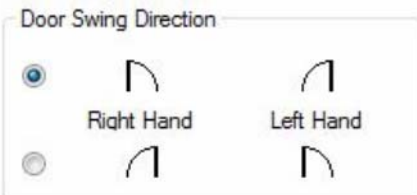
## Specifying the Definition of a Right-hand vs Left-hand Door

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The concept of a right-hand vs left-hand door differs around the world.

### To specify how the door swing direction is defined in your region:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Building Aids** in the left column.
3. In the *Door Swing Direction* area, select the option that represents the way you typically reference right-hand and left-hand doors:



4. Click **OK**.



## Editing Door Types

Door types include hinged, bi-fold, pocket, face slider, track slider, fold-up, tilt, roller, and pivot. You can edit a door's type on the door's Basic property page.

### To edit a door type:

1. Select the door whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, select the Basic tab.
4. In the *Type* area, click on the desired door type to select it.
5. Click **OK**.

## Editing the Size of a Door

You can edit the height or width of a door.

### To edit the size of a door:

1. Select the door whose size you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, enter the desired values in the **Height** and **Width** edit boxes on the Basic page.
4. Click **OK**.

**Tip:** You can also stretch a door opening dynamically by clicking and dragging its side grips if displayed. See *Stretching Doors, Windows and Openings* for more information.

## Editing the Shape of a Door

A door can be rectangular, arched or apexed. Note that you can only change the shape of a hinged door type.

### To edit the shape of a door:

1. Select the door whose shape you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, select either *Rectangular*, *Arched* or *Apexed* from the **Shape** drop box.
4. Edit the door's size properties if needed.
5. Click **OK**.

## Displaying a Highlite or Sidelites on a Door

A sidelite is a glass panel set on one or both sides of a door (usually an entry door). A highlite is a glass panel above a door. You can choose which lites which you want to display.

### To display lites on a door:

1. Select the door.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, select the Basic tab.
4. To display a highlite over the door, enable the **Display Highlite** check box.
5. To display a sidelite on the left side of the door, enable the **Display Left Sidelite** check box.
6. To display a sidelite on the right side of the door, enable the **Display Right Sidelite** check box.
7. Click **OK**.

## Editing a Door's Sidelites and Highlites

A sidelite is a glass panel set on one or both sides of a door (usually an entry door). A highlite is a glass panel above a door. You can create a custom configuration of sidelites and/or highlights for a door.

**To edit sidelites and highlites:**

1. Select the door whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, select the Lites tab.
4. In the *Type* window, select the lite you want to specify settings for. Note that the lite must be enabled on the Basic page before you can edit it.
5. To select a specific window type for the currently selected lite, click on the appropriate graphic in the *Type* area.
6. Edit the dimensions of the lite in the *Properties* area if desired. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the sidelite/highlite graphic, and vice versa.

**Shape.** Choose from *Rectangle*, *Arched* or *Trapezoid*.

(highlite) **Adjust Width.** Selecting *Opening* adjusts the width of the highlite to match the width of the opening (including any sidelites). Selecting *Door* adjusts the width of the highlite to match the width of the door (excluding any sidelites). Selecting *User Defined* lets you specify a precise width for the highlite in the **Width** edit box.

**Width.** The total width of the lite.

(sidelites) **Adjust Height to Door.** Automatically adjusts the height of a sidelite to match the height of the door.

**Height.** The overall height of the lite.

**# of Horizontal Panels.** The number of panels across the lite. If you specify more than one panel, vertical dividers are added inside the lite's frame.

**# of Vertical Panels.** The number of panels running vertically along the lite. If you specify more than one panel, horizontal dividers are added inside the lite's frame.

**# of Horizontal Panes.** The number of panes of glass across each panel.

**# of Vertical Panes.** The number of panes of glass running vertically along each panel.

## Editing a Door's Energy Properties

The rate of heat loss through a door is indicated in terms of the U-factor. You can specify a door's U-factor, and whether or not you want to include it in energy calculations.

**To edit a door's energy properties:**

1. Select the door.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, select the **Basic** tab.
4. To include the U-factor in calculations when exporting the model to building energy software, enable the **Include in Calculations** check box in the **Energy** area.
5. To specify the U-factor, edit the value in the **U-Factor** edit box.

To display the U-factor in door schedules, you need to add a U-Factor field to the door schedule layout. See Defining the Field Layout of a Schedule on page 402.

## Editing a Door's Leaf

You can choose from a variety of door leaf types and change the thickness of the leaf.

**To edit a door's leaf:**

1. Select the door whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Doors** dialog, select the Leaf tab.
4. In the *Type* area, click on the leaf type you want. If you would like to use a custom door leaf that has been imported into the Door Leafs library, select the **Custom** type, then select the desired leaf from the library.
5. If you want to change the thickness of the leaf, enter the thickness in the **Leaf Depth** edit box.

- Each door leaf type has its own set of dimensions that you can define. These dimensions vary according to how many panels the leaf has. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the door leaf graphic, and vice versa.
- Click **OK**.

## Editing Door Details

You can specify precise dimensions and offsets for the door frame, sash, mullions and transoms.

### To edit door details:

- Select the door whose properties you want to change.
- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
- In the **Doors** dialog, select the Details tab.
- Edit the dimensions as desired.

#### Frame

**Depth.** The depth of the frame members as seen from an overhead view.

**Width.** The width of the frame members as seen from an overhead view.

**Offset.** The offset of the door frame from the wall face.

#### Sash

**Depth.** The depth of sash members (sidelite/highlite frame) as seen from an overhead view.

**Width.** The width of sash members as seen from an overhead view.

**Offset.** The offset of the sash from the front of the door frame, i.e. how far back it sits in the door frame.

#### Mullion

**Vertical Separation.** If a lite has two or more panels running across it, this adds vertical dividers between the panels.

**Horizontal Separation.** If a lite has two or more stacked panels, this adds horizontal dividers between them.

**Depth.** The front-to-back thickness of the mullion as seen from an overhead view.

**Width.** The width (left-to-right distance) of the mullion as seen from an overhead view.

#### Transom

**Depth.** The front-to-back thickness of the transom member as seen from an overhead view. The transom is the member between the door and the sidelite or highlite frame.

**Width.** The width of the transom as seen from an overhead view.

- Click **OK**.

## Removing Trim from a Door Opening

By default, door openings include trim around them if a trim member is specified for openings in the wall's Trim properties. You can turn opening trim on or off for individual door openings.

### To remove trim from a door opening:

- Select the opening, then right-click and select **Properties**.
- In the **Doors** dialog, disable the **Include Opening Trim** check box.
- Click **OK**.

## Inserting Windows


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The catalog contains a wide variety of windows for you to insert, including fixed, casement, double casement, hopper, awning, sliding, double-hung, single-hung, bay, bow and louvered windows.

You can point and click to insert a window anywhere in a wall, automatically center the window on the wall, or offset the window a specific distance from the end of the wall.

Windows are inserted at the Head Height defined for the building location you insert the window on. You can raise or lower a window after you have inserted it if you need to.

**To insert a window:**

1. Make sure the location you want to insert windows on is the current location in the building locations drop box.
2. Select **Insert > Windows**, or click  on the Building toolbar.
3. In the catalog, select the window you want to insert.
4. If you want the window to be automatically centered on the wall, right-click and select **Center on wall**. Go to step 6.
5. If you want to offset the window a specific distance from the end of the wall, right-click and select **Enter insertion offset**. Enter the offset distance in the **Enter insertion offset** dialog, then click **OK**.
6. Position the window in the receiving wall. If you are using an insertion offset, position the window close to the end you want to offset it from. The window will snap inside the wall. Dimensions are displayed that show you the distance on either side of the window.
7. With your window positioned where you want it, click to insert it.
8. Right-click and select **Finish**.

## Moving a Window

You can move a window by clicking and dragging it inside the wall, or by editing the dynamic dimensions on either side of the window. You can move a window in both 2D and 3D.

**To move a window by clicking and dragging:**

1. Click on the window to select it.
2. Click and drag the window to move it, then release your mouse button. If you are moving a window in 3D, make sure that you select the center grip.

**To move a window by editing dimensions:**

1. Click on the window. Dynamic dimensions appear on either side of the window.
2. Click on the dimension you want to edit.
3. In the **Edit Dimension** dialog, enter the new value, then press **Enter** or click **OK**. The window position updates automatically.

## Flipping a Window

You can use the Flip Opening tool to instantly flip a window around in the wall. If the window has a swing, the swing is also flipped.

**To flip a window:**

1. Select the window.
2. Right-click in the drawing area and select **Flip Opening**, or select **Edit > Modify Elements > Flip Opening**.

## Editing Window Types

Window types include fixed, casement, hung, sliding, awning, hopper, vent, bay, bow and louver. You can edit a window's type on the window's Basic property page.

**To edit a window type:**

1. Select the window whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Windows** dialog, select the Basic tab.
4. In the *Type* area, click on the desired window type to select it.
5. Click **OK**.

## Editing a Window's Size Properties

You can edit the height and width of a window. You can also control the number of horizontal and vertical panes in the window. Some window types have additional properties that define their geometry.

### To edit the size of a window:

1. Select the window whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Windows** dialog, select the Basic tab.
4. Edit the dimensions as desired. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the window graphic, and vice versa.

Most windows have the common dimensions listed below. Some have additional settings to define their geometry.

**Window Width.** The width of the window, not including the frame.

**Window Height.** The height of the window.

**# of Horizontal Panels.** The number of window panels running horizontally across the window frame. If you specify more than one panel, vertical dividers are added inside the window frame.

**# of Vertical Panels.** The number of window panels running vertically along the window frame. If you specify more than one panel, horizontal dividers are added inside the window frame.

**# of Horizontal Panes.** The number of panes of glass across each window panel.

**# of Vertical Panes.** The number of panes of glass running vertically along each window panel.

5. Click **OK**

**Tip:** You can also stretch a window opening dynamically by clicking and dragging its side grips if displayed. See *Stretching Doors, Windows and Openings* for more information.

## Displaying a Highlite, Lowlite or Sidelites on a Window

A sidelite is a glass panel set on one or both sides of a window. A highlite is a glass panel above a window. A lowlite is a glass panel below a window. You can choose which lites which you want to display.

### To display lites on a window:

1. Select the window.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Windows** dialog, select the Basic tab.
4. To display a highlite over the window, enable the **Display Highlite** check box.
5. To display a lowlite under the window, enable the **Display Lowlite** check box.
6. To display a sidelite on the left side of the window, enable the **Display Left Sidelite** check box.
7. To display a sidelite on the right side of the window, enable the **Display Right Sidelite** check box.
8. Click **OK**.

## Editing a Window's Sidelites, Highlites and Lowlites

A sidelite is a glass panel set on one or both sides of a window. A highlite is a glass panel above a window. A lowlite is a glass panel below a window. You can create a custom configuration of sidelites, highlites and lowlites for a window.

### To edit a window's lites:

1. Select the window whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Windows** dialog, select the Lites tab.
4. In the *Type* area select the lite you want to specify settings for. Note that the lite must be enabled on the Basic page before you can edit it.
5. To select a specific window type for the currently selected lite, click on the appropriate graphic in the *Type* area.

6. Edit the dimensions of the lite in the *Properties* area if desired. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the sidelite/highlite graphic, and vice versa.

**Shape.** Choose from *Rectangle*, *Arched* or *Trapezoid*.

(highlite/lowlite) **Adjust Width.** Selecting *Opening* adjusts the width of the highlite to match the width of the opening (including any sidelites). Selecting *Window* adjusts the width of the highlite to match the width of the window (excluding any sidelites). Selecting *User Defined* lets you specify a precise width for the highlite in the **Width** edit box.

**Width.** The total width of the lite.

(sidelites) **Adjust Height to Window.** Automatically adjusts the height of a sidelite to match the height of the window.

**Height.** The overall height of the lite.

**# of Horizontal Panels.** The number of panels across the lite. If you specify more than one panel, vertical dividers are added inside the lite's frame.

**# of Vertical Panels.** The number of panels running vertically along the lite. If you specify more than one panel, horizontal dividers are added inside the lite's frame.

**# of Horizontal Panes.** The number of panes of glass across each panel.

**# of Vertical Panes.** The number of panes of glass running vertically along each panel.

7. Click **OK**.

## Editing a Window's Energy Properties

You can specify a window's frame type, glaze type, U-factor, and SHGC.

**To edit a window's energy properties:**

1. Select the window.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Windows** dialog, select the **Basic** tab.
4. In the **Energy** area, specify the following properties:

**Include in Calculations.** Check to include the energy property values in calculations when exporting the model to building energy software.

**Frame Type.** Select **Metal**, **Metal w Thermal**, **Wood**, or **Vinyl**.

**Glaze Type.** Select **Single Pane**, **Double Pane**, **Double Pane Low E**, **Triple Pane**, or **Triple Pane Low E**.

**U-Factor.** The rate of heat loss through the window.

**SHGC.** Solar Heat Gain Coefficient. The amount of solar radiation that passes through the window. Expressed as a number between 0 and 1.

To display the U-factor in window schedules, you need to add a U-Factor field to the schedule layout. See *Defining the Field Layout of a Schedule* on page 402.

## Editing Window Details

You can specify precise dimensions and offsets for the window frame, sash, mullions and transoms.

**To edit window details:**

1. Select the window whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Windows** dialog, select the **Details** tab.
4. Edit the dimensions as desired.

**Frame**

**Depth.** The depth of the frame members as seen from an overhead view.

**Width.** The width of the frame members as seen from an overhead view.

**Offset.** The offset of the window frame from the wall face.

Sash

**Depth.** The depth of sash members (sidelite/highlite/lowlite frame) as seen from an overhead view.

**Width.** The width of sash members as seen from an overhead view.

**Offset.** The offset of the sash from the front of the window frame, i.e. how far back it sits in the window frame.

Post (for Bays and Bows)

**Depth:** The thickness of posts in bay and bow windows.

**Width:** The width of posts in bay and bow windows.

Mullion

**Vertical Separation.** If a lite has two or more panels running across it, this adds vertical dividers between the panels.

**Horizontal Separation.** If a lite has two or more stacked panels, this adds horizontal dividers between them.

**Depth.** The front-to-back thickness of the mullion as seen from an overhead view.

**Width.** The width (left-to-right distance) of the mullion as seen from an overhead view.

Transom (for Lites)

**Depth.** The front-to-back thickness of the transom member as seen from an overhead view. The transom is the member between the window and the sidelite, highlite or lowlite frame.

**Width.** The width of the transom as seen from an overhead view.

5. Click **OK**.

## Removing Trim from a Window Opening

By default, window openings include trim around them if a trim member is specified for openings in the wall's Trim properties. You can turn opening trim on or off for individual window openings.

### To remove trim from a window opening:


1. Select the opening, then right-click and select **Properties**.
2. In the **Windows** dialog, disable the **Include Opening Trim** check box.
3. Click **OK**.

## Controlling the Display of Window Opening Symbols

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By default, swing-type windows display symbols that indicate the swing direction. These symbols are visible in 3D and elevation views. You can choose between two methods of displaying the symbols depending on your region, or disable the symbols altogether.

### To control the display of window opening symbols:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Building Aids** in the left column.
3. In the *Window Opening Symbols* area, select either **Type 1** or **Type 2**. If you want to disable window opening symbols, select **None**.
4. Click **OK**.

## Inserting Wall Openings


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An opening is a cutout in a wall of a specific shape, width and height. Openings can be rectangular, round, arched, octagonal or trapezoidal.

You can point and click to insert an opening anywhere in a wall, automatically center the opening on the wall, or offset the opening a specific distance from the end of the wall.



### To insert an opening:

1. Make sure the location you want to insert openings on is the current location in the building locations drop box.
2. Select **Insert > Openings**, or click  on the Building toolbar.
3. In the catalog, select the opening you want to insert.
4. If you want the opening to be automatically centered on the wall, right-click and select **Center on wall**. Go to step 6.
5. If you want to offset the opening a specific distance from the end of the wall, right-click and select **Enter insertion offset**. Enter the offset distance in the **Enter insertion offset** dialog, then click **OK**.
6. Position the opening in the receiving wall. If you are using an insertion offset, position the opening close to the end you want to offset it from. The opening will snap inside the wall. Dimensions are displayed that show you the distance on either side of the opening.
7. With your opening positioned where you want it, click to insert it.
8. Right-click and select **Finish**.

Openings are inserted at the Head Height defined for the building location you insert the opening on. You can resize, raise or lower an opening after you have inserted it if you need to.

## Creating a Niche

A niche is a recess in a wall. There are a number of rectangular, circular and arched niches in the catalog that you can insert easily using the Openings tool. You can create a custom niche by inserting an opening in a wall, and then specifying a niche depth in the opening's properties.

### To create a custom niche:

1. Insert an opening in the wall using the Openings tool.
2. Click on the opening to select it, and then right-click and select **Properties**.
3. In the **Openings** dialog, click on the drop box next to the **Specify Niche Depth** item.
4. Select either **Distance** or **Percentage** as your method of specifying the niche depth. The *Distance* option lets you enter a specific value for the depth, while the *Percentage* option lets you specify the depth as a percentage of the wall depth.
5. If you selected the *Depth* option, type the desired depth for the niche in the **Depth** edit box. If you selected *Percentage*, type the desired depth percentage in the **Depth** edit box. Note that you can specify a distance or percentage that is greater than the wall depth if needed. The niche would then protrude through the wall.
6. If you do not want any trim around the niche opening, disable the **Include Opening Trim** check box.
7. Click **OK**.

**Tip:** To flip a niche to the other side of the wall, use the Flip Opening tool on the right-click menu.

## Flipping a Niche

If you have created a niche in a wall and it appears to be on the wrong side of the wall, you can flip it instantly using the Flip Opening tool.

### To flip a niche to the other side of the wall:

1. Select the opening.
2. Right-click and select **Flip Opening**.

## Editing the Appearance of a Niche

You can edit the appearance of a niche in 3D by applying different materials to the recessed face.

### To edit the appearance of a niche:

1. Select the opening, then right-click and select **Properties**.
2. In the **Openings** dialog, select the Appearance tab.
3. Select the component whose appearance you would like to change.



**Inside Niche Back.** The interior face of the niche back.

**Niche Back Side.** The exterior face of the niche back. This would only be visible in 3D if the niche depth is greater than the wall depth, causing the niche to protrude from the wall.

4. Click the **Select** button in the *Material* area, then select a material to apply to the component from the **Materials** library.
5. Click **OK**.

## Moving a Wall Opening

You can move a wall opening by clicking and dragging it inside the wall, or by editing the dynamic dimensions on either side of the opening. You can move an opening in both 2D and 3D.

### To move an opening by clicking and dragging:

1. Click on the opening to select it.
2. Click and drag the opening to move it. If you are moving an opening in 3D, make sure that you select the center grip.
3. Release your mouse button.

### To move an opening by editing dimensions:

1. Click on the opening. Dynamic dimensions appear on either side of the opening.
2. Click on the dimension you want to edit.
3. In the **Edit Dimension** dialog, enter the new value, then press **Enter** or click **OK**. The opening position updates automatically.

## Editing the Size of a Wall Opening

You can edit the dimensions of a wall opening by changing the properties on the opening's Size property page.

### To edit the size of a wall opening:

1. Select the opening whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the *Properties* area, edit the dimensions of the opening. Dimensions vary according to the shape of the opening.
4. Click **OK**.

**Tip:** If you want the bottom of your opening to be level with the floor, change the height of opening to match the Head Height of the building location it is inserted on. Alternatively you can lower the opening using the Elevate tool.


**Tip:** You can also stretch an opening dynamically by clicking and dragging its side grips if displayed. See Stretching Doors, Windows and Openings for more information.

## Stretching Doors, Windows and Openings

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If the **Stretch Openings** option is enabled in your Program Settings, grips will appear at the edges of doors, windows and openings when you select them. In 2D you can then dynamically stretch an opening to make it narrower or wider. In 3D view you can stretch it both vertically and horizontally. An additional setting lets you specify that you want the opening to be automatically renamed when its size changes.

### To enable the stretching of openings:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Building Aids** in the left column.
3. Check the **Enable** box in the **Stretch Openings** area.
4. If you want openings to be automatically renamed according to their new size, enable the **Auto-rename Openings** check box. Note that this will also override any custom names that you have defined.
5. Click **OK**.

## Editing the Shape of a Wall Opening

Openings can be rectangular, round, arched, octagonal or trapezoidal.

**To change the shape a wall opening:**

1. Select the opening whose properties you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the *Type* area, click on the shape you want.
4. Click **OK**.

## Removing Trim from a Wall Opening

By default, wall openings include trim around them if a trim member is specified for openings in the wall's Trim properties. You can turn opening trim on or off for individual openings.

**To remove trim from a wall opening:**

1. Select the opening, then right-click and select **Properties**.
2. In the **Openings** dialog, disable the **Include Opening Trim** check box.
3. Click **OK**.

## Editing the Appearance of a Wall Opening in 2D Plan View

You can change the appearance of an opening in 2D plan view by editing its line style properties. This allows you to apply different colors, patterns or weights to different openings if you wish.

**To edit the appearance of an opening in 2D plan view:**


1. Select the opening, then right-click and select **Properties**.
2. In the **Openings** dialog, select the Appearance tab.
3. In the *Components* list, select **Header**.
4. Click the **Select** button in the *Linestyle* area.
5. Select the desired line style from the **Line Styles** dialog, then click **OK**.
6. Click **OK** in the **Openings** dialog.

## Inserting Doors, Windows and Openings to Center

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By default, the on-screen dimensions that appear when inserting doors, windows and openings measure from the edges of the opening object. The same applies when you insert openings using an offset. If you prefer you can measure to center when inserting openings.

**To insert doors, windows and openings to center:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Building Aids** in the left column.
3. In the *Opening Placement* area, select **Dimension to Center**.
4. Click **OK**.

## Inserting Doors, Windows and Openings to Edge

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If you have changed your program settings so that door, window and wall openings insert to center, you can switch it back to the default method where openings are measured from the edges of the opening.

**To insert doors, windows and openings to the edge of the opening:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.


2. In the **Program Settings** dialog, select **Building Aids** in the left column.
3. In the *Opening Placement* area, select **Dimension to Edge**.
4. Click **OK**.

## Inserting Shutters

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Using the Shutters tool you can instantly apply shutters to the wall on one or both sides of a window or opening. Choose a flat, paneled, or board-and-batten style, or create your own style. Shutters can be inserted on the exterior side or interior side of the wall, or both sides.

### To insert shutters:

1. Select **Insert > Detailing > Shutters**, or click the down arrow next to the Detailing button  on the Building toolbar and select **Shutters**.
2. In the catalog, select the type of shutter you would like to insert.
3. In the **Attach Shutters** dialog, select the side of the wall on which you want to insert the shutters by enabling or disabling the **Exterior Side** and/or **Interior Side** check box. Under each option you can then specify whether you would like to apply a shutter to the left side, right side or both sides of the window or opening.



4. Click **OK**.
5. Click on the window or opening that you want to apply shutters to. The shutters are inserted.

## Editing Shutters

You can edit the style and dimensions of shutters by editing their properties.

### To edit shutters:

1. Click on a shutter to select it. If you are editing a pair of shutters, clicking on one shutter selects them both.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the properties as desired. Each shutter type has different settings. Below is a brief description of each setting.

**Adjust Size.** If *By Opening* is selected, the height of the shutter automatically adjusts to the height of the window or opening it is applied to. If *Specify* is selected, you can define a specific shutter height in the Height edit box.

**Width.** The overall width of the shutter.

**Height.** The overall height of the shutter. This value is not adjustable if *By Opening* is selected in the *Adjust Size* drop box. It can only be edited if *Specify* is selected in the *Adjust Size* drop box.

**Thickness.** The depth of the shutter.

#### Additional Settings for Panel Style

**Panel Width.** The width of the panel(s).

**Top Rail Height.** The height of the top rail.

**Bottom Rail Height.** The height of the bottom rail.

**Number of Panels.** The number of panels in the shutter.

**Panel Type.** Choose either *Flat*, *Bevel* or *Louver*. If there are two or more panels, you can select different types for individual panels.

**Panel Height.** The height of a panel. If there are two or more panels, you can set different heights for individual panels.

**Mid Rail Height.** The height of the dividing rail. If there are more than two panels, you can set different rail heights between panels.

Additional Settings for Board-and-Batten Style

**Board Spacing.** The distance between boards.

**Batten Thickness.** The height of a batten.

**Batten Edge Offset.** The distance from the bottom of a board to the edge of the batten.

**Number of Boards.** The number of boards across the shutter.

**Number of Battens.** The total number of battens on the shutter.

# Chapter 9: Floors & Ceilings

If you have automatic floors enabled in your Program Settings, a floor will be automatically inserted when you connect three or more walls to create a closed wall layout. When you insert interior walls, the floor is split as new rooms are created. You can also manually split automatic floors using the Room Division tool.

There are three tools available on the Insert menu for inserting floors manually: Floor by Room, Floor by Perimeter, and Floor by Picking Points.

If you want different flooring types in different rooms, you can use the Materials Paintbrush to quickly apply different types of carpet, tiles, wood flooring, vinyl flooring, linoleum, or concrete to individual floors.

You can point and click to insert ceilings using one of the handy Ceiling tools: Ceiling by Room, Ceiling by Perimeter, or Ceiling by Picking Points. Any ceiling surface can easily be made into a tray or cathedral ceiling by simply editing the ceiling's properties.

You can create openings in floors and ceilings if you need to.

## Inserting a Structural Floor Throughout a Building Location

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The Structural Floor by Perimeter tool detects the perimeter walls on the current building location and inserts a structural floor of your choice throughout the entire location. This option is ideal if you have deleted your automatic floor and would like to create a floor that spans your model. Once inserted, you have the option of cutting joists along a bearing line if needed.

**To insert a structural floor throughout a building location:**

1. Make sure the building location that you want to insert the floor on is the current location.
2. Select **Insert > Structural Floor > Structural Floor by Perimeter**, or click the down arrow next to the Structural Floor



button on the Building toolbar and select **Structural Floor by Perimeter**.

3. In the catalog, select the structural floor system that you want to insert.
4. Click anywhere inside the model. The floor is automatically inserted.

**Note:** The Structural Floor by Perimeter tool does not take interior walls into account. Only one large floor system is created.

## Inserting a Structural Floor in a Room

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Using the Structural Floor by Room tool you can just click inside a room to automatically insert a structural floor of your choice in that room.

**To insert a structural floor in a room:**

1. Select **Insert > Structural Floor > Structural Floor by Room**, or click the down arrow next to the Structural Floor but-



ton on the Building toolbar and select **Structural Floor by Room**.

2. In the catalog, select the structural floor type you want to insert.
3. Mouse over the room to which you want to add a floor (it will highlight), then click inside the room. The floor is automatically inserted.

## Inserting a Structural Floor by Picking Points

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The Structural Floor by Picking Points tool provides the freedom to create a floor system of any size or shape anywhere in your drawing. Just pick points to form a closed shape and the floor is instantly created.

**To insert a structural floor by picking points:**

1. Select **Insert > Structural Floor > Structural Floor by Picking Points**, or click the down arrow next to the Structural



Floor button on the Building toolbar and select **Structural Floor by Picking Points**.

2. In the catalog, select the structural floor type you want to insert.
3. Select a start point for the floor, then continue selecting points to define the size and shape of the floor. Note that you do not have to select the start point again to finish the floor — the last point picked is always connected to the start point.
4. Right-click and select **Finish**.

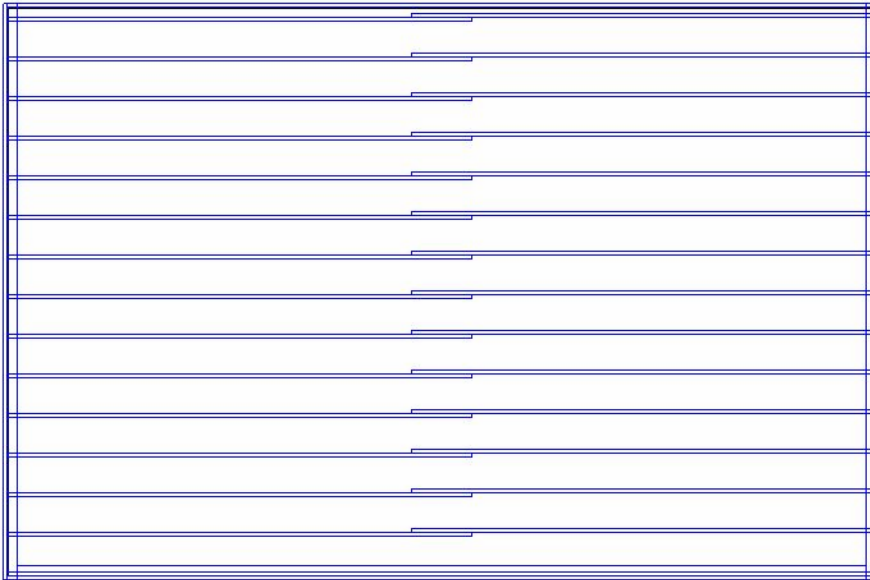
**Inserting a Bearing Line in a Structural Floor**

If you have inserted a structural floor, you can insert a bearing line to specify where you want joists to be cut within the floor system.

**To insert a bearing line:**

1. Select the edge of the structural floor. You may need to hide the wall edges to be able to do this. You can tell that a structural floor is selected if red arrows are displayed at the floor’s grip points.
2. Right-click and select **Structural Floor > Insert Bearing Line**.
3. Select two points to draw a line through the floor joists. The joists are automatically cut along the bearing line. The joists ends on the bearing line will be either overlapped or held back depending on what is specified in the floor’s properties.

In the following example, a bearing line was drawn down the middle of the floor system, and the joists were cut an overlapped along the bearing line:



**Stretching or Moving a Bearing Line in a Structural Floor**

When you insert a bearing line in a structural floor, grip points are displayed at each end of the bearing line when the floor structure is selected. You can click and drag these grip points to move them.

If you need to move a grip point a specific distance, select the floor structure and then right-click and select **Stretch Bearing Line**. This activates the Commander, where you can specify exact values for the move.

When you stretch or move a bearing line, the joists that bear on the line adjust with it.

## Removing a Bearing Line

If you want to remove a bearing line that you have inserted in a structural floor, follow the steps below.

1. Select the structural floor. You may need to hide walls to be able to select the edge of it.
2. Right-click and select **Remove Bearing Line**.
3. Click on the bearing line. This removes the bearing line and returns the joists to their original, uncut state.

## Moving the Framing Base Point in a Structural Floor

By default, framing in a structural floor starts from the top corner. You may want to shift the base point to start the joists a specific distance from the corner instead. This may, for example, facilitate the application of sheathing.

To move the framing base point:

1. Click on the edge of the structural floor to select it.
2. Right-click and select **Structural Floor > Move Framing Base Point**. The current framing base point is marked with a light blue triangle.
3. Either drag the light blue triangle to a new location, or click on any point in your drawing and enter a precise move distance in the Commander and press Enter. The base point is moved, and the framing adjusts accordingly.

## Adding Members to a Structural Floor

You can customize the framing of a structural floor by adding members to it. When you use the **Add to Structural Floor System** tool, manually inserted members become associated with the floor, and behave as though they are part of it. For example, if you move the floor, the members will move along with it. Or, if the floor is deleted, the members will also be deleted. Any **View Filter** changes applied to the floor will be applied to the added members as well.

**To add members to a structural floor:**

1. Insert the members using the **Members** tool or **Advanced Members** tool.
2. Select the inserted members, then right-click and select **Add to Structural Floor System**. A dialog box confirms the number of members added.

If needed you can disassociate a member from the floor using **Remove from Structural Floor System**.

## Removing a Member from a Structural Floor

To delete a member from a structural floor, simply select it and press **Delete** on your keyboard.

To disassociate a member that you have manually added to the floor using the **Add to Structural Floor System** option, select the member, then right-click and select **Remove from Structural Floor System**. The member will remain in the drawing, but will no longer be part of the floor system.

## Cutting an Opening in a Structural Floor

If you have used the **Structural Floor by Perimeter**, **Structural Floor by Room** or **Structural Floor by Picking Points** tool to create a structural floor system, you can use the **Cut Opening** tool on the floor's right-click menu to create an opening in it of any shape or size.

**To create an opening in a structural floor:**

1. Click on the edge of the floor to select it.
2. Right-click and select **Cut Opening**.
3. Select a start point for the opening, then continue selecting points to define the size and shape of the opening. Note that you do not have to select the start point again to finish the outline — the last point picked is always connected to the start point.
4. Right-click and select **Finish**.

## Editing Structural Floor Properties

Structural floor properties include settings for the joists, sheathing, sill plate, and rim joists.

To edit the general properties of an inserted floor, select the edge of the floor, then right-click and select **Properties**. In the **Structural Floor System** dialog, you can specify *General Properties* such as joist spacing, and define settings for the *Joists* and *Sheathing*.

Perimeter members can be edited on a per-edge basis, and can therefore be different on each edge. To edit the members along a particular edge, select the floor, then click on the red property marker on the desired edge. Edit the member settings for the selected edge in the **Member Properties** dialog box.

Structural floor properties are described below.

**Regenerate components when updated.** When checked, this erases and rebuilds the auto-generated framing components if the floor edge is modified (for example, stretched). When unchecked, the members remain intact when the floor edge is modified. Note that enabling this setting does not rebuild members that have been manually added to the floor system.

### General Properties

**Joist Direction.** The angle at which the joists run.

**Joist Spacing.** The spacing between joists.

**Style.** The behavior of joists that rest on a bearing line. The **Stagger** option overlaps the joist ends. The **Hold Back** option pushes the joist ends away from the bearing line.

**Distance.** The overlap distance when joist ends are staggered, or the distance between joist ends when they are held back along the bearing line.

### Sheathing

**Include.** Select **Yes** to include sheathing, or **No** if you do not want to include sheathing.

**Sheathing.** Click on the field and then click the browse button to select a sheathing material from the catalog.

**Phase.** Click in the field and then click the browse button to assign a phase to the sheathing. The phase can be used as a sort key in quantity reports.

**Usage.** Click in the field and then click the browse button to assign a usage to the sheathing. The usage can be used as a sort key in quantity reports.

### Joists/Sill Plate/Band Joist(s)/Rim Joist(s)/Opening Header(s)

These framing components are arranged into individual folders. Click **New** to add a member to a selected folder, or click **Copy** to copy an existing member. Click **Delete** to remove a selected member from the configuration.

Parameters include:

**Name.** A unique identifier for the member.

**Member.** Click in the field and then click the browse button to select a member from the catalog.

**Rotation.** The orientation of the member's profile.

**Phase.** Click in the field and then click the browse button to assign a phase to the member.

**Usage.** Click in the field and then click the browse button to assign a usage to the member.

**Alignment.** The point on a member that you want to use as a reference point when editing it. Choices are **Top**, **Center** and **Bottom**.

### Opening(s)

**Edge Offset.** The offset of the opening's edge members from the line that you draw when cutting an opening. You can enter a positive or negative value to offset the members to either side of the line.

**Joist Projection.** The distance that the joists project into the opening edge.

## Automatic Floors

If you have automatic floor insertion enabled in your Program Settings, a floor is automatically inserted throughout your model when you connect three or more walls to create a closed exterior wall layout. You can disable or enable automatic floor insertion at any time.



By default, hardwood flooring is applied when an automatic floor is created. If you use the House Builder Wizard, the floor type depends on the house style selected when using the Wizard. If you want you can apply a different material to the floor using the Materials Paintbrush.

When you draw interior walls, the floor is split into individual floors as new rooms are created provided the room's walls are all connected. You can also manually split automatic floors using the Room Division tool.

Automatic floors cannot be selected in 2D plan view. They can only be selected in 3D view. The only exception are floor edges that have been defined using the Room Division tool. Such edges are marked with a dashed line in 2D view, and can be stretched if necessary.

Automatic floors are directly associated with the walls that contain them. If you stretch your wall layout, the floor stretches with it. If you open up your wall layout by deleting a wall, the floor will be deleted.

**Tip:** For projects in which you plan to use the House Builder Wizard, you can change the default floor type by editing the House Builder Wizard element configuration before running the Wizard. You can also select the floor type you want while running the Wizard.

## Moving Defined Floor Edges

If you have used the Room Division tool to define a custom floor area in your model, you can move the defined floor edge in 2D view to increase or decrease the size of the defined floor area.

### To move a defined floor edge:


1. Click on the dashed floor edge in 2D plan view. Blue grips are displayed along the line.
2. Hover your pointer over the center grip, then click and drag to move the line.
3. Release your mouse button.

## Disabling or Enabling Automatic Floor Insertion

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An option in your Program Settings determines whether or not a floor is automatically inserted throughout your model when you form a closed wall layout. You can disable or enable this option at any time.

### To disable or enable automatic floor insertion:


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, select **Building Aids** in the left column.
3. In the *Building Aids* area, disable or enable the **Automatically Insert Floors** check box.
4. Click **OK**.

## Inserting a Floor Throughout a Building Location

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The Floor by Perimeter tool detects the perimeter walls on the current building location and inserts a floor of your choice throughout the entire location. This option is ideal if you have deleted your automatic floor and would like to create floors as quickly as possible throughout your model. It is also the perfect choice if you do not need different floors in each room.

### To insert a floor throughout a building location:

1. Make sure the building location that you want to insert the floor on is the current location.
2. Select **Insert > Floors > Floor by Perimeter**, or click the down arrow next to the Floors button  on the Building toolbar and select **Floor by Perimeter**.
3. In the catalog, select the floor type you want to insert.
4. Click anywhere inside the model. The floor is automatically inserted.


**Note:** The Floor by Perimeter tool does not take interior walls into account. Only one large floor surface is created. If you would prefer individual floors in each room, use the Floor by Room tool.

## Inserting a Floor in a Room

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Using the Floor by Room tool you can just click inside a room to automatically insert a floor of your choice in that room.

**To insert a floor in a room:**

1. Select **Insert > Floors > Floor by Room**, or click  on the Building toolbar.
2. In the catalog, select the floor type you want to insert.
3. Mouse over the room to which you want to add a floor (it will highlight), then click inside the room. The floor is automatically inserted.


**Note:** By default, floors inserted with the Floor by Room tool extend to the inside edge of the wall core (e.g. stud wall). If you prefer that they extend to the interior wall surface, you can define this in your program settings prior to inserting them. See Defining the Extents of Floors to be Inserted in Rooms on page 84.

## Defining the Extents of Floors to be Inserted in Rooms

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By default, a floor inserted with the Floor by Room tool extends to the inside edge of the wall core (e.g. stud wall). If you prefer you can set the floor to extend to the interior edge of the interior wall surface (e.g. drywall) instead. This is an insertion setting that is defined in your program settings. Changing this setting has no effect on floors that have already been inserted. It only affects floors that you are going to insert with the Floor by Room tool. If you want to change the extents of an existing floor you can click and drag its editing grips.

**To define the extents of floors to be inserted with the Floor by Room tool:**


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Building Aids** in the left column.
3. In the *Insertion by Room* area, click the drop box next to the **Floors** item.
4. If you want floors in rooms to extend to the wall core, select **Wall Core**. If you want them to extend to the interior wall surface, select **Wall Surface**.
5. Click **OK**.

## Inserting a Floor by Picking Points

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The Floor by Picking Points tool provides the freedom to create a floor of any size or shape anywhere in your drawing. Just pick points to form a closed shape and the floor is instantly created.

**To insert a floor by picking points:**

1. Select **Insert > Floors > Floor by Picking Points**, or click the down arrow next to the Floors button  on the Building toolbar and select **Floor by Picking Points**.
2. In the catalog, select the floor type you want to insert.
3. Select a start point for the surface, then continue selecting points to define the size and shape of the floor. Note that you do not have to select the start point again to finish the floor — the last point picked is always connected to the start point.
4. Right-click and select **Finish**.

## Resizing or Reshaping a Floor

You can resize or reshape a floor by clicking and dragging its edges and corners.

**Note:** You cannot stretch a floor that was created automatically with your wall layout. You can only stretch floors that were created with a Floor tool.

**To resize or reshape a floor:**

1. Select the floor by clicking on one of its edges. If you want to resize the floor, click on the edge that you want to adjust. A solid blue grip appears on the edge you selected, and hollow blue grips appear at each corner of the floor surface.
2. To resize the floor, hover your pointer over the solid blue grip, then click and drag the floor edge to adjust the floor size. Alternatively you can select the **Move Edge** tool on the right-click menu.
3. To reshape the floor, hover your pointer over one of the corner grips, then click and drag the corner to adjust the floor shape. Alternatively you can select the **Stretch** tool on the right-click menu.

If you would like to stretch only a portion of a floor edge, you can accomplish this by adding a node to the floor edge. See Adding a Node to a Floor on page 85.

**Adding a Node to a Floor**

You can add nodes to a floor edge to create more grips along the edge. You can then click and drag a grip on a specific segment to reshape that portion of the floor.

**To add a node to a floor:**

1. Select the floor.
2. Right-click and select **Add Node**, or select **Edit > Modify Elements > Add Node**.
3. Click on the point on the floor edge where you want to add a node. The edge is split into separate edges, each with its own grips for moving and stretching.


**Dividing a Room**

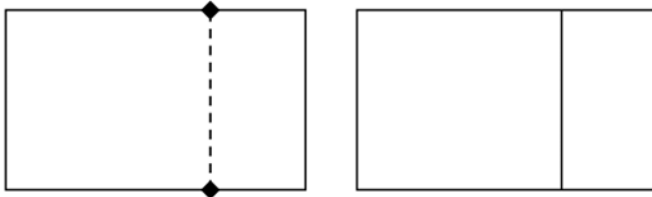
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If a room contains an automatic floor, you can use the Room Division tool to split the room into two separate areas. This enables you to have two different floor types/finishes in the same room. You can also use the Room Division tool to define an opening in a floor.

**Note:** You cannot divide a room that contains a floor that was created with a Floor tool.

**To divide a room:**

1. Select **Insert > Floors > Room Division**, or click the down arrow next to the Walls button  on the Building toolbar and select **Room Division**.
2. Select points to define the division line. If you are dividing a room into two segments, the end points of the line must be on the floor edge, although intermediate points are permitted anywhere on the floor surface.



If you are creating a floor within a floor, the split line must form a closed shape.

3. Right-click and select **Finish**.

**To move a division line:**

1. Click on the dashed division line in 2D plan view. Blue grips are displayed along the line.
2. Hover your pointer over the center grip, then click and drag to move the line.
3. Release your mouse button.

**Note:** When you divide a floor, the division lines are also created on the ceiling above.

## Editing the Thickness of a Floor

You can edit the thickness of a floor on its Basic property page.

### To edit the thickness of a floor:

1. Select the floor. If the floor was created automatically with your wall layout, you need to select the floor in 3D.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the value in the **Thickness** edit box on the Basic page.
4. Click **OK**.


## Cutting an Opening in an Automatic Floor

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You can insert an opening of any shape and size in an automatic floor by defining the area to be cut out, then deleting it. You may need to do this to accommodate a staircase.

**Note:** If you want to insert an opening in a floor that was created with a Floor tool, see Cutting an Opening in a Manually Inserted Floor on page 86.

### To insert an opening in an automatic floor:

1. Select **Insert > Walls > Room Division**, or click the down arrow next to the Walls button  on the Building toolbar and select **Room Division**.
2. Select points to define the outline of the opening, ensuring the outline forms a closed shape.
3. Right-click and select **Finish**. An outline is created on the floor surface. You can stretch, move and curve the outline if necessary to get the exact size and shape you want.
4. Go into 3D view and make sure the floor is visible and accessible.
5. Click in the center of the outline you drew to select the outline.
6. Press the **Delete** key on your keyboard, or right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.

## Cutting an Opening in a Manually Inserted Floor

If you have used the Floor by Room, Floor by Perimeter or Floor by Picking Points tool to create a floor, you can use the Cut Opening tool on the floor's right-click menu to create an opening in it of any shape or size.

### To create an opening in a manually inserted floor:

1. Select the floor surface.
2. Right-click and select **Cut Opening**.
3. Select a start point for the opening, then continue selecting points to define the size and shape of the opening. Note that you do not have to select the start point again to finish the outline — the last point picked is always connected to the start point.
4. Right-click and select **Finish**.

## Resizing or Reshaping a Floor Opening

If you have created an opening in a floor, you can resize or reshape the opening by clicking and dragging its edges or corners.

### To resize or reshape a floor opening:

1. Click on the edge of the opening.
2. To resize the opening, hover your pointer over the center blue grip of the edge that you want to move, then click and drag the edge to adjust the opening size.
3. If the opening is located in a manually inserted floor, you can reshape the opening by clicking and dragging a corner grip.

## Removing an Opening from an Automatically Inserted Floor

If you have inserted an opening in an automatic floor, you can remove it by deleting all of the opening edges.

**To remove an opening from an automatic floor:**

1. In 2D plan view, click on one of the opening's edges, then Shift+click to select the remaining edges.
2. Press the **Delete** key on your keyboard, or right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.

## Removing an Opening from a Manually Inserted Floor

You can remove an opening from a manually inserted floor using the Remove Opening tool. A manually inserted floor is one that was inserted with either the Floor by Room, Floor by Perimeter or Floor by Picking Points tool.

**Note:** You cannot remove an opening from a manually inserted floor using Delete.

**To remove an opening from a manually inserted floor:**

1. Click on the edge of the floor or opening to select the floor.
2. Right-click and select **Remove Opening**, or select **Edit > Modify Elements > Remove Opening**.
3. Click on the edge of the opening. The opening is removed.

## How Ceilings are Created

You can insert ceilings using any of the handy Ceiling tools — Ceiling by Room, Ceiling by Perimeter, or Ceiling by Picking Points.

You can edit the thickness and appearance of any ceiling as well as lower it to create a suspended ceiling, regardless of how you created it. You can also use the Materials Paintbrush to apply different colors or materials to individual ceilings. As well, any ceiling can be converted into a tray or cathedral ceiling by simply editing the ceiling's properties.


**Tip:** The underside of an upper-story floor can also serve as a ceiling. Similarly, the top side of a lower-story ceiling can serve as a floor.

## Inserting a Ceiling Throughout a Building Location

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The Ceiling by Perimeter tool detects the perimeter walls on the current building location and inserts a ceiling of your choice throughout the entire location. This option is ideal if you would like to create ceilings as quickly as possible throughout your model and do not have a need for different ceilings in each room.

**To instantly add a ceiling to the entire perimeter of a location:**

1. Make sure the location you want to insert the ceiling on is the current location in the building locations drop box.
2. Select **Insert > Ceilings > Ceiling by Perimeter**, or click the down arrow next to the Ceilings button  on the Building toolbar and select **Ceiling by Perimeter**.
3. In the catalog, select the ceiling type you want to insert.
4. Click anywhere inside the perimeter of the model. The ceiling is added automatically.
5. Right-click and select **Finish**.

**Note:** The Ceiling by Perimeter tool does not take interior walls into account. Only one large ceiling surface is created. If you would prefer individual ceilings in each room, use the Ceiling by Room tool.


## Inserting a Ceiling in a Room

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The Ceiling by Room option inserts a ceiling inside the perimeter of a room provided all the walls are connected. Adding ceilings by room allows you to have different ceiling types in different rooms.

**To insert a ceiling inside a room:**

1. Make sure the location you want to insert the ceiling on is the current location in the building locations drop box.

2. Select **Insert > Ceilings > Ceiling by Room**, or click  on the Building toolbar.
3. In the catalog, select the ceiling type you want to insert.
4. Mouse over the room to which you want to add a ceiling (it will highlight), then click inside the room. The ceiling is added automatically. (If you want, you can continue adding ceilings to other rooms.)
5. Right-click and select **Finish** from the shortcut menu.


**Note:** By default, ceilings inserted with the Ceiling by Room tool extend to the inside edge of the wall core (e.g. stud wall). If you prefer that they extend to the interior wall surface, you can define this in your program settings prior to inserting them. See Defining the Extents of Ceilings to be Inserted in Rooms on page 89.

## Inserting a Ceiling By Picking Points

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Using the Ceiling by Picking Points tool you can insert a ceiling by picking points to define the ceiling's outline. This lets you create a ceiling of any shape and size, anywhere in the drawing area.

### To create a ceiling by picking points:

1. Make sure the location you want to insert the ceiling on is the current location in the building locations drop box.
2. Select **Insert > Ceilings > Ceiling by Picking Points**, or click the down arrow next to the Ceilings button  on the Building toolbar and select **Ceiling by Picking Points**.
3. In the catalog, select the ceiling type you want to insert.
4. Select a start point for the ceiling outline.
5. Continue selecting points until the outline is defined. (You do not have to select the start point again because the last point you pick is always closed back to the start point.)
6. Right-click and select **Finish**.

## Creating a Tray Ceiling

A tray ceiling slopes upward with one or more steps prior to reaching a flat portion. This decorative ceiling treatment is often used to add volume or height to a room.

You can create a tray ceiling by changing a ceiling's type to Tray in its properties, then defining the tray height, skirt width and slope angle.

### To create a tray ceiling:

1. Create a regular flat ceiling in the room that you want to have a tray ceiling.
2. Select the ceiling.
3. Right-click and select **Properties**.
4. In the **Ceilings** dialog, click the **Tray** option in the *Type* area.
5. In the *Properties* area, click the **Tray Height** option, then type the desired distance from the base of the ceiling to the raised flat portion. This defines the height of the tray.
6. Click the **Skirt Width** option, then specify the desired distance from the outer edge of the ceiling to the edge of the tray.
7. Click the **Edge Shape** option, then select either *Straight*, *Gable* or *Arched*.

**Straight.** Creates straight tray edges that can be angled.

**Gable.** Creates straight tray edges and leaves one side open on the tray so that the tray can fit up against a wall.

**Arched.** Creates curved tray edges.

8. If you selected the *Straight* edge shape, specify the desired angle for the tray's edges in the **Slope Value** edit box. To specify the method that you would like to use to specify the slope value, choose either *Degrees*, *? in 12*, *1 in ?*, or *Percent* from the **Slope Type** drop box.
9. If you selected the *Arched* edge shape, specify the following values:

**Start Angle.** The angle of the start of the curve, measured from the base of the ceiling to the center of the starting curve. Choose a value from 1° to 90°.

**End Angle.** The angle of the upper portion of the curve, measured from the center of the ending curve to the top of the tray.

**Radius.** The distance from the base of the ceiling to the center of the curved edge.

- Click **OK**.

## Creating a Cathedral Ceiling

A cathedral ceiling is a high, vaulted, open ceiling that can be arched or slant upward to a point.

You can create a cathedral ceiling by changing a ceiling's type to Cathedral in its properties, then defining the ceiling's edge conditions.

### To create a cathedral ceiling:

- Create a regular flat ceiling in the room that you want to have a cathedral ceiling.
- Select the ceiling.
- Right-click and select **Properties**.
- In the **Ceilings** dialog, click the **Cathedral** option in the *Type* area.
- Click the **Skirt Width** option, then specify the distance from the edge of the ceiling at which you want the ceiling to start sloping upward. If you want the ceiling to start sloping directly from the outer edges, specify a value of 0.
- Click the **Edge Shape** option, then select either **Straight**, **Gable** or **Arched** to define the shape of the ceiling's sloping edges.

**Straight.** Creates straight edges that can be angled.

**Gable.** Creates straight edges and leaves one side open so that the ceiling can fit up against a wall.

**Arched.** Creates curved edges.

- If you selected the **Straight** edge shape, specify the desired angle for the sloping edges in the **Slope Value** edit box. To specify the method that you would like to use to specify the slope value, choose either *Degrees*, *? in 12*, *1 in ?*, or *Percent* from the **Slope Type** drop box.
- If you selected the **Arched** edge shape, specify the following values:

**Start Angle.** The angle of the start of the curve, measured from the base of the ceiling to the center of the starting curve. Choose a value from 1° to 90°.

**End Angle.** The angle of the upper portion of the curve, measured from the center of the ending curve to the top of the ceiling's peak.

**Radius.** The distance from the base of the ceiling to the center of the curved edge.

**Vert. Distance.** The distance from the base of the ceiling to the peak.

- Click **OK**.

**Note:** If you are creating a cathedral ceiling, you need to make sure your roof is steep enough to accommodate the ceiling. Otherwise, the ceiling will go through the roof.

## Defining the Extents of Ceilings to be Inserted in Rooms

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By default, a ceiling inserted with the Ceiling by Room tool extends to the inside edge of the wall core (e.g. stud wall). If you prefer you can set the ceiling to extend to the interior edge of the interior wall surface (e.g. drywall) instead. This is an insertion setting that is defined in your program settings. Changing this setting has no effect on ceilings that have already been inserted. It only affects ceilings that you are going to insert with the Ceiling by Room tool. If you want to change the extents of an existing ceiling you can click and drag its editing grips.

### To define the extents of ceilings to be inserted with the Ceiling by Room tool:

- Select **Settings > Document Settings** or click  on the Settings toolbar.



2. In the **Document Settings** dialog, click **Building Aids** in the left column.
3. In the *Insertion by Room* area, click the drop box next to the **Ceilings** item.
4. If you want ceilings in rooms to extend to the wall core, select **Wall Core**. If you want them to extend to the interior wall surface, select **Wall Surface**.
5. Click **OK**.

## Resizing or Reshaping a Ceiling

You can resize or reshape a ceiling by clicking and dragging its edges and corners.

### To resize or reshape a ceiling:

1. Select the ceiling by clicking on one of its edges. If you want to resize the ceiling, click on the edge that you want to adjust. A solid blue grip appears on the edge you selected, and hollow blue grips appear at each corner of the ceiling surface.
2. To resize the ceiling, hover your pointer over the solid blue grip, then click and drag the ceiling edge to adjust the ceiling size. Alternatively you can select the **Move Edge** tool on the right-click menu.
3. To reshape the ceiling, hover your pointer over one of the corner grips, then click and drag the corner to adjust the ceiling shape. Alternatively you can select the **Stretch** tool on the right-click menu.

If you would like to stretch only a portion of a ceiling edge, you can accomplish this by adding a node to the ceiling edge. For example, you may want to stretch a portion of a ceiling into the foyer or closet. See *Adding a Node to a Ceiling* on page 90.

## Adding a Node to a Ceiling

You can add nodes to a ceiling edge to create more grips along the edge. You can then click and drag a grip on a specific segment to reshape that portion of the ceiling.

### To add a node to a ceiling:

1. Select the ceiling.
2. Right-click and select **Add Node**, or select **Edit > Modify Elements > Add Node**.
3. Click on the point on the ceiling edge where you want to add a node. The edge is split into separate edges, each with its own grips for moving and stretching.

## Cutting Openings in Ceilings

You can create an opening in a ceiling using the Cut Opening tool. You create the opening by picking points to define its size and shape.

### To cut an opening in a ceiling:

1. Select the ceiling by clicking on one of its edges.
2. Right-click and select **Cut Opening**, or select **Edit > Modify Elements > Cut Opening**.
3. Select a start point for the opening.
4. Continue selecting points to define the opening. As you select points, the opening is created. The last point picked is always connected back to the start point to form a closed shape, so you don't have to select the start point again.
5. Right-click and select **Finish**.

## Resizing or Reshaping Ceiling Openings

If you have created an opening in a ceiling, you can resize or reshape the opening by clicking and dragging its edges or corners.

### To resize or reshape a ceiling opening:

1. In 2D plan view, click on the opening edge you want to move.
2. To resize the opening, hover your pointer over the center blue grip of the edge that you want to move, then click and drag the edge to adjust the opening size.



3. To reshape the opening, click and drag a corner grip.

## Removing an Opening from a Ceiling

You can remove an opening from a manually inserted ceiling using the Remove Opening tool. A manually inserted ceiling is one that was inserted with either the Ceiling by Room, Ceiling by Perimeter or Ceiling by Picking Points tool.

**Note:** You cannot remove an opening from a manually inserted ceiling using Delete.

### To remove an opening from a manually inserted ceiling:

1. Click on the edge of the ceiling or opening to select the ceiling.
2. Right-click and select **Remove Opening**, or select **Edit > Modify Elements > Remove Opening**.
3. Click on the edge of the opening. The opening is removed.



# Chapter 10: Stairs, Ramps & Railings

If your design has more than one floor, you'll want to insert a staircase. The catalog contains a variety of stair and ramp styles, including straight, spiral, fold-back, L-shaped and L-winder. There are even stairs specifically for decks and porches.

You can edit the composition and dimensions of each component in your staircase to create the exact look you want. Stairs and ramps are inserted as solid objects with point-and-click simplicity. Just select the staircase or ramp you want to insert in the catalog, then click to insert it in your model.


The catalog also contains an excellent selection of railing types. A railing can be just a handrail, or a balustrade with posts, top/bottom rails and newels. You can insert railings on a staircase automatically. You can choose to put it on both sides, the left side, the right side, or the center. You can also draw a horizontal railing by picking points.

## Inserting Stairs and Ramps

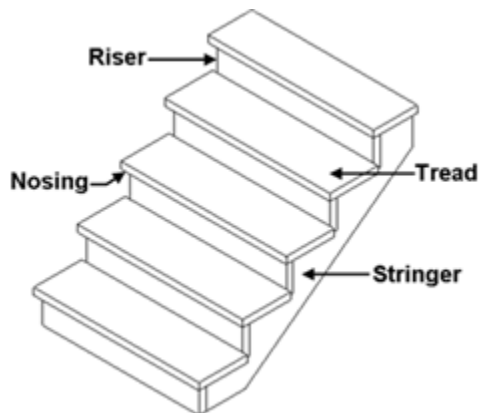
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You can insert a staircase or ramp with a single mouse click. If you place the staircase near a wall, the staircase will automatically snap to the wall. Once you have inserted a staircase, you can edit its size, style and geometry.

### To insert a staircase or ramp:

1. In the building locations drop box, select the location where you want to insert the base of the staircase.
2. Select **Insert > Stairs/Ramps**, or click  on the Building toolbar.
3. In the catalog, select the staircase or ramp you want to insert.
4. Position the staircase and click to insert it.
5. Right-click and select **Finish**.

## Parts of a Staircase



## Editing Stair Size Properties

You can edit the general dimensions of a staircase, such as height, width, and number of steps.

### To edit stair size properties:

1. Select the staircase whose stair properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Stairs/Ramps** dialog, edit the dimensions in the *Properties* window.

**Overall Height.** The vertical distance from the base of the staircase to the top of the staircase. Generally this is the distance from one floor to the next.

**Total Steps.** The total number of steps in the staircase including all treads and landings. This value is controlled by the Overall Height and Riser Maximum, so you can only go so high or so low when specifying the total number of steps.

**Riser Height.** The distance from the top of one tread to the top of the next tread. The riser height adjusts if you edit the Overall Height or Total Steps, making this a read-only value.

**Tread Run.** The width of a step from the nose of the step to the riser of the next step.

**Riser Maximum.** The maximum height allowed for risers. The riser height adjusts when you change the Overall Height or Total Steps variables.

**Show Riser.** Inserts vertical boards under the treads. If turned off, the stairs are open under the treads.

4. Click **OK**.

## Editing a Staircase Layout

You can choose from a multitude of preset staircase layouts and edit the dimensions of individual segments to suit your needs.

### To edit a staircase layout:

1. Select the staircase whose stair properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Stairs/Ramps** dialog, select the Layout tab.
4. To change the layout of the staircase, make a selection from the *Preset Layouts* drop box, or click the graphic to display the available layouts and select the one you want.
5. To edit the dimensions of a particular segment, select the segment in the *Layout Segments* window. For example, an L-shaped staircase will have three segments: Stair 1, Landing 2 and Stair 3. The Stair 1 segment is the lower flight of stairs, Landing 2 is the central landing between the two flights, and Stair 3 is the upper flight of stairs.

Different layouts will have different parameters. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the stair graphic, and vice versa.

### Stair Segments

**Number of Steps.** The number of steps in the flight.

**Position Offset.** Shifts the base of the staircase left or right from the center line. A positive value shifts it right, a negative value shifts it left. If the Upper Offset is set to 0, the entire staircase is moved.

**Lower Width.** The width of the bottom step.

**Upper Width.** The width of the top step.

**Upper Offset.** Shifts the top of the stair segment left or right to create an angled flight. A positive value shifts it right, a negative value shifts it left.

**Landing Connection.** Choose from Front, Bottom or Under to determine how the stairs attach to the landing.

**Adjust Width.** If the staircase has multiple segments, this adjusts the width of attached landings and stair flights to match the width settings of the current segment.

**Adjust Height.** When editing the number of risers or height of a segment in a multi-segmented staircase, this determines which other segments (or all others) are to be adjusted to make up the overall height of all segments.

### Landing Segments (vary per style)

**Position Offset.** Shifts the landing left or right. A positive value moves the landing right. A negative value moves it left.

**Width.** The width of the landing along the lower flight of stairs. By default this matches the Upper Width setting of the lower stair flight.

**Depth 1.** The width of the landing along the upper flight of stairs. By default this matches the Lower Width setting of the upper stair flight.

**Depth 2.** The width of the exposed side of the landing.

**Adjust Width.** Adjusts the width of attached stair flights to match the width of the landing.

6. To add a flight or landing to your staircase, click **Add** in the *Layout Segments* area. Select the segment you want to add in the **Add/Edit Segment** dialog.

7. The segment is added to your list of segments in the *Layout Segments* window. Proceed with defining the parameters for the new segment in the *Parameters* window.
8. To change an existing segment to another type, select the segment in the *Layout Segments* window, then click **Edit**. Select the new segment type in the **Add/Edit Segment dialog**.
9. To delete a segment from the staircase, select the segment in the *Layout Segments* window, then click **Delete**.
10. Once you are satisfied with your layout settings, click **OK**.

## Editing Stair Details

Editing stair details lets you precisely control the size and position of treads, risers, stringers and landing platforms.

### To edit stair details:

1. Select the staircase whose stair properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To change the stringer style or create a solid stair, click the appropriate graphic in the *Type* area.
4. To edit tread, riser, stringer and landing details, select the *Details* tab. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the stair graphic, and vice versa.
5. Edit the properties in the *Properties* area.

**Tread Thickness.** The thickness of each step.

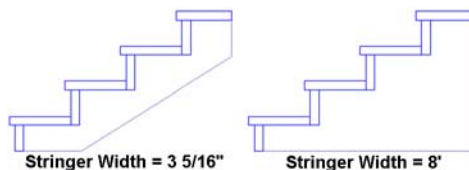
**Nosing Depth.** The distance the step extends past the riser.

**Riser Angle.** The tilt of the riser board. A value of 0 means the board is perpendicular to the step (straight up and down). A value above 0 tilts the riser down toward the back of the staircase. The maximum angle allowed is 20°.



**Stringer Side Offset.** The distance the side stringers are offset from the ends of the treads.

**Stringer Width.** The distance from the bottom of the stringer to the underside of the tread/riser intersection. Setting the stringer width to match the height of your staircase creates a stringer that runs from the staircase right to the floor.



**Stringer Thickness.** The thickness of the stringer member.

**Max Stringer Spacing.** The maximum distance allowed between stringers. If you increase the width of the staircase, additional stringers will be inserted if this spacing is exceeded.

**Landing Thickness.** The thickness of the landing platform.

6. Click **OK**.

## Editing the Appearance of a Stair Cut Line

When viewing a staircase in 2D plan view you can see a cut line through the staircase. The cut line is a standard drafting symbol for stairs.

You can change the cut line's position, size, angle and style. You can also hide it from view if you want.

### To edit the appearance of the cut line:

1. Select the staircase.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Stairs/Ramps** dialog, select the *Details* tab.

4. Edit the settings in the *Cut Line* area.

**Show Cut Lines.** Shows or hides the cut lines in 2D plan view.

**Extension.** The distance the cut line extends past the edge of the staircase in 2D plan view.

**Angle.** The angle of the cut line in 2D plan view.

**Spacing.** If using the *Double* or *Double Arch* style, this is the distance between the lines.

**Elevation.** How high up the staircase the cut line sits.

**Style.** Choose from *Single*, *Single Architectural*, *Double* and *Double Architectural*. The default is *Double Architectural*.

5. Once you've defined your cut line, click **OK**.

## Editing General Ramp Properties

If editing a ramp, you can select a uniform or full style, and edit the ramp thickness and landing thickness. If you want to change the layout (shape) of the ramp or edit properties such as the height or slope, see *Editing the Layout of a Ramp* on page 96.

### To edit ramp properties:

1. Select the ramp.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Stairs/Ramps** dialog, select the Basic tab.
4. If you want to change the ramp type, click on the type you want in the *Type* area. The first type is a ramp with uniform thickness, while the second is a full, wedge-style ramp.
5. If you selected the uniform ramp style, you can change its thickness by entering the desired thickness in the **Ramp Thickness** edit box.
6. To change the thickness of the landing, enter a value in the **Landing Thickness** edit box.
7. Click **OK**.

## Editing the Layout of a Ramp

You can choose from a multitude of preset ramp layouts as well as edit various layout properties such as length and slope.

### To edit the layout of a ramp:

1. Select the ramp.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Stairs/Ramps** dialog, select the Layout tab.
4. To change the layout of the ramp, make a selection from the *Preset Layouts* drop box, or click the graphic to display the available layouts and select the one you want.
5. To edit the dimensions of a particular segment, select the segment in the *Layout Segments* window. A straight ramp will have one segment, named Ramp 1. Other ramp styles will have more segments. For example, an L-shaped ramp will have three segments: Ramp 1, Landing 2 and Ramp 3. The Ramp 1 segment is the lower section of the ramp, Landing 2 is the central landing between the two sections, and Ramp 3 is the upper section of the ramp. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the ramp graphic, and vice versa.
6. Edit the variables in the *Parameters* window.

#### Ramp Segments

**Slope.** The angle of the ramp's incline.

**Length.** The length of the ramp's surface.

**Position Offset.** Shifts the base of the ramp left or right from the center line. A positive value shifts it right, a negative value shifts it left. If the Position Offset is set to 0, the entire ramp is moved.

**Lower Width.** The width of the bottom of the ramp.

**Upper Width.** The width of the top of the ramp.

**Upper Offset.** Shifts the top of the ramp segment left or right to create an angled ramp. A positive value shifts it right, a negative value shifts it left.

**Adjust Width.** For ramps with multiple segments, this adjusts the width of attached landings and ramp flights to match the width settings of the current segment.

**Adjust Height.** When editing the height of a segment in a multi-segmented ramp, this determines which other segments (or all others) are to be adjusted to make up the overall height of all segments.

Landing Segments (vary per style)

**Position Offset.** Shifts the landing left or right from the center line. A positive value moves it right, a negative value moves it left.

**Width.** The width of the landing along the lower ramp section. By default this matches the Upper Width setting of the lower ramp section.

**Depth 1.** The width of the landing along the upper ramp section. By default this matches the Lower Width setting of the upper ramp section.

**Depth 2.** The width of the exposed side of the landing.

**Adjust Width.** Adjusts the width of attached ramp segments to match the width of the landing.


7. To add a segment or landing to your ramp, click **Add** in the *Layout Segments* area. Select the segment you want to add in the **Add/Edit Segment** dialog.
8. The segment is added to your list of segments in the *Layout Segments* window. Proceed with defining the parameters for the new segment in the *Parameters* window.
9. To change an existing segment to another type, select the segment in the *Layout Segments* window, then click **Edit**. Select the new segment type in the **Add/Edit Segment** dialog.
10. To delete a segment from the ramp, select the segment in the *Layout Segments* window, then click **Delete**.
11. Once you are satisfied with your layout settings, click **OK**.

## Inserting Railings on Both Sides of a Staircase or Ramp

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You can insert railings on both sides of a staircase automatically. A railing can be just a handrail, or a balustrade with posts, top/bottom rails and newels.

**To insert railings on both sides of a staircase automatically:**


1. Select **Insert > Railings > Railings on Stairs Automatically**, or click the down arrow next to the Railings button  on the Building toolbar and select **Railings on Stairs Automatically**.
2. In the catalog, select the railing type you want to insert.
3. Click on the staircase. The railings are inserted automatically on both sides.
4. Right-click and select **Finish**.

## Inserting a Railing on the Left Side of a Staircase or Ramp

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A railing can be just a handrail, or a balustrade with posts, top/bottom rails and newels. Using the Railing on Stair Left tool you can insert a railing on the left side of a staircase easily by just clicking two points on the stair.

**To insert a railing on the left side of a staircase:**


1. Select **Insert > Railings > Railing on Stair Left**, or click the down arrow next to the Railings button  on the Building toolbar and select **Railing on Stair Left**.
2. In the catalog, select the railing type you want to insert.
3. Select a point anywhere along the bottom of the staircase (or along the tread where you want the bottom of the railing to sit) to define the level of the railing's bottom post. Your cursor will snap to the left side of the staircase as you start to draw the railing.

4. Select a point anywhere along the top of the staircase (or along the tread where you want the top of the railing to sit) to define the level of the railing's top post.
5. Right-click and select **Finish**.

## Inserting a Railing on the Right Side of a Staircase or Ramp

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A railing can be just a handrail, or a balustrade with posts, top/bottom rails and newels. Using the Railing on Stair Right tool you can insert a railing on the right side of a staircase easily by just clicking two points on the stair.


1. Select **Insert > Railings > Railing on Stair Right**, or click the down arrow next to the Railings button  on the Building toolbar and select **Railing on Stair Right**.
2. In the catalog, select the railing type you want to insert.
3. Select a point anywhere along the bottom of the staircase (or along the tread where you want the bottom of the railing to sit) to define the level of the railing's bottom post. Your cursor will snap to the right side of the staircase as you start to draw the railing.
4. Select a point anywhere along the top of the staircase (or along the tread where you want the top of the railing to sit) to define the level of the railing's top post.
5. Right-click and select **Finish**.

## Inserting a Railing Along the Center of a Staircase or Ramp

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A railing can be just a handrail, or a balustrade with posts, top/bottom rails and newels. Using the Railing on Stair Center tool you can insert a railing along the center of a staircase easily by just clicking two points on the stair.

**To insert a railing along the center of a staircase:**


1. Select **Insert > Railings > Railing on Stair Center**, or click the down arrow next to the Railings button  on the Building toolbar and select **Railing on Stair Center**.
2. In the catalog, select the railing type you want to insert.
3. Select a point anywhere along the bottom of the staircase (or along the tread where you want the bottom of the railing to sit) to define the level of the railing's bottom post. Your cursor will snap to the center of the staircase as you start to draw the railing.
4. Select a point anywhere along the top of the staircase (or along the tread where you want the top of the railing to sit) to define the level of the railing's top post.
5. Right-click and select **Finish**.

## Inserting a Horizontal Railing

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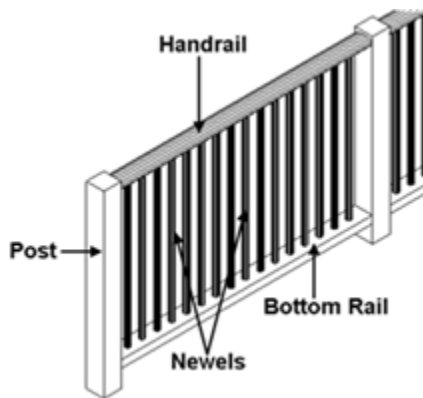
You can use the Railing by Picking Points tool to create a horizontal railing anywhere in your model. You may, for example, want to create a railing around a stairwell, or insert a railing to separate two rooms in your house. You create the railing by picking the start point and end point of the railing. Each point you pick serves as a main post point.

**To insert a railing along a floor:**

1. Make sure the building location that you want to insert the railing on is current.
2. Select **Insert > Railings > Railings by Picking Points**, or click  on the Building toolbar.
3. In the catalog, select the railing type you want to insert.
4. Select the start point for the railing.
5. Select an end point for the railing. You can continue adding sections to the railing if you want.
6. Right-click and select **Finish**.



## Parts of a Railing



## Editing Railing Properties

When editing a railing, you can choose a different railing type as well as control the dimensions and settings of posts, rails and newels.

### To edit railing properties:

1. Select the railing. If the railing has multiple segments, use Shift+click to select the remaining segments.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Railings** dialog, select the Basic tab.
4. To change the railing type, click on the type you want in the *Type* area.
5. To edit the settings of individual railing components, make your changes in parameters window. The available parameters vary depending on the railing type. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the railing graphic, and vice versa.

### Posts

**Include Posts.** Inserts a post at the railing's start point and endpoint, and at points in between defined by the Post Spacing.

**Include First Post.** If disabled, eliminates the post at the start point of the railing.

**Include Last Post.** If disabled, eliminates the post at the end point of the railing.

**Post Spacing.** The distance between intermediate posts in your railing.

**Post Position.** Choosing *From Start* measures the intermediate posts from the start point of the railing. Choosing *Centered* inserts an intermediate post at the center of the railing and measures other intermediate posts from there.

**Post Height.** This value is determined by the handrail and bottom rail heights.

**Post Style.** Choose either *Rectangle* or *Round* for the post shape.

**Post Width.** The width of the post.

**Post Depth.** The depth of the post.

**Post Rotation.** Determines the rotation of the connecting post where two railings connect. Choosing *Half Way* rotates the connecting post half way between the angle. Choosing *None* leaves the connecting post aligned to the first railing.

### Handrail

**Handrail Height.** The height of the handrail above the insertion surface.

**Make Continuous.** Makes the handrail cut through all posts, creating a continuous, solid member.

**Handrail Style.** Choose either a *Rectangle* or *Round* shape.

**Handrail Width.** The width of the handrail (as seen in 2D plan view).

**Handrail Depth.** The depth (thickness) of the handrail.

### Bottom Rail

**Bottom Rail Height.** The height of the bottom rail from the insertion surface.

**Bottom Rail Style.** Choose either a *Rectangle* or *Round* shape for the rail.

**Bottom Rail Width.** The width of the bottom (as seen in 2D plan view).

**Bottom Rail Depth.** The depth (thickness) of the bottom rail.

#### Balusters

**Baluster Spacing.** The horizontal distance between balusters.

**Baluster Style.** Choose either *Rectangle* or *Round* for the baluster shape.

**Baluster Width.** The width of the baluster.

**Baluster Depth.** The depth (thickness) of the baluster.

#### Stair Insertion

**Post Offset.** The horizontal offset of the first post from the bottom of the staircase. Only a positive value can be specified, which moves the post further back along the stairs.

**Side Offset.** Offset of railing from the sides of the treads.


**Connection.** Determines how railings are connected to the staircase. *Connection 2* maintains the distance from the nosing to the railing at all times. *Connection 1* breaks this rule to create a nicer-looking railing.

6. Click **OK**.

## Changing the Length of a Railing

You can lengthen or shorten a railing by clicking and dragging one of its end points.

### To stretch a railing:

1. Select the railing. A grip is displayed at each railing end.
2. Hover your pointer over the railing end you want to stretch. The Lengthen cursor is displayed. 
3. Click and drag to lengthen or shorten the railing, then release your mouse button.

## Stretching a Railing

You can use the Stretch tool to lengthen or shorten a railing and re-position it at the same time.

### To stretch a railing:

1. Select the railing.
2. Right-click and select **Stretch**.
3. Click and drag the railing end you want to adjust, then release the mouse button.

# Chapter 11: Roofs

To complete your structural model, you want to insert a roof over it. The design of your roof can be a major factor in the overall look and feel of your home. Inserting a roof in Envisioneer is incredibly simple. Just click inside your model and the roof is inserted.

Roofs are inserted by location. Therefore, if you have a two-story house, each story may require its own roof if the levels are split. The great thing about roofs in Envisioneer is that you can edit each roof edge individually to achieve the precise geometry, dimensions and appearance you want. This means that virtually any roof configuration is possible, including multiple pitch, multiple plate height roofs. And with a wide selection of roof styles to choose from, including hip, gable, mansard and arched, you can be as creative as you want.

To give your roof design that extra edge, you can add things like dormers, skylights and roof accessories such as solar panels and roof vents, all of which are completely customizable to suit your needs.


## Inserting an Automatic Roof Over Perimeter Walls

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You can use the Roof by Perimeter tool to automatically insert a roof over the perimeter wall layout of a selected building location. If you have a two-story home where the ground floor wall layout is different than the upper story wall layout, and you want each story to have its own roof, you will need to insert a roof on each location.

By default, the roof is inserted directly on top of the walls of the current building location. You can edit the support height as well as change the roof's style and dimensions.

### To insert a roof over an entire wall layout:

1. Make sure the current location is the location containing the walls you want to insert the roof over.
2. Select **Insert > Roofs > Roof by Perimeter**, or click  on the Building toolbar.
3. In the catalog, select the roof type you want to insert. Note that the catalog does not contain gable roofs. If you want to create a gable roof, insert a hip roof first, then convert it to a gable.
4. Click inside the wall perimeter. The roof is inserted automatically.


**Note:** If a roof already exists on the current location, it will be deleted.

## Inserting a Roof By Picking Points

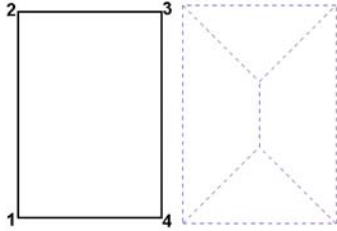
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You can use the Roof by Picking Points tool to create a roof of a custom size and shape by drawing the basic outline of the roof. This option is ideal when you want the roof to cover only a specific area, such as a porch.

### To create a roof by picking points:

1. Make sure the current location is the location containing the walls that you want to insert the roof over.
2. Select **Insert > Roofs > Roof by Picking Points**, or click the down arrow next to the Roofs button  on the Building toolbar and select **Roof by Picking Points**.
3. In the catalog, select the roof type you want to insert. Note that the catalog does not contain gable roofs. If you want to create a gable roof, insert a hip roof first, then convert it to a gable.
- 4.

Select a start point for the roof boundary. Typically you would select an exterior wall corner. Continue selecting points until the boundary is defined. (You do not have to select the start point again because the last point you pick is always closed back to the start point.)



5. Right-click and select **Finish**.

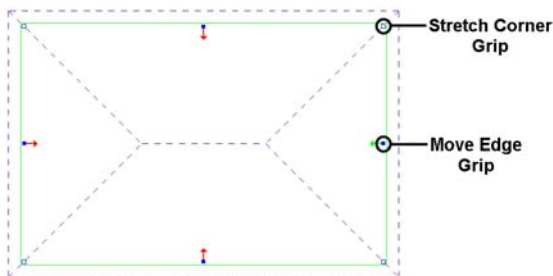
**Note:** If the roof you are inserting runs up against any upper-story walls, the roof will cut around the walls. You can adjust the roof to avoid saddle situations, or to ignore the walls. See *Changing the Way a Lower-Story Roof is Created* on page 102.

**Tip:** You can create any custom, complex roof by drawing the individual surfaces of the roof.

### Selecting a Roof for Editing

You can select a roof by clicking on one of its edges. When you select a roof, the entire roof is selected, and a number of different grips and markers appear on the roof.

General editing tools like Move and Rotate will affect the roof as a whole. By clicking and dragging the solid blue grips at the center of each edge you can move an edge to effectively stretch the roof. By clicking and dragging the hollow blue grips at the corners, you can stretch the corners of the roof to reshape it.



The red and green arrows are surface markers. The green arrow indicates the currently selected surface (roof segment). Changes to most properties, such as the roof type, slope, and overhang distance, affect only the currently selected surface (which is marked by the green arrow). You can make additional surfaces current by simply clicking on the red arrows to change them to green. This lets you apply changes to multiple surfaces simultaneously.

### Changing the Way a Lower-Story Roof is Created

By default, a lower-story roof cuts around upper-story walls where it runs up against upper-story walls. You can adjust the roof to avoid saddle situations if you want. A saddle situation is one where rain or snow runs down the roof slope and collects in areas where the roof meets a wall. You can also have the roof ignore the upper-story walls completely.

**To change the way a lower-story roof is created:**

1. Select the roof, then right-click and select **Properties**.
2. In the **Roofs** dialog, click the **Solution Type** button.
3. In the **Solution Type** dialog, click on the solution you want.
4. Click **OK** in the **Roofs** dialog.

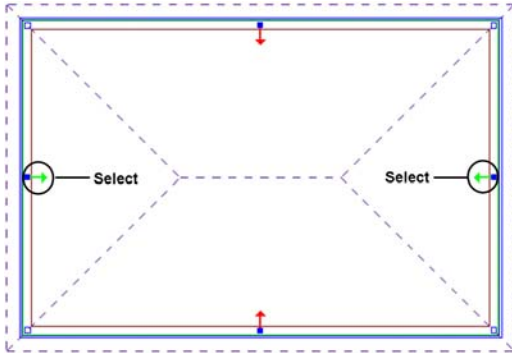
### Converting a Hip Roof to a Gable Roof

To convert a hip roof to a gable roof, you need to select two hip ends, then select the gable roof type in the roof properties.

**To convert a hip roof to a gable roof:**

1. Click on the roof edge of one of the ends you want to convert. The roof is selected, and arrows appear on each roof surface edge. The arrow on the roof edge you selected should be green to indicate that it is the currently selected roof surface.

- Click on the arrow on the opposite roof edge. That arrow turns green also. Both hip ends are now selected.



- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
- In the **Roofs** dialog, click the **Hip** button in the *Roof Shape* area of the Basic page.
- In the **Roof Shape** dialog, click the **Gable** graphic.
- Click **OK** in the **Roofs** dialog. The roof is converted.

**Note:** By default, gable ends on a roof do not display a wall or material within the pitched area of the roof. To extend the wall beneath a gable end to the pitched edges of the roof, see *Extending Walls to the Roof* on page 44. To display a separate wall in the pitched area, see *Displaying Walls Beneath Gable Ends* on page 103. To display a material in the pitched area rather than an actual wall, see *Defining the Material at Gable Ends* on page 103.

## Defining the Material at Gable Ends

If you have converted hip roof ends to gable roof ends, you can choose to display a material such as siding within the gabled areas by enabling the **Display Gable** option in the roof's properties and selecting a material for the roof's **Gable End** component. You can also choose to display no material at all at gable ends, or choose to display an actual wall. Note that the **Gable End** material setting does not apply if you have chosen to display an actual wall beneath gable ends in the roof's properties. Also, should you choose to display a material instead of a wall, the material will have no framing associated with it.

### To change the appearance of raked surfaces under gable ends:

- Click on a roof edge to select the roof.
- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
- If you want to display a material within the pitched areas of the roof's gable ends, enable the **Display Gable** check box on the Basic property page. If you do not want to display a material at all, disable this check box. (If you would like to display an actual wall instead of just a material, click in the **Wall Type** field below the **Display Gable** check box and select a wall from the catalog. See *Displaying Walls Beneath Gable Ends* on page 103.)
- If you are displaying a material (rather than a wall) at gable ends, select the **Appearance** tab.
- In the *Components* list, select **Gable End**.
- In the *Material* area, click the **Select** button.
- In the **Materials** dialog, select the material you would like to use, then click **OK**.
- Click **OK** in the **Roofs** dialog.


**Note:** If the **Display Gable** option is enabled and you do not select a wall type to display, the material specified for the **Gable End** component on the **Appearance** page will automatically be displayed at the selected gable end. If you want to display an actual wall instead of just a material at gabled ends, see *Displaying Walls Beneath Gable Ends* on page 103.

## Displaying Walls Beneath Gable Ends

If you have converted hip roof ends to gable roof ends, you can choose to display a wall within the gabled areas of the roof (above the main wall). This can be any wall type in your catalog and can be different from the main wall type below it. When you choose to display a wall at a gable end, the wall can be selected and edited independently of the main wall that supports it. If you choose a framed wall, you can view and edit its framing properties just like any other wall in your model. Note

that you can specify different wall display settings for each individual gable end in your roof, as making this change applies to selected roof edges only.

**To display walls beneath gable ends:**

1. Click on the roof edge where the gable end is located. The roof is selected, and the arrow on the selected roof edge is displayed in green. If you want to apply the same change to other gabled ends, click on their arrows to turn them green as well. Make sure all other arrows are red.
2. Right-click and select **Properties**.
3. In the **Roofs** dialog, enable the **Display Gable** check box on the Basic property page.
4. Click in the **Wall Type** field below the **Display Gable** option, then click  to display the **Catalog Access** dialog.
5. Select the wall type that you would like to display in the gabled area, then click **OK**. The selected wall type is displayed in the **Wall Type** field.
6. Click **OK** in the **Roofs** dialog.
7. Look at the gabled ends in 3D. If the wrong material appears to be displayed on the exterior side, you will need to flip the wall. See Forcing Wall Sides to be Exterior on page 43.

**Note:** Make sure that the tops of the main walls beneath the gabled ends of the roof are set to 'Level' instead of 'Auto Extend', 'Slope' or 'Step' in their properties. Otherwise, the main wall will extend up and over the gable end wall, resulting in extraneous wall surfaces in the gabled area.

**Note:** If you would prefer to display a simple material in the gabled areas instead of an actual wall, do not select a wall type in the Wall Type field. Instead, go to the Appearance property page and select the desired material for the Gable End component. See Defining the Material at Gable Ends on page 103.

## Stretching a Roof



You can stretch a roof by clicking and dragging its grips or by using the Stretch or Move Edge tools on the roof's right-click menu. Each method has different options and results.

When **grip editing**, clicking and dragging the center grip on a roof edge moves the edge uniformly in the direction you drag. Clicking and dragging a corner grip stretches only that corner, allowing you to reshape the roof surface if desired. Using the click-and-drag method maintains the support height of the roof surface.


The **Stretch** tool allows you to stretch the corners of a roof edge, allowing for reshaping if desired. When using the Stretch tool, the Commander becomes active allowing you to specify a precise stretch distance and direction. Also, the support height of the roof surface is maintained.

The **Move Edge** tool moves the edge of a roof surface in the direction you specify. There are two options when stretching a roof edge using the Move Edge tool. You can either maintain the support height of the stretched portion or allow the support height to adjust. When using the Move Edge tool the Commander is active so that you can specify a precise move distance and direction if desired.


**To stretch a roof by clicking and dragging:**

1. Click on a roof edge to select the roof.
2. To uniformly stretch the edge of a roof surface, hover your pointer over the solid blue grip at the center of the roof edge you want to move. The Move cursor is displayed. 
3. To stretch the corner of a roof surface, hover your pointer over the hollow blue grip at the corner you want to stretch. The Stretch cursor is displayed. 
4. Click and drag to stretch the roof, then release your mouse button.

**To stretch or reshape a roof with the Stretch tool:**

1. Click on a roof edge to select the roof.
2. Right-click and select **Stretch**. Your pointer becomes the Stretch cursor. 
3. Click and drag the corner of the roof surface that you want to move, then release your mouse button. Or, select a start point for the move, then enter the desired move distance and direction in the Commander.

**To move a roof edge and maintain its support height:**

1. Click on a roof edge to select the roof.
2. Hover your pointer over the solid blue grip at the center of the roof edge you want to move. The Move cursor is displayed. . Or, right-click and select **Move Edge > Maintain Support Height**. Selecting the Move Edge tool activates the Commander so that you can see or specify the precise stretch distance.
3. Click and drag to stretch the roof, then release your mouse button. If you selected the Move Edge tool you can also pick a start point for the move, then type a stretch distance in the Commander and press Enter to complete the stretch.

**To move a roof edge and allow its support height to adjust:**

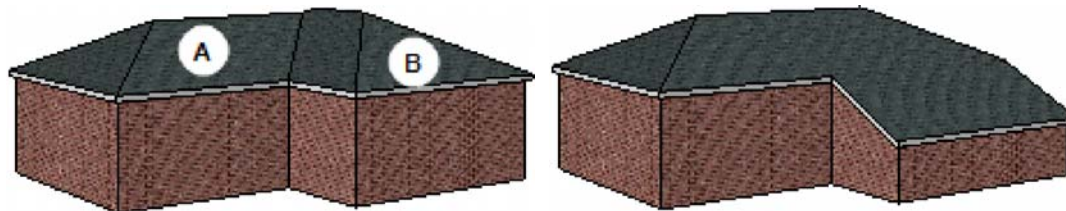
1. Click on a roof edge to select the roof.
2. Right-click and select **Move Edge > Adjust Support Height**.
3. Click and drag to stretch the roof, then release your mouse button. Or, pick a start point for the move, then type a stretch distance in the Commander and press Enter.

**Note:** When using the **Move Edge - Adjust Support Height** tool, you cannot stretch a roof so that it extends below the floor level of the building location on which the roof resides.

**Note:** If your roof was inserted automatically and you stretch your exterior wall layout, the roof stretches with it, eliminating the need to stretch the roof separately.

**Matching Roof Planes**

Use the Match Planes tool to instantly change the plane of one roof surface to match the plane of another. In the following example, surface **A** is selected as the plane to match, and then surface **B** is selected as the plane to change. Surface **B** then has the same plane as surface **A**. Notice that the support height of the surface **B** lowers to allow for the adjustment to the plane.



Surface A is the primary surface

Surface B is matched to surface A

**To match roof planes:**

1. Click on the roof to select it, then right-click and select **Match Planes**. Or, select **Edit > Modify Elements > Match Planes**.
2. Click on the roof surface whose plane you want to apply to another surface (i.e. the plane you want to match **to**). In 2D plan view click on the edge of the surface to select it. In 3D click anywhere on the surface to select it.
3. Click on the roof surface whose plane you want to match with the plane of the first surface selected. The plane adjusts.
4. Right-click and select **Finish**.

**Note:** The Match Planes tool is only available for roofs created with a Roofs tool. It is not available if the roof has been created with the Surfaces tool, or converted to surfaces.

**Note:** Both surfaces must be running in the exact same direction.

**Reshaping a Roof**

You can stretch the corners of a roof to change the shape of its perimeter.

**To reshape a roof:**

1. Click on a roof edge to select the roof.



2. Click and drag the hollow blue grips at the corners of the roof, then release your mouse button. Alternatively you can use the **Stretch** tool on the right-click menu.

## Breaking a Roof Surface

You can use the Break tool to insert a break on a roof surface edge. This splits the surface into two surfaces that can be edited individually.

### To break a roof surface:

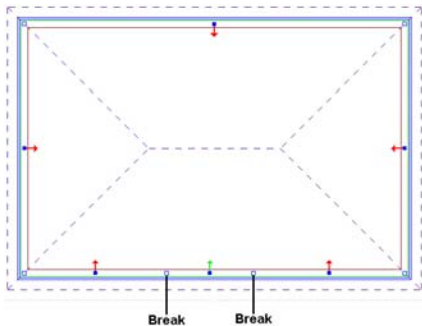
1. Select the roof.
2. Right-click and select **Break**, or select **Edit > Modify Elements > Break**.
3. Click on the edge of the surface you want to break at the point where you want to break it. A new grip appears at the break point.

## Creating Gables Mid-Fascia

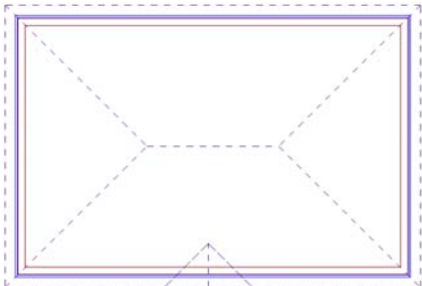
You can create a gable on any fascia edge by inserting two break points to create a new surface, then changing the shape of the new surface to a gable.

### To create a gable mid-fascia:

1. Select the roof.
2. Right-click and select **Break**, or select **Edit > Modify Elements > Break**.
3. Insert a break point on the fascia to define the start of the gable segment.
4. Select the **Break** tool again and insert another break point on the fascia to define the other end of the gable segment. A new surface is created between the two break points.



5. Click on the new surface's arrow to change it to green. If any other arrows are green, click them to change them to red.
6. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
7. Click the graphical button in the *Roof Shape* area.
8. In the **Roof Shape** dialog, click on the **Gable** option.
9. Click **OK**. The mid-fascia segment is converted to a gable.





## Editing the Basic Properties of a Roof Surface

Basic roof properties include Shape, Slope, Overhang Distance, Fascia Distance, etc. Changes are applied to the currently selected roof surface. You can edit multiple roof surfaces simultaneously if you want. Each surface in a roof can have different settings.

### To edit the basic properties of a roof surface:

1. Click on the edge of the surface whose properties you want to edit. The arrow marker on that edge should be green. To select additional surfaces to edit, simply click their arrows to change them from red to green. All surfaces with green arrows will receive the changes.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To convert the currently selected segments to a different roof type, click the graphical button in the *Roof Shape* area, then select a roof type in the **Roof Shape** dialog.
4. To edit the general dimensions and geometry of the roof, edit the values on the Basic page. Note that a gable roof will have fewer properties.

**Thickness.** The combined thickness of all roofing materials, such as shingles and sheathing.

**Slope Type.** The method used to measure the pitch of the roof. Choose from Degrees, ? in 12, 1 in ?, or Percent.

**Slope Value.** The pitch of the roof measured using the Slope Type method selected above.

**Overhang.** The distance from the side wall to the fascia.

**Overhang Drop.** The distance measured vertically from the support point to the underside of the fascia.

**Horiz. Distance.** The maximum horizontal distance allowed from the support point the uppermost point of the underside of the rafter. This is a calculated result from the Slope Value and Vert. Distance variables.

**Vert. Distance.** The maximum vertical distance allowed from the support point to the uppermost point of the underside of the rafter.

**Fascia Distance.** The distance from the ground to the top edge of the fascia board.

**Display Gable** (gables only). If the currently selected roof edge is a gable, you can choose what you want to display beneath the pitched edges of the roof (**None**, **Surface** or **Wall**).

The **None** option displays no material.

The **Surface** option displays a material such as siding, but no framing. The gable end material is defined on the **Appearance** tab.

The **Wall** option displays an actual wall from the catalog.

**Note:** If using the **Surface** or **Wall** option, make sure that the *Wall Top* of the main wall that supports the roof is set to *Level* and not *Auto Extend*, *Slope* or *Step*.

5. Click **OK**.

## Editing the Height of a Roof Surface

You can raise or lower a roof surface by editing its Support Height variable.

### To edit the height of a roof surface:

1. Click on the edge of the surface whose height you want to adjust. The surface's arrow should be green. To select additional surfaces to adjust, simply click their red arrows to change them to green arrows. The change applies to those surfaces marked with a green arrow, not the whole roof.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Roofs** dialog, select the Support and Details tab.
4. Edit the value in the **Support Height** edit box.
5. Click **OK**.

## Editing a Roof's Frame Details

You can choose to frame with rafters or trusses. You can also select the members you want to use and edit the precise dimensions of your roof's framing configuration.

### To edit a roof's framing details:

1. Click on a roof edge to select the roof.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To select a member type for each component in the roof frame (rafters, opening headers, fascia board, ridge board, gable board, hip board, valley board), click the **Specify Framing** button on the Basic page. Specify the properties in the **Roof Framing** dialog. See Specifying Roof Framing Options on page 148.
4. In the **Roofs** dialog, select the **Support and Details** tab.
5. Edit the parameters as desired.

**Support Type.** Choose *Truss* or *Rafter*.

**Raised Heel.** The portion of the rafter that rests on the wall plate.

**Birds Mouth.** The notch cut in the lower end of a rafter to fit it to the top plate of a wall.

**Seat.** The horizontal cut that is made when cutting a bird's mouth in a rafter.

#### Fascia

**Depth.** The thickness of the fascia board.

**Plumb.** The ends of the rafters are cut vertically resulting in a 90° fascia board.

**Raked.** The ends of the rafters have an angled cut.

#### Soffit

**Plumb.** Creates a flat soffit that is parallel with the ground.

**Raked.** Creates a soffit that is angled to match the roof slope.

#### Gable

**Type.** Choose either *Plain*, *Squared*, *Full Hip* or *Half Hip* for the gable return.

**Horizontal.** The horizontal distance of the return when looking at the gable end face on.

**Depth.** The depth of the return.

6. Once you have set your properties, click **OK**.

## Converting a Roof to Surfaces

If you have created a roof using one of the Roofs tools, you can explode the roof into individual surfaces. This allows for more in-depth editing and customization.

### To convert a roof to surfaces:

1. Click on a roof edge to select the roof.
2. Right-click and select **Convert Roof to Surfaces**, or select **Edit > Modify Elements > Convert Roof to Surfaces**.
3. In the **Catalog Access** dialog, select the desired surface material for the roof.
4. Click **OK**. The roof is converted.

Note that the framing on adjoining surfaces will adjust intelligently so that only one member is present along each adjoining edge instead of two.

To ensure that roof elements are correctly represented in 3D, and quantified correctly in the project estimate, you can use the Roof Edge Type Editor on the Surfaces menu to verify and specify properties for each roof edge.

## Inserting an Opening in a Roof

Once you have created a roof, you can insert a custom opening in it of virtually any shape and size using the Cut Opening tool. You create the opening by picking points to define its outline.

**To insert an opening in a roof:**

1. Select the roof by clicking on one of its edges.
2. Right-click and select **Cut Opening**, or select **Edit > Modify Elements > Cut Opening**.
3. Select a start point for the opening.
4. Continue selecting points to define the opening. As you select points, the opening is created. The last point picked is always connected back to the start point to form a closed shape, so you don't have to select the start point again.
5. When you have selected your final point, right-click and select **Finish**.

**Removing a Roof Opening**

You can remove an opening that you have created in your roof using the Remove Opening tool.

**To remove a roof opening:**

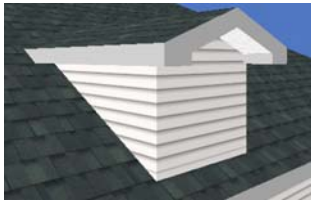
1. Select the roof.
2. Right-click and select **Remove Opening**, or select **Edit > Modify Elements > Remove Opening**.
3. Click on one of the roof opening's corner grips. The opening is removed.

**Note:** You cannot use Delete to remove a roof opening.

**Creating Dormers**

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A dormer is a small structure that projects from a roof slope. Dormers are often used to extend the usable floor area of a second story that is under a moderate to steeply pitched roof. They can be quite effective in opening up cramped rooms under the roof. A typical dormer consists of a roof and three walls. The most common type of dormer is the gable dormer, characterized by the front gable in the roof.



You can also create a dormer without walls. In this case the dormer roof sits on top of the main roof. Its purpose is usually to add character to an otherwise plain roof or to make your roof design more complex. For example, you can insert a dormer roof on your main roof and stretch it to create a porch roof or gable extension.

Dormers are easy to insert - just point and click. You can control the dormer's width, roof type, wall type, and wall height. You can also specify whether or not you want the dormer to have walls.

**To create a dormer:**

1. In the building locations drop box, select the location containing the roof you want to add the dormer to.
2. Select **Insert > Roofs > Dormer Roof**, or click the down arrow next to the Roofs button  on the Building toolbar and select **Dormer Roof**.
3. In the **Dormers** dialog, specify the desired width for the dormer in the **Dormer Width** edit box.
4. Click the **Dormer Roof** button, then select the desired roof type for the dormer. By default, the roof will have a gable front, regardless of the roof type. If you do not want it to have a gable front, uncheck the **Gable Front** check box.
5. If you want your dormer to have walls, check the **Include Walls** check box. Then, click the **Dormer Wall** button and select the desired wall type from the catalog. If you do not want your dormer to have walls, disable the **Include Walls** check box.

Note that dormer walls extend only to the surface of the main roof. As well, an opening is cut in the main roof surface to open the dormer up to the space below.

6. In the **Support height above main roof** edit box, type the height of the dormer's front wall, not including the raked portion between the two roof slopes. You can use this option even if you are not inserting walls to control the position of the bottom of the dormer roof.
7. Click **OK**. The dormer's wall footprint is attached to your cursor.
8. Position the dormer where you want it, then click to insert it. In most cases you would place the front dormer wall directly on top of the exterior wall.
9. Right-click and select **Finish**.


**Note:** If you can't seem to insert the dormer, it means that the dormer is too large for the surface you are inserting it on. You may want to try decreasing the wall height before inserting it.

## Inserting Skylights

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You can insert a skylight in your roof with point-and-click simplicity. The catalog contains a long list of skylights in a variety of sizes.

### To insert a skylight:

1. Select **Insert > Roofs > Skylights**, or click the down arrow next to the Roofs button  on the Building toolbar and select **Skylights**.
2. In the catalog, select the skylight you want to insert.
3. Position the skylight on the roof.
4. Click to insert the skylight.
5. Right-click and select **Finish**.

## Editing the Properties of a Skylight

Skylight properties include height and width, as well as dimensions for the frame and sash.

### To edit the properties of a skylight:

1. Click on the skylight to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the properties in the *Properties* window.

**Height.** The overall height of the skylight window opening.

**Width.** The overall width of the skylight window opening.

**Frame Depth.** The depth of the window frame.

**Frame Width.** The thickness of the window frame.

**Frame Offset.** The offset of the window frame from the roof surface.

**Sash Offset.** The distance the sash sits back in the window frame. The sash is the frame that holds the glass.

**Sash Depth.** The thickness of the sash in plan view.

**Sash Width.** The width of the sash in elevation.


4. Once you've set your properties, click **OK**.

## Inserting Roof Accessories

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You can add elements such as solar panels and roof vents to your roof using the Roof Accessories tool. When you insert a roof accessory on a roof, it inserts directly on the roof surface at the same angle as the roof surface.

### To insert a roof accessory:

1. Select **Insert > Roofs > Roof Accessories**, or click the down arrow next to the Roofs button  on the Building toolbar and select Roof Accessories.

2. In the catalog, select the roof accessory that you would like to insert.
3. Click on the roof surface on which you want to insert the accessory. If you are in 2D plan view, click on the edge of the roof surface. If you are in 3D view you can click anywhere on the surface. The element is attached to your cursor.
4. Position the element where you want it, then click to insert it.
5. Right-click and select **Finish**.



# Chapter 12: Surfaces

You can use the Surfaces tool to create a floor, roof or ceiling surface of virtually any size and shape. You can control the slope of a surface, as well as the elevation of the upper and lower points of the surface. The Surfaces tool can help you handle special or complex construction situations.


A full menu of editing tools are available for editing surfaces, including Move, Rotate, Duplicate, Curve and Cut Opening. You can also join two or more surfaces together to meet your specific construction needs.

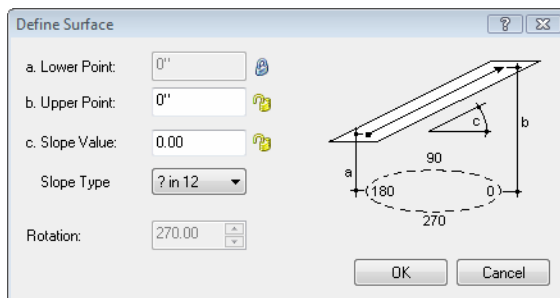
## Creating a Surface

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You can use the Surfaces tool to create a custom floor, roof or ceiling surface. First you draw the surface by picking points, then define its slope. This lets you create a surface of any size, shape or slope, which can be useful in special or complex construction situations.

### To create a surface:

1. Select **Insert > Surfaces > Surfaces**, or click  on the Building toolbar.
2. In the catalog, select the material you would like to use to create your surface.
3. Select two points to define the first edge of the surface. If the surface will be sloped, start by drawing what will be the lower edge of the surface. The surface will incline from this edge.
4. Continue selecting points to define the shape of the surface. As you select points, an arrow is displayed that indicates the direction of the slope. Note that since the surface is always closed, you do not need to pick the start point again to close it.
5. When you have defined the shape, right-click and select **Finish**. The **Define Surface** dialog appears.



If you want the lower edge of the surface to sit at a specific height, enter the height in the **Lower Point** edit box, then click the lock icon to lock that value in. Otherwise, this value will be variable depending on the Upper Point height or Slope Value.

If you want the upper edge of the surface to sit at a specific height, enter the height in the **Upper Point** edit box, then click the lock icon to lock the value in. Either the Lower Point or Slope Value fields must be unlocked in order to be able to enter an upper point value.

If you want the surface to have a specific slope, enter the slope in the **Slope Value** edit box. By default, the slope is measured using the **1 in ?** method. If you use a different method for slope measurement, select it from the **Slope Type** drop box. Other choices are *? in 12*, *Degrees*, and *Percent*. If you choose to lock the slope value, the Lower Point and Upper Point values become variable.

6. In the **Define Surface** dialog, enter values to define the slope of the surface. There are a few different ways to do this:  
If you want the lower edge of the surface to sit at a specific height, enter the height in the **Lower Point** edit box, then click the lock icon to lock that value in. Otherwise, this value will be variable depending on the Upper Point height or Slope Value.

If you want the upper edge of the surface to sit at a specific height, enter the height in the **Upper Point** edit box, then click the lock icon to lock the value in. Either the Lower Point or Slope Value fields must be unlocked in order to be able to enter an upper point value.

If you want the surface to have a specific slope, enter the slope in the **Slope Value** edit box. By default, the slope is measured using the **1 in ?** method. If you use a different method for slope measurement, select it from the Slope Type drop box. Other choices are *? in 12*, *Degrees*, and *Percent*. If you choose to lock the slope value, the Lower Point and Upper Point values become variable.

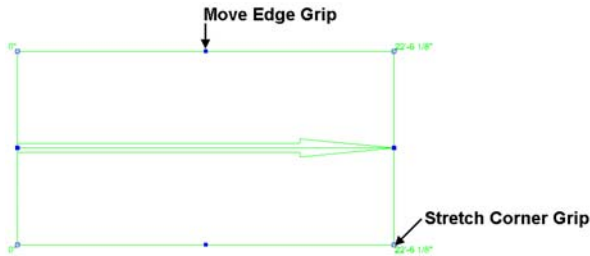
7. Click **OK**.

## Resizing or Reshaping a Surface

You can resize or reshape a surface by clicking and dragging its edges and corners.

### To resize or reshape a surface:

1. Select the surface by clicking on one of its edges.
2. To resize the surface, click and drag the solid blue grips located at the center of each edge. Alternatively you can use the **Move Edge** tool on the right-click menu to move an edge.



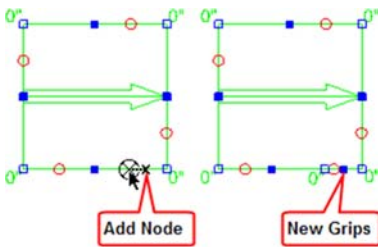
3. To reshape the surface, click and drag the hollow blue grips located at the corners. Alternatively you can use the Stretch tool on the right-click menu. You can add nodes to the surface edges to create more grips for stretching.

## Adding a Node to a Surface

You can add nodes to surface edges to create more grips. You can then click and drag the grips to reshape the surface.

### To add a node to a surface:

1. Select the surface.
2. Right-click and select **Surface Commands > Add Surface Node**, or select **Edit > Modify Elements > Add Surface Node**.
3. Click on the point on the surface edge where you want to add a node. The edge is split into separate edges, each with its own grips for moving and stretching.



## Editing the Slope of a Surface

You can edit the slope of a surface after you have inserted it. You can also edit the lower point and upper point heights.

### To edit the slope of a surface:

1. Select the surface.
2. Right-click and select **Surface Commands > Define Surface**, or select **Edit > Modify Elements > Define Surface**.



3. Edit the values in the **Define Surface** dialog, then click **OK**.

If you want the lower edge of the surface to sit at a specific height, enter the height in the **Lower Point** edit box, then click the lock icon to lock that value in. Otherwise, this value will be variable depending on the Upper Point height or Slope Value.

If you want the upper edge of the surface to sit at a specific height, enter the height in the **Upper Point** edit box, then click the lock icon to lock the value in. Either the Lower Point or Slope Value fields must be unlocked in order to be able to enter an upper point value.

If you want the surface to have a specific slope, enter the slope in the **Slope Value** edit box. By default, the slope is measured using the **1 in ?** method. If you use a different method for slope measurement, select it from the **Slope Type** drop box. Other choices are *? in 12*, *Degrees*, and *Percent*. If you choose to lock the slope value, the Lower Point and Upper Point values become variable.

## Editing the Location of a Surface's Lower or Upper Point

The ends of the arrow on a surface represent the Lower Point and Upper Point of the surface when you are defining the surface. By default, the Lower Point and Upper Point are located on the edges of the surface. You can edit the location of the Lower Point or Upper Point on the surface by adjusting the length of the up-slope arrow.

For example, if you were creating a roof surface, and wanted it to have an overhang of 16", you could move the bottom end of the arrow 16" away from the lower surface edge. You would then enter the roof support height in the Lower Point edit box when defining the surface.

### To edit the length of the arrow:

1. Select the surface.
2. Right-click and select **Surface Commands > Lengthen Arrow**, or select **Edit > Modify Elements > Lengthen Arrow**.
3. Click and drag the ends of the arrow to adjust its length.

## Editing the Up-Slope Direction of a Surface

You can change the up-slope direction of a surface by editing the rotation of the surface arrow.

### To edit the up-slope direction of a surface:


1. Select the surface.
2. Right-click and select **Surface Commands > Define Surface**, or select **Edit > Modify Elements > Define Surface**.
3. In the **Define Surface** dialog, edit the value in the **Rotation** edit box.
4. Click **OK**.

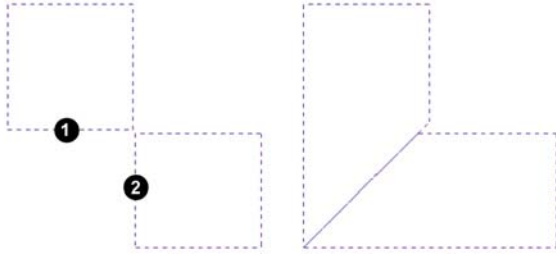
## Joining Surfaces Together

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You can use the Intersect Planes tool to join two surfaces together. To join two surfaces, you select the edge on each surface that you want to extend. The Intersect Planes tool calculates the plane where the two surfaces would intersect in space and extends the surface edges to this plane. This tool is particularly useful when creating a complex roof configuration where different surfaces have different slopes.

### To join two surfaces together:

1. In 2D plan view, select **Insert > Surfaces > Intersect Planes**, or click the down arrow next to the Surfaces button  on the Building toolbar and select **Intersect Planes**.
2. On the first surface, click on the edge that you want to extend.
3. On the second surface, click on the edge that you want to extend. The surface edges are extended to the intersecting plane.

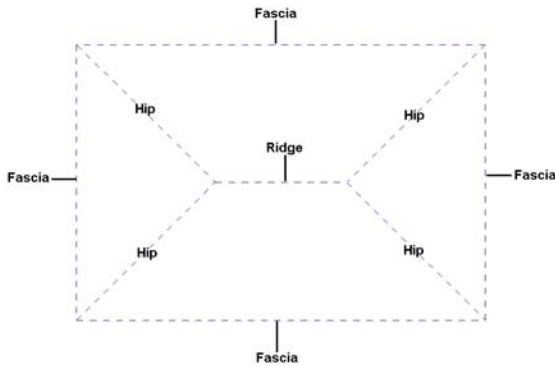


## Defining Roof Surface Edge Properties

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When you convert a roof to surfaces, or create a roof using the Surfaces tool, each edge of a roof has a definition applied to it that determines its appearance in 3D. For example, an edge defined as a Gable may have a gable end return. The roof edge definition also determines the properties of a roof edge, and these properties are calculated in quantity reports - for example, as hip length, ridge length, valley length, and so on.

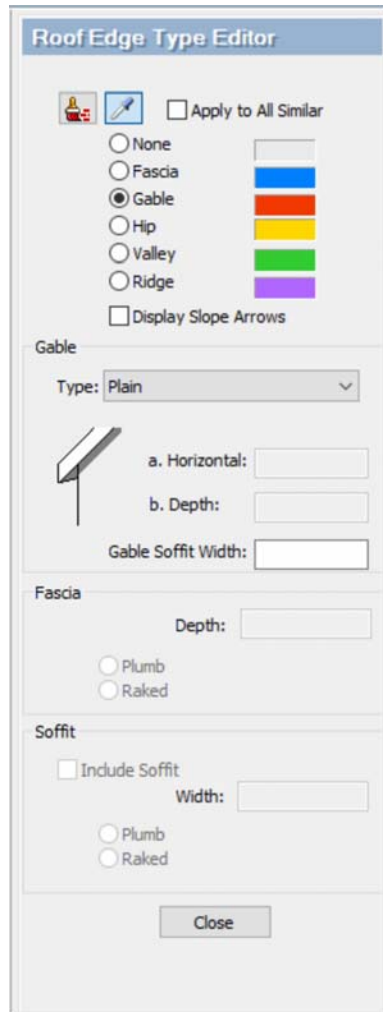
Below are sample roof surface edge definitions for a standard hip roof:



Edges can be defined as a Fascia, Gable, Hip, Valley or Ridge, or have no definition.

### To define a roof surface edge:

1. Select **Insert > Surfaces > Roof Edge Type Editor**. All roof surface edges in your drawing are marked with colored arrows, and the **Roof Edge Type Editor** appears on the right side of the screen:



The color of each arrow indicates the type of each roof edge, as referenced in the editor.

2. To edit a roof edge's type, select the desired option in the **Roof Edge Type Editor**.
3. If **Fascia** is selected as the roof edge type, you can specify the following settings:
  - [Fascia] Depth.** The thickness of the fascia board.
  - Plumb.** The ends of the rafters are cut vertically resulting in a 90° fascia board.
  - Raked.** The ends of the rafters have an angled cut.
  - Include Soffit.** Includes a soffit along the edge.
  - [Soffit] Width.** The width of the soffit.
  - Plumb.** Creates a flat soffit that is parallel with the ground.
  - Raked.** Creates a soffit that is angled to match the roof slope.
4. If **Gable** is selected as the roof edge type, you can specify the following settings:
  - Type.** Choose either *Plain*, *Squared*, *Full Hip* or *Half Hip* for the gable return.
  - Horizontal.** The horizontal distance of the return when looking at the gable end face on.
  - Depth.** The depth of the return.
  - Gable Soffit Width.** The width of the soffit along the gable edge.
5. To display arrows that indicate slope directions on your roof, enable the **Display Slope Arrows** check box.

6. Click on the arrow to which you want to apply the change.
7. When you have finished, click **Close**.

## Editing Roof Surface Edge Details

The fascia, soffit and gable settings on a roof surface's Details property page determine the appearance and construction of roof surface edges defined as Fascias or Gables.

### To edit roof surface edge details:

1. Click on a surface edge to select the surface.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Surfaces** dialog, select the Details tab.
4. Edit the settings as desired. They are described below.

#### Fascia

**Depth.** The thickness of the fascia board.

**Plumb.** The ends of the rafters are cut vertically resulting in a 90° fascia board.

**Raked.** The ends of the rafters have an angled cut.

#### Soffit

**Plumb.** Creates a flat soffit that is parallel with the ground.

**Raked.** Creates a soffit that is angled to match the roof slope.

#### Gable

**Type.** Choose either Plain, Squared, Full Hip or Half Hip for the gable return.

**Horizontal.** The horizontal distance of the return when looking at the gable end face on.

**Depth.** The depth of the return

5. Click **OK**.

## Curving a Surface Edge

You can curve a surface edge using the Curve tool. Once the tool is active, you can click and drag the edge to curve it, or select a point to curve to.

### To curve a surface edge by clicking and dragging:

1. Click on the edge you want to curve.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Click and drag the surface edge to the desired curve.
4. Release your mouse button.

### To curve a surface edge to a selected point:

1. Click on the surface edge you want to curve.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Select the point you want to curve to. The surface edge automatically curves to the point.
4. Click to finish.

## Editing the Thickness of a Surface

You can edit the thickness of a surface on its Basic property page.

### To edit the thickness of a surface:

1. Select the surface by clicking on one of its edges.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the value in the **Thickness** edit box on the Basic page.

4. Click **OK**.

## Cutting an Opening in a Surface

You can use the Cut Opening tool to quickly create an opening of any shape or size.

### To create an opening in a surface:

1. Select the surface.
2. Right-click and select **Cut Opening**.
3. Select a start point for the opening, then continue selecting points to define the size and shape of the opening. Note that you do not have to select the start point again to finish the outline — the last point picked is always connected to the start point.
4. Right-click and select **Finish**.

## Editing Surface Openings

You can resize, reshape and curve openings in a surface in the same way that you would edit the surface itself.

See the following topics:

Resizing or Reshaping a Surface on page 114

Curving a Surface Edge on page 118

## Removing an Opening from a Surface

You can remove an opening from a surface using the Remove Opening tool.

### To remove an opening from a surface:

1. Select the surface.
2. Right-click and select **Remove Opening**, or select **Edit > Modify Elements > Remove Opening**.
3. Click on the edge of the opening that you want to remove.

**Note:** You cannot remove an opening from a surface using Delete.



# Chapter 13: Interiors

The Interiors menu contains just about everything you would ever need to furnish and equip the interior of your home.

You may want to start with the handy Kitchen Builder Wizard to automatically create a kitchen design comprising cabinets and appliances. Just choose the shape, layout and materials you want, and then click to position and size the configuration to your exact specifications. If you prefer you can insert cabinets and appliances individually.

The Bathroom Builder Wizard works in much the same way – just step through the screens to select the layout and components you want, then watch as your bathroom is instantly created.


There are also a number of tools available for laying out utilities and equipment. These include Plumbing, Electrical, Equipment and HVAC.

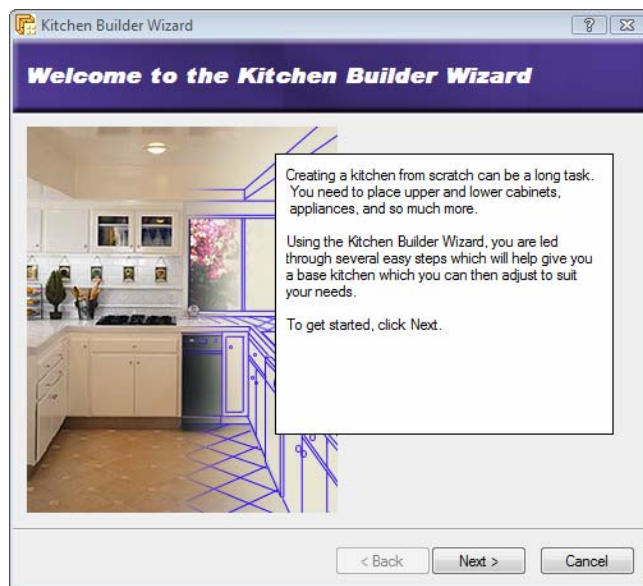
## Creating a Kitchen with the Kitchen Builder Wizard

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Using the Kitchen Builder Wizard you can quickly create a kitchen layout that includes upper and lower cabinets, a sink, refrigerator and stove. There are a number of layouts and styles to choose from.

### To create a kitchen with the Kitchen Builder Wizard:

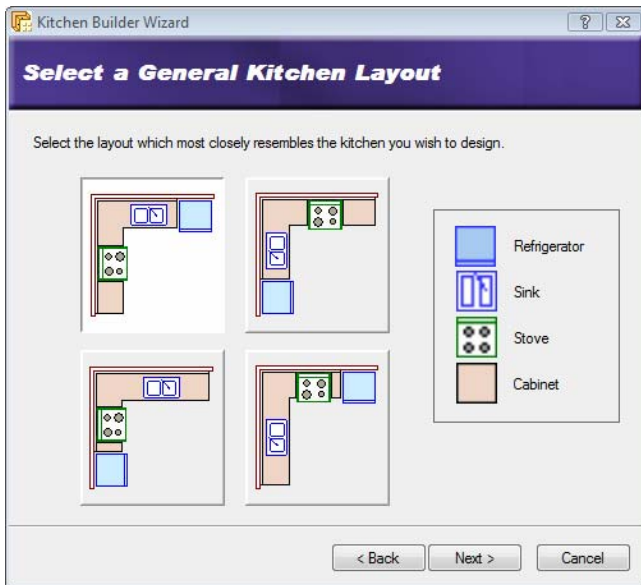
1. Select **Insert > Design Wizards > Kitchen Builder**, or click the down arrow next to the Design Wizards button  on the Building toolbar and select **Kitchen Builder**.



2. Click **Next**.



3. Click on the general style of kitchen you want — L-Shape, Galley or U-Shape.
4. Click **Next**.

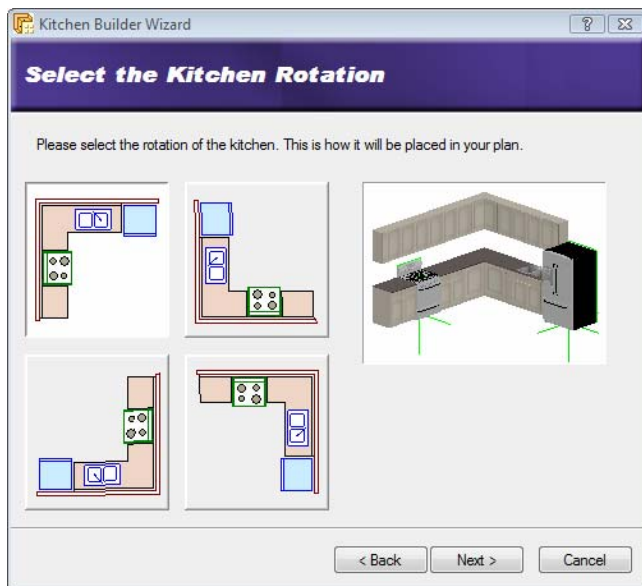


5. Select the layout that most closely resembles the layout you want. Remember that you can move and edit things later.
6. Click **Next**.





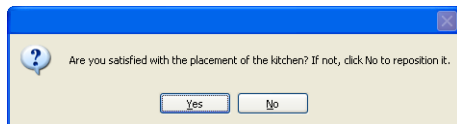
7. Select a general style for your kitchen. The selection you make mainly determines the materials and colors used for the cupboards and countertops.
8. Click **Next**.



9. Select the desired rotation for the kitchen layout by clicking the appropriate graphic.
10. Click **Next**.



11. Click **Finish**. The kitchen configuration is attached to your cursor.
12. Position the kitchen layout in your kitchen area. It will automatically snap to the walls when you get close to them. Click to anchor the kitchen elements. Dynamic dimensions are displayed to show you the size of the layout.
13. If you want you can stretch the layout by simply moving your pointer in the direction you want to stretch.
14. Once the dimensions are correct, click to finish the insertion.



15. Click **Yes** to finish the task. If you click **No** you can reposition or resize the kitchen.


## Creating a Custom Kitchen Wizard Configuration

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A Kitchen Builder Wizard configuration determines what types of cabinets and appliances are used in your kitchen. You are asked to select a configuration for your kitchen when you run the Kitchen Builder Wizard.

You can edit any of the existing configurations that are available in the Kitchen Builder Wizard, or create your own. Customized configurations are saved automatically and will be available when you run the Kitchen Builder Wizard in the current project, or any other project.

### To access the kitchen configuration library:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager** dialog, select **Libraries > Kitchen Configuration**.

### To add a new configuration to the list:

1. Select **Edit > Add Configuration**, or right-click in the Kitchen Configurations window and select **Add Configuration**. An entry named 'New Configuration' is added to the list.
2. Select the new configuration in the list. If you want to rename it, select **Edit > Rename Configuration**, or right-click and select **Rename Configuration**. Then, type the new name and press ENTER.

### To edit a kitchen configuration:

1. Select the configuration in the list. The element selections for the configuration are listed in the center pane.
2. In the center pane, select an element type you want to specify a style for (e.g. Refrigerator).

3. Click the **Select** button.
4. In the **Catalog Access** dialog, select the specific style you want to apply to the selected element type, then click **OK**.
5. Continue selecting styles for the remaining element types.

**To delete a configuration from the list:**


1. Select the configuration in the list.
2. Select **Edit > Delete Configuration**, or right-click and select **Delete Configuration**, or simply press the Delete key on your keyboard.

## Creating a Bathroom with the Bathroom Builder Wizard

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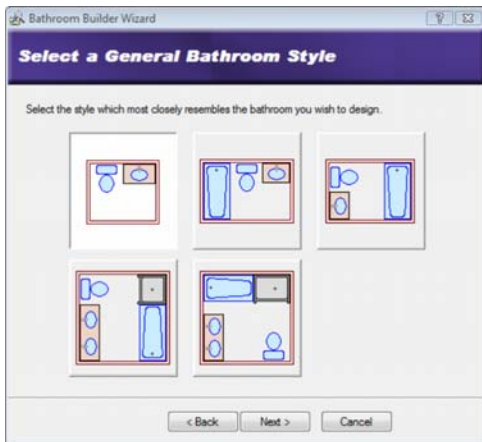
Using the Bathroom Builder Wizard you can quickly and easily create a bathroom layout that includes a cabinet, sink, toilet, tub and shower. There are a number of layouts and styles to choose from.

**To create a bathroom with the Bathroom Builder Wizard:**

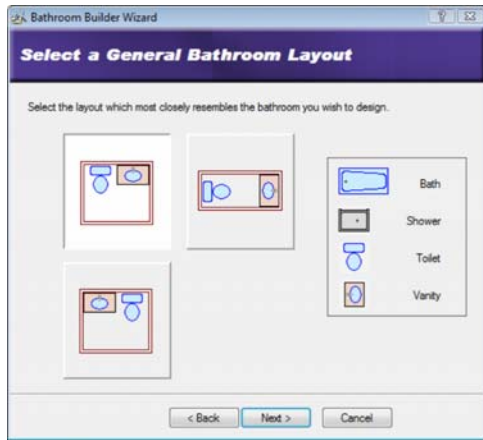
1. Select **Insert > Design Wizards > Bathroom Builder**, or click the down arrow next to the Design Wizards button  on the Building toolbar and select **Bathroom Builder**.



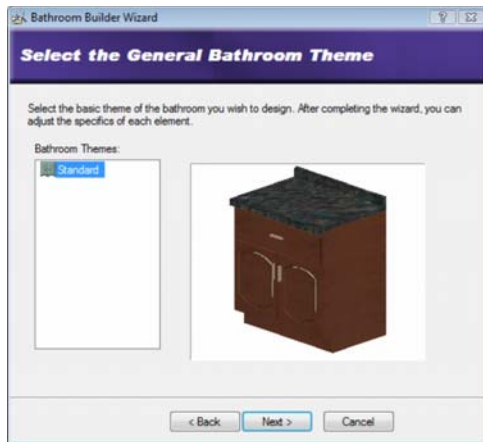
2. Click **Next**.



3. Select the image that contains the elements you want to include in your bathroom.
4. Click **Next**.



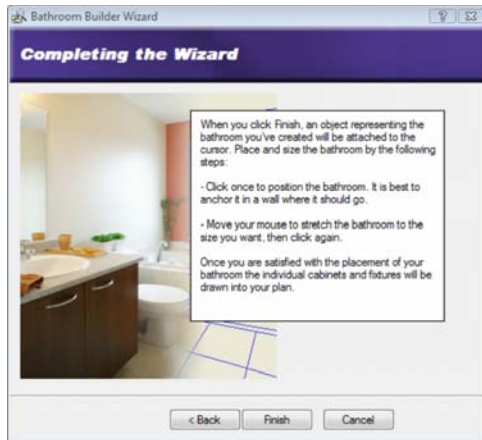
5. Click on the layout you want the bathroom elements to have.
6. Click **Next**.



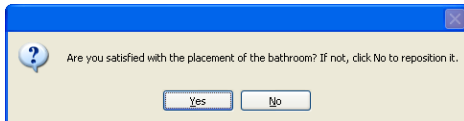
7. Select a style for your bathroom elements. Each style dictates which cabinet, countertop, sink, toilet, tub and shower will be used. Remember that you can edit the properties of individual elements later.
8. Click **Next**.



9. Click on the desired rotation for your bathroom configuration. This is how the configuration will be oriented when you are inserting it in your plan.
10. Click **Next**.



11. Click **Finish**.
12. Position the bathroom layout in your bathroom area. It will automatically snap to the walls when you get close to them. Click to anchor the bathroom elements. Dynamic dimensions are displayed to show you the size of the layout.
13. Move your cursor to stretch the layout to the desired size, then click again to finish.



14. If you are satisfied with the bathroom placement, click **Yes** to finish the task. If you click **No** you can reposition or resize the layout.


## Creating a Custom Bathroom Wizard Configuration

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A Bathroom Builder Wizard configuration determines what types of cabinets and plumbing fixtures are used in your bathroom. You are asked to select a configuration for your bathroom when you run the Bathroom Builder Wizard.

You can edit any of the existing configurations that are available in the Bathroom Builder Wizard, or create your own. Customized configurations are saved automatically and will be available when you run the Bathroom Builder Wizard in the current project, or any other project.

### To access the bathroom configuration library:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager** dialog, select **Libraries > Bathroom Configuration**.

### To add a new configuration to the list:

1. Select **Edit > Add Configuration**, or right-click in the Bathroom Configurations window and select **Add Configuration**. An entry named 'New Configuration' is added to the list.
2. Select the new configuration in the list. If you want to rename it, select **Edit > Rename Configuration**, or right-click and select **Rename Configuration**. Then, type the new name and press ENTER.

### To edit a bathroom configuration:

1. Select the configuration in the list. The element selections for the configuration are listed in the center pane.
2. In the center pane, select an element type you want to specify a style for (e.g. Vanity).
3. Click the **Select** button.
4. In the **Catalog Access** dialog, select the specific style you want to apply to the selected element type, then click **OK**.
5. Continue selecting styles for the remaining element types.

### To delete a configuration from the list:

1. Select the configuration in the list.
2. Select **Edit > Delete Configuration**, or right-click and select **Delete Configuration**, or simply press the Delete key on your keyboard.

## Inserting Cabinets

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Cabinets are essential for storage and can also contribute to the overall look and feel of a room. The catalog contains a huge selection of cabinet types, styles and sizes, all customizable to suit your taste and needs.

Cabinet types include base cabinets, corner cabinets, upper cabinets, islands, pantry cabinets and bathroom vanities.

You can insert cabinets in your design by simply pointing and clicking with your mouse. Cabinets automatically snap to walls and other elements when you get close to them provided Collision Control is turned on.

Note that most cabinets in the catalog have a countertop displayed. If you plan to insert a custom countertop over inserted cabinets with the Countertop tool, you may first want to turn off the **Show Counter** property for those cabinets. See Editing Cabinet Properties on page 128.

### To insert a cabinet:

1. Select **Insert > Interiors > Cabinets**, or click  on the Interiors toolbar.
2. In the catalog, select the cabinet you want to insert.
3. Position the cabinet where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Editing Cabinet Properties

Cabinet properties include cabinet type, size, and leaf style, as well as settings for the counter, shelves, toe space and hardware.

### To edit cabinet properties:

1. Select the cabinet whose properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To change the cabinet type, dimensions or 2D representation, select the **Basic** tab.

To specify the cabinet type, click the **Type** drop box and select either **Base**, **Upper** and **Pantry**. You can then select a style for the cabinet. Cabinet styles and size properties will vary depending on the cabinet type selected. Note that there is a **Spacer** style for filler cabinets.

Use the graphics as guides when determining the cabinet's properties. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the cabinet graphic, and vice versa. Note that if you change the dimensions of a cabinet that has a patterned door leaf, the leaf material will remap itself automatically to match the new cabinet size.

In the **2D Representation** area you can specify whether or not the left and right edges of the cabinet are displayed in 2D.

4. To change the cabinet's leaf style, select the **Leaf** tab.
5. To select a leaf style for the door, select *Door* from the **Apply to** drop box, then make your selections. To select a leaf style for the drawers, if applicable, select *Drawer* from the **Apply to** drop box. Leaf properties vary depending on the leaf style selected. Use the graphics as guides when setting these properties. If you would like to use a custom door leaf that has been imported into the Door Leafs library, select the **Custom** type, then select the desired leaf from the library.
6. To edit the counter, shelving, toe space or hardware details, select the Details tab.

**Show Counter.** Displays a counter on the cabinet.

**Thickness.** The thickness of the counter material.

**Show Backsplash.** Displays a backsplash on the cabinet. The backsplash is a vertical surface designed to protect the wall behind a countertop.

**Thickness.** The thickness of the backsplash material.

**Height.** The distance from the countertop to the top of the backsplash.

**Show Nosing.** Displays nosing (moulded projection) on the front edge of the counter.

**Thickness.** The depth of the nosing.

**Height.** The height of the nosing.

**Radius.** The radius of the curve.

**Show Shelves.** Displays shelves inside the cabinet. The shelves would be visible if the cabinet door is glass.

**Number of Shelves.** The number of shelves you would like to display inside the cabinet.

**Show Toe Space.** Causes the bottom of the cabinet to recess so you can stand close to the cabinet without contacting it with your toes.

**Toe Depth.** The depth of the recess.

**Toe Height.** The height of the recess.

**Show Handle.** Displays handles on the cabinet door and drawers, if present.

**Handle Style.** Choose from Box, Circle or Cylinder. A box style creates a rectangular handle. A circle style creates a round knob. The cylinder style creates a cylindrical handle.

**Distance a.** For pantry cabinets, this is the distance from the bottom of the upper cabinet portion to the top of the door handle.

**Distance b.** The distance from the bottom of the cabinet to the top of the door handle.

7. When you're finished editing properties, click **OK**.

## Inserting a Countertop


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You can insert a countertop anywhere in your drawing by picking points.

The width, thickness and appearance of a countertop is determined by the countertop's properties in the catalog. You control the length and direction of the countertop as you draw it.

Note that most cabinets in the catalog have a countertop displayed. If you plan to insert a countertop using the **Countertop** tool, you may first need to disable the **Show Counter** option in the properties of those cabinets, so that you do not have two countertops. See [Editing Cabinet Properties](#) on page 128.

### To insert a countertop:

1. Select **Insert > Interiors > Countertop**, or click  on the Interiors toolbar.
2. In the catalog, select the countertop that you want to insert.
3. Select a start point. Note that your insertion point is on the center line of the countertop.
4. Move your cursor in the direction you want the countertop to run, then select an endpoint for the countertop. You can continue selecting points in any direction to add more segments to the countertop if you want.
5. Double-click to finish, or right-click and select **Finish**.

## Editing the Properties of a Countertop

You can customize a countertop in the catalog, or one that you have inserted with the **Countertop** tool. For example, you can change its insertion height, width, backsplash, and nosing.

### To edit the properties of a countertop:

1. Select the countertop.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. On the **Basic** tab you can specify the following properties:
  - Type



- Insertion Height
  - Insertion Direction (*Left* or *Right*. Determines which edge the nosing is on.)
  - Thickness
  - Width
  - Backsplash Type (*None*, *Nosing*, *Backsplash*)
  - Backsplash Thickness
  - Backsplash Height
  - Nose Type (*None*, *Nosing*)
  - Nosing Thickness
  - Nosing Height
4. On the **Appearance** tab you can specify the *Layer*, *Material* and *Pattern* for each component of the countertop (2D Component, Surface, Splash).
  5. On the **Quantity** tab you can specify whether or not you want the countertop to be include in quantity reports, and specify quantity properties such as *Price*, *Phase* and *Category*.
  6. Click **OK**.


If the countertop was not inserted with the Countertop tool, and is instead associated with a cabinet, you must edit the countertop through the cabinet properties. On the **Details** tab of the cabinet properties dialog you can specify the thickness of the counter, and whether or not it is displayed. On the **Appearance** tab you can specify the layer, material and pattern for the cabinet's **Counter** component.

## Inserting Appliances

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You can insert a wide variety of kitchen and laundry appliances in your design by simply pointing and clicking with your mouse. Appliances automatically snap to walls and other elements when you get close to them provided Collision Control is turned on.

### To insert an appliance:

1. Select **Insert > Interiors > Appliances**, or click  on the Interiors toolbar.
2. In the catalog, select the appliance you want to insert.
3. Position the appliance where you want it, then click to insert it.
4. Right-click and select **Finish**.


**Note:** If you are inserting a built-in oven, just position it where you want it in the wall and it will snap into place correctly with only the oven door and controls protruding from the wall.

## Inserting Interior Furniture

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The catalog contains a variety of furnishings for every room in your home — everything from beds to CD stands. Furnishings automatically snap to walls and other elements when you get close to them provided Collision Control is turned on.

### To insert furniture:

1. Select **Insert > Interiors > Interior Furniture**, or click  on the Interiors toolbar.
2. In the catalog, select the element you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.




## Inserting Electronics

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Electronics include televisions, computers, clocks and telephones.

### To insert electronics:


1. Select **Insert > Interiors > Electronics**, or click  on the Interiors toolbar.
2. In the catalog, select the element you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Inserting Interior Accessories

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Accessories are those small, personal touches that really pull a room together. They are things like curtains, blinds, towel racks, shower curtains, medicine cabinets, plates, bowls, cups, mirrors and pictures.

### To insert accessories:


1. Select **Insert > Interiors > Interior Accessories**, or click  on the Interiors toolbar.
2. In the catalog, select the element you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Inserting Equipment

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The catalog contains a wide range of functional equipment, including exercise equipment, central vac units, utility boxes and meters, satellite dishes, and garbage disposal units.

### To insert equipment:

1. Select **Insert > Interiors > Equipment**, or click  on the Interiors toolbar.
2. In the catalog, select the element you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Inserting Interior Lighting


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The catalog offers an excellent selection of lighting fixtures for the interior of your home. Interior light fixtures include ceiling lights, wall lights, track lighting, recessed lights, and lamps.

Each lighting fixture has a light source in its property definition, such as an incandescent light bulb. Lights are particularly important if you plan to create a 3D RealView™ of your model, since the program uses light to calculate and create the rendered view.

With the exception of lamps, light fixtures are set to snap to either ceilings or walls depending on what kind of fixture they are.

### To insert a light fixture:

1. Select **Insert > Interiors > Interior Lighting**, or click  on the Interiors toolbar.
2. In the catalog, select the light fixture you want to insert.
3. Position the light where you want it, then click to insert it.
4. Right-click and select **Finish**.

**Tip:** If you switch to Rendered or Rendered Outline display mode, you can see instant lighting effects as you position and insert light fixtures.

**Note:** If you want to insert exterior light fixtures, use the Exterior Lighting tool.

## Changing the Way a Light Snaps Upon Insertion

By default, ceiling lights are set to snap to ceilings, and wall lights are set to snap to walls. Lamps have no snap setting so that you can place them anywhere in a room. You can change a light fixture's snap setting on the fixture's Behavior property page. Note that this applies to interior light fixtures only.

**To change the way a light snaps on insertion:**

1. In the catalog, select the light fixture whose snap setting you want to change.
2. Right-click and select **Edit Element**.
3. In properties dialog, select the Behavior tab.
4. From the **Align Light to** drop box, select either *Ceiling*, *Wall* or *None*.
6. Click **OK** in the **Lights** dialog.

## Editing a Light Fixture's Light Source

A light source is usually a type of light bulb. You can edit a light fixture's light source to achieve a different lighting effect.

**To edit a light fixture's light source:**

1. Select the light fixture whose properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Select the Lights tab.
4. To replace the currently selected light source with another type, click **Edit**, then select a light source from the **Light Sources** dialog.
5. To add a light source to the fixture, click **Add**, then select a light source from the **Light Sources** dialog.
6. To delete a light source from the light fixture, click **Delete**.
7. To edit the position of the light source in relation to the light fixture, specify the X, Y and Z coordinates in the *Light Position* area.

Coordinates are measured from the bottom center of the fixture. The small red box in the preview window indicates the current position of the light source. Changing the X value moves the light source left or right. Selecting Middle positions the light in the center of the fixture, and selecting Minimum or Maximum positions it on the left or right side. If you select Custom you can enter a specific value in the adjacent edit box which is relative to the center position. For example, entering -3 moves the light source 3" left from the center. Changing the Y value moves the light source forward or backward. Selecting Minimum brings the light source all the way forward, and selecting Maximum moves it to the back of the fixture. Changing the Z value moves the light source up or down. Selecting Minimum positions the light source at the bottom of the fixture, while selecting Maximum positions it at the top of the fixture.

8. To edit the orientation of the light source, edit the *Tilt up/down* and *Tilt left/right* values. You may want to do this if your light fixture is angled a certain way. For example, if you have adjustable track lighting, and each fixture is angled at 45 degrees, you will probably want to change the tilt of the light source to 45 degrees as well, so that the light shines at a 45-degree angle instead of straight down.

**Tilt up/down.** The angle of the light beam relative to the floor. A 0-degree tilt means that the light shines straight down.

**Tilt left/right.** The rotation of the light source left or right.

9. Once you've specified the properties, click **OK**.

## Turning a Light On or Off



By default, lights are on when you insert them. You can virtually turn lights on and off in one of two ways:

**Turn the light on/off directly:**

1. Select the light fixture in your drawing.

2. Right-click and select **Light On** or **Light Off**.

#### Edit the light's properties:


1. Select the light fixture.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Select the **Lights** tab.
4. To turn the light on or off, click the eye icon next to the light source name.
  -  Light is turned on
  -  Light is turned off
5. Click **OK**.

## Inserting Electrical Elements

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You can insert electrical elements such as outlets, light switches, thermostats and smoke detectors with a single mouse click. The backs of these elements automatically snap to walls and are inserted at a logical height on the wall, making accurate placement effortless. You can move, raise and lower these elements after you have inserted them.

#### To insert electrical elements:

1. Select **Insert > Interiors > Electrical > Electrical Elements**, or click  on the Interiors toolbar.
2. In the catalog, select the element you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.


**Note:** You can insert outlets throughout a room automatically using the Auto Place Outlets tool.

## Inserting Outlets Throughout a Room Automatically

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You can use the Auto Place Outlets feature to have automatically insert outlets throughout selected rooms in your model. You can move, raise and lower outlets after they have been inserted.

#### To insert outlets automatically:

1. Select **Insert > Interiors > Electrical > Auto Place Outlets**, or click  on the Interiors toolbar.
2. If you are using the Auto Place Outlets tool for the first time, you will be prompted to specify the following settings:
  - Outlet Element.** Click **Select** to choose the outlet that you would like to be inserted.
  - Min. wall length.** The minimum length that a wall must be to eligible for an outlet.
  - Max. distance from outlet.** The maximum distance between one outlet and the next.
  - Max. distance from opening.** The maximum distance that an outlet can be from a wall opening.

The values you specify will be saved as the default values going forward. You can change the default values at any time by selecting **Settings > Document Settings**.
3. Position your cursor inside the room in which you want to place outlets (it will highlight).
4. Click inside the room. Outlets are inserted throughout the room according to the settings you specified.


**Note:** You can insert outlets individually using the Electrical Elements tool.

## Inserting Electrical Wiring

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Once you've inserted electrical elements, you can use the Wiring tool to indicate the location of electrical wiring in your 2D plan. By default, wiring lines have arched segments and use a dashed linestyle. You can stretch and reshape individual segments after you've inserted the line. You can also edit the linestyle. Wiring is only visible in 2D plan view.

**To add electrical wiring:**

1. Select **Insert > Interiors > Electrical > Wiring**, or click the down arrow next to the Electrical button  on the Interiors toolbar and select **Wiring**.
2. Select a start point for the wiring line.
3. Select the next point for the wiring line. An arched line segment is created between the two points. Continue selecting points to add more segments.



4. Right-click and select **Finish**.

**Note:** You can change the line style of individual wires if you want. You can also mark your wiring lines with text.

## Stretching and Reshaping Wiring

You can stretch individual segments in a wiring line by clicking and dragging their grips. Stretching wiring segments can change their length or shape.

**To stretch a wiring segment:**

1. Select the segment you want to stretch. Grips are displayed along the segment.
2. Hover your pointer over the grip that you want to grab and stretch.
3. Click and drag to stretch the line, then release your mouse button.

## Editing the Line Style of Wiring

By default, electrical wiring is displayed using the Electrical Power Distribution line style, which is a brown, dashed line. You can select a different line style for selected wiring segments if you want. For example, you may want to select the Telephone line style for your telephone lines.


**To edit the line style of wiring:**

1. Select one of the line segments you want to change. Use Shift+click to select the remaining segments in the line.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Line Styles** dialog, select the line style you want to use.
4. Click **OK**. The line style is updated in your drawing.

## Selecting a Default Line Style for Wiring

You can select a default line style to use when drawing electrical wiring by editing your Drafting Settings.

**To select a default line style for electrical wiring:**

1. Select **Settings > Drafting Settings**, or click  on the Settings toolbar.
2. In the **Drafting Settings** dialog, select the *Electrical Wiring* item.
3. Click **Settings**.
4. In the **Line Styles** dialog, select the line style you want to use as the default when drawing electrical wiring, then click **OK**.
5. Click **OK** in the **Drafting Settings** dialog.

**Note:** You can edit the line style of electrical wiring after it has been drawn.


## Inserting Plumbing Fixtures

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Placing plumbing fixtures in your plan is easy — just select what you want to insert, then point and click. With Collision Control turned on, fixtures will automatically snap to walls when you get close to them. Also, fixtures will insert at a logical

height. For example, a toilet will insert on the floor, while a sink may insert 3' off the floor. You can edit a fixture's size and elevation, as well as move and rotate it.

#### To insert plumbing fixtures:

1. Select **Insert > Interiors > Plumbing Fixtures**, or click  on the Interiors toolbar.
2. In the catalog, select the fixture you want to insert.
3. Position the fixture where you want it, then click to insert it.
4. Right-click and select **Finish**.


**Note:** Certain sinks can only be inserted into a cabinet. If you are inserting such a sink, the cabinet must be large enough to house the sink.

## Inserting HVAC Elements

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You can insert HVAC elements such as fireplaces, furnaces, water heaters, central air units, floor registers and vents with a click of your mouse.

#### To insert an HVAC element:

1. Select **Insert > Interiors > HVAC Elements**, or click  on the Interiors toolbar.
2. In the catalog, select the element that you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.



# Chapter 14: Framing

Walls, floors, ceilings, roofs and surfaces have framing configurations assigned to them in their properties. You can choose which framing members you would like to use and edit their spacing by editing an element's framing properties.

Each building location in your project has a set of Framing Options assigned to it. These options determine how walls are framed on each location. They include a wall opening span table, framing rule, intersection reference table, and an infill configuration.

By entering into Framing Mode you can create custom configurations for individual walls and intersections in your model. While in this mode each wall, opening and intersection has special shading applied to it, identifying it as a unique framing component within the model. Three tools are available in this mode: Intersection Tool, Infill Tool, and Head Sill Jamb Tool.

Framing members are included in your project estimate. If you would like to generate a member schedule you will need to convert floor, ceiling and roof framing to actual elements using the Convert Framing to Members tool. After using this tool you can also select and edit individual members in your floor, ceiling or roof frame.

By default, framing is not visible, but you can use the Display Framing tool to view it instantly. Even when framing is displayed, framing cannot be selected for editing unless it is floor, ceiling or roof framing that has been converted to members. However, wall framing can be edited by editing a wall's framing properties, or editing the Framing Options in the Building Locations dialog. For more in-depth editing you can also switch to Framing Mode and edit the framing for individual walls and intersections.

## Displaying Framing

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Walls, floors, ceilings and roofs have a framing configuration assigned to them in their properties. You can instantly view just your house frame using the Display Framing tool, then return to a regular view of your model at any time.



### To display framing:

1. Select **View > Framing > Display Framing** or click  on the View Control toolbar.

### To return to a non-framed view:

1. Select **View > Framing > Display All But Framing** or click the down arrow next to  on the View Control toolbar and select Display All But Framing.

**Note:** You can also use the View Filter to display framing. However, the framing will not be displayed on its own unless you turn everything else off.

**Note:** Framing cannot be selected for editing in framing display mode. It is available for viewing purposes only. You can, however, change the framing options for walls, floors, ceilings and roofs.

**Note:** When in framing display mode, any members inserted with the Members tool are not visible. Floor, ceiling and roof framing that has been converted to members is not visible in this mode.

## Returning to a Non-Framed View

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If you have used the Display Framing tool to view your house frame, you can instantly return to a non-framed view using the Display All But Framing tool.

**To return to a non-framed view:**

1. Select **View > Framing > Display All But Framing** or click the down arrow next to the Display Framing button  on the View Control toolbar and select **Display All But Framing**.

## Wall Framing

Every building location in your project has a number of framing options assigned to it that determine how walls on that location will be framed. These options include:

- Span tables (determines how openings should be framed)
- Infill (stud/top plate/bottom plate configuration)
- Framing rule (the direction in which walls are framed)
- Intersection lookup table (determines how intersections are framed)

You can select the framing member that you want to use for your walls. You can also specify whether or not selected walls are framed as load-bearing walls, and customize the framing settings for each building location in your project.

You can define custom framing settings for individual walls, openings and intersections by going into Framing Mode. In this mode each framing component (infill, opening and intersection) has special highlighting applied to it for ease of identification and selection.

The catalog ships with pre-defined libraries of head/sill/jamb tables, wall opening span tables, and infill configurations. You can edit or add to these libraries to meet your specific construction needs.

## Selecting a Framing Member for Walls

Every wall has a setting in its properties that determines what type of member (e.g. 2 x 4) will be used to frame the wall. In other words, this is the member that will be used for the studs, top plate and bottom plate as well as the members used to frame openings (except the header).

You can edit the member selection for individual walls in your model, or for walls in the catalog.

**To edit the framing options for an individual wall or wall type:**

1. To edit a wall in your drawing, double-click it, or select the wall then right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.  
To edit a wall in the catalog, select the wall in the catalog, then right-click and select **Edit Element**.
2. In the **Walls** dialog, click the **Framing member** button.
3. Select the desired member from the **Catalog Access** dialog.
4. Click **OK**.

**Note:** By default, walls are framed using the framing options specified in your building location settings (see page 139). These options include an infill configuration that determines settings for the studs, top plate, bottom plate, and very top plate. By default, each of these components is set to use a framing member from the Member Library rather than the framing member selected in each wall's properties. See Defining a Wall Infill Configuration on page 518.

**Note:** You can override the framing member selection for individual walls in your model by customizing the infill configuration applied to the wall in Framing Mode. See Editing the Infill Configuration for Individual Walls on page 140.

**Note:** Stud spacing is determined by the infill configuration assigned to the building location on which a wall resides, or by the infill configuration assigned to a wall in Framing Mode if a custom one has been selected for it.



## Specifying Whether Walls are Load-bearing or Non-load-bearing

You can determine whether or not a wall is framed as a load-bearing wall by editing the wall's properties. This ensures that the proper head/sill/jamb configuration is applied to the wall.

### To frame a wall as load-bearing or non-load-bearing:

1. Select the wall, then right-click and select **Properties**. You can select multiple walls simultaneously.
2. Specify the desired framing behavior for the **Frame As Load Bearing** setting:
  - Auto.** The default value for all walls, this frames exterior walls as load-bearing, and interior walls as non-load-bearing.
  - Yes.** Frames the selected wall as load-bearing.
  - No.** Frames the selected wall as non-load-bearing.
3. Click **OK**.


## Defining Wall Framing Options for Building Locations

Each location in the Building Locations dialog has a set of framing options that determine how walls, openings and intersections on that location will be framed.

Location framing options include a span table selection, an infill configuration, framing rule, and intersection reference table.

The framing options you choose will determine what you see when framing is displayed (with the Display Framing tool), as well as the members reported in your Project Estimate. For example, if a wall has an infill configuration with studs 12" apart, the wall will have more studs than if it were to have an infill configuration with studs 16" apart.

### To define framing options for a building location:

1. Select **Settings > Building Locations**, or click  on the View Control toolbar.
2. In the **Building Locations** dialog, click in the location's **Framing Options** field.
3. Make the desired selections in the **Location Framing Options** dialog. The options are described below.
  - Span table.** The wall span table that determines the head/sill/jamb configuration to be used for openings of different sizes in walls. You can select a span table for load-bearing walls, and one for non-load-bearing walls.
 

You can create custom span tables. See Defining a Wall Opening Span Table on page 511. You can also select a custom span table for individual walls in Framing Mode. See Editing the Span Table Selection for Individual Walls on page 142.
  - Intersection lookup table.** The reference table containing rules for framing different types of intersections. You can edit intersection configurations by going into Framing Mode and using the Intersection tool. See Editing Intersection Framing on page 142.
  - Infill configuration.** The precise layout of studs, top plate, very top plate and bottom plate that fill the volume of the wall. You can define custom infill configurations if you want. See Defining a Wall Infill Configuration on page 518. You can also apply different infill configurations to individual walls in Framing Mode. See Editing the Infill Configuration for Individual Walls on page 140.
  - Framing rule.** The direction in which walls are framed. Options are described below.
    - From Bottom Left.* Walls frame from the bottom left corner of the drawing area (from bottom to top, left to right).
    - From Bottom Right.* Walls frame from the bottom right corner of the drawing area (from bottom to top, right to left).
    - From Top Left.* Walls frame from the top left corner of the drawing area (top to bottom, left to right).
    - From Top Right.* Walls frame from the top right corner of the drawing area (top to bottom, right to left).
    - From Start of Wall.* Walls frame from their "start point", which is the end marked with a green grip when the wall is selected.
    - From End of Wall.* Walls frame from their "end point", which is the end marked with a red grip when the wall is selected.
4. Click **OK**.

**Note:** You can override the building location framing options and specify custom framing options for individual walls, openings and intersections in your model by switching to Framing Mode.


## Going into Framing Mode

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When in Framing Mode, framing components (wall infill, intersections and openings) are displayed as "glass boxes", making it easy to identify and select each one. You can see these glass boxes in both 2D and 3D views.

Clicking on a wall lets you select the infill configuration, framing rule and wall opening span table for that wall. Clicking on an opening lets you select the opening span table to be used for framing that opening, or define a custom head/sill/jamb configuration for that particular opening. Clicking on an intersection lets you select the intersection framing configuration that you want to use on that intersection.

### To switch to Framing Mode:

1. Select **View > Framing Mode On/Off**, or click  on the Framing toolbar.  
To exit Framing Mode, select the Framing Mode On/Off tool or button again.

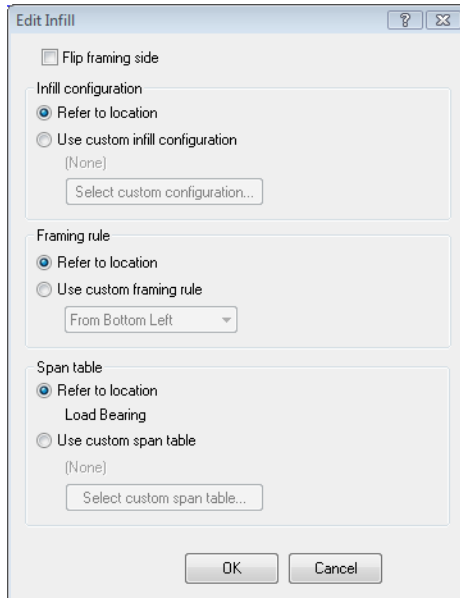
## Editing the Infill Configuration for Individual Walls

Infill refers to the material that fills the volume of the wall. An infill configuration determines what types of members are used for the studs, top plate, bottom plate and very top plate, the spacing between studs, and the way in which members are aligned and rotated.

By default, walls are framed using the infill configuration defined in the Framing Options for each building location. You can override this setting and select a custom infill configuration for individual walls in your model by going into Framing Mode.

### To edit a wall's infill configuration:

1. Go into Framing Mode (**View > Framing Mode On/Off**).
2. Double-click the wall that you want to edit, or select the wall and then right-click and select **Properties**. When selecting a wall, watch for the 'Wall Infill' screen tip to appear so that you know you are selecting the infill and not another framing component.



3. To use the infill configuration defined for the building location on which the wall resides, enable the **Refer to location** radio button in the *Infill Configuration* area.
4. To use a custom infill configuration, enable the **Use custom infill configuration** radio button in the Infill Configuration area, then click the **Select custom configuration** button and make a selection from the Wall Infill Library.
5. To flip the framing from one side of the wall to the other, enable the **Flip framing side** check box. If, for example, you notice that an opening's header member is positioned toward the exterior face of the wall and you want it positioned

toward the interior face, you would enable the **Flip framing side** check box to flip the framing to the other side of the wall.

**Note:** By default each infill configuration is set to use framing members from the Member Library rather than the framing member defined in the wall's properties. You can change infill settings by editing the parameters in the infill configuration. See Defining a Wall Infill Configuration on page 518. You can also create new infill configurations to suit your needs.

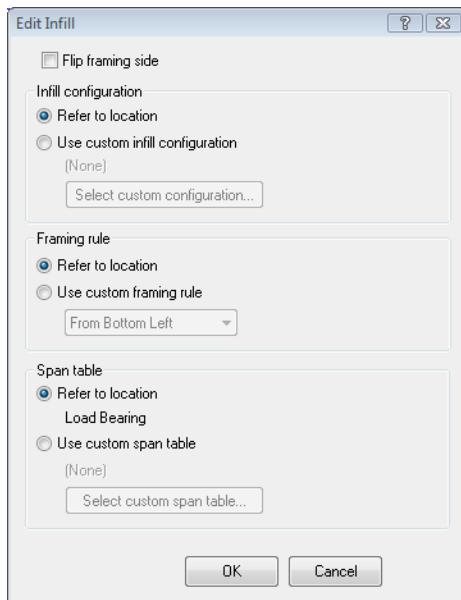
## Editing the Framing Rule for Individual Walls

The 'framing rule' refers to the direction in which walls are framed. You may, for example, want to start framing walls from the bottom left corner of your drawing area.

By default, the framing rule used to frame walls is the one defined in the Framing Options of each building location. You can override the framing rule for individual walls in your model by going into Framing Mode.

### To edit a wall's framing rule in Framing Mode:

1. Go into Framing Mode (**View > Framing Mode On/Off**).
2. Double-click the wall that you want to edit, or select the wall and then right-click and select **Properties**. When selecting a wall, watch for the 'Wall Infill' screen tip to appear so that you know you are selecting the infill and not another framing component.



3. To use the framing rule defined for the building location on which the wall resides, enable the **Refer to location** radio button in the Framing Rule area.
4. To use a custom framing rule, enable the **Use custom framing rule** radio button in the Framing Rule area, then select a framing rule from the drop box.

*From Bottom Left.* Walls frame from the bottom left corner of the drawing area (from bottom to top, left to right).

*From Bottom Right.* Walls frame from the bottom right corner of the drawing area (from bottom to top, right to left).

*From Top Left.* Walls frame from the top left corner of the drawing area (top to bottom, left to right).

*From Top Right.* Walls frame from the top right corner of the drawing area (top to bottom, right to left).

*From Start of Wall.* Walls frame from their "start point", which is the end marked with a green grip when the wall is selected.

*From End of Wall.* Walls frame from their "end point", which is the end marked with a red grip when the wall is selected.

## Editing the Span Table Selection for Individual Walls

By default, wall openings are framed according to the span tables selected in the Framing Options of each building location. There is a span table selection for load-bearing walls, and one for non-load-bearing walls. Each span table contains a list of opening sizes (spans) and the head/sill/jamb configuration that should be used for each span.

You can override the span table selection in your building locations and select a custom span table for individual walls in your model. This can only be done in Framing Mode.

### To edit the span table selection for an individual wall:

1. Go into Framing Mode (**View > Framing Mode On/Off**).
2. Double-click the wall infill that you want to edit, or select the wall infill and then right-click and select **Properties**. When selecting a wall infill, watch for the 'Wall Infill' screen tip to appear so that you know for sure that you are selecting the infill and not another framing component.
3. To use the span table defined for the building location on which the wall resides, enable the **Refer to location** radio button in the *Span Table* area. Then, select either the **Load-Bearing** or **Non-Load-Bearing** span table.
4. To use a custom span table, enable the **Use custom span table** radio button in the *Span Table* area, then click the **Select custom span table** button and make a selection from the Wall Span Table Library.

## Editing the Head/Sill/Jamb Configuration for Individual Openings

By default, wall openings are framed according to the span table selected in the infill settings for the wall in which the opening resides. A span table contains a list of opening sizes (spans) and the head/sill/jamb configuration that should be used for each span. You can override the span table selection and select a custom head/sill/jamb configuration for individual openings in your model. This can only be done in Framing Mode.

### To edit the head/sill/jamb configuration for an individual opening:

1. Go into Framing Mode (**View > Framing Mode On/Off**).
2. Double-click the opening that you want to edit, or select the opening and then right-click and select **Properties**. When selecting an opening, watch for the 'Head Sill Jamb Tool' screen tip to appear so that you know for sure that you are selecting an opening and not another framing component.
3. Select one of the following options:
  - Refer to Infill.** Uses the span table selected in the infill settings for the wall in which the opening resides. The program will find the opening's size in the span table and apply the head/sill/jamb configuration assigned to that opening size.
  - Use custom head/sill/jamb configuration.** Allows you to select a custom head/sill/jamb configuration to use. Click the **Select configuration** button and select the desired configuration from the Head Sill Jamb Library.
4. Click **OK**.

**Note:** When two or more openings are very close to each other, the openings are selected as a group rather than individually. Applying a single head/sill/jamb configuration to the group of openings prevents framing members from overlapping.

**Note:** If needed you can create custom span tables (see page 511) and custom head/sill/jamb configurations (see page 513).

## Editing Intersection Framing

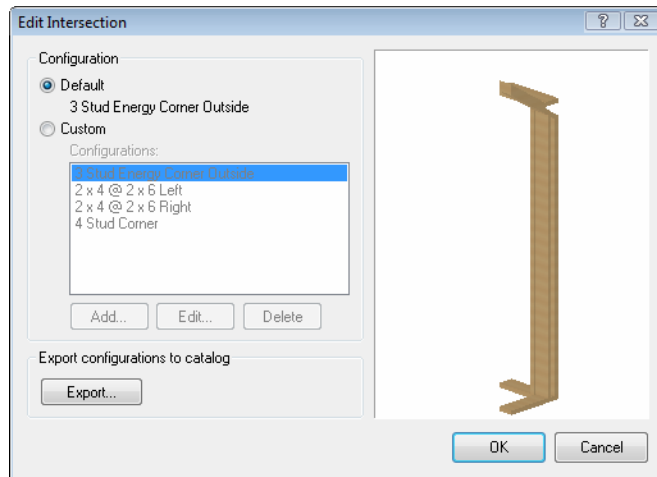
Each wall intersection in your model is framed using a standard intersection framing configuration designed specifically for that type of intersection. Intersection framing configurations are stored in an internal library called an *intersection lookup table*. The program matches intersections in your project with intersections in the lookup table to determine how each intersection should be framed.

When you switch to Framing Mode, each intersection is represented by a "glass box" for easy identification and selection. You can click on any intersection and apply a specific intersection framing configuration to it. When you apply a framing configuration to a selected intersection, you can choose to save that particular instance to the catalog, where it is added to an intersection lookup table that you choose. This way any configuration applications that you specify in the current project will be available for future use in any project. Otherwise, the intersection configuration that you specify resides in the current project only.

### To edit an intersection's framing configuration:

1. Go into Framing Mode (**View > Framing Mode On/Off**).

2. Double-click the intersection that you want to edit, or select the intersection and then right-click and select **Properties**. When selecting an intersection, watch for the 'Intersection tool' screen tip to appear when you hover over the intersection. This way you know for sure that you are selecting an intersection and not another framing component.



3. To apply the default configuration for this type of intersection (as defined in the intersection lookup table), enable the **Default** radio button. To apply a custom configuration, enable the **Custom** radio button, and then select a framing configuration from the list. You can add, edit and delete configurations. The preview pane displays a live preview of the selected configuration. You can right-click in this pane to display various viewing options. If viewing in 3D you can click and drag in the pane to rotate the preview around.
4. If you want to save all of the intersection configurations in the current drawing to an intersection lookup table, click , then type a name for the table in the **New Lookup Table Name** dialog.
5. Click **OK**.

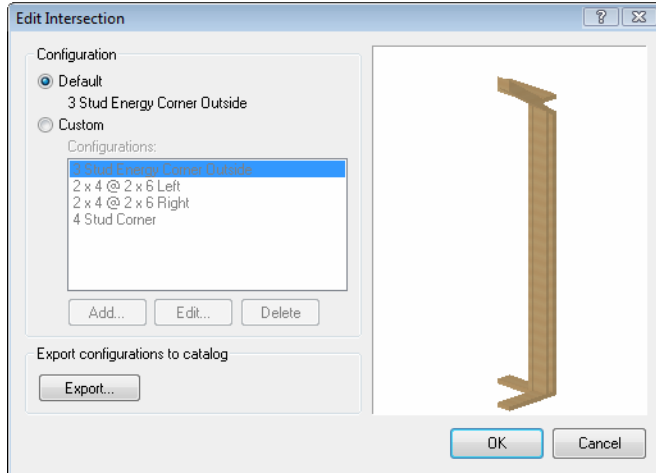
**Note:** Because there are so many different types of possible intersections, it is not possible to define intersection framing configurations externally (i.e. independently from an actual model). They can only be defined in Framing Mode.

## Creating Custom Intersection Framing Configurations

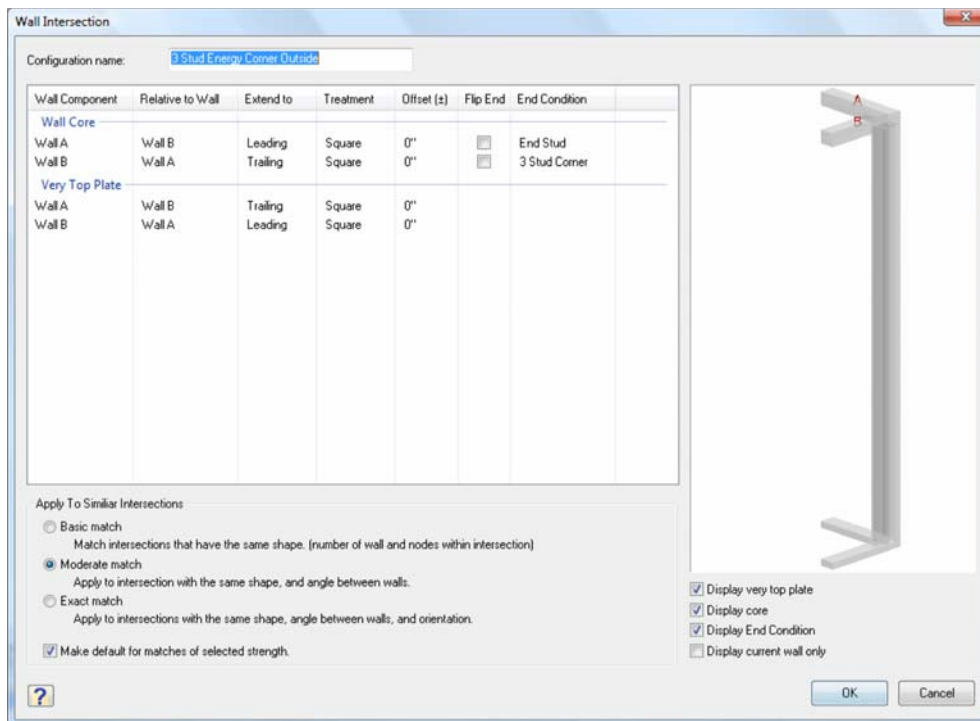
The intersection lookup table that ships with the program contains a variety of intersection framing configurations that can be applied to intersections in your model. You can edit the existing configurations or add new ones if needed. Each configuration consists of a number of detailed settings for the wall core and very top plate so that you can create the exact configuration you need.

### To create a custom intersection framing configuration:

1. Go into Framing Mode (**View > Framing Mode On/Off**).
2. Double-click the intersection that you want to edit, or select the intersection and then right-click and select **Properties**. When selecting an intersection, watch for the 'Intersection tool' screen tip to appear when you hover over the intersection. This way you know for sure that you are selecting an intersection and not another framing component.



3. If you want to edit a configuration in the **Edit Intersection** dialog, select it in the list, then click **Edit**.
4. If you want to add a new configuration, click **Add**.



5. Define the configuration in the **Wall Intersection** dialog. When defining a configuration, the wall core (studs, top plate, bottom plate) is defined independently of the very top plate. This allows you to overlap the very top plate at corners for greater strength if desired. The settings are described below.

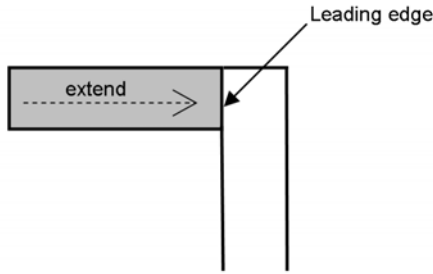
**Configuration name.** The name of the configuration as it appears in the list of configurations in the Edit Intersection dialog when an intersection is selected.

**Wall Component.** Select the wall to define (Wall A, Wall B, etc.). Refer to the diagram in the dialog to see which wall you are defining.

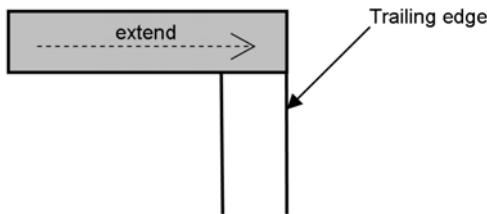
**Relative to Wall.** Click in this field to display a list of walls in the selected intersection. Select the wall to which you want the current wall to extend. If you do not want to extend the current wall, select *None*.

**Extend to.** Click in this field and select the method that you want to use to extend the current wall. Options are described below.

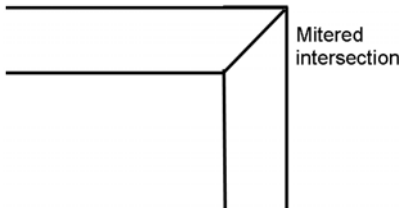
*Leading.* Extends the wall to the leading edge of the wall it intersects. The leading edge is the first edge that the current wall encounters when extended into the intersecting wall.



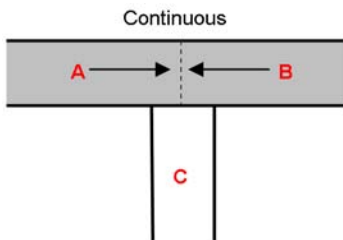
*Trailing.* Extends the wall to the trailing edge of the wall it intersects. The trailing edge is the second edge that the current wall encounters when extended into the intersecting wall.



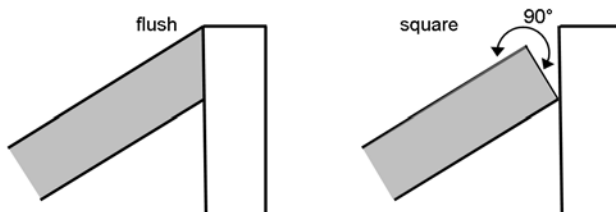
*Miter.* Extends the wall to the trailing edge of the wall it intersects and creates a 45° miter cut.



*Continuous.* Applicable only to intersecting walls that lie at the same angle, as in a T-intersection or X-intersection, this extends the current wall into the same-plane intersecting wall, forming a continuous wall.

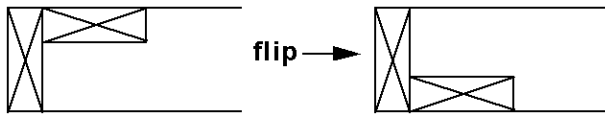


**Treatment.** Applicable only when the wall is being extended to the leading or trailing edge of another wall, and the angle between the walls is not 90°. The *Flush* option cuts the current wall so that it is flush with the edge of the intersecting wall. The *Square* option cuts the end of the wall squarely so that the wall end forms a 90° angle. (The angle of the intersecting wall is irrelevant.)



**Offset.** The distance that you want to offset the end of the wall from the intersecting wall. This value can be positive (for an extension) or negative (for a retraction).

**Flip End.** Flips the end studs to the other side of the wall.



**End Condition.** (*wall core only*) The number and orientation of studs at the wall's end (single, double, triple, turned, etc.). To select an end condition, click in the *End Condition* field and make a selection from the drop box. If you want to add or edit an end condition configuration, select **<Edit>** in the drop box to access the **End Condition Library**. You can create custom end conditions if necessary (see page 525).

- The configuration will be applied to all intersections similar to the current one. In the *Apply to Similar Intersections* area, select either **Basic Match**, **Moderate Match** or **Exact Match** to determine how similar the intersections must be to the current one in order to receive the new configuration.

**Basic Match.** The intersection has the same shape (same number of walls and nodes within the intersection).

**Moderate Match.** The intersection has the same shape, and angle between walls.

**Exact Match.** The intersection has the same shape, angle between walls, and orientation.

The table below illustrates sample matches to a selected intersection.

Sample Matches			
<p style="text-align: center;"><b>Intersection</b></p> <p>No. of Walls: 2 Angle Between Walls: 90° Orientation: bottom left</p>	<p style="text-align: center;"><b>Basic Matches</b></p> <p>No. of Walls: 2 Angle Between Walls: any Orientation: any</p>	<p style="text-align: center;"><b>Moderate Matches</b></p> <p>No. of Walls: 2 Angle Between Walls: 90° Orientation: any</p>	<p style="text-align: center;"><b>Exact Matches</b></p> <p>No. of Walls: 2 Angle Between Walls: 90° Orientation: bottom left</p>

- If you would like to use this configuration for intersections of this type when new walls are created, enable the **Make default for matches of selected strength** check box.
- The preview pane displays a live preview of the intersection configuration. You can right-click in the preview pane to access a menu of viewing options, including **View as 2D** and **View as 3D**. If viewing in 3D you can also click and drag inside the pane to rotate the preview around. The options below the preview pane allow you to determine which components you want to see in the preview.
- Click **OK**.

## Specifying Floor Framing Options

Floors have a framing configuration assigned to them which you see when you display framing. You can specify a custom framing configuration if you want. There are settings for the joist, rim joist, and opening header, and you can control the joist spacing and direction.

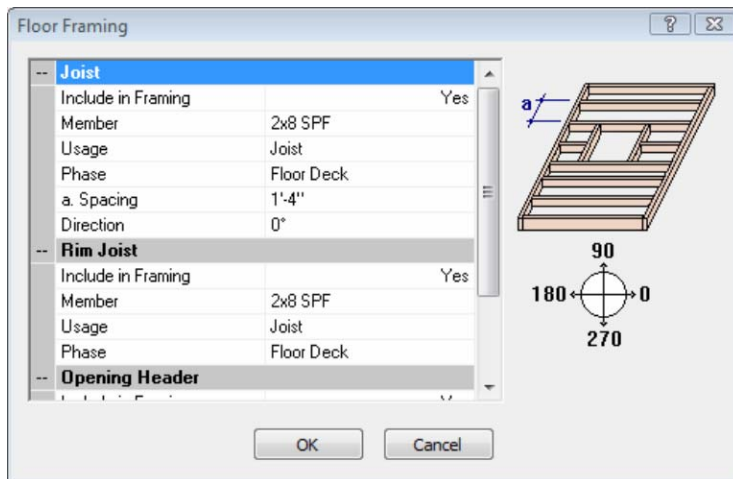
Framing can be displayed using the Display Framing tool, and is included in the project estimate. Settings in the framing configuration let you specify whether or not you want each component in the floor frame to be displayed and quantified, providing the ultimate in versatility and control. You can also assign a Phase and Usage to each member in the configuration so that they are sorted appropriately in the project estimate.




### To specify framing options for floors:



- In a non-framed view, select the floor. If the floor was created automatically, you need to select it in 3D view. You can also specify framing members for floors in the catalog.



- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
- On the Basic property page, click the **Specify Framing** button. The **Floor Framing** dialog appears.



- To select a joist member, click on the **Member** field in the *Joist* area, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
- To define the joist spacing, edit the value in the **a. Spacing** field.
- To define the joist direction, edit the angle in the **Direction** field.
- To select a rim joist member, click on the **Member** field in the *Rim Joist* area, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
- To select an opening header member, click on the **Member** field in the *Opening Header* area, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
- By default, the joists, rim joists and opening headers are set to be displayed in the framing and quantified in the project estimate. If you do not want one of those components to be displayed and quantified, click in the **Include in Framing** field in that component's settings and select **No**.
- You can assign a unique Usage and Phase to the joist, rim joist and opening header members. Usages help to identify what materials are used for, or could be used for on the construction site. Phase refers to the construction phase in which a material is used. Phase and Usage can be used as sort keys in your report template. Sort keys determine how materials are sorted in your project estimate.

To assign a Usage to a member, click in the member's **Usage** field and then click the browse button  in that field and make a selection from the **Usages** library. To assign a Phase to a member, click in the member's **Phase** field and then click the browse button  in that field and make selection from the **Phase** library.

- Click **OK**.

**Tip:** If you want to be able to select and edit floor framing members, or include them in member schedules, you must first convert them to actual elements using the Convert Framing to Members tool.

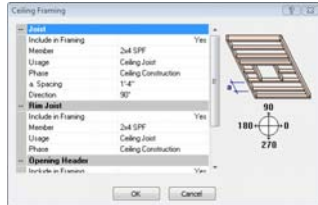
## Specifying Ceiling Framing Options




Ceilings have a framing configuration assigned to them which you see when you display framing. You can specify a custom framing configuration if you want. There are settings for the joist, rim joist, and opening header, and you can control the joist spacing and direction.



Framing can be displayed using the Display Framing tool, and is included in the project estimate. Settings in the framing configuration let you specify whether or not you want each component in the ceiling frame to be displayed and quantified, providing the ultimate in versatility and control. You can also assign a Usage and Phase to each member in the configuration.

**To specify framing options for ceilings:**

1. In non-framed view, select the ceiling you want to change. You can also specify framing members for ceilings in the catalog.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. On the Basic property page, click the **Specify Framing** button. The **Ceiling Framing** dialog appears.



4. To select a joist member, click on the **Member** field in the *Joist* area, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
5. To define the joist spacing, edit the value in the **a. Spacing** field.
6. To define the joist direction, edit the angle in the **Direction** field.
7. To select a rim joist member, click on the **Member** field in the *Rim Joist* area, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
8. To select an opening header member, click on the **Member** field in the *Opening Header* area, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
9. By default, the joists, rim joists and opening headers are set to be displayed in the framing and quantified in the project estimate. If you do not want one of those components to be displayed and quantified, click in the **Include in Framing** field in that component's settings and select **No**.
10. You can assign a unique Usage and Phase to the joist, rim joist and opening header members. Usages help to identify what materials are used for, or could be used for on the construction site. Phase refers to the construction phase in which a material is used. Phase and Usage can be used as sort keys in your report template. Sort keys determine how materials are sorted in your project estimate.

To assign a Usage to a member, click in the member's **Usage** field and then click the browse button  in that field and make a selection from the **Usages** library. To assign a Phase to a member, click in the member's **Phase** field and then click the browse button  in that field and make selection from the **Phase** library.

11. Click **OK**.

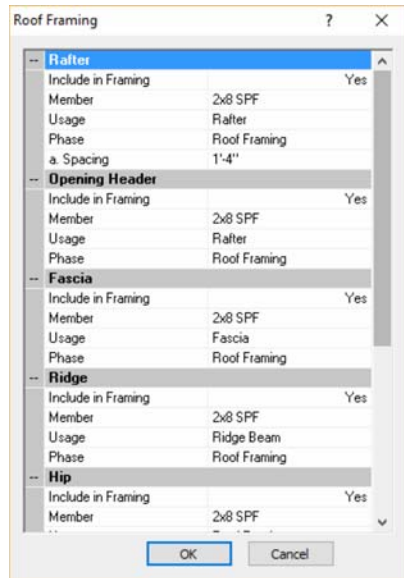
**Tip:** If you want to be able to select and edit ceiling framing members, or include them in member schedules, you must first convert them to actual elements using the Convert Framing to Members tool.

**Specifying Roof Framing Options**

Roofs have a framing configuration assigned to them that you see when you display framing. Framing can be displayed using the Display Framing tool, and is included in the project estimate. Settings in the framing configuration let you specify whether or not you want each component in the roof frame to be displayed and quantified. You can assign a member type, Usage and Phase to each member in the configuration.

**To specify framing members for roofs:**

1. In non-framed view, select the roof you want to change. You can also specify framing members for roofs in the catalog.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. On the Basic property page, click the **Specify Framing** button. The **Roof Framing** dialog appears.



4. Specify the desired options in the *Rafter*, *Opening Header*, *Hip*, *Valley*, *Gable*, and *Gable Ladder* sections.
  - To control whether or not each component in the frame is displayed in the framing and included in the project estimate, click in the component's **Include in Framing** field and select either **Yes** or **No**.
  - To select the member that you would like to use for a framing component, click on the **Member** field, then click the browse button  in that field to display the member catalog. Select the desired member in the **Catalog Access** dialog, then click **OK**.
  - You can assign a unique Usage and Phase to the rafter and opening header members. Usages help to identify what materials are used for, or could be used for on the construction site. Phase refers to the construction phase in which a material is used. Phase and Usage can be used as sort keys in your report template. Sort keys determine how materials are sorted in your project estimate.
 

To assign a Usage to a member, click in the member's **Usage** field and then click the browse button  in that field and make a selection from the **Usages** library. To assign a Phase to a member, click in the member's **Phase** field and then click the browse button  in that field and make selection from the **Phase** library.
  - If you are including Rafters or a Gable Ladder, you can specify the spacing between members in the **Spacing** field.
5. Click **OK**.

**Note:** Additional frame details can be found on a roof's Support and Details property page.

**Tip:** If you want to be able to select and edit roof framing members, or include them in member schedules, you must first convert them to actual elements using the Convert Framing to Members tool.

## Inserting Truss Profiles Under a Roof Surface

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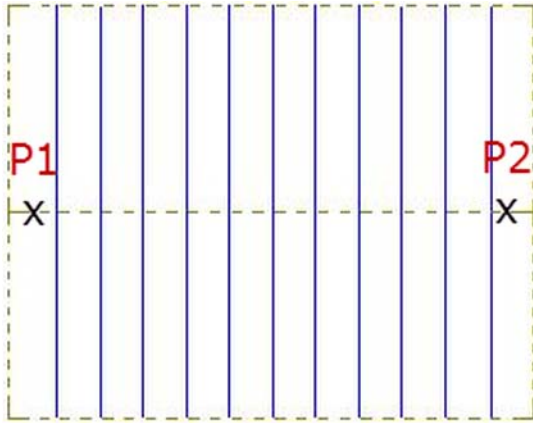
You can use the Truss Run tool to quickly insert a run of truss profiles under an existing roof surface. The tool will recognize the hips, valleys and gable ends of the roof and insert an appropriate profile. It also recognizes any ceiling surfaces beneath the roof, and will alter the profile of the bottom chord to accommodate them.

**Note:** Truss profiles are mainly for display, and are not quantifiable. To insert actual truss members, use the Timber Frames tool.

### To insert truss profiles under a roof surface:

1. Select **Insert > Roofs > Truss Run**.
2. In the catalog panel, select the truss profile that you would like to insert.

- Click on the roof edge at the start of the truss run, then click on the roof edge at the end of the truss run.



- Right-click and select **Finish**.




## Converting Framing to Members

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When roofs, floors, ceilings and surfaces are created, their framing cannot be selected for editing, and does not appear in member schedules. Using the Convert Framing to Members tool you can instantly convert a surface's framing into actual members that can be selected, edited, and quantified in schedules.

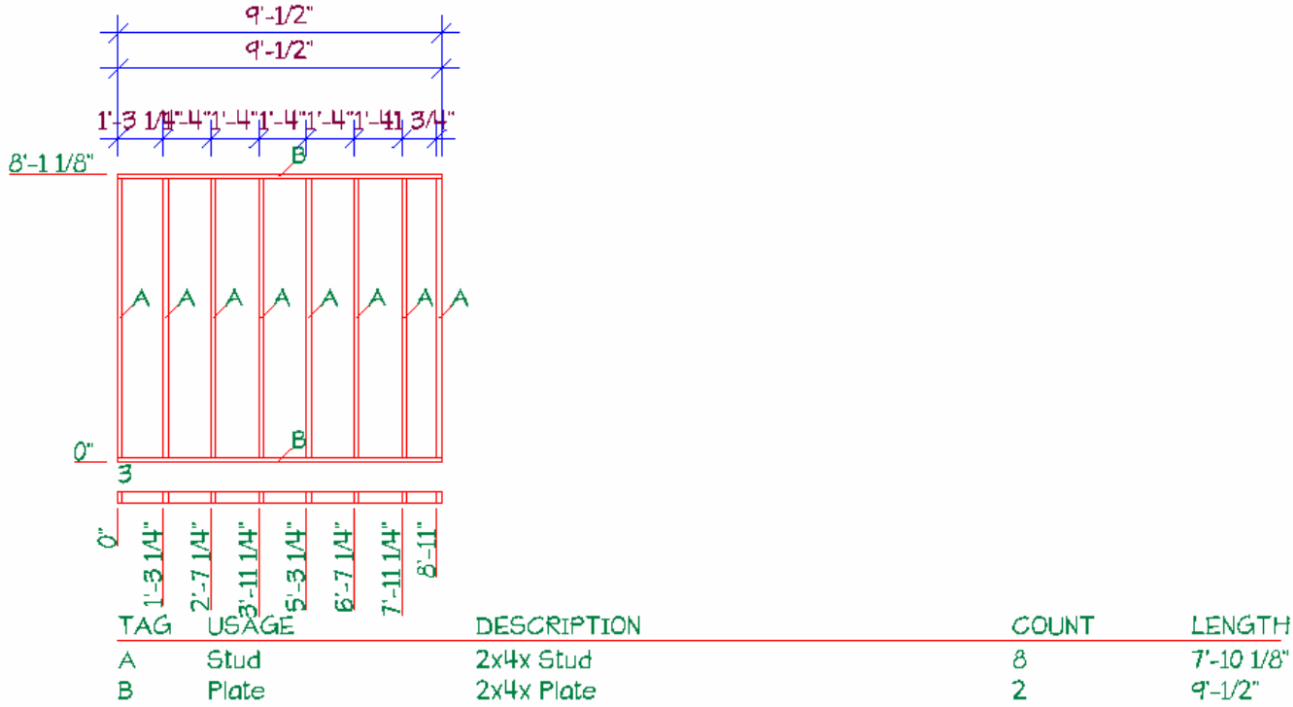
### To convert framing to members:

- Select **Insert > Members > Convert Framing to Members**, or click the down arrow next to the Members button  on the Building toolbar and select **Convert Framing to Members**.
- Select the roof, floor, ceiling or surface whose framing you want to convert. If you are in 2D plan view, click on the edge of the element. If you are in 3D, click anywhere on the surface of the element. (**Note:** Automatic floors can only be selected in 3D.)  
The framing is automatically converted.
- Right-click and select **Finish**.

# Chapter 15: Wall Panels

If you have your walls pre-built in a factory rather than stick-built on site, the program’s Wall Panel feature will be of great benefit to you. You can view an instant list of all wall panels in your project, then generate diagrams for each one.

Each diagram shows an elevation and a plan view of the wall’s framing configuration. By default the diagram is fully dimensioned, and each member in the diagram is tagged according to its type. A schedule is also included that lists the members used in the panel and the usage and quantity of each.



Prior to drawing walls you can set up a tagging system and define the settings that you want your wall panels to have. For example, you can decide which dimensions to include, define schedule settings, and control the amount of information displayed in the diagram. Once walls are drawn you can preview all wall panels and customize the appearance of each one. You can specify settings for all or multiple panels simultaneously, or customize individual panels to suit your needs.

Once you have defined panel properties and settings, you can insert wall panels onto worksheets. When you insert a wall panel diagram onto a worksheet, a block of that panel is created and stored in memory. Any time that you make a change to a wall’s framing configuration, you will need to regenerate its associated wall panel diagram in order to update its block definition. When you regenerate a panel, any inserted instances of it in your project are automatically updated. Since the diagrams are generated directly from wall panels in your model, you can submit them to the panel assembly plant with confidence knowing that they are accurate and designed to your specifications.

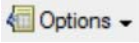
## Setting Up a Wall Panel Tagging System

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As you draw walls, each wall is marked with a wall panel tag. Each tag is associated with a wall panel diagram that is generated by the program. By default, panel tags are simply numbers, and numbering begins at 0. You can specify how you would like wall panels to be tagged prior to drawing walls. You can change the default start number, add a prefix or suffix to the number, add location data to the tag, and change the panel view side.

### To specify how you want wall panels to be tagged:

1. Select **Tools > Wall Panels**.

- In the **Wall Panels** dialog, click  and select **Panel Configuration**.
- In the **Panel Configuration** dialog, select **Panel Tags** in the left pane. The settings are described below.

**Default Start Number.** The number at which panel numbering starts by default. Note that this setting applies to walls that will be drawn and has no effect on walls that have already been drawn. If you have already drawn your walls you can customize the way panels are numbered using the Panel Numbering tool on the Options menu.

**Prefix.** A set of characters that appear before the panel number. For example, if you specify a prefix of 'WP', the panels would be named 'WP1', 'WP2', etc.

**Add location data before prefix.** Displays either the **Location Name** or **Location Number** before the prefix. For example, if panel WP2 resides on the Ground Floor location, and you select 'Location Name' to add to the prefix, the panel would be named 'Ground Floor WP2'. If you do not want to add location data to the prefix, ensure that **None** is selected in the drop box.

**Suffix.** A set of characters that appear after the panel number. For example, if you specify a suffix of 'EXT', the panels would be named '1EXT', '2EXT', etc.

**Add location data after suffix.** Displays either the **Location Name** or **Location Number** after the suffix. For example, if panel 2EXT resides on the Ground Floor location, and you select 'Location Name' to add to the suffix, the panel would be named '2EXT Ground Floor'. If you do not want to add location data to the suffix, ensure that **None** is selected in the drop box.

**Default Panel View Side.** This is the side of the wall that you are viewing, as indicated by the arrow on the wall panel tag in your 2D plan. The 'Left' or 'Right' side of the wall depends on the direction in which a wall is drawn. If you were to draw a wall from left to right, the 'left' side would be the side closest to the top of the screen. Imagine yourself standing at the wall's start point and looking to the left or the right to determine the desired view side.

- Click **OK** in the **Panel Configuration** dialog.
- Click **Close** in the **Wall Panels** dialog.


**Note:** If you have already drawn your walls, you can edit the wall panel names to suit your needs. See Editing Wall Panel Names on page 160.


**Note:** To select a text style for your wall panel tags, see Editing the Text Styles Used for Wall Panels on page 164.


## Displaying/Hiding Wall Panel Tags

As you draw walls, each wall is marked with a wall panel tag. Each tag is associated with a wall panel diagram that is generated by the program. By default, wall panel tags are not displayed. You can turn them on and off using your View Filter.


**To display or hide wall panel tags:**


- Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
- In the **View Filter** dialog, select the **Elements on Location** tab.
- By default, wall panel tags are locked from filtering, so you need to unlock them before you can control their visibility. Click the lock icon in the **Tags/Marks** row to unlock tags.

 Tags are locked

 Tags are unlocked

- Click the eye icon in the **Tags/Marks** row to turn wall panel tags on or off.

 Tags are turned on

 Tags are turned off

- Click **OK**.

**Note:** Wall panel tags are visible but not selectable in Framing Mode. You can only select wall tags when in normal design mode.

## Defining Wall Panel Settings

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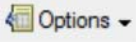
As you draw walls, each wall is marked with a wall panel tag. Each tag is linked to a wall panel diagram that the program generates. You can define the settings that you want your tags and wall panel diagrams to have prior to drawing walls, or customize them afterward. It is recommended that you define the wall panel settings before drawing walls to avoid having to regenerate wall panel diagrams.

When defining panel settings you can:

- Customize wall panel tags
- Set the panel view side
- Edit the scale of inserted panels
- Choose to insert a drawing border when panels are inserted
- Choose whether or not to display the elevation view, plan view, wall tags and very top plates in the diagram
- Choose what you want to dimension
- Choose whether or not you want to include a schedule, and where it is placed

All of these settings are defined in a single dialog and will be applied to panels as they are generated. If you have already drawn your walls and edit your wall panel settings, the settings will be applied to the panels that are currently selected in the Wall Panel List when you insert them. If you have already inserted wall panels onto worksheets, you will need to regenerate them in order to update them with your changes.

### To define wall panel settings:

1. Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
2. If you have already drawn your walls, select the panels in the list that you want to edit. 'Ctrl+click' to select multiple panels one by one, or 'Shift+click' to select a group of consecutive panels (or all panels). You can also click once on the building location name to instantly select all panels on that location. Note that you can expand and collapse each location by double-clicking the location name.
3. In the **Wall Panels** dialog, click  and select **Panel Configuration**. The **Panel Configuration** dialog box appears. This dialog contains 5 pages of settings.
4. To define a naming convention for wall panels, select **Panel Tags** in the left pane. The settings are described below.

**Default Start Number.** The number at which panel numbering starts by default. Note that this setting applies to walls that will be drawn and has no effect on walls that have already been drawn. If you have already drawn your walls you can customize the way panels are numbered using the Panel Numbering tool on the Options menu.

**Prefix.** A set of characters that appear before the panel number. For example, if you specify a prefix of 'WP', the panels would be named 'WP1', 'WP2', etc.

**Add location data before prefix.** Displays either the **Location Name** or **Location Number** before the prefix. For example, if panel WP2 resides on the Ground Floor location, and you select 'Location Name' to add to the prefix, the panel would be named 'Ground Floor WP2'. If you do not want to add location data to the prefix, ensure that **None** is selected in the drop box.

**Suffix.** A set of characters that appear after the panel number. For example, if you specify a suffix of 'EXT', the panels would be named '1EXT', '2EXT', etc.

**Add location data after suffix.** Displays either the **Location Name** or **Location Number** after the suffix. For example, if panel 2EXT resides on the Ground Floor location, and you select 'Location Name' to add to the suffix, the panel would be named '2EXT Ground Floor'. If you do not want to add location data to the suffix, ensure that **None** is selected in the drop box.

**Default Panel View Side.** This is the side of the wall that you are viewing, as indicated by the arrow on the wall panel tag in your 2D plan. The 'Left' or 'Right' side of the wall depends on the direction in which a wall is drawn. If you were to draw a wall from left to right, the 'left' side would be the side closest to the top of the screen. Imagine yourself standing at the wall's start point and looking to the left or the right to determine the desired view side. **Note:** This is the default view side for all walls that will be drawn. Once your walls are drawn you can flip the view side of individual panels using the Flip Panel View Side tool.



**Note:** If you have drawn walls already and want to apply edited name settings to the currently selected panels, you must use the Apply Name Changes to Selected Panel(s) tool on the Options menu to update the tags.

- To define the settings used when inserting panels onto worksheets, select **Insertion Settings** in the left pane. The settings are described below.

**Import Scale.** The scale of the panel diagram when it is inserted onto the worksheet. By default, the import scale is the same as the worksheet scale. This means that the diagram will fill most of the sheet, which is ideal if you only want one wall panel diagram on each sheet. If you want to insert multiple panels on a sheet, or make panels appear smaller on the sheet for any reason, select an import scale that is smaller than the worksheet scale.

Common Scales


192	1/16" = 1'-0"
96	1/8" = 1'-0"
64	3/16" = 1'-0"
48	1/4" = 1'-0"
32	3/8" = 1'-0"
24	1/2" = 1'-0"
16	3/4" = 1'-0"
12	1" = 1'-0"
8	1 1/2" = 1'-0"
4	3" = 1'-0"
2	6" = 1'-0"
1	12" = 1'-0"

**Worksheet Scale.** The scale of the worksheet that will be created if you choose to insert panels from Model View, or choose to insert panels onto new worksheets when in Worksheet View. By default, the scale displayed is the same scale that is set for your main Model view window.

**Plan View Spacing.** The distance between panels when multiple panels are inserted onto one worksheet.

**Drawing Border.** Inserts a drawing border around the panel when it is inserted onto a worksheet. The list will contain any title blocks that exist in the current project. If you do not want to include a border, select **None** in this drop box.

**# Panels Across in Multi-Panel Insertion.** If you are inserting multiple panels onto one worksheet, this value determines the maximum number of panels in one row. For example, if you are inserting 20 panels and you set this value to 5, your worksheet will contain 4 rows of panels with 5 panels in each row.

- To select the styles for text and dimensions in your wall panel diagrams, select **Text and Dimension Styles** in the left pane. Click on the item for which you want to select a style, then click the browse button  in that field to display the **Dimension Styles** or **Text Styles** dialog. You can make selections for the following styles:

**Dimension Style.** The style used for the dimensions in the wall panel diagram, including member tags.

**Label Text Style.** The style applied to the panel name in the wall panel diagram. The panel name appears at the lower left corner of the elevation view, or the top right corner of the plan view.

**Tag Text Style.** The style applied to wall panel tags in your 2D plan.

**Schedule Text Style.** The style applied to text in the member schedule.

- To specify what you would like to include in your wall panel diagrams, select **Panel Content** in the left pane. Select either **Yes** or **No** for each of the following to determine whether or not they will be included in the panel diagram.

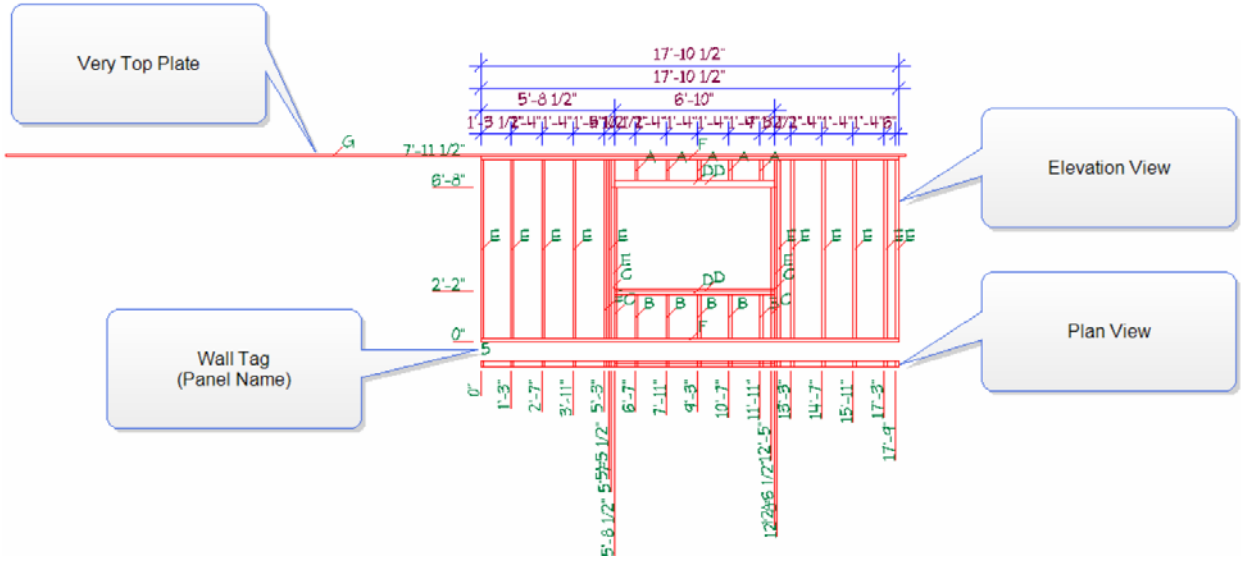
**Include Elevation View.** Includes the display of the framed panel in elevation view.

**Include Plan View.** Includes a plan view of the wall panel, which shows you the distance between members in the panel.

**Display Wall Tags.** Includes the wall panel tag name in the diagram. The tag appears at the bottom left corner of the elevation view, or top left corner of the plan view.

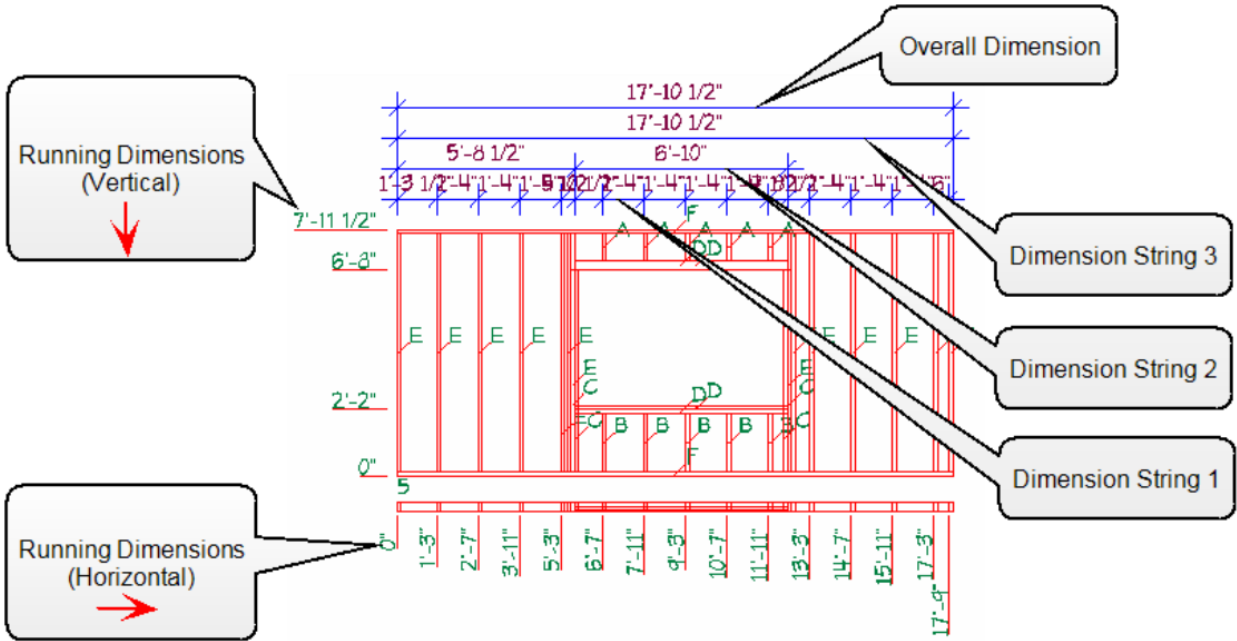
**Include Very Top Plates.** Includes the display of the very top plate if one is present in the frame.





- 8. To specify the dimensions that you would like to include on the panel diagram, select **Dimensions** in the left pane. Select either **Yes** or **No** for each available dimension string to specify whether or not it is included in the diagram. For example, you can choose whether or not you want to display dimensions for studs, top plates, bottom plates, cripples and openings.

There are 3 groups of dimensions in each diagram: those running up the side of the panel, those running across the top of the panel, and those running across the plan view. The dimensions running across the top of the panel include 4 dimension strings, each of which can be defined individually.





- 9. To specify whether or not you want to include a schedule along with the diagram or define schedule settings, select **Schedule** in the left pane. A typical schedule includes the tag, usage, description, count and length of each member type in the frame. Schedule settings are described below.

**Include Schedule.** Select either **Yes** or **No** to specify whether or not you want to include a schedule in the diagram.

**Placement.** Choose either **Below** or **Right** to specify where you want to place the schedule in relation to the annotated panel.

**Include Usage.** Select either **Yes** or **No** to specify whether or not you want to include a **Usage** column in the schedule that reports the usage of each member.

- Once you have defined your panel configuration, click **OK**.
- If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.

To regenerate inserted panels and update them with your changes, click  at the top of the dialog.

- When you are finished customizing and updating panels, click **Close** in the **Wall Panels** dialog.

**Tip:** If you have already drawn your walls and want to break a wall into two or more smaller panels, use the Break or Auto Break tool in your 2D plan.

**Note:** If walls have been drawn already, name changes are not automatically applied, even if you regenerate panels. You must use the Apply Name Changes to Selected Panel(s) tool to update wall panel names and tags.

**Note:** If you want to change a panel's framing configuration, you need to actually change the framing in the model, either by editing the framing options in your building locations or customizing framing configurations in Framing Mode. See Wall Framing on page 138.

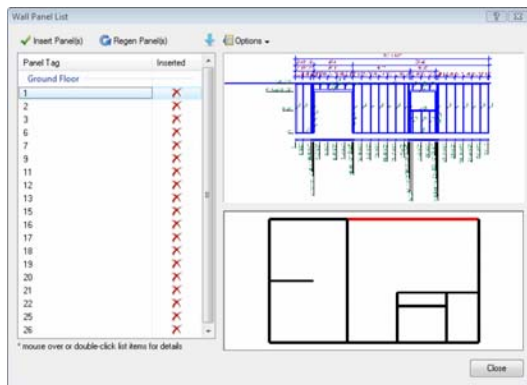
## Previewing Wall Panels

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As you draw walls in your project, each one is automatically tagged with a panel number. Each wall panel in your model has an associated wall panel diagram that shows you the wall's panel number, framing configuration and framing dimensions. You can display an instant list of wall panels in your project and preview each one.


**To preview wall panels:**

- In Model View or Worksheet View, select **Tools > Wall Panels**. In Model View you can also double-click any wall panel tag displayed in your 2D plan, or right-click a tag and select **Edit Wall Panels**. The **Wall Panels** dialog appears:




- To preview a wall panel, select it in the list in the left pane. The wall panel's diagram is displayed in the top right pane. The bottom right pane contains a 2D wall layout, and the currently selected wall panel is highlighted in red so that you know which one you are looking at.

Initially, every panel in the list will have an  beside it. That is because you haven't inserted any panels yet. When

you insert a panel onto a worksheet, a check mark  is displayed instead.

In addition to viewing panels in this dialog, you can customize panel settings, renumber panels, edit the properties of individual panels, and insert panels onto worksheets.

If you change a wall in your model (for example, if you change its length or its framing configuration), the wall panel preview will update automatically the next time that you open the **Wall Panels** dialog. However, if you have already

inserted the panel diagram for that wall, a Regenerate symbol  appears next to the panel name indicating that you need to regenerate the panel in order to update the inserted panel diagram with the changes you have made.

**Note:** Wall panel tags are visible but not selectable in Framing Mode. You can only select wall tags when in normal design mode. To turn wall panel tags on or off, use the View Filter.

**Note:** If a wall is intersected by one or more other walls, it is broken into multiple panels at those intersection points. You can use the Break tool on a wall's editing menu to manually create a break in a wall if needed. You can also use the Auto Break tool to break a wall into specific lengths.

## Viewing and Editing the Properties of Individual Wall Panels

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You can override the panel name settings defined in your panel configuration and define a custom name for individual wall panels in your project. You can define a prefix and/or suffix, and specify whether or not you want to include location data in the name.

### To customize the name of an individual wall panel:

1. In Model View or Worksheet View, select **Tools > Wall Panels**. In Model View you can also double-click any wall panel tag displayed in your 2D plan, or right-click a tag and select **Edit Wall Panels**.
2. In the left pane of the **Wall Panels** dialog, double-click the wall panel whose properties you want to view or edit, or right-click on the panel and select **Panel Properties**.
3. In the **Panel Properties** dialog, specify the name settings if desired. These are described below. As you define the name settings, the result is displayed in the **Panel Name** field.

**Add location data before prefix.** Displays either the **Location Name** or **Location Number** before the prefix. For example, if 'Panel2' resides on the Ground Floor location, and you select 'Location Name' to add to the prefix, the panel would be tagged 'Ground Floor Panel2'. If you do not want to add location data to the prefix, ensure that **None** is selected in the drop box.


**Add location data after suffix.** Displays either the **Location Name** or **Location Number** after the suffix. For example, if panel '2EXT' resides on the Ground Floor location, and you select 'Location Name' to add to the suffix, the panel would be tagged '2EXT Ground Floor'. If you do not want to add location data to the suffix, ensure that **None** is selected in the drop box.

**Prefix.** A set of characters that appear before the panel number. For example, if you specify a prefix of 'Panel', the panels would be tagged 'Panel1', 'Panel2', etc.

**Number.** The number assigned to the panel according to your panel configuration settings. This value cannot be edited for individual panels, but you can edit your panel numbering system. See Editing Wall Panel Numbering on page 158.

**Suffix.** A set of characters that appear after the panel number. For example, if you specify a suffix of 'EXT', the panels would be tagged '1EXT', '2EXT', etc.

**Panel Name.** The resulting panel name and tag.

4. To display the diagram's tags and dimensions in the preview window, enable the **Display Annotations** check box. Disabling annotations results in a larger preview of the panel, providing a close-up look.
5. Click **OK**. The panel name updates in the **Wall Panels** dialog and the panel tag updates in your 2D plan.
6. If you have previously inserted the panel onto a worksheet, a Regenerate symbol  appears next to the panel name. This indicates that you need to regenerate the panel in order to update it with your name changes.

To regenerate the panel, click  at the top of the dialog.

7. Click **Close** in the **Wall Panels** dialog.

## Flipping a Wall Panel's View Side

Walls are tagged automatically as you draw them. They are tagged on the side specified in your panel configuration settings. Once you have drawn your walls you can flip the panel tag of individual walls to the other side of the wall if desired. This will also flip the resulting wall panel diagram so that you are viewing the wall from the other side.

**To flip a wall panel's view side:**

1. In 2D plan view, right-click on the panel tag that you want to flip, then select **Flip Panel View Side**. The tag flips to the other side of the wall.

**Note:** If you have previously inserted the panel onto a worksheet and want to update the inserted diagram, you will need to regenerate it.

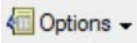
**Editing Wall Panel Numbering**

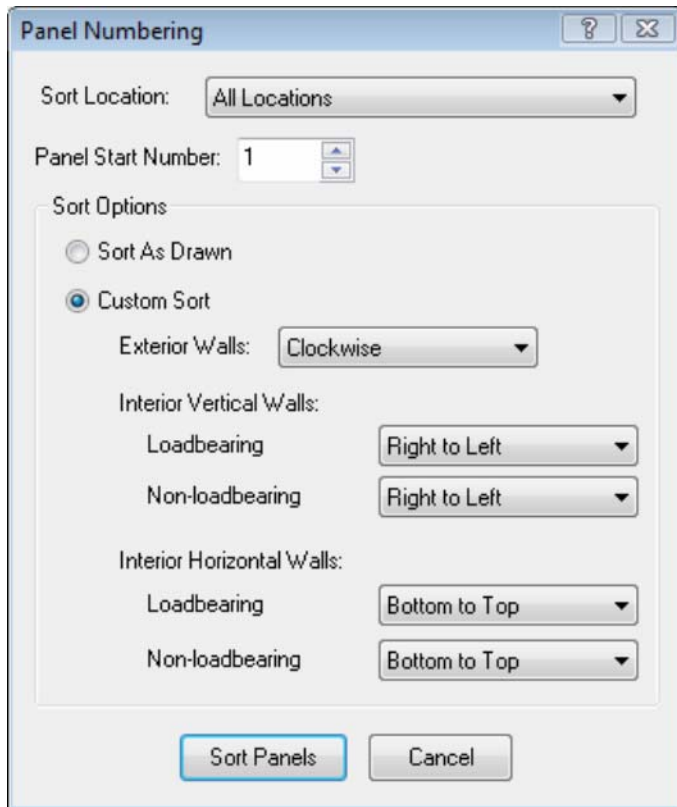
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By default, wall panels are numbered in the order in which walls are drawn, starting with the default Start Number defined in your panel configuration settings. When you draw a wall that intersects another wall, the wall that you intersect is broken into smaller panels, which can cause panel numbering to become non-sequential in your 2D plan.



You can customize the wall panel numbering order on each building location after your walls have been drawn. You can choose a different start number or specify custom numbering options for exterior walls, interior load-bearing walls and interior non-load-bearing walls. Instead of numbering panels in the order in which walls are drawn, you can number them in a specific direction. For example, you can number exterior walls in a clockwise or counterclockwise direction, or number vertically drawn walls from left to right or right to left.


**To edit wall panel numbering:**

1. In Model View, select **Tools > Wall Panels**. You can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or right-clicking a tag and selecting **Edit Wall Panels**.
2. In the **Wall Panels** dialog, click  and select **Panel Numbering**. The **Panel Numbering** dialog appears:



3. From the **Sort Location** drop box, select the location for which you want to customize panel numbering. If you want to apply the same rules to every location, select **All Locations**.
4. To specify a different start number for your panel numbering system, edit the value in the **Panel Start Number** edit box. For each wall panel in the sequence, panel numbers will increment by 1 from this value. For example, if the first panel is numbered 100, the next will be 101, and the one after that will be 102, and so on.

5. If you want all wall panels to be numbered in the order in which they were drawn, enable the **Sort as Drawn** radio button.
  6. If you want to sort panels in a specific direction rather than the order in which they were drawn, enable the **Custom Sort** radio button.
  7. To specify a sort order for exterior walls, click the drop box next to **Exterior Walls** and select either **As Drawn**, **Counter-Clockwise** or **Clockwise**.
  8. To specify a sort order for vertical interior walls, click the drop boxes in the **Interior Vertical Wall** area and select either **As Drawn**, **Left to Right** or **Right to Left**. For example, if you select Left to Right, the vertical interior walls on the left side of the plan will be numbered first, and numbering will increase as you go across the plan to the right. You can specify a different sort order for load-bearing and non-load-bearing walls.
  9. To specify a sort order for horizontal interior walls, click the drop boxes in the **Interior Horizontal Wall** area and select either **As Drawn**, **Top to Bottom** or **Bottom to Top**. You can specify a different sort order for load-bearing and non-load-bearing walls.
10. When you are finished defining your sort options, click . The wall panels in the **Wall Panels** dialog are sorted according to the rules you have set.
  11. If you have previously inserted any of the re-numbered panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update their tag numbers on the worksheets.

To regenerate inserted panels and update them with your changes, select them in the list and then click  at the top of the dialog.

12. To update the panel numbering in your 2D plan, click **Close** in the **Wall Panels** dialog.




**Tip:** You can also manually re-order wall panels by moving them up and down in the Wall Panels dialog. See Re-ordering Wall Panels Manually on page 159.


## Re-ordering Wall Panels Manually

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You can manually re-order wall panels by moving them up and down in the Wall Panels dialog. When you move a wall panel up or down, it acquires the number of the panel that was in that spot originally. For example, if you move panel 1 at the top of the list down one spot, it becomes panel 2. Once you have re-ordered your panels and close the Wall Panels dialog, the tags in your 2D plan will update. If you have inserted any of the panels onto worksheets, you will need to regenerate them in order to update their tag numbers on the worksheets.

### To re-order panels in the wall panel list:

1. Select **Tools > Wall Panels**. You can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
2. In the **Wall Panels** dialog, click on the wall panel that you want to move. The panel is highlighted red in the 2D plan shown in the dialog's lower right pane. This lets you know which panel you are re-numbering.
3. Click  at the top of the dialog to move the panel up in the list, or click  to move it down. As you move the panel up or down, it acquires the number of that spot in the list.
4. If you have previously inserted any of the re-numbered panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update their tag numbers on the worksheets.

To regenerate inserted panels and update them with your changes, select them in the list and then click  at the top of the dialog.

5. When you are finished re-ordering panels, click **Close** in the **Wall Panels** dialog. The wall panel tags in your 2D plan are updated.

**Note:** To sort your panels automatically according to a custom set of sorting rules, see Editing Wall Panel Numbering on page 158.

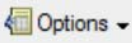
## Editing Wall Panel Names

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By default, wall panels are simply referred to by number and do not include any other information. You can add a prefix and/or suffix to the wall panel number, and add location data to the prefix or suffix for easier identification. You can edit the name definition for single or selected panels, or for all panels. (If you want to quickly edit the name of an individual wall panel and its associated tag, see Viewing and Editing the Properties of Individual Wall Panels on page 157.)

If you have already drawn your walls and edit your panel tag definition, the tags do not update automatically in your drawing or in the Wall Panels dialog. You must update them using the Apply Name Changes to Selected Panel(s) tool.

### To edit panel naming settings:

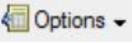


1. In Model View or Worksheet View, select **Tools > Wall Panels**. In Model View you can also double-click any wall panel tag displayed in your 2D plan, or right-click a tag and select **Edit Wall Panels**.
2. In the left pane of the **Wall Panels** dialog, select the panels whose name definition you want to change. 'Ctrl+click' to select multiple panels one by one, or 'Shift+click' to select a group of consecutive panels (or all panels). You can also click once on the building location name to instantly select all panels on that location. Note that you can expand and collapse each location by double-clicking the location name.
3. Click  and select **Panel Configuration**.
4. In the **Panel Configuration** dialog, select **Panel Tags** in the left pane. The settings are described below.

**Prefix.** A set of characters that appear before the panel number. For example, if you specify a prefix of 'WP', the panels would be named 'WP1', 'WP2', etc.

**Add location data before prefix.** Displays either the **Location Name** or **Location Number** before the prefix. For example, if panel WP2 resides on the Ground Floor location, and you select 'Location Name' to add to the prefix, the panel would be named 'Ground Floor WP2'. If you do not want to add location data to the prefix, ensure that **None** is selected in the drop box.

**Suffix.** A set of characters that appear after the panel number. For example, if you specify a suffix of 'EXT', the panels would be named '1EXT', '2EXT', etc.

**Add location data after suffix.** Displays either the **Location Name** or **Location Number** after the suffix. For example, if panel 2EXT resides on the Ground Floor location, and you select 'Location Name' to add to the suffix, the panel would be named '2EXT Ground Floor'. If you do not want to add location data to the suffix, ensure that **None** is selected in the drop box.

5. Click **OK**.
6. To apply edited name settings to the currently selected panels, click  and select **Apply Name Changes to Selected Panel(s)**. The tags in the **Wall Panels** dialog and in your drawing are updated.
7. If you have previously the selected panels onto worksheets, a Regenerate symbol  appears next to the panel name. This indicates that you need to regenerate the panel in order to update it with your tag changes. To regenerate the panel, click  at the top of the dialog.
8. Click **Close**.

**Note:** If you want to change the way panels are numbered, see Editing Wall Panel Numbering on page 158.

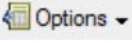

## Applying Name Changes to Wall Panels

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If you have already drawn your walls and have edited the name definition in your panel configuration settings, the tags will not update automatically in your drawing or in the Wall Panels dialog. You must update them using the Apply Name Changes to Selected Panel(s) tool.



**To apply tag changes to existing wall panels:**

1. In Model View, select **Tools > Wall Panels**. You can also double-click any wall panel tag displayed in 2D plan view, or right-click a tag and select **Edit Wall Panels**.
2. In the left pane of the **Wall Panels** dialog, select the panels whose tag name you want to update. 'Ctrl+click' to select multiple panels one by one, or 'Shift+click' to select a group of consecutive panels (or all panels). You can also click once on the building location name to instantly select all panels on that location. Note that you can expand and collapse each location by double-clicking the location name.
3. Click  and select **Apply Name Changes to Selected Panel(s)**. The current tag definition is applied to the selected panels in the Wall Panels dialog as well as in your drawing.
4. If you have previously inserted the selected wall panels onto worksheets, click  at the top of the dialog to update the inserted panels.
5. Click **Close** in the **Wall Panels** dialog.

**Note:** You do not need to use the Apply Name Changes to Selected Panel(s) tool if you have not drawn walls yet. The current tag definition will be automatically applied as you draw walls.

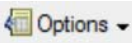
**Note:** If you regenerate a wall panel diagram that has been inserted onto a worksheet, the tag in the inserted diagram updates, but the name of the worksheet does not. You can edit the name of a worksheet by editing its view properties. See Renaming a View Window on page 265.

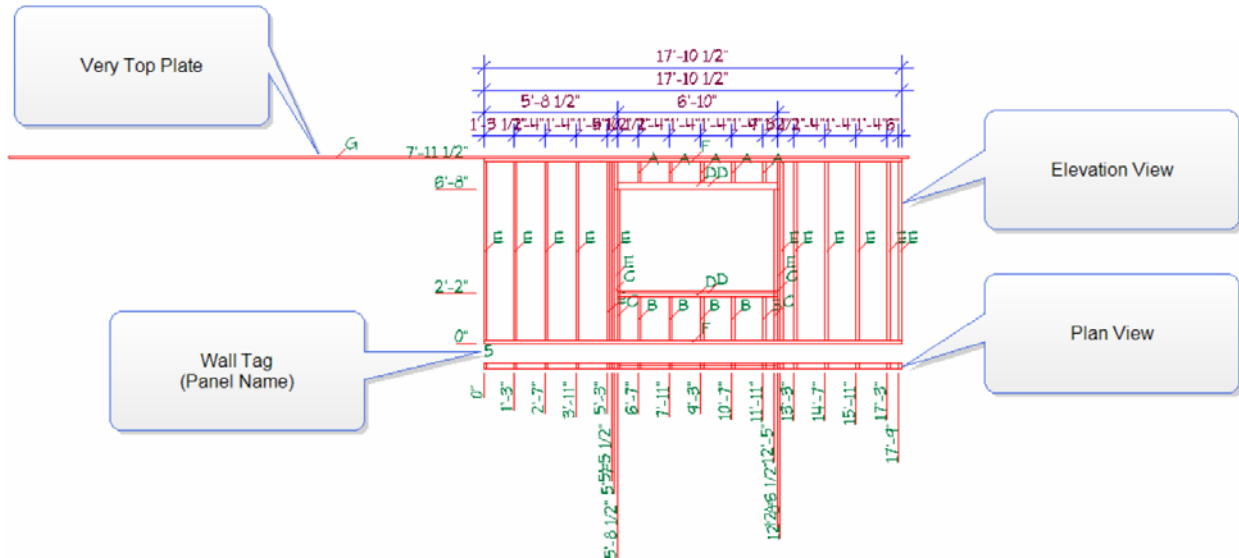
**Editing Content Display in Wall Panel Diagrams**


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By default, each wall panel diagram includes both an elevation view and plan view of the wall as well as the panel's tag number. The very top plate is also included. You can specify whether or not you want each of these items to be included in your wall panel diagrams by editing your panel configuration settings. Note that when you define panel content settings, they apply to all wall panels.

**To specify what you want displayed in your wall panel diagrams:**

1. Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
2. Click  and select **Panel Configuration**.
3. In the **Panel Configuration** dialog, select **Panel Content** in the left pane.
4. Select either **Yes** or **No** for each of the following to determine whether or not they will be included in the panel diagram.
  - Include Elevation View.** Includes the display of the framed panel in elevation view.
  - Include Plan View.** Includes a plan view of the wall panel, which shows you the distance between members in the panel.
  - Display Wall Tags.** Includes the wall panel tag name in the diagram. The tag appears at the bottom left corner of the elevation view, or top left corner of the plan view.
  - Include Very Top Plates.** Includes the display of the very top plate if one is present in the frame.



- Once you have defined your panel content, click **OK**.
- If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.

To regenerate inserted panels and update them with your changes, click  **Regen Panel(s)** at the top of the dialog.

- When you are finished customizing and updating panels, click **Close** in the **Wall Panels** dialog.

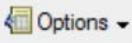
**Note:** If you have already inserted wall panel diagrams onto worksheets you can also manually edit wall panel diagrams by editing each panel's definition in Worksheet View. See *Editing Inserted Wall Panels Manually* on page 167.

## Editing Wall Panel Dimension Settings

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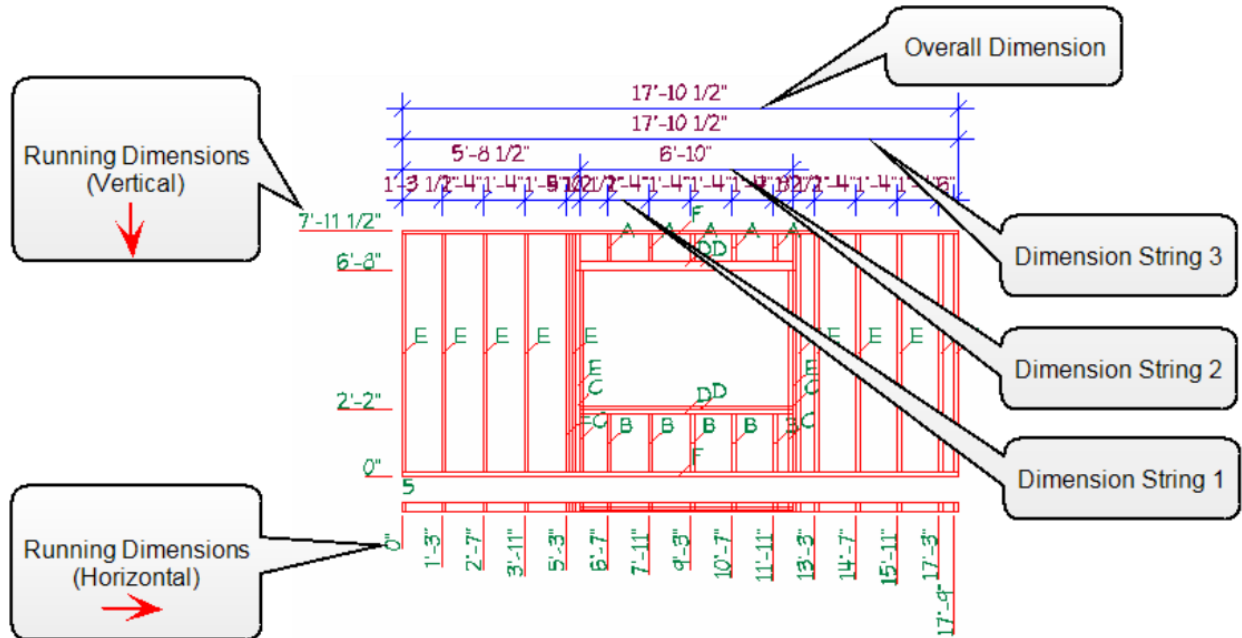
Wall panel diagrams have a default set of dimension settings that determine which items are dimensioned in the diagram, including studs, top plates, bottom plates, cripples and openings. You can choose which dimensions you want displayed by editing your panel configuration settings. Note that when you define dimension settings, they apply to all wall panel diagrams.



### To define wall panel dimension settings:


- Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or right-clicking a tag and selecting **Edit Wall Panels**.
- Click  **Options** and select **Panel Configuration**.
- In the **Panel Configuration** dialog, select **Dimensions** in the left pane.
- Select either **Yes** or **No** for each available dimension string to specify whether or not it is included in the diagram.

There are 3 groups of dimensions in each diagram: those running up the side of the panel, those running across the top of the panel, and those running across the plan view. The dimensions running across the top of the panel include 4 dimension strings, each of which can be defined individually.





5. To select a style to use for the dimensions, select **Text and Dimension Styles** in the left pane of the **Panel Configuration** dialog. Click on the **Dimension Style** item, then click the browse button  in that field. Select the desired style in the **Dimension Styles** dialog, then click **OK**.
6. Click **OK** in the **Panel Configuration** dialog.
7. If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.

To regenerate inserted panels and update them with your changes, click  **Regen Panel(s)** at the top of the dialog.

8. When you are finished customizing and updating panels, click **Close** in the **Wall Panels** dialog.

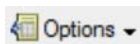

**Note:** If you have already inserted wall panel diagrams onto worksheets and you want to manually edit dimensions, you can do so by editing the panel's definition in Worksheet View. See [Editing Inserted Wall Panels Manually](#) on page 167.


## Editing the Dimension Style Used in Wall Panels


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You can select the dimension style that you would like to use in your wall panel diagrams. The selected style will be applied to all numerical dimensions as well as the member tags.

### To edit the text styles used for wall panels:

1. Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
2. In the **Wall Panels** dialog, click  **Options** and select **Panel Configuration**.
3. In the **Panel Configuration** dialog, select **Text and Dimension Styles** in the left pane.
4. Click on the **Dimension Style** item, then click the browse button  in that field.
5. In the **Dimension Styles** dialog, select the desired dimension style, then click **OK**.
6. Click **OK** in the **Panel Configuration** dialog.

7. If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.

To regenerate inserted panels and update them with your changes, click  at the top of the dialog.

8. When you are finished customizing and updating panels, click **Close** in the **Wall Panels** dialog.

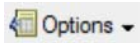
## Editing Wall Panel Schedule Settings

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By default, a member schedule is included in each wall panel diagram. You can control the placement of the schedule within the diagram and choose whether or not you want to include a usage for each member in the schedule. If you don't want to include a schedule in your wall panel diagrams, you can turn them off in your panel configuration settings. Note that schedule settings apply to all wall panel diagrams.

### To edit wall panel schedule settings:

1. Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or right-clicking a tag and selecting **Edit Wall Panels**.

2. Click  and select **Panel Configuration**.

3. In the **Panel Configuration** dialog, select **Schedule** in the left pane. A typical schedule includes the tag, usage, description, count and length of each member type in the frame.


Schedule settings are described below.


**Include Schedule.** Select either **Yes** or **No** to specify whether or not you want to include a schedule in the diagram.

**Placement.** Choose either **Below** or **Right** to specify where you want to place the schedule in relation to the annotated panel.

**Include Usage.** Select either **Yes** or **No** to specify whether or not you want to include a **Usage** column in the schedule that reports the usage of each member.

1. When you finished editing schedule settings, click **OK**.

4. If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.

To regenerate inserted panels and update them with your changes, click  at the top of the dialog.

5. When you are finished customizing and updating panels, click **Close** in the **Wall Panels** dialog.

**Note:** If you have already inserted wall panel diagrams onto worksheets and you want to manually edit an individual schedule, you can do so by editing the panel's definition in Worksheet View. See *Editing Inserted Wall Panels Manually* on page 167.

**Note:** To select a style for schedule text, see *Editing the Text Styles Used for Wall Panels* on page 164.


## Editing the Text Styles Used for Wall Panels


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You can select the text styles that you would like to use for the wall panel tags in your 2D plan and for the text that appears in your wall panel diagrams.

### To edit the text styles used for wall panels:


1. Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.


2. In the **Wall Panels** dialog, click  and select **Panel Configuration**.

- In the **Panel Configuration** dialog, select **Text and Dimension Styles** in the left pane.
- Click on the item for which you want to select a text style, then click the browse button  in that field to display the **Text Styles** dialog. You can make selections for the following styles:
 

**Label Text Style.** The style applied to the panel name in the wall panel diagram. The panel name appears at the lower left corner of the elevation view, or the top right corner of the plan view.

**Tag Text Style.** The style applied to wall panel tags in your 2D plan.

**Schedule Text Style.** The style applied to text in the wall panel's member schedule.
- When you are finished selecting text styles, click **OK**.
- If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.
 

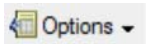
To regenerate inserted panels and update them with your changes, click  at the top of the dialog.
- When you are finished customizing and updating panels, click **Close** in the **Wall Panels** dialog.

## Editing Wall Panel Insertion Settings

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You can edit the settings used when wall panel diagrams are inserted onto worksheets. You can control the insertion scale of panels as well as the scale of the worksheets that are created. You can also choose to include a drawing border or title block along with the panel diagram. If inserting multiple panels on one sheet, you can define the number of panels that you want to have in each row, and control the spacing between panels.

### To define panel insertion settings:

- Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
- Click  and select **Panel Configuration**.
- In the **Panel Configuration** dialog, select **Insertion Settings** in the left pane. The settings are described below.

**Import Scale.** The scale of the panel diagram when it is inserted onto the worksheet. By default, the import scale is the same as the worksheet scale. This means that the diagram will fill most of the sheet, which is ideal if you only want one wall panel diagram on each sheet. If you want to insert multiple panels on a sheet, or make panels appear smaller on the sheet for any reason, select an import scale that is smaller than the worksheet scale.

#### Common Scales


192	1/16" = 1'-0"
96	1/8" = 1'-0"
64	3/16" = 1'-0"
48	1/4" = 1'-0"
32	3/8" = 1'-0"
24	1/2" = 1'-0"
16	3/4" = 1'-0"
12	1" = 1'-0"
8	1 1/2" = 1'-0"
4	3" = 1'-0"
2	6" = 1'-0"
1	12" = 1'-0"


**Worksheet Scale.** The scale of the worksheet that will be created if you choose to insert panels from Model View, or choose to insert panels onto new worksheets when in Worksheet View. By default, the scale displayed is the same scale that is set for your main Model view window.

**Plan View Spacing.** The distance between panels when multiple panels are inserted onto one worksheet.

**Drawing Border.** Inserts a drawing border around the panel when it is inserted onto a worksheet. If you do not want to include a border, select **None** in this drop box. You can choose any block that currently exists in your project. For example, in the default drawing you will see *Titleblock (Arch D-Landscape)* listed because that is the title block that is inserted on the default worksheets.

**# Panels Across in Multi-Panel Insertion.** If you are inserting multiple panels onto one worksheet, this value determines the maximum number of panels in one row. For example, if you are inserting 20 panels and you set this value to 5, your worksheet will contain 4 rows of panels with 5 panels in each row.

4. Click **OK**.
5. If you have previously inserted any of the panels onto worksheets, a Regenerate symbol  appears next to the names of the panels that have been inserted. This indicates that you need to regenerate the panels in order to update them with your changes.

To regenerate inserted panels and update them with your changes, click  at the top of the dialog.

6. Click **Close** in the **Wall Panels** dialog.

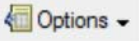
**Note:** Editing the wall panel insertion settings has no effect on wall panel diagrams that you have already inserted onto worksheets. If you want to use the new settings on inserted panels, you will have to delete the inserted panels and insert them again.

**Note:** If you have already inserted wall panel diagrams onto worksheets you can manually edit wall panel diagrams by editing each panel's definition in Worksheet View. See *Editing Inserted Wall Panels Manually* on page 167.

## Specifying Default Print Settings for Wall Panel Diagrams

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Prior to printing wall panel diagrams you can specify the print settings that you would like to use.

1. Select **Tools > Wall Panels**. If you have already drawn walls, you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
2. Click  and select **Default Print Setup**.
3. In the **Print Setup** dialog, specify the desired print settings. For more information about these settings, see "Printing Drawings" on page 443.
4. Click **OK**.


## Inserting Wall Panels onto Worksheets

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You can insert wall panel diagrams onto worksheets directly from the **Wall Panels** dialog. You can insert multiple diagrams simultaneously, saving valuable time and effort. If you insert wall panel diagrams from Model View, they are inserted onto new worksheets that the program creates for you. If you insert wall panel diagrams from Worksheet View, you can choose to insert the diagrams onto new sheets or existing sheets.

**To insert wall panel diagrams onto worksheets:**

1. You can insert panels from Model View or Worksheet View. However, if you want to insert panels onto an existing worksheet, make that Worksheet View window the current view window first.
2. Select **Tools > Wall Panels**. If you are in Model View you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
3. In the **Wall Panels** dialog, select the panels in the list that you want to insert. 'Ctrl+click' to select multiple panels one by one, or 'Shift+click' to select a group of consecutive panels (or all panels). You can also click once on the building location name to instantly select all panels on that location. Note that you can expand and collapse each location by double-clicking the location name.

4. If you are currently in Model View, click . A new worksheet will be created for each selected panel, and the panel diagrams will be inserted onto the sheets automatically. If your view tabs are displayed, you will see new tabs added — one for each new worksheet created.

If you are currently in Worksheet View, click  and then select either **On Current Worksheet** or **On New Worksheet(s)**.

If you select **On Current Worksheet**, all selected panels will be inserted on the current worksheet. The spacing and layout of panels is determined by the insertion settings in your Panel Configuration. If you select **On New Worksheet(s)**, a new worksheet will be created for each selected panel.

5. When you are finished inserting panels, click **Close**.


**Tip:** You can define various insertion settings prior to inserting panels. For example, you can choose to include a drawing border on the worksheet, set the spacing between inserted panels, and specify a scale for inserted panels. See Editing Wall Panel Insertion Settings on page 165.

**Note:** New worksheets containing panel diagrams are listed in the View Manager, so that you can control the visibility and properties of each one.

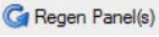


## Regenerating Wall Panels


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If you have inserted wall panel diagrams onto worksheets and you subsequently make changes to your wall framing or your wall panel configuration, the inserted diagrams do not update automatically. In order to update the inserted diagrams with your changes you need to regenerate them in the Wall Panels dialog.

If you see a Regenerate symbol  next to a panel's name in the **Wall Panels** dialog, this indicates that the panel has been inserted previously and that it requires regeneration. The program has detected a change in your wall framing or wall panel settings that impacts the appearance of the wall panel diagram.

### To regenerate wall panels:

1. Select **Tools > Wall Panels**. If you are in Model View you can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or right-clicking a tag and selecting **Edit Wall Panels**.
2. In the **Wall Panels** dialog, select the panels in the list that you want to regenerate. 'Ctrl+click' to select multiple panels one by one, or 'Shift+click' to select a group of consecutive panels (or all panels). You can also click once on the building location name to instantly select all panels on that location. Note that you can expand and collapse each location by double-clicking the location name.
3. Click . When a panel has been regenerated, the Regenerate symbol  is replaced by a check mark , indicating that the panel's definition has been updated.
4. Click **Close** in the **Wall Panels** dialog. If you go to a worksheet that contains a regenerated wall panel, you will see that the diagram has been updated.

**Note:** Panels that have never been inserted onto worksheets are marked with an  in the Wall Panels dialog. These panels do not require regeneration if you make changes to your wall framing or panel configuration because they have not been generated yet. Their diagrams will be generated with the current settings when you insert them onto worksheets.

**Note:** You can also manually edit wall panel diagrams that have already been inserted onto worksheets. See Editing Inserted Wall Panels Manually on page 167.

## Editing Inserted Wall Panels Manually

When you insert a wall panel diagram onto a worksheet, it is inserted as a block. This means that you can move, rotate, scale or delete the diagram as a whole. You can also edit every line, character and object in the diagram individually and even add objects to it. When you edit a block's definition, all instances of that block will update automatically with your changes.

**To edit an inserted wall panel diagram manually:**

1. Go to the worksheet containing the wall panel diagram that you want to edit.
2. Click anywhere on the diagram to select it.
3. If you want to edit the diagram as a whole, select the desired editing tool (Move, Rotate, Scale, Delete, etc.) from the **Modify** menu.
4. If you want to edit individual lines or text in the diagram, go to the Object Properties pane on the right side of the screen and click the **Edit** button in the **Definition** field. This takes you into block editing mode.
5. Click on an object that you want to edit, then make the desired change. Continue editing objects as needed.
6. When you are finished editing the diagram, press **ESC** on your keyboard to return to the overall worksheet.


**Note:** If you change a wall's size or framing, or change your panel configuration settings, you can update inserted wall panel diagrams with those changes by regenerating the panels in the Wall Panels dialog.

**Exporting Wall Panel Data to a CSV File**

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You can export data from selected wall panels to a CSV file to create an automatic bill of materials.

**To export wall panel data to a CSV file:**

1. Select **Tools > Wall Panels**. You can also bring up the **Wall Panels** dialog by double-clicking a wall panel tag in your 2D plan, or by right-clicking a tag and selecting **Edit Wall Panels**.
2. In the **Wall Panels** dialog, select the panels whose data you want to export. Single-click to select one panel, Shift-click to select a group of consecutive wall panels, or Ctrl+click to select multiple panels one at a time.
3. Click  **Options** and select **BOM from Selected Panel(s)**.
4. In the **Save As** dialog box, specify a name and save location for the generated file, then click **Save**. A message box confirms that the BOM generation is complete.

A partial sample file is shown below.

	A	B	C	D	E	F	G	H
1	Panel Name	TAG	USAGE	DESCRIPTION	DX1	DY1	COUNT	LENGTH
2		2 A	Stud	2x4 SPF	1 1/2"	3 1/2"	17	7'-8 5/8"
3		2 B	Header	2x6 SPF	1 1/2"	5 1/2"	4	4'-0"
4		2 C	Header	2x6 SPF	1 1/2"	5 1/2"	2	4'-4"
5		2 D	Plate	2x4 SPF	1 1/2"	3 1/2"	1	9'-8 1/4"
6		2 E	Plate	2x4 SPF	1 1/2"	3 1/2"	1	9'-11 3/4"
7		2 F	Plate	2x4 SPF	1 1/2"	3 1/2"	2	23'-9"
8		2 G	Jack Stud	2x4 SPF	1 1/2"	3 1/2"	4	6'-6 1/2"
9		2 H	Jack Stud	2x4 SPF	1 1/2"	3 1/2"	2	6'-7"
10		2 I	Opening	2x4 SPF	1 1/2"	3 1/2"	2	3'-9"
11		2 J	Cripple St	2x4 SPF	1 1/2"	3 1/2"	3	8 1/8"
12		2 K	Cripple St	2x4 SPF	1 1/2"	3 1/2"	6	8 5/8"
13		2 L	Cripple St	2x4 SPF	1 1/2"	3 1/2"	6	3'-1 1/8"
14		3 A	Stud	2x4 SPF	1 1/2"	3 1/2"	8	7'-8 5/8"
15		3 B	Plate	2x4 SPF	1 1/2"	3 1/2"	2	6'-9"
16		3 C	Plate	2x4 SPF	1 1/2"	3 1/2"	1	14'-1"



# Chapter 16: Terrain

By default, a basic 160' x 160' grass terrain is displayed in the drawing area. You can edit the terrain's size, base level, mesh spacing and contour display. You can also select a different material to apply to the terrain when viewing in Rendered and Rendered Outline display mode.

To recreate the topography of your lot, you can add Hills, Valleys, Berms, Trenches, Plateaus or Slopes to the existing terrain.

Alternatively you can use the Terrain Import Wizard to import data from a site recorder file. This instantly creates a Triangulated Irregular Network (TIN) mesh that accurately depicts the contours of your building site.

If you do not have a site recorder file to import, you can convert the standard terrain to a TIN mesh and then create contours by adding spot points to the mesh.

Once you've modeled the terrain, you can create sidewalks and driveways using the Paths tool, or create a patio with the Pads tool. To help control sloped areas, you may want to insert a Retaining Wall.


If you would like your property lines and building setbacks to be represented in your plan, just use the Site Boundary tool to define the outline of your lot.

## Defining the Size of the Terrain

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By default, a 160' x 160' terrain is displayed in the drawing area. You can edit the length and width of the terrain to suit your needs.

### To define the size of the terrain:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. To change the overall size of the terrain, enter the desired values in the **Length** and **Width** edit boxes.
4. Click **OK**.


**Note:** Length and width settings are not available if the terrain is currently a TIN mesh.

## Defining the Base Level of the Terrain

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You can define the elevation at which the base of the terrain sits by editing the terrain's base level in your program settings. This effectively raises or lowers the terrain when viewing in 3D. The base level is also the reference point from which topographical features like hills and berms are measured. The base level also applies to TIN meshes.

### To define the base level of the terrain:


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. To change the level at which the base of the terrain sits, type the desired value in the **Base Level** edit box. This value is measured from 0.
4. Click **OK**.

## Cutting the Terrain Around the Building

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By default, the standard terrain in every new project is set to cut around the building instead of through it. You can specify the building location that you want the terrain to cut around, or force the terrain to cut through the building if you prefer. These settings apply to both the standard terrain and TIN meshes.

**To define how the terrain cuts around the building:**


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. To force the terrain to cut around the building, enable the **Auto-cut terrain around building** check box. If you want the terrain to cut through the building, disable this check box.
4. To specify the building location that you want the terrain to cut around, click the **Select Building Location to Cut Around** drop box, then select the desired location.
5. Click **OK**.

## Defining the Terrain Mesh Spacing

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When viewing the terrain in Hidden Line or Rendered Outline display mode in 2D Plan view, or in any display mode other than Rendered mode in 3D view, a mesh is displayed on the surface of the terrain to help you visualize the contours of the terrain in these display modes. You can edit the spacing between terrain mesh lines.

**To define the terrain mesh spacing:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. Type the desired spacing between mesh lines in the **Mesh Spacing** edit box. A smaller mesh spacing will show a higher level of detail than a larger mesh spacing.
4. Click **OK**.


**Note:** The Mesh Spacing setting is not available if the current terrain is a TIN mesh.

## Controlling the Display of Terrain Contours

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If you add features such as hills and slopes to the terrain, or create a TIN mesh with varying spot level points, contour lines appear on the terrain in 2D view. You can control the interval at which contour lines appear, specify the elevation of the first contour, or disable contours if preferred.

**To control the display of terrain contours:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. To display contours on your terrain, enable the **Show Contours** check box. If you do not want to display contours, disable this check box.
4. In the **Start** edit box, enter the elevation of the first contour.
5. In the **Interval** check box, enter the desired spacing between contours.
6. Click **OK**.

**Note:** If the current terrain is TIN mesh, you can also control the labels that appear on contour lines.

## Selecting a Material for the Terrain


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By default, a grass texture is applied to the terrain in Rendered and Rendered Outline display mode. You can apply a different material to the terrain if you want. For example, you may want to display a sandy, snowy or concrete terrain.

**To select a material for the terrain:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.




3. Click  in the *Material* area, then make your selection in the **Materials** dialog and click **OK**. A preview of the selected texture is displayed on the Terrain settings page.
4. Click **OK**.

## Specifying Line Style Settings for the Terrain

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By default, the terrain resides on the Terrain layer, and adopts the color, line type and line weight assigned to that layer. You can override the layer settings and apply a different line style settings to the terrain lines.

**To specify line style settings for the terrain:**


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. In the *Material* area, select the desired color, line type and line weight.
4. Click **OK**.

## Displaying/Hiding the Terrain Boundary Line

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By default, when viewing the terrain in 2D view, the outline of the terrain is displayed. You can disable the display of the boundary line if you want. This setting is available for both the standard terrain and for TIN meshes.


**To display or hide the terrain boundary line:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Terrain** in the left pane.
3. In the *Terrain Mesh* area, check or uncheck the **Show Boundary** check box.
4. Click **OK**.

## Turning the Terrain On and Off

You can hide the terrain from view and display it again whenever you want using the View Filter.

**To turn the terrain on or off:**


1. Select **View > View Filters > View Filter** or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Elements on Terrain tab.
3. Click the eye icon next to the **Terrain** option. The eye closes.
4. Click **OK**.

## Creating Hills and Valleys

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You can add hills to your terrain with a single mouse click. You can control the height of a hill as well as its peak shape. Generally, the diameter of the hill base is the same as the hill height. You can insert multiple hills together to create one larger hill. Also, if you insert hills next to other terrain elements, like plateaus or slopes, the elements will automatically blend together.

**To insert a hill or valley:**

1. Select **Insert > Terrain > Hills/Valleys**, or click  on the Terrain toolbar.
2. In the **Hills/Valleys** dialog, specify the height of the hill in the **Height** edit box. Entering a negative value will create a valley.
3. Using the **Zenith** slider control, select a peak shape for the hill.
4. Click **OK**.

5. Click to insert the hill. You can insert multiple hills if you like.
6. Right-click and select **Finish**.

**Note:** The Hills/Valleys tool cannot be used on TIN meshes.

## Editing the Height or Shape of a Hill

To edit the height or peak shape of a hill:

1. Click in the center of the hill to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the properties in the **Hills/Valleys** dialog.
4. Click **OK**.

## Creating Berms and Trenches

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A berm is a mound or bank of soil without formal sides. You often see large berms on the sides of highways, which are used for noise control. On a reduced scale, a natural berm can provide some interesting benefits in a backyard landscape.

**Climate control.** Berms act as windbreaks, channeling air flow. Berms can create a warmer microclimate or direct cooling breezes.

**Privacy.** A berm can be a "friendly fence" in the back yard or between your house and a sidewalk.


**Vertical interest.** You can add variety and texture to your gardens with berms, change the view from your outdoor sitting areas, or even hide eyesores with them.

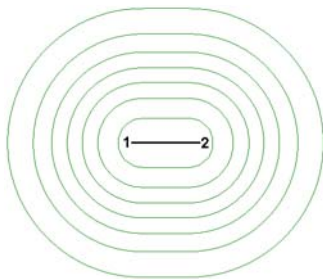
**Noise control.** A berm can cut down on traffic noise if you live on a busy street or near a schoolyard.

Berms may be shored with stone, bricks, or timbers, and planted with groundcovers, perennials, annuals, trees, etc.

You can control the height of a berm as well as its peak shape.

To create a berm/trench:

1. Select **Insert > Terrain > Berms/Trenches**, or click  on the Terrain toolbar.
2. In the **Berms/Trenches** dialog, specify the height of the berm in the **Height** edit box. Entering a negative value creates a trench.
3. Using the **Zenith** slider control, select a peak shape for the berm.
4. Click **OK**.
5. Select two points to define the length of the top of the berm. The berm will be created downward and outward from this line.



6. Right-click and select **Finish**.

**Note:** The Berms/Trenches tool cannot be used on TIN meshes.

## Stretching a Berm

To stretch a berm:

1. Click in the center of the berm to select it. Grips are displayed at either end of the berm's central line.

- Click and drag an end grip to stretch the berm, then release your mouse button. You can move the end point to any position on the screen.

## Editing the Height or Shape of a Berm

You can edit the height of a berm, or the depth of a trench, as well as its peak shape.

### To edit a berm's height or shape:


- Click in the center of the berm to select it.
- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.

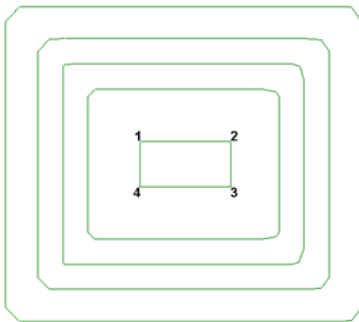
## Creating Plateaus

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A plateau is a relatively large, flat area of land situated above the adjacent land. Adding a plateau to your terrain involves clicking a few points to define the shape of the plateau. You can control the height of the plateau as well as its peak shape. Note that if you insert a plateau in close proximity to other terrain elements, such as hills, the elements automatically blend together.

### To create a plateau:

- Select **Insert > Terrain > Plateaus**, or click  on the Terrain toolbar.
- In the **Plateaus** dialog, specify the height of the plateau in the Height edit box. Entering a negative value creates an excavated area.
- Using the **Zenith** slider control, select a general shape for the plateau. The pointier the shape, the steeper the sides will be.
- Click **OK**.
- In the drawing area, select points to define the outline of the top of the plateau. Note that the last point picked always closes back to the start point, so you don't have to pick the start point again. The plateau will be created downward and outward from your outline.



- Right-click and select **Finish**.

**Note:** The Plateaus tool cannot be used on TIN meshes.

## Stretching a Plateau

### To stretch a plateau:

- Click in the center of the plateau to select it.
- Click on the edge of the central outline that you want to stretch. A blue grip is displayed on the selected edge.
- Click and drag the edge to stretch the plateau, then release your mouse button.

## Reshaping a Plateau

### To reshape a plateau:

- Click in the center of the plateau to select it. Corner grips are displayed on the central outline of the plateau.

2. Click and drag a corner grip to stretch the shape, then release your mouse button.

## Editing the Height or Peak Shape of a Plateau

To edit the height or peak shape of a plateau:


1. Click in the center of the plateau to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the properties in the **Plateaus** dialog.
4. Click **OK**.

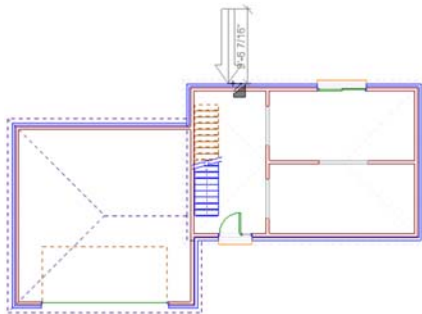
## Creating Slopes

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A slope is an area of land with a natural incline. It is often common practice to slope the land away from the sides of a house so that water drains away from it rather than towards it. When you create a slope, you select two points: the first point is the starting point of the slope, and the second point determines the length and direction of the slope. If the slope comes into contact with other terrain elements, like hills and plateaus, the elements automatically blend together.

To create a slope in your terrain:

1. Select **Insert > Terrain > Slopes**, or click  on the Terrain toolbar.
2. In the **Slopes** dialog, enable the **Height** button.
3. In the **Height** edit box, enter the desired height for the top of the slope. Note that slopes are built from the top surface of the terrain up.
4. Enable the **Angle** button.
5. In the **Angle** edit box, enter an angle (in degrees) for the slope. The higher the value, the steeper the slope.
6. Click **OK**.
7. Select a start point for the slope. The slope will incline from this point. Note that the sides of the slope will extend to the very edges of the terrain.
8. Move your cursor in the direction you want the slope to run. A stretchable arrow is displayed.



9. When the arrow is pointing in the right direction and is the desired length, click to insert the slope. The longer the arrow, the more gradual the slope will be. A shorter arrow will result in a steeper slope. Note that if the point you pick is not on the edge of the terrain, the land will level off at the top of the slope.
10. Right-click and select **Finish**.

**Note:** The Slopes tool cannot be used on TIN meshes.

**Note:** If you insert another slope, and that slope comes into contact with an existing slope, the new slope will insert on top of the existing slope.

## Stretching a Slope

### To stretch a slope:

1. Click in the center of the slope. The central arrow is displayed, and grips are displayed at either end of it.
2. Click and drag an end grip to stretch the arrow, then release your mouse button. Note that you can also rotate the arrow by selecting a different position for it while clicking and dragging. This changes the direction of the slope.

## Editing the Height of a Slope

### To edit the height of a slope:

1. Click in the center of the slope to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Slopes** dialog, enable the **Height** radio button.
4. Edit the height in the **Height** edit box.
5. Click **OK**.

## Editing the Angle of a Slope

### To edit the angle (steepness) of a slope:

1. Click in the center of the slope to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Slopes** dialog, enable the **Angle** radio button.
4. Edit the height in the **Angle** edit box.
5. Click **OK**.

## Importing Site Data

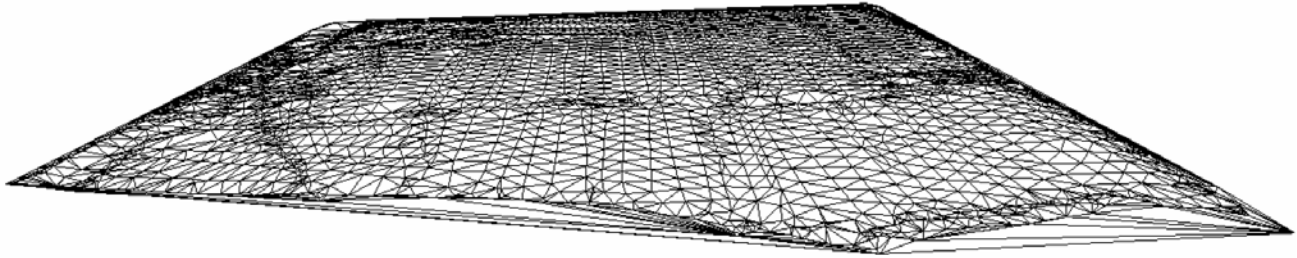
Construction Suite only

You can use the Terrain Import Wizard to import spot levels from a site recorder file. When you import site data, the program reads in the X, Y and Z coordinate values for each point in the file.

You can import site data from the following types of files:

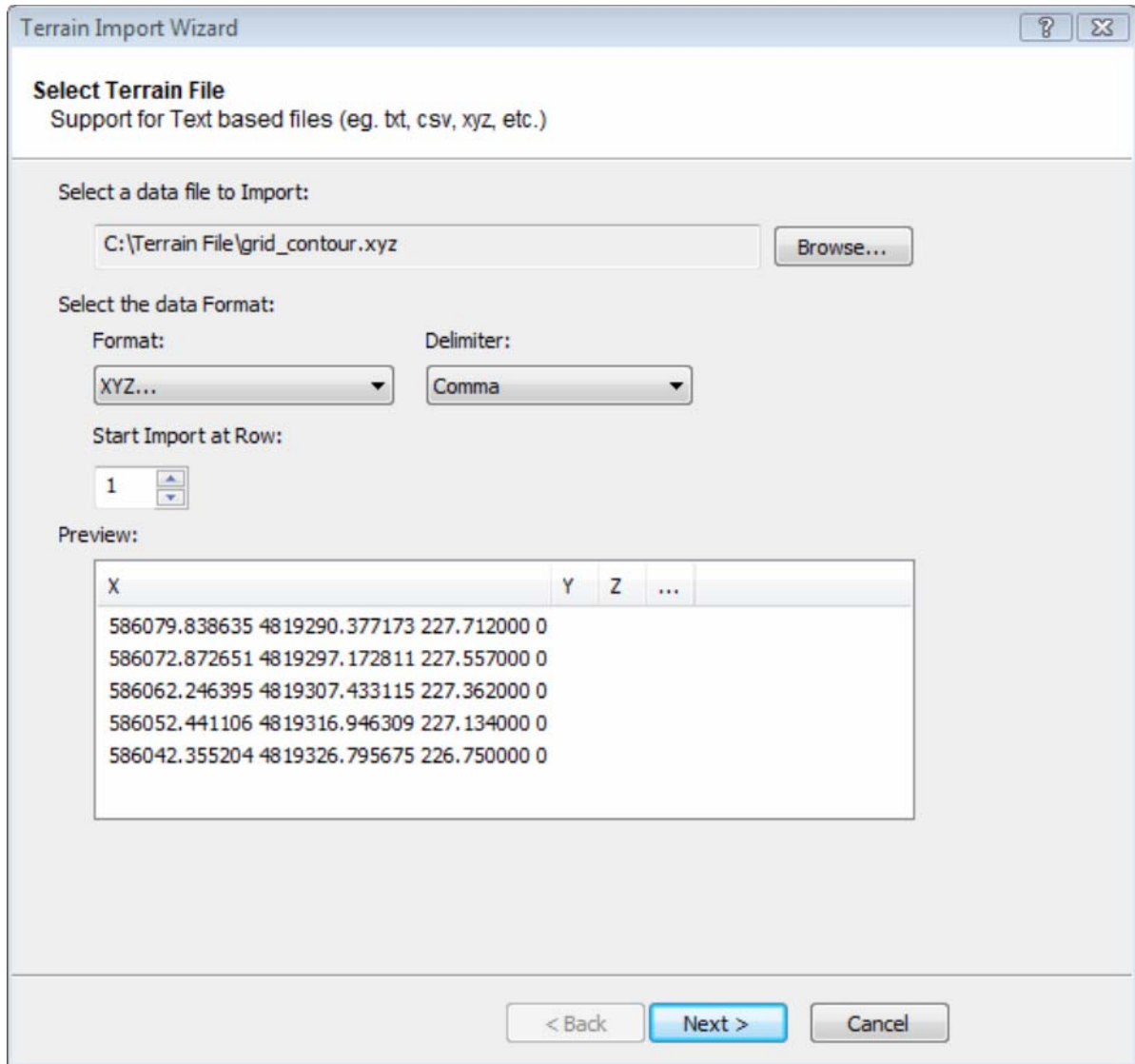
- TXT (delimited text file)
- CSV (Comma Separated Value file)
- GPX (GPS eXchange Format)
- XYZ (Coordinates file)
- YXZ (Coordinates file)
- PRM (Parameter file)
- PNT (Point file)
- AUF (Autodesk Uploadable File)
- NEZ (Northing, Easting and Elevation data)

Once you have stepped through the Wizard, a Triangulated Irregular Network (TIN) mesh is instantly created in the drawing area that accurately depicts the contours of your building site.



**To import site data:**

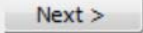
1. Select **Insert > Terrain > Import Site Data**, or click  on the Terrain toolbar.
2. On the first screen of the **Terrain Import Wizard**, click .
3. In the **Open** dialog, click the drop box next to the **File Name** edit box and select the file type you are looking for.
4. Locate and select the site recorder file that you want to import, then click **Open**. The file is loaded into the **Terrain Import Wizard**.

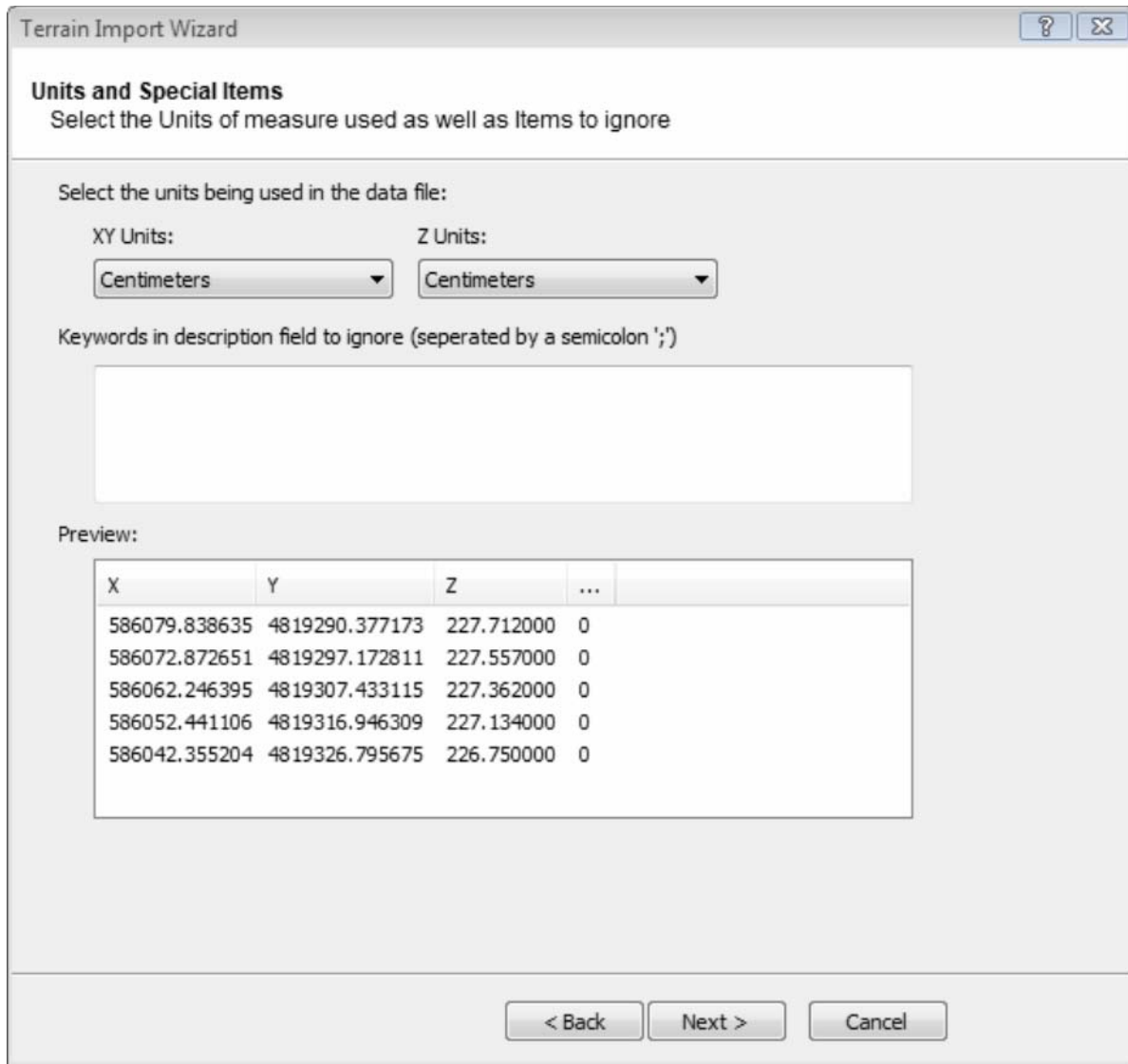


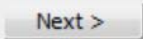
5. Click the **Format** drop box, then select the format of the data that you are importing.
6. Click the **Delimiter** drop box, then select the method used to separate data in the imported file. Choices are **Comma, Tab, Space, Semicolon, or Bar/Pipe**. If you are not sure what type of delimiter was used in the file, select the option that creates the most optimal result in the preview window. For example, if you are importing an XYZ file, you want to make sure that there is a value displayed in each column (X, Y and Z). If the wrong delimiter is selected, all values may appear grouped into one column (e.g. the X column), and the points will not be input properly.

X	Y	Z	...	
586079.838635	4819290.377173	227.712000	0	
586072.872651	4819297.172811	227.557000	0	
586062.246395	4819307.433115	227.362000	0	
586052.441106	4819316.946309	227.134000	0	
586042.355204	4819326.795675	226.750000	0	

7. If you want to start importing data from a row other than row 1, enter the row number in the **Start Import at Row** edit box.

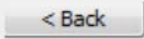
8. Click .
9. On the next screen, click the **Units** drop box and select the unit of measure used in the file that you are importing (**Millimeters, Centimeters, Meters, Inches, Feet** or **Yards**).

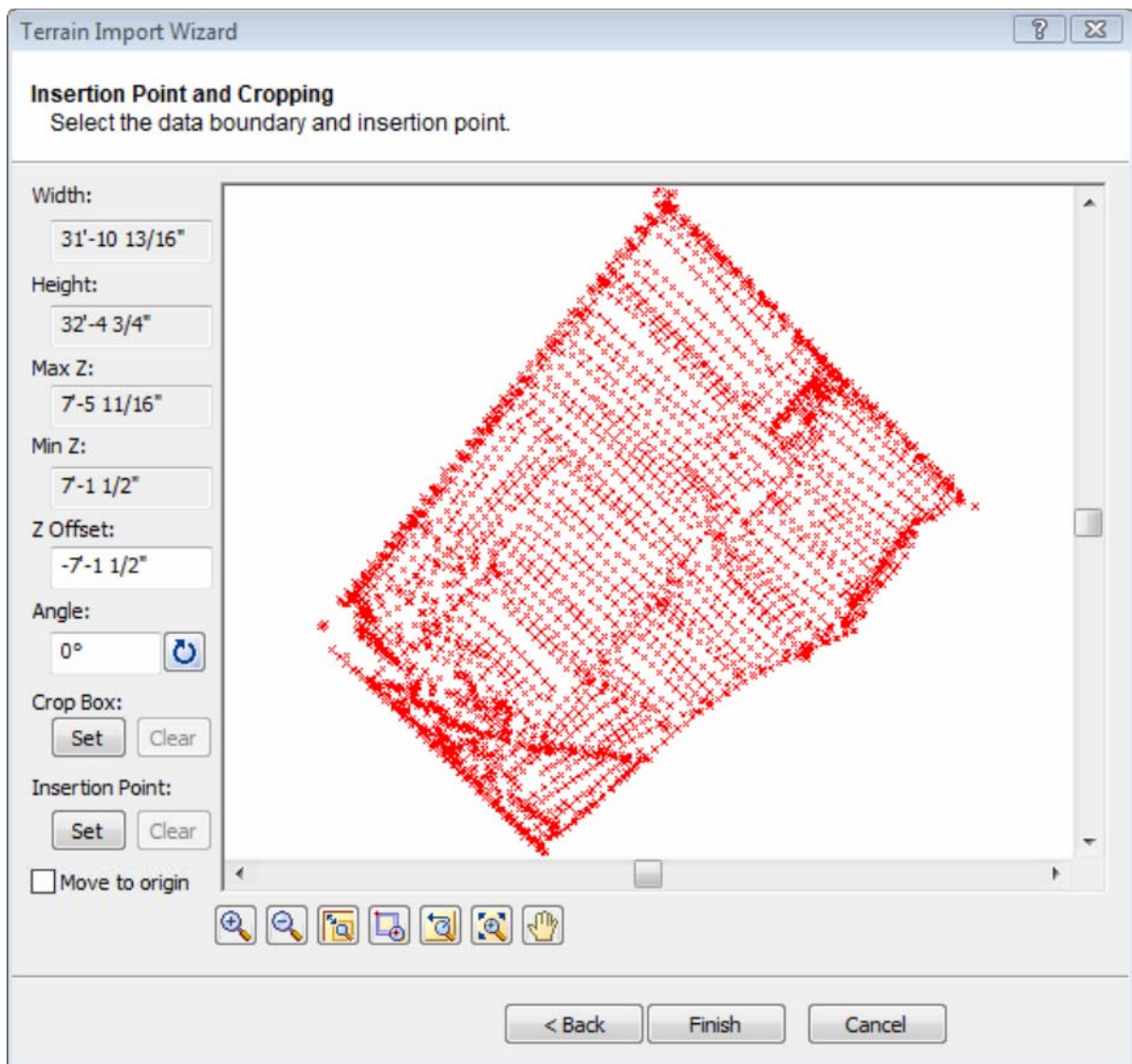





10. Certain points in the file may be there as a reference or comment only, and should not be included in the import. Such points are usually accompanied by text that distinguishes them from the measured spot levels. For example, a point may be labeled as a *benchmark* rather than a measured spot level. If the file contains points that you do not want to import, enter a keyword that identifies them in the file. If you are specifying multiple keywords, separate them with a semicolon (;). When the program is importing the file, any lines containing the specified keywords will be ignored.
11. Click . The points in the data file are imported into the Wizard. A preview of the resulting mesh is displayed on the next screen. You can zoom and pan in the preview window using the controls below the preview window.

The overall dimensions of the mesh (**Width** and **Height**) are displayed to the left of the preview. The elevation of the highest point on the mesh (the highest Z coordinate) is displayed in the **Max Z** box, and the lowest point (the lowest Z coordinate) is displayed in the **Min Z** box.

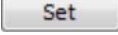



If the resulting values do not look realistic, click  to select input units that result in correct measurements. Note that the measurements are displayed in the unit of measure selected in your program settings, not necessarily the unit of measure used in the imported file.



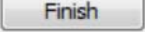
12. To adjust the base level from which spot levels are measured so that the mesh is inserted at the Base Level defined for the terrain in your program settings, edit the value in the **Z Offset** edit box. For example, if the **Min Z** value in your file is **20'**, and the Base Level in your program settings is set to **0"**, you might set the **Z Offset** value to **-20'** so that the bottom of the mesh sits at the 0" Base Level when it is inserted. If instead you were to specify a Z Offset of 0", the mesh would virtually be inserted 20' in the air when viewing in 3D.
13. If you want to change the angle of the mesh, enter the desired angle in the **Angle** edit box, or click the Pick Angle button  next to the **Angle** edit box and pick two points in the preview window to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
14. If you want to import only a portion of the mesh, click  under the **Crop Box** option, then click two points diagonally in the preview window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click .

15. Specify the point on the mesh that you want to be attached to your cursor when you are inserting the mesh:

To select a specific insertion point on the mesh, click  under the **Insertion Point** option, then select a point on the mesh that you would like to serve as the insertion point. A green circle is displayed at the selected point. This is the point that will be attached to your cursor when you insert the mesh in your drawing area. To remove the defined insertion point, click .

To move the insertion point to the origin specified in the original mesh file, enable the **Move to origin** check box.

If you do not select an insertion point or move it to the origin, your cursor will be attached to the center of the mesh when you insert it.

16. Click . The mesh is attached to your cursor.
17. Position the mesh in the drawing area, then click to insert it.

**Note:** If you import site data to create a TIN mesh and save the project as a version 7.2 file, the mesh will not be saved in that file. It will revert back to the standard, flat terrain.

## Converting the Terrain to a TIN Mesh

Construction Suite only

A Triangulated Irregular Network (TIN) mesh is a representation of the surface of the terrain based on a set of points. As an alternative to using Terrain tools such as Hills/Valleys, Slopes and Plateaus, you can convert your standard terrain to a Triangulated Irregular Network (TIN) mesh and then add spot level points to the mesh to create contours in the terrain. This can help you accurately depict the topography of your building site by illustrating changes in elevation across the site.

You can also convert a terrain that has had features such as hills and slopes added to it. In this case, spot level points and contours are displayed within the boundary of the TIN mesh.

### To convert the terrain to a TIN mesh:

1. Select **Insert > Terrain > Convert Terrain to TIN**.
2. In the **Convert Terrain** dialog, click **Yes** to confirm that you want to convert the terrain to a TIN mesh.

**Note:** If you convert the terrain to a TIN mesh and save the project as a version 7.2 file, the mesh will not be saved in that file. It will revert back to the standard, flat terrain.


## Adding Spot Level Points to a TIN Mesh

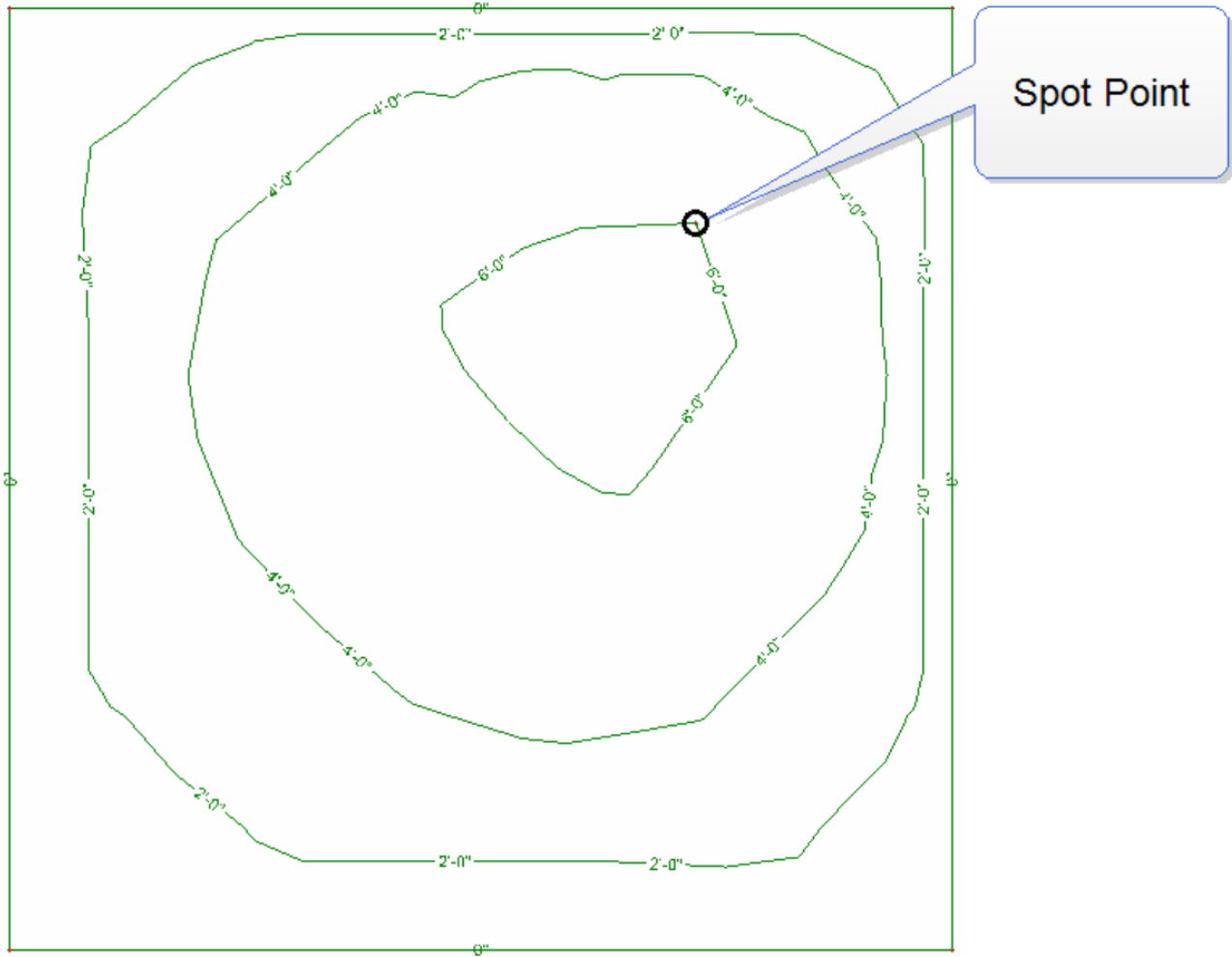
Construction Suite only

If you have converted the terrain to a TIN mesh, or have imported data from a site recorder file to create a TIN mesh, you can use the Spot Points tool to add spot level points to the mesh. Adding spot level points with different elevations creates contours on the mesh. This is a great alternative to using terrain tools such as Hills/Valleys, Slopes and Plateaus. Even adding only a few key points can result in a fairly good representation of your building site.

As you are positioning a spot point on the mesh you can view its current position by looking at the X and Y coordinates displayed on the Commander, and specify the point's Z coordinate, or elevation. You can also edit the point's elevation after insertion.

### To add spot level points to a TIN mesh:

1. Select **Insert > Terrain > Spot Point**, or click  on the Terrain toolbar. A spot point is attached to your cursor, and the Commander displays **X**, **Y** and **Z** edit boxes.
2. To specify the elevation of the spot point, type a value and press the Tab key. This value is measured from the base of the terrain and appears in the **Z** edit box as you type it.
3. With the Z value defined, position the spot point on the mesh. As you move it around, the values in the **X** and **Y** edit boxes update the display the point's current position. You can type directly in the **X** and **Y** edit boxes if you want.
4. Click to insert the spot point. Contours are created around the inserted point. Each contour is marked with elevation text.

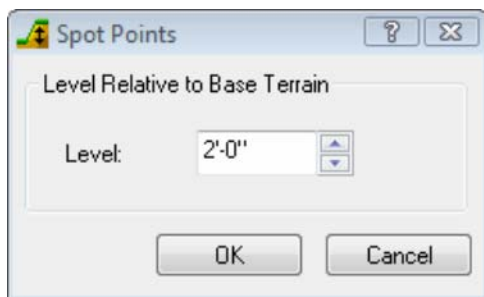


## Editing the Elevation of Spot Level Points

If you have used the Spot Points tool to add a spot level point to a TIN mesh, you can edit the elevation of that point after it has been inserted. When you edit the elevation of a spot level point, the contours update to reflect the change in the mesh.

### To edit the elevation of a spot level point:

1. Click on the spot point to select it.
2. Right-click and select **Properties**. The current elevation of the point is displayed in the **Spot Points** dialog.



3. Edit the value in the **Level** edit box to adjust the elevation of the point. The value is measured from the base of the terrain.
4. Click **OK**. The mesh is updated.

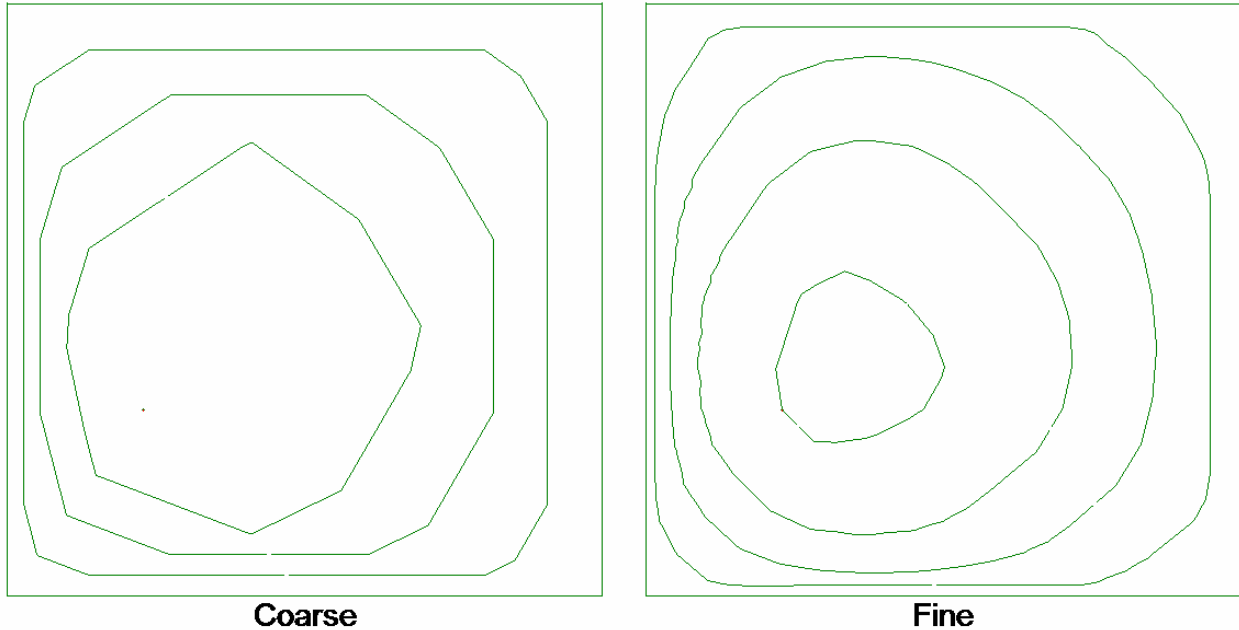
## Adjusting the Smoothness of Mesh Contours

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If you have imported site data to create a TIN mesh or have converted the terrain to a TIN mesh and added spot level points, you can control the smoothness of the mesh's contour lines. Fine smoothing creates gentle, rounded curves, while a more coarse setting creates more angular lines.

**To adjust the smoothness of mesh contours:**

1. Select **Settings > Program Settings**.
2. In the **Program Settings** dialog, select **Terrain** in the left pane.
3. In the right pane, click and drag the **TIN Smoothing** slider to the desired setting. Fine smoothing creates gentle, rounded curves, while a more coarse setting creates more angular lines.



4. Click **OK**.

**Note:** The TIN Smoothing setting is not available if the current terrain is not a TIN mesh.

## Controlling the Display of Terrain Contour Labels

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When you import site data to create a TIN mesh or add spot level points to a TIN mesh, the resulting contour lines are marked with labels that indicate the elevation of each contour. You can turn contour labels on or off, and select a text style to apply to the labels if they are turned on.

**To control the display of terrain contour labels:**

1. Select **Settings > Program Settings**.
2. In the **Program Settings** dialog, select **Terrain** in the left pane.
3. In the right pane, enable the **Show Labels** check box if you want to display contour labels, or disable the check box if you do not want to display labels.
4. To select a text style for the labels, click  below the **Show Labels** check box. Make a selection in the **Text Styles** dialog, then click **OK**.
5. Click **OK** to apply your changes.

## Resetting the Terrain

Construction Suite only

If you have imported site data to create a TIN mesh or converted the standard terrain to a TIN mesh, you can use the Reset Terrain tool to remove the TIN mesh from your drawing and re-insert a standard, flat terrain. The size and properties of the terrain are determined by your program settings.

### To reset the terrain:


1. Select **Insert > Terrain > Reset Terrain**. The TIN mesh is removed, and the terrain is reset.

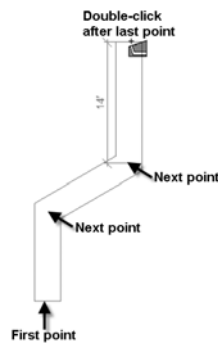
## Creating Paths, Sidewalks and Driveways

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The catalog contains a wide variety of path types, including boardwalks, sand paths, gravel paths, brick paths, and driveways. The width and thickness of a path is determined by the path's properties in the catalog. You control the length and direction of the path as you draw it. Dimensions are displayed as you draw each segment.

### To create a path:

1. Select **Insert > Terrain > Paths**, or click  on the Terrain toolbar.
2. In the catalog, select the path type you want to insert.
3. Select a start point for your path. Note that your insertion point is on the center line of the path.
4. Move your cursor in the direction you want the path to run, then select an endpoint for the path. You can continue selecting points in any direction to add more sections to the path if you want.



**Tip:** To create a smooth curve in the path, click several points with a short distance between each point.


5. Double-click to finish, or right-click and select **Finish**.

**Note:** By default, all paths hug the terrain they are inserted on, but you can disable the Hug Terrain option in the path's properties if you want.


## Stretching a Path Element

You can lengthen or shorten a sidewalk, pathway or driveway by clicking and dragging its end grips, or using the Stretch tool. If you use the click-and-drag method, the path is constrained to its current direction when you stretch it. If you use the Stretch tool you can rotate the path while stretching. You can also use the Commander when the Stretch tool is active.

### To stretch a path by clicking and dragging:

1. Click on the path to select it.
2. Click and hold your mouse button over one of the path's end grips. The Lengthen cursor is displayed .
3. Drag to stretch the path, then release your mouse button.

### To stretch a path with the Stretch tool:

1. Click on the path to select it.
2. Right-click and select **Stretch**. Your cursor becomes the Stretch cursor .

3. Click and hold your mouse button over one of the path's end grips, drag to stretch the path in any direction, then release your mouse button. If you want to enter a precise stretch distance or direction, click on the end grip, specify the desired distance and direction in the Commander, then press **Enter**.

## Editing the Thickness or Width of a Path Element

You can edit the thickness of your path material or the path's overall width.

### To edit the thickness or width of a path:


1. Select the path. If the path has multiple segments, you do not have to select them all. Property changes affect the whole path.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To edit the thickness of the path, enter a value in the **Thickness** edit box.
4. To edit the width of the path, enter a value in the **Width** edit box.
5. Click **OK**.

## Creating a Pad

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You can use the Pads tool to insert a concrete or brick pad directly on your terrain. By drawing the outline of the pad, you control its precise size and shape. You can use the Materials Paintbrush to apply a different color or material to the pad after it has been inserted.

### To create a pad:

1. Select **Insert > Terrain > Pads**, or click  on the Terrain toolbar.
2. In the catalog, select the type of pad that you want to insert.
3. Select a start point for the pad.
4. Continue selecting points to define the outline of the pad. Note that the last point picked always closes back to the start point, so you don't have to pick the start point again.
5. Right-click and select **Finish**.

**Note:** By default, pads hug the terrain they are inserted on. If the terrain is not flat where you are inserting the pad, you may want to turn off the pad's Hug Terrain option to make the pad flat and have it positioned at the Terrain Base Level specified in your Terrain Settings.

## Disabling the Hug Terrain Option

Disabling the Hug Terrain option ensures an element remains flat regardless of any slopes in the terrain, and positions the element at the Base Level specified in your terrain settings.


### To disable the Hug Terrain option:

1. Click on the edge of the element to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. On the Basic property page, uncheck the **Hug Terrain?** check box.
4. Click **OK**.

## Resizing a Pad

You can resize a pad by stretching one of its edges.

### To resize a pad by stretching it:

1. Click on the edge of the pad to select it.
2. Hover your pointer over the center blue grip of the edge you want to move. This displays the Move cursor.  Alternatively you can select the **Move Edge** tool on the right-click menu.
3. Click and drag to stretch the pad, then release your mouse button.

## Reshaping a Pad

You can change the shape of a pad by clicking and dragging its corners.

### To reshape a pad:

1. Click on the edge of the pad to select it. A grab handle is displayed at each corner.
2. Click and drag a corner grip to stretch the pad.
3. Release your mouse button.

## Editing the Thickness of a Pad

You can edit the thickness of a pad on the pad's Basic property page.

### To edit the thickness of a pad:


1. Click on the edge of the pad to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Pads** dialog, select the Basic tab.
4. Enter the desired thickness in the **Thickness** edit box.
5. Click **OK**.

## Drawing Retaining Walls

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Drawing retaining walls is easy — just point and click. Envisioneer automatically displays dimensions as you draw, and connects corners for you.

### To draw a retaining wall:

1. Select **Insert > Terrain > Retaining Walls**, or click  on the Terrain toolbar.
2. In the catalog, select the wall type you want to insert.
3. Select a start point for the wall.
4. Move your cursor in the direction you want your wall to run. Its length is shown as you draw the wall.
5. When the wall is the length you want, click to set its endpoint.
6. Continue selecting points to add on to the wall if you want.
7. When you are done, right-click and select **Finish**.



## Creating a Site Boundary Using the Reference Angle Method

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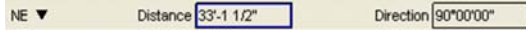
When creating a site boundary using the Reference Angle Method, angles are measured using compass bearings and a reference angle. Each angle is measured within a given quadrant (NE, NW, SE or SW). The angle is the acute (less than 90°) angle from the North or South meridian as measured to the East or West. For example, the bearing N 90d00'00" E can be thought of as 90° east of North.

By default, the angle is specified using the degrees/minutes/seconds format, but you can choose to use decimal degrees if you prefer.

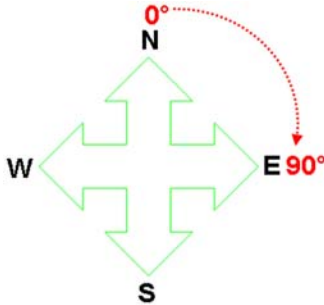
### To create a site boundary with the Reference Angle Method:

1. Make sure the Reference Angle format is selected on the Site Boundaries page in your Document Settings.
2. In 2D plan view, select **View > Zoom and Navigate > Zoom to Fit**, or click  on the View Control toolbar. This will bring the entire terrain into view so you can insert the boundary easily and precisely.
3. Select **Insert > Terrain > Site Boundary**, or click  on the Terrain toolbar.
4. Select a point for the first peg (stake). The Commander becomes instantly active, displaying options for defining the length and direction of line segments.

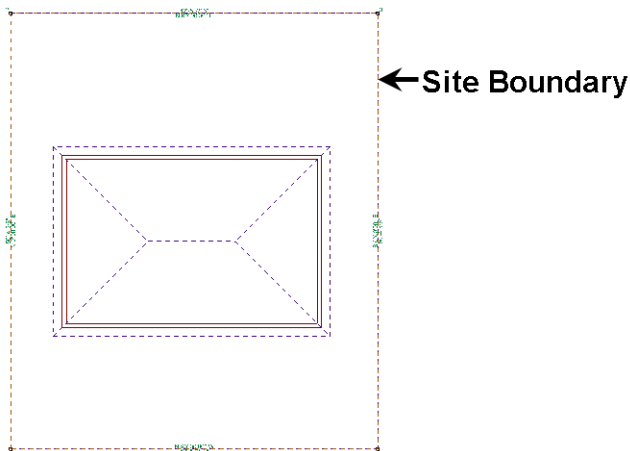




5. Move your mouse in the general direction you want the first site boundary line to run. This determines the quadrant you are working in, and the compass points used in the bearing. Note that you can also select a quadrant (NE, NW, SE or SW) from the drop box in the Commander if you prefer — just remember to Tab over to the **Distance** edit box when you're done.
6. Type a length for the boundary line. The value appears in the Commander's **Distance** edit box.
7. To specify the direction of the line, either move your mouse in the desired direction (watching the resulting angle in the Commander's **Direction** edit box), or press the Tab key to move to the **Direction** edit box, then enter the desired angle and press ENTER. Remember that the angle is measured from the North or South meridian, and should be between 0 and 90 degrees.



8. Continue defining the remaining segments. When you have defined all but the last segment, right-click and select **Finish**. A closing line segment will be created automatically between the first and last peg, forming a closed site boundary.





**Note:** Bearings coincide with the angle of the north arrow specified in your global settings.

### Creating a Site Boundary Using the Angle Bearing Method

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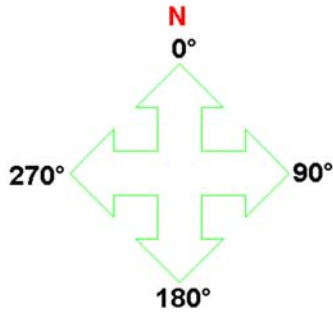
When using the Angle Bearing Method to draw a site boundary, each angle is calculated clockwise from the positive Y axis, or North meridian. By default, each bearing is entered as a forward bearing, but you can choose to enter a back bearing instead.

#### To create a site boundary with the Angle Bearing Method:

1. Make sure the Angle Bearing format is selected on the Site Boundaries page in your Document Settings.
2. In 2D plan view, select **View > Zoom and Navigate > Zoom to Fit**, or click  on the View Control toolbar. This will bring the entire terrain into view so you can insert the boundary easily and precisely.
3. Select **Insert > Terrain > Site Boundary**, or click  on the Terrain toolbar.



4. Select a point for the first peg (stake). The Commander becomes instantly active, displaying options for defining the length and direction of line segments.
5. If you want to enter a back bearing instead of a forward bearing, select **Back bearing** from the Commander's left drop box. Just remember to Tab over to the **Distance** edit box when you're done.
6. Type a length for the first boundary line. The value appears in the Commander's **Distance** edit box.
7. To specify the direction of the line, either move your mouse in the desired direction (watching the resulting angle in the Commander's **Direction** edit box), or press the Tab key to move to the **Direction** edit box, then type the desired angle and press ENTER. Remember that each angle is calculated clockwise from the positive Y axis, or North meridian.



8. Continue defining the remaining segments. When you have defined all but the last segment, right-click and select **Finish**. A closing line segment will be created automatically between the first and last peg, forming a closed site boundary.

## Stretching a Site Boundary

You can resize or reshape a site boundary by clicking and dragging its grips.

### To stretch a site boundary:

1. Click on one of your lot lines to select the site boundary. If you want to resize the boundary, click on the specific lot line that you want to move. Clear blue grips appear at each corner of the boundary, and a solid blue grip appears at the center of the lot line you selected.
2. To resize the boundary, click and drag the solid blue grip. To reshape the boundary, click and drag one of the clear blue corner grips.
3. Release your mouse button.

**Note:** You can also edit the length and direction of individual lot lines precisely by editing the boundary's properties.

## Editing the Length or Direction of Site Boundary Edges

You can edit the length or direction of a site boundary edge by editing site boundary properties.

### To edit the length or direction of a site boundary edge:

1. Click on the lot line you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To edit the length of the current segment, type the desired value in the **Length** edit box.
4. To edit the distance of the setback line from the lot line, type the distance in the **Setback** edit box.
5. To edit the angle of the current segment, make the appropriate changes in the *Direction* area of the **Site Boundary Edge** dialog. There are two methods of defining direction. The method that is available is the one that was used to draw the site boundary initially, or whatever is current on the Units of Measure page in your Program Settings.

If the *Reference Angle Method* is current, you can edit the direction of the segment by editing the value in the **Angle** edit box. If the *Angle Bearing Method* is current, you can edit the direction of the segment by editing the **Forward Bearing** or **Back Bearing** value.

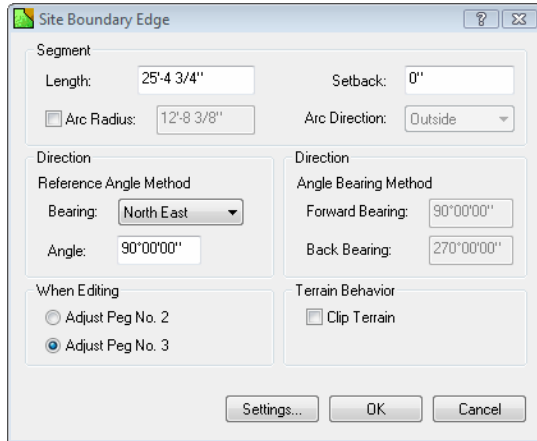
6. In the *When Editing* area, select the appropriate **Peg No.** to adjust, as editing the length or angle of a segment will cause a peg to move.
7. Click **OK**.

## Defining Setback Distances

By default, setback lines are not included in your site boundary, as all setback distances are set to 0. You can specify a setback distance for each individual site boundary edge.

### To define setback distances:

1. Click on the property line you want to specify a setback distance for. Note that setback distances are defined per site boundary edge, one at a time.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.



3. In the **Site Boundary Edge** dialog, edit the value in the **Setback** edit box.
4. Click **OK**.

## Clipping the Terrain to the Site Boundary

If you have added a site boundary to your plan, you can choose to clip the terrain to the site boundary so that when you view the model in 3D, you see only your lot. In other words, the terrain is resized to the size of your lot in 3D.

### To clip the terrain to the site boundary:

1. Click on the edge of the site boundary to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Site Boundary Edge** dialog, enable the **Clip Terrain** check box.
4. Click **OK**.

The terrain boundary line becomes dashed in 2D plan view, indicating that it will be clipped. The terrain will be clipped (resized) when you view the model in 3D.

## Curving a Site Boundary Edge

You can curve a site boundary edge using the Curve tool, or by editing site boundary edge properties.

### To curve a site boundary edge using the Curve tool:

1. Click on the site boundary edge you want to curve.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Click and drag the edge to the desired curve.
4. Release your mouse button.

### To curve a site boundary edge by editing its properties:

1. Click on the lot line you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.


3. Enable the **Arc Radius** check box, then enter the desired arc radius in the adjacent edit box. The arc radius is the distance from the lot line (in its uncurved state) to the top of the proposed arc.
4. Select the desired direction of the arc from the **Arc Direction** drop box. Selecting **Inside** creates the arc toward the inside of the boundary, while selecting **Outside** pushes it outward.
5. Click **OK**.

## Editing a Site Boundary's Line, Text and Peg Styles

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You can edit site boundary settings before or after a site boundary has been created. Settings include line styles for lot lines and setback lines, text styles for bearings, lengths and pegs, as well as peg size and style. You can also control which textual information you want to appear.

### To edit site boundary settings:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Site Boundaries** in the left column.  
If you have already drawn a site boundary, you can also access site boundary settings by clicking the **Settings** button in the **Site Boundary Edge** dialog.
3. To edit the line style of the outside boundary line, select **Boundary line** from the drop box in the *Lines* area, then select the desired color, line type and line weight for the line.
4. To edit the line style of the setback line, select **Setback line** from the drop box in the *Lines* area, then select the desired color, line type and line weight for the line.
5. To edit the line style of the pegs, select **Peg** from the drop box in the *Lines* area, then select the desired color, line type and line weight for the line.
6. To edit the peg style, select either the **Round** or **Square** option in the *Pegs* area. To edit the size of the peg symbol, enter the desired value in the **Width** edit box.
7. To edit the text style of bearing text, click the **Bearing** button, then select the desired text style from the **Text Styles** dialog. If you do not want to include bearing text in the site boundary, disable the adjacent **Include** check box. By default, bearing text appears on the inside of the site boundary. If you want it to appear on the outside, select **Outside Line** from the drop box next to the **Include** check box. Note that if you are including both bearing text and length text, one must be set to the outside of the boundary, and one must be set to the inside. You cannot have both on the same side. Otherwise, one of them will be disabled.
8. To edit the text style of length text, click the **Length** button, then select the desired text style from the **Text Styles** dialog. If you do not want to include length text in the site boundary, disable the adjacent **Include** check box. By default, length text appears on the outside of the site boundary line. If you want it to appear on the inside, select **Inside Line** from the drop box next to the **Include** check box.
9. To edit the text style of peg text, click the **Peg** button, then select the desired text style from the **Text Styles** dialog. If you do not want to include peg text in the site boundary, disable the adjacent **Include** check box.
10. To edit the distance between text and the site boundary line, enter the desired distance in the **Distance from line** edit box. This applies to all forms of text — bearing, length and peg text.
11. Click **OK**.

## Selecting a Method of Measurement When Drawing a Site Boundary


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There are two methods of angle measurement available for creating a site boundary. With the Reference Angle method, each angle is measured from the North or South meridian within a given quadrant (NE, NW, SE, SW). With the Angle Bearing method, each angle is measured clockwise from the positive Y axis, or North meridian.

Site units can be Imperial or Metric. You can select the unit of measure you want to use and specify the desired level of precision.

When specifying the angle of each site boundary segment, you can use Degrees/Minutes/Seconds, or Decimal Degrees with a specified level of precision.

**To select a method of angle measurement for site boundary entry:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Site Boundaries** in the left column.
3. Select the desired entry method from the **Bearing Format** drop box (*Reference Angle* or *Angle Bearing*).
4. In the *Distances* area, select either **Imperial** or **Metric**, then select a unit of measure from the **Units** drop box. Imperial choices are *Feet-Inches* and *Inches*. Metric choices are *Millimeters*, *Centimeters* and *Meters*. From the **Precision** drop box, select a level of precision for distance measurements.
5. From the **Units** drop box in the *Angles* area, select the unit you wish to use when specifying the angle of each site boundary edge. Choose either the *Degrees/Minutes/Seconds*, or *Decimal Degrees*. If your choice is *Decimal Degrees*, select the desired level of precision from the adjacent **Precision** drop box.
6. Click **OK**.

# Chapter 17: Landscaping

Envisioneer offers a full set of landscaping tools to help you design a complete and realistic landscape plan. You may want to start with major structures, such as Decks, Patios, Fences, Sheds and other Exterior Structures.

Once those are in place you can bring your plan to life with Garden Beds, Edging and Plants, and even lay out an Irrigation system!


Enhance and personalize your plan even further by adding Furniture, Accessories and Lighting.

## Inserting Plants

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Inserting plants involves nothing more than a single mouse click, and once inserted, they can be dragged and dropped anywhere you like. Before inserting plants, you may want to research different plant types in the Plant Encyclopedia, which contains thousands of different plant species.

### To insert a plant:

1. Select **Insert > Landscape > Plants**, or click  on the Landscape toolbar.
2. In the catalog, select the plant you want to insert. If you want to view the plant's size or requirements before inserting it, right-click in the catalog and select Properties.
3. Position the plant where you want it, then click to insert it.
4. Right-click and select **Finish**.

**Note:** Although the Master Catalog contains a wide variety of plants for you to insert, it does not contain all the plants listed in the Encyclopedia. You can, however, insert plants from the Encyclopedia. You can also add plants from the Encyclopedia to the current catalog.

## Editing the Appearance of a Plant in 2D View

By default, plants are represented by a circular symbol in 2D plan view. You can choose from three 2D plant styles. You can also change the diameter of the trunk in 2D, or hide the trunk altogether.

### To edit the style of a plant in 2D:

1. Select the plant whose properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Plants** dialog, select the Size tab.
4. To change the style of the circle shown in 2D plan view, click the style you want in the *Type* area.
5. To change the size of the trunk in 2D plan view, edit the value in the **Trunk Diameter** edit box. To hide the trunk from 2D view, select No from the **Show trunk in plan?** drop box.
6. Click **OK**.

## Changing the Age of a Plant

The age of a plant determines its size at planting time. You can increase or decrease the age of a plant by making a change on the plant's Plant Info property page.

### To change the age of a plant:

1. Click on the plant whose planting age you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Plants** dialog, select the Plant Info tab.
4. Move the **Planting Age** slider left or right until the desired planting age is displayed. Planting age is measured in years.

5. Click **OK**.

## Forcing a Custom Plant Size

The size of a plant is determined by properties in the Plant Encyclopedia. You can specify a custom height and width for a plant on the plant's Size property page. Note that if you do this, however, the plant's size changes in both 2D and 3D regardless of the *Planting Age* setting on the Plant Info page.

**Note:** If you just want to see plants at a different maturity level (i.e. change their age), you should change their planting age instead. You can also apply an overall age change to your landscape.


### To change the size of a plant:

1. Select the plant whose properties you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Plants** dialog, select the Size tab.
4. Set the **Size from encyclopedia** option to **No**.
5. To change the width of the plant, enter a value in the **Width** edit box.
6. To change the height of the plant in 3D view, edit the value in the **Height** edit box.
7. Click **OK**.

## Seeing Plant Growth Over Time

Once you have inserted plants in your landscape plan, you can see how they will look any specified number of years down the road using the Plant Growth Over Time feature.

### To see plant growth over time:

1. Select **Insert > Landscape > Gardening > Plant Growth Over Time**, or click the down arrow next to the Gardening button  on the Landscape toolbar and select **Plant Growth Over Time**.




2. Enter the number of years to add to your landscape.
3. Click **OK**.

## Applying Seasonal Changes to Plants

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The Plant Seasonal Change feature updates the appearance of the plants in your drawing to reflect a particular season. Generally the change applies to flowering plants and trees that have a certain bloom time.

### To apply seasonal changes to your plants:

1. Select **Insert > Landscape > Gardening > Plant Seasonal Change**, or click the down arrow next to the Gardening button  on the Landscape toolbar and select **Plant Seasonal Change**.
2. In the **Program Settings** dialog, change the date. Select a month by clicking the arrows on the month bar at the top of the calendar. Select a day by clicking a number on the calendar.
3. Click **OK**. The plants in your drawing are updated according to the time of year you specified.

**Note:** Keep in mind that seasonal changes may have different results depending on the plant's properties in the Encyclopedia. Things to consider are the climate of the region the plant is in, and the plant's world origin.


## Using the Plant Encyclopedia

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The Plant Encyclopedia contains comprehensive information on thousands of plants. The Encyclopedia has many uses related to the selection and care of plants. You can:

- View information about any plant
- Select plants based on certain criteria
- Research potential diseases
- Learn how to care for your plants

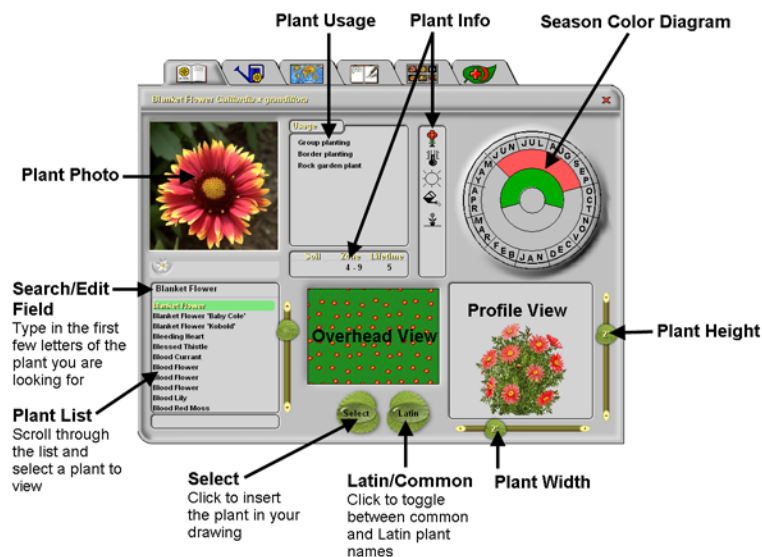
### To access the Plant Encyclopedia:

1. Select **Insert > Landscape > Gardening > Plant Encyclopedia**, or click  on the Landscape toolbar.  
You can also access the Plant Encyclopedia by clicking the **Encyclopedia** button on a plant's Encyclopedia property page.

## Encyclopedia Main Page

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The Encyclopedia's main page contains a comprehensive plant list that you can scroll through and select plants from. The page also displays a photo and two previews of a selected plant, as well as basic information about the plant and its appropriate growing environment.



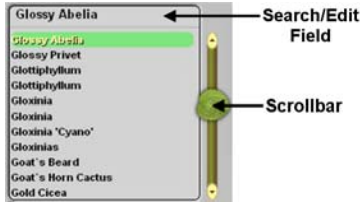
## Selecting a Plant to View

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By default, the plant list on the Encyclopedia's main page contains all 7500 plant species. If you have used the Plant Filter to filter out certain plant types, the list is smaller.

To select a plant in the plant list, use the scrollbar beside the plant list to scroll through the list of plants, then click on the plant you want to view. By default, common plant names are listed in the plant list. You can switch to Latin names by clicking the **Latin** button.

If you know the name of the plant you are looking for, you can locate it more quickly by typing the first few letters of the plant's name in the Search Edit field above the plant list. The list of plants will move to the closest match as you type.




## Viewing Plant Information

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The Encyclopedia's main page displays images and basic information about the currently selected plant.

### To view plant information:

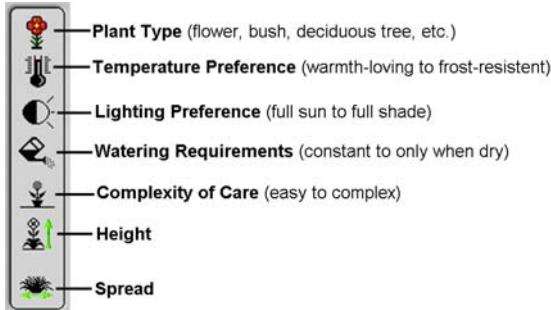
1. Select **Insert > Landscape > Gardening > Plant Encyclopedia**, or click  on the Landscape toolbar.
2. Select the plant you want to view information about.
3. Basic information is displayed on the main page, which is described below.

**Usage.** This window lists all the possible ways you can use the plant. Click one of the usage options to view a brief description of the usage in the Plant Usage catalog.

**Soil/Zone/Lifetime.** The window below the **Usage** window indicates **Soil Preference** (alkaline, acidic, heavy, etc.), **Zone** (ranging from 1 for Sub-Arctic to 10 for Sub-Tropical), and **Lifetime** (the life expectancy of the plant in years). Each of the icons/items in this window has a tool tip. If you hover your cursor over the icon/item, a small pop-up window appears displaying a brief description of the item. For example, if you hover your cursor over the soil preference icon, the window will display the preferred soil type that the icon indicates.

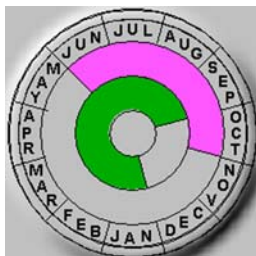


**Plant Type and Needs.** The window to the right of the **Usage** window indicates the following:



Each of the icons in this window has a tool tip. If you hover your cursor over the icon, a small pop-up window appears displaying a brief description of the icon.

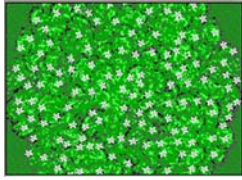
**Season Color Diagram.** This circle gives you an idea of what you can expect from the chosen plant throughout the year. The outer circle shows the months in which the plant blooms, and the color of its flowers. Fruits are also indicated in this circle, showing the period when they ripen, and the color of their fruit. The inner circle indicates when the plant has foliage (including autumn leaves), and the color of its leaves.





## Plant Views

The main page has two views: **overhead** and **profile**. The overhead view shows you a textured view of the plant from above.



The profile view gives you an idea of the plant's height and spread, and shows you what your plant will look like in 3D.

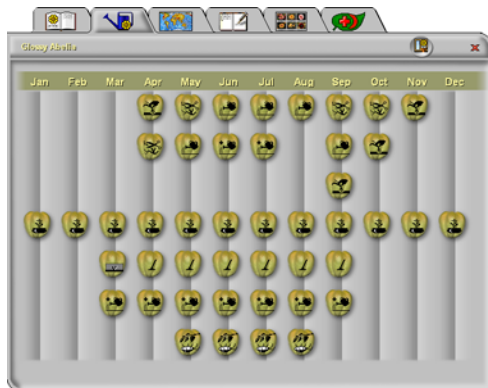


**Note:** The profile view shows the plant's total height. If the plant is a vegetable, this includes the underground part. If the plant is a water plant, the underwater part is included. The width of bushes and flowers can be affected by how they are pruned. The plant will reach optimum size at maturity and under favorable conditions.

## Plant Care Calendar

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The Encyclopedia's Plant Care Calendar page shows the required monthly care (planting, watering, fertilizing, etc.) for the currently selected plant.



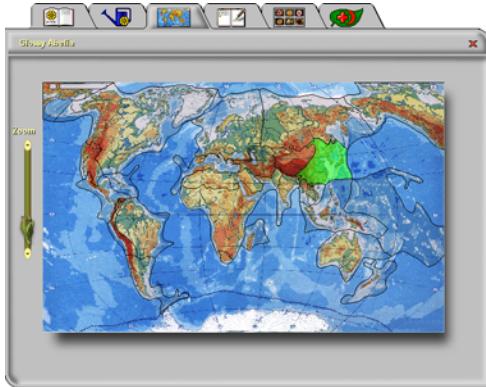
To see detailed information about each plant care task, click on the icon. A Care dialog appears displaying helpful animations and tips on how to complete a given task. Click **Animate** to play the animation, and **Stop** to stop it. Clicking the tools icon in the top right corner of the dialog opens a dialog showing the tools you will need to complete the task.



## World Map Page

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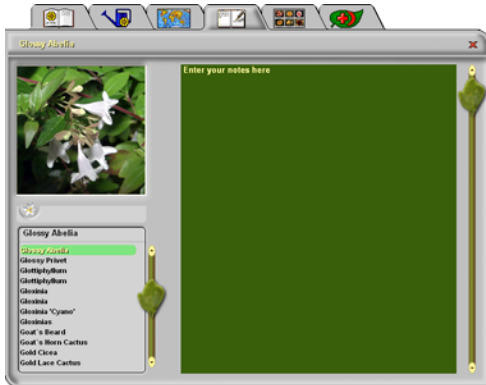
The Encyclopedia's World Map page displays a world map that indicates the region of the world where the currently selected plant originates. Right-click on a highlighted region to see details about the climate and growing conditions most favorable for plants indigenous to the region.



## Notebook Page

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You can use the Encyclopedia's Notebook page to enter and view notes about the currently selected plant. To select a plant, scroll through the list and click on it, or use the Search Edit field above the plant list to enter the first few letters of the plant name and find a quick match. Click in the box on the right side of the page and type your note. When you move to another page in the Encyclopedia, your text is saved automatically.





## Picture Page

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The Encyclopedia's Picture page contains a collage of thumbnail images of all the available plants in the plant list. You can browse through the images manually or by using the arrows at the top of the page.



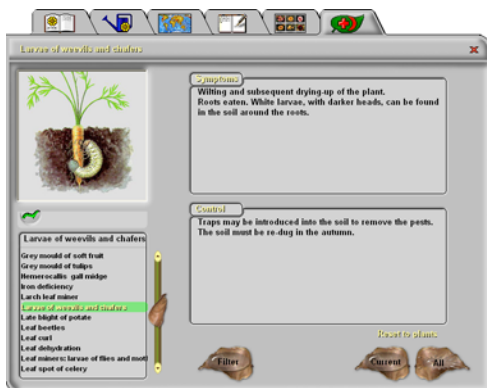
To view a large picture of a selected plant, click the View Large button  at the top of the page.

To return to the thumbnail views, click the View Thumbnail button .

## Diseases Page

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The Encyclopedia's Diseases page lists the possible diseases that may affect a plant. By default, the disease list contains the diseases that can affect the currently selected plant. If you want to view a comprehensive list of diseases for all plants, click **All** in the bottom right corner of the page.



When you select a disease in the disease list, you will see a picture of the disease, details of its symptoms in the **Symptoms** windows, and care information in the **Control** window.

If you want to search in reverse to find all plants affected by a specific disease, click the **Filter** button at the bottom of the page. This opens the main Encyclopedia page. To restore your plant list, return to the **Diseases** page and click the **All** button.

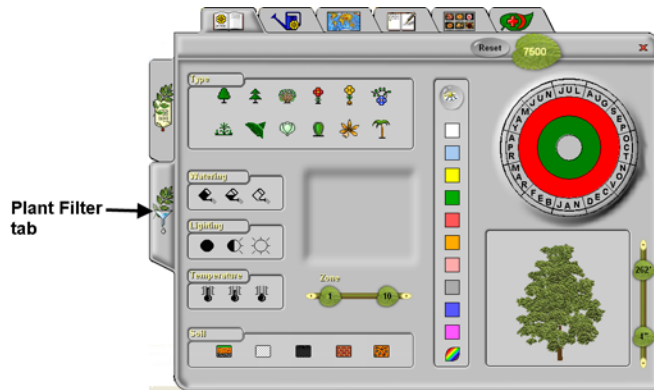
## Filtering the Plant List

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The Encyclopedia's Plant Filter lets you filter out unwanted plants from your plant list by specifying various criteria.

### To use the Plant Filter:

1. Select the Plant Filter tab on the left side of the Encyclopedia window.



- Each Encyclopedia page has different options. Click on the tabs along the top of the Encyclopedia window to select the page you want, then select the options you want.

The main Encyclopedia page lets you select the Plant Type, Watering Needs, Lighting Preference, Soil Preference, Zone, Color (for flower, leaf, autumn leaf, and fruit), Height and Blooming Season.

The **Plant Care Calendar** page lets you select the Complexity of Care required, Speed of Growth (for both height and spread), Life Expectancy and Usage.

The **World Map** page lets you select the region of the world where the plants originate. For example, if you wanted to find plants for an Asian-themed water garden, you would click on the Asian region of the map to exclude any plants that aren't indigenous to Asia.

The **Notebook** page lets you filter plants by notes that you've entered previously on this page. For example, you could enter the note "Front Yard" for all plants that you want to use in your front yard. When you are ready to lay out the front yard of your landscape plan you can go back to the **Plant Filter** and limit your plant list to only the plants you've pre-chosen for your front yard.

The **Picture** page lets you limit your plant list by the part of the plant shown in its photo (leaf, bark, fruit, etc.).

The filter option available on the **Diseases** page is different, because it affects the disease list, not the plant list. To use this filter, click on the image that represents the part of the plant affected or type of infestation, then select the **Encyclopedia** tab on the left side of the window to switch to the regular **Diseases** page. For example, if you are considering planting lilies or daffodils in your garden, and want to know what type of diseases these bulb plants may encounter, click the Bulb image on the **Diseases** page (in **Plant Filter** mode), then go into **Encyclopedia** mode and select the **Diseases** page.

- Select the criteria for filtering.

When you are in Plant Filter mode, each icon and scale represents a specific plant criterion. As soon as you click on an icon or move a slider, filtering begins. To deselect an icon, click on it again.

**Note:** If some of the icons disappear, it is because no such plant is selectable within the current criteria. For example, if you select minimal water, the climber plant type icon will disappear because there are no climbing plants that will accept minimal watering.

If you select more than one icon within a single group, then all plants with any of the checked properties will be selected. For example, selecting maximum light and medium light will exclude all plants that flourish under minimal light (shade) conditions. If icons/sliders of more than one type are checked/moved, then plants that satisfy all the chosen criteria will be selected. For example, if you click on the deciduous tree icon in the **Type** box, the full sun icon in the **Lighting Preference** box, and the white square on the **Color** box, then only hardwood trees that flourish in full sunlight, require minimal watering, and produce white flowers will be selected.


- The total number of plants available — based on the filters you have applied — is indicated by red in the upper right corner of the window. If at any time you want to restore the complete list of plants, click **Reset**.

## Inserting Plants from the Encyclopedia

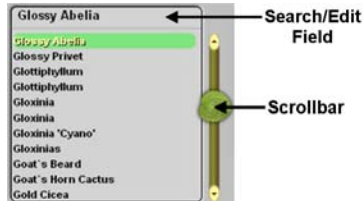
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The Plant Encyclopedia contains more than 7500 plant species, not all of which are included in the catalog. You can insert a plant directly from the Encyclopedia if you want.

### To insert a plant from the Encyclopedia:

1. Select **Insert > Landscape > Gardening > Plant Encyclopedia**, or click  on the Landscape toolbar.
2. In the Plant Encyclopedia, locate and select the plant you want to insert. To select a plant in the plant list, use the scrollbar beside the plant list to scroll through the list of plants, then click on the plant you want to view. By default, common plant names are listed in the plant list. You can switch to Latin names by clicking the **Latin** button.

If you know the name of the plant you are looking for, you can locate it more quickly by typing the first few letters of the plant's name in the Search edit field above the plant list. The list of plants will move to the closest match as you type.



3. Click the **Select** button. The Encyclopedia closes, and the plant is attached to your cursor.
4. Insert the plant in your plan.
5. Right-click and select **Finish**.

## Adding Plants to the Catalog from the Encyclopedia

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Although the catalog contains a vast array of plants for you to insert, it does not contain all the plants listed in the Plant Encyclopedia.

You can add any plant from the Plant Encyclopedia to any catalog by following the steps below.

### To add a plant from the encyclopedia to the current catalog:


1. Select **File > Catalogs > Element Manager**.
2. In the **Element Manager** dialog, select or create the group you want to add the plant to.
3. Select **Edit > Add Element**.
4. In the **Plants** dialog, select the Plant Info tab.
5. Click the **Encyclopedia** button to launch the Plant Encyclopedia.
6. On the Encyclopedia's main page, select the desired plant in the plant list.
7. Click **Select**. Notice that the Plant Info page of the **Plants** dialog is now full with the selected plant's information.
8. In the **Name** edit box, specify a name for your plant.
9. Specify the remaining properties (Size, Quantity or Behavior) if desired, then click **OK** in the **Plants** dialog. Note that the settings on the Appearance page have no effect on the plant's appearance. The appearance of a plant is determined by settings in the Encyclopedia.
10. Click **OK** in the **Element Manager** dialog. The plant is added to your catalog.

## Inserting Irrigation

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The catalog contains a wide selection of pop-up sprinklers with varying ranges of spray. You insert a sprinkler by simply pointing and clicking with your mouse. When you insert a sprinkler, the coverage of the spray is outlined with a dashed line.

### To insert pop-up sprinklers:

1. Select **Insert > Landscape > Irrigation**, or click  on the Landscape toolbar.
2. In the catalog, select the sprinkler you want to insert.
3. Position the sprinkler where you want it, then click to insert it. You can continue inserting more sprinklers if you want.

4. Right-click and select **Finish**.

## Editing a Sprinkler's Spray Properties

You can edit the distance covered by a sprinkler's spray, as well as the spray pattern line style.

**To edit a sprinkler's spray properties:**


1. Select the sprinkler.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To edit the spray distance, edit the size values on the Basic property page. For most sprinklers you would edit the **Width** and **Depth** values. The Adjustable sprinkler in the catalog lets you specify a custom radius and included angle for the spray.
4. To edit the line style of the spray pattern, select the Appearance tab, then select **Spray Pattern** in the left pane. Click the Select button in the *Linestyle* area to select a different line style.
5. Click **OK**.

## Creating Fills

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You can use the Fills tool to define an area filled with soil, sand, gravel, concrete, bark or water. You define the area by picking points to draw its outline. Filled areas automatically hug the terrain they are inserted on.

**To create a filled area:**


1. Select **Insert > Landscape > Fills**, or click  on the Landscape toolbar.
2. In the catalog, select your fill material.
3. Select a start point for your filled area.
4. Continue selecting points to define the boundary of the filled area. Note that the last point picked always closes back to the start point, so you don't have to pick the start point again.
5. Right-click and select **Finish**.

**Note:** You cannot insert a fill on top of another fill.

## Resizing a Filled Area

You can resize a filled area by stretching one of its edges.

**To resize a filled area by stretching it:**

1. Click on the filled area to select it.
2. Click on the edge you want to stretch.
3. Hover your pointer over the solid blue grip to display the Move cursor.  Alternatively you can select the **Move Edge** tool on the right-click menu.
4. Click and drag to stretch the fill.
5. Release your mouse button.

## Reshaping a Filled Area

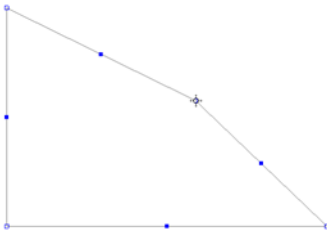
You can change the shape of a filled area by stretching its corners. You can do this by clicking and dragging its grips.

**To reshape a filled area by stretching:**

1. Click on the filled area to select it. A grab handle is displayed at each corner.



2. Click and drag a corner grip to stretch the filled area.



3. Release your mouse button.

## Curving a Filled Area

You can curve the edge of a fill using the Curve tool. Once the tool is active, you can click and drag the edge to curve it, or select a point to curve to.

### To curve a fill edge by clicking and dragging:

1. Click on the fill edge that you want to curve.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Click and drag the fill edge to the desired curve.
4. Release your mouse button.

### To curve a fill edge to a selected point:


1. Click on the fill edge you want to curve.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Select the point you want to curve to. The fill edge automatically curves to the point.
4. Click to finish.

## Inserting Edging

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Edging can be an attractive accent around gardens, ponds, sidewalks, driveways, and other areas. It can also help retain fill materials and keep weeds out of your garden. You can choose from PVC lawn edging, wood posts, or rails. You insert edging by simply picking points to define the end points and direction of the edging.

### To insert edging:

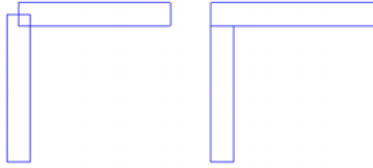
1. Select **Insert > Landscape > Edging**, or click  on the Landscape toolbar.
2. In the catalog, select your edging material.
3. Select a start point for the edging.
4. Move your cursor in the direction you want the edging to run, then select an endpoint for the edging. You can continue selecting points in any direction to add more sections to the edging if you want.
5. Right-click and select **Finish**.

**Tip:** You can also insert decorative borders around a garden. See Inserting Exterior Accessories on page 219.



## Cleaning Up the Corners of Edging

If you edged around an area with posts or rails, you'll notice that the edging members connect on center at the corners. You may want to lengthen the members to form completely flush intersections.



### To clean up the corners of edging:

1. Click on one of the edging members. Blue grab handles are displayed at the ends of the member.
2. Hover your pointer over the end grip to display the Lengthen cursor. ⇨
3. Click and drag the edging so that it meets up with the outside of the member it is connected to, then release your mouse button.
4. Select the other member.
5. Click and drag the end so that it meets up with the inside edge of the connecting member, then release your mouse button.

## Changing the Length of Edging

You can lengthen or shorten edging by clicking and dragging its end points.

### To change the length of edging:

1. Select the edging you want to lengthen or shorten. Grips are displayed at the center and ends of the edging.
2. Hover your pointer over the end you want to stretch. The Lengthen cursor is displayed. ⇨
3. Click and drag to lengthen or shorten the edging, then release your mouse button.

## Breaking Edging

When you create a break in edging, you can select and edit the portions on either side of the break independently.

### To create a break in edging:

1. Select the edging you want to break.
2. Right-click and select **Break**, or select **Edit > Modify Elements > Break**.
3. Click where you want to break the edging.

## Editing the Height and Width of Edging

You can edit the height or width (thickness) of edging on the edging's Basic property page.

### To edit the height or width of edging:

1. Click on the edging to select it. Use Shift+click to select multiple segments if necessary.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To edit the height of the edging, change the value in the **Edge Height** edit box.
4. To edit the width (thickness) of the edging, change the value in the **Edge Width** edit box. Note that this variable is not available for PVC edging.
5. If the edging is post edging, you can control the spacing between posts by editing the value in the **Approx. Edge Spacing** edit box.
6. Click **OK**.


## Inserting a Fence

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To insert a fence, you draw it just like a wall by selecting a start point and end point. This allows you to create a fence of any length. You can continue selecting points in other directions to add on to the fencing (if you want to fence around your yard, for example).

#### To insert a fence:


1. Select **Insert > Landscape > Fences/Gates > Fences**, or click  on the Landscape toolbar.
2. In the catalog, select the fence type you want to insert.
3. Select a start point for the fence.
4. Move your cursor in the direction you want the fence to run. The fence stretches as you move your cursor.
5. Select an end point for the fence. If you want you can continue adding sections to the fence in any direction by simply selecting points.
6. Right-click and select **Finish**.

**Tip:** If you have inserted a site boundary in your plan, you can draw your fence on top of the lot lines for ease. The fence then acts as a visual indicator of your property extents in 3D.

## Stretching a Fence Layout

You can stretch a fence layout by clicking and dragging one of the fence segments.


#### To stretch a fence layout:

1. Click on the fence segment you want to move.
2. Position your pointer over the center blue grip to display the Move cursor. .
3. Click and drag to stretch the layout, then release your mouse button.

## Changing the Length of a Fence

You can lengthen or shorten a fence by clicking and dragging its end points.

#### To change the length of a fence:

1. Select the fence you want to lengthen or shorten.
2. Position your cursor over the fence end that you want to stretch. The Lengthen cursor is displayed. .
3. Click and drag to lengthen or shorten the fence, then release your mouse button.

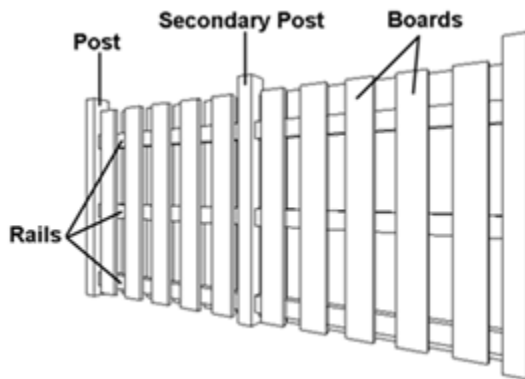
## Creating a Break in a Fence

When you create a break in a fence, you can select the fence portions on either side of the break independently. You may want to insert one or more breaks in a fence so that you can then remove certain segments of it.

#### To create a break in a fence:

1. Select the fence you want to break.
2. Right-click and select **Break**, or select **Edit > Modify Elements > Break**.
3. Click where you want to break the fence.

## Parts of a Fence



## Editing the Properties of a Fence

You can change the height of a fence, specify whether or not you want the fence to hug the terrain, edit the size and position of fence posts, and edit the dimensions of the rails and boards.

### To edit the properties of a fence:

1. Click on the fence to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. To change the type of fence, click on the appropriate graphic in the *Type* area. Choose from General, Privacy, Picket or Ranch. The General style just inserts a plain, flat surface.
4. To change the height of the fence, edit the values in the **Fence Height** edit box.
5. If you want the bottom of the fence to hug the terrain, check the **Hug Terrain?** check box, then select either *Raked* or *Stepped* from the **Slope Type** drop box.
6. To change the dimensions or position of the fence posts, edit the post parameters in the *Posts* area.

**Secondary Post Position.** Choosing *Centered* starts the spacing of intermediate posts from the middle of the fence to create a balanced look. Choosing *From Start* starts the spacing of intermediate posts from the first main post.

**Max. Post Spacing.** The maximum allowable spacing between posts. If you stretch the fence, the spacing between posts increases. More posts are added to prevent the spacing from exceeding the maximum.

**Post Width.** The width (and depth) of fence posts.

**Post Extension.** The distance the fence posts extend past the top of the fence boards.

**Post Rotation.** Determines the rotation of the connecting post where two fence segments connect. Choosing *Half Way* rotates the connecting post half way between the angle. Choosing *None* leaves the connecting post aligned to the first fence.

7. To change the dimensions of the top, middle or bottom rail, edit the rail parameters in the *Rails* area.

**Rail Width.** The width of the rail members.

**Rail Depth.** The thickness of the rail members.

**Top Rail Height.** The distance from the bottom of the fence to the top rail.

**Middle Rail Height.** The distance from the top rail to the middle rail.

**Bottom Rail Height.** The distance from the middle rail to the bottom rail.

8. To change the dimensions of the boards in a privacy or picket fence, edit the board parameters in the *Boards* area.

**Board Style.** Choose either *Squared* or *Pointed*. You would typically see pointed boards on a picket fence.

**Board Width.** The width of one fence board.

**Board Depth.** The thickness of one fence board.

**Board Spacing.** The distance from the center of one board to the center of the next board.

**Board Offset.** The offset of the bottom of the fence boards from the ground.


- When you're done editing properties, click **OK**.

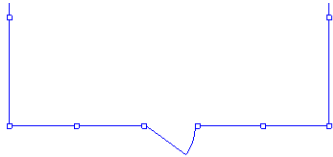
## Inserting a Gate

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The catalog contains a variety of gate types, including wood, picket and ranch style gates. Gates just pop themselves right into fences. Naturally, if you are inserting a gate in a fence, you want to choose a gate size that corresponds to the fence size. For example, if your fence is a 6' wood privacy fence, you would likely choose the 6' wood privacy gate. Gates are shown slightly open so you can identify them easily in 2D and 3D views.

### To insert a gate:

- Select **Insert > Landscape > Fences/Gates > Gates**, or click the down arrow next to the Fences button  on the Landscape toolbar and select **Gates**.
- In the catalog, select the gate you want to insert.
- Position the gate where you want it, then click to insert it. The gate will automatically pop itself into the fence when you position it in the fence.



- Right-click and select **Finish**.

## Flipping a Gate

You can use the Flip Opening tool to flip an entire gate around. If the gate originally opened out, it now opens in; if it was hinged on the left, it is now hinged on the right (and vice versa).

### To flip a gate:

- Click the gate to select it.
- Right-click in the drawing area and select **Flip Opening**, or select **Edit > Modify Elements > Flip Opening**.

## Flipping a Gate's Swing

Use the Flip Swing tool to flip only the swing of a gate. The gate will be hinged on the opposite side, but it will still open in the same direction, either in or out.

### To flip a gate swing:

- Click the gate to select it.
- Right-click in the drawing area and select **Flip Swing**, or select **Edit > Modify Elements > Flip Swing**.

## Editing the Properties of a Gate

You can change the height and width of a gate as well as the dimensions of the rails and boards. You can also control how far the gate is open in 2D and 3D views.

### To edit the properties of a gate:

- Click on the gate to select it.
- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
- To change the type of gate, click on the appropriate graphic in the *Type* area. Choose from General, Privacy, Picket or Ranch. The General style just inserts a plain, flat door.
- To change the overall size of the gate, edit the values in the **Gate Width** and **Gate Height** edit boxes.
- To change the swing type, select either *Left* or *Right* from the **Swing Type** drop box. This determines which side the gate is hinged on.

- If you want to change how far the gate is open in 3D views, edit the percentage in the **3D Percent Open** edit box. To change how far the gate is open in 2D views, change the percentage in the **2D Percent Open** edit box.
- To change the dimensions of the top, middle or bottom rail, edit the rail parameters in the *Rails* area.
  - Rail Width.** The width of the rail members.
  - Rail Depth.** The thickness of the rail members.
  - Top Rail Height.** The distance from the bottom of the gate to the top rail.
  - Middle Rail Height.** The distance from the top rail to the middle rail.
  - Bottom Rail Height.** The distance from the middle rail to the bottom rail.
- To change the dimensions of the boards in a privacy or picket fence, edit the board parameters in the *Boards* area.
  - Board Style.** Choose either *Squared* or *Pointed*. You would typically see pointed boards on a picket fence.
  - Board Width.** The width of one fence board.
  - Board Depth.** The thickness of one fence board.
  - Board Spacing.** The distance from the center of one board to the center of the next board.
  - Board Offset.** The offset of the bottom of the gate boards from the ground.
- When you're done editing properties, click **OK**.


## Building a Shed with the Shed Builder Wizard

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The Shed Builder Wizard will create a custom shed for you in a few easy steps. All you need to do is select a shed style, enter the desired dimensions, and specify the door and window placement. You can even select what materials you would like to use for the roof, walls, floor, door and window.

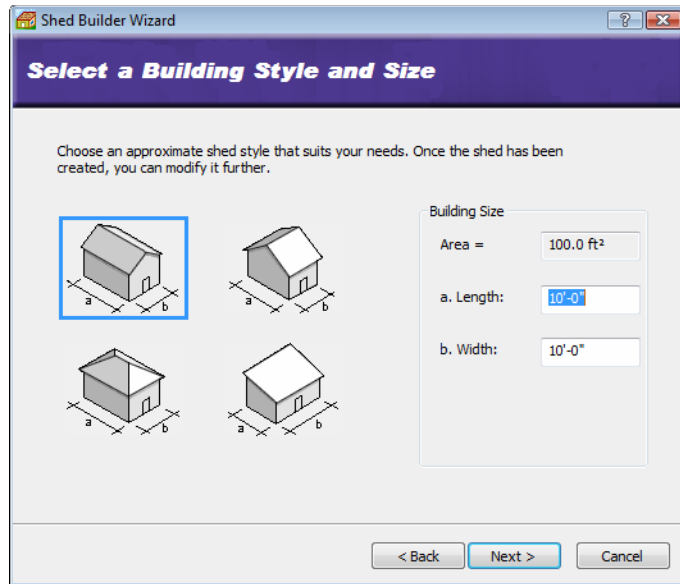
Once you've inserted the shed in your plan, you can further edit its individual components to achieve the exact size and appearance you want.

### To build a shed:

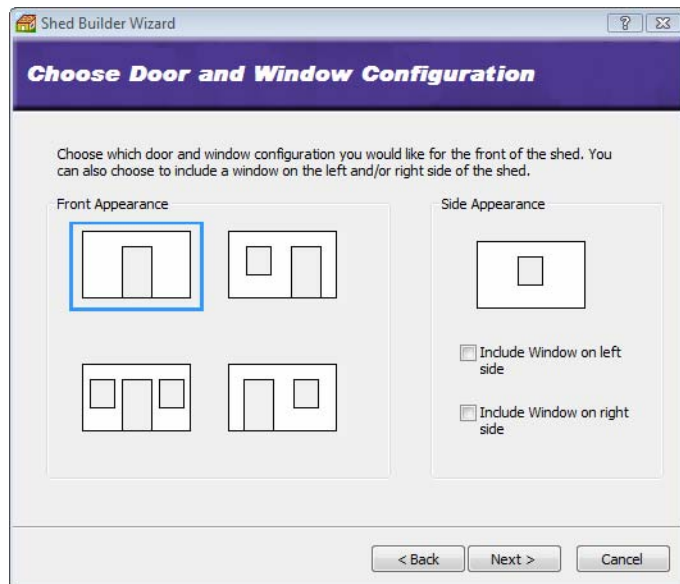
- Select **Insert > Design Wizards > Shed Builder**, or click the down arrow next to the Design Wizards button  on the Building toolbar and select Shed Builder.



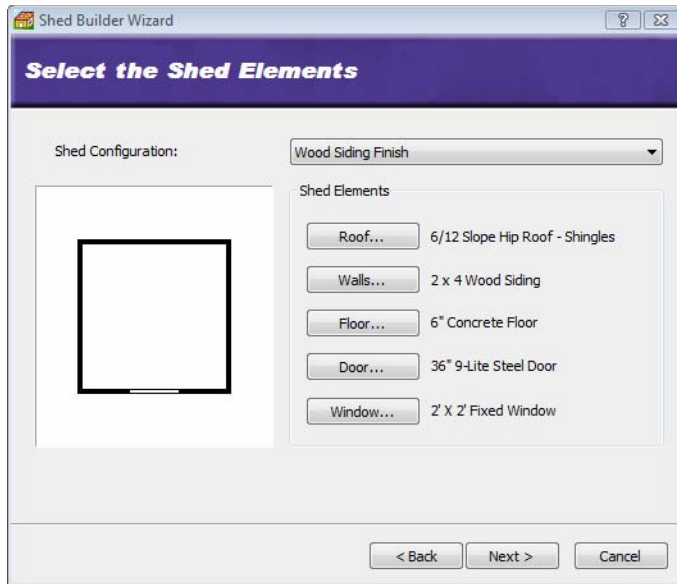
- On the Welcome screen, click **Next**.



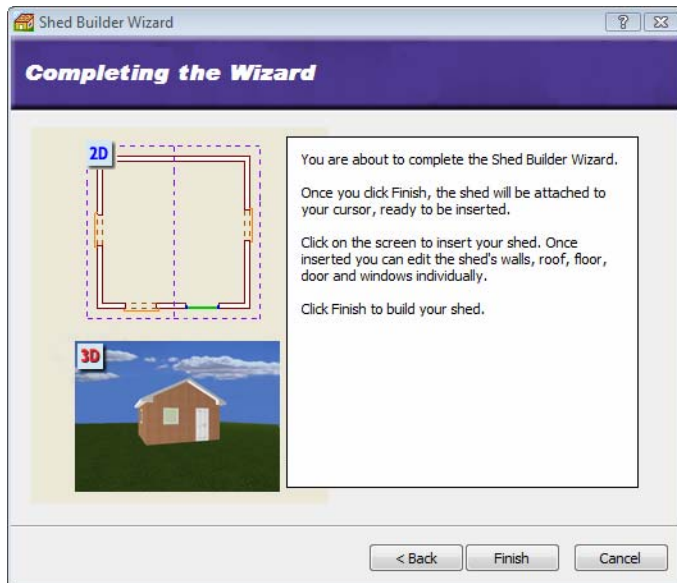
3. On the next screen, click on the graphic that most closely resembles the style of shed you would like to build.
4. Enter the desired dimensions for the shed in the **Length** and **Width** edit boxes.
5. Click **Next**.



6. On the Door and Window Configuration screen, click on the door/window combination that you would like for the front of the shed. If you would like a window on the left side of the shed, enable the **Include Window on left side** check box. If you would like a window on the right side of the shed, enable the **Include Window on right side** check box.
7. Click **Next**.



8. On the Shed Elements screen you can select a custom materials to use for the shed’s roof, walls, floor, door and window. Just click the desired elements button, then make a selection from the catalog. If you have defined your own shed configuration in the Library Manager, you can simply select it from the **Shed Configuration** drop box.



9. On the final screen, click **Finish**. The shed is attached to your cursor, ready to be inserted.
10. Position the shed where you want it, then click to insert it.

**Tip:** If you would like to insert a pre-made shed from the catalog, use the Exterior Structures tool. You can find sheds in the Storage and Enclosures category of the catalog.

## Editing a Shed

If you have created and inserted a shed with the Shed Builder Wizard, you can edit its roof, walls, floor, door and window individually. Just click on the element you want to edit, then edit it as you would if it were part of a house. For example, you can stretch the walls to make the shed bigger or smaller, or select a different window size.


## Creating a Custom Shed Builder Wizard Configuration

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A Shed Builder Wizard configuration determines what elements are used for a shed's roof, walls, floor, door and window. You are asked to select a configuration for your shed when you run the Shed Builder Wizard.

You can edit any of the existing configurations that are available in the Shed Builder Wizard, or create your own. Customized configurations are saved automatically and will be available when you run the Shed Builder Wizard in the current project, or any other project.

#### To access the shed configuration library:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager** dialog, select **Libraries > Shed Configuration**.

#### To add a new configuration to the list:

1. Select **Edit > Add Configuration**, or right-click in the Shed Configuration window and select **Add Configuration**. An entry named 'New Configuration' is added to the list.
2. Select the new configuration in the list. If you want to rename it, select **Edit > Rename Configuration**, or right-click and select **Rename Configuration**. Then, type the new name and press ENTER.

#### To edit a shed configuration:

1. Select the configuration in the list. The element selections for the configuration are listed in the center pane.
2. In the center pane, select an element type you want to specify a style for (e.g. Wall).
3. Click the **Select** button.
4. In the **Catalog Access** dialog, select the specific style you want to apply to the selected element type, then click **OK**.
5. Continue selecting styles for the remaining element types.

#### To delete a configuration from the list:

1. Select the configuration in the list.
2. Select **Edit > Delete Configuration**, or right-click and select **Delete Configuration**, or simply press the Delete key on your keyboard.


## Building a Deck with the Deck Builder Wizard

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The Deck Builder Wizard takes all the work out of building a deck because it does it all for you! Just select the decking material and deck shape, enter the dimensions you want, then point and click to insert the deck. By default, decks include posts, beams and railings.

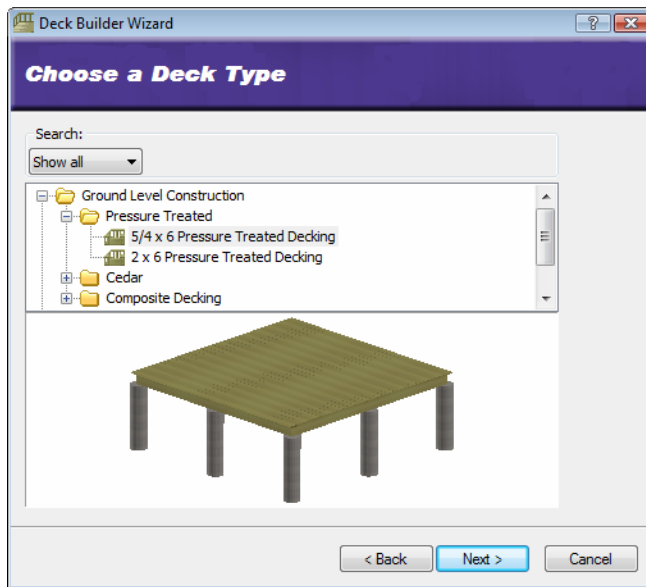
After inserting a deck you can move, stretch, rotate, raise or lower it if needed, as well as edit its properties, which include settings for posts, railings and skirting.

#### To build a deck using the Deck Builder Wizard:

1. In the Building Locations drop box, select the location you want to associate the deck with. The height of a deck is determined by the **Height above current location** variable in the deck properties. You can edit this value after the deck has been inserted if necessary.
2. Select **Insert > Design Wizards > Deck Builder**, or click the down arrow next to the Design Wizards button  on the Building toolbar and select **Deck Builder**.

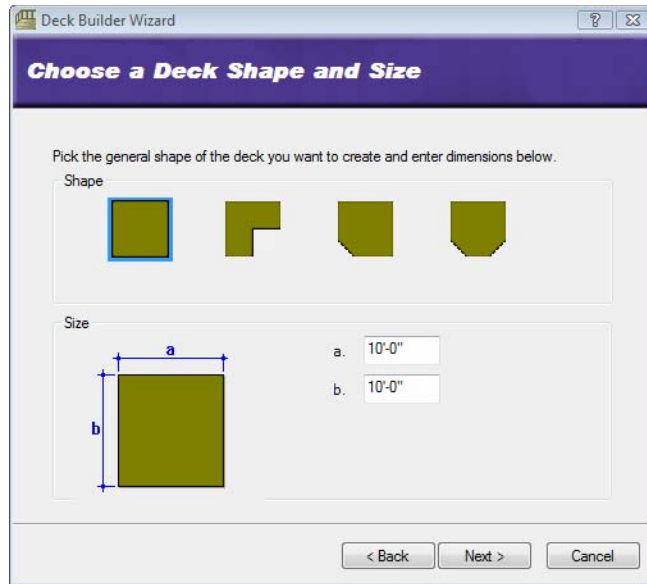


3. In the **Deck Wizard** dialog, click **Next**.

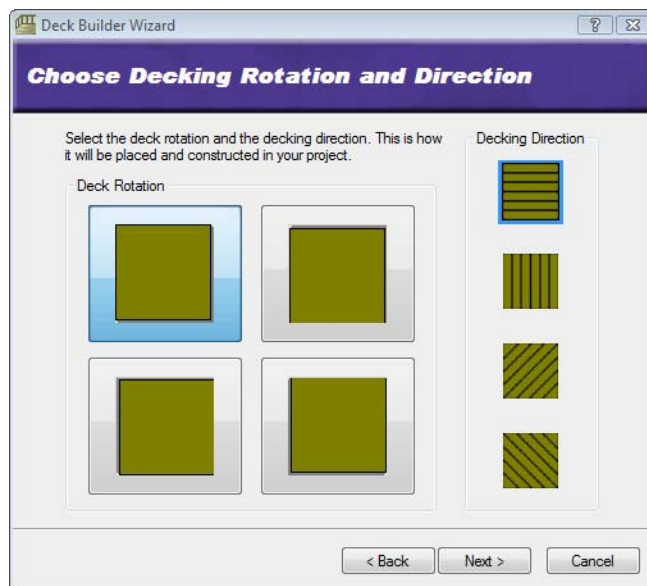


4. Select the decking material you would like to use.
5. Click **Next**.

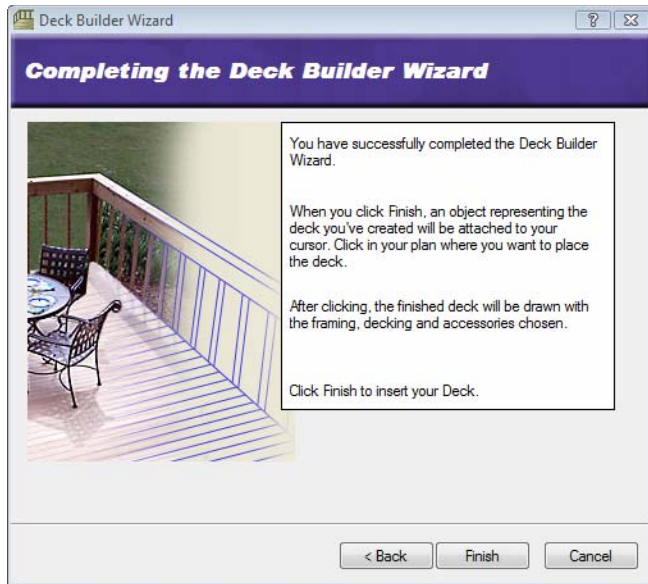




6. In the *Shape* area, click on the shape that most closely resembles the shape you want to create. Remember that you can edit the shape after the deck has been inserted.
7. In the *Size* area, specify the desired dimensions for the deck.
8. Click **Next**.



9. In the *Deck Rotation* area, select the desired rotation for your deck. This is how the deck will be oriented when it is attached to your cursor.
10. In the *Decking Direction* area, select the direction you want the deck boards to run.
11. Click **Next**.



12. Click **Finish**. The Deck Wizard closes, and the deck is attached to your cursor, ready to be inserted.
13. Position the deck where you want it, then click to insert it.


## Building a Deck with the Deck Tool

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You can use the Deck tool to build a deck of virtually any shape and size.

Once you've inserted a deck you can move, stretch, rotate, raise or lower it if needed, as well as edit its properties, which include settings for posts, railings and skirting.

### To create a deck:

1. In the Building Locations drop box, select the location you want to associate the deck with. The height of a deck is determined by the **Height above current location** variable in the deck properties. You can edit this value after the deck has been inserted if necessary.
2. Select **Insert > Landscape > Decks > Decks**, or click  on the Landscape toolbar.
3. In the catalog, select the decking material you want to use.
4. Select a start point for the deck outline. Continue selecting points until the outline is defined. (You do not have to select the start point again because the last point you pick is always closed back to the start point.)



5. Right-click and select **Finish**.

## Changing the Direction of Deck Boards

You can use the Set Decking Direction tool to change the direction of your deck boards.

### To change the direction of deck boards:


1. Select the deck by clicking on one of its edges.

2. Right-click and select **Set Decking Direction**, or select **Edit > Modify Elements > Set Decking Direction**.
3. Select two points to define a line that runs in the direction you want the deck boards to run. The deck boards update to match the direction of the line.

## Stretching a Deck

You can stretch a deck in any direction by clicking and dragging one of its edges.

### To stretch a deck:

1. Click on the deck edge you want to stretch.
2. Hover your pointer over the center blue grip to display the Move cursor.  Alternatively you can select the **Move Edge** tool on the right-click menu.
3. Click and drag to stretch the deck, then release your mouse button.

If you would like to stretch only a portion of a deck edge, you can accomplish this by adding a node to the deck edge. See [Adding a Node to a Deck](#) on page 213.

## Reshaping a Deck

You can change the shape of a deck by stretching any of its corners.

### To reshape a deck:

1. Click on the deck to select it. A grip is displayed at each corner.
2. Click and drag a corner grip to stretch the deck. Alternatively you can select the **Stretch** tool on the right-click menu.
3. Release your mouse button.

If you would like to stretch only a portion of a deck edge, you can accomplish this by adding a node to the deck edge. See [Adding a Node to a Deck](#) on page 213.

## Adding a Node to a Deck

You can add nodes to a deck edge to create more grips along the edge. You can then click and drag a grip on a specific segment to reshape that portion of the deck.

### To add a node to a deck:

1. Select the deck.
2. Right-click and select **Add Node**, or select **Edit > Modify Elements > Add Node**.
3. Click on the point on the deck edge where you want to add a node. The edge is split into separate edges, each with its own grips for moving and stretching.

## Changing the Height of a Deck

By default, decks are inserted at a height that is relative to the current building location.

### To change the height of a deck:

1. Select the deck by clicking on one of its edges.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. On the Support property page, edit the value in the **Height above current location** edit box.
4. Click **OK**.

## Editing Deck Post Properties

You can edit a deck's post type, post spacing and post depth. You can also disable posts altogether if you want.

### To edit deck post properties:

1. Select the deck by clicking on one of its edges.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Decks** dialog, select the Support tab.

4. If you want to remove posts from the deck, uncheck the **Include Posts** check box in the *Supports* area.
5. To select a different member to use for deck posts, click the **Select** button next to the **Include Posts** edit box, then make your selection from the catalog.
6. To change the spacing between posts along beams, edit the value in the **Spacing along Beam** edit box.
7. To change the depth of the posts in the ground, edit the value in the **Depth below ground level** edit box. This effectively changes the overall height of the post, but does not affect the portion shown above ground.
8. Click **OK**.

## Editing Deck Footings

You can control the display of footings under your deck by editing deck properties. You can also choose the footing material you want to use.

### To create footings under deck posts:

1. Select the deck by clicking on one of its edges.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. On the Support property page, check the **Include Footings** check box in the *Supports* area.
4. Click the **Select** button next to the **Include Footings** edit box, then select the desired footing type from the catalog.
5. Click **OK**.

## Editing the Deck Frame

You have complete control over the way a deck is constructed. You can specify the way you want the beams constructed in relation to the posts. You can also select specific materials to use for deck boards, beams and joists, as well as edit the spacing and overhang of these members.

### To edit the deck frame:

1. Select the deck by clicking on one of its edges.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Decks** dialog, select the Frame tab.
4. To change the way the beams are constructed, click on the desired configuration in the *Construction* area. Beams are the vertical members that rest on or are attached to the posts, and that support the deck joists.
5. To select a different material for the deck boards, click the **Select** button in the *Decking* area, then make your selection from the catalog.
6. To edit the spacing between deck boards, edit the value in the **Spacing** edit box in the *Decking* area.
7. To change the amount the deck boards hang over the deck frame, edit the value in the **Overhang** edit box in the *Decking* area.
8. To adjust the angle of the deck boards in relation to the joists, edit the value in the **Angle from Joists** edit box.
9. To select a different material for the deck joists, click the **Select** button in the *Joists* area, then make your selection from the catalog.
10. To edit the spacing between joists, edit the value in the **Spacing** edit box in the *Joists* area.
11. To change the amount the joists hang over the beams, edit the value in the **Overhang** edit box in the *Joists* area. The general rule of thumb is to limit the extension to 1/3 of their length.
12. To select a different material for the deck beams, click the **Select** button in the *Beams* area, then make your selection from the catalog.
13. To change the amount the beams extend past each other, edit the value in the **Overhang** edit box in the *Beams* area.
14. Once you've specified the deck frame properties, click **OK**.

## Controlling the Display of Deck Railings

By default, ground-level and low-level decks do not have railings turned on, while raised-level and second-story decks do. You can control the display of railings for each side of a deck.

**To control the display of deck railings:**

1. Select the deck.
2. Click on the edge properties grip (red circle) on the deck edge you want to define.
3. To display a railing on the selected deck edge, enable the **Railing** check box. If you do not want to display a railing on the deck edge, clear the **Railing** check box.
4. If you want to display railings on all deck edges, enable the **Apply to all edges** check box.
5. Click **OK**.

**Note:** If you add stairs to your deck, an opening will be automatically created in the railing.

**Changing the Style of a Deck Railing**

You can change a deck's railing type by making a selection on the Accessories property page.

**To change a deck's railing style:**

1. Select the deck by clicking on one of its edges.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Decks** dialog, select the Accessories tab.
4. In the *Railings* area, click the **Select** button.
5. Select the desired railing type from the catalog.
6. Click **OK**.

**Controlling the Display of Deck Skirting**

Skirting is basically screening such as lattice along the bottom of a deck that conceals the underside of the deck frame. It can also keep out animals and debris. Most decks do not display skirting by default. You can control the display of skirting for each deck edge.

**To control the display of skirting on your deck:**

1. Select the deck by clicking on one of its edges.
2. Click on the edge properties grip (red circle) on the deck edge you want to define.
3. To display skirting on the selected deck edge, enable the **Skirting** check box. If you do not want to display skirting on the deck edge, clear the **Skirting** check box.
4. If you want to display skirting on all deck edges, enable the **Apply to all edges** check box.
5. Click **OK**.

**Changing the Skirting Material on a Deck**

You can change a deck's skirting material by making a selection on the Accessories property page.

**To change a deck's skirting material:**

1. Select the deck.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Decks** dialog, select the Accessories tab.
4. In the *Skirting* area, click the **Select** button.
5. Select the desired skirting material from the catalog.
6. Click **OK**.

**Inserting an Opening in a Deck**

Once you have created a deck, you can insert a custom opening in it of virtually any shape and size using the Cut Opening tool.

You create the opening by picking points to define its outline.


### To insert an opening in a deck:

1. Select the deck by clicking on one of its edges.
2. Right-click and select **Cut Opening**, or select **Edit > Modify Elements > Cut Opening**.
3. Select a start point for the opening.
4. Continue selecting points to define the opening. As you select points, the opening is created. The last point picked is always connected back to the start point to form a closed shape, so you don't have to pick the start point again.
5. When you have selected your final point, right-click and select **Finish**.

### Resizing a Deck Opening

You can resize a deck opening by clicking and dragging one of its edges.

#### To stretch a deck opening:

1. Select the deck.
2. Hover your pointer over the center blue grip of the edge that you want to move. This displays the Move cursor.  Alternatively you can select the **Move Edge** tool from the right-click menu.
3. Click and drag in the direction you want to stretch, then release your mouse button.

### Reshaping a Deck Opening

You can change the shape of a deck opening by stretching its corners. You can do this by clicking and dragging.

#### To reshape a deck opening by stretching:

1. Select the deck.
2. Click and drag the corners of the opening to stretch it, then release your mouse button. Alternatively you can select the **Stretch** tool from the right-click menu.

### Removing Deck Openings

You can delete an opening from a deck using the Remove Opening tool.

**Note:** You cannot remove an opening using Delete.

#### To remove a deck opening:

1. Click on the edge of the deck or opening to select the deck.
2. Right-click and select **Remove Opening**, or select **Edit > Modify Elements > Remove Opening**.
3. Click on the edge of the opening. The opening is removed.


### Adding Stairs to a Deck

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You can add a staircase to your deck with a single mouse click. Stairs automatically snap to your deck for easy insertion, and the railings on the deck are automatically removed to allow for the stair opening. By default, stairs extend from the deck platform down to the terrain, so there's absolutely nothing you need to calculate. Also, deck stairs have a railing on both sides by default, but you can remove one or both of them if you want after the stairs have been inserted.

You can choose either pressure treated or cedar stairs, and edit the stair dimensions to get the exact result you want.

#### To add stairs to a deck:

1. Select **Insert > Landscape > Decks > Deck Stairs**, or click the down arrow next to the Decks button  on the Landscape toolbar and select **Deck Stairs**.
2. In the catalog, select the type of stairs you would like to insert.
3. Move your pointer close to the deck edge. Position the stairs where you want them, then click to insert them.
4. Right-click and select **Finish**.

## Editing the Size of Deck Stairs

You can edit the overall height and width of deck stairs, the width of the steps, and the riser height.

### To edit the size of deck stairs:

1. Click on the staircase to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the properties on the Basic tab.

**Extend Stair.** The option selected determines where the base of the stairs sit. You can either change where they extend to, or specify an explicit height. By default, the deck stairs are inserted at deck level and run down to the terrain.

**Down to terrain.** Extends the stairs down to the ground.

**Down to previous location.** Extends the stairs to the floor level of the building location below the current one.

**Down to deck location.** Extends the stairs down to the floor level of the building location the deck is associated with. You might use this if you have raised your deck above the floor level of the current location and want to extend the stairs down.

**Explicit Height.** Extends the stairs down a specific distance that you define in the Overall Height edit box.

**Overall Height.** Available only if Explicit Height is selected in the Extend Stair drop box, this lets you define a fixed height for the stairs.

**Max. Riser Height.** The maximum distance allowed between individual steps. Note that if your riser height exceeds the width of the member you are using for your riser boards, two or more boards will be inserted for each riser.

**Tread Run.** The width of each step. The width of a step is measured from the nose of the step to the riser of the next step. Note that if your tread run exceeds the width of the member you are using for your treads, two or more boards will be inserted for each step.

**Overall Width.** The width of the stairs measured from one end of a step to the other end of the step.

4. Click **OK**.

## Controlling the Display of Railings on Deck Stairs

By default, deck stairs have a railing on both sides. You can choose to have a railing on the left side only or right side only, or remove them altogether.

### To control the display of railings on deck stairs:

1. Click on the staircase to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the *Railings* area, uncheck the **Include Railings** check box if you don't want any railings on your deck stairs. If you want one or more railings on the stairs, leave this check box enabled.
4. If you want a railing on the left side of the stairs, select **Railing on left side** from the drop box. If you want a railing on the right side of the stairs, select **Railing on right side** from the drop box. If you want a railing on both sides of the stairs, select **Railing on both sides**.
5. Click **OK**.

## Editing Stringers, Treads and Risers on Deck Stairs

You can specify detailed settings for the stringers, risers and treads on your deck stairs.

### To edit stringer, riser or tread details:

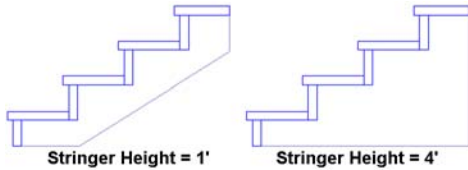
1. Click on the staircase to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Deck Stairs** dialog, select the Details tab.
4. To change the stringer style, click the appropriate graphic in the *Stringer* area. Choose from *Notched*, *Under* or *Side*.
5. Edit the remaining properties as desired.

#### Stringer



**Spacing.** The spacing between the outside stringers and intermediate stringers.

**Height.** The distance from the bottom of the stringer to the underside of the tread/riser intersection. Specifying a stringer height that is the same as the overall height of the staircase creates a staircase that is completely closed on the sides. In other words, the stringers go right to the ground.



**Width.** The thickness of the stringer members.

Riser

**Closed Riser.** Inserts riser boards under the steps. If you leave this disabled, the staircase will be open under the treads.

**Select.** Click this button to select a riser board to use.

**Spacing.** When the riser comprises two or more boards, this is the spacing between the boards.

**Angle.** The tilt of the riser boards. A value of 0 means the board is perpendicular to the step (straight up and down). A value above 0 tilts the riser down toward the back of the staircase. The maximum angle allowed is 20°.



Tread

**Select.** Click this button to select the type of wood to use for your steps.

**Spacing.** When each step comprises two or more boards, this is the spacing between those boards.

**Nosing.** The distance the step extends past the riser.

**Overhang.** The distance the ends of the steps extend past the outer stringers.


6. Click **OK**.

## Inserting Exterior Structures

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You can insert a wide variety of exterior structures to make your outdoor living space more functional. These include play gyms, swings, sandboxes, trampolines, tennis and volleyball courts, detached garages, sheds, gazebos, arbors, garden boxes, greenhouses, pools and hot tubs. All structures are inserted with a single mouse click and can be easily moved, rotated and edited.

**To insert an exterior structure:**

1. Select **Insert > Landscape > Exterior Structures**, or click  on the Landscape toolbar.
2. In the catalog, select the structure you want to insert.
3. Position the structure where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Inserting a House Template

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A house template is basically the exterior shell of a finished home. If you are creating a landscape plan and your project does not contain a model, you can insert a house template to serve as the focal point of your plan.

**To insert a house template:**

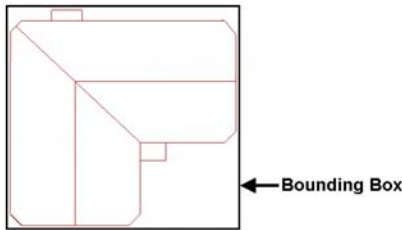
1. Select **Insert > Landscape > Exterior Structures**, or click  on the Landscape toolbar.



2. In the catalog, select the House Templates group, then select the desired house template.
3. Position the template where you want it, then click to insert it.
4. Right-click and select **Finish**.

Although a house template looks like a real house, it can't be edited like a real model can. It is considered a single-click element, so clicking on any part of the template selects the entire house.

It is important to note that when you select the house template, the invisible bounding box is always square or rectangular, and does not necessarily follow the shape of the house outline. This can interfere with the selection of other elements near the house. If you have inserted elements around the house, such as plants, and want to select them, you may want to use the View Filter to make the house template non-selectable for ease of editing your landscape plan.




Another thing to note is that the house template's exterior walls are not visible in 2D. You only see the roof line. If you want to insert things like fills up against the exterior walls of the house, you will need to either draw them in 3D, or draw them in 2D and then move them into place in 3D.

## Inserting Exterior Furniture

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You can insert patio tables, patio chairs, picnic tables, loungers and benches with a single mouse click. When inserting exterior furniture, you have the option of inserting it on the terrain, or on a building location.

### To insert exterior furniture:


1. Select **Insert > Landscape > Exterior Furniture**, or click the down arrow next to the Exterior Furniture button  on the Landscape toolbar. Then, select either **Exterior Furniture on Terrain** or **Exterior Furniture on Location**, depending on where you want to insert the element. The **Exterior Furniture on Location** option lets you insert the element on a deck, or on anything that is associated with a building location.
2. In the catalog, select the element you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Inserting Exterior Accessories

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Exterior accessories include everything from bird baths to weather vanes. Inserting exterior accessories is easy — just point and click. You can insert exterior accessories on the terrain, or on a building location.

### To insert an exterior accessory:


1. Select **Insert > Landscape > Exterior Accessories**, or click the down arrow next to the Exterior Accessories button  on the Landscape toolbar. Then, select either **Exterior Accessories on Terrain** or **Exterior Accessories on Location**. The 'on Location' option lets you insert the element on a deck, or on anything that is associated with a building location.
2. In the catalog, select the accessory you want to insert.
3. Position the element where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Inserting Exterior Lighting

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Inserting exterior light posts and ground lighting is easy — just point and click.

**To insert an exterior light fixture:**

1. Select **Insert > Landscape > Exterior Lighting**, or click the down arrow next to the Exterior Lighting button  on the Landscape toolbar. Then, select either **Exterior Lighting on Terrain** or **Exterior Lighting on Location**, depending on where you want to insert the element. The **Exterior Lighting on Location** option lets you insert the element on a deck, or on anything that is associated with a building location.
2. In the catalog, select the light you want to insert.
3. Position the light where you want it, then click to insert it.
4. Right-click and select **Finish**.

**Tip:** If you switch to Rendered or Rendered Outline display mode, you can see instant lighting effects as you position and insert light fixtures.

# Chapter 18: Editing Elements in Model View

When you double-click after inserting an element or select **Finish** from the right-click menu, you automatically go into Selection Mode, meaning you can select elements in your drawing area and edit them. Most elements can be moved, rotated, copied, replaced and deleted. Some elements have additional editing commands available. For example, you can lengthen, break and curve walls. All elements have a property sheet where you can change the size or appearance of the element.


To access a menu of editing commands for a selected element, just right-click in the drawing area or select **Edit > Modify Elements**. Certain functions can be performed without selecting any commands at all. For example, you can move and rotate most elements by simply clicking and dragging your mouse.

This chapter describes how to select elements, and use general editing commands like Move, Rotate, Elevate, Duplicate, Replace and Delete. It also describes how to access and edit element properties. For information about editing a specific type of element, see the chapter about that element.

## Undoing the Previous Action

The Undo tool cancels your most recent action. You can undo as many actions as you have taken since your last save.

### To undo an action:


- Select **Edit > Undo**, or
- Click  on the Standard toolbar, or
- Press Ctrl+Z

**Tip:** You can use the Redo tool to reapply an action you have canceled using the Undo tool.

## Redoing an Undo

The Redo tool reapplies a tool that you have reversed using Undo. Redo will only work directly following an Undo.

### To redo a task:

- Select **Edit > Redo**, or
- Click  on the Standard toolbar, or
- Press Ctrl+Y


## Moving Elements

When you select an element in Model View, you are automatically in Drag and Drop mode. If the element is a singular, one-click object, like a cabinet or plant, you can move the element by simply clicking and dragging it. If you want to move an area-drawn element, such as a roof or floor, you need to select the Move tool before clicking and dragging. Otherwise, doing a straight drag-and-drop will only stretch it. If you click and drag a wall, all walls attached to it move with it.

If you have your Commander turned on and would like to be able to enter precise values for the move, you need to select the Move tool instead of doing a straight drag-and-drop.

**Note:** Elements associated with walls, such as doors and windows, can only be moved within the wall they are in. You cannot move them to another wall.

### To move an element using drag-and-drop:

1. Select the element you want to move. You are now in Drag and Drop mode.
2. Hover your pointer over the element's center grip to display the Move cursor. 
3. Click and drag to move the element.

4. When the element is where you want it, release the mouse button.

**To move an element using the Move tool:**

1. Select the element you want to move.
2. Right-click and select **Move**, or select **Edit > Modify Elements > Move**.
3. Select a base point for the move. The move distance and direction will be measured from this point.
4. Without holding your mouse button down, move your mouse to move the element. Select the point you want to move the element to, or enter a distance and direction in the Commander.

**Tip:** You can nudge an element slightly using the arrow keys on your keyboard.

## Nudging Elements

You can nudge an element or object slightly using the arrow keys on your keyboard. By default, the element is nudged 1" (or 25mm). You can change the nudge distance in your program settings before nudging if you like.

For an additional level of control, a secondary nudge distance is also available in your program settings. By default it is set to 1'-0" (or 300mm). This distance is used if you press and hold down the CTRL key while using the arrow keys.

**To nudge an element:**

1. Select the element that you want to nudge.
2. Use the arrows on your keyboard to nudge the element up, down, left or right. This uses the primary nudge distance defined in your program settings.

**To nudge an element using the CTRL key:**


1. Select the element that you want to nudge.
2. Press and hold down the CTRL key on your keyboard.
3. While holding down the CTRL key, use the arrows on your keyboard to nudge the element up, down, left or right. This uses the secondary nudge distance defined in your program settings.

## Editing Nudge Distances

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By default, an element is moved 1" (25mm) when you nudge it using your arrow keys. If you hold down the CTRL key while using the arrow keys, a secondary nudge distance of 1'-0" (305mm) is used. You can edit both of these nudge distances in your program settings.

**To edit nudge distances:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Drawing Aids** in the left column.
3. To edit the primary nudge distance (when using only your arrow keys to nudge), edit the value in the **Normal** edit box in the *Nudge Distance* area.
4. To edit the secondary nudge distance (when using the CTRL key in conjunction with the arrow keys), edit the value in the **With CTRL key** edit box.
5. Click **OK**.

## Raising and Lowering Elements

Most elements can be raised or lowered using the Elevate tool on the element's right-click menu. Some elements, such as roofs, do not provide access to the Elevate tool. In the case of a roof, you can raise or lower it by changing the Support Height variable in its properties.

Many block elements (like furniture and plants) also have a *Distance above current location or terrain* variable in their properties that you can use to raise or lower the element. Walls have a *Drop Exterior Face* variable, and columns have a *Base Offset* variable in their properties that you can edit.

**To raise or lower an element using the Elevate tool:**

1. Select the element that you want to raise or lower.
2. Right-click and select **Elevate**, or select **Edit > Modify Elements > Elevate**. The value shown in the **Elevate** dialog is the current elevation of the element above the floor level or terrain.
3. In the **Elevate** dialog, specify the desired elevation of the element above the floor. If the element is a landscaping element, the value you specify is relative to the terrain. The distance you enter is the distance from the floor or terrain to the insertion point of the element. For most elements, the insertion point is at the base of the element. For windows and wall openings, however, the insertion point is at the top of the element. Therefore, if you are raising or lowering a window or wall opening, specify the desired distance from the floor to the top of the window or opening.
4. If you are in a 3D or elevation view and would like to see what the element looks like at the new elevation, click **Apply**. The Elevate tool remains active while the change is applied to the element in your model.
5. To apply the change to the element, click **OK**.

**To raise or lower a block element by editing its properties:**

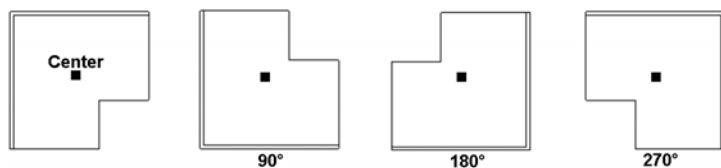
1. Select the element you want to raise or lower.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the properties dialog, select the **Behavior** tab. If there is no Behavior tab, you will need to use the Elevate tool to raise or lower the element.
4. Edit the value in the **Distance above current location or terrain** edit box.
5. Click **OK**.


## Rotating Elements

Singular, one-click elements like cabinets and furniture can be rotated on the spot by simply clicking and dragging them while in Rotation mode. Railings can be rotated by clicking and dragging their end points. For most other elements such as walls, floors, ceilings or roofs, you need to use the Rotate tool. You also need to use the Rotate tool if you want to be able to enter a precise rotation angle in the Commander, or you want to rotate the element about a point other than the center point of the element.

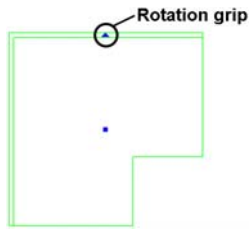
**Doing a Simple, On-the-Spot Rotation**

If you see a triangular grip on an element when it is selected, it can be rotated by simply clicking and dragging it. Using this method, the element is rotated about its center point. If your Angle Snap is on, the element will rotate in increments of whatever angle is set for the Angle Snap. If the Angle Snap is off, the element will rotate in increments of 1°.

**To rotate an element by clicking and dragging:**

1. Select the element you want to rotate.
2. Hover your pointer over the triangular grip to display the Rotate cursor. 

**Tip:** If the triangular grip is in close proximity to the square grab handle, you may want to zoom in on the element to distinguish between the two grips. If you do not see the triangular grip, the element can only be rotated with the Rotate tool.



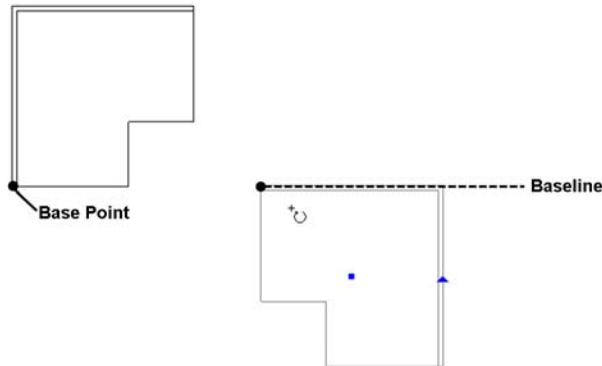
3. Click and drag to rotate the element.
4. When the element is at the desired rotation, release your mouse button.

### Using the Rotate Tool

Using the Rotate tool you can rotate an element about any selected base point. You should also use the Rotate tool if you want to be able to enter a precise rotation angle in the Commander. If your Angle Snap is on, the element will rotate in increments of whatever angle is set for the Angle Snap. If you are using the Commander, you can override the Angle Snap by entering the desired angle in the Commander. If the Angle Snap is off, the element will rotate in increments of 1°.

#### To rotate an element using the Rotate tool:

1. Select the element to rotate.
2. Right-click and select **Rotate**, or select **Edit > Modify Elements > Rotate**.
3. Select a base point for the rotation. The base point can be any point on the element (e.g. center point or corner point), or any point in the drawing area. The point you pick establishes an automatic baseline that runs through the point at 180°. You can rotate full-circle around this baseline.



**Tip:** If you want to align an element with another element that may be lying at an odd angle, select a base point on the other element, then line up your rotation line with that element.

4. Without holding your mouse button down, move your mouse to rotate the element. The element will rotate from the defined base point in the direction you move the mouse. If the Commander is turned on, you can view the angle of rotation as you rotate, or enter a precise angle. Positive angle values are read in a counter-clockwise direction, while negative values are read in a clockwise direction.

### Curving Elements

You can curve line-drawn elements such as walls, as well as area-drawn elements such as floors.

If an element has the Curve tool on its right-click menu, it can be curved. Once the Curve tool is active, you can click and drag the edge to curve it, or select a point to curve to.

#### To curve an element by clicking and dragging:

1. Click on the element edge that you want to curve.
2. Right-click and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Click and drag the edge to the desired curve.
4. Release your mouse button.

**To curve an element to a selected point:**

1. Click on the ceiling edge you want to curve.
2. Right-click in and select **Curve**, or select **Edit > Modify Elements > Curve**.
3. Select the point you want to curve to. The ceiling edge automatically curves to the point.
4. Click to finish.

**Note:** For more precise curving, see Curving Elements Using the Commander on page 435.

**Copying Elements on the Same Location**

The Duplicate tool creates a copy of a selected element that you can then position where you like on the current location.

**To duplicate an element in Model View:**

1. Select the element to copy.
2. Right-click and select **Duplicate**, or select **Edit > Modify Elements > Duplicate**.
3. Select a base point for the copy movement. Typically you would select one of the element's grips, but you can click anywhere in the drawing. The base point is simply a reference point used to define the move distance.
4. Select the point you are copying the element to. You can do this by moving your mouse and then clicking to insert the copy, or by typing a distance and direction in the Commander.

**Copying Objects to Other Locations**

The Duplicate to Locations tool lets you copy existing elements and objects to other locations. This is useful if the elements you have already drawn will have the same layout on another location. For example, you can copy the exterior walls on the Ground Floor to the Second Floor and instantly create another story. You can also use this tool to copy text, dimensions and CAD objects to another location.

When you use the Duplicate to Locations tool you have the option of deleting the original objects. This is a great way to move objects from one location to another if they are not on the correct location.

**To copy objects to other locations:**

1. Make sure the location you want to copy objects FROM is current.
2. Select the objects that you want to copy.
3. Right-click and select **Duplicate to Locations**.
4. In the **Duplicate to Locations** dialog, select the target location(s) you want to copy the objects to.
5. Click **OK**. You are asked if you want to delete the original object.
6. If you want to delete the original objects, click **Yes**. You would select this if you wanted to move the objects instead of copying them. If you want to leave the original objects on their current location, click **No**. The objects are copied.

**Note:** The location you are copying to must exist in the Building Locations dialog.

**Arraying Elements**

When you array elements, you create multiple copies of an element at the same time. You can create an array in a single row or column, or multiple rows and columns. You can also control the spacing between elements in the array, and the array's rotation angle.



*Sample array of posts with 2 rows and 5 columns*

**To array an element in Model View:**

1. Select the element you want to array.

2. Right-click and select **Array**, or select **Edit > Modify Elements > Array**.
3. In the **Number of Rows** box, type the number of horizontal rows you want or use the arrows to select a value.
4. In the **Number of Columns** box, type the number of vertical columns you want.
5. In the **Distance Between Rows** box, type the spacing you want between rows. This determines the distance between elements appearing in columns (vertical spacing).
6. In the **Distance Between Columns** box, type the spacing you want between columns. This determines the distance between elements appearing in rows (horizontal spacing).
7. In the **Array Rotation Angle** box, type the degree of rotation for the array.
8. Click **OK**. The array is created.

**Note:** The Array tool is only available for certain elements.

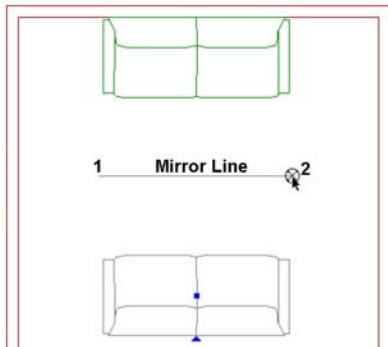
## Mirroring Elements

You can create a mirror image of selected elements using the Mirror tool. You mirror the elements by specifying a mirror line — an imaginary line about which the elements are flipped. Once the element has been mirrored, you can choose whether or not you want to delete the original element.

**Tip:** You can use the Mirror tool to reverse an entire floor plan.

### To mirror elements in Model View:

1. Select the elements you want to mirror.
2. Right-click and select **Mirror**, or select **Edit > Modify Elements > Mirror**.
3. Click two points to define a mirror line.



4. When prompted to choose whether or not you want to delete the original object, click **Yes** to delete the original object, or click **No** to leave the original intact.

## Replacing Elements

You can use the Replace tool to replace an element in your drawing with a different item from the catalog.


### To replace an element:

1. Select the element that you want to replace.
2. Right-click and select **Replace**, or select **Edit > Modify Elements > Replace**.
3. In the **Replace** dialog, select the replacement item.

You can use the **Search** feature to quickly narrow down the element list according to a specified keyword or part number. Click the drop box in the **Search** area and select either **Description** to search by keyword, or **Part No.** to search by part number. An edit box appears next to the drop box.





In the edit box, enter the keyword(s) or part number to search for, then press Enter or click . For keyword searches, the search will display any match that contains the specified text string, even if the string is part of a word. Note that only elements of the type that you are replacing are displayed.

Once search results are obtained they are displayed in the catalog portion of the dialog.

To return the catalog to its default state, where all elements are displayed, select **Show All** from the **Search** drop box. Search terms that you have used are saved in the **Search** window for future use.


- Once you have selected the replacement item, click **OK**. The element is automatically replaced.

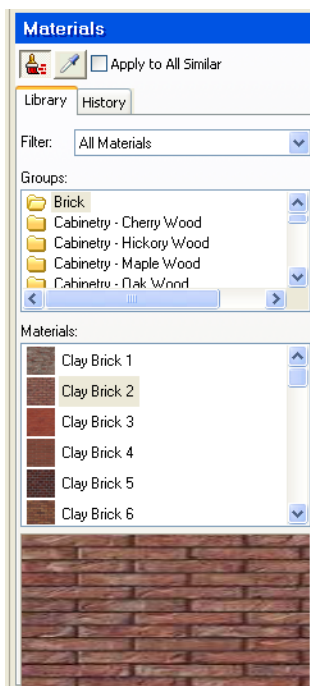
**Note:** You can only replace an element with another of the same type. For example, you can replace a window with another window, but you cannot replace a window with a door.

## Applying Colors and Materials with the Materials Paintbrush

The Materials Paintbrush is best used in 3D view and the 2D Designer's Plan view. It lets you select a material or color in the catalog, then apply it to elements. When you use the Materials Paintbrush on an element, the settings on the element's Appearance property page update to match the selections you made with the Materials Paintbrush.

### To use the Materials Paintbrush:

- Select **Edit > Materials Paintbrush**, or click  on any tabbed toolbar.
- In the catalog panel, select the material you want to apply. There is an incredible selection to choose from, including Wood, Brick, Marble, Concrete, Steel, Carpet, Tile, Roofing, Paint, Fabric, and much more. You can filter the material list according to specific applications by making a selection from the **Filter** drop box.



- If you want to apply the material to all instances of the element you select, enable the **Apply to All Similar** check box. For example, let's say your model's exterior walls are 2x6 Framed Masonry walls, and you want them all to have horizontal siding instead. If you enable the Apply to All Similar option, all you have to do is click on one of the walls, and all of the walls of the same type will change simultaneously.
- In 3D view, click on the element that you want to apply the material to. The material is immediately applied.
- Right-click and select **Finish**.

**Note:** To undo the last application, right-click in the drawing area and select **Step Back**.

## Undoing a Material Application

If you have just used the Materials Paintbrush to apply a material to an element, you can undo the application using the Step Back tool.

**To undo a material application:**

1. With the Materials Paintbrush still active, right-click in the drawing area and select **Step Back**, or select **Edit > Modify Elements > Step Back**.


You can continue stepping back to the point when the Materials Paintbrush was first launched.

**Note:** You cannot undo a material application if you have left the Materials Paintbrush mode.

## Sampling Materials with the Eyedropper

While the Materials Paintbrush is active you can use the Eyedropper tool to identify a material applied to an element in your drawing. Once you've clicked on the element, the catalog panel updates to display the material applied to the element. This eliminates guesswork and allows you to identify a material that you want to use again without having to search the catalog.

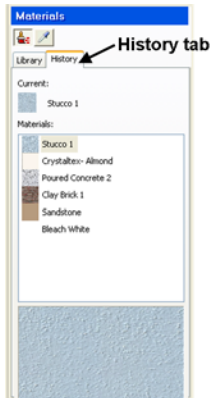
**To sample a material with the Eyedropper:**

1. Activate the Materials Paintbrush tool.
2. In the catalog panel, click . Your cursor becomes an eyedropper.
3. Click on the element whose material you want to sample. The catalog updates to display the material applied to the element.

**Note:** The material will not be added to the materials history list unless you apply it to an element.

## Viewing Recently Used Materials

When you use the Materials Paintbrush, a record is kept of the materials you have used. You can view a list of the most recently used materials by selecting the **History** tab in the catalog panel while the Materials Paintbrush is active. If you want to use one of the recently used materials, just select it in the history list and proceed with applying in your drawing.




## Setting the Maximum Size for the Material History List

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By default, when the Materials Paintbrush tool is active, the History tab in the catalog panel displays a maximum of 15 materials. You can change this setting if you wish.

**To change the maximum setting for the material history list:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, enter the desired maximum number of materials in the **Material history list** edit box, or use the arrows to scroll up or down through a list of values.
3. Click **OK**.

## Deleting Elements

You can delete an element from your drawing in two quick steps.

### To delete an element:

1. Select the element.
2. Press the **Delete** key on your keyboard, or right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.



# Chapter 19: 2D and 3D Viewing

There are a variety of options for viewing your design in 2D and 3D. When you begin working, your design is displayed as a 2D Plan. You can also use the 2D Designer's Plan tool to instantly view a rendered version of your 2D plan.

When working in 2D view, you can magnify or reduce the view using the Zoom In, Zoom Out or Zoom Realtime tools. You can also magnify a selected area using the Zoom Window tool. The Zoom to Fit tool magnifies your design so it fills the drawing area, creating the largest view possible. The Pan tool lets you pan the view in any direction by simply clicking and dragging.

You can instantly switch to 3D view with a couple of mouse clicks. Using the 3D QuickView tool you can instantly view your 3D design from a number of pre-set angles. Or you can choose one of the pre-defined 3D Cameras — 3D Perspective or 3D Overview — as well as create new views to suit your needs.

While in a 3D view you can navigate through the scene using realtime navigation tools such as Walk Around, Fly Around, and Look Around.

You can select 2D and 3D viewing and navigation tools from the View menu or from the View Control and Zoom & Navigate toolbars below the drawing area. Most of these tools can also be found on the handy Navigator, which is an all-in-one onscreen controller similar to a handheld video game controller.

Elevations are automatic — just select the one that you want to view, or create a custom one. You can create a Section by defining a cut line through your model.

Using the Dynamic Cutaway tool you can dynamically strip away a portion of your 3D model so that you can see inside it.


For a truly amazing experience you can try the Stereo Vision tool. Just slip on a pair of 3D glasses and watch every detail of your 3D model pop out at you.

In 2D plan view, your drawing is displayed in Wireframe mode by default. In 3D view, it is displayed in Rendered mode. You can switch to other display modes such as Hidden Line and Patterned at any time.


## Using the Navigator

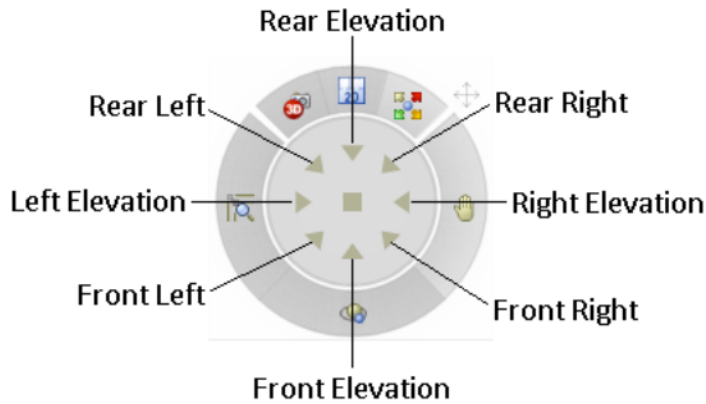
The Navigator is an onscreen controller that lets you switch between 2D and 3D, zoom and pan, and navigate in 3D. Similar to a video game controller, it brings the most frequently used viewing and navigation tools together in one place.





To display a 2D plan view, click  on the Navigator.


To display a 3D camera view, click .


To display a 3D QuickView, click , then select the desired view angle on the Navigator's center pad.




To zoom in realtime, click  and then click and drag on the Navigator's center pad. Drag upward to zoom in, drag downward to zoom out.

To pan the view, click  and then click and drag on the Navigator's center pad in the direction that you want to pan.

To walk around in a 3D camera view, click  and then click and drag on the Navigator's center pad in the direction that you want to walk. For example, to walk forward, click and drag upward.

To fly around the model, click  and then click and drag on the Navigator's center pad. The Fly Around tool revolves the camera around the target in a 3D view. Drag upward or downward to tilt the model down or up, drag right to rotate the model in a clockwise direction, or drag left to rotate it counterclockwise.

To spin the view with the Look Around tool, click  and then click and drag on the Navigator's center pad. The Look Around tool revolves the target around the camera in a 3D Camera view. Drag left to spin the model clockwise, drag right to spin it counterclockwise. Drag up to lower the height and shorten the distance of the target. Drag down to raise the height and lengthen the distance of the target.

**Note:** The Walk Around, Fly Around and Look Around tools are only available if the current view is a 3D view. In a 3D QuickView, the only navigation tool available is Fly Around.

## Moving the Navigator

You can move the Navigator around on the screen by clicking and dragging its move grip.



### To move the Navigator:

1. Click and hold your mouse button over the Navigator's grip.


2. While holding your mouse button down, drag the Navigator to the desired location on the screen.
3. Release your mouse button.

## Turning the Navigator On or Off

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You can turn the onscreen Navigator on or off as needed through your program settings.


### To turn the Navigator on or off:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Navigation** in the left pane.
3. In the right pane, enable or disable the **Enable** check box in the *Navigator Control* pane.
4. Click **OK**.

## Viewing the 2D Plan

When you start a drawing, the default view is a 2D plan view, which is a flat, overhead view. 2D plan view is ideal for creating a floor plan.

### To display your model in 2D plan view:


- Select **View > 2D Plan**, or
- Click  on the View Control toolbar or on the onscreen Navigator, or
- Right-click in the drawing area and select **2D Plan**, or

By default, all locations are visible at the same time. However, any locations other than the current location are dimmed. While in 2D plan view you can zoom in and out, and pan your drawing.

## Viewing a 2D Designer's Plan

By default, your design is displayed in a wireframe 2D plan view. You can use the 2D Designer's Plan tool to quickly display a rendered version of the 2D plan view. In a rendered view, materials are applied to the elements and terrain, creating a more realistic view. For example, if you have a shingled roof on your model, you will actually see the shingles in 2D Designer's Plan view.

### To view a 2D Designer's Plan:

1. Select **View > 2D Designer's Plan**, or click  on the View Control toolbar.


**Note:** You can use the View Filter to hide elements like the roof or ceilings so that you can see inside the model.

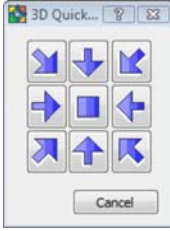
## Quick 3D Viewing

Using the 3D QuickView tool you can instantly view your design in 3D by selecting a pre-defined view angle. You can view your design from the front left, rear left, front right or rear right corner. You can also create an orthogonal elevation view by selecting a front, rear, left or right view angle.

Each 3D QuickView is a parallel view, which means distance is eliminated from the view. 3D views are automatically displayed in rendered mode for optimal effect.

### To create a basic 3D view:

1. Select **View > 3D QuickView**, or click  on the View Control toolbar or the onscreen Navigator.
2. In the **3D QuickView** dialog (or in the Navigator), click the button representing the angle you want to view from. The corner arrows represent the four available isometric views, which let you view your design from any corner at a 30° angle. Clicking the center button creates a 2D rendered plan view.



**Note:** The 3D QuickView tool is designed for quick, basic 3D viewing. These views are preset and do not have cameras associated with them. Most navigation tools are not available in a 3D QuickView, except for Fly Around. For 3D views that you can adjust, see Displaying 3D Camera Views on page 234.


## Displaying 3D Camera Views

A camera view is a 3D perspective view. In a perspective view, the scale of an element decreases according to its distance from the viewer, creating a more real-world view.



Envisioneer offers two pre-defined camera views for your convenience: *3D Perspective* and *3D Overview*. The 3D Perspective lets you view your design from a Southwest viewpoint. The 3D Overview looks at your design from an elevated position, creating an overhead view. You can change a 3D view by editing camera properties, as well as create new views.

### To view a 3D camera view:

1. Select **View > 3D Cameras**, then select the camera view you want to display. Or, click  on the View Control toolbar and select the camera view to display. You can also click  on the Navigator to display the first 3D camera view in the list.

You can change the view interactively by changing the settings or camera/target positions in the Camera Properties panel on the right side of the screen, or by clicking and dragging on the center pad in the Navigator.


To close the Camera Properties panel and display the Catalog panel, click the panel's **Close Properties** button.

**Tip:** If you have your cameras turned on in 2D, you can switch to a 3D view by selecting a camera, right-clicking it, then selecting **Activate View**.

## Creating a New 3D Camera View

You can create a new 3D view by placing a new camera in your 2D plan view. Once you've inserted the camera, you specify the camera angle and viewing field angle by rotating and clicking your mouse.

### To create a new 3D camera view:

1. While in 2D plan view, select **View > 3D Cameras > Place New Camera**, or click  on the View Control toolbar and select **Place New Camera**. A camera is attached to your cursor, ready to be inserted.
2. Click to insert the camera where you want it.
3. Move your cursor in the direction you want to view. Moving the cursor back and forth changes the camera angle.
4. Once you have the desired direction and angle in place, click to select a location for the target.



- Once you've defined the position and angle of your camera, the 3D view is instantly displayed.

The view will appear on your 3D Cameras menu and toolbar flyouts for easy access. (By default, the first view you create is called Camera1).

**Note:** If a camera is placed in a room that has no light fixtures, the camera headlight feature will illuminate the room when you are viewing the room in 3D. This light is only available when viewing and navigating in real time and is not used in rendering.

## Changing a 3D Camera View

You can change a 3D camera view using the Camera Properties panel that appears when you switch to a 3D camera view, or by clicking and dragging on the center pad of the Navigator.

The position of the camera determines the point you are viewing your design from while in a 3D camera view. You can change your viewpoint by moving your camera in the Camera Properties panel. You can also change your camera height and adjust the viewing field angle.

If you are currently in a 3D camera view, you can use navigation tools such as Walk Around and Fly Around to move the camera dynamically.

You can also change what you're focused on in a 3D camera view by moving the target in the Camera Properties panel. You can also change the target height.

You can use the onscreen Navigator to quickly move the camera and target simultaneously by clicking and dragging on the Navigator's center pad.

## Turning Cameras On and Off

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Every 3D camera view is controlled by a virtual "camera". The Cameras On/Off tool displays a camera icon on the screen. This gives you an idea of where you are viewing from. If you click on a camera, the target and viewing field angle become highlighted. This lets you know what the camera is focused on, and how much of your design is included in the view.

Having cameras displayed in 2D plan view allows you to move cameras and targets in order to adjust the 3D views they are associated with. This is an alternative to adjusting 3D views interactively with the Camera Properties panel.

### To turn cameras on:

- Select **View > Viewing Aids > Cameras On/Off**, or
- Click  on the View Control toolbar

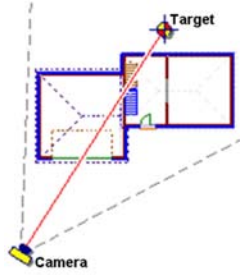
In 2D plan view, all cameras for all 3D camera views are visible. (By default there are two: one for the 3D Perspective, and one for the 3D Overview.) You may need to zoom out to see them.

## Changing Your Viewpoint


Moving a camera changes the angle you are viewing from in a 3D camera view. You can change the position of a camera by clicking and dragging the camera grip in the interactive Camera Properties panel. You can also move a camera while in 2D plan view if your cameras are turned on. If the Navigator is displayed you can change your viewpoint by clicking and dragging on the Navigator's center pad.

### To change your viewpoint in a 3D camera view:

- Display the 3D camera view, and make sure the Camera Properties panel is displayed. If it isn't, right-click in the view window and select **Camera Properties**.
- In the view map window of the Camera Properties panel, click and drag the yellow camera grip, then release your mouse button. The 3D view updates automatically.



**To change your viewpoint from 2D plan view:**

1. Make sure you are in 2D plan view.
2. Turn your cameras on.
3. By default, the camera for the 3D Perspective view is located to the left of the model. The camera for the 3D Overview is located towards the right side of the model. Click on the camera you want to move.
4. Hover your pointer over the camera's blue grip to display the Move cursor . Or, right-click in the drawing area and select **Move Camera**.
5. Click and drag the camera to move it where you want it.
6. To see the resulting view, right-click and select **Activate View**, or simply double-click the camera.

**Note:** If you use the Navigator to change your viewpoint, the camera and target both move simultaneously in the direction that you drag. If you want to move only the camera, use one of the other techniques described above.

**Note:** You cannot change the viewpoint of a 3D QuickView, since these views do not have cameras associated with them.

### Changing the Camera Height

The height of your camera determines the height you are viewing your model from in a 3D Camera View. A positive camera height lets you look down on your model, while a negative camera height lets you look up at your model.

**To change the camera height:**

1. Display the 3D camera view, and make sure the Camera Properties panel is displayed. If it isn't, right-click in the view window and select **Camera Properties**.
2. In the Camera Properties panel, type the height you want in the **Camera Height** edit box, or use the arrows to scroll up or down through a list of values.

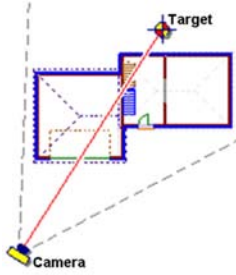
### Changing the Target of a 3D Camera View

The target of a 3D camera view is the area you are focused on, or looking towards. You can change the position of a target by clicking and dragging the target grip in the interactive Camera Properties panel. You can also move a target while in 2D plan view.


**To change the target in a 3D camera view:**

1. Display the 3D camera view, and make sure the Camera Properties panel is displayed. If it isn't, right-click in the view window and select **Camera Properties**.
- 2.

In the view map window of the Camera Properties panel, click and drag the circular target grip, then release your mouse button. The 3D view updates automatically.



#### To change a target from 2D plan view:

1. In 2D plan view, turn your cameras on.
2. By default, the camera for the 3D Perspective view is located to the left of the model. The camera for the 3D Overview is located towards the right side of the model. Click on the camera whose target you want to move. The target is usually inside or near your model. It is marked with a blue grip.
3. Hover your pointer over the target's grip to display the Move cursor . Or, right-click in the drawing area and select **Move Target**.
4. Click and drag the target to move it where you want it.
5. To see the resulting view, right-click and select **Activate View**, or simply double-click the camera.

**Note:** If the Navigator is displayed, you can move the camera and target simultaneously by clicking and dragging on the Navigator's center pad. If you want to move only the target, however, use one of the two techniques described above.

### Changing the Target Height in a 3D Camera View

Raising or lowering your target can increase or decrease the steepness of the angle you are viewing from when looking through the camera.

#### To change the target height:

1. Display the 3D camera view, and make sure the Camera Properties panel is displayed. If it isn't, right-click in the view window and select **Camera Properties**.
2. In the Camera Properties panel, type the height you want in the **Target Height** edit box, or use the arrows to scroll up or down through a list of values.

### Changing the Viewing Field Angle

In a 3D camera view, the viewing field refers to your field of vision. It works like a camera lens: higher values produce a wide-angle view; lower values produce a close-up view.

Sometimes changing the viewing field angle makes it seem like you are zooming in or out. This is because for wide-angle views, the program needs to shrink the image to provide enough screen space to contain the view. Conversely, the program enlarges the image to fill the screen at smaller view angles, creating a close-up view.

#### To change the viewing field angle in a 3D camera view:

1. Display the 3D camera view, and make sure the Camera Properties panel is displayed. If it isn't, right-click in the view window and select **Camera Properties**.
2. In the Camera Properties panel, type the desired angle in the **View Angle** edit box, or use the slider to increase or decrease the angle.



60° View Angle



100° View Angle

## Viewing in Presentation/Virtual Reality Mode





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In Presentation Mode, you navigate using an external controller (such as a video game controller), or the arrow keys on your keyboard. If you have a virtual reality headset, you can create a 360° virtual reality viewing experience.

When navigating in Presentation Mode, you will not walk through walls or other objects. Instead you can walk up and down stairs, step onto decks, and walk through open doors, just as you would in real life.

To enter into Presentation Mode, select **View > Presentation Mode**.

A unique toolbar is displayed below the view window.

- If you have a virtual reality headset, click  to enter Virtual Reality Mode.
- To turn global illumination on or off, click . Global illumination is a process that adds more realistic lighting to a 3D scene. Reflections, refractions, and shadows are examples of global illumination. This feature becomes available after you have generated the global illumination cache (see next item).
- To generate the global illumination cache, click . This precalculates the lights, shadows and reflections for the model, so that you can navigate more smoothly while in virtual reality mode. Once the global illumination cache has been generated, you can turn global illumination on and off (see previous item).
- To exit Presentation Mode, click .

By default, a standard 360° view is produced during virtual reality viewing. You can switch to a stereoscopic view in your Program Settings. In a stereoscopic view, depth data is added between the foreground and background, creating a more immersive experience. See Stereoscopic VR Viewing on page 238.


If you want to render a panoramic view that can be shared and viewed with the Envisioneer VR app, see Rendering a Panoramic View for VR Viewing on page 411.

## Stereoscopic VR Viewing

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By default, a standard 360° view is produced during virtual reality viewing in Presentation Mode. If you switch to a stereoscopic view, depth data is added between the foreground and background, creating a more immersive experience.

**To enable or disable stereoscopic VR viewing:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Graphics** in the left column.
3. In the **VR** pane, check or uncheck the **Stereoscopic** check box.
4. Click **OK**.

**Specifying the Properties of a 3D Scene**

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When a view window contains a 3D scene, there are a number of properties that you can specify to control the appearance of the scene, such as the background and amount of daylight.

**To specify scene properties:**

1. Display the scene, then right-click and select **Scene Properties**. Or, select **View > View Properties** and select the **Scene Properties** tab.
2. In the **Scene Properties** panel, specify the following settings:
 

**Use physically accurate lighting.** Enabling this option causes light to be simulated in a more natural way, resulting in optimal rendering quality. Note, however, that these advanced lighting calculations will increase rendering time.

**Exposure.** Determines how light or dark the image will appear. The higher the value, the lighter the image will be.

**Date and Time.** Determines how much daylight will be in the scene relative to your global location.

**Background.** If **Use physically accurate lighting** is enabled, a realistic sky background is automatically generated, and the background type is set to **Physical Sky**.

If **Use physically accurate lighting** is disabled, you can select an image to use for the background. From the **Type** drop box, select either **2D Image** or **3D Image** depending on the type of image you want to use. 2D images are displayed directly across from the camera, and therefore move when you move. 3D images form a skybox, creating the perception of a realistic 3D world. You can then select the image to use from the **Materials** library.

**Sky settings.** This setting helps to control the amount of light being cast onto a scene. Choices are *Clear Sky*, *Partly Cloudy Sky*, and *Overcast Sky*. For example, if your rendered image looks overexposed, you can select a partly cloudy or overcast sky to reduce the amount of light coming through.

If **Use physically accurate lighting** is enabled, the following settings are also available:

**Sky Power.** The sky multiplier. Set the value to 1.0 to create a physically accurate sky texture. Lower values can be used to simulate the effect of clouds or environment on the sky intensity.

**Sky Saturation.** The intensity of color in an image. If saturation is set to 1.0, colors are as computed by the model, and the image will have overly bright colors. If the value is lower, returned colors will look more grayish.

**Sun Power.** The intensity of sunlight. This applies in Realistic display mode and photo-realistic renderings, both of which displays sun and shadows.

**Enable reflections.** Simulates light reflecting off of objects and surfaces.


**Enable sun light.** If disabled, sun light is not created, regardless of the time of day. It is recommended that you disable sun light if you are rendering within a room that has no openings.

**Enable sun shadow.** Simulates the shadows cast by objects when they are illuminated by the sun.
3. Click **Close**.

**Walking Around in a 3D Camera View**

When you are in a 3D camera view, you can use the Walk Around tool to walk around your model, or even go right inside it. You can walk forward, backward, left or right.

**To walk around in a 3D camera view:**

1. Select **View > Zoom and Navigate > Walk Around**, or right-click in the drawing area and select **Walk Around**, or click  on the Zoom and Navigate toolbar or on the Navigator.

2. Click and hold down your mouse button in the drawing area or on the Navigator's center pad.
3. Drag in the direction you want to move.
  - To move forward, drag upward.
  - To move backward, drag downward.
  - To walk left or right, drag left or right.
  - If you drag up to the left, your path of motion will curve upward to the left, and so forth.

**Tip:** You can also walk around using only your mouse. Click and hold the CTRL key and your left mouse button, then drag to walk around.

**Tip:** You can also use your arrow keys to walk forward and backward. Click the up arrow to walk forward, and click the down arrow to walk backward.


**Note:** The Walk Around tool is not available if the view is a 3D QuickView.

**Note:** By default, motion will continue when you stop dragging, until you release your mouse button. If you would prefer that motion stop when you stop dragging, you should change your motion response setting. See Setting the Zoom and Navigation Motion Response on page 244.

## Flying Around Your 3D Model

In a 3D camera view, the Fly Around tool revolves the camera around the target, making it seem like the model is spinning.

**To fly around your model in a 3D camera view:**

1. Select **View > Zoom and Navigate > Fly Around**, or right-click in the drawing area and select **Fly Around**, or click  on the Zoom and Navigate toolbar or on the onscreen Navigator.
2. Click and hold down your mouse button in the drawing area or on the Navigator's center pad.
3. Drag in the direction that you want to rotate the model. For example, if you want to rotate the model to the right, drag to the right.

**Note:** To have the model rotate in the opposite direction when you drag, enable the **Invert Orbit Navigation** setting in **Settings > Program Settings > Navigation**.


**Note:** By default, motion will continue when you stop dragging, until you release your mouse button. If you would prefer that motion stop when you stop dragging, you should change your motion response setting. See Setting the Zoom and Navigation Motion Response on page 244.

**Tip:** You can also fly around by clicking and dragging your middle mouse button provided that the Fly Around tool is assigned to the middle mouse button in your navigation settings. (By default, the Look Around tool is assigned to the middle button.)

## Spinning the View with the Look Around Tool

In a 3D camera view, the Look Around tool revolves the target around the camera.

**To spin the view in a 3D camera view:**

1. Select **View > Zoom and Navigate > Look Around**, or right-click in the drawing area and select **Look Around**, or click  on the Zoom and Navigate toolbar or on the Navigator.
2. Click and hold down your mouse button in the drawing area or on the Navigator's center pad, then drag to look around.
  - Drag right to move the target in a counterclockwise direction. Your model orbits around you in a clockwise direction.
  - Drag left to move the target in a clockwise direction. Your model orbits around you in a counterclockwise direction.

- Drag up to lower the height and shorten the distance of the target. Your view becomes high-angle, and your model moves toward the top of the screen.
- Drag down to raise the height and lengthen the distance of the target. Your view becomes low-angle, and your model moves toward the bottom of the screen.

**Note:** Be careful when using the Look Around tool. It is very easy to lose sight of your model since the camera's "eye" is fixed in one direction only. It does not move to follow the orbiting target. Therefore, your field of vision is limited, and your model can quickly get above, below or behind you.

**Note:** The Look Around tool is not available if the view is a 3D QuickView.

## Resetting the Camera

If you have moved the camera of a 3D camera view, either by dragging it in 2D plan view or using a navigation tool like Walk Around or Pan, you can use the Reset Camera tool to move the camera back into its original position. Note that this tool is only available when the current view is a 3D view.

**To reset the camera to its original position:**


1. Select **View > Zoom and Navigate > Reset Camera**, or click  on the Zoom and Navigate toolbar.

**Note:** The Reset Camera tool is not available if the view is a 3D QuickView.

## Zooming In

The Zoom In tool magnifies the entire view in increments. Zooming is possible in both 2D and 3D view.


**To zoom in:**

1. Select **View > Zoom and Navigate > Zoom In**, or click  on the Zoom and Navigate toolbar.
2. To zoom in more, select the Zoom In tool repeatedly until the view is sufficiently magnified.

## Zooming Out

The Zoom Out tool reduces the size of the current view in increments.


**To zoom out:**

1. Select **View > Zoom and Navigate > Zoom Out**, or click  on the Zoom and Navigate toolbar.
2. To zoom out more, select the Zoom Out tool repeatedly until the desired zoom level is achieved.

## Zooming in Realtime

The Zoom Realtime tool continuously magnifies or shrinks the view as you click and drag with your mouse. You can zoom in and out in 2D plan view or any 3D view.

**To zoom in and out:**

1. Select **View > Zoom and Navigate > Zoom Realtime**, or click  on the Zoom and Navigate toolbar or on the Navigator.
2. Click in the drawing area or on the Navigator's center pad, then drag up or down to zoom in or out. To zoom in, click and drag upward. To zoom out, click and drag downward.
3. When the view is the desired size, release your mouse button.

**Note:** By default, zooming will continue when you stop dragging, until you release your mouse button. If you would prefer that zooming stop when you stop dragging, you should change your motion response setting. See Setting the Zoom and Navigation Motion Response on page 244.

**Tip:** You can also zoom in and out using the scroll wheel on your mouse, or by holding down the CTRL key and right mouse button simultaneously.



## Zooming With a Scroll Wheel Mouse

If you have a mouse with a scroll wheel, you can zoom in and out in real time by rolling the wheel. The position of your mouse pointer determines the center of zoom.


**To zoom with a scroll wheel mouse:**

1. Position your pointer over the center of the area you want to zoom.
2. To zoom in, roll the wheel forward.
3. To zoom out, roll the wheel backward.

## Zooming a Selected Area (Zoom Window)

Using the Zoom Window tool you can magnify a particular area of your design by drawing a selection window around it.

**To zoom a selected area:**

1. Select **View > Zoom and Navigate > Zoom Window**, or click  on the Zoom and Navigate toolbar. Your cursor becomes a magnifying glass.
2. Click and drag a selection window around the area you want to magnify.



**Note:** The Zoom Window tool is not available in 3D camera views.

## Zooming to Fit the Drawing Area

The Zoom to Fit tool instantly extends your drawing to the edges of the drawing area. This ensures your entire drawing is visible at the most maximized view possible, and makes full use of the drawing area. Note that the terrain is considered part of your drawing. If you want to zoom your model to fit the drawing area, you need to turn the terrain off before using Zoom to Fit.

**To zoom the drawing to fit the drawing area:**


1. Select **View > Zoom and Navigate > Zoom to Fit**, or click  on the Zoom and Navigate toolbar.

**Note:** The Zoom to Fit tool is not available in 3D camera views.

## Panning

Using the Pan tool you can move the current view of your design to bring a particular part of your design into view. This is especially useful when the area you want to view is currently not visible because you have zoomed in on your drawing.

**To pan the current view:**

1. Select **View > Zoom and Navigate > Pan**, or click  on the Zoom and Navigate toolbar or on the Navigator.
2. Click and hold your mouse in the drawing area or on the Navigator's center pad.
3. Drag the view in the direction you want to pan.
4. Release the mouse button.



**Tip:** You can also pan the view using your mouse. To pan in 2D view, click and drag the middle button. To pan in 3D view, click and hold the CTRL key while pressing the middle button.

**Tip:** In 2D views you can also pan the view using the arrow keys on your keyboard.

## Zooming Back to the Previous View

If you have used a zoom or pan tool, you can use the Zoom Previous tool to instantly return the view to its previous state.

**To zoom back to the previous view:**

1. Select **View > Zoom and Navigate > Zoom Previous**, or click  on the Zoom and Navigate toolbar.


## Zooming and Navigating with the Mouse

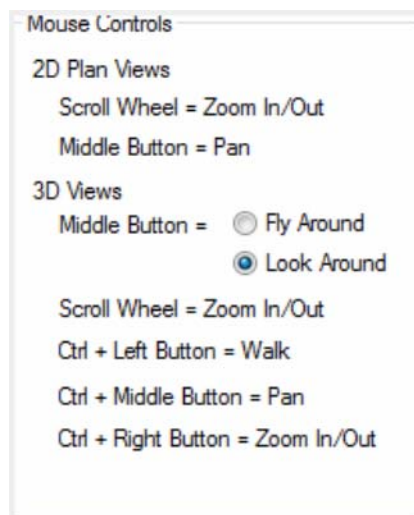
You can use the buttons on your mouse to perform many zoom and navigation functions instead of making selections from the menu, toolbar or Navigator. This allows you to instantly change your view while designing, making the design process more quick and efficient. For example, you can zoom in realtime by simply rolling the scroll wheel on your mouse.

In 2D view you can use the mouse to zoom and pan. In 3D view you can use the mouse to zoom, pan, walk around, look around, or fly around.

You can view the mouse control settings at any time by displaying the Navigation page in your Program Settings.

**To view mouse control settings:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Navigation** in the left pane.




**Note:** By default, the Look Around tool is assigned to the middle mouse button. You can assign the Fly Around tool to it if you prefer by selecting the Fly Around option for the Middle Button setting.

## Assigning a Navigation Action to the Middle Mouse Button

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You can use your middle mouse button to either Look Around or Fly Around without having to make a selection from the menu, toolbar or Navigator. By default, the Look Around tool is assigned to the middle mouse button. You can choose to assign the Fly Around tool to it if you prefer.

**To assign a navigation action to the middle mouse button:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Navigation** in the left pane.


3. In the Mouse Controls area, select either the **Look Around** or **Fly Around** option next to the **Middle Button** setting.
4. Click **OK**.

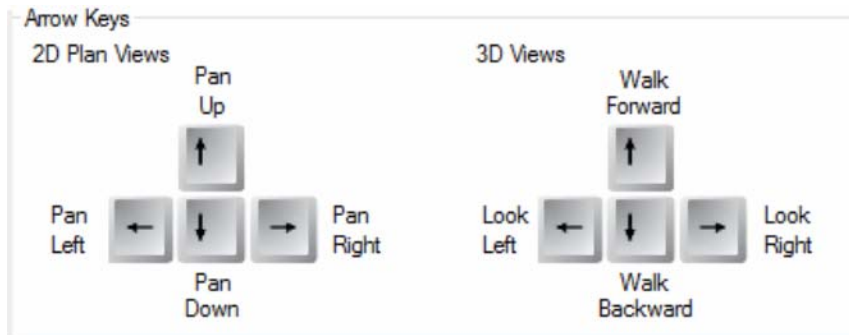
## Using Arrow Keys to Pan and Navigate

You can use the arrow keys on your keyboard to pan, walk or look around instead of making selections from the menu, toolbar or Navigator. This allows you to instantly shift your view when needed. In 2D view you can use the arrow keys to pan the view. In 3D view you can use the arrow keys to walk and look around. You can click an arrow key to move in increments, or click and hold an arrow key for continuous motion in the specified direction.

You can view the arrow key settings at any time by displaying the Navigation page in your Program Settings.

### To view arrow key settings:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Navigation** in the left pane.




## Adjusting Zoom and Navigation Speed

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You can adjust the rate of motion for zoom and navigation tools so that your motion is faster or slower when dragging your mouse. This applies to continuous motion tools, including Zoom Realtime, Pan, Walk Around, Fly Around, and Look Around.

### To adjust zoom and navigation speed:


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Navigation** in the left pane.
3. In the *Zoom and Navigation Speed* area, click and drag the slider to adjust the zoom and navigation speed. Slide left for slower motion, or slide right for faster motion.
4. Click **OK**.

## Setting the Zoom and Navigation Motion Response

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By default, when using continuous motion tools such as Zoom Realtime, Pan, Walk Around and Fly Around, motion continues in the current direction when you stop dragging your mouse, until you release your mouse button. If you prefer that motion stop when you stop dragging, you can disable continuous motion in your program settings.

### To select a zoom and navigation motion response:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Navigation** in the left pane.
3. In the *Zoom and Navigation Speed* area, check or uncheck the **Continuous Motion** check box.
4. Click **OK**.


## Viewing Elevations

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Elevations are 2D images that show a particular side of your model (front, rear, left or right) as if you were looking at it face on. While in an elevation view you can zoom in and out as well as change the display type.



### To view an elevation:

1. Select **View > Elevations**, or click  on the View Control toolbar.
2. From the flyout, select the elevation you want to view (Front, Back, Right or Left).

When you are in elevation view, the Elevation Properties panel is displayed on the right side of the screen. You can use this panel to interactively adjust the elevation and its settings.


**Tip:** If you have your elevation marks turned on in your 2D plan view, you can switch to an elevation view by selecting an elevation mark, right-clicking it, then selecting **Activate View**. Or, you can simply double-click the elevation mark.

## Creating a Custom Elevation

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You can create a custom elevation by inserting an elevation mark in your 2D plan view. Once you've inserted the mark, which represents your viewpoint, you can rotate it using your mouse to define the view direction.

### To create a custom elevation:

1. Make sure you are in 2D plan view.
2. Turn your elevation marks on. This is not necessary, but we recommend it so that you can see where other elevation marks are located. The default elevation marks are located at the extents of the terrain, so you may need to zoom out to see them.
3. Select **View > Elevations > Create New Elevation**, or click  on the View Control toolbar and select **Create New Elevation**. An elevation mark is attached to your cursor, ready to be inserted.
4. Click to insert the new elevation mark. This represents your viewpoint, so naturally you would select a point in front of the model side you want to look at in your elevation.
5. Move your cursor to rotate the arrow on the elevation mark and define the view direction. Once it is pointing in the desired direction (usually towards your model), click to finish.

Once you've positioned the elevation mark, the resulting elevation is instantly displayed. It is also added to the Elevations menu and toolbar flyout for easy access. Note that elevations sections are named automatically when you create them, starting with the name A1. The number increments each time you create a new elevation or section. You can rename elevations and sections in their properties.


## Turning Elevation Marks On and Off


You can use the View Filter to display or hide elevation marks in your 2D plan view. An elevation mark contains the label given to the elevation in the elevation's properties, as well as a target arrow that identifies the view direction of the elevation.




By default, four marks are displayed, one for each of the default elevations on the Elevation View menu. If you have created a custom elevation, a mark is displayed for that elevation as well.

**To turn elevation marks on or off:**

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the **Viewing Aids** tab.
3. In the **Elevation Mark** row, click the eye icon in the *Display* column to toggle elevation marks on or off.

 Marks are turned on

 Marks are turned off

The marks are located at the extents of your drawing, so you may need to zoom out to see them.

If you select and right-click an elevation mark, you can access a menu of tools including Move, Move Target and Activate View.

**Moving Elevation Marks**

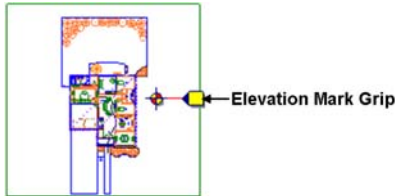
By default, elevation marks are centered with your model, which means the model is centered on the screen when you view the resulting elevation view. If you move an elevation mark in your 2D plan view, the model may be moved left or right when you display the elevation view.

You can move an elevation mark while in elevation view using the interactive Elevation Properties panel. Alternatively you can move it while in 2D plan view, then display the resulting view.

**To move an elevation mark while in elevation view:**


1. Display the elevation view, and make sure the Elevation Properties panel is displayed. If it isn't, right-click in the view window and select **Elevation Properties**.
- 2.

In the view map window of the Elevation Properties panel, click and drag the elevation mark grip. The elevation view updates instantly.



For front and rear elevations, move the mark left or right. For left or right elevations, move the mark up or down. Note that moving a mark closer to or farther away from the model has no effect on the resulting elevation view.

**To move an elevation mark while in 2D plan view:**

1. Select the elevation mark in 2D plan view.
2. Hover your pointer over the mark's blue grip to display the Move cursor.  Or, right-click in the drawing area and select **Move**.
3. Click and drag the mark to move it where you want it.
4. Right-click and select **Activate View** to see the resulting elevation, or simply double-click the elevation mark.

**Changing the Target of an Elevation**

By default, elevation marks point straight at your model. The result is a completely face-on view when you display the resulting elevation view. If you rotate an elevation mark, you change the target of the elevation. This focuses the view on a different part of your design when you display the elevation view.

**To change the target of an elevation:**

1. Go to 2D plan view, and make sure your elevation marks are turned on.
2. Select the mark whose target you want to change.
3. Right-click and select **Move Target**.

4. Click and drag to rotate the mark so it is pointing in a different direction.
5. Right-click and select **Activate View** to see the result, or simply double-click the elevation mark.

## Editing Elevation Properties

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You can edit the name of an elevation as it appears on the Elevation Views menu, as well as edit the mark text and mark text style.

### To edit elevation properties:

1. Display the elevation view and make sure the Elevation Properties panel is displayed. If it isn't, right-click in the view window and select **Elevation Properties**.
2. To edit the name of the elevation as it appears on the Elevations menu, edit the name in the **Name** edit box.
3. To edit the text that appears on the elevation mark, edit the text in the **Mark Text** edit box.
4. To apply a different text style to the elevation mark, click the **Text Style** button and make a selection from the **Text Styles** dialog. You can also add and edit text styles if you want.

## Detailing Elevations

In Model View, text, dimension and drafting tools are only available in 2D plan view, and not in elevation views. To be able to detail an elevation in Model View, you need to create a new view window, then use the Insert View tool to import an image of the elevation into the new view window. If your product does not contain the Insert View tool, this procedure is not possible.

To avoid having to create new view windows, and have more detailing and editing power, we recommend detailing elevations in Worksheet View — the program's 2D production drafting module.

### To be able to detail an elevation in Model View, follow these steps:

1. Create the desired elevation view in the *Model* view window.
2. Create a new view window and name it *Elevation* (or something similar).
3. With a 2D plan view displayed in the new view window, use the **Insert View** tool to copy the elevation view from the *Model* view window to the new view window.
4. Detail the copied elevation view image as desired.

## Deleting an Elevation

You can delete an elevation from the Elevations menu by deleting its corresponding elevation mark in 2D plan view.

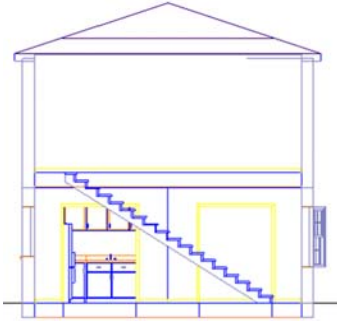
### To delete an elevation:

1. Go to 2D plan view, and make sure your elevation marks are turned on.
2. Select the mark to delete.
3. Press the **Delete** key on your keyboard, or right-click and select **Delete**.

## Creating a Section


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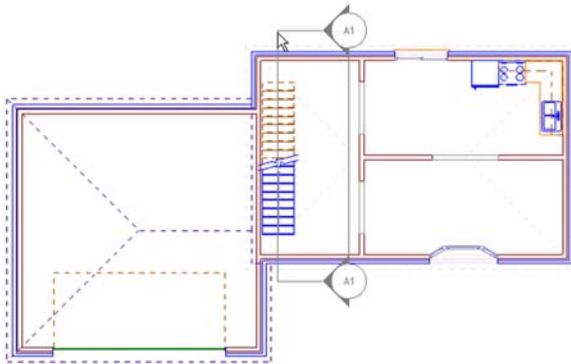
You can cut through any portion of your model to create a section view, or *cross-section*. Section views are a great way to see the interior features of your model that you are not able to see from the outside, and clarify construction details.



To create a section, you draw a section line through your model in 2D plan view, then click to define the view direction and depth.

**To create a section:**

1. Make sure you are in 2D plan view.
2. Select **View > Sections > Create New Section**, or click  on the View Control toolbar and select **Create New Section**.
3. Select two points to draw a line that cuts through your model. This is the line you will be viewing from.
4. Move your cursor in the direction you want to view. The more you move away from the section line, the deeper your view becomes. Once the bounding box is the desired distance and direction from the section line, click to finish.



Once you've defined the section mark, the resulting section view is instantly displayed. It is also added to the Sections menu and toolbar flyouts for easy access. Note that elevations sections are named automatically when you create them, starting with the name A1. The number increments each time you create a new elevation or section. You can rename elevations and sections in their properties.

## Viewing Sections

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If you have created section views, you can display them at any time using the Sections menu or toolbar.

**To view a section:**


1. Select **View > Sections**, or click  on the View Control toolbar and select the section name.


**Tip:** If you have your section marks turned on in your 2D plan view, you can switch to a section view by selecting a section mark, right-clicking it, then selecting **Activate View**.


## Turning Section Marks On and Off

When you create a section, a section mark is displayed in the 2D plan view. The section mark contains markers at each end of the section line which indicate the direction of the section view. You can turn section marks on and off using the View Filter.

**To turn section marks on or off:**

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the **Viewing Aids** tab.
3. In the **Section Mark** row, click the eye icon in the *Display* column to toggle section marks on or off.

 Marks are turned on

 Marks are turned off

**Changing Your Viewpoint in a Section**

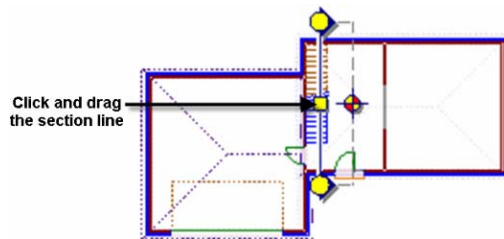
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You can change your viewpoint in a section by moving a section mark. You can use the Section Properties panel to move the section mark interactively. Alternatively you can move the section mark in 2D plan view, then display the resulting view.

**To change your viewpoint in a section:**

1. Display the section, and make sure the Section Properties panel is displayed. If it isn't, right-click in the view window and select **Section Properties**.
- 2.

In the view map window of the Section Properties panel, click and drag the red square grip at the center of the section mark line, then release your mouse button. The section updates instantly.

**To change your viewpoint from 2D plan view:**

1. In 2D plan view, make sure your section marks are turned on.
2. Click on the section mark.
3. Hover your pointer over the blue grip on the section line to display the Move cursor . Or, right-click in the drawing area and select **Move**.
4. Click and drag the mark to move it where you want it.
5. Right-click and select **Activate View** to see the result.

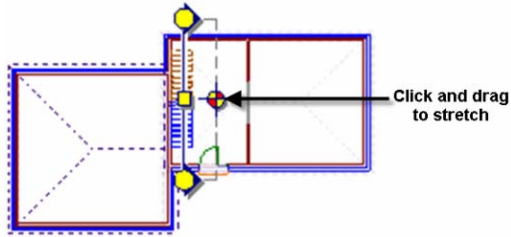
**Changing the Depth of a Section**

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You can change the depth of a section by stretching the section line bounding box. You can change the depth interactively using the Section Properties panel. Alternatively you can change the depth in 2D plan view, then display the resulting view.

**To change the depth of a section:**

1. Display the section, and make sure the Section Properties panel is displayed. If it isn't, right-click in the view window and select **Section Properties**.
2. In the view map window of the Section Properties panel, click and drag the circular grip opposite the main section mark line, then release your mouse button. The section updates instantly.



### To change the depth from 2D plan view:

1. In 2D plan view, make sure your section marks are turned on.
2. Click on the section mark.
3. Hover your pointer over the blue grip on the bounding box line to display the Stretch cursor. Or, right-click in the drawing area and select **Stretch**.
4. Click and drag to make the bounding box smaller or bigger. The bigger the box, the deeper the view.
5. Right-click and select **Activate View** to see the result.

## Detailing Sections

To detail a section, you can use a variety of text, dimension and drafting tools. Such tools are only available in 2D plan view, and not in section views. You can, however, create a new view window, then use the Insert View tool to import an image of the section into the new view window. If your product does not contain the Insert View tool, this procedure is not possible.

To avoid having to create new view windows, and have more detailing and editing power, we recommend detailing sections in Worksheet View — the program's 2D production drafting module.

### To be able to detail a section, follow these steps:

1. Create the desired section view in the *Model* view window.
2. Create a new view window and name it *Section* (or something similar).
3. With a 2D plan view displayed in the new view window, use the **Insert View** tool to copy the section view from the *Model* view window to the new view window.
4. Detail the copied section image as desired.

## Editing Section Properties

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You can edit the name of a section as it appears on the Sections menu, as well as edit the section mark text and text style.

### To edit section properties:

1. Display the section and make sure the Section Properties panel is displayed. If it isn't, right-click in the view window and select **Section Properties**.
2. To edit the name of the section as it appears on the Sections menu, edit the name in the **Name** edit box.
3. To edit the text that appears on the section mark, edit the text in the **Mark Text** edit box.
4. To apply a different text style to the section mark, click the **Text Style** button and make a selection from the **Text Styles** dialog. You can also add and edit text styles.

## Deleting a Section

You can delete a section from the Sections menu by deleting its corresponding section mark in 2D plan view.

### To delete a section:

1. In 2D plan view, make sure your section marks are turned on.
2. Select the mark to delete.
3. Press the **Delete** key on your keyboard, or right-click and select **Delete**.




## Creating Dynamic Cutaway Views

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The Dynamic Cutaway tool lets you strip away a portion of your 3D model so that you can see inside it. By sliding a selected clipping plane back and forth, you essentially create a moving cross-section of your design.



**To create a dynamic cutaway view:**

1. Go into 3D view.
2. Select **View > Dynamic Cutaway**, or click  on the View Control toolbar.
3. In the **Dynamic Cutaway** dialog, click on the clipping plane you would like to use. For example, if you want to strip away the front of your house, click on *Front*.
4. Click and drag the slider in the **Dynamic Cutaway** dialog to move the clipping plane back and forth. As you move the clipping plane, your design is stripped away.
5. To change the angle of the clipping plane, click and drag inside the dialog's clipping plane graphic to rotate the clipping plane.



6. When you have created the desired view, click **OK**. Note that the 3D view will remain a cutaway view once you close the **Dynamic Cutaway** dialog. If you want to return to the original view, click on *None* in the **Dynamic Cutaway** dialog before clicking **OK**.

## What is Stereo Vision?

Stereo Vision gives you depth perception. Here's how it works:

Both of your eyes are aimed at the same target, but because each eye is located in a different position, each takes in a unique view from its own perspective. When the two separate images arrive simultaneously in the back of the brain, they are united into one picture. The combined picture appears three-dimensional because it has the added depth dimension.

## Displaying a 3D Stereo View

Selecting the Stereo Vision tool while wearing a pair of 3D glasses adds the perception of depth to a 3D view, making it seem like every detail is popping out at you. This is a great way to really step into your model and get a true feel for it.

**To display a 3D stereo view:**

1. Display a 3D view.
2. Select **View > Stereo Vision > Stereo Vision On/Off**.
3. Put on a pair of 3D glasses. You can use any pair of anaglyphic (red/cyan) glasses.

**Tip:** Stereo vision works when viewing still images as well as when you are navigating through a 3D scene.

## Adjusting Stereo Vision Settings

You can adjust your 3D stereo view by editing the stereo vision settings. Make sure you have your 3D glasses on while editing the settings.

**To edit stereo vision settings:**

1. Select **View > Stereo Vision > Stereo Vision Settings**.

2. Editing the settings by clicking and dragging the sliders. For the most part you just need to play around with the settings until you achieve the result you want.

Below is a description of each setting.

**Stereo Effect.** Adjusts the distance between the red image and cyan image.

**Comfort Adjustment.** Caters to the differences in the human eye. Since each eye takes in a unique view from its own perspective, and each person's eyes and vision are different, the image will not appear exactly the same to everyone.


**Projection Plane Distance From Camera.** The distance of the projection plane from the camera determines which objects in the model appear to pop out of the screen, and which ones are sunken into the screen.

## Changing the Display Mode

By default, your design is displayed in Wireframe mode when you are in 2D plan view. When you switch to a 3D view, the default display mode is Rendered mode. There are six display modes you can choose from — Wireframe, Hidden Line, Rendered, Rendered Outline, Patterned, and Realistic.

Note that when you change the display mode in one view and then switch to another view and change the display mode in that view, the display mode in the first view will be retained when you go back to it.

### To change the display mode:

1. Select **View > Display Mode**, or click the down arrow next to the Display Mode button  on the View Control toolbar to view the Display Mode menu.
2. Choose the desired display mode. These are described below.

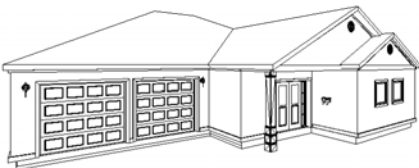
### Wireframe

Each line in your design is visible, creating a “see-through” view. It is available for both 2D and 3D views.



### Hidden Line

In a hidden line view, all lines that you would normally not see are removed from the view, creating an opaque view.



## Rendered

In Rendered display mode, textures and colors are applied to the elements and terrain, creating a very realistic view. **Note:** The Rendered display mode should not be confused with a 3D RealView.



## Rendered Outline

In the Rendered Outline display mode, textures and colors are applied to the elements and terrain, and surface edges are outlined in a single, dark line for increased surface definition.



## Patterned

In Patterned display mode, patterns of lines (hatching) are applied to the surfaces of elements. Patterns are part of a material's definition. Therefore, the materials applied to your elements determine what patterns you will see.



## Realistic

Shades and shadows are displayed in Realistic mode, which change in real time as you navigate. This can be particularly noticeable when viewing interiors with light fixtures and other sources of light and reflection.





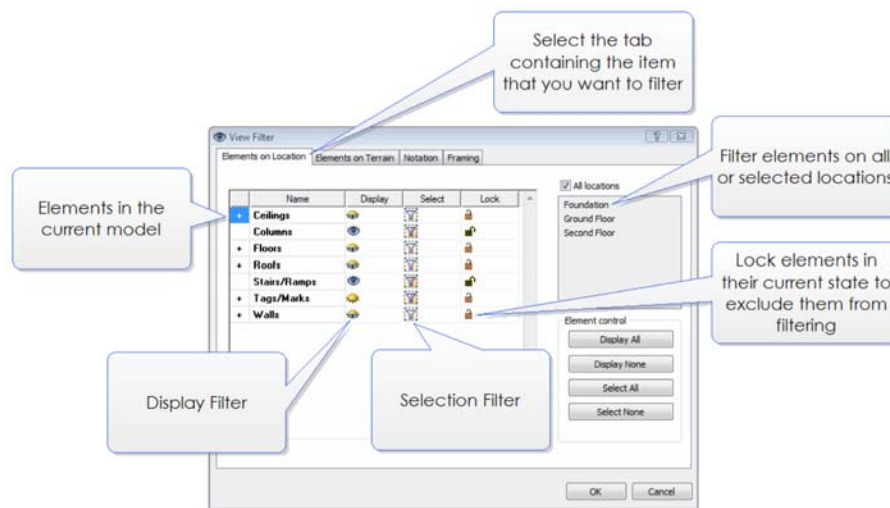
# Chapter 20: View Filters

The unique View Filter dialog acts as a display filter, letting you decide which elements or locations you want displayed at any given time. For example, you may want to hide your roof and ceilings to be able to see inside the model. It also acts as a selection filter, letting you control whether or not certain objects can be selected, which is sometimes necessary when trying to select a particular element in your drawing, like a floor or ceiling.

Other features allow you to “pick and choose” with your mouse precisely what you would like to filter. These include Pick Items to Hide, Hide All Except, Pick Items to Make Non-Selectable, and Make All Non-Selectable Except.

To access the View Filter:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.



## Filtering the Display

The View Filter provides precise control over what elements and locations are displayed in a view at any given time.

You can display/hide:

- an entire location, or multiple locations
- building elements on a specific location or multiple locations
- wall panel tags
- the terrain
- elements on the terrain
- notation elements such as text, dimensions, schedules and drafting objects
- viewing aids such as elevation and section marks
- framing components in Framing Mode

**Note:** Using the View Filter does not delete elements from your drawing. It just hides them from view.

**To filter the display:**

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.

The **View Filter** dialog contains several tabs, including *Elements on Location*, *Elements on Terrain*, and *Notation*.

The *Elements on Location* tab lists all the elements in your model that are associated with building locations. Many elements in the list can be expanded to display a list of sub-components for precise view control. You can display or hide elements on all locations, or specific locations.


The *Elements on Terrain* tab lists the terrain and any landscaping elements in your drawing that are associated with the terrain.


The *Notation* tab contains items such as text, dimensions, drafting objects, and project trace images.


The *Viewing Aids* tab contains items such as elevation marks and section marks.

The *Framing* tab lists the framing components tools available in Framing Mode — the Head/Sill/Jamb tool, Intersection tool and Wall Infill tool.

The icons in the *Display* column indicate whether or not that location or element is currently displayed. Clicking an icon toggles the icon to the opposite state (on or off).


 Element is turned on


 Element is turned off

 On the *Elements on Location* tab, this icon indicates that some of an element's components are turned on, and some are turned off.

Clicking **Display All** turns on all elements displayed on the current tab. Clicking **Display None** turns off all elements displayed on the current tab. On the *Elements on Location* tab, these buttons affect elements on the currently selected location(s).

The icons in the *Lock* column indicate whether or not an item is locked. If an item is locked, it remains in its current state regardless of any element filtering you do. For example, if *Wall Framing* is locked in a visible state, *Wall Framing* will remain visible even if you turn off the *Walls* element, or click the **Display None** button.

 Item is locked


 Item is unlocked


 Some of the item's components are locked, and some are not


## Displaying/Hiding Elements on Locations


You can use the View Filter to display or hide selected element types on all or selected building locations. This applies to building elements such as walls and doors, as well as landscaping elements that were inserted using the "Insert on Location" option.

### To display or hide building elements:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the *Elements on Location* tab.
3. By default, elements on all locations are displayed in the element list. To control the visibility of elements on a specific location, disable the **All Locations** check box, then select the location where you want to filter the view. You can Ctrl+click to select multiple locations if you want.
4. To turn an element on or off, click the element's eye icon in the *Display* column to toggle it on or off. If you want to filter specific element components, click the element's plus sign (+) to display a list of components. For example, the *Walls* element can have components such as wall surfaces, trim, wall framing, doors and windows. Each component has its own display icon.

 Element or component is turned on

 Element or component is turned off

 Indicates that some of an element's components are turned on, and some are turned off


5. To display or hide all building elements currently shown in the element list, click **Display All** or **Display None**.

- To lock an element or component in its current display state, click the lock icon in the *Lock* column. When an item is locked, any filtering you do in the dialog will have no effect on the locked item. For example, if *Wall Framing* is locked in a visible state, *Wall Framing* will remain visible even if you turn off the *Walls* element, or click the **Display None** button.
- Click **OK**.

## Displaying/Hiding Building Locations

You can turn individual locations on or off. When you turn a location off, all elements on that location are hidden from view.


### To display or hide entire locations:


- Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
- In the **View Filter** dialog, select the Elements on Location tab.
- Disable the **All Locations** check box.
- In the locations list, select the location that you want to display or hide. You can Ctrl+click to select multiple locations if you want.
- Click **Display All** or **Display None** to turn all the elements on the selected location on or off.
- Click **OK**.


## Displaying/Hiding Elements on the Terrain

You can use the View Filter to display or hide the terrain and any elements associated with the terrain, such as landscaping elements.

### To filter elements on the terrain:

- Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
- In the **View Filter** dialog, select the Elements on Terrain tab.
- Click the eye icons in the *Display* column to turn elements on or off. You can also click the **Display All** or **Display None** button to display or hide all terrain elements simultaneously.

 Element is turned on

 Element is turned off


- Click **OK**.


**Note:** The visibility of decks is controlled on the Elements on Location tab. This also applies to exterior lighting, exterior furniture or exterior accessories that were inserted using the “Insert on Location” option.


## Displaying/Hiding Notation Objects

You can use the View Filter to control the visibility of notation objects such as text and dimensions.

### To filter notation objects from view:

- Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
- In the **View Filter** dialog, select the Notation tab.
- Click the eye icon in the *Display* column next to the notation object you want to display or hide. Clicking the icon toggles visibility on and off. You can also click the **Display All** or **Display None** button to display or hide all notation objects simultaneously.

 Object is turned on


 Object is turned off


- Click **OK**.

## Displaying/Hiding Framing Mode Components

When in Framing Mode, framing components (wall infill, intersections and openings) are displayed as "glass boxes", making it easy to identify and select each one. You can hide selected framing components from view if you want.

### To filter components from view in Framing Mode:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Framing tab.
3. Click the eye icon in the *Display* column next to the framing component that you want to display or hide in Framing Mode. The Head Sill Jamb Tool option relates to the display of openings. Other components that may be listed are Intersections and Wall Infill.

 Component is turned on

 Component is turned off

4. Click **OK**.

## Selection Filtering

You can use the View Filter to prevent specific elements from being selected. You can even prevent entire building locations from being selected.

### To control element selectability:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.

The **View Filter** dialog contains various tabs, including *Elements on Location*, *Elements on Terrain*, and *Notation*.

The *Elements on Location* tab lists all the elements in your model that are associated with building locations. Many elements in the list can be expanded to display a list of sub-components for precise filtering. You can control the selectability of elements on all locations, or specific locations.


The *Elements on Terrain* tab lists the terrain and any landscaping elements in your drawing that are associated with the terrain.


The *Notation* tab contains items such as text and dimensions.


The *Viewing Aids* tab contains items such as elevation marks and section marks.

The *Framing* tab lists the framing components tools available in Framing Mode — the Head/Sill/Jamb tool, Intersection tool and Wall Infill tool.

The icons in the *Selection* column indicate whether or not an element is currently selectable. Clicking an icon toggles the icon to the opposite state (selectable or non-selectable).


 Element is selectable


 Element is not selectable

 On the *Elements on Location* tab, this icon indicates that some of an element's components are selectable, and some are not.

Clicking **Select All** makes all elements on the current tab selectable. Clicking **Select None** turns off selectability for all elements displayed on the current tab. On the *Elements on Location* tab, these buttons affect elements on the currently selected location(s).

The icons in the *Lock* column indicate whether or not an item is locked. If an item is locked, it remains in its current state regardless of any element filtering you do. For example, if walls are currently non-selectable and you click the **Select All** button to make all elements selectable, walls will remain unselectable if they are locked.

 Item is locked

 Item is unlocked






Some of the item's components are locked, and some are not

**Note:** Wall framing cannot be selected, but you can select intersections, openings and wall infill while in Framing Mode. Floor, ceiling and roof framing cannot be selected unless you convert their framing to actual members.

## Making Elements on Locations Selectable or Non-Selectable

You can use the View Filter to control the selectability of elements on all or selected building locations. This applies to building elements such as walls and doors, as well as landscaping elements that were inserted using the "Insert on Location" option.

### To change the selectability of elements on locations:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Elements on Location tab.
3. By default, elements on all locations are displayed in the element list. To control the selectability of elements on a specific location, disable the **All Locations** check box, then select the location that you want to filter. You can Ctrl+click to select multiple locations if you want.
4. To control an element's selectability, click the element's filter icon in the *Selection* column to toggle it on or off.



Element is selectable



Element is not selectable


If you want to control the selectability of specific element components, click the element's plus sign (+) to display a list of element components. For example, the Walls element can have components such as wall surfaces, trim, wall framing, doors and windows. Each component has its own filter icon.

5. To control the selectability of all building elements currently shown in the element list, click **Select All** or **Select None**.
6. To lock an element or component in its current state of selectability, click the lock icon in the *Lock* column. When an item is locked, any filtering you do in the dialog will have no effect on the locked item. For example, if walls are currently non-selectable and you click the **Select All** button to make all elements selectable, walls will remain unselectable if they are locked.
7. Click **OK**.

## Making Building Locations Selectable or Non-Selectable

When you make a location non-selectable, no elements on that location can be selected in any view.


### To make a location selectable or non-selectable:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Elements on Location tab.
3. Disable the **All Locations** check box.
4. In the locations list, select the location that you want to filter. You can Ctrl+click to select multiple locations if you want.
5. Click **Select All** or **Select None** to make all elements on the selected location selectable or non-selectable.
6. Click **OK**.


## Making Elements on the Terrain Selectable or Non-Selectable


You can use the View Filter to control the selectability of the terrain or any elements associated with the terrain, such as landscaping elements.

### To make elements on the terrain selectable or non-selectable:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Elements on Terrain tab.

3. Click the filter icons in the *Selection* column to toggle selectability on or off.

 Element is selectable

 Element is not selectable


4. If you want to make all elements on the *Elements on Terrain* tab selectable or non-selectable, click the **Select All** or **Select None** button.
5. Click **OK**.


**Note:** The selectability of decks is controlled on the Elements on Location tab. This also applies to exterior lighting, exterior furniture or exterior accessories that were inserted using the “Insert on Location” option.


## Making Notation Objects Selectable or Non-Selectable

You can use the View Filter to control whether or not notation objects such as text and dimensions can be selected for editing.

**To make notation objects selectable or non-selectable:**

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Notation tab.
3. Find the item that you want to control and then click its filter icon in the *Selection* column to toggle selectability on or off.

 Object is selectable


 Object is not selectable

4. Click **OK**.


## Making Framing Mode Components Selectable or Non-Selectable

When in Framing Mode, framing components (wall infill, intersections and openings) are displayed as “glass boxes”, making it easy to identify and select each one. You can use the View Filter to prevent specific framing components from being selected while in Framing Mode.

**To control the selectability of Framing Mode components:**

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Framing tab.
3. Find the item that you want to control and then click its filter icon in the *Selection* column to toggle selectability on or off. The Head Sill Jamb Tool option relates to wall openings. Other components that may be listed are Intersections and Wall Infill.

 Component is selectable


 Component is not selectable

4. Click **OK**.

## Hiding Items by Picking in Your Drawing

Using the Pick Items to Hide tool you can select items directly in your drawing that you want to hide.


**To hide an item by picking:**

1. Select **View > View Filters > Pick Items to Hide**, or click the down arrow next to the View Filters button  on the View Control toolbar and select **Pick Items to Hide**.
2. Click on the item that you want to hide. Note that filtering occurs per *item type* rather than individual item. For example, if you pick one column, all columns will be hidden.
3. Right-click and select **Finish**.

## Hiding All Except What Is Picked

Using the Hide All Items Except tool you can select an item in your drawing and automatically hide everything else for quick display control.


### To hide all except what is picked:

1. Select **View > View Filters > Hide All Items Except**, or click the down arrow next to the View Filters button  on the View Control toolbar and select **Hide All Items Except**.
2. Click on the item that you want to remain displayed. Note that filtering occurs per *item type* rather than individual item. For example, if you pick one column, all columns will remain displayed.
3. Right-click and select **Finish**.

## Making Items Non-Selectable by Picking in Your Drawing

Using the Pick Items to Make Non-Selectable tool you can select items directly in your drawing that you want to make non-selectable.


### To make an item non-selectable:

1. Select **View > View Filters > Pick Items to Make Non-Selectable** or click the down arrow next to the View Filters button  on the View Control toolbar and select **Pick Items to Make Non-Selectable**.
2. Click on the item that you want to make non-selectable. Note that filtering occurs per *item type* rather than individual item. For example, if you pick one column, all columns will be made non-selectable.
3. Right-click and select **Finish**.

## Making All Non-Selectable Except What Is Picked

Using the Make All Non-Selectable Except tool you can pick an item in your drawing that you want to be selectable, and automatically make everything else non-selectable.



### To make all non-selectable except what you pick:

1. Select **View > View Filters > Make All Non-Selectable Except** or click the down arrow next to the View Filters button  on the View Control toolbar and select **Make All Non-Selectable Except**.
2. Click on the item(s) that you want to be selectable. Note that filtering occurs per *item type* rather than individual item. For example, if you pick one column, all columns will be made selectable.
3. Right-click and select **Finish**.

## Creating a View Filter Template

You can create filter templates in the **View Filter** dialog which enable you capture a specific group of filter settings, and instantly apply them to your drawing. For example, if you wanted to display an electrical diagram, you could create an 'Electrical' template in which only walls, electrical elements and electrical wiring are shown.

### To create a view filter template:


1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, click .
3. In the **New View Filter Template** dialog, you can select an existing template on which to base the new template if desired.
4. Specify the desired display and selection settings. For more information, refer to Filtering the Display on page 255 and Selection Filtering on page 258.
5. In the **Template Name** edit box, type a name for the template.
6. By default, the template will displayed on the **View > View Filters** menu for quick access. If you do not want it to appear there, disable the **Include in menu** check box. Note that the template will still be displayed in the **Templates** drop box in the **View Filter** dialog.

7. Click **Save**.
8. To apply the template settings, click **Apply** in the **View Filter** dialog.

## Applying a View Filter Template

If you have created a view filter template, you can apply its filter settings to the current view by selecting it from the **View > View Filters** menu. This assumes that the **Include in menu** option is selected in the template's properties.



You can also apply a template in the **View Filter** dialog:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the desired template from the **Template** drop box.
3. Click **Apply**.

## Editing a View Filter Template

If you have created a view filter template, you can edit its filter settings if needed.

**To edit a view filter template:**

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the template from the **Template** drop box.
3. Click .
4. In the **Edit View Filter Template** dialog, edit the filter settings.
5. Click **Save**.

# Chapter 21: Managing View Windows

The View Manager contains a listing of view windows and lets you open, close, create, and edit views. Every new project has at least one pre-defined view window. A *Model View* view window is where you build and edit your 3D model. A *Worksheet View* window takes you into a 2D drafting mode where you can create your construction documents. **Note:** *Building Essentials* does not have Worksheet views.

You can easily create new view windows as needed. Each window can have different view settings. For example, you may want to display a wireframe, 2D plan view in one view window, and a 3D view in another window.

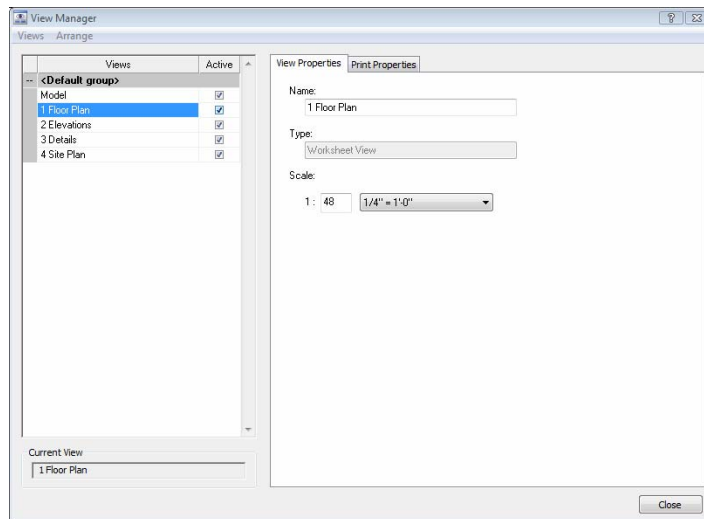
When you create new view windows, you can switch between open view windows using the **Window** menu or view tabs.

You can display multiple view windows at the same time using the Tile Open Views and Cascade Open Views tools. View windows can be moved, resized and closed to create the exact arrangement you want.

You can edit the name and scale of views listed in the View Manager, as well as specify print properties for each view.

To access the View Manager:

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.




## Adding a Group to the View Manager

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Views are arranged in groups for ease of organization. You can add groups to the View Manager to help you organize views.

**To create a new group in the View Manager:**


1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select **Arrange > Add Group**, or right-click in the left pane and select **Arrange > Add Group**. A 'New Group' is added to the list.
3. Edit the group's name in the **Name** edit box in the right pane.

You can now add views to the group, or move existing views into the group.

## Renaming a Group in the View Manager

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### To rename a group in the View Manager:

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select the group that you want to rename. It's properties appear in the right pane.
3. Edit the name in the **Name** edit box.
4. Click **OK**.

## Deleting a Group in the View Manager

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### To delete a group in the View Manager:

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select the group that you want to delete.
3. Select **Arrange > Remove Group**, or right-click in the left pane and select **Arrange > Remove Group**. The group is deleted.


**Note:** If a group contains views and you delete it, the views will be deleted also. You may first want to move the views into another group.

## Expanding and Collapsing Groups in the View Manager

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Views are contained in groups in the View Manager. You can expand or collapse individual groups, or all groups simultaneously.

### To expand or collapse groups:

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. To expand a group that is currently collapsed, click the small plus sign (+) to the left of the group's name.
3. To expand all groups at once, select **Arrange > Expand All**, or right-click in the left pane and select **Arrange > Expand All**.
4. To collapse a group that is currently expanded, click the small minus sign (-) to the left of the group's name.
5. To collapse all groups at once, select **Arrange > Collapse All**, or right-click in the left pane and select **Arrange > Collapse All**.

## Creating a New View Window

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Every new project contains at least one pre-defined view window.

You can use the View Manager to create new view windows and specify different view settings for each window. For example, you may want to create a view window called '3D View' and display a 3D view in that window.

If your product contains the Worksheet View mode, you can create either a **Model View** window or **Worksheet View** window. You build, edit and view your model in Model View windows. When you create a Worksheet View window, you are automatically switched to the 2D production drafting mode. Here you can create detailed and accurate construction documents.

Views are stored in groups for easy organization and navigation. You can add view windows to the default group, or create your own groups if you want. You can add views using the View Manager, or through the view tabs below the drawing area.

**To create a new view in the View Manager:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the left pane of the **View Manager** dialog, select the group you want to add the view to.
3. Select **Views > Add Model View** or **Add Worksheet** (depending on which type of view you want to create), or right-click in the left pane and select **Add Model View** or **Add Worksheet**. A *Model View* window will contain your actual 3D model. In model view you can build and edit your model. Selecting *Worksheet View* will put you directly into drafting mode where you can create working drawings.

**Note:** You cannot create Worksheet View windows in *Building Essentials*.

A new view is added to the list.

4. In the **Name** edit box in the right pane, type a name for the view window.
5. Select a view scale for the view.

The view scale is the ratio of units on paper to real-world units. If the scale is set to 1:48 (1/4" = 1'-0"), a quarter inch on paper will represent one foot of your model. For example, an 8-foot wall would be 2 inches on paper. The view scale becomes particularly important in Worksheet View, where you create all of your printable working drawings. (Note that you can set a print scale for the view that is independent of the view scale.)

6. If you want to define the view's print settings at this time, select the **Print Properties** tab in the right pane, then define the print settings.
7. Click **OK**. The new view becomes the current view window.

**To create a new view through the view tabs:**


1. Right-click any view tab and select either **Add Model View** or **Add Worksheet** (depending on which type of view you want to create). A new view tab is added.
2. To edit the properties of the view window, such as the name and view scale, right-click the view tab and select **View Manager**.

## Copying a View Window

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You can copy an existing view window to create a new view window. When you copy a view, the contents and display settings of the view are copied to the new view window. The Copy View tool works on both Model View and Worksheet View windows. You can copy a view in the View Manager, or through the view tabs.

**To copy a view in the View Manager:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the left pane of the **View Manager** dialog, select the view window that you want to copy.
3. Select **Views > Copy View**, or right-click and select **Copy View**.

**To copy a view through the view tabs:**

1. Right-click on the view tab that you want to copy.
2. Select **Copy View**.

## Renaming a View Window

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You can edit the name of a view window as it appears in the View Manager, in the program's title bar, and on the view tabs. You can do this in the View Manager, or by accessing the view window's properties.

**To rename a view window when it is the current view window:**

1. Select **View > View Properties**, or right-click in the view window and select **View Properties**.
2. In the **View Properties** dialog, type the new name in the **Name** edit box.

3. Click **OK**.

**To rename a view window in the View Manager:**


1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. On the left side of the **View Manager** dialog, select the view that you want to rename. It's properties appear in the right pane.
3. Edit the view's name in the **Name** edit box in the right pane.
4. Click **OK**.

## Opening View Windows


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If you have closed a view window either through the View Manager or by clicking a view window's Close button, you can open it again by making it active in the View Manager.

**To open a view window:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. Click in the check box next to the view window's name to make it active. It appears on the **Window** menu as well as on a view tab if you have view tabs turned on.

**To open all view windows at once:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select **Views > Set All Active**, or right-click in the left pane and select **Set All Active**.

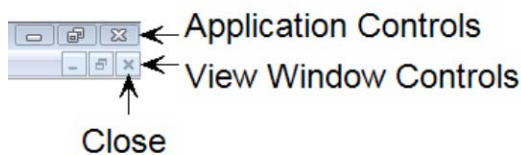
## Closing View Windows

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By default, the *Model* view window is open when you start a project. Others may be open as well depending on the program version you are using. You can close individual view windows by making them inactive in the View Manager, by clicking the view window's Close button, or through the right-click menu of view tabs.

**To close a view window from within the window itself:**


1. Click the Close button in the top right corner of the view window.



**To close a view window using the View Manager:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. Click in the check box next to the view's name to make the view inactive.

**To close all view windows at once:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select **Views > Set All Inactive**, or right-click in the left pane and select **Set All Inactive**.



**To close a view window from the view tabs:**


1. Right-click the view tab of the window that you want to close.
2. Select **Close View**.

**Deleting a View Window**

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You can delete a view window by removing it from the View Manager, or by selecting the Delete View tool on a view tab's right-click menu.

**To delete a view window from the View Manager:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. Select the view to delete.
3. In the **View Manager** dialog, select **Views > Delete View**, or right-click in the left pane and select **Delete View**.

**To delete a view window from the view tabs:**


1. Right-click on the view tab containing the view that you want to delete.
2. Select **Delete View**.
3. Click **OK** to confirm that you want to permanently delete the view.

**Re-ordering Views in the View Manager**

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You can move views up or down in the View Manager to control which group they are contained in, or change their place in the list.

**To re-order views in the View Manager:**


1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select the view that you want to move.
3. Select **Arrange > Move Up** or **Arrange > Move Down**, or right-click in the left pane and select **Arrange > Move Up** or **Arrange > Move Down**. Repeat to move the view further up or down if necessary.

**Displaying/Hiding the View Tabs**

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When view tabs are turned on, a row of tabs is displayed below the drawing area. Each tab represents an open view in the View Manager. View tabs make it easy to switch from one view to another.

**To turn view tabs on or off:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Tool Display* area, check or uncheck the **View Tabs** check box.
4. Click **OK**.

**Making a View Window the Current View Window**

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If you have multiple view windows, you can use the Set Current option in the View Manager to make a particular view window the current one displayed.

**To set the current view window:**

1. Select **View > View Manager**, or click  on the View Control toolbar, or right-click any view tab and select **View Manager**.
2. In the **View Manager** dialog, select the view window you want to make current.
3. Select **Views > Set Current**, or right-click in the left pane and select **Set Current**. The selected view window is now the current view window.

## Switching Between View Windows

All open view windows appear on the program's **Window** menu, making it easy to switch from one window to another.

Also, if you have turned your view tabs on, view tabs for each open view window are displayed below the drawing area.

To make a view window the current view window, simply select it from the **Window** menu, or select the view's corresponding view tab below the drawing area.

## Tiling View Windows

By default, only one maximized view window is displayed at a time. Using the Tile Open Views tool you can instantly tile all open view windows in the drawing area. This is a great way to see different views of your design while you are working on it. When you make a change in one view window, the design updates automatically in all other view windows.

**To tile all open view windows:**

1. Select **Window > Tile Open Views**.

## Cascading View Windows

By default, only one maximized view window is displayed at a time. Using the Cascade Open Views tool you can instantly display all open view windows in a stacked format, with the current view window on top. Once the view windows are cascaded you can move and resize each one if you want.

**To cascade all open view windows:**

1. Select **Window > Cascade Open Views**.

## Returning to a Maximized View

If you have tiled or cascaded your open view windows, you can return to a maximized view (where only one view window is visible) by maximizing one of the open view windows.

**To maximize a view window:**

1. Click the Maximize button in the view window you want to maximize.

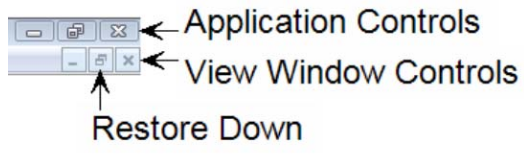


## Restoring the Previous Arrangement of View Windows

If you tiled, cascaded or arranged your view windows, then maximized one of them, you can use the Restore Down button to return to the view window arrangement that was displayed before you used the Maximize button.

**To restore the previous arrangement of view windows:**

1. Click the Restore Down button in the top right corner of the current view window.





# Chapter 22: Drafting in Model View

In Model View, you can find a variety of drafting tools on the Tools menu, such as Text and Dimensions.

The Tools > Layout sub-menu contains a basic set of line and shape tools — Line, Arc, Circle, Rectangle and Polygon Hatch, as well as a set of detailing tools — Batt Insulation, Rigid Insulation, Wood Section, Masonry Section, and Cut Line. Objects drawn with these tools will not display in 3D view. You can use these tools to help with your design layout. For example, you may want to draw construction lines to help you place walls and other elements.

In addition to drafting tools, the Layout menu contains the Insert View tool, which lets you insert views of your model — 2D plans, elevations, sections or 3D views — into the current view window.

You can use the Import PDF File to import the contents of any PDF file into your Envisioneer project. You can define the size and angle of the imported block prior to importing it. If the PDF contains a floor plan, you can scale the plan to the correct size upon import, then trace the imported plan using building tools such as the Walls tool to create an accurate 3D model in Envisioneer.

You can also use the Import CAD File tool to import an AutoCAD DWG or DXF file into your project, such as a title block, detail or drafting symbol. Using these tools allows you to create quick, basic working drawings.


Many of the drafting tools that you see in Model View are also available in Worksheet View. The exceptions are Auto Exterior Dimensions, Auto Interior Dimensions, and Room Dimensions. These tools can only be used in Model View.

**Note:** We recommend completing your working drawings in Worksheet View rather than Model View. Worksheet View provides access to the same tools you see on the Layout menu, plus many more. Dedicated solely to 2D production drafting, Worksheet View gives you all the drawing and editing tools needed to create fast, accurate, detailed working drawings.

## Adding Text in Model View

You can add custom text or pre-defined labels to your drawing. You can select the text style you want to use, and control the justification of the text. Text can be moved and rotated after it has been inserted, just like most other elements.

**To add custom text to your drawing:**

1. Select **Tools > Text > Text**, or click  on the Annotation toolbar.



2. In the **Text** dialog, type the text you want to add. If you want to import a text (\*.txt) file, click **Import**, then select the file to import.
3. To select a style for the text, click the **Text Style** button and select or create a text style in the **Text Styles** dialog.
4. By default, text is left justified. For multi-line text, this means that text lines will line up on the left, and be ragged on the right. If you want to change the **justification** Justification refers to the way lines of text "line up" in relation to the window that contains them. A "left" justification lines the left side of the text up with the left side of the window, leaving the right side ragged. of the text, click the appropriate justification button above the text editing window.



 Left Justify

 Center Justify

 Right Justify

5. If you want to automatically return to the **Text** dialog after you have inserted the current text, enable the **Multiple text insert** check box. This is ideal when you want to insert different pieces of text without having to select the **Text** tool again.
6. Click **OK**. The text is attached to your cursor.
7. Position the text where you want it, then click to insert it.

#### To add pre-defined labels to your drawing:

1. Select **Tools > Text > Text**, or click  on the Annotation toolbar.
2. In the **Text** dialog, select the label you want in the *Pre-defined Labels* list on the right side of the dialog, then drag it into the editing window. You can also double-click the label or click  to add the label to the editing window.
3. If you want to add or edit a label, click the **Library** button to access the Labels library.
4. To select a style for the text, click the **Text Style** button and select or create a text style in the **Text Styles** dialog.
5. If you want to automatically return to the **Text** dialog after you have inserted the current text, enable the **Multiple text insert** check box. This is ideal when you want to insert different pieces of text in your drawing without having to select the **Text** tool again.
6. Click **OK**. The text is attached to your cursor.
7. Position the text where you want it, then click to insert it.

## Editing Text Content in Model View

You can edit the content of a text element by accessing its properties.

#### To edit text:

1. Select the text you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Text** dialog, edit the text in the text window.
4. Click **OK**.

## Changing the Style of Text in Model View

You can edit the appearance of text by applying a different text style to it.

#### To change the style of text:

1. Select the text whose style you want to change.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Text** dialog, click **Text Style**.
4. In the **Text Styles** dialog, select a new text style. You can also create your own text style, or edit the current text style.  
Note that if you edit an existing text style, your changes are permanently saved in the text styles library, and are not project-specific.
5. Click **OK** in the **Text Styles** dialog.
6. Click **OK** in the **Text** dialog. The text is changed automatically.

**Note:** The Properties tool lets you change the text style of the selected text object only. If you want to globally change all text objects that use a particular text style, see Updating a Text Style Globally on page 273.

## Updating a Text Style Globally

You can use the Update Style tool to change the text style of all text objects in your drawing that use the same text style.

**To update a text style globally:**

1. Select a text object whose text style you want to change.
2. Right-click and select **Update Style**, or select **Edit > Modify Elements > Update Style**.
3. In the **Text Style Properties** dialog, make the desired text style change.
4. Click **OK**. All text objects using the selected text style will automatically update.

**Changing the Justification of Multi-line Text**

You can change the way multiple lines of text are aligned.


**To change the justification of text:**

1. Select the text you want to edit.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Text** dialog, click the appropriate justification button below the editing window.
4. Click **OK**.

**Finding and Replacing Text in Model View**

You can use the Find and Replace tool to find a specific word or phrase in your project. You can also replace it instantly with another word or phrase of your choice.

**To find and replace text:**

1. Select **Tools > Text > Find and Replace**, or click  on the Annotation toolbar.
2. In the **Find and Replace Text** dialog, type the word or phrase that you want to find in the **Find what** edit box.
3. If you want to replace the text with something else, enter the replacement text in the **Replace with** edit box.
4. Select any options you want to use to control the search. These are described below.

**Match case.** Find text with the same capitalization as the search text. For example, if you enter the word "Bedroom" as your search text, the word "bedroom" would not be returned as a match because the first character is not uppercase.

**Match whole word.** Find only whole words, not parts of words. For example, if you enter the word "day" as your search text, the words "Monday" or "daytime" would not be returned as matches.

**Search up.** Search backward from the current search position.

5. Click **Find Next**.

If the text is found, the first instance is displayed in the lower pane of the **Find and Replace Text** dialog, and the text is highlighted in the drawing area.

6. To replace the text with the text in the **Replace with** edit box, click **Replace**. To instantly replace all instances of the search text, click **Replace All**.
7. To search for the next instance of the text, click **Find Next** again. When the search is complete, the **End of Search** dialog will appear notifying you that all text has been searched.
8. When you are finished searching for text, close the **Find and Replace Text** dialog.


**Note:**The Find and Replace tool searches the current building location only.

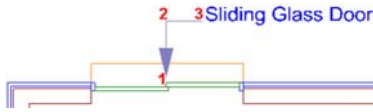
**Adding Text with a Leader in Model View**

You can insert text with an arrow attached to it that points to a particular element or area in your drawing. The leader has two segments and can be oriented in any fashion.

**To add a text with leader:**

1. Select **Tools > Text > Text with Leader**, or click  on the Annotation toolbar.
2. To select a dimension style for the leader, click the **Dimension Style** button and make a selection from the **Dimension Styles** dialog.

3. Type the desired text in the editing window. Or, to import a text (\*.txt) file, click **Import**, then select the file to import.
4. To insert a pre-defined label, select the label you want in the *Pre-defined Labels* list on the right side of the dialog, then drag it into the editing window. You can also double-click the label or click  to add the label to the editing window. To access the Labels library, where you can add and edit labels, click **Library**.
5. If you want to automatically return to the **Leader** dialog after you have inserted the current text, enable the **Multiple text insert** check box. This lets you keep inserting text without having to select the Text with Leader tool again.
6. Click **OK**.
7. In the drawing area, select the point where you want the arrowhead to appear.
8. Select the next point of the leader. If you only want a two-point leader, right-click and select **Finish** at this point. Otherwise, you can select a third point for the leader if you want.
9. If you are creating a three-point leader, select a third point for the leader. The text is inserted.



## Moving and Stretching a Leader

You can move or stretch a leader by clicking and dragging its grips.

### To move/stretch a leader:

1. Click on the text with leader to select it. Grips appear on the leader.
2. Click and drag a grip to move it, then release your mouse button.

## Changing the Style of Text with a Leader in Model View

The text style and leader arrow style of text with a leader is determined by the current dimension style, which by default is the Standard dimension style. You can change the style of text with a leader by selecting a dimension style with the desired style settings.

### To select a different style for text with a leader:

1. Click on the text with leader to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Leader** dialog, click the **Dimension Style** button.
4. In the **Dimension Styles** dialog, select the dimension style that you want to use, then click **OK**. For information about editing dimension styles, including leader settings, see Customizing the Dimension Styles Library on page 491.
5. Click **OK** in the **Leader** dialog. The text with leader is updated.

**Note:** The Properties tool lets you change the style of the selected text object only. If you want to globally change all text objects that use a particular text style, see Updating the Style of Text with a Leader Globally on page 274.

## Updating the Style of Text with a Leader Globally

You can use the Update Style tool to change the style of all text with leader objects in your drawing that use the same dimension style.

### To globally update the style of text with a leader:

1. Select a text with leader object whose dimension style you want to change.
2. Right-click and select **Update Style**, or select **Edit > Modify Elements > Update Style**.
3. In the **Dimension Style Properties** dialog, make the desired dimension style change. Leader arrow properties are specified on the *Leader* tab. The text style is specified on the *Text* tab.
4. Click **OK**.



## Moving Leader Text in Model View

If you have inserted text with a leader, you can move the text independently of the leader.

### To move leader text:

1. Click on the text with leader to select it.
2. Right-click and select **Move Text**, or select **Edit > Modify Elements > Move Text**.
3. Click and drag the text to move it, then release your mouse button.

## Editing Leader Text in Model View

If you have inserted text with a leader, you can change the text to whatever you want.

### To edit leader text:

1. Click on the text with leader to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the **Leader** dialog, edit the text as desired, then click **OK**.

## Dimensions (Model View)

Envisioneer automatically displays on-screen dimensions as you draw, making it easy to draw walls at correct lengths, and insert elements like doors and windows precisely where you want them. These dimensions are drawing aids only that disappear once you have inserted the element.

The Dimensions menu in Model View offers a variety of powerful tools to help you add dimensions to your 2D plan. Dimension values are calculated automatically so you can annotate your drawing quickly and effortlessly.

Use the Auto Exterior Dimensions tool to automatically apply dimensions to the perimeter of your model, and the Auto Interior Dimensions tool to insert auto-calculated dimensions on the model's interior. Another powerful tool is the Room Dimensions tool, which instantly calculates the dimensions of a room (length x width) and inserts the measurement in the room.

Three tools are available for inserting singular dimensions. Use the Linear Dimensions tool to insert a simple horizontal or vertical dimension, and the Aligned Dimensions tool to insert a dimension that aligns with (takes the angle of) the object being dimensioned. Use the Angular Dimensions tool to insert a dimension that measures an angle rather than a distance.

Use the Continuous Dimension tool to quickly add more segments to an existing linear or aligned dimension. You can use the Baseline Dimension tool to build multiple dimensions along a common baseline, creating a series of stacked dimensions. You can create an Overall Dimension from two or more selected dimensions.

By default dimensions use the Current Dimension Style. You can also change the style of an individual dimension after it has been inserted, or perform a global update of a dimension style.

You can move or stretch a dimension after it has been inserted, as well as align, join and split dimensions.

## Setting the Current Dimension Style in Model View

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When you add dimensions to your drawing, they use the current dimension style, which by default is the Standard dimension style. You can select a different dimension style to be the current one if you want.

### To set the current dimension style:

1. Select **Settings > Current Dimension Style**.
2. In the **Current Dimension Style** dialog, click the **Select** button..
3. In the **Dimension Styles** dialog, select the style you want to set as current.
4. Click **OK** in the **Dimension Styles** dialog.
5. Click **OK** in the **Current Dimension Style** dialog.

## Creating Automatic Exterior Dimensions

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The Auto Exterior Dimensions tool automatically dimensions the exterior walls of your home. By default, three dimension strings are created: one for openings, one for wall segments, and an overall dimension for each side of the model.

**To create automatic exterior dimensions:**

1. Select **Tools > Dimensions > Auto Exterior Dimensions**, or click  on the Annotation toolbar.


**Note:** You can control which dimension strings are created, as well as how walls and wall elements are dimensioned. You must specify these settings before the dimensions are created.

## Specifying Exterior Dimension Settings

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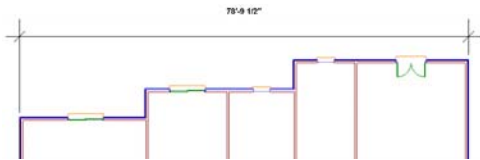
Before using the Apply Auto Exterior Dimensions tool to create automatic exterior wall dimensions, it is a good idea to specify the settings for the exterior dimensions. These settings control how the walls and wall elements (doors, windows, openings, etc.) are dimensioned.

**To specify exterior dimension settings:**

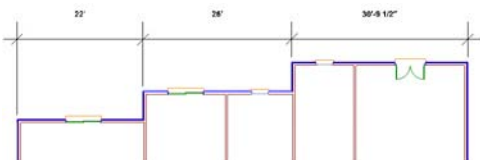
1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Dimension Auto Exterior** in the left column.
3. Specify the settings described below.

Include Dimension String for:

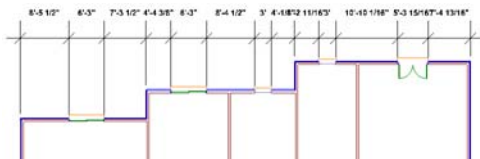
**Overall.** The outermost dimension string that dimensions the overall length of each exterior wall.



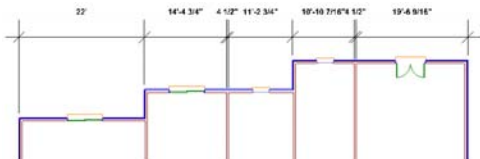
**Projections.** String that dimensions all projecting points along an exterior wall. If a wall has no projections, this string will be identical to the overall dimension string.



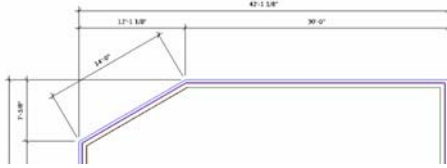
**Openings:** String that dimensions all major projections and all openings in the exterior walls, including door and window openings. Openings can be dimensioned on center, or to the outside edges (see the **Openings** area of the dialog).



**Interior Walls:** String that dimensions to all major projections and each interior wall that projects into the exterior wall. (You can specify which edges you want to dimension to in the **Interior Walls** area of the dialog).



**Angled Walls:** Angled string that dimensions angled walls.



Dimension Line Distances

**Dim Line Spacing:** The spacing between successive dimension lines (when two or more strings are used).

**Dimension Offset:** The distance between the first dimension string and the walls.

Extension Lines

Extension lines extend from the dimension line toward the walls being dimensioned. In situations where dimension points are not parallel with each other, you can specify whether you want the extension lines to extend all the way to the dimension points, or whether you want them to line up with the shortest dimension point.

Openings

If you are including a dimension string for openings, you can specify whether you want the openings to be dimensioned on center, or to the edges of the openings.

**Add Opening Height after Width.** For door, window and opening dimensions, enabling this option displays the height of the opening in addition to the width. For example, if an opening is 5' wide and 6'-8" high, the dimension would read 5'-0"/6'-8". You can choose a different separator if you wish.

**Separation.** The character or format used to separate the opening width and opening height. Available choices are shown below with examples.

/ (forward slash)	5'-0"/6'-8"
— (dash)	5'-0"— 6'-8"
X	5'-0" X 6'-8"
<b>Multi-line</b>	5'-0" 6'-8"

End Condition

You can choose which exterior wall faces you want to dimension to.

*Surface (Exterior).* Dimensions to the outer edge of the walls's exterior surface (e.g. brick, stone or siding). If the wall does not contain an exterior surface, the outer edge of the core wall is used instead.

*Core (Exterior).* Dimensions to the outer edge of the core wall (e.g. stud wall).

*Core (Center).* Dimensions to the center of the core wall (e.g. stud wall).

*Core (Interior).* Dimensions to the inner edge of the core wall (e.g. stud wall).

*Surface (Interior).* Dimensions to the interior edge of the interior surface (e.g. drywall or plaster). If the wall does not contain an interior surface, the inner edge of the core wall is used instead.

Interior Walls

If you are including the **Interior Walls** dimension string, you can specify whether you want the interior walls to be dimensioned to the center or edges of the wall core, or to the edges of the wall's interior surfaces. You can select more than one option if needed.

*Edges (Surfaces).* Dimensions to the edges of the wall's interior surfaces (e.g. drywall or plaster).

*Edges (Core).* Dimensions to the edges of the core wall (e.g. stud wall).

*Center (Core).* Dimensions to the center of the core wall (e.g. stud wall).


4. Click **OK**.

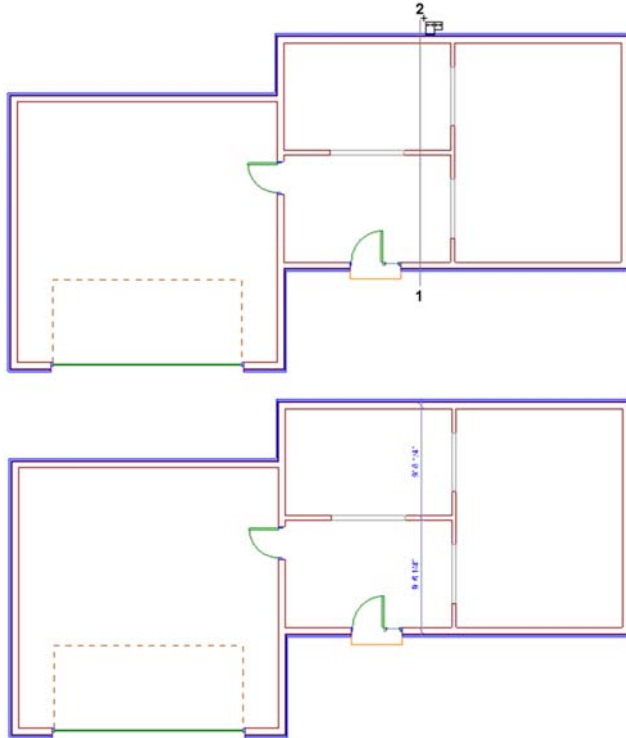
**Creating Automatic Interior Dimensions**

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The Auto Interior Dimensions tool automatically dimensions interior walls in your model. To create automatic interior wall dimensions, you draw a base line through your model. Dimensions are created for any walls along that line (running in the same direction as the line).

**To create automatic interior dimensions:**

1. Select **Tools > Dimensions > Auto Interior Dimensions**, or click  on the Annotation toolbar.
2. Select a start point for the base line that is outside of the model.



3. Select an end point for the base line that is outside of the model. Dimensions are created along that line.
4. Right-click and select **Finish**.


**Note:** Before creating automatic interior dimensions, you may want to specify the interior dimension setting, which determines exactly how the walls are dimensioned.

**Specifying Interior Dimension Settings**

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If you are using the Auto Interior Dimensions tool to create automatic interior wall dimensions, you can specify how you want the walls dimensioned before creating the dimensions. By default, walls are dimensioned on center. If you prefer you can dimension to other or additional wall edges.

**To specify the auto interior dimension setting:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Dimension Auto Interior** in the left column.
3. You can specify whether you want the interior walls to be dimensioned to the center or edges of the wall core, or to the edges of the wall’s interior surfaces. You can select more than one option if needed.

*Leading Edge (Surface).* Dimensions to the leading edge of the interior surface (e.g. drywall or plaster). The leading edge is the first edge of the interior surface that the dimension line encounters as it runs from its start point.

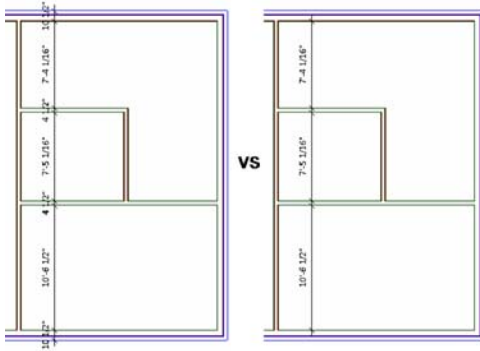
*Leading Edge (Core).* Dimensions to the leading edge of the core wall (e.g. stud wall). The leading edge is the first edge of the core wall that the dimension line encounters as it runs from its start point.

*Center (Core)*. Dimensions to the center of the core wall (e.g. stud wall).

*Trailing Edge (Core)*. Dimensions to the trailing edge of the core wall (e.g. stud wall). The trailing edge is the second edge of the core wall that the dimension line encounters as it runs from its start point.

*Trailing Edge (Surface)*. Dimensions to the trailing edge of the interior surface (e.g. drywall or plaster). The trailing edge is the second edge of the interior surface that the dimension line encounters as it runs from its start point.

- If you do not want to include the width of intersecting walls in the dimensions, enable the **Ignore Wall Dimensions** check box. The difference is shown below:

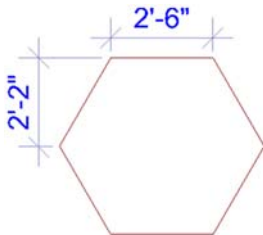


- Click **OK**. You can now proceed with creating auto interior dimensions.

## Creating Linear Dimensions in Model View


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A linear dimension is a horizontal or vertical dimension with extension lines going vertically (for a horizontal linear dimension) or horizontally (for a vertical linear dimension) to the origins of the extension lines, which define the endpoint of the dimension.



This tool is ideal for creating interior dimensions, or dimensions on a landscape plan.

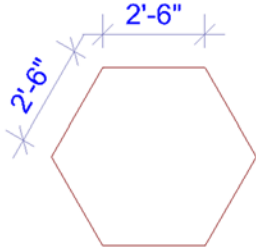
**To create linear dimensions:**

- Select **Tools > Dimensions > Linear Dimensions**, or click  on the Annotation toolbar.
- Click a point in your drawing to begin the dimension line.
- Move your mouse (you do not have to hold the mouse button down) to a second point and click. A dimension line including offsets, arrows and a numerical value is added to your drawing.
- Move your mouse away from the dimension line to stretch your extension lines. When the extension lines are the desired length, click to finish the dimension.


## Creating Aligned Dimensions in Model View

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An aligned dimension is similar to a linear dimension, except it tilts to the same angle as the element you are dimensioning, making it the ideal choice for elements that are not horizontal or vertical.



**To create aligned dimensions in Model View:**

1. Select **Tools > Dimensions > Aligned Dimensions**, or click  on the Annotation toolbar.
2. Click a point in your drawing to begin the dimension line.
3. Move your mouse (you do not have to hold the mouse button down) to a second point and click. A dimension line including offsets, arrows and a numerical value is added to your drawing.
4. Move your mouse away from the dimension line to stretch your extension lines. When the extension lines are the desired length, click to finish the dimension.


**Creating Angular Dimensions in Model View**

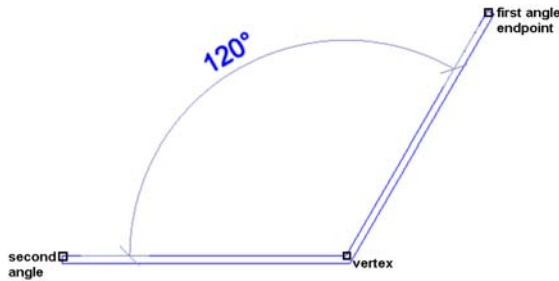
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You can use the Angular Dimensions tool to insert a dimension that measures an angle rather than a distance. This is particularly useful where objects are not rectangular, or are not perpendicular to one another.

To create an angular dimension, you select three points that will be used to create the dimension, then select a location for the dimension line.

**To create an angular dimension:**

1. Select **Tools > Dimensions > Angular Dimensions**, or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Angular Dimensions**.
2. Select the angle's vertex point.
3. Select the first endpoint of the angle.
4. Select the second endpoint of the angle.

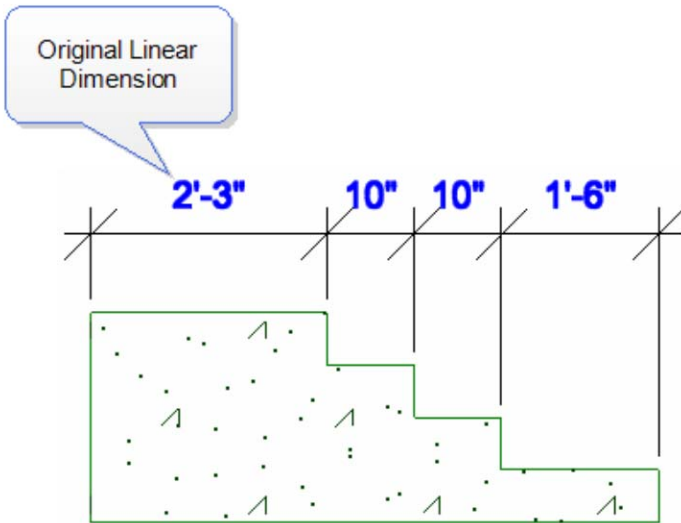


5. With the dimension attached to your crosshairs, position the dimension where you would like it, and then click to insert it.


**Creating Continuous Dimensions in Model View**

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You can easily add more segments to an existing dimension using the Continuous Dimension tool. Simply pick points where you want each extension line to be, and the dimension line will automatically extend with each point picked. This creates a series of dimensions that are end to end. When you select the Continuous Dimension tool, it automatically starts to continue the last dimension created in the current session, from that dimension's second extension line. You can choose a different extension line from which to continue, or select a different dimension altogether.



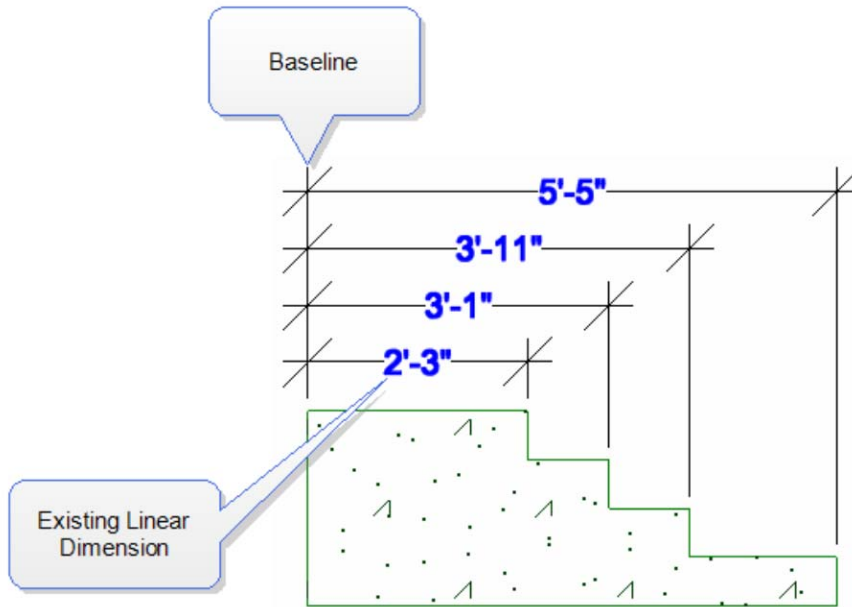
#### To create continuous dimensions:

1. Select **Tools > Dimensions > Continuous Dimension** or click  on the Annotation toolbar. Your cursor will automatically snap to the second extension line of the last linear or aligned dimension created in the current session.  
If you would like to continue the dimension from the other extension line, right-click and choose **Select continued dimension**, then click near the end from which you want to continue.  
If you would like to continue a different dimension, right-click and choose **Select continued dimension**, then click on the desired dimension, clicking near the end from which you would like to continue.
2. Move your cursor in the direction in which you would like to continue the dimension. The dimension line extends as you move your cursor.
3. Click to select the next extension line point. This creates a new dimension.
4. Continue adding more dimensions as needed.
5. When you are finished adding dimensions, right-click and select **Finish**.


### Creating Baseline Dimensions in Model View

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You can use the Baseline Dimension tool to create multiple dimensions along the same baseline. Baseline dimensions are built from an existing linear or aligned dimension in your drawing. Simply pick points where you want each extension line to be, and new dimensions will be created with each point picked. When you select the Baseline Dimension tool, it automatically starts from the second extension line of the last linear or aligned dimension created. You can choose to continue from the other extension line instead, or choose a different dimension to continue if you want. Each new dimension is stacked next to the previous one.



**To create baseline dimensions:**

1. Select **Tools > Dimensions > Baseline Dimension** or click  on the Annotation toolbar. Your cursor will automatically snap to the second extension line of the last linear or aligned dimension created. This will be the first extension line of the new dimensions.  
 If you want to continue from the other extension line instead, right-click and choose **Select continued dimension**, then click near the extension line that you want to use as your first extension line point.  
 If you would like to continue a different dimension altogether, right-click and choose **Select continued dimension**, then click on the dimension that you would like to continue.
2. Move your cursor in the direction in which you would like to continue the dimension, then select a point for the second extension line. A new dimension is created.
3. Continue to select extension line points to add more dimensions.
4. When you are finished adding dimensions, right-click and select **Finish**.

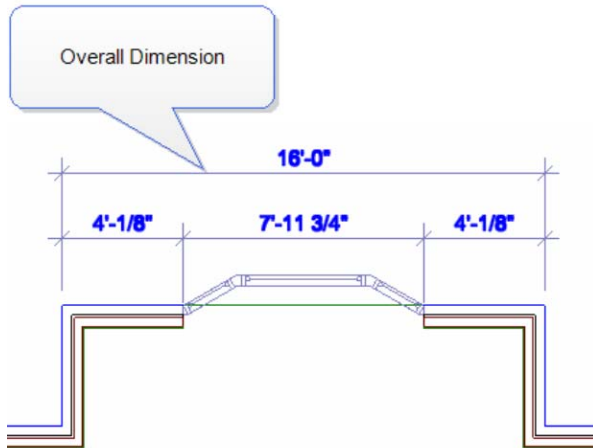
**Tip:** To change the spacing between baseline dimensions, edit the **Baseline Offset** value in your dimension style properties. See Changing the Style of a Dimension in Model View on page 285.

**Creating Overall Dimensions in Model View**


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You can use the Overall Dimension tool to create one overall dimension from two or more existing dimensions in your drawing. The overall dimension extends from the first extension line of the first dimension picked to the second extension line of the last dimension picked.





To create an overall dimension:


1. Select **Tools > Dimensions > Overall Dimension** or click  on the Annotation toolbar.
2. Click where you would like the dimension line to be placed.
3. Click on the first dimension from which you would like to create an overall dimension.
4. Click on the second dimension from which you would like to create an overall dimension. An overall dimension is created. You can select more dimensions to add if you want.
5. Right-click and select **Finish**.

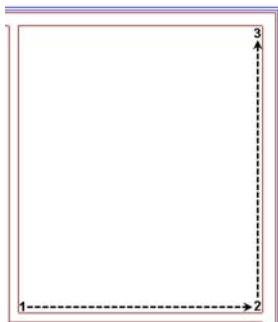
## Creating Room Dimensions

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Using the Room Dimensions tool you can quickly calculate the dimensions of a room (e.g. 8' x 10') and insert the dimension on your plan.

To create room dimensions:

1. Select **Tools > Dimensions > Room Dimensions**, or click  on the Annotation toolbar.
2. Click on a corner of the room.
3. Click an adjacent corner to indicate the width and rotation of the room. Then, click an opposite corner to indicate the length of the room.



4. In the **Room Dimensions** dialog, you can edit the resulting dimensions if needed.
5. Select the format in which you want the dimensions displayed — either **Width x Length**, or **Length x Width**.
6. To select a style for the dimension, click the **Dimension Style** button, then make a selection from the **Dimension Styles** dialog.

7. Click **OK**. The dimensions are automatically inserted at the center of the room.

## Moving a Dimension Line in Model View

You can move a dimension line using the Move Dimension Line tool. When you move a dimension line, the extension lines stretch to accommodate the move.

**To move a dimension line using the Move Dimension Line tool:**

1. Select the dimension.
2. Right-click and select **Move Dimension Line**, or select **Edit > Modify Elements > Move Dimension Line**.
3. Click any point to serve as the base point for the move.
4. Move your mouse in the direction you want to move the dimension line.
5. Click to finish the move.

## Stretching Dimensions in Model View

You can make a dimension longer or shorter, or stretch either of its extension lines. When you stretch the length of a dimension, the dimension value updates automatically to reflect the new length.

**To adjust the length of a dimension:**

1. Select the dimension.
2. Click on one of the lower extension grips, then drag the dimension to stretch it. Note that it is possible to stretch the extension line at the same time.



3. Release your mouse button.

**To adjust the length of extension lines:**

1. Select the dimension.
2. Click the grip at the end of the extension line, then drag to stretch the extension line.
3. Release your mouse button.

## Aligning Dimensions in Model View

You can use the Align Dimension tool to align an existing dimension with another.

**To align dimensions:**

1. Click on the dimension that you want to align another dimension with.
2. Right-click and select **Align Dimension**, or select **Edit > Modify > Align Dimension**.
3. Click on the dimension that you want to align with the first dimension. The dimension adjusts to align with the first dimension.

## Joining Dimensions in Model View

You can join two existing linear or aligned dimensions using the Join Dimension tool. Joining two dimensions turns two dimensions into one, and the dimension value updates automatically to display the new length.

**To join dimensions:**

1. Click on one of the dimensions that you want to join with another.
2. Right-click and select **Join Dimension**, or select **Edit > Modify > Join Dimension**.
3. Click on the dimension that you want to join with the first. The two dimensions are joined into one.

**Note:** If the two dimensions that you are joining are not aligned with each other, the second dimension picked will be aligned with the first dimension picked when they are joined.

## Splitting Dimensions in Model View

You can split a dimension into two dimensions at a selected point using the Split Dimension tool.

### To split a dimension:

1. Click on the dimension that you want to split.
2. Right-click and select **Split Dimension**, or select **Edit > Modify > Split Dimension**.
3. Click on the dimension line where you would like to split the dimension. The dimension is split at the selected point.

## Overriding Dimension Text in Model View

You can edit a dimension's calculated numerical value to suit your needs, or add information to the value. You can even change the value to text, such as "Varies".

### To override dimension text:

1. Select the dimension, then right-click and select **Override Text**. Or, select **Edit > Modify Elements > Override Text**.
2. If you want to replace the current dimension value with something else, type the desired text in the **Override Dimension Text** dialog. You can type any numerals or characters you want.

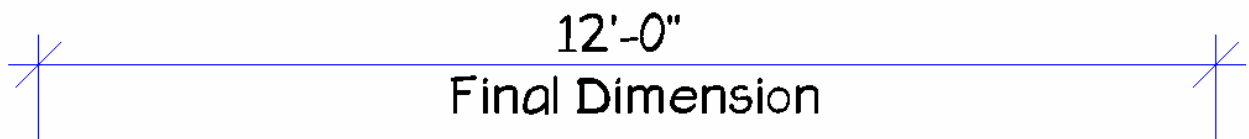
If you want to keep the current value but add information before or after the value, use a pair of angle brackets **<>** before or after the additional text. For example, if you wanted to add the words 'Final Dimension' after the dimension value, you would type **<> Final Dimension** in the edit box.

For a 12'-0" dimension, the dimension would then look like this:



If you want to add text below the dimension value (on the other side of the dimension line), type the characters **⌵** where you want to drop down to a new line. For example, if you wanted to add the 'Final Dimension' text below the current dimension value instead of beside it, you would type **<> ⌵ Final Dimension** in the edit box.

The dimension would then read:



The line break option can be used with the current dimension value (as shown in the example above), or with custom text that you type in the edit box. Note that you can only use the line break option once when overriding a dimension. You cannot keep adding more lines of text.

3. Click **OK** to update the dimension text.

## Changing the Style of a Dimension in Model View

You can change the appearance of a dimension's line, arrows and text by applying a different dimension style to it.

### To change the style of a dimension:

1. Select the dimension. You can select multiple dimensions using Shift+click.
2. Right-click and select **Change Style**, or select **Edit > Modify Elements > Change Style**. (Note: For text with a leader, select *Properties*).

3. In the **Dimension Styles** dialog, select the style that you want to apply to the dimension. You can also create your own dimension style, or edit the current dimension style. Note that if you edit an existing dimension style, your changes are permanently saved in the dimension styles library, and are not project-specific.
4. Click **OK**.

**Note:** The Change Style tool lets you change the dimension style of the selected dimension only. If you want to globally change all dimensions that use a particular dimension style, use the Update Style tool instead.

## Updating a Dimension Style Globally

You can use the Update Style tool to change the style of all dimensions in your drawing that use the same dimension style.

### To update a dimension style globally:

1. Select a dimension whose dimension style you want to change.
2. Right-click and select **Update Style**, or select **Edit > Modify Elements > Update Style**.
3. In the **Dimension Style Properties** dialog, make the desired dimension style change.
4. Click **OK**. All dimensions using the selected dimension style will update automatically.

## Specifying How Elements are Marked

Element marks show information such as an element's dimensions or part number. By default, doors, windows and openings insert with marks displayed, while other elements do not. You can specify whether or not a mark is displayed for any element in your drawing or catalog, and even specify custom mark text if desired.

You can specify default element mark settings such as the format and text style of marks in your Document Settings. See Specifying Settings for Element Marks on page 286.


### To specify how an element is marked:

1. Select the element in your drawing, then right-click and select **Properties**. Or, if you have not inserted the element yet, select it in the catalog, then right-click and select **Edit Element**.
2. In the properties dialog, select the Quantity tab.
3. In the *Quantity* pane, select the desired mark method from the **Mark** drop box:
  - Auto**. Inserts a mark with the default mark settings.
  - Custom**. Inserts a mark with custom text that you specify in the **Mark** field.
  - Off**. Disables the creation of a mark.
4. Click **OK**.

## Specifying Settings for Element Marks

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You can specify the default format and appearance of element marks in your Document Settings. There are settings for door, window, opening, member and cabinet marks, as well as a set of default settings for all other types of elements.

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Element Marks** in the left column.
3. Specify the mark settings. You can specify unique mark settings for doors, windows, openings, members, and cabinets. For all other elements, the settings in the **Default Mark** section will be used.

The available settings are:

**Format**. The format for the element's measurements. e.g. *Width x Height*

**Units**. The units in which measurements are displayed. e.g. *Feet-inches*

**Precision**. The precision of the element's measurements in terms of the selected units.

**Position**. The position of the mark in relation to the element (*Inside, Outside* or *Center*).


**Offset**. The distance of the mark from the element when the **Position** is set to *Inside* or *Outside*.


**Layer.** The layer on which marks will reside in Worksheet View.


**Text Style.** The style of the mark text (font, font size, color, etc.).

## Displaying/Hiding Element Marks

You can display or hide element marks using your View Filter. Note that marks will only be shown on elements that have **Marks** turned on in their properties. By default, doors, windows and openings have marks turned on. See Specifying How Elements are Marked.

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.
2. In the **View Filter** dialog, select the Elements on Location tab.
3. Click the eye icon in the *Display* column to toggle marks on or off.

 Marks turned on

 Marks turned off


4. Click **OK**.

## Drawing Lines in Model View

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You can draw a line with one or more segments by simply picking points.

**To draw a line:**

1. Select **Tools > Layout > Line**, or click  on the Layout toolbar.
2. Select a start point for the line.
3. Select the end point for the line. If you want you can continue adding segments to the line. If you want to close the last line back to the first line to create a closed shape, right-click and select **Close**.
4. When you are finished drawing the line, right-click and select **Finish**.

**Note:** Lines can only be drawn in 2D plan view.

## Extending a Line to Another Object (Model View)

You can use the Extend tool to extend a line to another drafting object in your drawing.

**To extend a line to another object:**

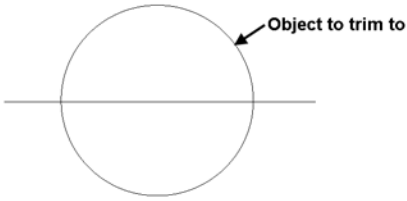
1. Select the object you want to extend **to**. The object must be a line, arc, circle or rectangle. It must also be in the path of the line you want to extend.
2. Right-click and select **Extend**.
3. Select the line you want to extend, clicking near the end that you want to extend. The line is extended to the object you selected.

## Trimming a Line to Another Object (Model View)

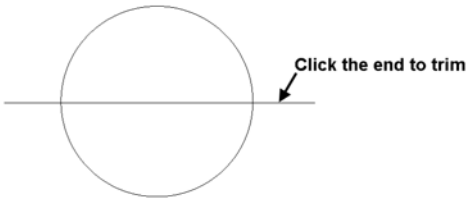
If a line passes through another drafting object, you can use the Trim tool to trim the line to the object it intersects.

**To trim a line to another object:**

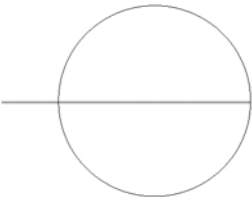
1. Select the object you want to trim to. The object must be a line, arc, circle or rectangle. Also, the line must intersect the object. In the following example, you would select the circle as the object to trim to.



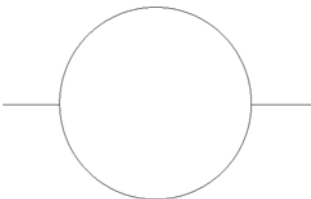
2. Right-click and select **Trim**.
3. Select the line you want to trim, clicking near the end you want to trim.



The line is trimmed automatically to the nearest border.



In the above example, if you clicked on the center of the line, the portion inside the circle would be trimmed:



## Breaking a Line in Model View

You can break a line into two separate lines using the Break tool.

### To break a line:

1. Click on the line to select it.
2. Right-click and select **Break**.
3. Click the point on the line where you want to break it. The line is broken at the selected point.

## Drawing Arcs in Model View

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There are three Arc tools available in Model View:

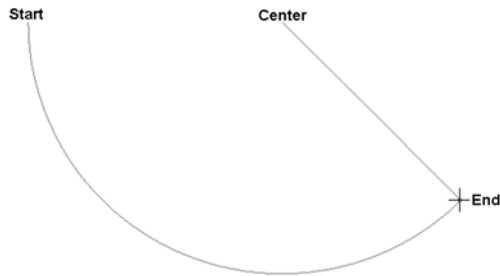
**Start, Center, End.** When you specify the start and center points, you define the arc's radius. The end point establishes the arc's length.

**3 Points.** Select a start point for the arc, a second point along the arc, then drag the arc into position as you specify the end point.

**Start, End, Radius.** Select the start and end point of the arc to define its length, then select a third point to define the arc's radius (curve).


**To draw an arc with the Start, Center, End tool:**

1. Select **Tools > Layout > Arc > Arc - Start, Center, End**, or click the down arrow next to the Arcs button  on the Layout toolbar and select **Arc - Start, Center, End**.
2. Select a start point for the arc.
3. Select the arc's center point. The radius is now defined.
4. Select the arc's end point to define the arc's length.



5. Right-click and select **Finish**.


**To draw an arc with the 3 Points tool:**

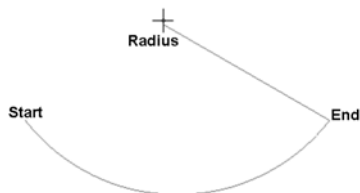
1. Select **Tools > Layout > Arc > Arc - 3 Points**, or click the down arrow next to the Arcs button  on the Layout toolbar and select **Arc - 3 Points**.
2. Select the start point of the arc.
3. Select a second point on the arc.
4. Drag the arc to stretch it to the desired length and position, then select the end point of the arc.



5. Right-click and select **Finish**.

**To draw an arc with the Start, End, Radius tool:**

1. Select **Tools > Layout > Arc > Arc - Start, End, Radius**, or click the down arrow next to the Arcs button  on the Layout toolbar and select **Arc - Start, End, Radius**.
2. Select the start point of the arc.
3. Select the end point of the arc to define its length.
4. Move your pointer to curve the arc, then select a third point to define the arc's radius.



5. Right-click and select **Finish**.

**Note:** Arcs can only be drawn in 2D plan view.

**Editing the Curve of an Arc in Model View**

You can change how much an arc curves by clicking and dragging its center grip.

**To edit the curve of an arc:**

1. Click on the arc to select it.
2. Hover your pointer over the center grip, then click and drag the handle to change the arc's curve.

**Extending an Arc to Another Object (Model View)**

You can use the Extend tool to extend an arc to another drafting object in your drawing.

**To extend an arc to another object:**

1. Select the object you want to extend to. The object must be a line, arc, circle or rectangle. It must also be in the path of the arc you want to extend.
2. Right-click and select **Extend**.
3. Select the arc you want to extend, clicking near the end that you want to extend. The arc is extended to the object you selected.

**Trimming an Arc to Another Object (Model View)**

If an arc passes through another drafting object, you can use the Trim tool to trim the arc to the object it intersects.

**To trim an arc to another object:**

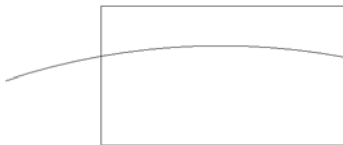
1. Select the object you want to trim to. The object must be a line, arc, circle or rectangle. Also, the arc must intersect the object. In the following example, you would select the rectangle as the object to trim to.



2. Right-click and select **Trim**.
3. Select the arc you want to trim, clicking near the end you want to trim.



The arc is trimmed automatically to the nearest border.



In the above example, if you clicked on the center of the arc, the portion inside the rectangle would be trimmed:




**Drawing Circles in Model View**

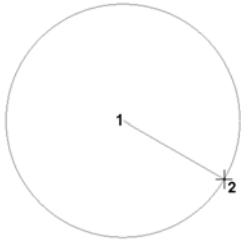
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There are two ways to draw a circle. With the Circle - Center, Radius tool you draw the circle from the center out, by picking two points to define its radius. With the Circle - 2 Point tool, you draw the circle outward from a selected point, essentially defining the circle's diameter.




**To draw a circle by specifying its radius:**

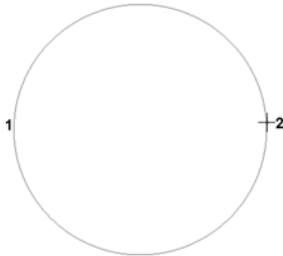
1. Select **Tools > Layout > Circle > Circle - Center, Radius**, or click the down arrow next to the Circles button  on the Layout toolbar and select **Circle - Center, Radius**.
2. Click the point that is to be the center of the circle.
3. Move your pointer away from the center point. The circle grows as you move farther away from the center.
4. When the circle is the desired size, click to finish.



5. Right-click and select **Finish**.

**To draw a circle by specifying its diameter:**

1. Select **Tools > Layout > Circle > Circle - 2 Point**, or click the down arrow next to the Circles button  on the Layout toolbar and select **Circle - 2 Point**.
2. Click a point in the drawing. The circle will grow from this point.
3. Move your pointer away from the selected point. The farther you move away from this point, the larger the circle becomes.
4. When the circle is the desired size, click to finish.



5. Right-click and select **Finish**.

**Note:** Circles can only be drawn in 2D plan view.

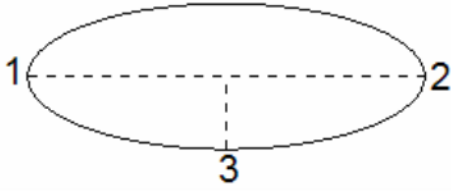
**Creating Ellipses in Model View**

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To draw an ellipse, select **Tools > Layout > Ellipse**, then select either **Ellipse - Axis** or **Ellipse - Center**.

To use the **Ellipse - Axis** tool:

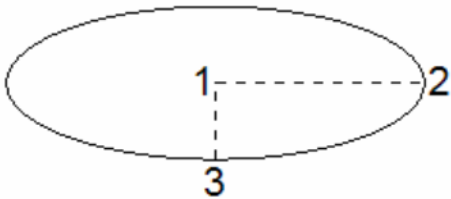
1. Select two points to define the major axis of the ellipse.
2. Select a third point away from the axis to define the minor radius.



3. Right-click and select **Finish**.

To use the **Ellipse - Center** tool:

1. Select the midpoint of the ellipse, then select a second point to define the major radius of the ellipse.
2. Select a third point to define the minor radius.



3. Right-click and select **Finish**.

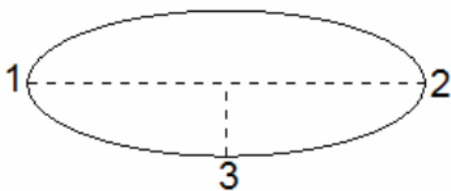
### Creating Elliptical Arcs in Model View

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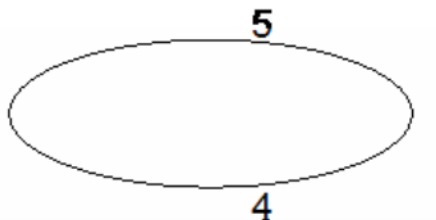
To draw an elliptical arc, select **Tools > Layout > Ellipse**, then select either **Elliptical Arc - Axis** or **Elliptical Arc - Center**.

To use the **Elliptical Arc - Axis** tool:

1. Select two points to define the major axis of the ellipse.
2. Select a third point away from the axis to define the minor radius.



3. Select two points to define the end points of the arc.



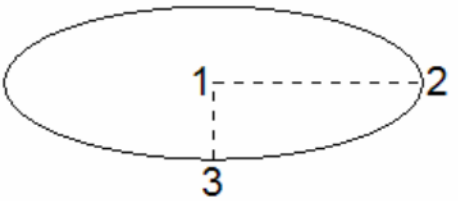
The section between the two points will form the arc:



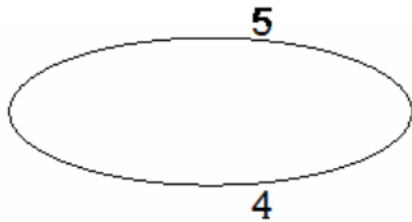
4. Right-click and select **Finish**.

To use the **Elliptical Arc - Center** tool:

1. Select the midpoint of the ellipse, then select a second point to define the major radius of the ellipse.
2. Select a third point to define the minor radius.



3. Select two points to define the end points of the arc.



The section between the two points will form the arc:




4. Right-click and select **Finish**.

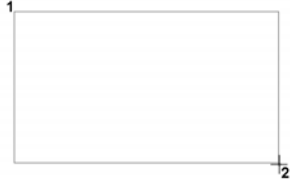
## Drawing Rectangles in Model View

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You can draw a rectangle easily by just picking two points on the screen.

**To draw a rectangle:**

1. Select **Tools > Layout > Rectangle**, or click  on the Layout toolbar.
2. Click a point on the screen. This will be one of the rectangle's corners.
3. Move your pointer away from the current point. The rectangle grows as you move farther away.
4. When the rectangle is the desired size, click to finish it.




5. Right-click and select **Finish**.

## Drawing Hatched Polygons in Model View

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You can use the Polygon Hatch tool to draw a polygon of any shape with hatching of your choice instantly applied. You can edit the shape, line style and hatch pattern of the polygon after it has been inserted.

### To draw a hatched polygon:

1. Select **Tools > Layout > Polygon Hatch**, or click  on the Layout toolbar.
2. Select a start point for the polygon, then continue selecting points to define its shape. Note that you do not have to select the start point again, as the polygon always remains closed as you draw it. Be careful not to cross any lines, or the polygon will not be created.
3. Once you've selected the last point of the polygon, right-click and select **Finish**.

**Tip:** If you don't want your polygon to have hatching, you can set its hatch properties to None.

## Editing the Style of a Polygon's Boundary Line (Model View)

When you draw a polygon, the boundary line uses the default line style set for Drafting Objects in your Drafting Settings. You can change the line style of a polygon's boundary line after the polygon has been inserted.

### To edit the style of a polygon's boundary line:

1. Click on the edge of the polygon to select it.
2. Right-click and select **Properties**. The **Polygon Hatch** dialog appears.
3. Click on **Color**, **Line Type**, or **Line Weight** to change the individual line style properties.
4. Click **OK** to apply the changes.

## Editing a Polygon's Hatch Pattern in Model View

Once you have created a polygon, you can edit the properties of the hatch pattern applied, or select a different hatch pattern to apply.

### To edit a polygon's hatch pattern:


1. Click on the edge of the polygon to select it.
2. Right-click and select **Properties**.
3. In the **Polygon Hatch** dialog, click the **Select** button in the *Pattern* area.
4. In the **Patterns** dialog, select the hatch pattern you want to apply, then click **OK**. You can add and edit patterns if you want.
5. Click **OK**. The polygon is automatically updated.

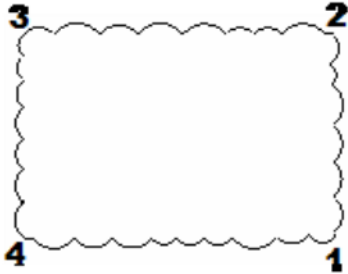
**Tip:** If you don't want the polygon to have hatching, select 'None' in the pattern list.

## Drawing Revision Clouds in Model View

Revision clouds call attention to areas of change in your drawing. You can quickly draw a revision cloud around any portion of your drawing by simply clicking a few points.

**To draw a revision cloud:**


1. Select **Tools > Layout > Revision Cloud > Revision Cloud**, or click  on the Layout toolbar.
2. Pick points to form the outline of the cloud, then hover your cursor over the start point to close the shape. When picking points, be careful not cross over any segments that you have already drawn.

**Specifying Default Revision Cloud Settings**

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You can define the settings that you would like your revision clouds to have prior to drawing them. You can select a line style and hatch pattern, and define an arc size.

**To define revision cloud settings:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Revision Cloud** in the left column.
3. By default, revision clouds are drawn on the Drafting - Hatch layer. To select a different layer, click the browse button next to the **Layer** box, then select a layer from the **Layers** dialog.
4. To override the color, line type, or line weight, click in the **Color**, **Line Types**, or **Line Weight** box and make the desired selection.
5. To apply a pattern to revision clouds which is visible in Patterned display mode, enable the **Include** check box in the **Pattern** area. Click **Select** in the **Pattern** area to select a pattern from the **Patterns** library.
6. To define the size of the arcs in the revision cloud, enter values in the **Minimum Arc Length** and **Maximum Arc Length** edit boxes..
7. Click **OK**.

**Converting 2D Lines and Shapes to 3D Building Elements**

In Model View you can convert lines, arcs, circles, rectangles and polygons to actual 3D building elements such as walls, members, strip footings and edging.

**To convert lines and shapes to 3D building elements:**

1. Select the line or shape.
2. Right-click and select **Convert To**, or select **Edit > Modify Elements > Convert To**. Then, select the building element that you want to convert the object to.
3. In the **Catalog Access** dialog, select the material you want to use for the element, then click **OK**. The object is instantly converted.


**Note:** Circles and arcs cannot be converted to members.

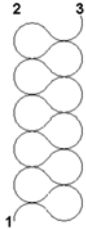
**Drawing Batt Insulation in Model View**

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You can add sections of batt insulation to a 2D view by picking points to define the length and width of the insulation detail.

**To draw batt insulation in Model View:**

1. Select **Tools > Layout > Details > Batt Insulation**, or click the down arrow next to the Details button  on the Layout toolbar and select **Batt Insulation**.
2. Click two points to define the length of the insulation section, then move your pointer away from the base line and click a third point to define the width of the section.




### Drawing Rigid Insulation in Model View

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You can add sections of rigid insulation to a 2D view by picking points to define the length and width of the insulation detail.

**To draw rigid insulation:**

1. Select **Tools > Layout > Details > Rigid Insulation**, or click  on the Layout toolbar and select Rigid Insulation.
2. Click two points to define the length of the insulation section, then move your pointer away from the base line and click a third point to define the width of the section.




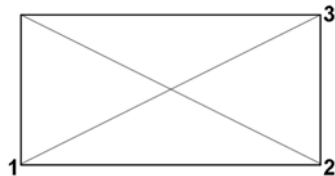
### Drawing a Wood Section in Model View

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Wood sections can be used to represent blocking, wood posts or other wood elements in a 2D view. You can add a custom-sized wood section to a 2D view by picking points to define its length and width.

**To draw a wood section:**

1. Select **Tools > Layout > Details > Wood Section**, or click the down arrow next to the Details button  on the Layout toolbar and select **Wood Section**.
2. Click two points to define the length of the wood section, then move your pointer away from the base line and click a third point to define the width of the section.




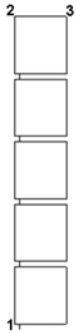
## Drawing a Masonry Section in Model View

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You can add a masonry section to a 2D view to represent an area where brick, stone or concrete is used. You create a masonry section by specifying the dimensions of one masonry unit and joint, and then picking points to define the length and direction of the section.

### To draw a masonry section:

1. Select **Tools > Layout > Details > Masonry Section**, or click the down arrow next to the Details button  on the Layout toolbar and select **Masonry Section**.
2. In the **Masonry Section** dialog, select either **Brick** or **Block** to define how you want the masonry to be represented graphically in the section.
3. Specify the desired dimensions for each brick and joint.
  - Masonry Height.** The height of one masonry unit (e.g. brick) in the section.
  - Masonry Width.** The width of each masonry unit in the section.
  - Joint Height.** The distance between masonry units.
  - Joint Width.** The offset of the mortar from the face of the masonry units.
4. Click **OK**.
5. In your drawing, click two points to define the length of the masonry section, keeping in mind that the line you are defining will represent the exterior face of the masonry. Then, move your pointer away from the base line and click a third point to define the direction of the section relative to the base line.



## Editing Masonry Section Properties in Model View

Once you have created a masonry section, you can edit the dimensions of the masonry units and joints by accessing the masonry section properties.

### To edit masonry section properties:


1. Click on the masonry section to select it.
2. Right-click and select **Masonry Section Properties**.
3. In the **Masonry Section Properties** dialog, edit the values as desired.
  - Masonry Height.** The height of one masonry unit (e.g. brick) in the section.
  - Masonry Width.** The width of each masonry unit in the section.
  - Joint Height.** The distance between masonry units.
  - Joint Width.** The offset of the mortar from the face of the masonry units.
4. Click **OK**.

## Drawing a Cut Line in Model View

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A cut line is a standard drafting symbol used to represent a break in the drawing. It indicates that the object continues in the same manner after or between the break lines. You can add a cut line to a 2D view by picking points to define the length and extent of the cut line.

**To draw a cut line:**

1. Select **Tools > Layout > Details > Cut Line**, or click the down arrow next to the Details button  on the Layout toolbar and select **Cut Line**.
2. Click two points to define the length of the cut line, then move your pointer away from the base line and click a third point to define the extent of the break symbol's sharpness.



### Inserting Views in Model View

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You can use the Insert View tool to insert different views of your drawing into one Model View window. For example, you could insert four different elevations into a view window to simulate a typical drawing sheet.

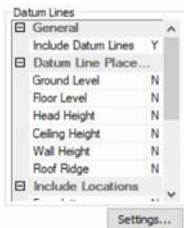
You can insert a 2D plan view, elevation, section, 3D camera view, or 3D QuickView. When you insert a view, it is inserted as a 2D image (even if the view is a 3D view), and is only visible in 2D plan view. The image can be moved once it has been inserted, but you cannot change the appearance of its contents.

**To insert a view:**

1. Make sure the view window into which you want to insert the view is the current view window.

**Note:** The view in the view window must be a 2D plan view. Otherwise, the Insert View tool is unavailable. If you do not want the 2D plan view displayed, use the Display None option in the View Filter.

2. Select **Tools > Layout > Insert View**, or click  on the Layout toolbar.
3. In the **Insert View** dialog, select the tab containing the type of view you want to insert (2D, 3D, elevation, etc.).
4. Select the specific view you would like to insert (e.g. Front Elevation).
5. For all view types except 3D camera views you can specify a scale for the inserted view in the *Properties* area. The scale is the ratio of units on paper to real-world units. If the scale is set to 1:1 (12" = 1'- 0"), twelve inches on paper will represent one foot of your model. This would be a rather large printout. A scale of 1:12 (1" = 1'- 0"), however, would result in a smaller-scale view when the drawing is printed because every foot is represented by only one inch on paper.
6. If you are inserting an elevation or section, a **Datum Lines** pane appears in the dialog:



If you want datum lines to be inserted at key points in the elevation or section, select **Yes** from the **Include Datum Lines** drop box. Otherwise, select **No**.

If you are including datum lines:



In the **Datum Line Placement** section, select the points at which you want a datum line to be placed (Ground Level, Floor Level, etc.) by selecting **Yes** next to each one that you want to include.

If the elevation or section shows more than one location:




In the **Include Locations** section, select the locations where you would like datum lines to be displayed by selecting **Yes** next to each desired location.

To define the appearance of the datum lines, datum marks, leader lines and text, click **Settings**. See “Defining the Appearance of Datum Lines in Elevations and Sections” on page 318.

7. In the *Insertion* area, select the format in which you want the view to be inserted. The **Image** option inserts a raster image, or bitmap, which can be resized once inserted. You can also change the display mode of a raster image to rendered, rendered outline, or patterned. The **Drawing** option inserts a vector image. Vector data provides useful information about the geometry in a drawing, such as endpoints, curves and polygons. Vector images are displayed in wireframe or hidden line display mode.
8. To filter elements from the view that you are inserting, click  below the preview window.
9. To change the display mode of the view, click , then selected the desired display mode. Choices are Wireframe, Hidden Line, Rendered, Rendered Outline and Patterned. Note that if the *Drawing* option is selected in the Insertion area, the image will only appear in wireframe or hidden line display mode when inserted.
10. To zoom or pan the view in the preview window, use the zoom/pan tools below the preview window.


**To zoom in by increments:**

1. Click  below the view map window.

**To zoom out by increments:**


1. Click .

**To zoom in and out in real time:**

1. Click .
2. To zoom in, click and drag toward the top of the screen.
3. To zoom out, click and drag toward the bottom of the screen.
4. When the view is the desired size, release your mouse button.

**Tip:** You can also zoom in and out using the scroll button on your mouse.


**To zoom a selected area:**

1. Click . Your cursor becomes a magnifying glass.
2. Click and drag a selection window around the area you want to magnify.


**To zoom to the extents of the view map window:**

1. Click .

**To pan (shift) the view:**

1. Click .
2. Click and hold your mouse button in the view map window.
3. Drag the view in the direction you want to pan.
4. Release the mouse button.

**To zoom back to the previous view:**


1. Click .
2. Click **Insert**. The image is attached to your cursor.
3. Click to insert the view image where you want it. You can move and stretch the image later if you want.

## Resizing a Model View Image (in Model View)

If a view of the model has been imported into a Model View window, you can resize the inserted image by clicking and dragging its corner grab handles. This shrinks or enlarges the view depending on the direction in which you stretch.

**Note:** If the *Drawing* insertion option was selected when the view was inserted, it is considered a vector image and cannot be resized. You can only resize views that were inserted with the *Image* insertion option selected.

### To resize an imported view image:


1. Click on the image to select it. Its bounding box is highlighted, and blue grips appear at the corners and center.
2. Hover your pointer over a corner grip to display the Stretch cursor. 
3. Click and drag to stretch the view, then release your mouse button.

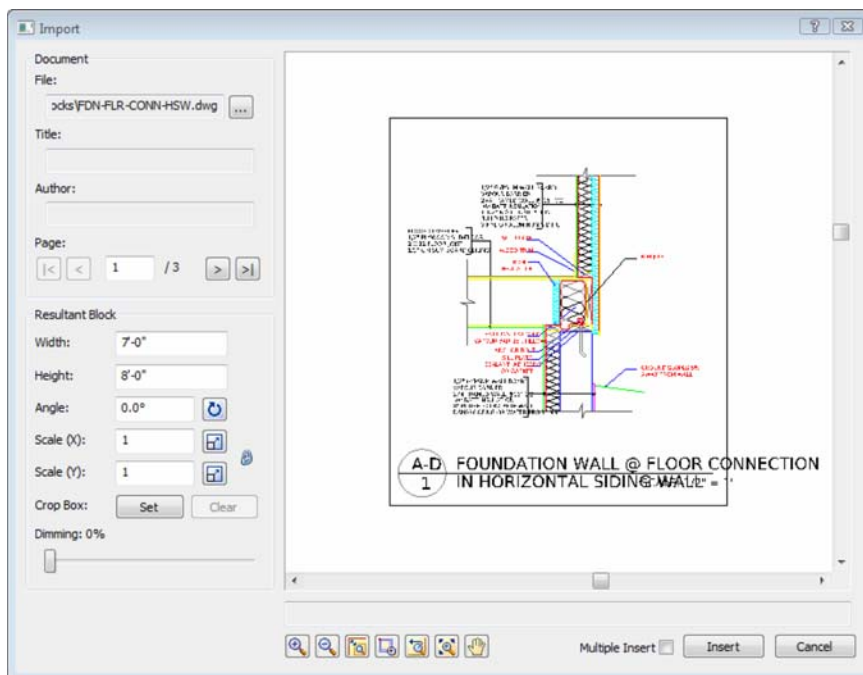
## Importing CAD Files in Model View

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The Import CAD File tool lets you bring an AutoCAD DWG or DXF file into your project as a 2D image. You may, for example, want to bring in a drawing sheet border, title block, drafting symbol, or detail. You can define the size and angle of the imported block prior to importing it.

### To import a CAD file in Model View:

1. In Model View, select **Tools > Layout > Import CAD File**, or click  on the Layout toolbar. You can also select **File > Import > Import CAD File**.
2. In the **Open** dialog, select the type of file you want to import from the **Files of type** drop box.
3. Select the file you want to import, then click **Open**.
4. In the **Component Options** dialog, specify how you would like colors and linetypes to be displayed. If **By Layer** is selected, the resulting image will use the colors and linetypes assigned to the layers of the CAD drawing. If **By Color** is selected, it will use the colors and linetypes of individual entities in the CAD drawing.
5. Click **OK**. The image is displayed in the **Import** dialog. You can zoom and pan in the preview pane using the zoom/pan controls below the pane. Note that changing the zoom level inside the preview pane has no effect on the image when it is imported.




6. If the document has more than one page, navigate to the page that you want to import by clicking the buttons in the *Page* area of the **Import** dialog.

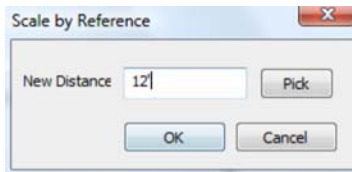


7. Before importing the image you will need to define the size or scale of the imported image.


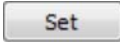

Initially the size of the image is the same as the size in the CAD file. You can set a custom size by editing the values in the **Width** and **Height** edit boxes. When you do so, the **Scale** values adjust accordingly.

If you are importing a floor plan and you know the scale at which it was drawn originally, you can enter that value in the **Scale** edit boxes. For example, if the plan was drawn at a 1/4" = 1'-0" (1:48) scale, you would enter **48** in the **Scale (X)** or **Scale (Y)** edit box. There are separate X and Y (horizontal and vertical) scale settings. By default, whatever you enter in one edit box will automatically be displayed in the other edit box, maintaining the same scale in both directions. If you want the X scale to be different than the Y scale, you need to click the lock icon beside the **Scale (X)** and **Scale (Y)** edit boxes. With the lock 'unlocked' you can enter a different value in each edit box.

Another way of specifying the scale is to draw a reference line along an existing object in the CAD image and specify the length of that object in real-world units. To do this, click the Pick Scale button  next to the **Scale (X)** or **Scale (Y)** edit box, then pick two points along an object in the CAD image to define a reference line. (If the X scale and Y scale will differ, you should pick points along a horizontal object for the X scale, and pick points along a vertical object for the Y scale.) Then in the **Scale by Reference** dialog, enter the length of the reference line and click **OK**. For example, if you know that a particular wall in your plan is 12' long, draw a line along that wall and then enter 12' in the **Scale by Reference** dialog.



The **Scale** values in the **Import** dialog will then adjust to reflect the scale you defined.

8. To specify the angle of the imported image, enter a value in the **Angle** edit box, or click Pick Angle button  next to the **Angle** edit box and pick two points along an object in the CAD image to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
9. If you want to import only a portion of the image, click  under the **Crop Box** option, then click two points diagonally in the preview window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click , then click **OK** to confirm that you want to clear the crop box.
10. To dim the imported image, slide the **Dimming** slider to the desired dim level. The higher the percentage, the more dim the image will be.
11. If you want the **Import** dialog to appear again after you insert the image so that you can insert another image, enable the **Multiple Insert** check box.
12. To import the image into the current view window, click **Insert**. The image is attached to your cursor.
13. Position the image where you want it, then click to insert it.

**Tip:** For your convenience, there are also a number of pre-defined drafting symbols, details and title blocks in DWG format available in the program's Drafting Objects directory.

## Specifying a Default Drafting Objects Directory


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When you use the Import CAD File tool, you are prompted to select a DWG or DXF file to open. By default, the program's Drafting Objects folder is displayed in the **Open** dialog, where you can find a number of pre-defined drafting symbols and title blocks. This folder is in the following location:

*C:\ProgramData\Cadsoft\Envisioneer\Drafting Objects*

You can specify a different default directory to display if you want.

**To specify a default drafting objects directory:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select the General tab.
3. In the *File Paths* area, scroll down and select the **Drafting Settings Directory**.
4. Click **Modify**.
5. In the **Browse for Folder** dialog, locate and select the directory you want to use as the default drafting objects directory, then click **OK**.
6. Click **OK** in the **Program Settings** dialog.

## Importing a PDF File in Model View

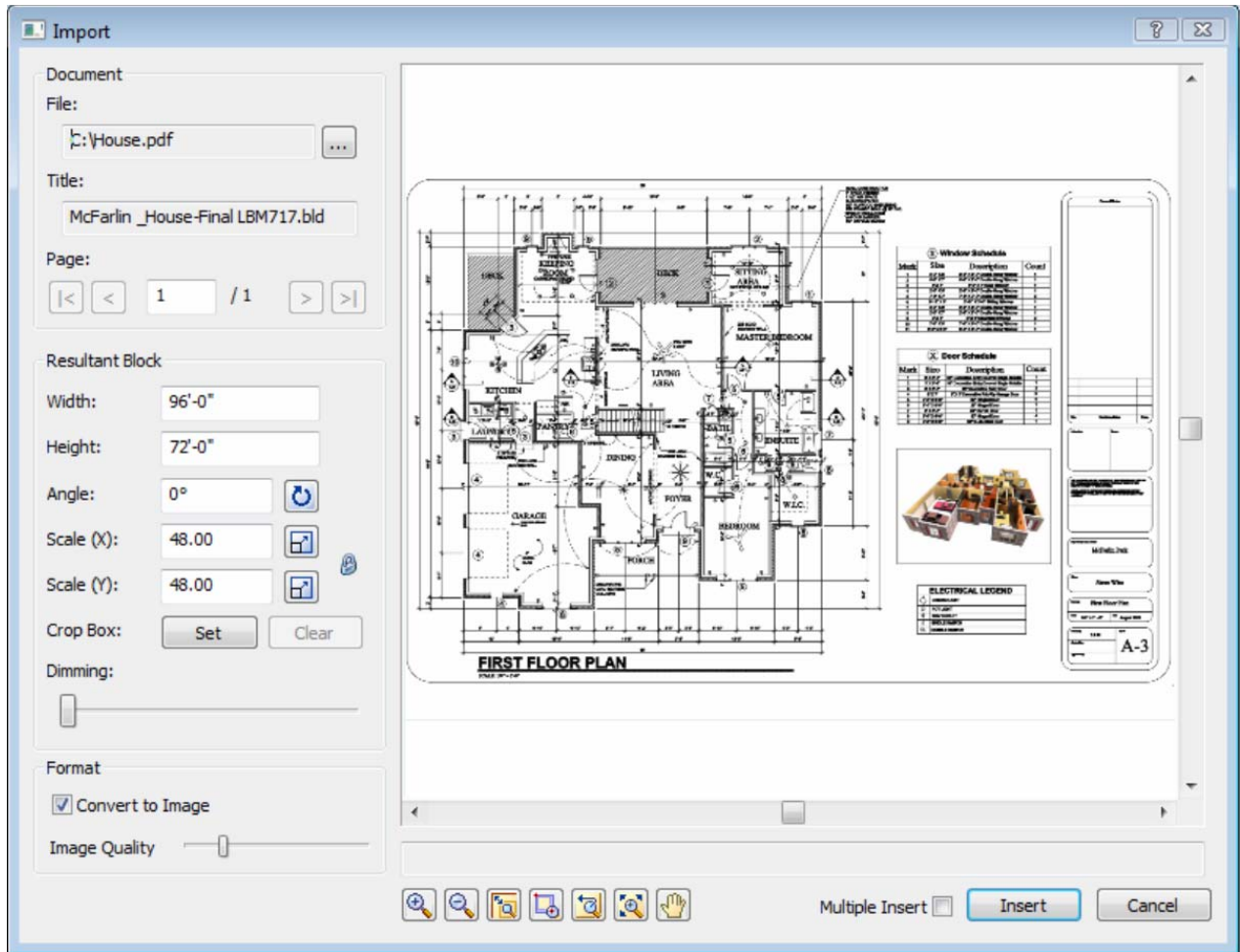
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You can use the Import PDF File to import the contents of any PDF file into your Envisioneer project. You can define the size and angle of the imported block prior to importing it. If the PDF contains a floor plan, you can scale the plan to the correct size upon import, then trace the imported plan using building tools such as the Walls tool to create an accurate 3D model in Envisioneer.

**To import a PDF file in Model View:**

1. Select **File > Import > Import PDF File**, or **Tools > Layout > Import PDF File**, or click  on the Layout toolbar.
2. In the **Open** dialog, locate and select the PDF file that you want to import, and then click **Open**. (If the **Font Support Issue** dialog appears, see the note below.)

The PDF file is displayed in the **Import** dialog. You can zoom and pan in the PDF preview pane using the zoom/pan controls below the pane. Note that changing the zoom level inside the preview pane has no effect on the image when it is imported.




3. If the PDF has more than one page, navigate to the page that you want to import by clicking the buttons in the *Page* area of the **Import PDF** dialog.

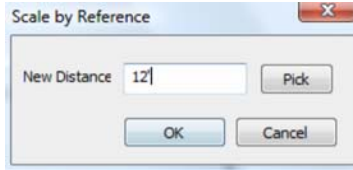


4. Before importing the PDF you will need to define the size or scale of the imported image. This is especially important if you are importing a floor plan because you want the walls to be the correct length when you trace them.




Initially the size of the image is the same as the page size in the PDF file. You can set a custom size by editing the values in the **Width** and **Height** edit boxes. When you do so, the **Scale** values adjust accordingly.

If you are importing a floor plan and you know the scale at which it was drawn originally, you can enter that value in the **Scale** edit boxes. For example, if the plan was drawn at a 1/4" = 1'-0" (1:48) scale, you would enter **48** in the **Scale (X)** or **Scale (Y)** edit box. There are separate X and Y (horizontal and vertical) scale settings. By default, whatever you enter in one edit box will automatically be displayed in the other edit box, maintaining the same scale in both directions. If you want the X scale to be different than the Y scale, you need to click the lock icon beside the **Scale (X)** and **Scale (Y)** edit boxes. With the lock 'unlocked' you can enter a different value in each edit box.

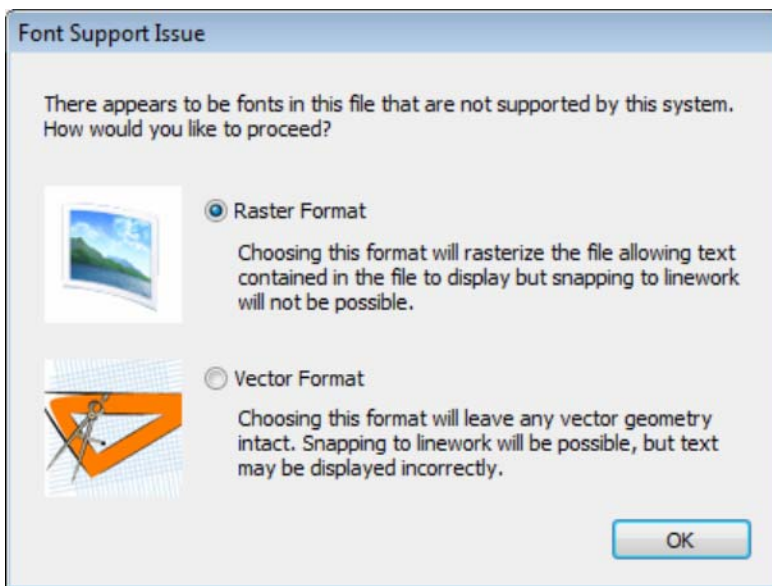
Another way of specifying the scale is to draw a reference line along an existing object in the PDF image and specify the length of that object in real-world units. To do this, click the Pick Scale button  next to the **Scale (X)** or **Scale (Y)** edit box, then pick two points along an object in the PDF image to define a reference line. (If the X scale and Y scale will differ, you should pick points along a horizontal object for the X scale, and pick points along a vertical object for the Y scale.) Then in the **Scale by Reference** dialog, enter the length of the reference line and click **OK**. For example, if you know that a particular wall in your plan is 12' long, draw a line along that wall and then enter 12' in the **Scale by Reference** dialog.



The **Scale** values in the **Import** dialog will then adjust to reflect the scale you defined.

5. To specify the angle of the imported image, enter a value in the **Angle** edit box, or click the Pick Angle button  next to the **Angle** edit box and pick two points along an object in the PDF image to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
  6. If you want to import only a portion of the image, click  next to the **Crop Box** item, then click two points diagonally in the PDF window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click , then click **OK** to confirm that you want to clear the crop box.
  7. To dim the imported image, slide the **Dimming** slider to the desired dim level. The higher the percentage, the more dim the image will be.
  8. To import the file as an image with no vector information, make sure that the **Convert to Image** check box is enabled. This option is particularly useful for large files that take a long time to open. If this option is enabled you can adjust the quality of the resulting image by dragging the **Quality** slider to the desired position. Note that increasing the quality may also increase the time needed to load the image.
- Note:** If the PDF is converted to an image, you will not be able to snap to points on the image like you can on a vector-based PDF.
9. If you want the **Import** dialog to appear again after you insert the PDF so that you can insert another PDF, enable the **Multiple Insert** check box.
  10. To import the image into the current view window, click **Insert**. The image is attached to your cursor.
  11. Position the image where you want it, then click to insert it.

**Note:** If the PDF file that you are importing contains fonts that are not available on your computer, the **Font Support Issue** dialog will appear. Before importing the PDF, you need to specify how you want to handle this issue.



You can choose to rasterize the text by selecting the **Raster Format** option. This maintains the display of the text, but you will not be able to snap to linework once the PDF is inserted in your project. If you choose the **Vector Format** option, all vector geometry will remain intact so that you can snap to linework once the PDF is inserted, but the text may not display properly.

**Tip:** If the PDF is a vector PDF (one that was generated from vector-based design software), you can snap to points on the imported plan while tracing. Note that the Ortho snap takes precedence over the Object Snap when tracing to facilitate the creation of straight lines.

**Tip:** You can hide the imported image from view by disabling the visibility of Drafting objects in your View Filter.





# Chapter 23: Drafting in Worksheet View

Worksheet View is a powerful, 2D production drafting module. Here you can find all of the drawing and editing tools needed to create fast, accurate, detailed working drawings.

Selecting a Worksheet View tab below the drawing area takes you directly into Worksheet View. There are a number of pre-defined Worksheet View windows available, and you can create more if needed.

The pre-defined Worksheet View windows contain a generic border and title block. You can delete the border/title block if you do not want to use it, or customize it to suit your needs. You can also use the Import CAD File tool to insert one of the pre-defined title blocks in the program's Drafting Objects folder, or your own title block in DWG or DXF format. You can also use the Import Image tool to insert a BMP, JPG or TGA image, such as a company logo.

Once your drawing border is in place, you can use the Define SmartView tool to insert a view of your model onto the worksheet. You can insert 2D Plan Views, 3D Camera Views, 3D QuickViews, Elevations and Sections.

Once you have inserted a view you can begin annotating it. You can add text, dimensions, lines, shapes, hatching, details (such as insulation) and symbols.

If your worksheet has content that you want to reuse in other projects, you can capture it in a block using the Define Block tool. You can even attach user-defined attributes to blocks for maximum versatility and control.

All objects drawn in Worksheet View are drawn on layers. This provides you with control over line types, line weights and colors, and whether or not objects can be seen, selected or plotted.

**Tip:** There are three powerful dimensioning tools available in Model View that you may want to use before inserting 2D plan views in Worksheet View. These are Auto Exterior Dimensions, Auto Interior Dimensions, and Room Dimensions.

## Worksheet View

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When you open a new project, a Model View window is displayed. This is where you build, edit and view your 3D model.

When you switch to a Worksheet View window, you go directly into 2D drafting mode. The Worksheet View interface is different than the Model View interface. It offers a number of different drafting tools that help you create professional-looking working drawings. You can start by inserting a view of your model with the Define SmartView tool, such as a floor plan or elevation. You can then edit and annotate the drawing to suit your documentation needs.

## Switching to Worksheet View

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Once you have created your model you can begin creating your construction documents. Envisioneer offers a complete 2D drafting mode called Worksheet View. To enter Worksheet View you need to open a Worksheet view window using the view tabs or the Window menu. You can also open Worksheet View windows from the View Manager.

A number of Worksheet view windows have been pre-defined for you, such as Floor Plan, Elevations and Details.

### To switch to Worksheet View:

1. Select a view tab below the drawing area that represents a Worksheet View window, or click on the **Window** menu and select the desired view.

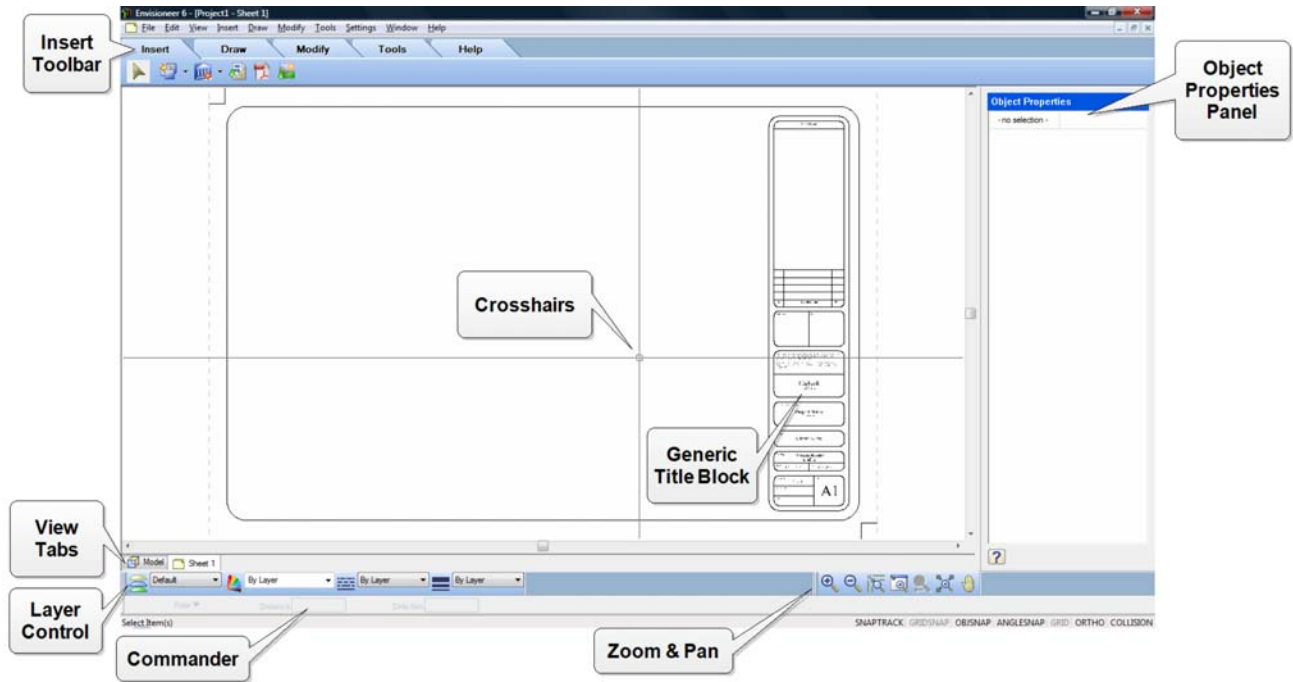
You can also access a Worksheet View window through the View Manager.

## The Worksheet View Environment

The layout of Worksheet View is similar to the layout you see in Model View. There is a title bar, menu bar and toolbar area at the top of the screen.

Below the drawing area you will see the view tabs that let you switch between view windows, the View toolbar, and the Commander. At the bottom of the screen you can see the same status bar available in Model View.

In Worksheet View, the information panel on the right side of the screen displays Object Properties.



**Insert Toolbar**

The Insert toolbar provides access to a number of powerful, automated tools that will help you get your worksheet started. Use the SmartView tools to define and insert a view of your 3D model, whether it be a 2D plan, elevation, section, or 3D view. If your model changes you can instantly update the views on your worksheets to reflect the changes. Using the Import CAD File tool you can insert title blocks, details and symbols that are in DWG or DXF format. Use the Import PDF tool to bring in a PDF file, scaled and rotated as desired. With the Import Image tool you can bring in any image in JPG, BMP or TGA format, such as a company logo. To save time you can use the Define Block tool to capture a group of objects in a block that can be saved and then inserted on other worksheets.



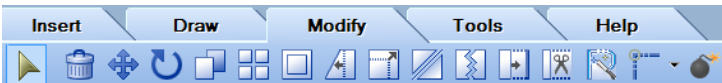
**Draw Toolbar**

The Draw toolbar contains a number of drafting tools: Line, Polyline, Circle, Arc, Polygon, Boundary Hatch, Rigid Insulation, Batt Insulation, Wood Section, Masonry Section and Cut Line.



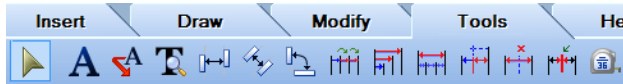
**Modify Toolbar**

The Modify toolbar contains a wide variety of tools for editing objects in your drawing: Delete, Move, Rotate, Duplicate, Array, Offset, Stretch, Scale, Mirror, Break, Extend, Trim, Fillet, Join Polyline, and Explode.



## Tools Toolbar

Insert pre-defined labels or custom Text, as well as Linear, Aligned and Angular Dimensions. Build on existing dimensions using the Continuous, Baseline and Overall Dimension tools, and edit dimensions using the Align, Join and Split Dimension tools. Use the Measure tool to quickly determine the distance between any two points.



## Properties Toolbar

The Properties toolbar indicates the current layer, and the color, line type and line weight assigned to that layer. You can override layer settings by making selections from the layer setting drop boxes. The toolbar also provides access to the Layer Properties dialog.



## View Toolbar

The View toolbar contains a complete set of zoom and pan tools: Zoom In, Zoom Out, Zoom Realtime, Zoom Window, Zoom Previous, Zoom to Fit, and Pan.



## Drawing Area

By default, the drawing area displays a virtual piece of paper with a shadow behind it. This represents the paper size set in the view's Print Properties. If you change the paper size selection in the view's Print Properties, the virtual sheet of paper will update to reflect the new size. Having the virtual paper displayed enables you to see how the worksheet content will appear on the printed page. If you want you can disable the virtual sheet of paper to create a standard look where a solid background is displayed throughout the entire drawing area.

By default, print margins are marked with a dotted line if you have your virtual paper enabled. These are the print margins set in the properties of the printer that is currently selected for the view. You can disable the display of the print margin lines if you want.

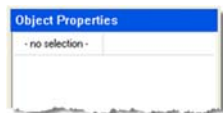
Each pre-defined worksheet contains a sample drawing sheet border that you can delete or edit to suit your needs. You can insert any pre-defined or custom title block, as well as various views of your model. From there you can edit, detail and annotate your drawing to create a detailed, accurate construction document.

## Crosshairs, Pickbox and Cursor

In Worksheet View you see *crosshairs*, which are lines that represent the two coordinate axes. At the center of the crosshairs is a *pickbox*, a square used for selecting objects. When you move your pointer outside the drawing area you see a *cursor*, an arrow for accessing menus and toolbars. The cursor can also become a double-headed arrow when resizing windows.

## Object Properties Panel

The Object Properties panel displays the properties of the currently selected object, such as the layer it is assigned to. You can edit properties by simply making different selections in the panel.




## Controlling the Display of the Paper Shadow in Worksheet View

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By default, a virtual sheet of paper with a shadow behind it is displayed in the drawing area in Worksheet View. This piece of paper represents the paper size selection in the view's Print Properties. Having the virtual paper displayed lets you see

how the worksheet content will fit and appear on the printed page. You can disable the virtual paper display if you want to create a standard look where a solid background is displayed throughout the entire drawing area.

**To control the display of the paper shadow:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Worksheet View Behavior* area, check or uncheck the **Enable Paper Shadow** check box.
4. Click **OK**.

## Controlling the Display of Page Margin Lines in Worksheet View

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By default, dashed lines are displayed on the virtual paper in Worksheet View to show you where the page margins are. Page margins denote the areas of the paper (along the borders) in which the printer will not print any content (i.e. the *non-printable areas*). Page margins are set in the properties of the printer that is selected for each view.

**To control the display of page margin lines:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Worksheet View Behavior* area, check or uncheck the **Enable Page Margin Lines** check box.
4. Click **OK**.

**Note:** Page margin lines can only be displayed if your paper shadow is enabled.

## Layer Control

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Layers are like the overlays used in paper-based drafting. They are used to organize the content of a drawing and group information by function. For example, you may have a layer dedicated to text and dimensions, and another specifically for your title block.

All objects in Worksheet View are drawn on layers. As you draw, new objects are placed on the current layer. There are several pre-defined layers available in Worksheet View that you can use. You can edit the properties of these layers, or create new ones.

By placing objects on layers you can determine the following:

- Whether objects on a layer are visible
- Whether objects on a layer can be selected for editing
- What color, line type and line weight is assigned to objects on a layer
- Whether objects are plotted
- Whether objects on the layer will appear in front of or behind objects on other layers

## Selecting a Layer to Draw On


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Before you draw or insert an object in Worksheet View, you should select a layer to put it on.

**To quickly select a layer:**

1. Click the layer drop box on the Properties toolbar and select the layer you want.

**To make a layer current in the Layer Properties dialog:**

1. Select **View > Layer Properties**, or click  on the Properties toolbar.
2. Select the layer that you want to make current.








3. Click , or right-click and select **Set Current**, or or click  and choose **Set Current**.

## Creating a New Layer for the Current Project

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You can easily create your own layers for the current project and define their name, color, line type and line weight. You can also control whether or not objects on the layer are visible, selectable or plottable. Layers created in Worksheet View are specific to the current project, and will be available in all Worksheet Views in the current project. If you want to create a layer that can be used in other projects, add it to the Layers Library instead.

### To create a new layer for the current project:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.
2. In the **Layer Properties** dialog, click , or right-click in the layer list and select **Add**. You can also click  and select **Add**. A new layer called *Layer 1* is added below the currently selected layer.
3. To edit the name of the layer, click the current name, then type the desired name and press Enter. Or click  and then type the desired name.
4. To control the visibility of objects on the layer, click the eye icon  in the **Display** column.
5. To control the selectability of objects on the layer, click the layer's filter icon  in the **Selectable** column.
6. To control whether or not objects on the layer will be plotted, click the layer's printer icon  in the **Plot** column to toggle plotting on and off.
7. To edit the default color assigned to the layer, click inside the *Color* field, then make a selection from the list of colors. Or, select *Other* to access the **Colors** dialog.
8. To edit the layer's default line type assignment, click inside the *Line Type* field, then make a selection from the list of line types. Or, select *Other* to access the **Line Types** dialog.
9. To edit the layer's default line weight assignment, click inside the *Line Weight* field, then make a selection from the list of line weights. Or, select *Other* to access the **Line Weights** dialog.
10. Click **OK**.

## Editing Layer Properties

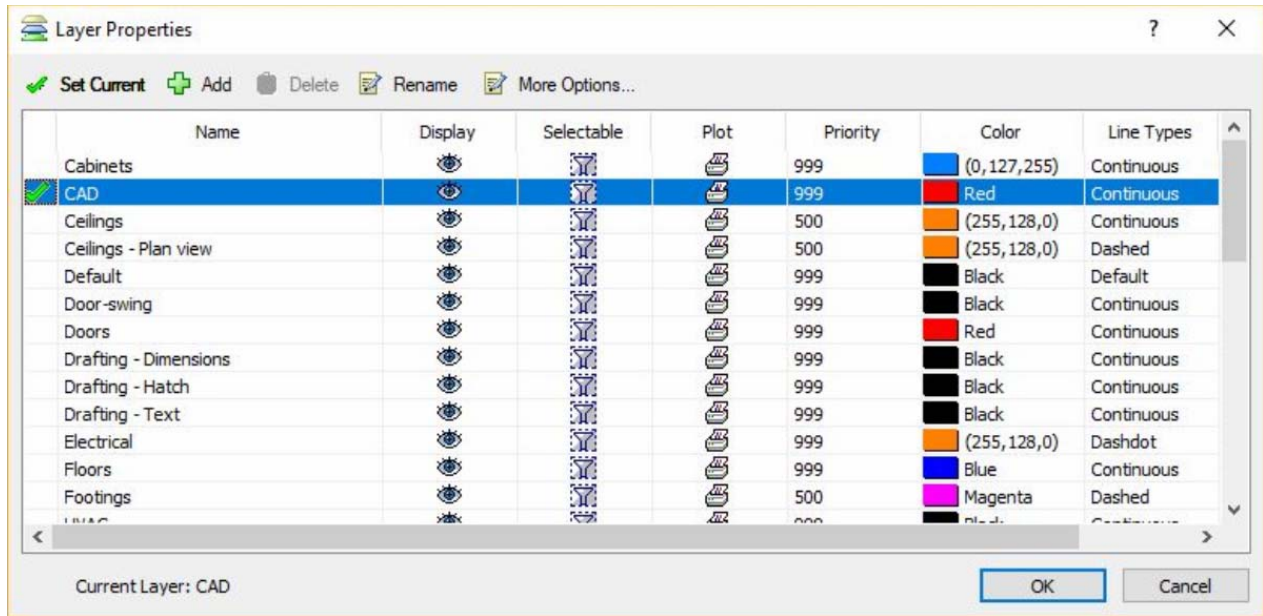
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You can add, edit, rename and delete layers in the current project. Layer properties include the layer name, color, line type and line weight. You can also specify whether or not a layer is visible, whether or not it can be selected, and whether or not it plots. You can change the display order priority of a layer, so that objects on the layer appear in front of or behind objects on other layers. You can edit the settings for single layers or for multiple layers simultaneously.

Layers defined in Worksheet View are specific to the current project, and any changes you make will apply to all Worksheet Views in the current project. If you want to define layers that can be used in other projects, edit your Layers Library instead.

### To edit layer properties in the current project:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.



- To rename a layer, select the layer in the list and then click , or right-click and select **Rename**. Type the new name, then press Enter.
- To add a layer, click , or right-click and select **Add**. A layer named *Layer 1* is added to the list. You can edit the properties of the layer to suit your needs.
- To delete a layer, select the layer in the list and then click , or right-click and select **Delete**. You cannot delete a layer that currently has objects on it.
- To edit a layer's properties, select the layer that you want to edit. If you want to edit multiple layers simultaneously, select the layers that you want to edit using one of the following methods:

To select a group of sequential layers, click on the first layer in the group, then holding down the Shift key select the last layer in the group.

To select multiple layers one at a time, hold down the CTRL key while selecting layers.

To select all layers, right-click in the layer list and choose **Select All**, or click and choose **Select All**.

To deselect all layers, right-click in the layer list and choose **Deselect All**, or click and choose **Deselect All**.

If you have some layers selected and want to invert the selection so they are not selected and all other layers are selected, right-click in the layer list and select **Invert Selection**, or click and select **Invert Selection**.

- Edit the settings as desired. You can simply click inside a field to edit it, or if multiple layers are selected, use options such as **Display**, **Selectable**, **Plot**, **Set Color**, **Set Line Type** and **Set Line Weight** on the right-click menu or the menu. If multiple layers are selected, the same change will apply to all selected layers. Settings are described below.

**Display.** Controls whether or not objects on the layer are visible. Click the eye icon to toggle visibility on or off.


Layer is visible

Layer is invisible

**Selectable.** Controls whether or not objects on the layer can be selected. Click the filter icon to toggle selectability on or off.



 Objects on layer are selectable

 Objects on layer are not selectable

**Plot.** Controls whether or not objects on the layer will be plotted. Click the printer icon to toggle the plot state on or off.

 Objects on layer will plot

 Objects on layer will not plot

**Priority.** The display order priority of the layer. A layer with a higher number will appear in front of a layer with a lower number.

**Color.** The color of objects on the layer. Click the box to display a list of colors. Select the desired color, or select *Other* to access the **Color** dialog.

**Line Type.** The style of line used to display objects on the layer. Click the box to display a list of line types. Select the desired line type, or select *Other* to access the **Line Types** dialog.

**Line Weight.** The weight of the line used to display objects on the layer. Click the box to display a list of line weights. Select the desired line weight, or select *Other* to access the **Line Weights** dialog.



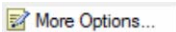
7. Click **OK**.

## Deleting a Layer

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You can delete unused layers from the layer list if you like.

### To delete a layer:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.
2. In the **Layer Properties** dialog, click on the layer that you want to delete.
3. Click , or right-click and select Delete, or click  and select **Delete**. The layer is deleted.

## Transferring an Object to Another Layer

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In Worksheet View, you can transfer an object that you have drawn to another layer by making a layer selection on the Properties toolbar or in the Object Properties panel.

### To transfer an object to another layer:

1. Select the object.
2. In the Object Properties panel, select the layer that you want to transfer the object to from the **Layer** drop box. Or, select a layer from the layer drop box on the Properties toolbar.

**Note:** Transferring an object to another layer does not make that layer current.

## Overriding Color, Line Type and Line Weight

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By default, the color, line type and line weight settings on the Properties toolbar are set to *BYLAYER*, which means the color, line type and line weight of new objects are determined by the settings of the layer they are drawn on. For example, if a layer's color setting is red, objects drawn on that layer will be red. If you select a specific color on the Properties toolbar, however, that color is used for all new objects, overriding the default color for the current layer. The same applies to line types and line weights.


- To override a layer setting before drawing an object, make the desired color, line type or line weight selection on the Properties toolbar.
- To edit an object's color, line type or line weight after it has been drawn, select the object, then make the desired changes in the Object Properties panel.


## Controlling the Visibility of Layers


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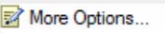
You can make a layer visible or invisible by editing its properties. Hiding layers can reduce the complexity of a drawing by removing unnecessary objects from view, without removing them from the drawing. You may, for example, want to hide a layer containing construction lines.

### To control the visibility of layers:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.
2. In the **Layer Properties** dialog, click the layer's eye icon in the *Display* column to toggle visibility on and off.

 Layer is visible

 Layer is invisible

To toggle the visibility for multiple layers simultaneously, select the layers and then right-click and select **Display**, or click  and select **Display**.

To select multiple layers, hold down the CTRL key while selecting layers. If you want to select a group of sequential layers, select the first layer in the group, then holding down the Shift key, select the last layer in the group.

To select all layers, right-click in the layer list and choose **Select All**, or click  and choose **Select All**.

To deselect all layers, right-click in the layer list and choose **Deselect All**, or click  and choose **Deselect All**.

3. Click **OK**.


**Note:** Changes to layer visibility are per worksheet.

## Controlling the Ability to Select and Edit Objects on Layers


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You may have specific layers containing objects that you do not want anyone to be able to edit. You can determine whether or not objects on a layer are selectable by editing the layer's properties. This may be particularly useful if the drawing is being shared with other people.

### To control the selectability of objects on a layer:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.
2. In the **Layer Properties** dialog, click the layer's filter icon in the *Selectable* column to toggle selectability on and off.

 Objects on layer are selectable

 Objects on layer are not selectable

To toggle the selectability of multiple layers simultaneously, select the layers and then right-click and select **Selectable**, or click  and select **Selectable**.

To select multiple layers, hold down the CTRL key while selecting layers. If you want to select a group of sequential layers, select the first layer in the group, then holding down the Shift key, select the last layer in the group.

To select all layers, right-click in the layer list and choose **Select All**, or click  and choose **Select All**.

To deselect all layers, right-click in the layer list and choose **Deselect All**, or click  and choose **Deselect All**.

3. Click **OK**.




## Controlling Whether or Not a Layer is Plotted


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You can determine whether or not a layer is plotted by editing the layer's properties. If you turn off plotting for a layer, the objects on that layer are still displayed. However, if a layer is set to plot but is currently turned off (invisible), the layer will not be plotted.

### To control a layer's plot setting:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.
2. In the **Layer Properties** dialog, click the layer's printer icon in the *Plot* column to toggle plotting on and off.

 Objects on layer will plot

 Objects on layer will not plot

To toggle the plot setting for multiple layers simultaneously, select the layers and then right-click and select **Plot**, or click  and select **Plot**.

To select multiple layers, hold down the CTRL key while selecting layers. If you want to select a group of sequential layers, select the first layer in the group, then holding down the Shift key, select the last layer in the group.

To select all layers, right-click in the layer list and choose **Select All**, or click  and choose **Select All**.

To deselect all layers, right-click in the layer list and choose **Deselect All**, or click  and choose **Deselect All**.


3. Click **OK**.

## Controlling the Display Order Priority of Layers

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You can make objects on certain layers appear in front of or behind objects on other layers. You can achieve this by assigning numbers of priority to layers.

### To control the display order priority of layers:

1. In Worksheet View, select **View > Layer Properties**, or click  on the Properties toolbar.
2. In the **Layer Properties** dialog, click the value in a layer's *Priority* column, and then enter the desired number of priority. A layer with a higher number will appear in front of a layer with a lower number.
3. Click **OK**.

**Note:** Changes to layer priority are per worksheet.

## Using Object Snaps in Worksheet View

Object snaps help you locate precise points on objects when drawing and editing in Worksheet View, without having to know their coordinates or draw construction lines. For example, if you hover your pickbox along a line, the pickbox will automatically snap to the precise endpoints and midpoint of that line as the pickbox nears those points. Envisioneer displays a special marker whenever your pickbox comes close to a snap point.

Worksheet View offers nine object snaps for accurately locating precise points.

**Endpoint.** Snaps to the endpoint of an existing line or arc.

**Midpoint.** Snaps to the midpoint of a line or arc.

**Center.** Snaps to the center point of an arc or circle.

**Nearest.** Snaps to a point on a line, circle, arc or other object that is nearest to the center of the pickbox (where the crosshairs intersect).

**Intersection.** Snaps to the point where objects cross each other.

**Insertion.** Snaps to the insertion point of text, blocks, imported model views, and imported CAD objects.

**Perpendicular.** Snaps to a point on a line, arc or circle that forms a perpendicular from the current point to the selected object.

**Tangent.** Snaps to a point on an object that forms a tangent between the object and another point.

**Quadrant.** A quadrant is a section of an arc or circle. This snaps to the 0-, 90-, 180- and 270-degree positions on a circle or arc.

## Selecting the Objects Snaps You Want to Use

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By default, all nine object snaps are active while you are drawing and editing in Worksheet View. You can disable selected object snaps if you want.

### To select object snaps to use:

1. In Worksheet View, select **Settings > Object Snap Settings**.
2. Uncheck the boxes of object snaps that you do not want to use. Any that you want to use should be checked.

**Endpoint.** Snaps to the endpoint of an existing line or arc.

**Midpoint.** Snaps to the midpoint of a line or arc.

**Center.** Snaps to the center point of an arc or circle.

**Nearest.** Snaps to a point on a line, circle, arc or other object that is nearest to the center of the pickbox (where the crosshairs intersect).

**Intersection.** Snaps to the point where objects cross each other.

**Insertion.** Snaps to the insertion point of text, blocks, imported model views, and imported CAD objects.

**Perpendicular.** Snaps to a point on a line, arc or circle that forms a perpendicular from the current point to the selected object.

**Tangent.** Snaps to a point on an object that forms a tangent between the object and another point.

**Quadrant.** A quadrant is a section of an arc or circle. This snaps to the 0-, 90-, 180- and 270-degree positions on a circle or arc.

3. Click **OK**.

## Using a Specific Object Snap (Snap Override)

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If while drawing or editing in Worksheet View you want to use a specific object snap, you can temporarily disable all active object snaps and select the specific one that you want to use.

### To use a specific object snap:

1. When you are ready to select a point, right-click and select **Snap Overrides**, then select the specific object snap that you want to use.
2. Select the point using the object snap.

Once you've used a snap override, all enabled objects snaps become active again.

## Turning Object Snaps On and Off

If you do not want object snaps to be active while you are drawing and editing, you can disable them.

### To turn object snaps on and off:

- Press F5 on your keyboard, *or*
- Click the OBJSNAP button on the Status bar, *or*
- Select **Settings > Program Settings**, then on the Drawing Aids pane, check or uncheck the Enable (F5) check box in the Object Snap area

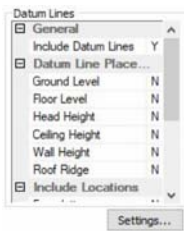
## Inserting a SmartView of your Model in Worksheet View

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Using the Define SmartView tool you can quickly insert any view of the model you created in Model View, including 2D Plan views, elevations, sections, 3D Camera views and 3D QuickViews. When you insert a SmartView onto a worksheet the SmartView and its settings are saved in memory so that you can quickly insert the same view again onto other sheets using the Insert SmartView tool. If you make changes to your 3D model in Model View, you can choose to instantly update your inserted SmartViews to reflect the changes.

### To insert a SmartView:

1. In Worksheet View, select **Insert > SmartViews > Define SmartView**.
2. In the **Insert View** dialog, select the tab containing the type of view you want to insert (2D, 3D, elevation, etc.). The **Name** edit box will be automatically populated with an appropriate name (e.g. 2D Plan). If you have inserted this type of view before, a number will be appended to the name to differentiate it from previous SmartViews (e.g. 2D Plan 1). You can edit the name if desired.
3. Select the specific view you would like to insert (e.g. Front Elevation).
4. For all view types except 3D Camera views you can specify a scale for the inserted view in the *Properties* area. The scale is the ratio of units on paper to real-world units. For example, a 1/4" = 1'-0" scale means that every foot of your actual is represented by 1/4" on paper. When setting a scale for the SmartView, consider the scale of the worksheet on which you are inserting the SmartView.
5. If you are inserting an elevation or section, a **Datum Lines** pane appears in the dialog:



If you want datum lines to be inserted at key points in the elevation or section, select **Yes** from the **Include Datum Lines** drop box. Otherwise, select **No**.



If you are including datum lines:

In the **Datum Line Placement** section, select the points at which you want a datum line to be placed (Ground Level, Floor Level, etc.) by selecting **Yes** next to each one that you want to include.

If the elevation or section shows more than one location:

In the **Include Locations** section, select the locations where you would like datum lines to be displayed by selecting **Yes** next to each desired location.

To define the appearance of the datum lines, datum marks, leader lines and text, click **Settings**. See “Defining the Appearance of Datum Lines in Elevations and Sections” on page 318.

6. In the *Insertion* area, select the format in which you want the view to be inserted. The **Image** option inserts a raster image, or bitmap, which can be resized once inserted, but cannot be updated. The **Drawing** option inserts a vector image that can be updated with changes to your model. Vector data provides useful information about the geometry in a drawing, such as endpoints, curves and polygons. Vector images are displayed in wireframe or hidden line display mode.
7. To filter elements from the view that you are inserting, click  below the preview window.
8. To change the display mode of the view, click , then selected the desired display mode. Choices are Wireframe, Hidden Line, Rendered, Rendered Outline and Patterned. Note that the display mode tool is not available for 2D plan views. Also, if the **Drawing** option is selected in the *Insertion* area, the image will only appear in wireframe or hidden line display mode when inserted.
9. To zoom or pan the view in the preview window, use the zoom/pan tools below the preview window.

**Note:** If you have inserted an elevation or section and it appears as though some lines or faces are missing, try disabling polygon consolidation in your program settings and then insert the SmartView again. See Enabling/Disabling Polygon Consolidation When Inserting a SmartView on page 318.

## Inserting a Saved SmartView

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Every time you use the Define SmartView tool to insert a SmartView of your model, the SmartView is saved in memory so that you can quickly insert the same view again onto other sheets using the Insert SmartView tool.

### To insert a saved SmartView:

1. In Worksheet View, select **Insert > SmartViews > Insert SmartView**.
2. In the **Insert SmartView** dialog, select the SmartView that you want to insert from the top drop box.
3. Click **OK**.
4. Position the SmartView where you want it, then click to insert it.

**Note:** If you are inserting the saved SmartView on a worksheet that has a different scale than the worksheet on which you originally inserted the SmartView, the SmartView will appear to be different in size than it did on the original worksheet.


## Enabling/Disabling Polygon Consolidation When Inserting a SmartView

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Polygon consolidation combines individual polygons and/or objects into a single object. By default, polygon consolidation is enabled in your program settings.

If you insert a SmartView that is an elevation or section view onto a worksheet and discover that certain lines or faces are missing in the inserted view, disabling polygon consolidation prior to inserting the SmartView may resolve this issue.

### To enable or disable polygon consolidation:

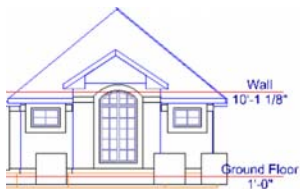
1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select **Workspace** in the left pane.
3. In the *Worksheet View Behavior* area, check or uncheck the **Enable Polygon Consolidation** check box.
4. Click **OK**.

**Note:** Disabling polygon consolidation may cause extraneous lines to be displayed in inserted SmartViews. For example, you may see a line on the exterior wall face where an interior wall intersects it.

## Defining the Appearance of Datum Lines in Elevations and Sections


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When inserting an elevation or section view onto a worksheet, you have the option of including datum lines at key points such as the Floor Level and Wall Height of each location. Sample datum lines are shown below.



Prior to inserting an elevation or section, you can define the appearance of datum lines, leaders, marks and text. You can also turn off individual components if desired.

### To define datum line properties:

1. If you are currently in the **Insert View** dialog, click **Settings** in the **Datum Lines** pane on the elevation view or section view tab. Otherwise, select **Settings > Document Settings** or click  on the Settings toolbar, then select **Datum Lines** in the **Document Settings** dialog.

2. You can define the following properties:

#### General

**Layer.** The drawing layer on which the datum lines, marks and text will be placed. The layer dictates the color, line type and line weight of datum and/or leader lines if **By Layer** is selected for these settings in the datum line properties.

#### Datum Marks

These are optional blocks that can be displayed at the end(s) of each datum line.

**Position.** If including a block at the end of datum lines, specify whether you want to display the block at **Both** ends, the **Left** end or **Right** end of the datum line.

**Datum Block.** To display a block at the end of each datum line, select the desired block from the drop box. If you do not want to display a block, select **None**. The blocks in the drop box are blocks that have been created using the **Define Block** tool (see Creating a Block on page 350).

#### Leader Lines

Leader lines extend from the ends of datum lines (past the extents of the model). Leader lines are optional and can have a different appearance than that of the datum line. If used, they are the lines along which the text is placed.

**Position.** Specify whether you want to display leader lines at **Both** ends, the **Left** end or **Right** end of each datum line.

**Length.** The length of the leader line. If you do not want to include leader lines, specify a length of **0**. Keep in mind that you can also extend datum lines past the extents of the model by specifying an **Extension Distance** in the *Datum Lines* section.

**Color.** The color of the leader lines. If **By Layer** is selected, the color is determined by the layer selected in the **Layer** field.

**Line Type.** The style of the leader lines (solid, dashed, etc.). If **By Layer** is selected, the line type is determined by the layer selected in the **Layer** field.

**Line Weight.** The thickness of the leader lines. If **By Layer** is selected, the line weight is determined by the layer selected in the **Layer** field.

#### Datum Lines

Datum lines are lines that pass through the model. Their display is optional. If used, they can be extended past the extents of the model.

**Display.** Select either **On** or **Off** to specify whether or not you want datum lines displayed.

**Extension Distance.** The distance by which the datum lines extend past the extents of the model.

**Color.** The color of the datum lines. If **By Layer** is selected, the color is determined by the layer selected in the **Layer** field.

**Line Type.** The style of the leader lines (solid, dashed, etc.). If **By Layer** is selected, the line type is determined by the layer selected in the **Layer** field.

**Line Weight.** The thickness of the leader lines. If **By Layer** is selected, the line weight is determined by the layer selected in the **Layer** field.

#### Text

Text can be optionally displayed at the end(s) of datum lines. It can consist of a description and/or elevation from grade.

**Description.** The location name. Specify where you want to display the elevation text relative to the leader line (**Above-Right**, **Below-Right**, etc.). If you do not want to display a description, select **None**.

**Elevation.** The height above grade. Specify where you want to display the elevation text relative to the leader line. If you do not want to display elevation text, select **None**.

**Style.** The text style in which the text will be displayed.

**Alignment.** The alignment of the text relative to the leader line. Selecting **Left** or **Right** will align the text with the left end or right end of the leader line, while selecting **Center** will center the text along the leader line.

## Editing a SmartView

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If you have inserted a SmartView on your worksheet, you can edit the contents of the SmartView if needed. You can edit its individual components (for example move or delete lines or other objects), or add objects to it. Any changes or additions you make are automatically saved to the SmartView's definition, so any future insertions of the SmartView will contain your changes.

### To edit a SmartView:

1. Double-click the inserted SmartView, or select the SmartView and then click the **Edit** button in the **Definition** field in the Object Properties panel. Everything except the SmartView is dimmed, indicating that you are now in SmartView editing mode.
2. Make the desired changes or additions.
3. Press ESC to return to your worksheet.

**Note:** If you inserted your SmartView using the 'Image' option instead of the 'Drawing' option, in-place editing is not available. However, you can replace the image with another saved on your computer. To do so, click the browse button in the Object Properties panel.

**Note:** If you want your changes to apply to the selected instance of the SmartView only and not future insertions of the SmartView, explode the SmartView and then make your edits. This leaves its original definition intact. Note, however, that the SmartView will no longer be linked to the 3D model and can no longer be updated with changes you make to the model.

## Redefining a SmartView's Settings

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If you have inserted a SmartView on a worksheet you can change its settings using the Redefine SmartView tool. You can change the scale of the SmartView, change what is visible in the SmartView, or select different content to display, such as a different location in a 2D plan or a different view in an elevation.

### To redefine a SmartView's settings:

1. Select **Insert > SmartViews > Redefine SmartView**.
2. Click on the edge of the inserted SmartView to select it.
3. Define the desired settings for the SmartView in the **Redefine SmartView** dialog.
4. Click **Update** to apply the new settings to the inserted SmartView.

## Updating a SmartView with Changes to your Model

*Express | Pro Architect | Building Essentials | Construction Suite*

If you make changes to your model in Model View after you have inserted SmartViews of the model in Worksheet View, you can use the Update SmartView tool to instantly update a selected SmartView with the changes. For example, if you add a window to the model and then update a SmartView, the window will then appear in the SmartView.

### To update a SmartView:

1. In Worksheet View, select **Insert > SmartViews > Update SmartView**. (In *Express*, use the **Tools** menu.)
2. Click on the edge of the SmartView to select it. The SmartView is instantly updated.

**Note:** Currently you cannot update 3D views of your model or any view that was inserted using the 'Image' option instead of the 'Drawing' option.

**Note:** When you update a SmartView, you are changing its definition. This means that **all** inserted instances of the SmartView will update on all worksheets.

**Tip:** If you have several different SmartViews that you want to update with changes to your model, use the Update SmartView (Global) tool, which lets you update multiple SmartViews simultaneously.

## Updating SmartViews Globally

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If you make changes to your model in Model View after you have inserted SmartViews of the model in Worksheet View, you can use the Update SmartViews (Global) tool to instantly and simultaneously update multiple inserted SmartViews with the changes you made. When using this tool and can choose which SmartViews you want to update.

### To update SmartViews globally:

1. In Worksheet View, select **Insert > SmartViews > Update SmartViews (Global)**. (In *Express*, use the **Tools** menu.)
2. In the **Update SmartViews** dialog, check the boxes of the SmartViews that you want to update. Note that all inserted instances of a selected SmartView will update on all worksheets.
3. Click **Update**.


**Note:** Currently you cannot update 3D views of your model or any view that was inserted using the 'Image' option instead of the 'Drawing' option.

## Deleting Unreferenced SmartViews from Memory

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When you insert a SmartView in your drawing, a block of that SmartView is stored in memory, and the inserted SmartView *references* that stored block. If you delete an inserted SmartView from your drawing, the block that it references remains in memory. Having too many unreferenced SmartViews in your project can increase drawing file size. You can alleviate this problem by deleting unreferenced SmartViews from memory.

### To delete unreferenced SmartViews:

1. In Worksheet View, select **Insert > SmartViews > Delete Unreferenced SmartViews**.
2. If there are any unreferenced SmartViews in memory, they are listed in the **Delete Unreferenced SmartViews** dialog. Check the ones that you want to delete. You can select all SmartViews simultaneously by clicking the top check box beside the **SmartView Name** label.
3. Click . A dialog warns you that you will not be able to undo changes to your drawing since your last save if you proceed with deleting unreferenced items.
4. Click **OK** in the dialog to proceed with the deletion.

## Customizing the Default Title Block

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When you open one of the pre-defined Worksheet View windows, a generic drawing sheet border and title block are displayed. You can edit the border or title block to suit your needs.

### To customize the default title block:

1. Click on the border to select the border and title block.
2. In the Object Properties panel, click the **Edit** button in the **Definition** field.

You can now select individual parts of the border or title block to edit them, or add objects to the title block. Changes are saved automatically to the block definition.

## Deleting the Default Drawing Border and Title Block

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If you do not want to use the default drawing sheet border and title block, you can delete them.

### To delete the default drawing border and title block:

1. Click on the border to select it.
2. Press the Delete key on your keyboard, or select **Modify > Delete**.




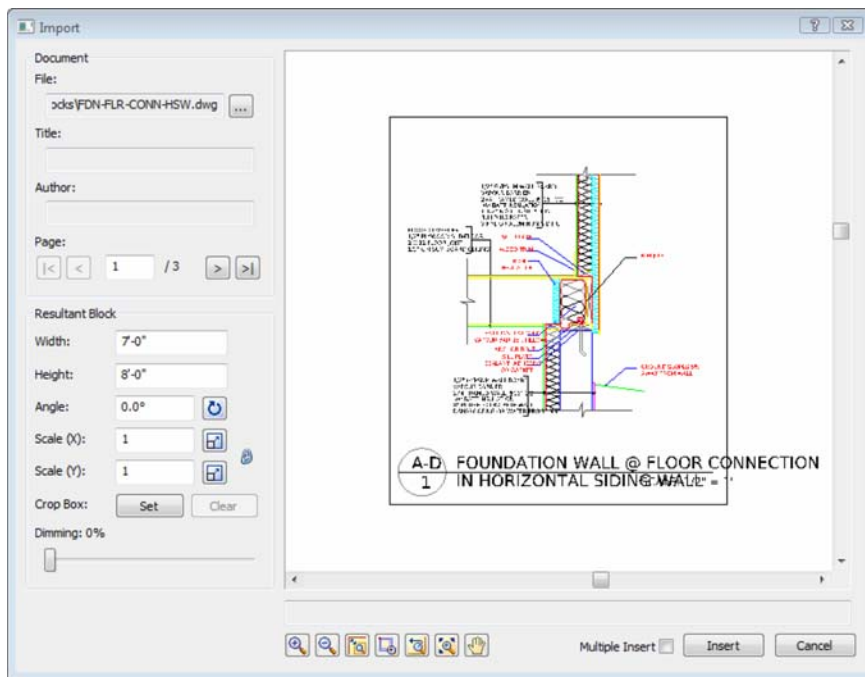
## Importing CAD Files in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

The Import CAD File tool lets you insert any AutoCAD DWG or DXF file into your worksheet view window. You may, for example, want to bring in a drawing sheet border, title block, detail or drafting symbol. You specify the scale of the drawing prior to insertion.

### To import a CAD file:

1. In Worksheet View, select **Insert > Import CAD File**, or click  on the Insert toolbar. You can also select **File > Import > Import CAD File**.
2. In the **Open** dialog, select the type of file you want to import from the **Files of type** drop box.
3. Select the file you want to import, then click **Open**.
4. Click **OK**. The image is displayed in the **Import** dialog. You can zoom and pan in the preview pane using the zoom/pan controls below the pane. Note that changing the zoom level inside the preview pane has no effect on the image when it is imported.



5. If the document has more than one page, navigate to the page that you want to import by clicking the buttons in the **Page** area of the **Import** dialog.




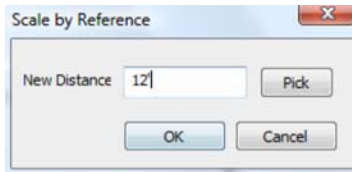
6. Before importing the image you will need to define the size or scale of the imported image.

Initially the size of the image is the same as the size in the CAD file. You can set a custom size by editing the values in the **Width** and **Height** edit boxes. When you do so, the **Scale** values adjust accordingly.


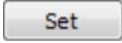
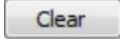
If you are importing a floor plan and you know the scale at which it was drawn originally, you can enter that value in the **Scale** edit boxes. For example, if the plan was drawn at a 1/4" = 1'-0" (1:48) scale, you would enter **48** in the **Scale (X)** or **Scale (Y)** edit box. There are separate X and Y (horizontal and vertical) scale settings. By default, whatever you enter in one edit box will automatically be displayed in the other edit box, maintaining the same scale in both directions. If you want the X scale to be different than the Y scale, you need to click the lock icon beside the **Scale (X)** and **Scale (Y)** edit boxes. With the lock 'unlocked' you can enter a different value in each edit box.



Another way of specifying the scale is to draw a reference line along an existing object in the CAD image and specify the length of that object in real-world units. To do this, click the Pick Scale button  next to the **Scale (X)** or **Scale (Y)** edit box, then pick two points along an object in the CAD image to define a reference line. (If the X scale and Y scale will differ, you should pick points along a horizontal object for the X scale, and pick points along a vertical object for the Y scale.) Then in the **Scale by Reference** dialog, enter the length of the reference line and click **OK**. For example, if you know that a particular wall in your plan is 12' long, draw a line along that wall and then enter 12' in the **Scale by Reference** dialog.



The **Scale** values in the **Import** dialog will then adjust to reflect the scale you defined.

7. To specify the angle of the imported image, enter a value in the **Angle** edit box, or click Pick Angle button  next to the **Angle** edit box and pick two points along an object in the CAD image to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
8. If you want to import only a portion of the image, click  next to the **Crop Box** item, then click two points diagonally in the preview window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click , then click **OK** to confirm that you want to clear the crop box.
9. To dim the imported image, slide the **Dimming** slider to the desired dim level. The higher the percentage, the more dim the image will be.
10. If you want the **Import** dialog to appear again after you insert the image so that you can insert another image, enable the **Multiple Insert** check box.
11. To import the image into the current view window, click **Insert**. The image is attached to your cursor.
12. Position the image where you want it, then click to insert it.


**Tip:** For your convenience, there are also a number of pre-defined drafting symbols, details and title blocks in DWG format available in the program's Drafting Objects directory.

## Importing a PDF File in Worksheet View

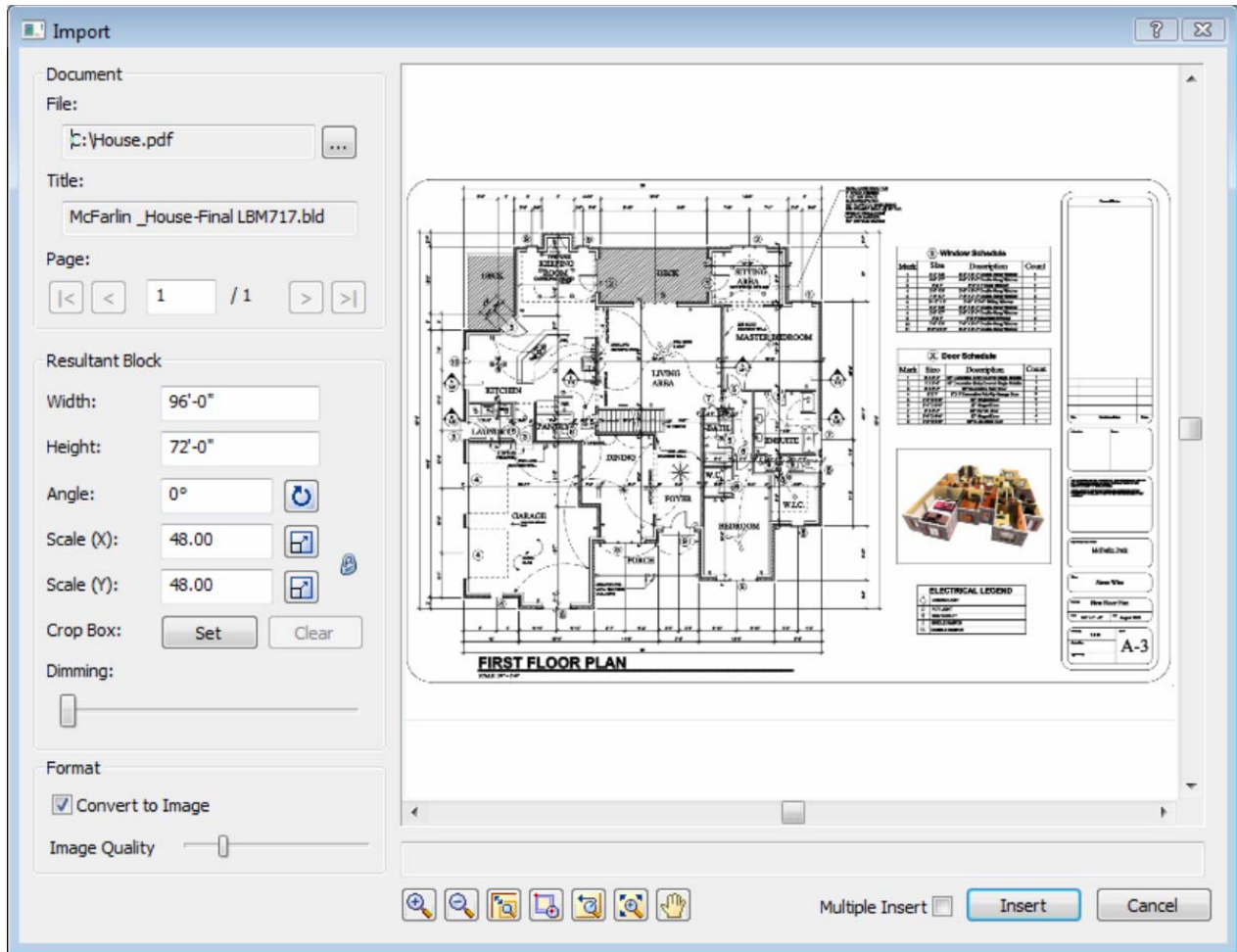
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You can use the Import PDF File to import the contents of any PDF file into your Envisioneer project. You can define the size and angle of the imported block prior to importing it. You can also choose to import a portion of the image if needed.

### To import a PDF file in Worksheet View:

1. Select **File > Import > Import PDF File**, or **Insert > Import PDF File**, or click  on the Insert toolbar.
2. In the **Open** dialog, locate and select the PDF file that you want to import, and then click **Open**. (If the **Font Support Issue** dialog appears, see the note below.)

The PDF file is displayed in the **Import PDF** dialog. You can zoom and pan in the PDF preview pane using the zoom/pan controls below the pane. Note that changing the zoom level inside the preview pane has no effect on the image when it is imported.




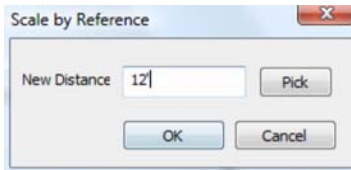
3. If the PDF has more than one page, navigate to the page that you want to import by clicking the buttons in the *Page* area of the **Import PDF** dialog.



4. Before importing the PDF you will need to define the size or scale of the imported image.  
Initially the size of the image is the same as the page size in the PDF file. You can set a custom size by editing the values in the **Width** and **Height** edit boxes. When you do so, the **Scale** values adjust accordingly.

If you are importing a floor plan and you know the scale at which it was drawn originally, you can enter that value in the **Scale** edit box. For example, if the plan was drawn at a 1/4" = 1'-0" (1:48) scale, you would enter **48** in the **Scale (X)** or **Scale (Y)** edit box. There are separate X and Y (horizontal and vertical) scale settings. By default, whatever you enter in one edit box will automatically be displayed in the other edit box, maintaining the same scale in both directions. If you want the X scale to be different than the Y scale, you need to click the lock icon beside the **Scale (X)** and **Scale (Y)** edit boxes. With the lock 'unlocked' you can enter a different value in each edit box.

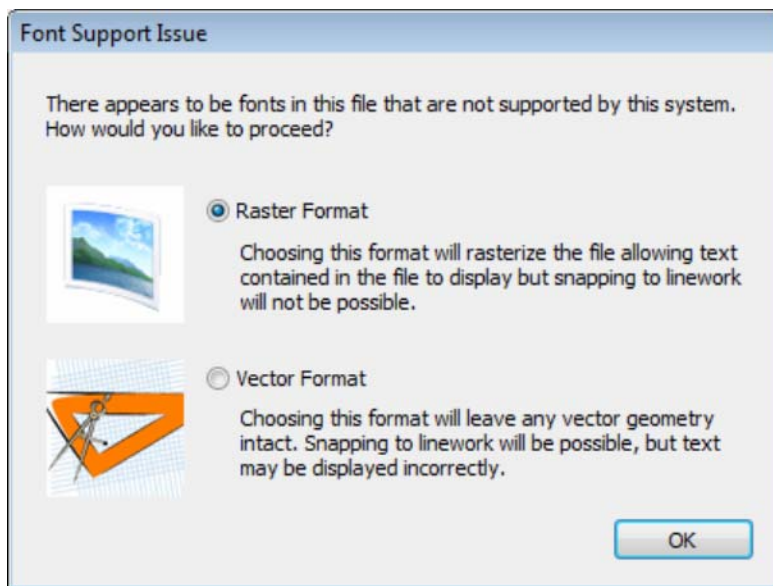
Another way of specifying the scale is to draw a reference line along an existing object in the PDF image and specify the length of that object in real-world units. To do this, click the Pick Scale button  next to the **Scale (X)** or **Scale (Y)** edit box, then pick two points along an object in the PDF image to define a reference line. (If the X scale and Y scale will differ, you should pick points along a horizontal object for the X scale, and pick points along a vertical object for the Y scale.) Then in the **Scale by Reference** dialog, enter the length of the reference line and click **OK**. For example, if you know that a particular wall in your plan is 12' long, draw a line along that wall and then enter 12' in the **Scale by Reference** dialog.



The **Scale** values in the **Import PDF** dialog will then adjust to reflect the scale you defined.

5. To specify the angle of the imported image, enter a value in the **Angle** edit box, or click the Pick Angle button next to the **Angle** edit box and pick two points along an object in the PDF image to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
6. If you want to import only a portion of the image, click  next to the **Crop Box** item, then click two points diagonally in the PDF window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click , then click **OK** to confirm that you want to clear the crop box.
7. To dim the imported image, slide the **Dimming** slider to the desired dim level. The higher the percentage, the more dim the image will be.
8. If you want the **Import** dialog to appear again after you insert the PDF so that you can insert another PDF, enable the **Multiple Insert** check box.
9. To import the image into the current view window, click **Insert**. The image is attached to your cursor.
10. Position the image where you want it, then click to insert it.

**Note:** If the PDF file that you are importing contains fonts that are not available on your computer, the **Font Support Issue** dialog will appear. Before importing the PDF, you need to specify how you want to handle this issue.




You can choose to rasterize the text by selecting the **Raster Format** option. This maintains the display of the text, but you will not be able to snap to linework once the PDF is inserted in your project. If you choose the **Vector Format** option, all vector geometry will remain intact so that you can snap to linework once the PDF is inserted, but the text may not display properly.

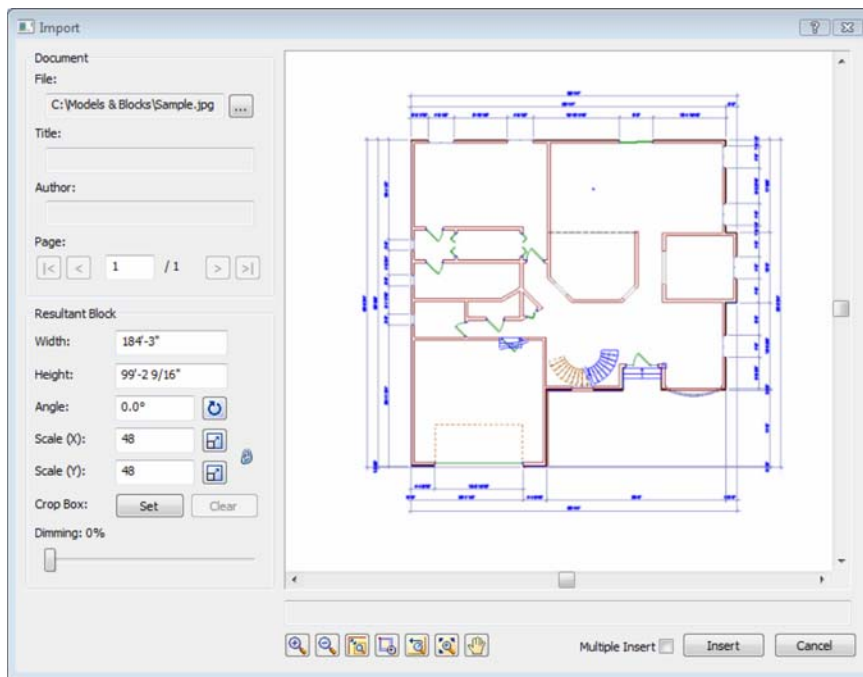
## Importing an Image in Worksheet View

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Using the Import Image tool you can import a BMP, JPG or TGA file onto your worksheet, such as a floor plan or your company logo. You can scale or crop the image prior to import.

### To import an image:


1. In Worksheet View, select **Insert > Import Image**, or click  on the Insert toolbar. You can also select **File > Import > Import Image**.
2. In the **Open** dialog, select the file type you are importing from the **File type** drop box. You can import BMP, JPG or TGA files.
3. Locate the file to import, then click **Open**.
4. The image is displayed in the **Import** dialog. You can zoom and pan in the preview pane using the zoom/pan controls below the pane. Note that changing the zoom level inside the preview pane has no effect on the image when it is imported.

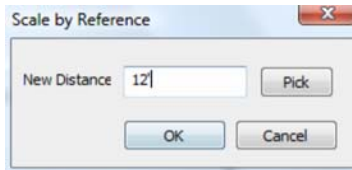


5. Before importing the file you will need to define the size or scale of the imported image.


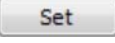
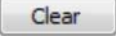
You can set a custom size by editing the values in the **Width** and **Height** edit boxes. When you do so, the **Scale** values adjust accordingly.

If you are importing a floor plan and you know the scale at which it was drawn originally, you can enter that value in the **Scale** edit boxes. For example, if the plan was drawn at a 1/4" = 1'-0" (1:48) scale, you would enter **48** in the **Scale (X)** or **Scale (Y)** edit box. There are separate X and Y (horizontal and vertical) scale settings. By default, whatever you enter in one edit box will automatically be displayed in the other edit box, maintaining the same scale in both directions. If you want the X scale to be different than the Y scale, you need to click the lock icon beside the **Scale (X)** and **Scale (Y)** edit boxes. With the lock 'unlocked' you can enter a different value in each edit box.

Another way of specifying the scale is to draw a reference line along an existing object in the image and specify the length of that object in real-world units. To do this, click the Pick Scale button  next to the **Scale (X)** or **Scale (Y)** edit box, then pick two points in the image to define a reference line. (If the X scale and Y scale will differ, you should pick points along a horizontal object for the X scale, and pick points along a vertical object for the Y scale.) Then in the **Scale by Reference** dialog, enter the length of the reference line and click **OK**. For example, if you know that a particular wall in your plan is 12' long, draw a line along that wall and then enter 12' in the **Scale by Reference** dialog.



The **Scale** values in the **Import** dialog will then adjust to reflect the scale you defined.


6. To specify the angle of the imported image, enter a value in the **Angle** edit box, or click the Pick Angle button  next to the **Angle** edit box and pick two points along an object in the image to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
7. If you want to import only a portion of the image, click  next to the **Crop Box** item, then click two points diagonally in the preview window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click , then click **OK** to confirm that you want to clear the crop box.
8. To dim the imported image, slide the **Dimming** slider to the desired dim level. The higher the percentage, the more dim the image will be.
9. If you want the **Import** dialog to appear again after you insert the image so that you can insert another image, enable the **Multiple Insert** check box.
10. To import the image onto the current worksheet, click **Insert**. The image is attached to your cursor.
11. Position the image on the sheet, then click to insert it.

## Scaling an Inserted Image

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If you have used the Import Image tool in Worksheet View to insert an image in your drawing, you may need to scale it to make it the correct size.

### To scale an inserted image:



1. Select the image.
2. Select **Modify > Scale**, or click  on the Modify toolbar.
3. Select a base point to scale from. Typically this is a point on the image.
4. Enter the desired scale factor in the **Scale** edit box. For example, to double the size of the image, type 2. To reduce the size by half, type 0.5.
5. Click **OK**.






## Adding Text in Worksheet View


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You can add custom text to your worksheet using the Text tool. You can control the style and color of the text, and even apply different styles or colors to individual characters.

### To add text in Worksheet View:



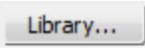
1. In Worksheet View, click the layer drop box and select the layer you would like to insert the text on.
2. Select **Tools > Text > Text**, or click  on the Tools toolbar.
3. In the **Text** dialog, select the text style you would like to apply to the text from the text style drop box.
4. If you would like to add or edit a text style, click  to access the Text Styles library. The selected text style and its associated font and font size are displayed in the adjacent drop boxes.

5. To select a color for the text, click , then select a color from the pop-up color palette.
6. To select a background color for the text, click , then select a color from the pop-up color palette. Creating a background fill can make it easier to see text when it is placed on top of patterned and rendered images.
7. To make the text bold, click .
8. To italicize the text, click .
9. To underline the text, click .
10. To change the justification of the text, click the appropriate **justification** Justification refers to the way lines of text "line up" in relation to the window that contains them. A "left" justification lines the left side of the text up with the left side of the window, leaving the right side ragged. button.

 *Left Justify*

 *Center Justify*

 *Right Justify*

11. Type the desired text in the text preview window. Or, to import a text (\*.txt) file, click , then select the file to import.
12. To insert a pre-defined label, select the label you want in the *Pre-defined Labels* list on the right side of the dialog, then drag it into the editing window. You can also double-click the label or click  to add the label to the editing window.  
To access the Labels library, where you can add and edit labels, click .
13. To change the zoom level inside the editing window, select a value from the **Zoom** drop box.
14. To edit the style, color or justification of the text in the preview window, or parts of the text, highlight the text that you want to change, then make your new selections above the preview window.
15. If you want to automatically return to the **Text** dialog after you have inserted the current text, enable the **Multiple text insert** check box. Otherwise, the Text command is finished once you insert the text.
16. When you are ready to insert the text in your drawing, click **OK**. The text is attached to your crosshairs.
17. Position the text where you would like it, then click to insert it.

**Note:** If you select part of the text in the editing window and try to resize it, the selected characters cannot be 8 times larger or 4 times smaller than any unselected text in the editing window. If all text is selected, however, you can resize without limits.

## Editing Text in Worksheet View

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You can edit the font, height, color and content of text after it has been inserted.

### To edit text in Worksheet View:

1. Select the text.
2. Make the desired changes in the **Object Properties** panel.

**Tip:** To quickly display the **Text** dialog where you can edit all text properties, just double-click the text.


## Finding and Replacing Text in Worksheet View

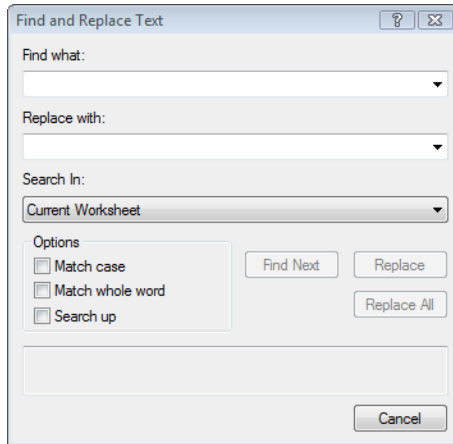
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You can use the Find and Replace tool to find a specific word or phrase in your project. You can also replace it instantly with another word or phrase of your choice.



**To find and replace text:**

1. Select **Tools > Text > Find and Replace**, or click the down arrow next to the Text button  on the Tools toolbar and select **Find and Replace**.
2. In the **Find and Replace Text** dialog, type the word or phrase that you want to find in the **Find what** edit box.



3. If you want to replace the text with something else, enter the replacement text in the **Replace with** edit box.
4. From the **Search In** drop box, select the area of your project that you want to search. Options are *Current Worksheet* and *Current Selection*. If nothing was selected before you chose the Find and Replace tool, the only option is *Current Worksheet*.
5. Select any options you want to use to control the search. These are described below.
  - Match case.** Find text with the same capitalization as the search text. For example, if you enter "Bedroom" as your search text, the text "bedroom" would not be returned as a match because the first character is not uppercase.
  - Match whole word.** Find only whole words, not parts of words. For example, if you enter the word "day" as your search text, the words "Monday" or "daytime" would not be returned as matches.
  - Search up.** Search backward from the current search position.
6. Click **Find Next**.
 

If the text is found, the first instance is displayed in the lower pane of the **Find and Replace Text** dialog, and the text is highlighted in the drawing area.
7. To replace the text with the text in the **Replace with** edit box, click **Replace**. To instantly replace all instances of the search text, click **Replace All**.
8. To search for the next instance of the text, click **Find Next** again. When the search is complete, the **End of Search** dialog will appear notifying you that all text has been searched.
9. When you are finished searching for text, close the **Find and Replace Text** dialog.

## Controlling the Quality of Text Through Antialiasing

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By default, antialiasing is used in the display of text in Worksheet View. Antialiasing smooths jagged edges by changing the color or intensity of pixels at object edges. If you find that text in Worksheet View looks too fuzzy, you can try disabling antialiasing.

### To enable or disable antialiasing in Worksheet View:








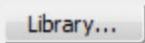

1. Select **Settings > Program Settings** or click the Program Settings button on the Settings toolbar.
2. In the **Program Settings** dialog, select **Workspace** in the left pane.
3. Check or uncheck the **Enable Antialiased Text** check box.
4. Click **OK**.

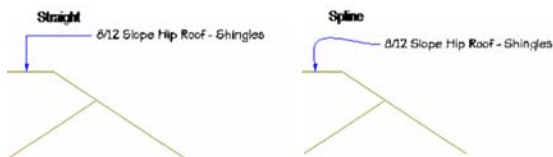
## Adding Text with a Leader in Worksheet View

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Using the Text with Leader tool you can insert text with a leader line attached to it. The leader has an arrow at one end, and two segments that can be oriented in any fashion.

**To add text with a leader:**

1. Select **Tools > Text > Text with Leader**, or click the down arrow next to the Text button  on the Tools toolbar and select **Text with Leader**.
2. In the **Text** dialog, select the text style you would like to apply to the text from the text style drop box.
3. If you would like to add or edit a text style, click  to access the Text Styles library.
4. To make the text bold, click .
5. To italicize the text, click .
6. To underline the text, click .
7. Type the desired text in the text preview window. Or, to import a text (\*.txt) file, click , then select the file to import.
8. To insert a pre-defined label, select the label you want in the *Pre-defined Labels* list on the right side of the dialog, then drag it into the editing window. You can also double-click the label or click  to add the label to the editing window. To access the Labels library, where you can add and edit labels, click .
9. To change the zoom level inside the text preview window, select a value from the zoom drop box .
10. To edit the style, color or justification of the text in the preview window, or parts of the text, highlight the text that you want to change, then make your new selections above the preview window.
11. Click **OK**.
12. By default, the leader lines will be straight. If you want to create an arched leader line, right-click and select **Spline** before selecting your first point. If you drew an arched leader previously, the style will remain set to **Spline** for subsequent leaders that you create. To create straight leader lines, right-click and select **Straight** before drawing the leader.



13. In the drawing area, select the point where you want the arrowhead to appear. Typically this is next to or on an object.
14. Select the next point of the leader. If you only want a two-point leader, right-click and select **Finish** at this point. Otherwise, you can select a third point for the leader if you want.


**Tip:** To automatically tag a building element with its name, use the Description with Leader tool instead.

## Editing the Style or Content of Leader Text in Worksheet View

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Once you have inserted text with a leader, you can access and edit the text properties through the Object Properties panel.

**To edit leader text:**

1. Select the text.
2. In the Object Properties panel, click  next to the **Contents** item.



3. Make the desired changes in the **Text** dialog, then click **OK**.

**Tip:** To quickly launch the **Text** dialog where you can edit all text properties, just double-click the text.

## Moving Leader Text in Worksheet View

If you have inserted text with a leader, you can move the text independently of the leader.

### To move leader text:

1. Select the text with leader.
2. Click and drag the grip that appears on the text to move the text, then release your mouse button.

## Changing the Style of a Leader in Worksheet View

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When you use the Text with Leader tool, the style of the leader (i.e. arrowhead) is determined by the current dimension style. You can change the leader style by selecting a dimension style with the desired style settings.

### To select a different style for a leader:

1. Click on the text with leader to select it.
2. In the Object Properties panel, select the desired dimension style from the **Style** drop box.

## Scaling Leader Arrows in Worksheet View

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If you have inserted text with a leader, you can edit the scale of the leader arrowhead.

### To scale a leader arrow:

1. Select the text with leader.
2. In the Object Properties panel, enter the desired scale for the leader arrow in the **Scale** edit box. For example, to double the size, enter 2. To reduce the size by half, enter 0.5.

## Setting the Current Dimension Style in Worksheet View

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When you add dimensions to your drawing, they use the current dimension style, which by default is the Standard dimension style. You can select a different dimension style to be the current one if you want.

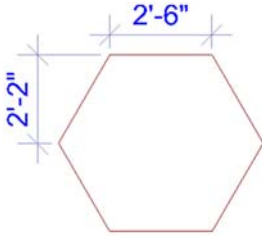
### To set the current dimension style:

1. Select **Settings > Current Dimension Style**.
2. In the **Current Dimension Style** dialog, click the **Select** button.
3. In the **Dimension Styles** dialog, select the style you want to set as current.
4. Click **OK** in the **Dimension Styles** dialog.
5. Click **OK** in the **Current Dimension Style** dialog.


## Creating Linear Dimensions in Worksheet View

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A linear dimension is a horizontal or vertical dimension with extension lines going vertically (for a horizontal linear dimension) or horizontally (for a vertical linear dimension) to the origins of the extension lines, which define the endpoint of the dimension.



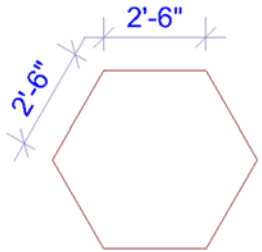
**To create linear dimensions:**

1. Select **Tools > Dimensions > Linear Dimensions**, or click  on the Tools toolbar.
2. Click a point in your drawing to begin the dimension line.
3. Move your mouse (you do not have to hold the mouse button down) to a second point and click. A dimension line including offsets, arrows and a numerical value is added to your drawing.
4. Move your mouse away from the dimension line to stretch your extension lines. When the extension lines are the desired length, click to finish the dimension.


**Creating Aligned Dimensions in Worksheet View**

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An aligned dimension is similar to a linear dimension, except it tilts to the same angle as the object you are dimensioning, making it the ideal choice for elements that are not horizontal or vertical.



**To create aligned dimensions in Worksheet View:**

1. Select **Tools > Dimensions > Aligned Dimensions**, or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Aligned Dimensions**.
2. Click a point in your drawing to begin the dimension line.
3. Move your mouse (you do not have to hold the mouse button down) to a second point and click. A dimension line including offsets, arrows and a numerical value is added to your drawing.
4. Move your mouse away from the dimension line to stretch your extension lines. When the extension lines are the desired length, click to finish the dimension.


**Creating Angular Dimensions in Worksheet View**

*Express | Pro Architect | Building Essentials | Construction Suite*

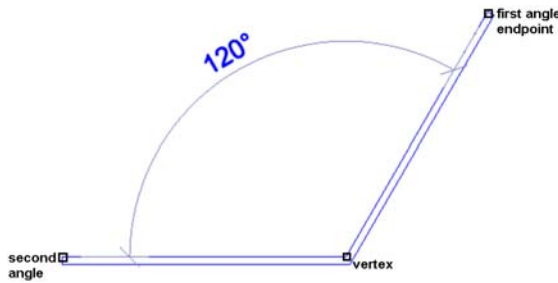
You can use the Angular Dimensions tool to insert a dimension that measures an angle rather than a distance. This is particularly useful where objects are not rectangular, or are not perpendicular to one another.

To create an angular dimension, you select three points that will be used to create the dimension, then select a location for the dimension line.

**To create an angular dimension:**

1. Select **Tools > Dimensions > Angular Dimensions**, or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Angular Dimensions**.
2. Select the angle's vertex point.

3. Select the first endpoint of the angle.
4. Select the second endpoint of the angle.

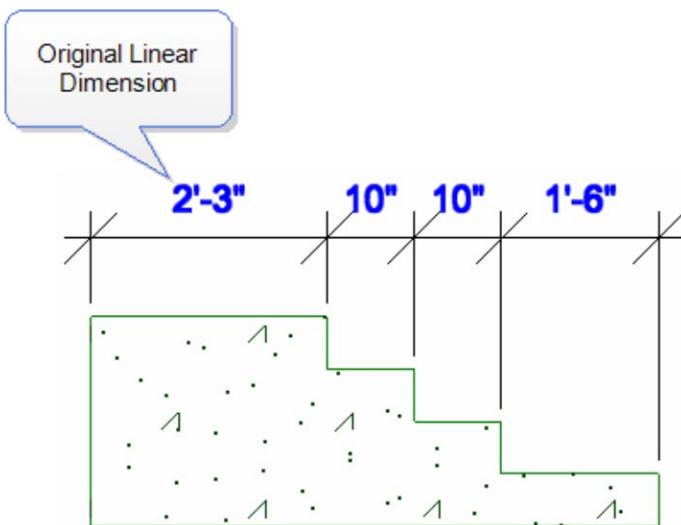


5. With the dimension attached to your crosshairs, position the dimension where you would like it, and then click to insert it.


## Creating Continuous Dimensions in Worksheet View

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You can easily add more segments to an existing linear or aligned dimension using the Continuous Dimension tool. Simply pick points where you want each endpoint to be, and the dimension line will automatically extend with each point picked. This creates a series of dimensions that are end to end.



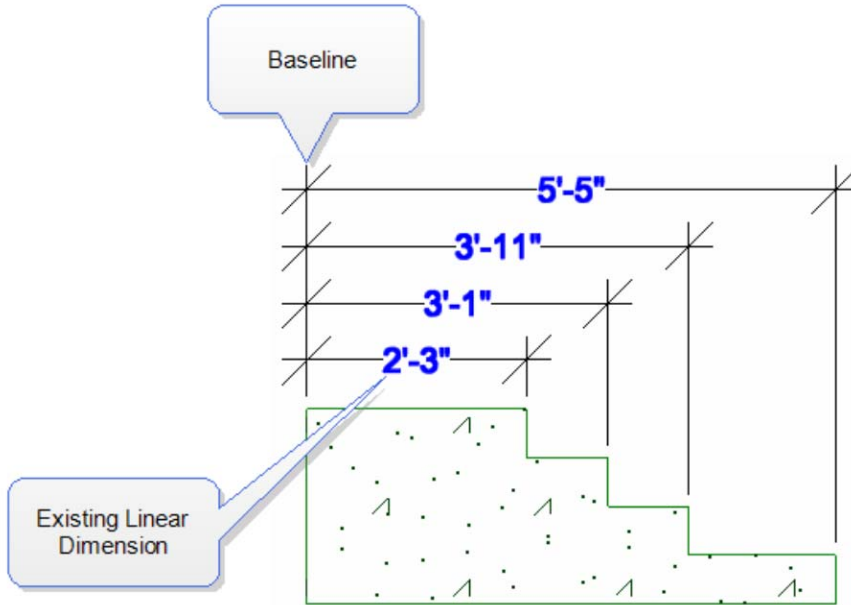
### To create continuous dimensions:

1. Select **Tools > Dimensions > Continuous Dimension** or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Continuous Dimension**.
2. If it is not currently selected, click on the linear or aligned dimension that you would like to continue.
3. Move your cursor in the direction in which you would like to continue the dimension. You can continue a dimension from either endpoint. The dimension line extends as you move your cursor.
4. Click to select the next extension line point. This creates a new dimension.
5. Continue adding more dimensions as needed.
6. When you are finished adding dimensions, right-click and select **Finish**.


## Creating Baseline Dimensions in Worksheet View

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You can use the Baseline Dimension tool to create multiple dimensions along the same baseline. Baseline dimensions are built from an existing linear or aligned dimension in your drawing. Simply pick points where you want each extension line to be, and new dimensions will be created with each point picked.



### To create baseline dimensions:

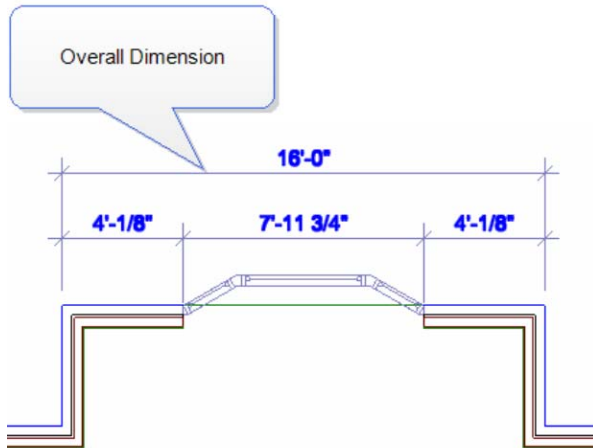
1. Select **Tools > Dimensions > Baseline Dimension** or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Baseline Dimension**.
2. If not already selected, click on the dimension that you would like to continue, clicking near the extension line that you would like to use as the first extension line (baseline) for each new dimension.
3. Move your cursor in the direction in which you would like to continue the dimension, then select a point for the second extension line. A new dimension is created.
4. Continue to select extension line points to add more dimensions.
5. When you are finished adding dimensions, right-click and select **Finish**.

**Tip:** To change the spacing between baseline dimensions, edit the **Baseline Offset** value in your dimension style properties. See [Changing the Style of a Dimension in Worksheet View](#) on page 337.


## Creating Overall Dimensions in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

You can use the Overall Dimension tool to create one overall dimension from two or more existing dimensions in your drawing. The overall dimension extends from the first extension line of the first dimension picked to the second extension line of the last dimension picked.



#### To create an overall dimension:

1. Select **Tools > Dimensions > Overall Dimension** or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Overall Dimension**.
2. Click where you would like the dimension line to be placed.
3. Click on the first dimension from which you would like to create an overall dimension.
4. Click on the second dimension from which you would like to create an overall dimension. An overall dimension is created. You can select more dimensions to add if you want.
5. Right-click and select **Finish**.

### Moving Dimension Text in Worksheet View

You can move a dimension's text without affecting the dimension line.

#### To move dimension text:

1. Click on the dimension to select it.
2. Position your crosshairs over the solid blue grip that is on the text, then click and drag to move the text.

### Resetting the Dimension Text Position in Worksheet View

If you have moved a dimension's text, you can use the Reset tool to move it back to its original position if needed.

#### To reset the dimension text position:

1. Click on the dimension to select it.
2. In the Object Properties panel, click the **Reset** button in the **Text Position** field.

### Moving a Dimension Line in Worksheet View

You can move a dimension line by clicking and dragging it. When you move a dimension line, the extension lines stretch.

#### To move a dimension line:

1. Select the dimension.
2. Click and drag one of the dimension line's end grips, then release your mouse button.

## Stretching Dimensions in Worksheet View

You can make a dimension longer or shorter, or stretch either of its extension lines. When you stretch the length of a dimension, the dimension value updates automatically to reflect the new length.

### To adjust the length of a dimension:

1. Select the dimension.
2. Click on one of the lower extension grips, then drag the dimension to stretch it. Note that it is possible to stretch the extension line at the same time.
3. Release your mouse button.

### To adjust the length of extension lines:


1. Select the dimension.
2. Click the grip at the end of the extension line, then drag to stretch the extension line.
3. Release your mouse button.

## Aligning Dimensions in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

You can use the Align Dimension tool to align an existing dimension with another.

### To align dimensions:


1. Select **Tools > Dimensions > Align Dimension**, or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Align Dimension**.
2. Click on the dimension that you want to align another dimension to.
3. Click on the dimension that you want to align with the first dimension. The second dimension adjusts to align with the first dimension.

## Joining Dimensions in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

You can join two existing linear or aligned dimensions using the Join Dimension tool. Joining two dimensions turns two dimensions into one, and the dimension value updates automatically to display the new length.

### To join dimensions:


1. Select **Tools > Dimensions > Join Dimension**, or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Join Dimension**.
2. Click on one of the dimensions that you want to join with another.
3. Click on the dimension that you want to join with the first. The two dimensions are joined into one.

## Splitting Dimensions in Worksheet View

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You can split a dimension into two dimensions at a selected point using the Split Dimension tool.

### To split a dimension:

1. Select **Tools > Dimensions > Split Dimension**, or click the down arrow next to the Dimensions button  on the Tools toolbar and select **Split Dimension**.
2. Click on the dimension that you would like to split.
3. Click on the dimension line where you would like to split the dimension. The dimension is split at the selected point.

## Changing the Style of a Dimension in Worksheet View

You can apply a different dimension style to a dimension in Worksheet View by simply making a style selection in the Object Properties panel.

### To change the style of a dimension:

1. Select the dimension. You can select multiple dimensions using Shift+click.
2. In the Object Properties panel, select the desired dimension style from the **Style** drop box. To access the Dimension Styles library, where you can add and edit dimension styles, select *Other* from the **Style** drop box.

## Overriding Dimension Text in Worksheet View

*Express | Pro Architect | Building Essentials | Construction Suite*

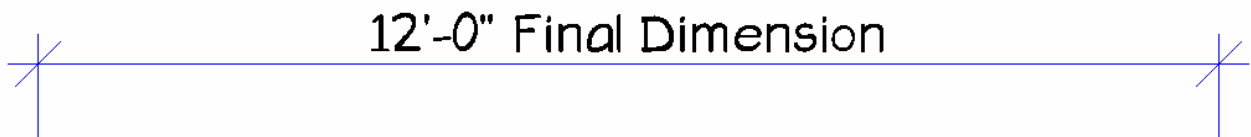
In Worksheet View it is possible to edit a dimension's calculated numerical value to suit your needs, or add information to the value. You can even change the value to text, such as "Varies".

### To override dimension text:

1. Select the dimension.
2. If you want to replace the current dimension value with something else, type the desired text in the **Override** edit box in the Object Properties panel. You can type any numerals or characters you want.

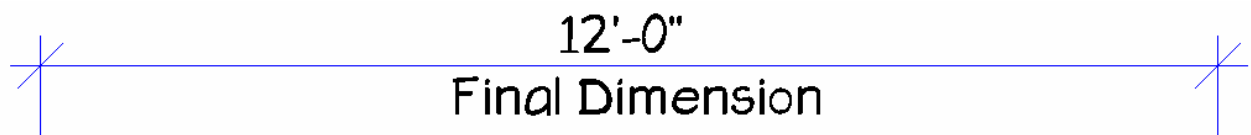
If you want to keep the current value but add information before or after the value, use a pair of angle brackets <> before or after the additional text. For example, if you wanted to add the words 'Final Dimension' after the dimension value, you would type <> **Final Dimension** in the edit box.

For a 12'-0" dimension, the dimension would then look like this:



If you want to add text below the dimension value (on the other side of the dimension line), type **↵** where you want to drop down to a new line. For example, if you wanted to add the 'Final Dimension' text below the current dimension value instead of beside it, you would type <> **↵ Final Dimension** in the edit box.

The dimension would then read:



The line break option can be used with the current dimension value (as shown in the example above), or with custom text that you type in the edit box. Note that you can only use the line break option once when overriding a dimension. You cannot keep adding more lines of text.

3. Press **Enter** or click in the drawing area to update the dimension.

## Scaling a Dimension in Worksheet View

*Express | Pro Architect | Building Essentials | Construction Suite*

Dimension scale affects the size of the dimension geometry: text, ticks and offsets. It does not affect the measured length shown in a dimension. You may need to scale dimensions in Worksheet View if you are importing a view whose scale is different than the scale of the worksheet, or scaling a block that contains dimensions.

### To scale a dimension:

1. Select the dimension.

2. In the Object Properties panel, edit the value in the **Scale** edit box. For example, to double the dimension sizing, enter 2. To reduce the sizing to half, enter 0.5.

## Scaling Dimension Values in Worksheet View

*Express | Pro Architect | Building Essentials | Construction Suite*

In Worksheet View you can scale the measured length shown in a dimension by editing the dimension's Value Scale property. You may need to scale dimension values if you are importing a view whose scale is different than the scale of the worksheet, or scaling a block that contains dimensions.

### To scale a dimension value:

1. Select the dimension.
2. In the Object Properties panel, edit the value in the **Value Scale** edit box. For example, to double the value, enter 2. To reduce the value by half, enter 0.5.


**Note:** You cannot scale a value that has been overridden.

## Drawing Lines in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

You can draw a line with one or more segments by simply picking points.

### To draw a line in Worksheet View:

1. Select **Draw > Line**, or click  on the Draw toolbar.
2. Select a start point for the line.
3. Select the end point for the line. If you want you can continue adding segments to the line. The line will snap to common points on objects provided those snaps are enabled in your Object Snap settings.
4. When you are finished drawing the line, right-click and select **Finish**.

**Note:** If a line has multiple segments, each segment is considered a separate entity.


## Drawing Polylines in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

A polyline is a continuous line composed of one or more line segments. To create a polyline, you select the endpoints of each line segment. When you select a polyline, grips are displayed at each segment endpoint. You can move these grips to effectively stretch the polyline in different directions.



### To draw a polyline:

1. Select **Draw > Polyline**, or click  on the Draw toolbar.
2. Select a start point for the polyline.
3. Select the end point of the first line segment.
4. Move your mouse in the direction you want the next segment to run. When the segment is the correct length, click to define its endpoint.
5. Continue adding segments as desired.
6. Right-click and select **Finish**.



## Joining Objects to a Polyline

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You can join an existing line, arc or other polyline to a polyline using the Join Polyline tool provided the end of the object is currently connected to the end of the polyline. Together the object and the polyline form one continuous polyline. If the object you initially choose is not a polyline, you will be prompted to turn it into one.

### To join an object to a polyline:

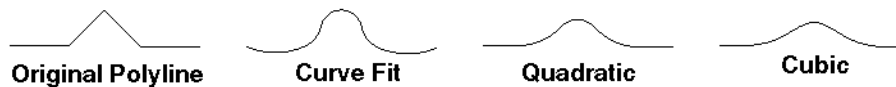
1. Select **Modify > Join Polyline** or click the Join Polyline button on the Modify toolbar.
2. Click on the polyline to which you want to join objects. A dialog confirms your selection. Click **OK**.  
If the object is not a polyline, you will be asked if you want to convert it to one. Click **Yes** to convert the object to a polyline, or click **No** to select a different object.
3. Click on the line, arc or polyline that you want to join to the polyline, then press **Enter** or right-click and select **Enter**. The object is joined to the polyline.

## Curving a Polyline (Worksheet View)

You can curve a polyline by simply making a selection from the Curve Type drop box in the Object Properties panel. There are three different curve types available: Curve Fit, Quadratic, and Cubic. Each creates a different degree of curvature.

### To curve a polyline:

1. Click on the polyline to select it.
2. In the Object Properties panel, make a selection from the **Curve Type** drop box. These are described below.
  - Curve Fit.** Creates a smooth curve with high curvature, passing through all of the vertices.
  - Quadratic.** Creates a smooth curve that is pulled toward the vertices but passes through only the first and last vertices.
  - Cubic.** Creates a smooth curve that is pulled toward the vertices but passes through only the first and last vertices. Cubic curving creates the smoothest curve with the lowest curvature.



**Tip:** To remove the curve from a polyline, just select **None** from the Curve Type drop box.

## Decurving a Polyline

If you have fit a polyline with a curve in Worksheet View, you can remove the curve by editing the polyline's properties.

### To decurve a polyline:

1. Click on the polyline to select it.
2. In the Object Properties panel, select **None** from the **Curve Type** drop box.

## Drawing Arcs in Worksheet View

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There are three tools available for drawing arcs in Worksheet View.

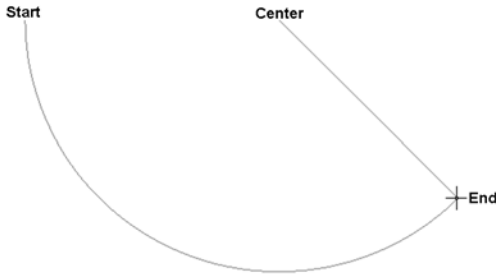
**Start, Center, End.** When you specify the start and center points, you define the arc's radius. The end point establishes the arc's length.

**3 Points.** Select a start point for the arc, a second point along the arc, then drag the arc into position as you specify the end point.


**Start, End, Radius.** Select the start and end point of the arc to define its length, then select a third point to define the arc's radius (curve).

**To draw an arc with the Start, Center, End tool:**

1. Select **Draw > Arc > Arc - Start, Center, End**, or click the down arrow next to the Arc button  on the Draw toolbar and select **Arc - Start, Center, End**.
2. Select a start point for the arc.
3. Select the arc's center point. The radius is now defined.
4. Select the arc's end point to define the arc's length.




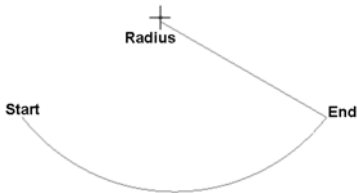
**To draw an arc with the 3 Points tool:**

1. Select **Draw > Arc > Arc 3 Points**, or click the down arrow next to the Arc button  on the Draw toolbar and select **Arc - 3 Points**.
2. Select the start point of the arc.
3. Select a second point on the arc.
4. Drag the arc to stretch it to the desired length and position, then select the end point of the arc.



**To draw an arc with the Start, End, Radius tool:**

1. Select **Draw > Arc > Arc Start, End, Radius**, or click the down arrow next to the Arc button  on the Draw toolbar and select **Arc - Start, End, Radius**.
2. Select the start point of the arc.
3. Select the end point of the arc to define its length.
4. Move your pointer to curve the arc, then select a third point to define the arc's radius.



**Editing the Curve of an Arc in Worksheet View**

You can change how much an arc curves by clicking and dragging its midpoint grip. Alternatively you can edit the Radius in the Object Properties panel.

**To edit the curve of an arc:**

1. Click on the arc to select it.
2. Hover your pickbox over the hollow midpoint grip, then click and drag to change the arc's curve.

**To edit the radius of an arc:**


1. Select the arc.
2. In the Object Properties panel, enter the desired radius in the **Radius** edit box.
3. Click in the drawing area to update the arc.

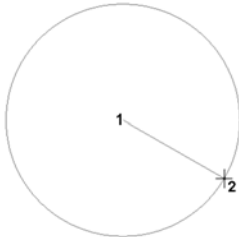
**Drawing Circles in Worksheet View**


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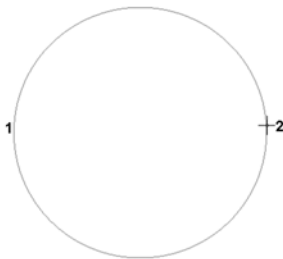
There are two ways to draw a circle. With the Circle - Center, Radius tool you draw the circle from the center out, by picking two points to define its radius. With the Circle - 2 Point tool, you draw the circle outward from a selected point, essentially defining the circle's diameter.

**To draw a circle by specifying its radius:**


1. Select **Draw > Circle > Circle - Center, Radius**, or click the down arrow next to the Circle button  on the Draw toolbar and select **Circle - Center, Radius**.
2. Click the point that is to be the center of the circle.
3. Move your pointer away from the center point. The circle grows as you move farther away from the center.
4. When the circle is the desired size, click to finish.

**To draw a circle by specifying its diameter:**

1. Select **Draw > Circle > Circle - 2 Point**, or click the down arrow next to the Circle button  on the Draw toolbar and select **Circle - 2 Point**.
2. Click a point in the drawing. The circle will grow from this point.
3. Move your pointer away from the selected point. The farther you move away from this point, the larger the circle becomes.
4. When the circle is the desired size, click to finish.

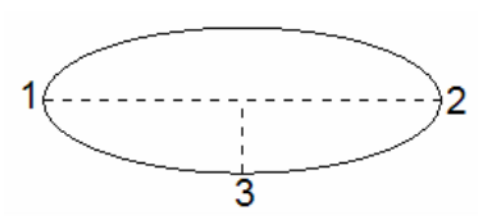
**Drawing an Ellipse in Worksheet View**

*Pro Architect | Building Essentials | Construction Suite*

To draw an ellipse in Worksheet View, select **Draw > Ellipse**, or click the down arrow next to the Ellipse button  on the Draw toolbar, then select either **Ellipse - Axis** or **Ellipse - Center**.

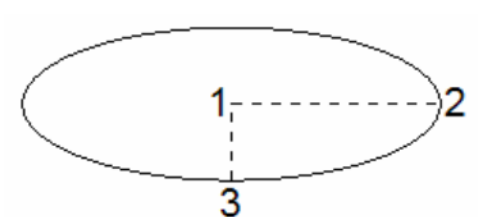
To use the **Ellipse - Axis** tool:

1. Select two points to define the major axis of the ellipse.
2. Select a third point away from the axis to define the minor radius.




To use the **Ellipse - Center** tool:

1. Select the midpoint of the ellipse, then select a second point to define the major radius of the ellipse.
2. Select a third point to define the minor radius.



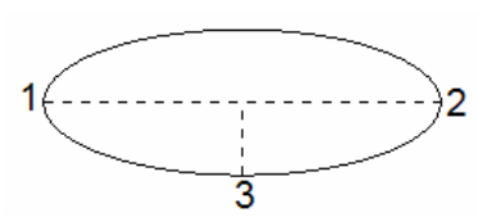
## Drawing Elliptical Arcs in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

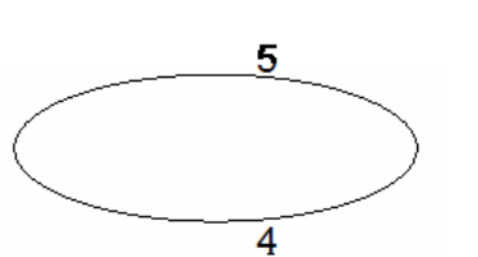
To draw an elliptical arc in Worksheet View, select **Draw > Ellipse**, or click the down arrow next to the Ellipse button  on the Draw toolbar, then select either **Elliptical Arc - Axis** or **Elliptical Arc - Center**.

To use the **Elliptical Arc - Axis** tool:

1. Select two points to define the major axis of the ellipse.
2. Select a third point away from the axis to define the minor radius.



3. Select two points to define the end points of the arc.

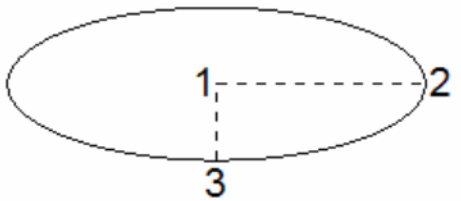


The section between the two points will form the arc:



To use the **Elliptical Arc - Center** tool:

1. Select the midpoint of the ellipse, then select a second point to define the major radius of the ellipse.
2. Select a third point to define the minor radius.




3. Select two points to define the end points of the arc.  
The section between the two points will form the arc.

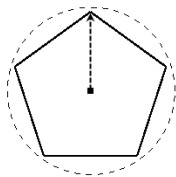
## Drawing Polygons in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

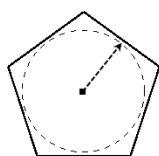
A polygon is a closed, multi-sided object. You can use the Polygon tool to quickly create a polygon with three or more equal sides (such as a triangle, square or hexagon) without having to draw each side. Just specify the number of sides you want, select a center point, then select a point to define the size of the polygon. You can choose to inscribe the polygon inside an imaginary circle, or circumscribe it about an imaginary circle.

**To draw a polygon:**

1. In Worksheet View, select **Draw > Polygon** or click  on the Draw toolbar.
2. In the **Polygon** dialog, enter the number of sides you want the polygon to have in the **Number of Sides** edit box. The minimum number of sides is 3 and the maximum is 1000.
3. From the drop box select either **Inscribed in Circle** or **Circumscribed about Circle**. Use the Inscribed in Circle option when you want to specify the distance between the center of the polygon and each vertex. That is, the corners of the polygon will touch the circumference of an imaginary circle. Use the Circumscribed about Circle option when you want to specify the distance between the center of the polygon and the midpoint of each side. That is, the polygon's sides will be tangent to the circle.



**Inscribed**



**Circumscribed**


4. Click **OK**.
5. In the drawing area, select a center point for the polygon. The polygon will be created outward from this point.
6. Move your pointer away from the center to stretch the polygon to the desired size. Note that the direction in which you move determines the rotation of the polygon.
7. When the polygon is the desired size, click to finish.

## Drawing Hatched Polygons in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

A polygon is a closed object consisting of three or more line segments. You can use the Polygon Hatch tool to draw a free-form polygon of any shape with hatching of your choice instantly applied (or no hatching if you prefer). You can edit the shape, line style and hatch pattern of the polygon after it has been inserted.

### To draw a hatched polygon:

1. Select **Draw > Polygon Hatch**, or click  on the Draw toolbar.
2. In the **Polygon Hatch** dialog, select the appearance properties that you would like the polygon to have. If you would like it to have a boundary line, enable the **Include** check box in the *Boundary Line* area. If you would like the polygon to be hatched, enable the **Include** check box in the *Pattern* area, then click **Select** to select a hatch pattern from the **Patterns** library.
3. Select a start point for the polygon, then continue selecting points to define its shape. Note that you do not have to select the start point again, as the polygon always remains closed as you draw it. Be careful not to cross any lines, or the polygon will not be created.
4. Once you've selected the last point of the polygon, right-click and select **Finish**.

**Note:** The color, line type and line weight of the boundary line is determined by the properties of the layer that the polygon is drawn on.

## Editing a Polygon's Hatch Pattern Line Properties in Worksheet View

If you have created a polygon using the Polygon Hatch tool, you can change the color, line type and line weight of the polygon's hatch pattern after it has been inserted.

### To edit a polygon's hatch pattern:

1. Click on the polygon to select it.
2. In the Object Properties panel, select the desired settings from the **Color**, **Line Type** and **Line Weight** drop boxes.

## Editing a Polygon's Hatch Pattern in Worksheet View

Once you have created a polygon, you can replace its hatch pattern with a different one, or edit the properties of the existing one.

### To edit a polygon's hatch pattern:


1. Click on the polygon to select it.
2. In the Object Properties panel, make your desired changes.
  - To hide the hatch pattern's boundary line, disable the **Boundary/Include** check box.
  - To hide the hatch pattern, disable the **Pattern/Include** check box.
  - To replace the hatch pattern with a different one, click the **Style** drop box and select the pattern you want.
  - To edit the scale of the hatch pattern, enter the desired scale in the **Scale** edit box.
  - To edit the angle of the hatch pattern, enter the desired angle in the **Angle** edit box.
  - To edit the start point of the hatch pattern in relation to the polygon, click the browse button in the **Specify Origin** field, then select the desired start point in your drawing.

## Drawing Rectangles in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

You can draw a rectangle easily by just picking two points on the screen.

### To draw a rectangle:

1. Turn your Ortho off.
2. Select **Draw > Rectangle**, or click  on the Draw toolbar.

3. Click a point on the screen. This will be one of the rectangle's corners.
4. Move your pointer away from the current point. The rectangle grows as you move farther away.
5. When the rectangle is the desired size, click to finish it.




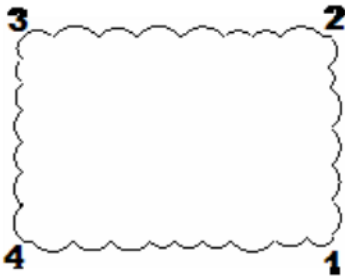
## Drawing Revision Clouds in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

Revision clouds call attention to areas of change in your drawing. You can quickly draw a revision cloud around any portion of your drawing by simply clicking a few points.

**To draw a revision cloud:**

1. Select **Draw > Revision Cloud**, or click  on the Draw toolbar.
2. Pick points to form the outline of the cloud, then hover your cursor over the start point to close the shape. When picking points, be careful not cross over any segments that you have already drawn.




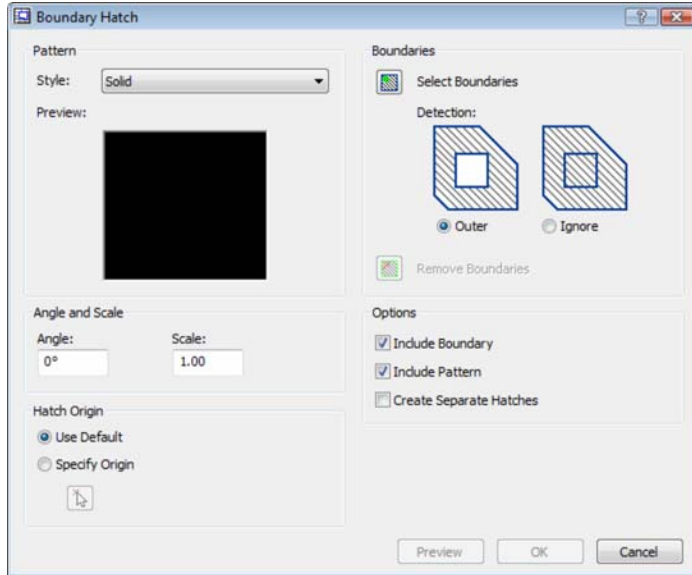
## Creating Hatching Using Boundary Hatch




*Pro Architect | Building Essentials | Construction Suite*

Hatch patterns represent actual materials, such as shingles and brick. You can apply a hatch pattern to any closed area in a 2D view using the Boundary Hatch tool. For example, you may want to apply a shingle pattern to the roof in an elevation. You can choose an angle and scale for the pattern, and specify how you want the hatching applied. When you apply hatching, the hatch pattern becomes an object that you can edit to suit your needs.

**To apply hatching:**

1. In Worksheet View, make sure your 2D view is displayed (plan or elevation).
2. Select **Draw > Boundary Hatch**, or click  on the Draw toolbar.



3. In the **Boundary Hatch** dialog, click the **Style** drop box and select the pattern that you would like to apply.
4. Click  **Select Boundaries**. This takes you back out to your drawing.
5. Position your crosshairs inside the area that you want to hatch. The area's boundary becomes highlighted. Click inside the area to select it. You can select multiple areas if you want. When you are finished selecting areas to hatch, right-click and select **Enter**.
6. By default, if a boundary contains another closed boundary, the inner boundary will not be hatched. If you want to hatch the inner boundary as well, enable the **Ignore** radio button in the **Hatching** dialog. Otherwise, enable the **Outer** radio button to hatch only the outer boundary.
7. To deselect an area that you have selected, click  **Remove Boundaries**, click inside the area, then right-click and select **Enter**.
8. By default, patterns are applied horizontally (0 degrees). If you want to rotate the pattern, enter the desired angle in the **Angle** edit box.
9. To change the size of the pattern, enter a value in the **Scale** edit box. A value of 2 doubles the size, while a value of .5 reduces the size by half.
10. By default, the pattern is created from the 0,0 origin (the **Use Default** radio button is selected). If you want the pattern to be created from a different point, enable the **Specify Origin** radio button, then click . Select the desired origin point in the drawing. For example, if you were applying a brick pattern to a wall and wanted full bricks along the bottom of the wall, you would select one of the wall's bottom corners as the origin.
11. If you want the boundary to be part of the hatch pattern (i.e. have the same color and line weight applied), enable the **Include Boundary** check box. Otherwise, the boundary line will remain the way it was before hatching, and will not be part of the hatch object.
12. By default, if more than one boundary is selected for hatching, only one hatch object is created. If you want to create a separate hatch object for each boundary, enable the **Create Separate Hatches** check box. This is important if you want to edit the hatching later.
13. Once you have selected your boundary and specified your options, click **Preview** to see how the hatching will look. When you are finished previewing the hatching, press ESC, or right-click and select **Cancel**.
14. To apply the hatching, click **OK**.

**Note:** If the Boundary Hatch tool is not successful in detecting the boundary, use the Polygon Hatch tool instead.

**Note:** The color and weight of the pattern's lines are determined by the layer that the pattern is on.



**Tip:** You can insert elevations that are already hatched by setting the display mode to Patterned in the Insert View dialog when inserting the elevations onto your worksheet. The patterns applied depend on the material settings in each element's properties.

## Editing Hatch Pattern Line Properties in Worksheet View

You can change the color, line type and line weight of a hatch pattern (created with the Boundary Hatch tool) after it has been inserted in Worksheet View.

### To edit hatch pattern properties:

1. Click on the hatching to select it.
2. In the **Object Properties** panel, select the desired settings from the **Color**, **Line Type** and **Line Weight** drop boxes.

## Editing an Object's Hatch Pattern in Worksheet View

Once you have created hatching using the Boundary Hatch tool, you can replace the hatch pattern with a different one, edit the properties of the existing one, or add or remove boundaries.

### To edit an object's hatch pattern:


1. Click on the hatching to select it.
2. In the **Object Properties** panel, make your desired changes.
3. To hide the hatch object's boundary line, disable the **Boundary/Include** check box.
4. To hide the hatch pattern, disable the **Pattern/Include** check box.
5. To replace the hatch pattern with a different one, click the **Style** drop box and select the pattern you want.
6. To edit the scale of the hatch pattern, enter the desired scale in the **Scale** edit box.
7. To edit the angle of the hatch pattern, enter the desired angle in the **Angle** edit box.
8. To edit the start point of the hatch pattern in relation to the hatch object, click the browse button in the **Specify Origin** field, then select the desired start point in your drawing.

## Drawing Batt Insulation in Worksheet View

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Batt insulation is pre-cut, flexible insulation that fits inside wall cavities between the studs. You can add sections of batt insulation to your Worksheet View drawing by picking points to define the length and width of the insulation detail.

### To draw batt insulation:

1. In Worksheet View, select **Draw > Details > Batt Insulation**, or click the down arrow next to the Details button  on the Draw toolbar and select **Batt Insulation**.
2. Click two points to define the length of the insulation section, then move your pointer away from the base line and click a third point to define the width of the section.




## Drawing Rigid Insulation in Worksheet View

*Pro Architect | Building Essentials | Construction Suite*

Rigid insulation takes the form of non-flexible panels and is often used on roofs and walls to provide thermal insulation. You can add sections of rigid insulation to a Worksheet View drawing by picking points to define the length and width of the insulation detail.

**To draw rigid insulation:**

1. In Worksheet View, select **Draw > Details > Rigid Insulation**, or click  on the Draw toolbar.
2. Click two points to define the length of the insulation section, then move your pointer away from the base line and click a third point to define the width of the section.




**Drawing a Wood Section in Worksheet View**

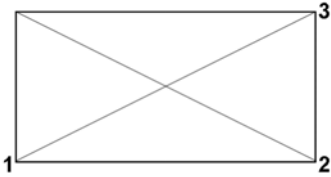
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Wood sections can be used to represent blocking, wood posts or other wood elements in a 2D drawing.

You can add a custom-sized wood section to a worksheet by picking points to define its length and width.

**To draw a wood section:**

1. In Worksheet View, select **Draw > Details > Wood Section**, or click the down arrow next to the Details button  on the Draw toolbar and select **Wood Section**.
2. Click two points to define the length of the wood section, then move your pointer away from the base line and click a third point to define the width of the section.




**Drawing a Masonry Section in Worksheet View**

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You can add a masonry section to a 2D worksheet to represent an area where brick, stones or concrete blocks are used. You create a masonry section by specifying the dimensions of one masonry unit and joint, and then picking points to define the length and direction of the section.

**To draw a masonry section:**

1. Select **Draw > Details > Masonry Section**, or click the down arrow next to the Details button  on the Draw toolbar and select **Masonry Section**.
2. In the **Masonry Section** dialog, select either **Brick** or **Block** to define how you want the masonry to be represented graphically in the section.
3. Specify the following:
  - Masonry Height.** The height of one masonry unit (e.g. brick) in the section.
  - Masonry Width.** The width of each masonry unit in the section.
  - Joint Height.** The distance between masonry units.
  - Joint Width.** The offset of the mortar from the face of the masonry units.
4. Click **OK**.

- In your drawing, click two points to define the length of the masonry section, keeping in mind that the line you are defining will represent the exterior face of the masonry. Then, move your pointer away from the base line and click a third point to define the direction of the section relative to the base line.



## Editing Masonry Section Properties in Worksheet View

Once you have created a masonry section, you can edit the dimensions of the masonry units and joints by accessing the masonry section properties.

### To edit masonry section properties:


- Click on the masonry section to select it.
- Right-click and select **Masonry Section Properties**.
- In the **Masonry Section Properties** dialog, edit the values as desired.
  - Masonry Height.** The height of one masonry unit (e.g. brick) in the section.
  - Masonry Width.** The width of each masonry unit in the section.
  - Joint Height.** The distance between masonry units.
  - Joint Width.** The offset of the mortar from the face of the masonry units.
- Click **OK**.

## Drawing a Cut Line in Worksheet View

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A cut line is a standard drafting symbol used to represent a break in the drawing. It indicates that the object continues in the same manner after or between the break lines. You can add a cut line to a 2D view by picking points to define the length and extent of the cut line.

### To draw a cut line:

- In Worksheet View, select **Draw > Details > Cut Line**, or click the down arrow next to the Details button  on the Draw toolbar and select **Cut Line**.
- Click two points to define the length of the cut line, then move your pointer away from the base line and click a third point to define the extent of the break symbol's sharpness.




## Inserting a Roof Symbol

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A roof symbol indicates the slope of a roof. When inserting a roof symbol you first define its properties, then click to insert it on your worksheet.

To insert a roof symbol:

1. In Worksheet View, select **Draw > Details > Roof Symbol**, or click the down arrow next to the Details button  on the Draw toolbar and select **Roof Symbol**.
2. In the **Roof Slope Symbol** dialog, specify the following properties:
 

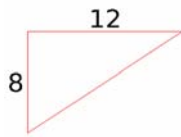
**Slope Type.** Select the method for specifying the slope: **? in 12** or **1 in ?**.

**Slope Value.** Enter the value that completes the slope measurement. For example, if you selected **? in 12** as the method, you would enter **8** for an 8 in 12 slope.

**Text Style.** Select a text style for the slope measurement.

**Length.** The overall length of the symbol including text.

**Alignment.** Specify the orientation of the symbol: **Left** or **Right**. The symbol below is left-aligned:





3. Click **OK**.
4. Click to insert the symbol on your worksheet.


## Creating a Block

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A block is a single object that is composed of many other objects. A block can be a symbol, detail, note or entire drawing that you need to use more than once. You can use the Define Block tool to capture a group of objects in a block. To create the block you specify a block insertion point, then select the objects that you want to capture in the block.

### To create a block:

1. In Worksheet View, select **Insert > Blocks > Define Block**, or click  on the Insert toolbar.
2. In the **Block Name** edit box, type a name for the block.
3. Click  (the *Pick Point* button) in the **Define Block** dialog. You are taken out to your drawing.
4. Select a point to serve as the block's insertion point. This is the point that will be attached to your crosshairs when you insert the block later.
 

The **Define Block** dialog reappears. If an insertion point was successfully selected, the message "*base point defined*" is displayed in the *Base point* area of the dialog.
5. Click  (the *Select Objects* button) in the **Define Block** dialog. You are taken out to your drawing again.
6. Select the objects that you want to capture in the block, then press Enter (or right-click and select **Enter**).
 


The **Define Block** dialog reappears and displays the number of objects selected in the *Objects* area of the dialog.
7. To leave the original objects in the drawing in their original state, enable the **Retain** radio button.
8. To convert the objects you selected to a block, enable the **Convert to block** radio button.
9. To remove the objects you selected from the drawing, enable the **Delete** radio button.
10. Click **OK**. The block is now created and saved.

## Inserting a Block

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If you have used the Define Block tool to capture objects in a block, you can use the Insert Block tool to insert the block at any time, on any worksheet, in any project.

**To insert a block:**

1. In Worksheet View, select **Insert > Blocks > Insert Block**, or click the down arrow next to the Blocks button  on the Insert toolbar and select **Insert Block**.
2. From the **Block Name** drop box, select the block that you would like to insert.
3. Click **OK**. The block is attached to your crosshairs.
4. Click to insert the block where you want it.


**Note:** If you want to insert a block created in another project, use the **Insert Block from File** tool on the Blocks menu. If you want to insert a block created in another program (DWG or DXF file), use the **Import CAD File** tool on the Insert menu.

**Inserting a Block from Another Project**

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If you have created blocks in another Envisioneer project, you can import them into the current project using the Insert Block from File tool.

**To insert a block from another project:**

1. In Worksheet View, select **Insert > Blocks > Insert Block from File**. Or, click the down arrow next to the Blocks button  on the Insert toolbar and select **Insert Block from File**.
2. In the **Open** dialog, locate and select the Envisioneer project (\*.bld file) containing the block that you want to import, then click **Open**.
3. In the **Block Selection** dialog, select the block that you want to import, then click **OK**. The block is attached to your crosshairs.
4. Click to insert the block in your drawing area.


**Note:** If a block by the same name already exists in the current project, you will have the option of replacing it with the incoming block, or renaming the incoming block.

**Note:** If you want to insert a block created in another program (DWG or DXF file), use the **Import CAD File** tool on the Insert menu.

**Scaling a Block**

You can use the Scale tool to increase or decrease the size of a block to suit your drawing needs.

**To scale a block:**

1. Select the block.
2. Select **Modify > Scale**, or click  on the Modify toolbar.
3. Select a base point to scale from. Typically this is a point on the block.
4. Enter the desired scale factor in the Scale edit box. For example, to double the size of the block, type 2. To reduce the size by half, type 0.5.
5. Click **OK**.

**Note:** If the block contains a dimension, the dimension value does not scale. If you need to scale the dimension value, double-click the block, select the dimension, then edit the Value Scale in the Object Properties panel.

**Editing a Block**

If you have inserted a block on your worksheet, whether it be with one of the Blocks tools or the Import CAD File tool, you can edit the contents of the block if needed. You can edit its individual components or add objects to it. Any changes or additions you make are automatically saved to the block's definition, and any instances of the block in your project are automatically updated.

**To edit a block:**



1. Double-click the block, or select the block and then click **Edit** in the **Definition** field of the Object Properties panel. Everything except the block is dimmed, indicating that you are now in block editing mode.
2. Make the desired changes to the block.
3. Press ESC on your keyboard to return to your worksheet.

**Deleting Unreferenced Blocks**

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When you insert a block in your drawing, a copy of the block is stored in memory, and the inserted block *references* that stored block. If you delete a block from your drawing, the block that it references remains in memory. Having too many unreferenced blocks in your project can increase drawing file size. You can alleviate this problem by deleting unreferenced blocks from memory.

**To delete unreferenced blocks:**






1. Select **Insert > Blocks > Delete Unreferenced Blocks**, or click the down arrow next to the Blocks button  on the Insert toolbar and select **Delete Unreferenced Blocks**.
2. The **Delete Unreferenced Blocks** dialog lists all of the blocks that are not being used by the drawing. Enable the check boxes beside the blocks that you want to delete. You can select all blocks simultaneously by clicking the top check box beside the **Block Name** label.
3. Click . A dialog warns you that you will not be able to undo changes to your drawing since your last save if you proceed with deleting unreferenced items.
4. Click **OK** to proceed with the deletion.

**Defining Attributes**


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Attributes allow you to attach textual information to blocks. They are useful for entering text that changes with each insertion of a particular block. For example, you can add attributes to a title block that prompt for the designer's name, current date or drawing sheet number each time someone inserts the title block into a drawing. Once you've defined the attribute, you insert it in the drawing (for example, on your title block), then capture the object and attribute in a block.

**To create an attribute:**

1. In Worksheet View, select **Insert > Blocks > Insert Attribute**, or click the down arrow next to the Blocks button  on the Insert toolbar and select **Insert Attribute**.
2. In the **Tag** edit box, type the name of the attribute as you would like it to appear when the attribute is inserted. For example, if the attribute is for a person's name, type *Name*. Or, to use a project setting as the tag name, click the arrow in the **Tag** edit box and select a project setting from the drop box (e.g. **#Project\_name**). When you insert a block that contains the attribute, the tag name will be auto-populated with the value of that setting in the **Project Manager** dialog box.
3. In the **Prompt** edit box, type a prompt that asks what value you want the attribute to have when it is inserted. (For example, *Enter your name.*) If you selected a project setting as the tag name, this field is disabled, because the value will be taken from the **Project Manager** dialog box.
4. Select a style for the text from the text styles drop box. If you would like to add or edit a text style, click  to access the Text Styles library.
5. To make text bold, select the text that you want to make bold in the editing window, then click .
6. To italicize text, click .
7. To underline the text, click .

- To change the justification of the text, click the appropriate **justification**. Justification refers to the way lines of text "line up" in relation to the window that contains them. A "left" justification lines the left side of the text up with the left side of the window, leaving the right side ragged. button.

 *Left Justify*

 *Center Justify*

 *Right Justify*

- If you want the attribute to have a pre-defined (default) value when you insert the block that contains it, enter the desired text in the editing window. The value will be displayed after you have captured in the attribute in a block, and then insert the block. At that time you can accept or overwrite the default value that you have assigned. If you do not want the attribute to have a pre-defined value, leave the editing window blank. Note that you cannot specify a default value if a project setting has been selected as the tag name.
- Click **OK**. The text is attached to your crosshairs.
- Insert the text attribute in your drawing. You can now go ahead and create a block containing the attribute.

## Editing an Attribute Before it is Captured in a Block

After you have used the Insert Attribute tool to define and insert an attribute, you can edit the attribute before it is captured in a block. For example, you can move and rotate it, change the text style, or change the tag name. Simply click on the attribute, and then edit it just as you would any other type of text.


If you want to edit attribute properties, double-click the attribute to access the **Edit Attribute** dialog. If the attribute is already selected, clicking the browse button in the **Contents** field of the Object Properties panel displays the **Edit Attribute** dialog.

## Creating a Block with Attributes

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Once you have defined and inserted an attribute using the Insert Attribute tool, you can capture it in a block.

### To create a block with attributes:


- In Worksheet View, select **Insert > Blocks > Define Block**, or click  on the Insert toolbar.
- Define the block just as would any other block, making sure that you select the attributes as well any other objects that you want to include in the block. For example, if you added attributes to a title block, select the entire title block including the attributes, then press **Enter**.
- Click **OK** in the **Define Block** dialog.

## Inserting a Block with Attributes

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Once you have created a block containing attributes you can use the Insert Block tool to insert the block and define the attribute values.

### To insert a block with attributes:


- In Worksheet View, select **Insert > Blocks > Insert Block**, click the down arrow next to the Blocks button  on the Insert toolbar and select **Insert Block**.
- In the **Insert Block** dialog, select the block to insert, then click **OK**.
- To define a value for an attribute, click on the attribute name in the *Value* column, type the desired value, then press **Enter**.
- Click **OK**. The block is attached to your crosshairs.
- Insert the block in your drawing.

## Editing Block Attribute Values

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If a block with attributes is present in your drawing, you can use the Edit Block Attributes tool to edit the attribute values that have been specified.

### To edit attribute values:

1. In Worksheet View, select **Insert > Blocks > Edit Block Attributes**, or click the down arrow next to the Blocks button  on the Insert toolbar and select **Edit Block Attributes**. (In *Express*, use the **Tools** menu.)
2. Click on the block containing the attributes, then press **Enter**.
3. Edit the values in the **Edit Block Attributes** dialog, then click **OK**.

## Editing Objects in Worksheet View

Worksheet View offers a full suite of editing tools, located on the **Modify** menu: Delete, Move, Rotate, Duplicate, Array, Offset, Stretch, Scale, Mirror, Break, Extend, Trim, Chamfer, Fillet, and Explode. Many of these tools are available in Model View, and generally work in the same way.

A unique feature of Worksheet View is that you can select an editing tool *before* selecting the object to edit, or vice versa. (In Model View, you always select the object first.) If you select the tool first, you need to select the object by clicking, windowing or crossing it, then press Enter (or right-click and select **Enter**) to complete the selection. You can then proceed with the editing function. For example, if you want to break a line, select **Modify > Break**, select the line and press Enter, then select the break point.

If you select the object first, you can either select a tool from the **Modify** menu or right-click menu.

**Note:** Throughout the online help, the procedures for editing objects in Worksheet View describe the method where the object is picked first.

## Selecting Objects in Worksheet View

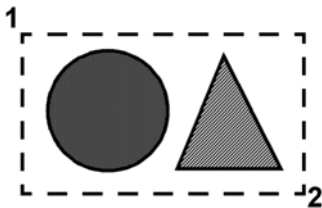
There are three ways to select objects in Worksheet View: by clicking, by windowing, and by crossing.

The simplest way to select an object is to just click on it. If you want to select a number of objects, click on the first one, then Shift+click the rest of the objects that you want to select. Objects that are defined through dialogs, such as text and attributes, can be double-clicked to display their property dialogs.

If you are trying to select multiple objects, you may find it easier to *window* or *cross* the objects.

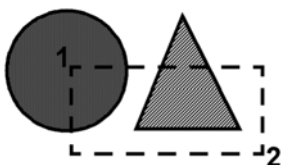
### To select objects by windowing:

1. Starting to the left of the objects, click and drag a selection window around the objects. All objects that you want to select must be totally enclosed by the selection window.



### To select objects by crossing:

1. Starting to the right of the objects, click and drag a selection window through the objects that you want to select. The objects do not need to be totally enclosed in the window. As long as they are inside or touching the selection window, they will be selected.





**To select all objects on the current worksheet:**

1. Select **Edit > Select All**.

**To re-select the objects you last selected:**

1. Select **Edit > Select Previous**.

**To deselect individual objects:**

1. Hold down your Shift key.
2. Click the object that you want to deselect.

**To deselect everything in your selection set:**

1. Select **Edit > Deselect All**, or simply click in a blank spot somewhere else in the drawing area.

## Moving Objects in Worksheet View


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With the exception of polygons and dimensions, objects in Worksheet View can be moved by simply clicking and dragging. If you have your Commander turned on and would like to be able to enter precise values for the move, you need to select the Move tool instead of doing a straight drag-and-drop.

**To move an object using drag-and-drop:**

1. Select the object.
2. Hover your pickbox over the object's square blue grip at the center of the object.
3. Click and drag to move the object.
4. When the object is where you want it, release the mouse button.

**To move an object using the Move tool:**

1. Select the object.
2. Select **Modify > Move**, or right-click and select **Move**, or click  on the Modify toolbar.
3. Select a base point for the move. The move distance and direction will be measured from this point.
4. Without holding your mouse button down, move your mouse to move the element. Select the point you want to move the object to, or enter a distance and direction in the Commander.

## Rotating Objects in Worksheet View

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Objects that were inserted with a single click can be rotated by clicking and dragging their rotation grip, which is triangular in shape. Such objects include text, blocks, inserted views, inserted images, and inserted CAD files.

For most other objects, you need to use the Rotate tool. You also need to use the Rotate tool if you want to be able to enter a precise rotation angle in the Commander, or you want to rotate the object about a point other than the center point of the object.


If your Angle Snap is on, the object will rotate in increments of whatever angle is set for the Angle Snap. If you are using the Commander, you can override the Angle Snap by entering the desired angle in the Commander. If the Angle Snap is off, the object will rotate in increments of 1° provided Ortho is turned off.

**To rotate an object by clicking and dragging:**

1. Select the single-click object that you want to rotate.
2. Hover your pickbox over the object's triangular grip.
3. Click and drag to rotate the object.
4. When the object is at the desired rotation, release your mouse button.

**To rotate an object using the Rotate tool:**

1. Select the object.


2. Select **Modify > Rotate**, or right-click and select **Rotate**, or click  on the Modify toolbar.
3. Select a base point for the rotation. The base point can be any point on the object (e.g. center point or corner point), or any point in the drawing area. The point you pick establishes an automatic baseline that runs through the point at 180°. You can rotate full-circle around this baseline.
4. Without holding your mouse button down, move your mouse to rotate the object. The object will rotate from the defined base point in the direction you move the mouse. If the Commander is turned on, you can view the angle of rotation as you rotate, or enter a precise angle. Positive angle values are read in a counter-clockwise direction, while negative values are read in a clockwise direction.

## Duplicating Objects in Worksheet View

*Express | Pro Architect | Building Essentials | Construction Suite*

The Duplicate tool creates a copy of a selected object that you can then position where you like on the same sheet.

### To duplicate an object:

1. Select the object to copy.
2. Select **Modify > Duplicate**, or right-click and select **Duplicate**, or click  on the Modify toolbar.
3. Select a base point for the copy movement. Typically you would select one of the object's grips, but you can click anywhere in the drawing. The base point is simply a reference point used to define the move distance.
4. Select the point you are copying the object to. You can do this by moving your mouse and then clicking to insert the copy, or by typing a distance and direction in the Commander.

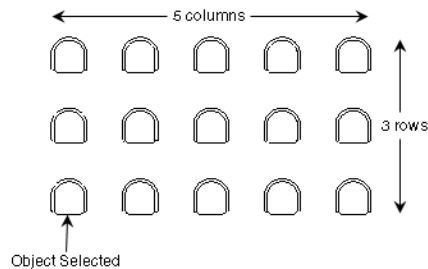
**Note:** If you want to copy an object to another worksheet, use the Copy and Paste tools on the **Edit** menu instead.

## Arraying Objects in Worksheet View

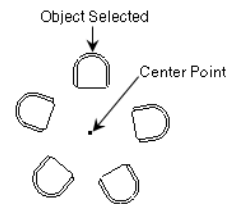
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You can create copies of objects in a rectangular or polar (circular) pattern called an array.

When you create a rectangular array, objects are arranged in a pattern of rows and columns. You can control the number of rows and columns, the spacing between the rows and columns, and the array's rotation angle.




When you create a polar array, objects are arranged in a circular pattern about a selected center point. You can specify criteria such as the total number of objects you want to include in the array, the angle to fill, or the angle between objects.





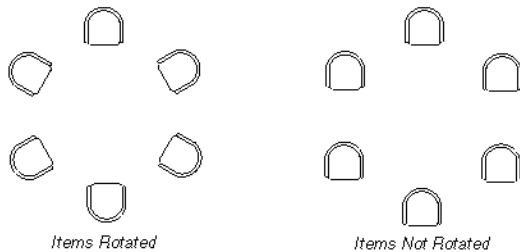
To create a rectangular array:

1. Select the object that you want to array.

2. Select **Modify > Array**, or right-click and select **Array**, or click  on the Modify toolbar.
3. In the **Array** dialog, enable the **Rectangular** radio button.
4. In the **Number of Rows** box, type the number of horizontal rows you want or use the arrows to select a value.
5. In the **Number of Columns** box, type the number of vertical columns you want.
6. In the **Distance Between Rows** box, type the spacing you want between rows. This determines the distance between objects appearing in columns (vertical spacing).
7. In the **Distance Between Columns** box, type the spacing you want between columns. This determines the distance between objects appearing in rows (horizontal spacing).
8. In the **Array Rotation Angle** box, type the degree of rotation for the array.
9. Click **OK**. The array is created.

To create a polar array:

1. Select the object that you want to array.
2. Select **Modify > Array**, or right-click and select **Array**, or click  on the Modify toolbar.
3. In the **Array** dialog, enable the **Polar** radio button.
4. Click , and then select the point in your drawing area that will serve as the center of the array.
5. To rotate the items as they are arrayed, enable the **Rotate Items** check box. If you disable this check box, each item in the array will have the same orientation as the selected object.



6. From the **Method** drop box, select the criteria that you want to use to create the array.
  - Total Number of Items & Angle to Fill*
  - Total Number of Items & Angle Between Items*
  - Angle to Fill & Angle Between Items*

7. Enter values for the two parameters that support the method you selected.

**Total number of items.** The total number of items in the array, including the selected object.

**Angle to fill.** The distance to fill around the circumference of the array.

**Angle between items.** The distance between each item.

Arrays are generated counterclockwise from the selected object. To produce a clockwise array, enter a negative value in the *Angle to fill* edit box.

8. To preview the array, click **Preview**. The array is displayed in your drawing area. If you are satisfied with the array, click **Yes** in the dialog to create it. Otherwise, click **No** to return to the **Array** dialog.


If you do not want to preview the array, just click **OK** in the **Array** dialog to create the array.

## Offsetting Objects in Worksheet View

*Express | Pro Architect | Building Essentials | Construction Suite*

Offsetting creates a new object whose shape is the same as the shape of a selected object. Offsetting a circle, for example, creates a larger or smaller circle, depending on which side you specify for the offset. You can offset lines, polylines, circles, arcs and polygons.

### To offset an object:


1. Select the object to offset.
2. Select **Modify > Offset**, or right-click and select **Offset**, or click  on the Modify toolbar.
3. In the **Offset** dialog, enter the distance that you would like to offset the object, then click **OK**.
4. In the drawing, click on the side that you would like to offset to.

## Stretching Objects in Worksheet View

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Any object that can be stretched manually (by editing grips) can also be stretched using the Stretch tool. With this method you can specify a stretch distance and direction with the Commander.

### To stretch an object:


1. Select **Modify > Stretch**, or right-click and select **Stretch**, or click  on the Modify toolbar.
2. Click and drag a crossing selection window (from right to left) around the line end or corner that you want to stretch.
3. Press Enter, or right-click and select **Enter**.
4. Select a base point to stretch from. This can be any point in the drawing.
5. Move your crosshairs in the direction that you want to stretch, then either click when the object is the desired length, or enter a stretch distance in the Commander.

## Scaling Objects in Worksheet View

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You can use the Scale tool to increase or reduce the size of an object.

### To scale an object:

1. Select the object.
2. Select **Modify > Scale**, or right-click and select **Scale**, or click  on the Modify toolbar.
3. Select a base point to scale from. Typically this is a point on the object.
4. Enter the desired scale factor in the **Scale** edit box. For example, to double the size of the object, type 2. To reduce the size by half, type 0.5.
5. Click **OK**.

**Note:** If you are scaling a block, and the block contains a dimension, the dimension value does not scale. If you need to scale the dimension value, double-click the block, select the dimension, then edit the Value Scale in the Object Properties panel.


## Mirroring Objects in Worksheet View

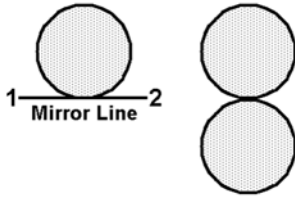
*Express | Pro Architect | Building Essentials | Construction Suite*

You can create a mirror image of a selected object using the Mirror tool. You mirror the object by specifying a mirror line — an imaginary line about which the object is flipped. Once the object has been mirrored, you can choose whether or not you want to delete the original object.

### To mirror an object:

1. Select the object that you want to mirror.

2. Select **Modify > Mirror**, or right-click and select **Mirror**, or click  on the Modify toolbar.
3. Click two points to define a mirror line. The element is mirrored.




4. When prompted to choose whether or not you want to delete the original object, click **Yes** to delete the original object, or click **No** to leave the original intact.

## Breaking Objects in Worksheet View

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You can use the Break tool to create a break in a line, polyline, arc, or polygon. This divides the object into segments which can be edited individually, and adds a grip at the break point.

### To break a line, polyline, arc or polygon:


1. Select the object.
2. Select **Modify > Break**, or right-click and select **Break**, or click  on the Modify toolbar.
3. Select the point where you want to break the object.

## Extending Objects in Worksheet View

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You can use the Extend tool to extend one object to another.

### To extend an object to another:


1. Select **Modify > Extend**, or right-click and select **Extend**, or click  on the Modify toolbar.
2. Select the object you want to extend **to**, then press Enter (or right-click and select **Enter**). The object must be in the path of the object that you want to extend.
3. Select the object that you want to extend. The object is extended to the first object you selected.

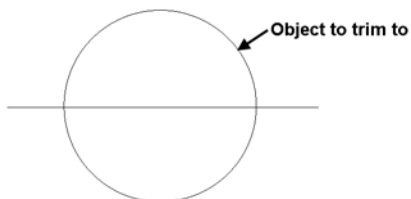
## Trimming Objects to Other Objects (Worksheet View)

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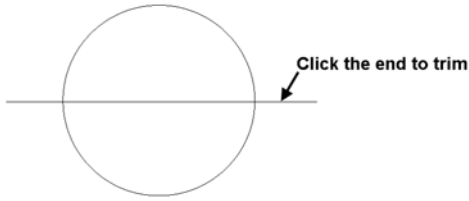
When two drafting objects cross each other, you can use the Trim tool to trim one object to the other.

### To trim an object to another object:

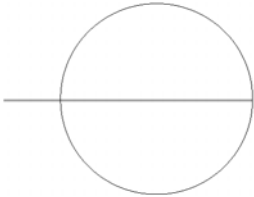
1. In Worksheet View, select **Modify > Trim**, or right-click and select **Trim**, or click  on the Modify toolbar.
2. Select the object that you want to trim **to**, then press Enter (or right-click and select **Enter**). In the following example, you would select the circle as the object to trim to.



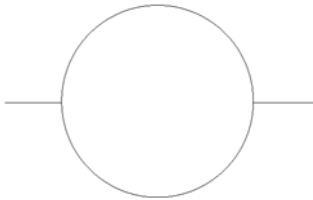
2. Select the object that you want to trim, clicking near the end you want to trim.



The line is trimmed automatically to the nearest border.



In the above example, if you clicked on the center of the line, the portion inside the circle would be trimmed:




## Chamfering Objects in Worksheet View

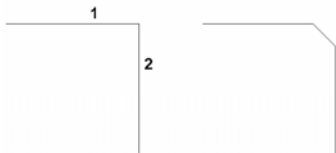
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Use the **Chamfer** tool to create a beveled connection between two lines or polylines.

**To chamfer objects:**

1. Select **Modify > Chamfer**, or click  on the Modify toolbar.
2. In the **Chamfer Distances** dialog, specify the first and second chamfer distance (the distance each object will be cut back). The distances that you specify will be applied in the order that you select the objects.
3. Select the first object, then select the second object. The chamfer is created.

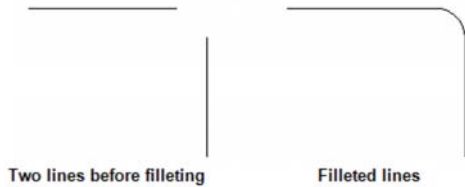
In the following example, line **1** will be cut back (horizontally) by the **First Distance** specified, and line **2** will be cut down (vertically) by the **Second Distance** specified. A line will then be drawn between the two endpoints to create the angled connection.



## Filleting Objects in Worksheet View


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Filleting connects two lines together at a point where they would naturally meet if both were extended. If the objects already intersect, one object is trimmed to the other. The Fillet tool can be used on lines, polylines, arcs, and circles.




There are two fillet options available. The **Fillet - Join** tool performs a straight connection, causing the lines to meet at a single point, while the **Fillet - Radius** tool connects two lines with a curve.

#### To join objects at a single point:

1. Select **Modify > Fillet > Fillet - Join**, or click the arrow next to  on the Modify toolbar and select **Fillet - Join**.
2. Select the first object that you want to join. If the object is a line or arc, click near the specific end that you want to extend.
3. Select the second object that you want to join. The objects are connected.

#### To join objects with a curve:


1. Select **Modify > Fillet > Fillet - Radius**, or click the arrow next to  on the Modify toolbar and select **Fillet - Radius**.
2. In the **Radius** dialog box, specify the desired radius for the curve, then press Enter or click **OK**.
3. Select the first object that you want to fillet.
4. Select the second object that you want to fillet. The objects are connected with a curve.

## Exploding Objects in Worksheet View

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You can use the Explode tool to “blow up” an object into its component parts. You could use this on objects such as blocks, inserted model views and inserted CAD files (such as a detail or title block). Once an object has been exploded you are free to edit its individual components.

#### To explode an object:


1. Select the object.
2. Select **Modify > Explode**, or right-click and select **Explode**, or click  on the Modify toolbar.

## Deleting Objects in Worksheet View

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You can delete an object from your drawing in two quick steps.

#### To delete an object:

1. Select the object.
2. Press the Delete key on your keyboard, select **Modify > Delete**, or right-click and select **Delete**, or click  on the Modify toolbar.

## Editing the Line Style of Lines, Shapes and Details in Worksheet View

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By default, lines, shapes and details are drawn using the color, line type and line weight assigned to the layer that the line is drawn on. You can easily change the line style of an object after you have inserted it.

#### To change the line style of a line object:


1. Click on the line, shape or detail to select it.
2. In the Object Properties panel, select the desired settings from the **Color**, **Line Pattern** and **Line Weight** drop boxes.

## Measuring Distance and Angle in Worksheet View

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Using the handy Measure tool you can measure the distance and angle between any two points in your drawing.

### To measure in Worksheet View:

1. Select **Tools > Measure**, or click  on the Tools toolbar.
2. Click the first point that you want to measure from. As you move your crosshairs away from this point, distance and angle information is reported on the status bar:



3. Click the second point that you want to measure to. All calculations, including the distance along the X axis and Y axis, are reported in the **Measure** dialog.

## Drafting Settings

In your Drafting Settings you can select a default line style to be used for drafting objects (lines, circles, arcs, rectangles) when they are drawn. You can also set a default line style for revision clouds, hatched polygons, and details.


You can also assign a layer to objects created in Model View that are not building elements. These include lines and shapes, revision clouds, hatched polygons, details, room division lines, CAD blocks, text, dimensions, schedules, room regions, site boundaries, terrain lines, and wall panel components. When these objects are imported into Worksheet View, they will reside on the layer assigned to them if you explode the block that they are part of.

## Specifying Default Revision Cloud Settings

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You can define the settings that you would like your revision clouds to have prior to drawing them. You can select a line style and hatch pattern, and define an arc size.

### To define revision cloud settings:


1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Revision Cloud** in the left column.
3. By default, revision clouds are drawn on the Drafting - Hatch layer. To select a different layer, click the browse button next to the **Layer** box, then select a layer from the **Layers** dialog.
4. To override the color, line type, or line weight, click in the **Color**, **Line Types**, or **Line Weight** box and make the desired selection.
5. To apply a pattern to revision clouds which is visible in Patterned display mode, enable the **Include** check box in the **Pattern** area. Click **Select** in the **Pattern** area to select a pattern from the **Patterns** library.
6. To define the size of the arcs in the revision cloud, enter values in the **Minimum Arc Length** and **Maximum Arc Length** edit boxes..
7. Click **OK**.

## Specifying Default Polygon Hatch Settings

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You can define the settings that you would like hatched polygons to have prior to drawing them, such as the line style and hatch pattern.

### To define polygon hatch settings:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Polygon Hatch** in the left column.
3. By default, polygons are drawn on the Drafting - Hatch layer. To select a different layer, click the browse button next to the **Layer** box, then select a layer from the **Layers** dialog.




4. To override the color, line type, or line weight assigned to the selected layer, click in the **Color**, **Line Types**, or **Line Weight** box and make the desired selection.
5. To apply a pattern to polygons, which is visible in Patterned display mode, enable the **Include** check box in the **Pattern** area. Click **Select** in the **Pattern** area to select a pattern from the **Patterns** library.
6. Click **OK**.

## Selecting a Default Line Style for Drafting Objects

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You can select a default line style for lines, arcs, circles and rectangles in Model View.

**To select a default layer for drafting objects:**

1. Select **Settings > Drafting Settings**, or click  on the Settings toolbar.
2. In the **Drafting Settings** dialog, select the *Drafting Objects* item.
3. Click **Settings**, and then select the desired layer in the **Line Style** dialog. The layer determines the color, line type, and line weight of the object.
4. You can override the color, line type or line weight by clicking on the desired property and making a different selection from the drop box.
5. Click **OK** in the **Drafting Settings** dialog.


**Note:** You can edit the line style of a drafting object after it has been drawn.

## Selecting a Default Line Style for Revision Clouds

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You can select a default line style to use when drawing revision clouds in Model View.

**To select a default line style for revision clouds:**

1. Select **Settings > Drafting Settings**, or click  on the Settings toolbar.
2. In the **Drafting Settings** dialog, select the *Revision Cloud* item.
3. Click **Settings**, and then select the desired line style in the **Line Styles** dialog.
4. Click **OK** in the **Drafting Settings** dialog.


**Note:** You can edit the line style of a revision cloud after it has been drawn.

## Specifying a Default Line Style and Pattern for Hatched Polygons

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You can select a default line style, pattern and color to use when drawing hatched polygons in Model View.

**To specify default settings for hatched polygons:**

1. Select **Settings > Drafting Settings**, or click  on the Settings toolbar.
2. In the **Drafting Settings** dialog, select the *Polygon Hatch* item.
3. Click **Settings**.
4. By default, polygons are drawn on the Drafting - Hatch layer. To select a different layer, click the browse button next to the **Layer** box, then select a layer from the **Layers** dialog.
5. To override the color, line type, or line weight, click on the property and make a selection from the drop box.
6. Click **OK** in the **Drafting Settings** dialog.


**Note:** You can edit the properties of a hatched polygon after it has been drawn.

## Selecting a Default Layer for Details

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You can select a default line style to use when drawing batt insulation, rigid insulation, wood sections, masonry sections and cut lines in Model View.

**To specify default settings for details:**

1. Select **Settings > Drafting Settings**, or click  on the Settings toolbar.
2. In the **Drafting Settings** dialog, select the *Details* item.
3. Click **Settings**.
4. By default, details are drawn on the CAD layer. To select a different layer, click the browse button next to the **Layer** box, then select a layer from the **Layers** dialog.
5. To override the color, line type, or line weight, click on the property and make a selection from the drop box.
6. Click **OK** in the **Drafting Settings** dialog.

**Note:** You can edit the properties of a detail after it has been drawn.

## Assigning Layers to Objects in Model View

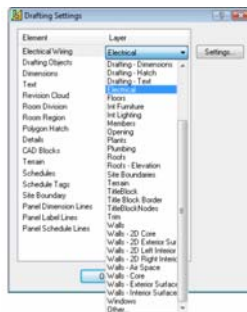
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You can assign a layer to objects created in Model View that are not building elements. These include lines and shapes, revision clouds, hatched polygons, details, room division lines, CAD blocks, text, dimensions, schedules, room regions, site boundaries, terrain lines, and wall panel components. When these objects are imported into Worksheet View, they will reside on the layer assigned to them if you explode the block that they are part of.

A layer definition includes settings for an object's line style, line weight and color.

**To assign layers to objects in Model View:**

1. Select **Settings > Drafting Settings**.
2. In the **Drafting Settings** dialog, select the object to which you want to assign a layer.
3. Click the drop box in the *Layer* column, and then select the desired layer from the drop list.



4. Click **OK**.

**Note:** Building elements have a layer assignment on their Appearance property page.

# Chapter 24: Estimating and Analysis

There are several powerful tools available to help you analyze your project and generate various types of reports and information.

**Area/Perimeter.** You can use the Area/Perimeter Calculator to display the area (e.g. square footage) and perimeter length of each location in your model, as well as the total area and total perimeter (of all locations).

**Room Measurements.** You can use a Room Region tool to instantly calculate the area, perimeter and volume of a room or selected area in your model and insert the information in your drawing.

When you use a Room Region tool, a boundary is created around the room or area. This boundary defines a *room region* in your model that can be used in the Area/Perimeter Calculator and for creating a room region schedule.

**Project Estimate.** Any elements that you insert in your drawing are tracked internally, making it possible to generate a project estimate automatically. You can also generate a partial estimate for selected elements when needed.

When you generate an estimate for your project, the estimate comprises a quantity report as well as a cut list. The quantity report, or bill of materials, lists all of the materials used to build your house, as well as the quantity, unit price and total cost of each material. The cut list reports all the timber and steel members in your drawing calculates the number of members you need to purchase using realistic cut lengths of your choice.

**Quote.** A quote is a list of products with quantities, pricing and other important information. Quotes are used by building material supply retailers, wholesalers, distributors and contractors to facilitate the design, sale and installation of construction projects. You can use the Generate Quote tool to instantly generate a quote that opens in Quote Generator software (included). You can then edit the quote to suit your needs.

**Schedules.** You can display, print and insert complete door, window, member or room region schedules for each location in your project. By default, doors, windows or members are tagged with schedule marks that link them to the associated schedule.

**Upload to ERP.** If your organization uses an Enterprise Resource Planning (ERP) system, you can connect to it directly from Envisioneer and upload an order to it using the Upload to ERP tool.

You can edit a schedule's layout, text styles and line styles, and control the content and style of schedule marks.

**REScheck Export.** You can use the REScheck Export tool export data from your Envisioneer model to a REScheck file to determine if it meets IECC or certain state code requirements.

## Calculating Area and Perimeter

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The Area/Perimeter Calculator displays the area (e.g. square footage) and perimeter length of the building footprint on each location in your model. It also displays the total area and total perimeter (of all locations). You can use the calculator at any given point in time. The values in the calculator update automatically as your model increases or decreases in size.

Note that the calculations are taken from the exterior side of the building's perimeter walls.

### To measure area:

1. Select **Tools > Analyze > Area/Perimeter**, or click  on the Analyze toolbar. Area measurements are displayed on the *Area* tab of the **Area/Perimeter Calculator** dialog. Perimeter measurements are shown on the *Perimeter* tab.



If you have created room regions in your model, they are listed under their associated location names. For example, if you have calculated the area of your garage using the Room Region by Room tool, you will see the garage listed under the Ground Floor location, or whatever location it was built on. By default, the sub-total of each location is the total area or perimeter of that location, including all regions on that location. You can omit selected locations or room regions from the total if you want. If a calculation is included in the total, it is highlighted **green**.

2. To omit a location or region from the calculation, select **Omit** from the drop box in the *Include* column. By default, room regions are already omitted because they are part of the overall calculation for the location.
3. To subtract the area or perimeter of a region from a location's sub-total, select **Subtract** from the drop box in the *Include* column. For example, if you want to remove the garage from the calculation, select **Subtract** next to the Garage room region. The garage's measurement then highlights **red**, indicating that it has been subtracted.
4. To add a location that you have omitted back into the calculation, select **Add** from the drop box in the *Include* column.
5. To turn the grid lines off, uncheck the **Show Grid** check box.
6. To print the calculations, click **Print**.
7. When you are done viewing the area calculations, click **OK**.

**Note:** The units of measure used for the area and perimeter can be changed on the Units of Measure page in your program settings.



## Calculating the Space in Rooms and Areas

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Using the **Room Region by Room** tool or the **Room Region by Picking Points** tool you can instantly calculate the area, perimeter and volume of a room or selected area in your model and insert the information in your drawing.

When you use a Room Region tool, a boundary is created around the room or area. This boundary defines a *room region* in your model that can be used in the Area/Perimeter Calculator and for creating a room region schedule. You can control the line style of the region boundary and apply a hatch pattern to the region if you want.

### To calculate the space in a room or area:

1. If you want to calculate the space in a room, select **Tools > Analyze > Schedules > Room Region by Room**, or click  on the Analyze toolbar. Note that this tool requires that the room have a closed wall layout.
2. If you want to calculate the space in a particular area in your design, select **Tools > Analyze > Schedules > Room Region by Picking Points**, or click  on the Analyze toolbar. This does not necessarily have to be a room — it could be any space, such as a courtyard.
3. To display text in the title of the calculation note, enable the **Display Name** radio button, then type the desired text in the adjacent edit box (e.g. Garage).
4. To display a mark as the title of the note, enable the **Display Mark** radio button, then type the desired mark text in the adjacent edit box.

5. Select the desired justification for the title by clicking the appropriate justification button.

 Left Justify

 Center Justify

 Right Justify

6. In the *Calculation Display* area, check off which pieces of information you would like to display in the note. Choices are **Display Area**, **Display Perimeter** and **Display Volume**. Note that the units of measure used for the area, perimeter and volume can be changed on the Units of Measure page in your program settings.
7. If you enabled **Display Volume**, enter the height of the room in the **Height** edit box. By default, the location's wall height is used, but you can overwrite this if necessary.
8. If you plan to create a room region schedule later, you can enter information in the *Additional Schedule Fields* area. These fields, which include *Ref Note*, *Floor Finish*, *Ceiling Finish*, *Wall Finish* and *Base Finish*, are fields that can appear in a room region schedule.
9. To define the appearance of the note and room region object, select the *Settings* tab.
  - To select a text style for the title text, click the **Text Style** button in the *Title Appearance* area, then make a selection from the **Text Styles** dialog.
  - To select a line style for the mark if you are using a mark instead of text, click the **Line Style** button in the *Title Appearance* area, then make a selection from the **Line Styles** dialog.
  - To select a style for the mark if you are using a mark instead of text, make a selection from the **Mark Style** drop box. Choices include *Square*, *Circle*, *Hexagon*, *Octagon*, and *Text Only*.
  - To select a text style for the body of the note, click the **Text Style** button in the *Calculation Appearance* area, then make a selection from the **Text Styles** dialog.
  - To select a line style for the region boundary, click the **Line Style** button in the *Region Appearance* area, then make a selection from the **Line Styles** dialog.
  - To display a hatch pattern throughout the region, click the **Pattern** button and make a selection from the **Patterns** dialog.
  - To edit the color of the hatch pattern, click the **Color** swatch and make a selection from the **Color** dialog.
10. Once you've defined your settings, click **OK**.
11. If you selected the **Room Region by Room** tool, mouse over the room whose space you are calculating (it will highlight), then click inside the room. The room region is created, and the note is inserted.
12. If you selected the **Room Region by Picking Points** tool, pick points to define the boundary of the area whose space you want to calculate, then right-click and select **Finish**. The room region is created, and the note is inserted.
13. You can now calculate the space of another room, or click **Cancel** to close the **Room Region** dialog.

**Note:** Room regions are linked to their associated walls and update automatically if walls are stretched.

**Note:** By default, room regions inserted by room extend to the wall core (e.g. stud wall). If you prefer that they extend to the interior wall surface, you can define this in your program settings prior to inserting the room regions. See Defining the Extents of Room Regions to be Inserted in Rooms on page 367.

**Note:** Region hatch patterns are only visible when the display mode is set to Patterned.

**Note:** Room regions are listed in the View Filter, so you can control their visibility and selectability.


## Defining the Extents of Room Regions to be Inserted in Rooms

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By default, a room region inserted with the Room Region by Room tool extends to the inside edge of the wall core (e.g. stud wall). If you prefer you can set the room region to extend to the interior edge of the interior wall surface (e.g. drywall) instead. This is an insertion setting that is defined in your program settings. Changing this setting has no effect on room

regions that have already been inserted. It only affects room regions that you are going to insert with the Room Region by Room tool. If you want to change the extents of an existing room region you can click and drag its editing grips.

**To define the extents of room regions to be inserted with the Room Region by Room tool:**

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, click **Building Aids** in the left column.
3. In the *Insertion by Room* area, click the drop box next to the **Room Regions** item.
4. If you want room regions in rooms to extend to the wall core, select **Wall Core**. If you want them to extend to the interior wall surface, select **Wall Surface**.
5. Click **OK**.

## Editing Room Region Properties

Once you have inserted a room region note in your drawing, you can edit the settings pertaining to the content and style of the note, and the style of the room region boundary and pattern.

**To edit room region properties:**

1. Click inside the room region to select it.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the settings in the Room Region dialog.
4. Click **OK**.

## Resizing or Reshaping a Room Region

You can resize or reshape a room region boundary by clicking and dragging its edges and corners. The calculations in the room region note update automatically.

**To resize or reshape a room region:**

1. Click inside the room region to select it.
2. To resize the region, click and drag the solid blue grips located at the center of each edge. Alternatively you can use the **Move Edge** tool on the right-click menu to move an edge.
3. To reshape the region, click and drag the hollow blue grips located at the corners. Alternatively you can use the **Stretch** tool on the right-click menu.

**Note:** Room regions are linked to their associated walls and update automatically if walls are stretched.

## Moving Room Region Text

By default, the space calculation note appears at the center of a room region. You can move the title or body of a room region note using the Move Text tool.

**To move room region text:**

1. Click inside the room region to select it.
2. Right-click and select **Move Text**, or select **Edit > Modify Elements > Move Text**.
3. Hover your pointer over the solid blue grip displayed over the text, then click and drag to move the text where you want it. Note that the title and body of the note are moved separately.
4. Release your mouse button.

## Project Estimate

The Project Estimate tool automatically generates a **quantity report** and **cut list** at any time during the design process. If you make changes to your model, the estimate will update automatically.

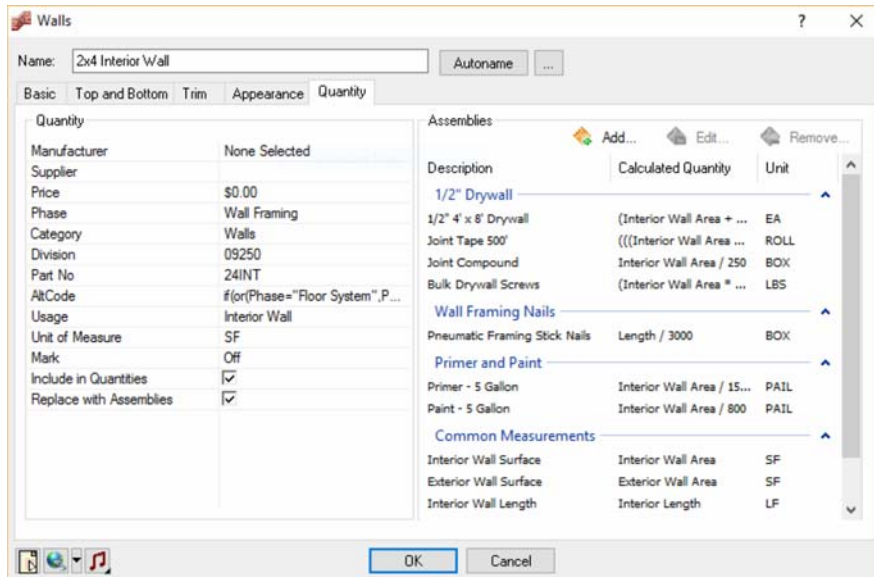
The quantity report, or bill of materials, lists all of the materials used to build your house, as well as the quantity, unit price and total cost of each material. The quantity report also lists assemblies, which are part of an element's properties. For example, a wall may have assemblies such as studs, drywall, insulation, vapor barrier, and drywall screws.

The cut list reports all the timber and steel members in your drawing calculates the number of members you need to buy from your supplier using realistic lengths of your choice.

When you view your project estimate, you can choose a report template to apply to the estimate. The template determines what information is reported, how it is reported, and the file type created when you save the estimate. Some templates generate files that are compatible with popular estimating programs. You can edit report templates to suit your needs, or even create new ones.

## Editing the Quantitative Properties of Elements

Included among the property pages of every element is a Quantity property page. This page contains a number of *variables* that are commonly used in inventory control, quoting and estimating — fields such as Manufacturer, Part Number, Price and Unit of Measure. The information on this page is used when a project estimate is generated.




Some of the fields on the Quantity page are used to define the sort order of information in quantity reports, as defined by the report template used. These fields include Division, Alt Code, Phase, Usage and Category.

You can edit the quantitative properties of elements in the catalog, or in your drawing. Alternatively you can generate and save a project estimate, then edit the fields in the estimate's associated editor, such as *Excel* or *Notepad* (depending on the report template used).

### To edit the quantitative properties of elements in your drawing:

1. Select the element in your drawing.
2. Right-click and select **Properties**.
3. In the properties dialog, select the **Quantity** tab.

### To edit the quantitative properties of elements in your catalog:

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click inside the catalog panel and select **Element Manager**.
2. Select the element(s) that you want to edit.
3. In the properties pane, select the **Quantity** tab.

**Note:** Editing elements in a catalog has no effect on elements already inserted in your drawing. It only affects future insertions of the element.

Below is a description of each available property.

**Manuf:** The Manufacturer of the product. Click the browse button to access the Manufacturers library where you can add, edit and select manufacturers.



**Supplier:** The company or store who will be supplying the product.

**Price:** The unit price of the product. This value correlates with the selection in the **Units** field. For example, if Linear Feet is specified in the **Units** field, you would enter the price per linear foot here.

**Phase:** Materials are often shipped to the building site in phases, such as the Site Work, Foundation or Framing phase. The selection here indicates the phase this particular element is associated with. Phases can be used as sort keys in estimates and quotes. Click the browse button to select a phase from the Phase library.

**Category:** Elements can be grouped into categories according to their type, such as sheathing or pre-cut lumber. Categories can be used as sort keys in estimates and quotes. Click the browse button to select a category from the Category library.

**Division:** A construction division identification. In North America, CSI divisions are used.

**Part No.:** Part Number. A series of numbers that identifies the product. This could be a vendor part number, manufacturer part number, etc.

**Alt Code:** An alternate code for identifying the item. You might use this to link to an inventory control database or estimating system. Vendors may use Alt Codes as alternate lookup keys or product IDs, often to facilitate product substitutions. The Alt Code can be used as a sort key in estimates and quotes.

An Alt Code can be any series of numbers or characters, and you can also incorporate element variables into the code by creating a custom Alt Code formula. The Alt Code is a great way to combine two or more variables into one for simpler sorting. For example, instead of grouping materials by Location first and then by Phase in your report template, resulting in materials from the same Phase being spread out into multiple location groups, you could group them by Location AND Phase at the same time by specifying an Alt Code formula that includes both of these variables. By using the Alt Code as the primary sort key, this would put all items sharing the same Location and Phase into onto one group, which would make it easier to create delivery and distribution lists. For example, if you specified an Alt Code formula of **Location\_Phase**, you might see headings and groups such as 'Ground Floor\_Wall Systems', 'Second Floor\_Wall Systems', etc. in your project estimate.

To create a custom formula, click the browse button next to the **Alt Code** field, then define a formula in the **Define Formula** dialog. See Specifying Formulas on page 395.

**Usage.** An element's usage can help make it more clear what the element is to be used for. For example, a 2" x 4" member could be used for Blocking, or for a Stud. Usages can be used as sort keys in estimates and quotes. Click the browse button to select a usage in the Usages library.

**Unit of Measure.** The unit of measure used to quantify the element. You can quantify an element in terms of a *Count*, *Length*, *Area* or *Volume*. For example, if you purchase vapor barrier in rolls, you might select **Roll** as the unit of measure. In this case you would be quantifying a *Count*. If you would rather measure your vapor barrier in linear feet, you would select **LNFT** instead, which is a *Length* measurement. You might want to quantify drywall in terms of *Area*, in which case your unit of measure might be **SQFT** or **SQMM**.

Units of measure are stored in a library for your convenience. You can add and edit units of measure in the Units of Measure library. Each unit of measure has a set of properties that determine what the unit quantifies (Count, Length, Area or Volume), the unit format (Decimal, Inches, etc.), the unit precision, and the unit text displayed after the numerical value. Most importantly, each unit of measure contains a conversion factor. The program measures all quantities in millimeters initially. The conversion factor is the number you need to multiply by to convert from millimeters to the unit you want.

Click the browse button next to the **Units** field to select a unit of measure from the Units of Measure library.

**Note:** The Unit of Measure selected on element's Quantity property page is not necessarily the unit that will be used in the project estimate. This is determined by the report template used to display your estimate, specifically the Record defined for that element in the report template. If the **Unit** in a Record is set to the **Quantity** variable, or to a formula that uses the **Quantity** variable, the program will use the measurement calculated from the Quantity page settings.

**Mark.** Displays a text mark on the element in 2D. Selecting **Auto** displays an auto-generated mark whose properties are determined by the default **Element Mark Settings** in your **Program Settings**. Selecting Custom enables you to type a custom text in the **Mark** field. If you do not want to display a mark, select **Off**.

**Include in Quantities.** Specifies whether or not the element will be included in quantity reports.

**Replace with Assemblies.** If disabled, and an element has assemblies defined on the **Quantity** tab, both the element and its assemblies will appear in quantity reports. If enabled, only the element's assemblies will be reported.

**Include cut lengths?.** (Members only) If enabled, tally lines containing cut lengths will be added to the quantity report, preceding the total linear length calculation of a member.



## Editing Material Pricing

Most elements have a default unit price set for them in their properties. These prices are used in the project estimate.

You can specify prices for elements in the catalog, or elements in your drawing. If you have already created your design, you can edit the prices of inserted elements by selecting them in the drawing, then editing their properties. Alternatively you can generate and save a project estimate, then edit the pricing in the estimate's associated editor, such as *Excel* or *Notepad* (depending on the report template used).

**Note:** You can specify pricing for material finishes (brick, paint, wallpaper, etc.) that are applied to elements by adding an assembly to the material. See Editing Material Properties.

### To edit the price of an inserted element:

1. Select the element in your drawing. You can select multiple elements of the same type using Shift+click.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the properties dialog, select the Quantity tab.
4. Edit the value in the **Price** edit box. Note that prices are unit prices. For a carpet, for example, you would enter the price per square foot, not the price of the entire carpet.
5. Click **OK** in the properties dialog.

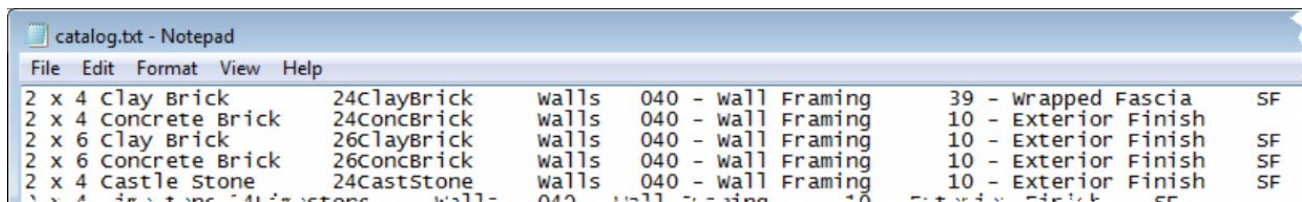
If you edit the price of any element in the catalog, the price change will affect all new insertions of the element.

### To edit material pricing in the catalog:

1. Select **File > Catalogs > Element Manager**, or right-click an element in the catalog and select **Element Manager**.
2. Select the element that you want to edit.
3. In the properties pane, select the Quantity tab.
4. Edit the value in the **Price** edit box. Note that prices are unit prices. For a carpet, for example, you would enter the price per square foot, not the price of the entire carpet.
5. Click **OK**.


## Exporting the Quantitative Properties of all Catalog Elements to a Text File

You can use the Export TXT File tool in the Element Manager to export the description and key quantitative properties of all catalog elements to a tab-separated text file. Each entry in the file includes the element Name, Part Number, Category, Phase, Usage, and Unit of Measure. Sample entries are shown below.



Quantity	Description	Part Number	Category	Phase	Usage	Unit of Measure
2 x 4	Clay Brick	24ClayBrick	walls	040 - wall Framing	39 - wrapped Fascia	SF
2 x 4	Concrete Brick	24ConcBrick	walls	040 - wall Framing	10 - Exterior Finish	
2 x 6	Clay Brick	26ClayBrick	walls	040 - wall Framing	10 - Exterior Finish	SF
2 x 6	Concrete Brick	26ConcBrick	walls	040 - wall Framing	10 - Exterior Finish	SF
2 x 4	Castle Stone	24CastStone	walls	040 - wall Framing	10 - Exterior Finish	SF

### To export the quantitative properties of elements to a text file:

1. Make sure that the catalog that you want to export is the current catalog.
2. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.
3. In the **Element Manager** dialog, select **File > Export TXT File**.
4. In the **Save As** dialog box, type a name for the file in the **File name** edit box (without extension).
5. Select the desired save location, then click **Save**.

## Attaching Assemblies to Elements


Assemblies are parts that are linked to an element, but do not exist in the drawing. For example, a door may have a Lock Set assembly attached to it which includes a door lock and a set of hinges. A wall may have a Drywall assembly that includes

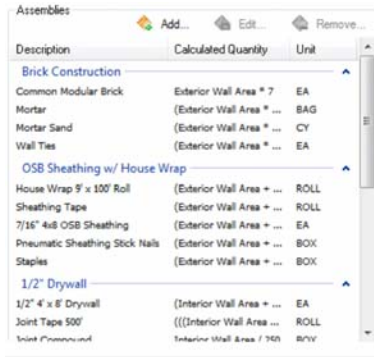
drywall sheets, drywall screws, and paint. If an element in your project has an assembly assigned to it in its properties, the materials in that assembly will be included in the quantity report. You can attach one or more assemblies to an element.

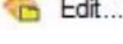
**To attach assemblies to an element:**

1. To attach assemblies to an inserted element, select the element, and then right-click and select **Properties**, or select **Edit > Modify Elements > Properties**. You can select multiple elements of the same type using Shift+click, or the **Select All Similar** tool.

To attach assemblies to an element in the catalog, select **File > Catalogs > Element Manager**. In the **Element Manager**, select the element in the left pane.

2. In the property dialog, select the **Quantity** tab.
3. Click  in the *Assemblies* area.
4. In the **Assembly** dialog, select the assembly that you want to attach to the element, then click **OK**. The contents of the assembly are displayed in the *Assemblies* pane on the Quantity page.



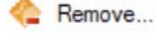
To edit an assembly that is attached to the element, select the assembly and click . You can then define the assembly in the **Assembly** library.

**Tip:** You can customize the **Assembly** library by adding or editing assemblies if needed.

**Removing an Assembly from an Element**

You can remove assemblies from an element using the Remove tool on the element’s Quantity property page.

**To remove an assembly from an element:**

1. Access the element’s Quantity property page.
2. In the *Assemblies* area, select the assembly that you want to remove.
3. Click .
4. Click **OK**.

**Replacing an Element with its Assemblies in Quantity Reports**

By default, if an element has assemblies defined on its Quantity property page, both the element and its assemblies will appear in quantity reports. You can choose to report only an element’s assemblies if you want.

**To replace an element with its assemblies in the quantity report:**

1. Access the element’s Quantity property page.
2. In the *Quantity* panel, enable the **Replace element with assemblies** check box. If this check box is disabled, the element will appear in the quantity report along with all of its assembly items.
3. Click **OK**.

## Viewing a Quantity Report

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The quantity report, or bill of materials, lists all of the materials used to build your house, as well as the quantity, unit price and total cost of each material. The quantity report also lists assemblies, which are part of an element's properties. For example, a wall may have assemblies such as studs, drywall, insulation, vapor barrier, and drywall screws.

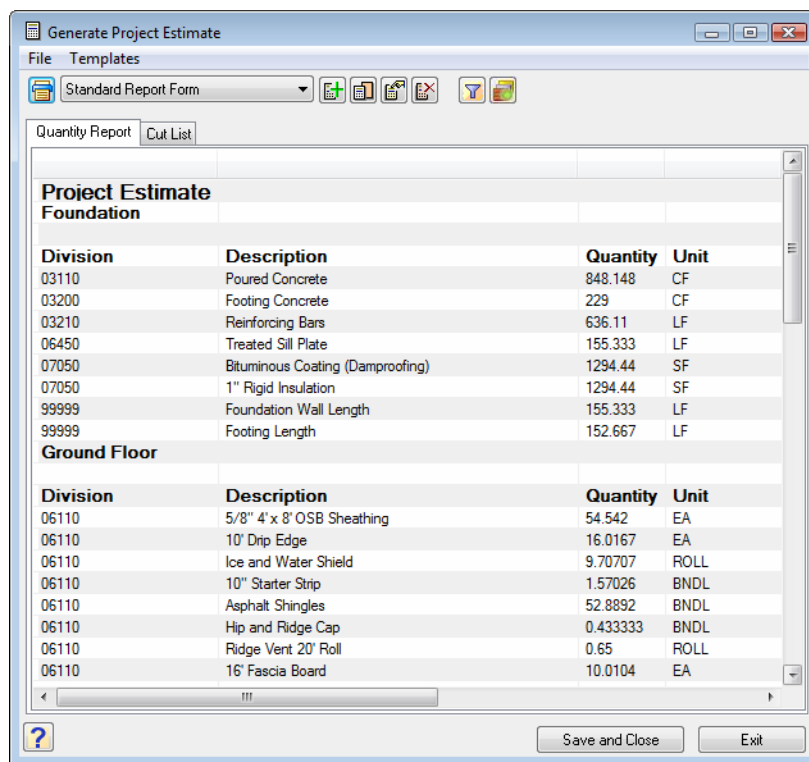
The quantity report is displayed on the Quantity Report page of the **Generate Project Estimate** dialog.

### To view a quantity report:

1. To view a quantity report for the full project, select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.

To view a quantity report for specific elements only, select the elements in your drawing, then right-click and select **Generate Estimate**.

2. Make sure the Quantity Report tab is selected.



## Selecting a Report Template

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By default, the quantity report uses the *Standard Report Form* template, which generates a TXT file. You can select a different report template to use if you want. Below is a list of the available templates.

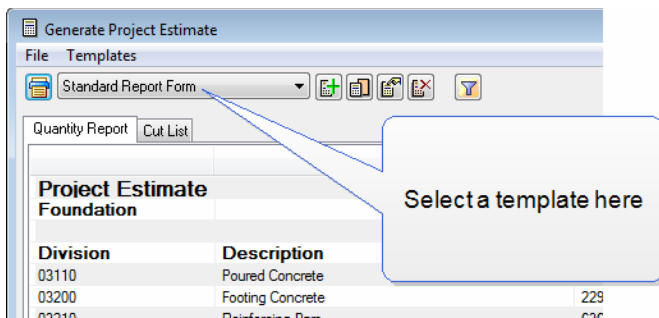
- Standard Report Form
- Microsoft® Excel XLS
- BuilderTREND Link
- CG Visions BIM Pipeline
- Constellation Buildsoft
- Constellation FAST

- Constellation HomeDev
- Constellation NEWSTAR
- Estimator (CSV by Cadsoft)
- PrioSoft File Format (CSV)
- ProEst Quantity Template (TXT)
- Quote Generator
- CSG TakeOff Plus (TXT)
- UDA Construction Office™ (XLS)

If you created a custom template in an older version of the program, or would like to use a template that you have copied to your system but don't see in the list, you can open it using the Open Template tool.

**To select a report template:**

1. In the Generate Project Estimate dialog, select the template you want to use from the template drop box.



**To open a report template that is not in the list:**




1. In the Generate Project Estimate dialog, click the Open Template button.
2. In the **Open** dialog, locate the template that you want to open. If the template was created in the current version of the program, it will have an \*.RXML extension. If the template was created in an older version of the program, click the drop box next to the **File Name** edit box and select **Report Template (pre-version 8.0)**, then locate the template. It will have an \*.RPT extension.
3. Click **Open**.
4. In the **Report Template** dialog, click **Save**. The template is added to the list, and your estimate is displayed using that template.

**Filtering Locations from an Estimate**

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In a project estimate, materials are grouped by location, and there is a terrain category for landscaping materials. You can omit a location from your quantity report and/or cut list if you want.


**To filter locations from the estimate:**


1. In the Generate Project Estimate dialog, make sure the correct tab is selected (Quantity Report or Cut List). The location filter applies to the current tab only.
2. Click  beside the report form drop box.
3. To omit a location and its elements from the report, click the location's filter icon. You can omit landscaping elements from the report by filtering the terrain out.
4. Click **OK**. The estimate is updated.

## Ignoring Assemblies Attached to Materials

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If an element has a material applied to it on its Appearance property page, that material may have an assembly attached to it. By default, the information contained in those assemblies is included in the quantity report so that material pricing is included in the overall project cost.

To ignore the information in assemblies that are attached to materials, click  in the **Generate Project Estimate** dialog box. The estimate will regenerate itself.


If you have chosen to ignore material assemblies, you can choose to include them again by clicking .

## Printing a Quantity Report

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You can print the quantity report directly from the **Generate Project Estimate** dialog. Alternatively you can open the quantity report in its associated editor and print it there.

### To print the quantity report:

1. If you are in the **Generate Project Estimate** dialog, select the Quantity Report tab.
2. Select **File > Print**, or click  to the left of the report form drop box.
3. In the **Print** dialog, select the printer you want to use, then click **Print**.

**Tip:** You can also print a saved report by opening it in its associated editor, and printing it from there.

## Saving a Quantity Report

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The **Generate Project Estimate** dialog acts like a viewer for your quantity report. If you want to save the quantity report to a file, you need to use the Save and Close tool. By default, quantity reports are saved in the same directory where the project is saved. The file extension depends on the currently selected report template.

### To save the current quantity report:

1. In the Generate Project Estimate dialog, select **File > Save and Close**, or click the **Save and Close** button at the bottom of the dialog.
2. In the **Save As** dialog, select the folder where you want to save the file, then type a name for the report in the **File Name** edit box.
3. Click **Save**.

## Opening a Quantity Report in its Associated Editor



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You can choose to open your quantity report in its associated editor. For example, if the report is using the Standard Report Form template, which generates a TXT file, the report will open in *Notepad*. You can do this directly from the **Generate Project Estimate** dialog, or by using the View Project Estimate tool.

### To open a quantity report from the Generate Project Estimate dialog:

1. In the Generate Project Estimate dialog, select **File > Open with Associated Editor**.

### To view a saved quantity report:

1. Select **Tools > Analyze > View Project Estimate**, or click  on the Analyze toolbar.
2. In the **View Project Estimate** dialog, click , then locate the file to open.
3. Click **Open**. The report opens in its associated editor.

**Tip:** If you have already saved your quantity report, an alternative way of opening the quantity report is to double-click the file in *Windows Explorer*, or to open the associated editor and use that program's Open function.

## Closing the Generate Project Estimate Dialog

When you are finished viewing the current project estimate, you can close the **Generate Project Estimate** dialog without saving the estimate.

**To close the Generate Project Estimate dialog:**

1. Select **File > Exit**, or click  in the top right corner of the dialog.

**Note:** This does not save the estimate. If you want to save before closing, click the **Save and Close** button in the dialog.

## Excluding Elements from a Quantity Report

You can prevent an element from appearing in the quantity report by changing a setting on the element's Quantity property page.

**To prevent an element from appearing in a quantity report:**

1. Select the element in your drawing.
2. Right-click and select **Properties**.
3. In the properties dialog, select the Quantity tab.
4. Disable the **Include Element in Quantities** check box.
5. Click **OK**.

**Note:** You can also apply this change to elements in the catalog. The change will affect all new insertions of the element.


**Note:** As an alternative, you can filter selected elements from your quantity report by editing the report template.

## Viewing a Cut List

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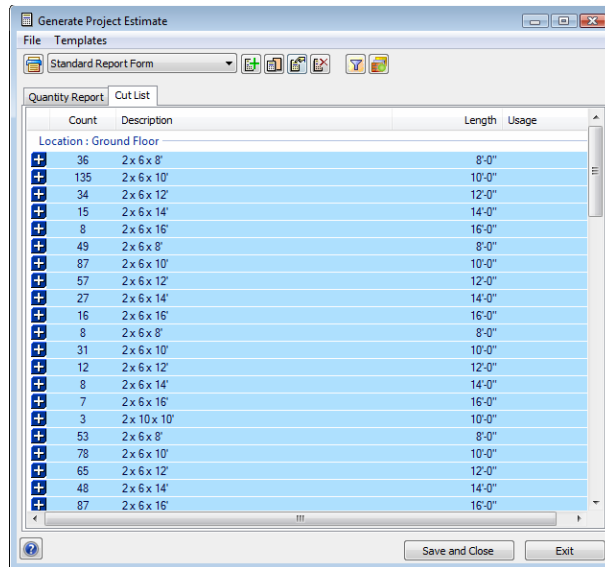
The cut list is displayed on the Cut List page of the **Generate Project Estimate** dialog. The cut list reports all the timber and steel members in your drawing. It calculates the number of members you need to buy from your supplier using the purchased lengths specified in each member's properties.


**To view a cut list:**

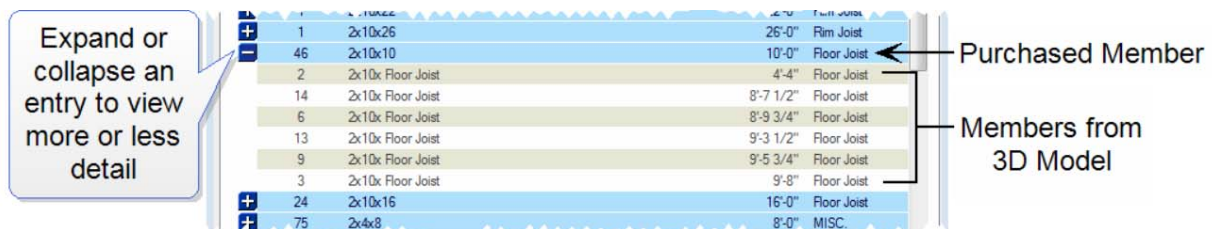
1. To view a cut list for the full project, select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.

To view a cut list for specific elements only, select the elements in your drawing, then right-click and select **Generate Estimate**.

2. In the **Generate Project Estimate** dialog, select the Cut List tab.



3. By default, purchased items are grouped by building location and usage. You can set different grouping options in your Optimization Settings. For example, you can group by Usage if you want. The cut list is color-coded to make it easy to read and understand. Purchased items are the main entries and are highlighted in blue. You can expand each purchased member entry to see exactly how the number of members was calculated (i.e. how the members in your 3D model were cut down into purchased lengths). To expand an entry, click the plus sign  to the left of the entry. The breakdown list is highlighted in an alternating gray and white pattern.



**Note:** Currently the cut list does not report deck boards — only beams and joists. Deck boards are, however, included in the quantity report.



**Note:** To optimize the cut list and define settings that determine how the content is sorted and displayed, you need to edit the report template that you are using to display the estimate. See [Optimizing a Cut List on page 377](#).

## Optimizing a Cut List

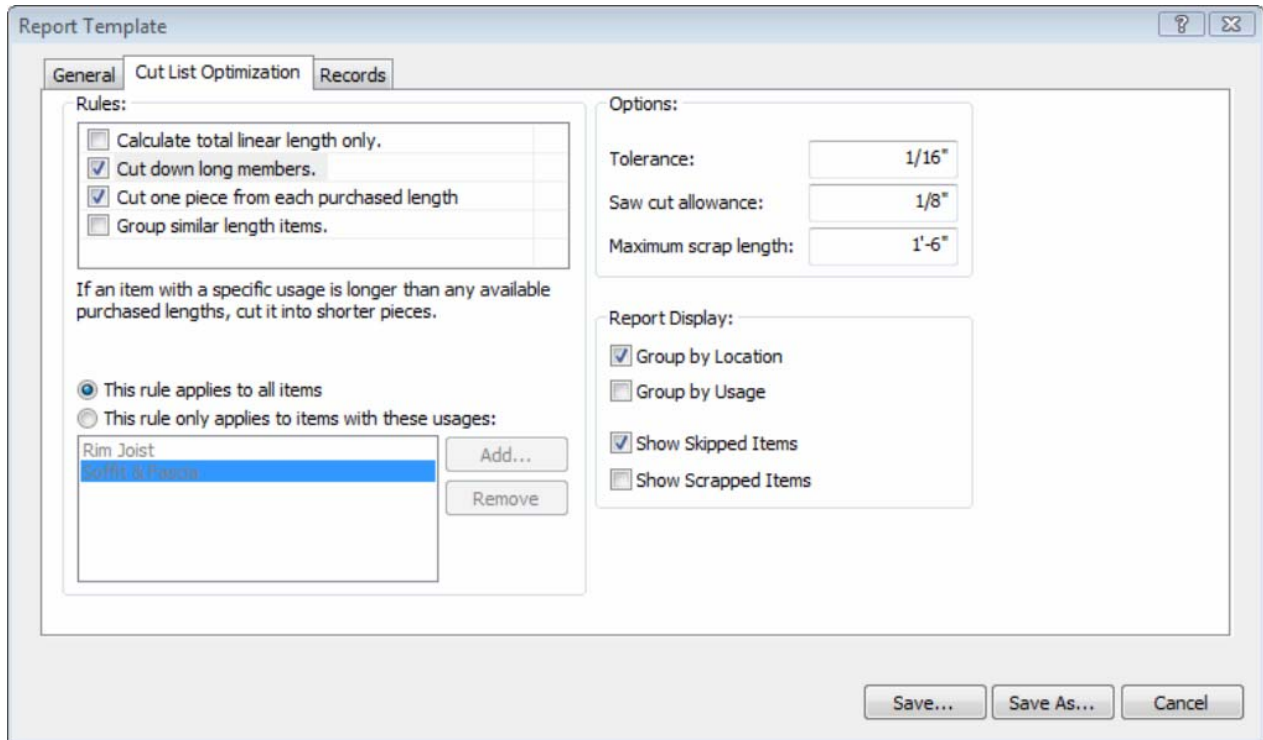
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You can optimize your cut list in a variety of ways to calculate the best combination from the stock lengths available and therefore minimize waste. You can set a number of different rules that determine how members are cut, as well as options such as the saw cut allowance and maximum scrap length. You can also define how you want the items in your cut list to be sorted and displayed. Optimization settings are defined in the report template.

### To optimize a cut list:

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to use from the template drop box.
3. Select **Templates > Edit**, or click  on the toolbar.
4. In the **Report Template** dialog, select the **Cut List Optimization** tab.




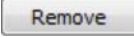


5. To set rules that determine how members should be cut or reported, enable or disable the appropriate check boxes in the **Rules** pane. Below is a description of each available rule.

**Calculate total linear length only.** Reports members in the quantity report in terms of total linear length. If disabled, purchased lengths are reported in the quantity report.

**Cut down long members.** For members with specific usages whose length exceeds the maximum purchased length defined on the member's *Purchased Items* property page, this lets you cut down the member into shorter pieces. For example, if a member is 20' long in the drawing but the longest purchased length defined in that member's properties is 16', the member may be broken down into a 12' piece and 8' piece if **Cut down long members** is turned on.

To select the usages to which you want this rule to apply, enable and select the rule in the list, then click  next to the usage pane to access the **Usages** library. When you select a usage in the library and click **OK**, it is added to the usage pane below the list of rules.

To remove a usage from the usage pane, select the usage, then click .

**Note:** If **Cut down long members** is turned off and a member is detected that is longer than the maximum purchased length defined in the member's properties, the member will become a *skipped item*, which is an item that cannot be cut according to the defined purchased lengths and cutting rules. You can display skipped items in the cut list by enabling the **Show Skipped Items** check box.

**Cut one piece from each purchased length.** Cuts only one piece from each purchased length provided that the leftover piece is short enough to be scrapped. You can define the **Maximum Scrap Length** in the dialog's **Options** pane. If you disable the **Cut one piece from each purchased length** option, you are allowing more than one piece to be cut from each purchased length.

**Group similar length items.** Cuts items of similar length from the same purchased length whenever possible. This reflects the way many contractors work on site.

Note that when purchased lengths of members are cut, the quantity optimizer evaluates the leftover piece a second time to ensure optimal lumber usage.

6. To specify a tolerance for member lengths, enter the desired value in the **Tolerance** edit box. For example, if you have a member that is 8'-1/32" and your tolerance is set to 0, the member would be bumped up to the next available pur-



chased member length (e.g. 10'). If the tolerance is set to 1/32", however, it would use the 8' purchased member length because the extra 1/32" is less than or equal to the allowable tolerance.

7. To account for the scrap resulting from the gauge of the saw's cutting blade, enter the saw blade width in the **Saw Cut Allowance** edit box.
8. To specify the maximum length a piece can be to be considered scrap, enter the desired value in the **Maximum Scrap Length** edit box. When members are cut, any leftover pieces that exceed the Maximum Scrap Length are not considered scrap and will be used for other usages if possible.
9. To group members by building location in the cut list, enable the **Group by Location** check box.
10. To group members by usage, enable the **Group by Usage** check box.
11. To display items that do not fit within the purchased member definitions and cutting rules, enable the **Show Skipped Items** check box. For example, if the **Cut down long members** rule is disabled and there is a member in the drawing that is longer than the maximum purchased length defined in the member's properties, the member will not be displayed in the cut list unless you enable the **Show Skipped Items** check box. Skipped items are shown in red in the cut list.

Location : Second Floor - Skipped Items

3	2x6x Misc. (skipped)	23'-0"	MISC.
2	2x4x Misc. (skipped)	22'-6 1/2"	MISC.
1	2x4x Misc. (skipped)	23'-5 1/2"	MISC.
2	2x8x Rafter (skipped)	37'-11 1/2"	Rafter

12. To display all scrapped items in the cut list, enable the **Show Scrapped Items** check box. A scrapped item is the piece left over after a member has been cut from a purchased length. Scrapped items are highlighted in alternating fields of green and white at the end of the cut list.

Location : Second Floor - Scrapped Items

1	2x6x8	3/4"	MISC.
2	2x6x10	1"	MISC.
1	2x6x20	1 3/32"	MISC.
2	2x6x16	1 1/2"	MISC.
1	2x6x20	2 27/32"	MISC.
4	2x6x14	3 17/32"	MISC.
1	2x6x14	3 3/4"	MISC.


13. Once you have defined your optimization settings, click **Save** in the **Report Template** dialog. The cut list updates automatically.

## Printing a Cut List

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You can print a cut list directly from the **Generate Project Estimate** dialog.

### To print a cut list:



1. In the Generate Project Estimate dialog, select the Cut List tab.
2. Select **File > Print**, or click  to the left of the report form drop box.
3. In the **Print** dialog, select the printer you want to use, then click **Print**.

## Specifying How Members are Reported in the Quantity Report

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Members can be reported in terms of **total linear length**, or in **purchased lengths** in the quantity report. Purchased lengths are the lengths of lumber you would actually buy at the lumber yard. This option is set in the report template that you select for your estimate.

**To specify how you want members to be reported:**

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to use for the quantity report.
3. Select **Templates > Edit**, or click  on the toolbar.
4. In the **Report Template** dialog, select the **Cut List Optimization** tab.
5. If you want to report the member in terms of total linear length, enable the **Calculate Total Linear Length Only** check box.
6. If you want to report the member in purchased lengths, disable the **Calculate Total Linear Length Only** check box. You will then need to define purchased member lengths for members in your project.

**Tip:** You can optimize the way members are cut to reduce waste as much as possible. See *Optimizing a Cut List* on page 377. If you want to include cut lengths for a member type in your Quantity Report, enable the *Include Cut Lengths* option in the member's properties. See *Editing the Quantitative Properties of Elements* on page 369.

## Specifying Purchased Lengths for Members

Members can be reported in terms of **total linear length**, or in **purchased lengths** in the quantity report. Purchased lengths are the lengths of lumber you would actually buy at the lumber yard.

If you want to use purchased lengths in your quantity report, you must specify that you want to use purchased lengths in your report template (see *Specifying How Members are Reported in the Quantity Report* on page 379), and define purchased lengths on a member's **Purchased Items** property page. Otherwise, members are reported in terms of total linear length. For example, if you have 1000 feet worth of 2" x 6" floor joists in your model, the cut list will report 1000 feet of 2" x 6" floor joists if you don't have purchased lengths specified for 2" x 6" floor joists in your model. If, however, you specify an 8', 10' and 12' purchased length for the floor joist members, the cut list will report a certain number of 8' floor joists, a certain number of 10' floor joists, etc. - whatever is needed to account for that 1000 feet of floor joist material.

The **Purchased Items** property page also has a direct relationship with the Cut Down Long Members option on a report template's Cut List Optimization page. If this option is enabled, members that exceed the longest purchased length will be reported using a combination of cut lengths specified on a member's **Purchased Items** property page.

For example, you might have 40' of top plate on one wall, but you likely wouldn't buy a 40' member. It would be more realistic to buy several smaller lengths to make up that 40' of top plate.

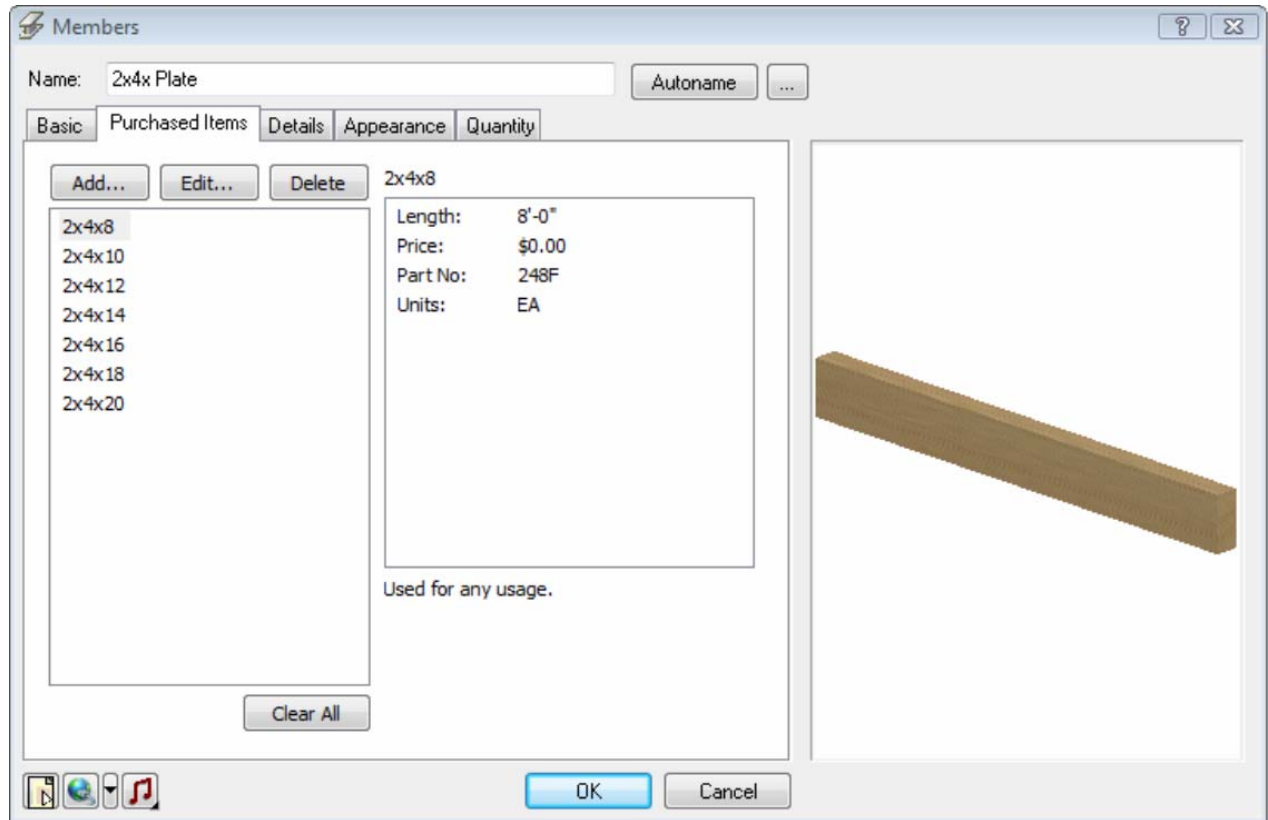
**To specify purchased lengths for a member:**

1. To specify purchased lengths for wall, floor, ceiling or surface members in your drawing, select the element in your drawing, then right-click and select **Properties**. For walls, click the **Framing member** button in the properties dialog. For floors, ceilings, roofs and surfaces, click the **Specify Framing** button in the properties dialog. In the framing dialog, select the member to edit, then click **Select**. In the **Catalog Access** dialog, right-click the member to edit and select **Edit Element**.

To specify cut lengths for a member in the catalog, double-click the member in the catalog panel, or select it in the catalog panel and then right-click and select **Edit Element**. You can also open the Element Manager, then select the member that you want to edit.

To specify cut lengths for members in an existing deck, click on the edge of the deck to select it, then right-click and select **Properties**. In the **Decks** dialog, select the Frame tab. Then, click the **Select** button in the *Joists* or *Beams* area. Note that it is not currently possible to specify cut lengths for deck boards (planking). In the **Catalog Access** dialog, right-click the member to edit and select **Edit Element**.

2. In the properties dialog, select the **Purchased Items** tab. All cut lengths currently defined for the item are displayed.



- 3.
4. To delete a purchased length from the list, select it and then click **Delete**. To delete all purchased lengths from the list, click **Clear All**.
5. To add a purchased length to the list, click **Add**. To edit an existing purchased length, select it in the list, then click **Edit**.
6. Define the properties of the purchased length in the **Define Purchased Member** dialog.





7. Specify a name for the purchased length as you would like it to appear in your estimate. If you want to name it automatically using a pre-defined naming convention, click the **Autoname** button. (See Using Automatic Name Generation on page 474.)
8. Enter the desired length for the item in the **Length** edit box.
9. In the *Purchased Member Use* area, specify which usages the purchased length can be used for. (Usages can be used as sort keys in estimates and quotes.)

If the purchased length can be used for any usage, enable the **All usages** radio button.

If you want the purchased length to be used for certain usages only, enable the **Only these usages** radio button, then

Click **Add Usage...** to select the desired usages from the **Usages** library. When you select a usage in the library, it is added to the usage list in the **Define Purchased Items** dialog.

If the purchased length can be used for most usages with some exceptions, enable the **Any usage except these** radio button, then click  to select the usages that you do not want the purchased length to be used for. When you select a usage in the **Usages** library it is added to the usage list.

To delete a usage from the usage list, select it and then click .

10. In the *Quantity* area, specify the *Price*, *Part Number* and *Unit of Measure* for the member. This information may appear in estimates and quotes, and can be used to sort information in reports.
11. Once you have defined the purchased length, click **OK** in the **Define Purchased Items** dialog.
12. Once you have defined all desired purchased lengths for the member, click **OK** in the properties dialog.


**Note:** If you want to include cut lengths for a member type in your Quantity Report, enable the *Include Cut Lengths* option in the member's properties. See Editing the Quantitative Properties of Elements on page 369.

## Disabling or Enabling Cut List Generation

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If you are not interested in viewing a cut list, you can disable cut list generation if you want. If you do so, the Cut List page of the **Generate Project Estimate** dialog will be blank. This option is set in your report template.

**To disable or enable cut list generation:**



1. Select **Tools > Analyze > Generate Project Estimate**.
2. In the **Generate Project Estimate** dialog, select the template you would like to use.
3. Select **Templates > Edit**, or click  on the toolbar.
4. In the **Report Template** dialog, on the General page, disable the **Optimize Cut List** check box.
5. Click **Save**.

## Creating a New Report Template

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The content and appearance of a project estimate are determined by a report template. There are a variety of report templates that you can edit to suit your needs. You can also create new templates if you prefer.

**To create a new report template:**



1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select **Templates > New**, or click  on the toolbar.
3. Define your template settings in the **Report Template** dialog.
4. Click **Save**. The current estimate updates automatically in the **Generate Project Estimate** dialog.

## Opening a Report Template

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If you created a custom template in an older version of the program, or would like to use a template that you have copied to your system but don't see listed in the Generate Project Estimate dialog, you can open it using the Open Template tool.

**To open a report template that is not in the list:**

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select **Templates > Open**, or click the Open Template button .
3. In the **Open** dialog, locate the template that you want to open. If the template was created in the current version of the program, it will have an \*.RXML extension. If the template was created in an older version of the program, click the

drop box next to the **File Name** edit box and select **Report Template (pre-version 8.0)**, then locate the template. It will have an \*.RPT extension.

4. Click **Open**. The template's properties are displayed in the **Report Template** dialog box.
5. In the **Report Template** dialog, click **Save**. The template is added to the list, and your estimate is displayed using that template.



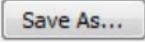
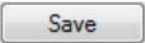
**Note:** When you save a template that was created in an older version of the program, a copy of the template is saved in the current \*.RXML format. The original file will remain on your system in its original format.

## Copying a Report Template

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You can create a copy of an existing report template by saving it under a different name. You can then edit the copied template to suit your needs.

**To create a copy of an existing report template:**



1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template to copy from the report form drop box, then click  on the toolbar.
3. In the **Report Template** dialog, click .
4. In the **Save As** dialog, type a name for the new file in the **File Name** edit box. It will be saved in RXML format.
5. Click . The template is added to your list of report templates.

## Editing a Report Template

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The content and appearance of a project estimate are determined by a report template. You can edit any of the report templates to suit your needs.

**To edit an existing report template:**



1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template to edit from the report template drop box.
3. Select **Templates > Edit**, or click  on the toolbar.
4. Edit your template settings in the **Report Template** dialog. See Report Template Properties on page 384.
5. Click **Save**. The current estimate updates automatically in the **Generate Project Estimate** dialog.

## Deleting a Report Template

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You can delete a report template from your list of templates if you want.

**To delete a report template:**

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template to delete from the report template drop box.
3. Select **Templates > Delete**, or click  on the toolbar.
4. Click **Yes** to confirm the deletion. The template is deleted. By default the report now uses the previous template in the list.

## Report Template Properties

Report templates have a detailed set of properties that you can customize to suit your needs. When creating or editing a template, you can specify the following:

### General Settings

To access general report template properties, select the **General** tab in the Report Template dialog.

General settings, such as the template name, report file extension, sort order for information, and element filter. You can also choose to generate a cut list if you want.

**Description:** This is the description of the template as it appears in the list of available templates in the **Generate Project Estimate** dialog.

**Report Extension.** Determines the type of file the estimate is written to when you save it. The file type you choose in part determines what application launches when you select the Open with Associated Editor tool in the **Generate Project Estimate** dialog. You can use *Windows Explorer* to associate a file extension with a particular application.

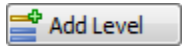
**Display Currency Symbol.** Controls the display of the currency symbol (e.g. dollar sign).

**Optimize Cut List:** Enable this check box if you want to produce a cut list in addition to the quantity report. You can specify cut list optimization settings on the Cut List Optimization tab.

**Use Cut List Results in Report.** Applies the cutting rules specified on the Cut List Optimization tab to the members in the quantity report.

#### Sort Options

Quantity information can be sorted by *Location*, *Division*, *Category*, *Phase*, *Usage*, *Supplier*, and *Alternate Code*. All of these fields (except *Location*) are specified on an element's Quantity property page. You can specify up to six levels of sorting in your report, and choose either *Ascending* or *Descending* for each level. The order in which sort keys appear in the Sort Options pane determine the order in which information is sorted. For example, if you choose to sort by *Location* and then by *Division*, the program will find the first location, list the first division of that location, then list all of the elements in that division. It will then list subsequent divisions and their elements until all divisions have been listed for that location.



**Add Level** Adds a sort level below the currently selected sort level. Once the level has been added, select the desired sort level from the drop box.



**Delete Level** Removes the currently selected sort level from the list.



**Promote Sort Level.** Moves the currently selected sort level up in the list.



**Demote Sort Level.** Moves the currently selected sort level down in the list.

#### Template Element Filter

The Template Element Filter determines which elements are included in the project estimate, and which are not.



Element will be included in the estimate.



Element will be omitted from the estimate.

Note that there is also a location filter in the **Generate Project Estimate** dialog that filters locations in your report.

## Optimization Settings

These settings apply to the cut list. For more information, see *Optimizing a Cut List* on page 377.

#### Rules

**Calculate Total Linear Length Only.** Reports members in terms of total linear length instead of purchased member lengths in the quantity report.


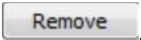
**Cut down long members.** For members with specific usages whose length exceeds the maximum purchased length defined on the member's *Purchased Items* property page, this lets you cut down the member into shorter pieces. For example, if a member is 20' long in the drawing but the longest purchased length defined in that member's properties is 16', the member may be broken down into a 12' piece and 8' piece if **Cut down long members** is turned on.



**Cut one piece from each purchased length.** Cuts only one piece from each purchased length provided that the leftover piece is short enough to be scrapped. You can define the **Maximum Scrap Allowance** in the dialog's **Options** pane. If you disable the **Cut one piece from each purchased length** option, you are allowing more than one piece to be cut from each purchased length.

**Group similar length items.** Cuts items of similar length from the same purchased length whenever possible. This reflects the way many contractors work on site.

**This rule applies to all items.** Applies the currently selected rule to all items, regardless of their usage.

**This rule only applies to items with these usages.** Applies the currently selected rule to items with specific usages only (those usages displayed in the box below this setting). To add a usage to the usage pane, click  and then select a usage from the Usage library. To remove a usage from the usage pane, select the usage, then click .

#### Options

**Tolerance.** The allowable tolerance for member lengths. For example, if you have a member that is 8'-1/32" and your tolerance is set to 0, the member would be bumped up to the next available purchased member length (e.g. 10'). If the tolerance is set to 1/32", however, it would use the 8' purchased member length because the extra 1/32" is less than or equal to the allowable tolerance.

**Saw cut allowance.** The width of the saw's cutting blade.

**Maximum scrap length.** The maximum length a piece can be to be considered scrap. When members are cut, any leftover pieces that exceed the Maximum Scrap Length are not considered scrap and will be used for other usages if possible.

#### Report Display

**Group by Location.** Groups items by building location in the cut list. (e.g. Ground Floor, Second Floor, etc.)

**Group by Usage.** Groups items by usage in the cut list. (e.g. Stud, Plate, Floor Joist, etc.)

**Show Skipped Items.** Displays items that do not fit within the purchased member definitions and cutting rules. For example, if the **Cut down long members** rule is disabled and there is a member in the drawing that is longer than the maximum purchased length defined in the member's properties, the member will not be displayed in the cut list unless you enable the **Show Skipped Items** check box. Skipped items are shown in red in the cut list.

**Show Scrapped Items.** Displays all scrapped items in the cut list. A scrapped item is the piece left over after a member has been cut from a purchased length.

## Record Settings

To access record properties, select the **Records** tab in the Report Template dialog.

Record settings, which determine how report headers, footers and element entries appear in the report. Each element type has its own default format with an appropriate listing of fields. You can add, edit and delete fields if you want. If you do this, however, make sure your headers correspond to the information being reported.

### Headers and Footers

Headers are words or strings of text (titles) that appear at the beginning of a document, or that introduce a block of information. For example, the default report header includes the title *Project Estimate* and the name of the drawing file. In addition to the main report header, you can specify up to three levels of subsequent headers. For example, Level 1 headers could include titles like Description, Quantity and Price, which identify specific types of information that follow them.

Footers are words or strings of text that appear at the bottom of reports or blocks of information. You can specify a main report footer as well as additional levels of footers if you want. See Editing Headers and Footers in a Report Template on page 389.

### Elements

Each element type can be reported differently in your quantity report using a format that you specify. For example, walls are generally reported in terms of length (linear feet), while elements like doors are counted as individual items. Floors and ceilings are reported in terms of area (square feet), in which case a formula is used to determine the quantity value.



Each element type has its own default format with an appropriate listing of fields. You can add, edit and delete fields if you want. If you do this, however, make sure your headers correspond to the information being reported. See Editing Element Entries in a Report Template on page 391.

## Editing the Name of a Report Template

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You can edit the name of any report template on the template's General property page. This is the name you see in the **Generate Project Estimate** dialog's report form drop box.

**To edit the name of a report template:**



1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template to edit from the report template drop box.
3. Select **Templates > Edit**, or click  on the toolbar.
4. On the General page of the **Report Template** dialog, edit the name in the **Description** edit box.
5. Click **Save**.

## Editing the File Extension of Generated Quantity Reports

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When you save a quantity report, it is written to a file whose type is determined by the report template you are using. For example, the file type created when using the Standard Report Form template is a TXT file. You can edit the file type generated by editing the report template.

**To edit the file extension of generated reports:**

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to edit from the report template drop box.
3. Select **Templates > Edit**, or click  on the toolbar.
4. On the General page of the **Report Template** dialog, edit the file extension in the **Report Extension** edit box.
5. Click **Save**.



The file type you choose in part determines what application launches when you select the Open with Associated Editor tool in the **Generate Project Estimate** dialog.

## Controlling the Display of the Currency Symbol in a Quantity Report

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Prices and costs in the quantity report usually include a currency symbol, such as a dollar sign. You can disable the display of the currency symbol by editing the report template.

**To control the display of the currency symbol:**

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to edit from the report template drop box.
3. Select **Templates > Edit**, or click  on the toolbar.
4. On the General page of the **Report Template** dialog, check or uncheck the **Display Currency Symbol** check box.
5. Click **Save**.



## Using Optimized Results for Members in the Quantity Report

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For those members which are set to be reported in purchased lengths instead of total linear length, you can choose whether or not you want to apply optimization settings to those purchased lengths in your quantity report. Optimization settings are defined in the report template that you apply to your project estimate.



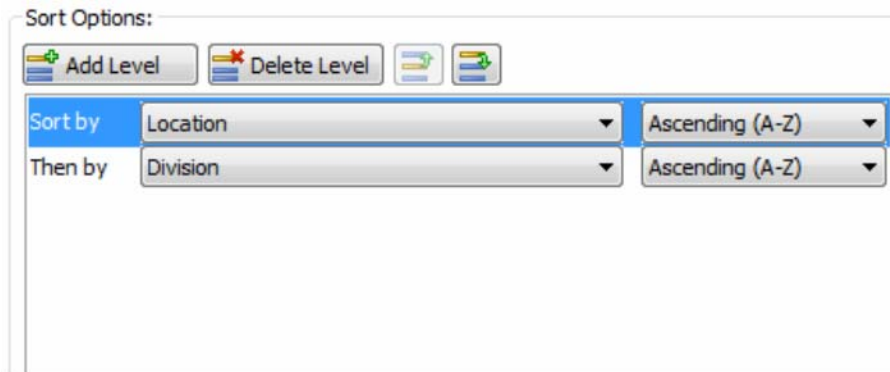
**To use optimized results for members in your quantity report:**



1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to use for the quantity report.
3. Select **Templates > Edit**, or click  on the toolbar.
4. In the **Report Template** dialog, on the General page, make sure the **Optimize Cut List** check box is enabled, and then enable the **Use Cut List Results in Report** check box.
5. Click **Save**.

**Specifying the Sort Order of Materials in a Quantity Report**

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Sorting rules for materials are specified in the report template that is applied to the project estimate. Quantity information can be sorted by *Location*, *Division*, *Category*, *Phase*, *Usage*, and *Alternate Code* in the quantity report. All of these fields (except *Location*) are specified on an element's Quantity property page. You can specify up to six levels of sorting in your report, and choose either *Ascending* or *Descending* for each level. The order in which sort keys appear in the Sort Options pane determine the order in which information is sorted. For example, if you choose to sort by *Location* and then by *Division*, the program will find the first location, list the first division of that location, then list all of the elements in that division. It will then list subsequent divisions and their elements until all divisions have been listed for that location.


**To specify the sort order of materials in an estimate:**


1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to edit from the report template drop box.
3. Select **Templates > Edit**, or click  on the toolbar.
4. On the General page of the **Report Template** dialog, specify your sort options in the *Sort Options* area.

The first entry in the list is the primary **Sort Level** for the report. Once materials have been sorted according to the first sort level, they are then sorted according to the next sort level in the list, and so on. You can specify up to 6 sort levels for your report. The order in which sort keys appear in the list is the order in which materials will be sorted.

To add a sort level to the report template, click . The sort level is added below the one that was selected prior to adding a level. Once the sort level is added to the list, click the drop box and select the key that you want to sort by (Location, Division, Phase, etc.).

To remove a sort level from the report template, select the sort level in the list, and then click .

To move a sort level up in the list, select the sort level in the list and then click .

To move a sort level down in the list, select the sort level in the list and then click .


5. Click **Save** to save your changes.


## Filtering Elements from the Quantity Report


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You can omit specific types of elements from your quantity report by editing the report template. For example, if you wanted to create a window schedule, you would enable the Windows element group and disable all other element groups.

### To filter elements from a project estimate:

1. In the Generate Project Estimate dialog, select **Templates > Edit**, or click  on the toolbar.
2. In the **Report Template** dialog, click the filter icon of the element you want to filter. When the filter icon is white, the element will not appear in the estimate.

 Element will be included in the estimate.

 Element will be omitted from the estimate.

3. Click **Save**. The quantity report updates automatically in the **Generate Project Estimate** dialog.



**Note:** You can also prevent an element from appearing in the quantity report by editing the element's properties. See [Excluding Elements from a Quantity Report](#) on page 376.

## Specifying How Information is Displayed in a Quantity Report

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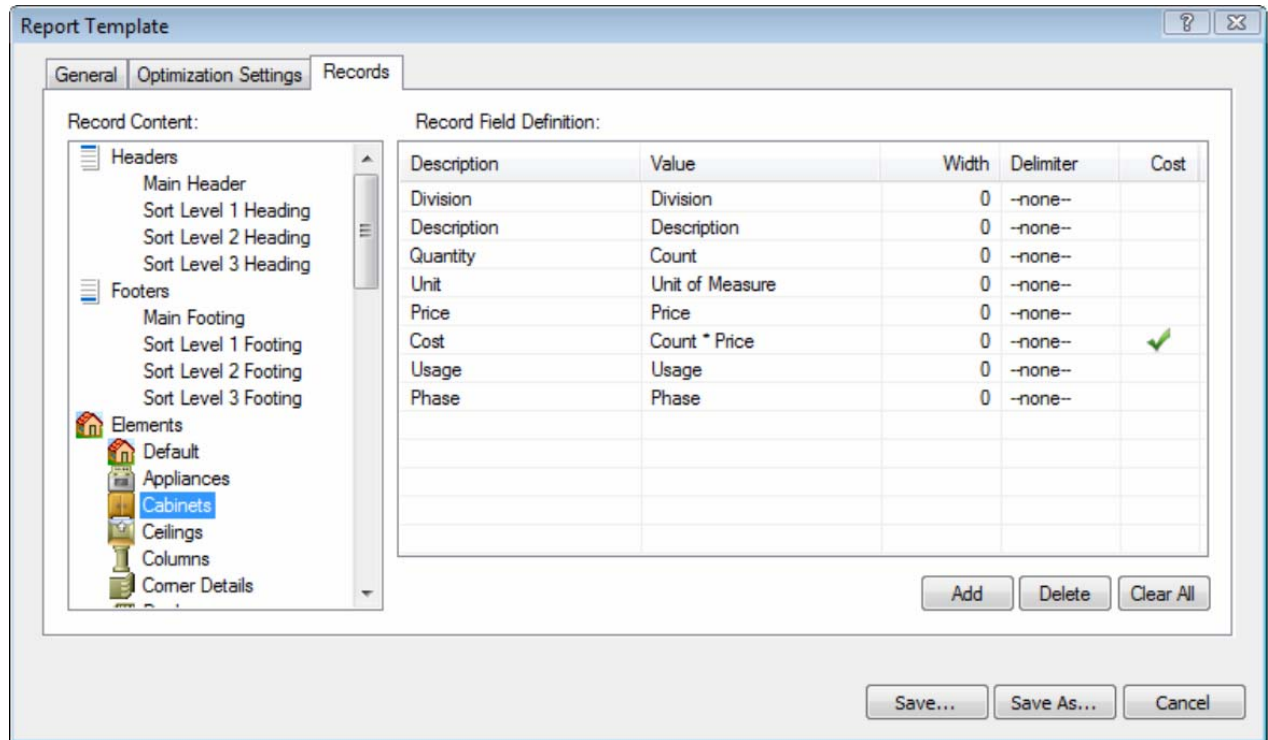
The settings on a template's Records page determine how report headers, footers and element entries appear in a project estimate. Records are made up of individual fields. You can edit, add, delete or copy fields within a record, giving you complete control over how information is reported.

### To access the Records page:

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to use for your estimate.
3. Select **Templates > Edit**, or click  on the toolbar.
4. In the **Report Template** dialog, select the **Records** tab.

### To display a record:

1. In the *Record Content* window, expand the item you want to view records for (Report Header, Report Footer or Elements).



2. Select the record that you want to view. The record is displayed in the adjacent *Record Field Definition* window.

Below is a sample element record that contains six fields:

**08210 32" Hinged Door 3.00 Ea. \$40.00 \$120.00**

Here are the fields that make up the record:

**08210:** Division (variable)

**32" Hinged Door:** Description (variable)

**3.00:** Count (variable)

**Ea.:** Unit (constant)

**\$40.00:** Price (variable)

**\$120.00:** Cost (formula: Count\*Price)



## Editing Headers and Footers in a Report Template

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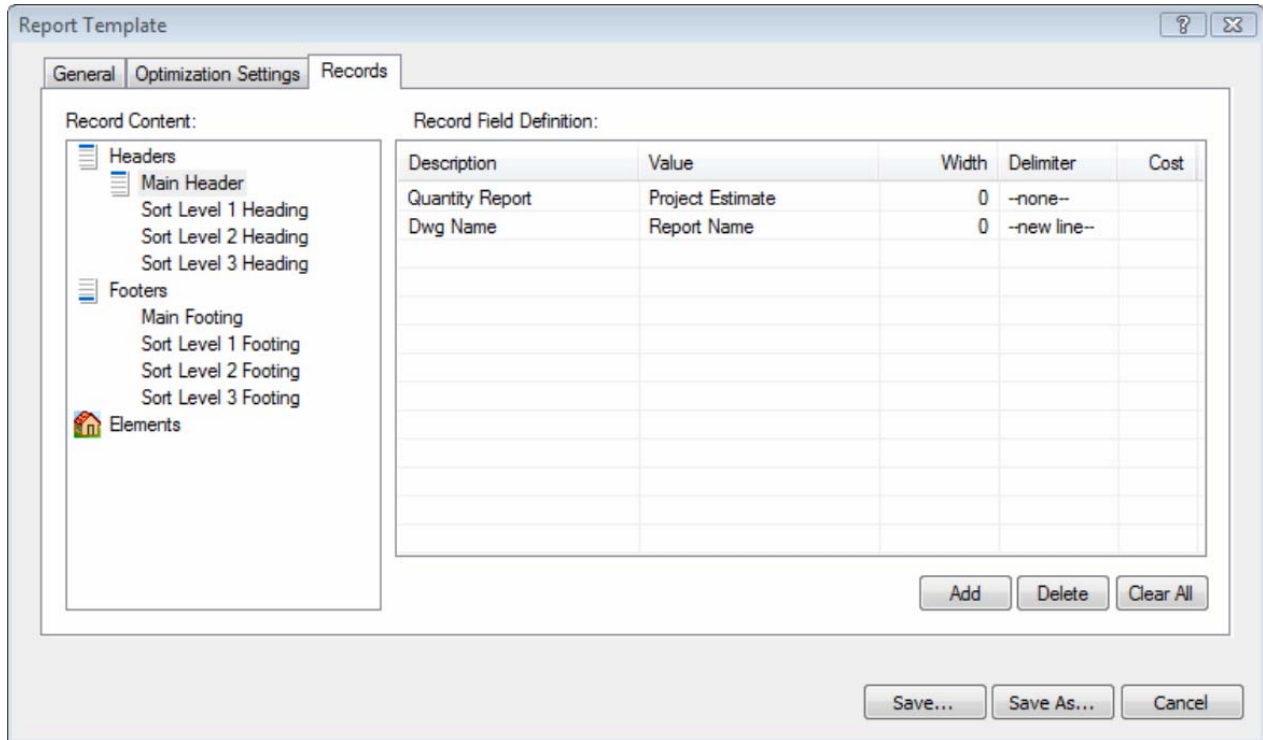
Headers are words or strings of text (titles) that appear at the beginning of a document, or that introduce a block of information. For example, the default report header includes the title "Project Estimate" and the project name. In addition to the main report header, you can specify up to three levels of subsequent headers. For example, Level 1 headers could include titles like Description, Quantity and Price, which identify specific types of information that follow them.

Footers are words or strings of text that appear at the bottom of reports or blocks of information. You can specify a main report footer as well as additional levels of footers if you want.

### To edit a header or footer:

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select **Templates > Edit**, or click  on the toolbar.
3. In the **Report Template** dialog, select the **Records** tab.
4. In the *Record Content* window, expand the **Headers** or **Footers** group.

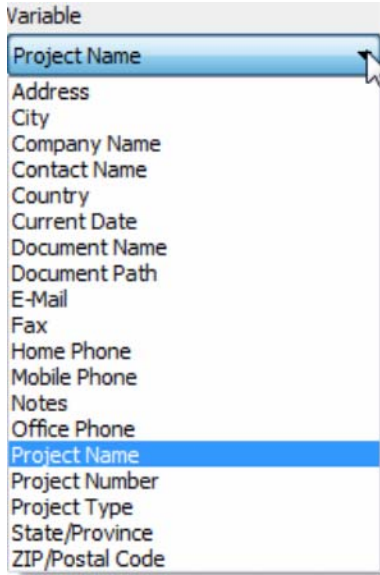
5. Select the record you want to edit (e.g. *Main Header*).



6. Click on the field you want to edit. Then, depending on the type of field it is, either type a value (in the case of the *Description* field, for example), or make a selection from a drop box.

**Description.** Identifies the field by name.

**Value.** To specify a value for a header/footer field, click in the Value field and then click  to access the **Specify Value** dialog. For headers and footers, this will likely be either a *Constant* or *Variable*. For example, if you wanted to specify a title, you would select the *Constant* option and then type the desired title (e.g. 'Project Estimate' or 'Location') in the edit box. If you wanted to specify a value that changes depending on the project, such as the project name, you would select the *Variable* option and then select the desired variable from the list (e.g. Project Name). Most header/footer variables are directly linked to fields in the **Project Manager** dialog.



**Width.** The maximum width of the field. If the field entry exceeds the field width, the entry will be shortened to fit.

**Delimiter.** An item that separates one field from another. Choose from *Comma*, *Tab*, *New Line* or *None*.



- When you are finished editing fields, click **Save**. The estimate updates automatically to reflect your changes.

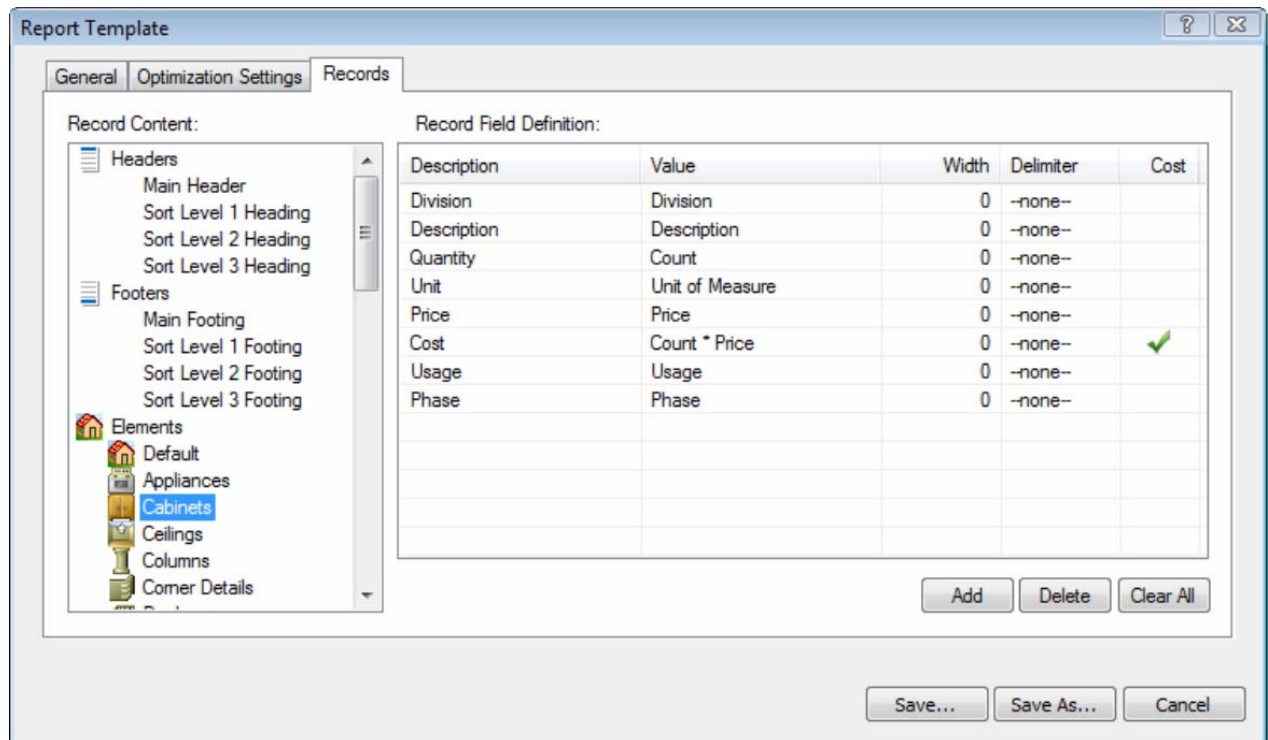
## Editing Element Entries in a Report Template

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Each element type can be reported differently in your project estimate using a format that you specify. For example, walls are generally reported in terms of length (linear feet), while elements like doors are counted as individual items. Floors and ceilings are reported in terms of area (square feet), in which case a formula is used to determine the quantity value.


Each element type has its own default format with an appropriate listing of fields. You can add and delete fields if you want. If you do this, however, make sure your headers correspond to the information being reported.

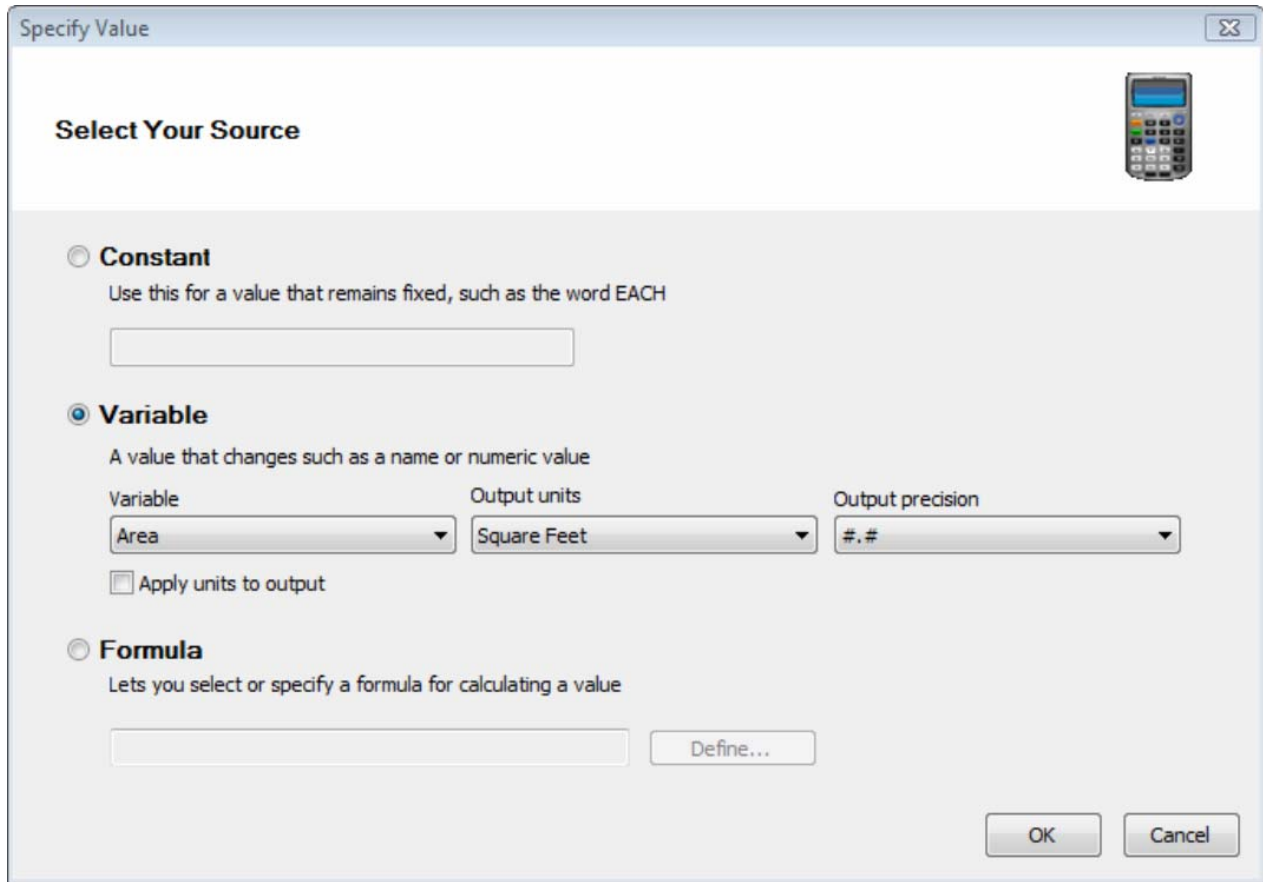
- Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
- In the **Generate Project Estimate** dialog, select **Templates > Edit**, or click  on the toolbar.
- In the **Report Template** dialog, select the **Records** tab.
- In the *Record Content* window, expand the **Elements** group.
- Select the element whose fields you want to edit.



- Click on the field that you want to edit. Then, depending on the type of field it is, either type a value (in the case of the Description field, for example), or make a selection from a drop box. Below is a list of field types.

**Description.** Identifies the field by name.

**Value.** Click in the Value field and then click  to display the **Specify Value** dialog.



In this dialog you can specify whether the value is a *Constant*, *Variable* or *Formula*. These are described below.

**Constant:** A value that remains fixed, such as the word EACH.

**Variable:** A value that changes, such as a name or numerical value. If the source is a variable, select the desired variant from the drop box. In the case of elements, choose from items such as *Count*, *Length*, *Area*, *Volume*, *Description*, *Type*, *Division*, *Manufacturer*, *Supplier*, *Price*, *Part Number* and *Alternate Code*.


For certain variables, such as *Length*, *Area* and *Volume*, you can specify the output units for the item, such as *Millimeters*, *Feet-Inches*, *Square Meters* or *Cubic Yards*. For some units you can also select a level of precision for the measurement.

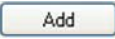

\* Note that the *Quantity* variable refers to the calculated quantity of the material as calculated according to the Unit of Measure setting in the object's properties.

**Formula:** Lets you select or specify a formula for calculating a value. For example, to calculate the Cost of doors in your project, you might specify a formula of **Count \* Price** in the Value field of the Cost entry (the number of doors multiplied by the unit price of the door). See *Specifying Formulas* on page 395.

**Width.** The maximum width of the field. If the field entry exceeds the field width, the entry will be shortened to fit.

**Delimiter.** An item that separates one field from another. Choose from Comma, Tab, New Line or None.

**Cost.** Click in the Cost field to include the total cost calculated for the item. A check mark  indicates that the cost will be reported.

7. To add a field to the element record, position your cursor in the list of fields and then click . A field will be added above the one that was selected prior to adding a field.
8. To delete a field from the record, select the field and then click .
9. When you are finished editing fields, click **Save**. The estimate updates automatically to reflect your changes.

## Editing Fields in a Record

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Each entry in your project estimate is based a *record* in the report template. Each record is made up of several fields. Fields that constitute a value can be defined as either a *constant*, *variable* or *formula*.

As an example, the entry for a door may look something like this:

**08210 32" Hinged Door 3.00 Ea. \$40.00 \$120.00**

This entry is made of up of the following six fields:

**08210:** Division (variable)

**32" Hinged Door:** Description (variable)

**3.00:** Count (variable)



**Ea.:** Unit (constant)

**\$40.00:** Price (variable)

**\$120.00:** Cost (formula: Count\*Price)

You can edit the fields for any record in your report template to suit your needs.

### To edit a field in a record:

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select the template you want to use for your estimate.
3. Select **Templates > Edit**, or click  on the toolbar.
4. In the **Report Template** dialog, select the **Records** tab.
5. In the left pane, select the element whose record you want to edit.
6. Click on the field that you want to edit. Then, depending on the type of field it is, either type a value (in the case of the Description field, for example), or make a selection from a drop box. Below is a list of field types.

**Description.** Identifies the field by name.

**Value.** Click in the Value field and then click  to display the **Specify Value** dialog.



In this dialog you can specify whether the value is a *Constant*, *Variable* or *Formula*. These are described below.

**Constant:** A value that remains fixed, such as the word EACH.

**Variable:** A value that changes, such as a name or numerical value. If the source is a variable, select the desired variant from the drop box. In the case of elements, choose from items such as *Count*, *Length*, *Area*, *Volume*, *Description*, *Type*, *Division*, *Manufacturer*, *Supplier*, *Price*, *Part Number* and *Alternate Code*.


For certain variables, such as *Length*, *Area* and *Volume*, you can specify the output units for the item, such as *Millimeters*, *Feet-Inches*, *Square Meters* or *Cubic Yards*. For some units you can also select a level of precision for the measurement.


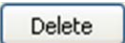

\* Note that the *Quantity* variable refers to the calculated quantity of the material as calculated according to the Unit of Measure setting in the object's properties.

**Formula:** Lets you select or specify a formula for calculating a value. For example, to calculate the Cost of doors in your project, you might specify a formula of **Count \* Price** in the Value field of the Cost entry (the number of doors multiplied by the unit price of the door). See *Specifying Formulas* on page 395.

**Width.** The maximum width of the field. If the field entry exceeds the field width, the entry will be shortened to fit.

**Delimiter.** An item that separates one field from another. Choose from Comma, Tab, New Line or None.

**Cost.** Click in the Cost field to include the total cost calculated for the item. A check mark  indicates that the cost will be reported.

7. To add a field to the element record, position your cursor in the list of fields and then click . A field will be added above the one that was selected prior to adding a field.
8. To delete a field from the record, select the field and then click .
9. Click  to save the changes to your template.

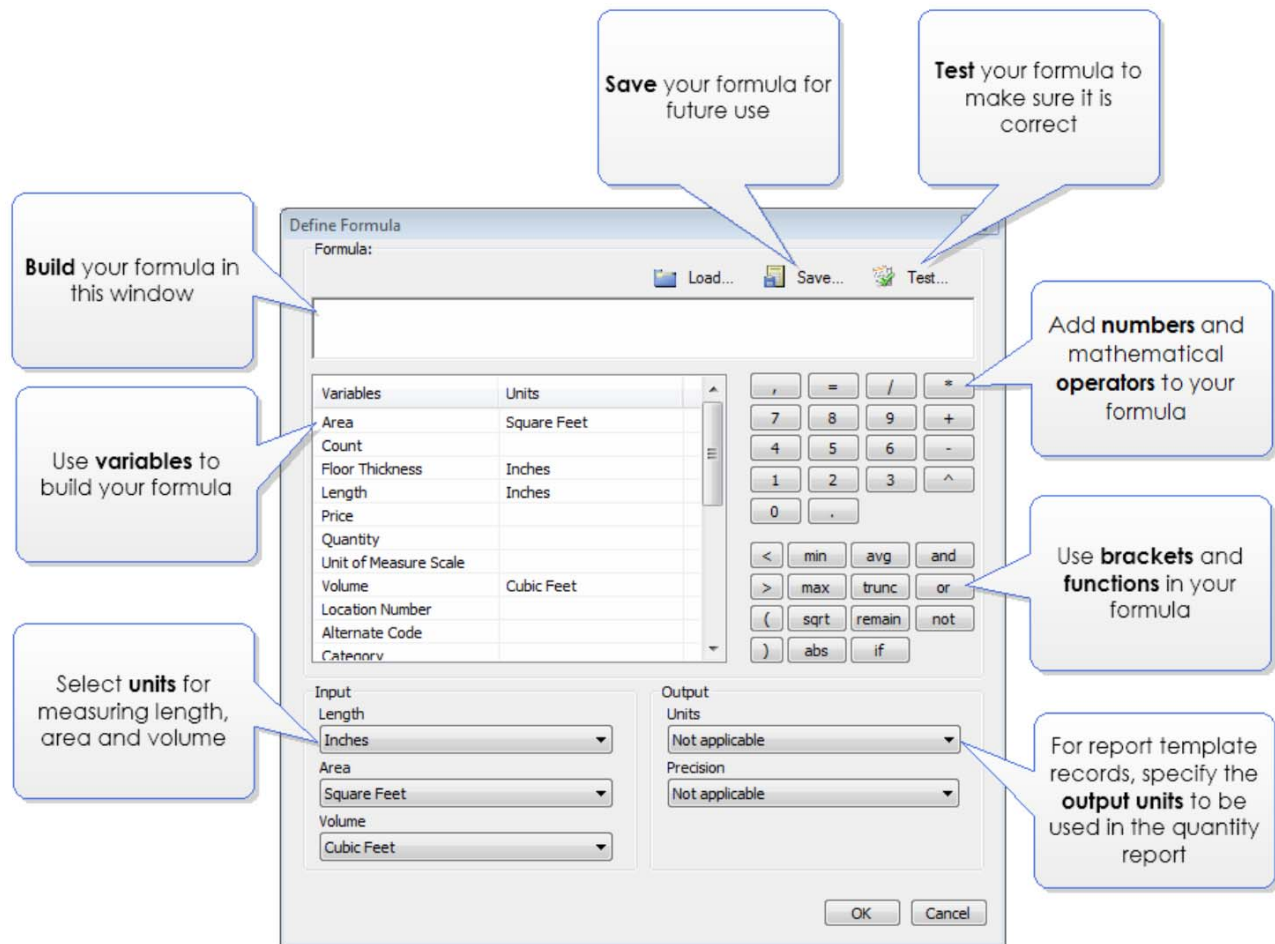


## Specifying Formulas

If you are defining an assembly, or adding or editing a value field on the Records page of the Report Template dialog, you can choose to specify a formula for calculating the quantity of that item. Formulas are mathematical equations (e.g. Count x Price) that are used to calculate a value (e.g. Cost). You can create and edit formulas to suit your needs. Once you have created a formula you can test it with sample values to make sure that it is working correctly.

You can save a formula for future use. You can then load a saved formula into the **Define Formula** dialog if you want to edit it or use it to create a new formula.



Below is an overview of the **Define Formula** dialog.



### To create a formula:

Build your formula by typing directly in the formula window as well as clicking any of the available variables, numbers, operators and functions displayed in the dialog. The available variables vary according to element type. For example, if you are defining fields for a door, variables such as *Count*, *Height* and *Width* will be included in the list. For a wall you are likely to see variables such as *Exterior Wall Area* and *Interior Wall Area*.

As an example, if you are creating a formula to count door hinges, and there are two hinges per door, you might specify a formula of **Count \* 2** (the number of doors multiplied by 2), which would count two door hinges for every instance of the door in your drawing. To create this formula, you would do the following:

1. Click the **Count** variable in the list of variables.
2. Click .
3. Click  or type **2** after the multiplication symbol.

Input Units

If you are using *Length*, *Area* or *Volume* variables in your formula, you can specify the units in which you want to measure those values by making the desired selections from the **Length**, **Area** and **Volume** drop boxes in the *Input* area. Initially, all quantities are measured in millimeters regardless of the units of measure used in your project. Making selections from the **Length**, **Area** and **Volume** drop boxes converts the millimeter values into the units you want. This saves you a lot of time and effort because you do not have to specify conversion factors in your formula — the conversion is done for you.

For example, if your formula contains the *Area* variable and you would like the area of the item to be measured in square feet, you would select **Square Feet** from the **Area** drop box.

The screenshot shows a dialog box titled "Input" with three sections: "Length", "Area", and "Volume". Each section has a dropdown menu. The "Length" dropdown is set to "Inches", the "Area" dropdown is set to "Square Feet", and the "Volume" dropdown is set to "Cubic Feet".

**Note:** The Length option applies to all distance measurements including Height and Width.

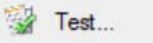
Output Units

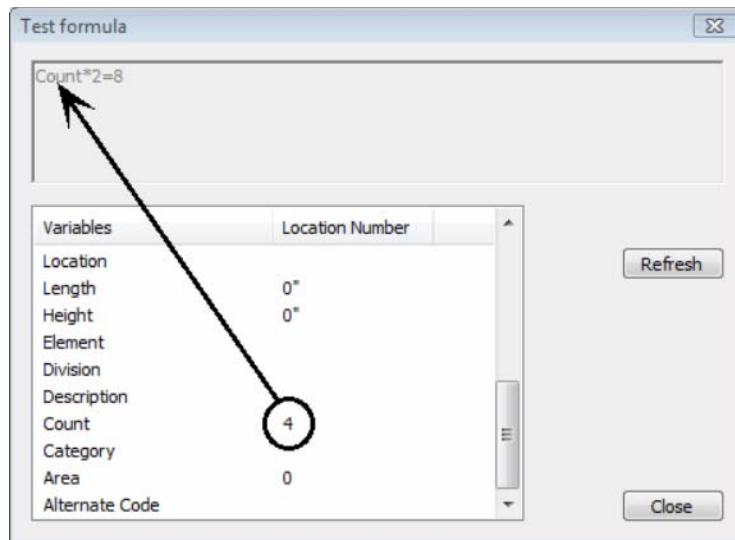
If you are defining a record in a report template, the **Define Formula** dialog will contain an *Output* area containing unit choices for **Length**, **Area** and **Volume**. These are the units of measure that will be used to display the calculated quantity in the quantity report.

The screenshot shows a dialog box titled "Output" with two sections: "Units" and "Precision". The "Units" dropdown is set to "Square Feet" and the "Precision" dropdown is set to "#.#".

**Note:** Output units are absent from the dialog if you are specifying a formula for an assembly because assemblies are simply calculated values. Reports on the other hand involve both calculating values and *reporting* calculated values.


**To test a formula:**

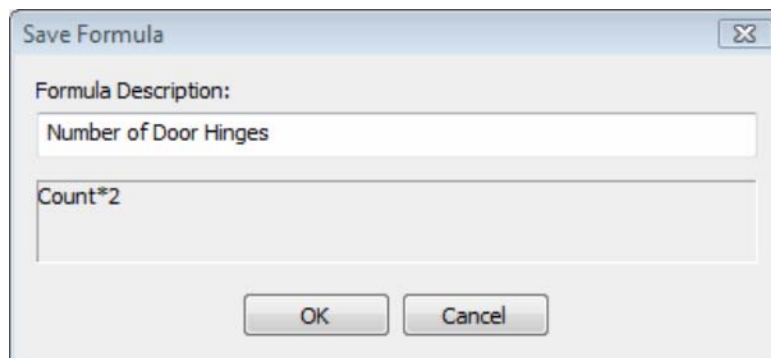
1. Click  at the top of the dialog. The formula appears in the **Test Formula** dialog.
2. In the *Variables* window, click on one of the variables that your formula contains, then type a value for that variable and press Enter. For example, our door hinge formula contains a *Count* variable. If we type **4** for the *Count* and press Enter, the formula will display an answer of **8**, which is correct ( $4 \times 2=8$ ).



- When you are finished testing the formula, click **Close** to return to the **Define Formula** dialog.


#### To save a formula:

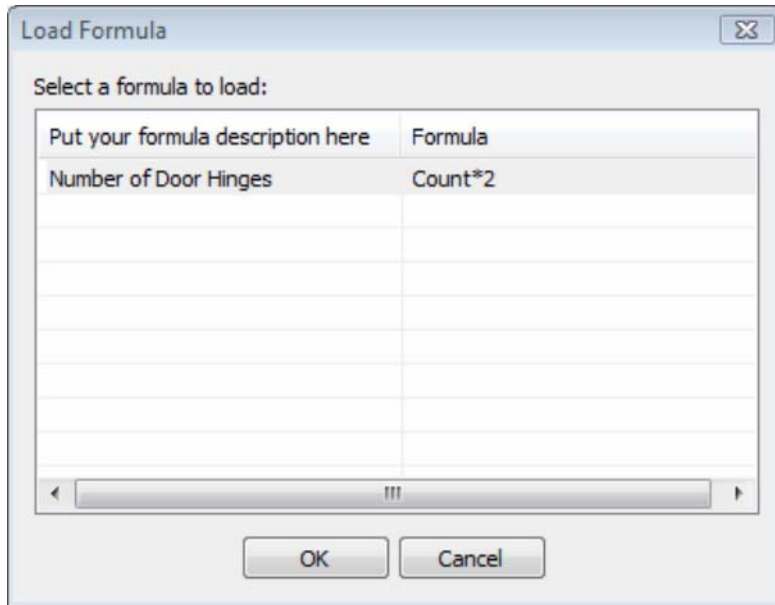
- Click  **Save...** at the top of the dialog.
- In the **Save Formula** dialog, type a name or description of the formula for easy identification.



- Click **OK**.

#### To load a saved formula:

- Click  **Load...** at the top of the dialog.
- In the **Load Formula** dialog, select the formula that you would like to load.





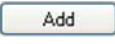
3. Click **OK**.

## Adding Fields to a Record

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When defining a report template, you can add information to a record by adding fields to it.

**To add a field to a record:**



1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select **Templates > Edit**, or click  on the toolbar.
3. In the **Report Template** dialog, select the **Records** tab.
4. In the *Record Content* window, expand the **Elements** group.
5. Select the element whose fields you want to edit.
6. Position your cursor in the list of fields.
7. Click . A field will be added above the one that was selected prior to adding a field.
8. Define the field. See *Editing Fields in a Record* on page 393.

## Deleting Fields from a Record

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When editing a report template, you can delete one or all fields in a record.

**To delete a field from a record:**

1. Select **Tools > Analyze > Generate Project Estimate**, or click  on the Analyze toolbar.
2. In the **Generate Project Estimate** dialog, select **Templates > Edit**, or click  on the toolbar.
3. In the **Report Template** dialog, select the **Records** tab.
4. In the *Record Content* window, expand the **Elements** group.
5. Select the element whose fields you want to edit.


6. Select the field that you want to delete, then click . If you want to delete all fields in the record, click . You are prompted to confirm the deletion. Click **Yes** to delete all fields, or click **No** to leave the fields intact.

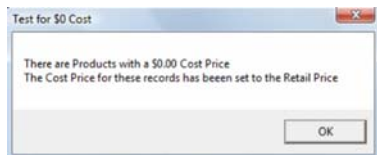
## Generating a Quote (QG)

Construction Suite only

A quote is a list of products with quantities, pricing and other important information. Quotes are used by building material supply retailers, wholesalers, distributors and contractors to facilitate the design, sale and installation of construction projects. You can use the Generate Quote tool to instantly generate a quote that opens in Quote Generator software (included). You can then edit the quote to suit your needs. For example, you can import SKU numbers, edit pricing, and account for things like labor and markup.

### To generate a quote:

1. Select **Tools > Analyze > Generate Quote**, or click  on the Analyze toolbar. The quote is opened in Quote Generator.
2. If there are any products with a \$0.00 Cost value, the following dialog will appear:



This is simply a warning that some Cost values will need your attention. The cells are highlighted in red in the quote.

**Note:** If you have already generated a quote in QG and you are generating one again, a dialog will appear that gives you the option of reloading the previously saved quote, or loading a new quote from Envisioneer. Click **Yes** to open a quote from Envisioneer, or click **No** to reload the previously saved quote.




**Note:** Quote Generator is a separate application. To view its online help, select **Help > View Help** in Quote Generator. Information is also included in the main Envisioneer help file.

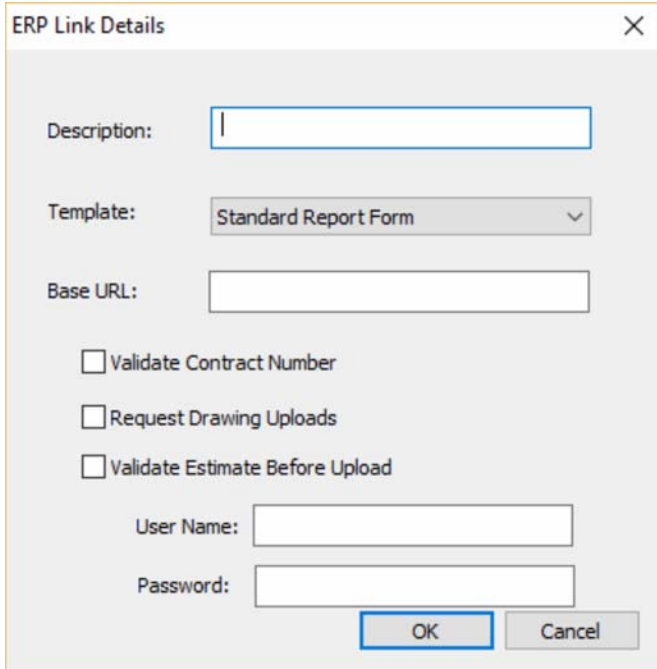
## Uploading Data to an ERP System

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You can use the **Upload to ERP** tool to upload a drawing's quantitative data to a remote Enterprise Resource Planning (ERP) system. Initially you will need to define the URL of the ERP system, enter your sign-in credentials, and specify upload options.

### To upload data to an ERP system:

1. Select **Tools > Analyze > Upload to ERP**, or click  on the Analyze toolbar.
2. To set up a link to an ERP system, click  next to the **ERP System** drop box. Or, to edit the details of an existing link, select it from the drop box, then click . Specify the settings in the **ERP Link Details** dialog box:



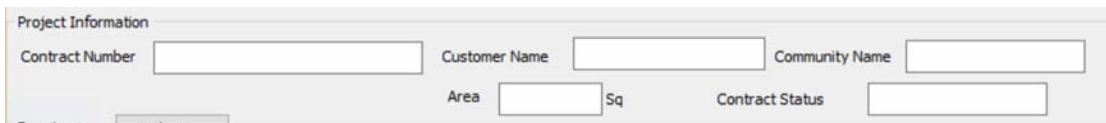
The following is a brief description of the settings:

**Description:** The name to be displayed in the **ERP System** drop box.

**Template:** The report template that will be used to format the data.

**Base URL:** Example: *http://www.your.com/*

**Validate Contract Number:** Displays the following panel in the **Upload to ERP System** dialog box:



**Request Drawing Uploads:** Displays a browse feature in the **Upload to ERP System** dialog box, enabling you to upload drawings from your local machine.



**Validate Estimate Before Upload:** Enables the online system to confirm that all elements in the estimate are valid. Elements may be considered invalid if they are not recognized by the system, if they are outside of the user’s price range, and so on.

**User Name/Password:** The credentials you use to sign in to the ERP system.



3. Once you have specified a link to an ERP System, it will become an available option in the **ERP System** drop box. Select it to continue.
4. If **Request Drawing Uploads** is enabled in the link’s details, you can click **Select**, then use the file browser to select drawings for upload.  
A report is displayed in the dialog which combines data from the report template with data pulled from the online ERP system.
5. From the **Please Choose Upload Type** drop box, select either **Original Order**, **Changed Order**, or **Final Order** to identify the identify the status of the order.
6. Click **OK** to begin the upload.

## Generating a Door Schedule

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You can instantly view a door schedule for any location in your project. The schedule displays a detailed description of each door type on the selected location, as well as the count for each door type. You can insert the schedule in your project with a simple mouse click. By default, the doors in your project are tagged with schedule marks when you insert the schedule.

### To generate a door schedule:



1. Select **Tools > Analyze > Schedules > Door Schedule**, or click  on the Analyze toolbar.
2. To edit the title of the schedule, edit the heading in the **Schedule Title** edit box.
3. To view a schedule for another building location, select the desired location from the **Reference Building Location** drop box.
4. To prevent the doors in your project from being tagged with schedule marks, disable the **Tag Elements with Schedule Mark** check box.
5. To edit the layout or appearance of the schedule or schedule marks, click Setup.
6. To print the schedule, click , then make the desired selections in the **Print** dialog.
7. To insert the schedule in your project, click **OK**. (Otherwise, click **Cancel** to exit the dialog.) The schedule is attached to your cursor, ready to be inserted.
8. Position the schedule where you want it, then click to insert it.

## Generating a Window Schedule

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You can instantly view a window schedule for any location in your project. The schedule displays a detailed description of each window type on the selected location, as well as the count for each window type. You can insert the schedule in your project with a simple mouse click. By default, the windows in your project are tagged with schedule marks when you insert the schedule.

### To generate a window schedule:

1. Select **Tools > Analyze > Schedules > Window Schedule**, or click  on the Analyze toolbar.
2. To edit the title of the schedule, edit the heading in the **Schedule Title** edit box.
3. To view a schedule for another building location, select the desired location from the **Reference Building Location** drop box.
4. To prevent the windows in your project from being tagged with schedule marks, disable the **Tag Elements with Schedule Mark** check box.
5. To edit the layout or appearance of the schedule or schedule marks, click Setup.
6. To print the schedule, click , then make the desired selections in the **Print** dialog.
7. To insert the schedule in your project, click **OK**. (Otherwise, click **Cancel** to exit the dialog.) The schedule is attached to your cursor, ready to be inserted.
8. Position the schedule where you want it, then click to insert it.



## Generating a Member Schedule

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You can instantly view a member schedule for any location in your project. The schedule displays members inserted with the Members tool. Roof, floor, ceiling and surface framing is not included. However, you can convert framing to members so that they appear in the member schedule.

The schedule displays a detailed description of each member type on the selected location, as well as the size and length for each member type. You can insert the schedule in your project with a simple mouse click. By default, the members in your project are tagged with schedule marks when you insert the schedule.

### To generate a member schedule:



1. Select **Tools > Analyze > Schedules > Member Schedule**, or click  on the Analyze toolbar.
2. To edit the title of the schedule, edit the heading in the **Schedule Title** edit box.
3. To view a schedule for another building location, select the desired location from the **Reference Building Location** drop box.
4. To prevent the members in your project from being tagged with schedule marks, disable the **Tag Elements with Schedule Mark** check box.
5. To edit the layout or appearance of the schedule or schedule marks, click Setup.
6. To print the schedule, click , then make the desired selections in the **Print** dialog.
7. To insert the schedule in your project, click **OK**. (Otherwise, click **Cancel** to exit the dialog.) The schedule is attached to your cursor, ready to be inserted.
8. Position the schedule where you want it, then click to insert it.

## Generating a Room Region Schedule

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If you have calculated the space in rooms and areas using a Room Region tool, you can generate a room region schedule. The schedule lists any rooms for which you have created a room region. It displays the area, perimeter and volume of each room. You can insert the schedule in your project with a simple mouse click.


### To generate a room schedule:

1. Select **Tools > Analyze > Schedules > Room Region Schedule**, or click  on the Analyze toolbar.
2. To edit the title of the schedule, edit the heading in the **Schedule Title** edit box.
3. To view a schedule for another building location, select the desired location from the **Reference Building Location** drop box.
4. To edit the layout or appearance of the schedule, click Setup.
5. To print the schedule, click , then make the desired selections in the **Print** dialog.
6. To insert the schedule in your project, click **OK**. (Otherwise, click **Cancel** to exit the dialog.) The schedule is attached to your cursor, ready to be inserted.
7. Position the schedule where you want it, then click to insert it.

## Printing a Schedule

You can print a door, window or member schedule directly from the Schedule dialog.

### To print a schedule:

1. If you have already inserted the schedule in your project, click on it to select it, then right-click and select **Properties**. If you have not inserted it yet, select **Tools > Analyze > Schedules**, then select the type of schedule you want to print.
2. In the Schedule dialog, click .
3. In the **Print** dialog, select the desired printer to use, then click **Print**.

## Defining the Field Layout of a Schedule

Each type of schedule has a default layout of fields. You can remove any of these fields, as well as add new fields if you want. You can also control the content and size of each field.

### To define the layout of a schedule:

1. In the **Schedule** dialog, click **Setup**. Note that if you have already inserted the schedule, the inserted schedule will be deleted, and a new one will be generated in the dialog.  
In the **Schedule Setup** dialog, the current layout is displayed in the *Layout* area of the dialog.



2. To delete a field, click on it to select it, then click **Remove**.
3. To edit a field's title, click on the field to select it, then edit the title in the **Heading** edit box.
4. To edit a field's content, click on the field to select it, then make a selection from the **Content** drop box.
5. To edit the width of a field, click on the field to select it, then edit the value in the **Width** edit box.
6. To insert a new field, click on the field that you want to appear to the right of the new field, then click **Insert**. A blank field is added to the left of the currently selected field. Define the Heading, Content and Width variables. Content options include Auto Mark, Description, Type, Height, Width, Height x Width, Width x Height, Thickness, Height Rough Opening, Width Rough Opening, Count, Location, Division, Category, Manufacturer, Supplier, Price, Part Number, Alternate Code, U-Factor, and Catalog Mark.
7. Click **OK**. The schedule is updated with your new settings.

**Note:** You cannot edit the layout of an inserted schedule by selecting the Properties tool. A new schedule will have to be generated.

## Defining the Text Styles in a Schedule

You can control the text styles used for a schedule's title, headings and content, as well as the justification of text within each field.

### To define the text styles in a schedule:

1. If you have already inserted the schedule in your project, click on it to select it, then right-click and select **Properties**. If you have not inserted it yet, select **Tools > Analyze > Schedules**, then select the type of schedule you want to generate.
2. In the **Schedule** dialog, click **Setup**.
3. To edit the text style used for the schedule title, field headings or content, click the **Title**, **Headings** or **Content** button in the *Schedule Appearance* area. In the **Text Styles** dialog, select the text style you want to use for the selected item, then click **OK**.
4. To edit the justification of text in each column, click the desired justification button. A left justification aligns all the text on the left side of the column. A right justification aligns the text on the right side of the column. With a centered justification, each line of text is centered in each column.
5. Click **OK**.

**Note:** Text style settings apply only to the inserted schedule, not the schedule displayed in the dialog.

## Defining the Line Styles in a Schedule

You can change the line styles used for a schedule's border and division lines.

### To define the line styles in a schedule:

1. If you have already inserted the schedule in your project, click on it to select it, then right-click and select **Properties**. If you have not inserted it yet, select **Tools > Analyze > Schedules**, then select the type of schedule you want to generate.
2. In the **Schedule** dialog, click **Setup**.
3. To select a line style for the schedule's border, click the **Border** button, then make a selection from the **Line Styles** dialog.
4. To select a line style for the lines between columns and rows, click the **Division** button, then make a selection from the **Line Styles** dialog.
5. Click **OK**.

**Note:** Line style settings apply only to the inserted schedule, not the schedule displayed in the dialog.

## Defining Schedule Marks

When defining schedule marks, you can choose either a circle, square, hexagon or octagon shape. You can also control the line style used for the mark, as well as the text style of the mark content.

### To define schedule marks:

1. If you have already inserted the schedule in your project, click on it to select it, then right-click and select **Properties**. If you have not inserted it yet, select **Tools > Analyze > Schedules**, then select the type of schedule you want to generate.
2. In the **Schedule** dialog, click **Setup**.
3. To select a shape for the schedule marks, click on the appropriate graphic in the *Mark Style* area of the **Schedule Setup** dialog.
4. To select a text style for the schedule mark text, click the **Text Style** button in the *Mark Style* area, then select the desired style in the **Text Styles** dialog.
5. To select a line style for the mark line, click the **Line Style** button in the *Mark Style* area, then select the desired line style in the **Line Styles** dialog.
6. Click **OK**.

## Removing Schedule Marks

If you do not want doors or windows to be tagged with schedule marks, you can prevent them from appearing by editing your schedule settings.

### To remove schedule marks:

1. If you have already inserted the schedule in your project, click on it to select it, then right-click and select **Properties**. If you have not inserted it yet, select **Tools > Analyze > Schedules**, then select the desired type of schedule.
2. In the Schedule dialog, disable the **Tag Elements with Schedule Mark** check box.
3. Click **OK**.

**Note:** You can also hide schedule marks from view using the View Filter.

## Green 3D Home.com

The Green 3D Home web site is dedicated to helping you "go green". The site provides comprehensive information on greening your home, energy use, and energy resources. Some of the things you can find on this site include:

- BIM catalogs of manufacturers' products for download
- Tips on how you can green each room in your home
- Detailed analysis of your home
- Information on how we use energy, and how much
- Information on various energy sources
- Green products and services
- Sharing projects and ideas with others

### To access the Green 3D Home web site:

1. Select **Tools > Analyze > Green 3D Home.com** or click  on the Help toolbar. Or, go to <http://www.green3dhome.com> in your Internet browser.

## Exporting Model Data to REScheck

Building Essentials | Construction Suite

You can use the REScheck Export tool to export data from your Envisioneer model to a REScheck XML (\*.rxl) file. You can then open this file in REScheck to determine whether new homes, additions, and alterations meet the requirements of the International Energy Conservation Code (IECC), or a number of state energy codes.

### To export model data to REScheck:

1. Select **Tools > Analyze > REScheck Export**.
2. In the **Save As** dialog, select a save location and file name, then click **Save**.



# Chapter 25: Rendering & Animation

3D RealView™ Rendering adds light and shadow to a textured 3D view to achieve photo-realistic images of both the interior and exterior of your home. You can save rendered images in BMP, JPG or TGA format, or open them directly in image editing applications where you can further edit and enhance them. Once you've set up your scene, creating a 3D RealView rendering involves only a mouse click or two. In a short time you'll have a vivid, life-like view to enjoy!

Use the Render Panoramic View tool to generate a realistic, wide-angle view that can be viewed using the Envisioneer VR app.

The powerful Animation tool lets you record an actual tour through your 3D model that you can play back at any time. You can even add realistic sounds to your animation, such as a doorbell ringing. You can also choose to ray trace the animation for a photorealistic display that includes light, shadows and reflection. To create an animation, all you need to do is draw one or more paths for the camera to follow. Then, just sit back and watch your design come to life!

Attaching sounds to elements is a great way to add realism and excitement to your design. For example, you can attach the sound of a doorbell to a door, or even a voice-over. Once you've attached a sound to an element you can play it any time using the Play Sound tool. The catalog includes a number of pre-defined sounds for your convenience, including a creak, knock, doorbell, phone, clock chime, horn and ignition. You can attach sounds to individual elements in your drawing, or to elements in the catalog.

## 3D RealView™ Rendering

Rendering is a process of generating an image from a 3D model. The image is like a photograph, and contains texture, lighting and shadows. In fact, it is sometimes difficult to distinguish a 3D RealView™ rendering from an actual photograph. 3D RealView™ renderings are great to use when presenting designs to clients. Their photorealistic nature captures attention and gives clients a true sense of the design.

Renderings are easy to create — just set up your 3D view, make sure you have lighting in place, and then use the **Render 3D RealView** tool to create the rendering.

Before creating a rendering you can select a quality level for the rendered image, and define various settings that affect the image output.

The progress of the rendering is displayed in real time, and you can adjust the brightness of the image and any highlighted areas either during rendering or after rendering. Once the image has been rendered, you can save it as a BMP, JPG or TGA file, or open it directly in an image editing program for further enhancement.

## How Rendering Works

A rendered view is a photo realistic 3D view that includes light and shadows. To render a view, two algorithms are used: *global illumination* and *raytracing*.

*Global illumination* is an algorithm that simulates the many reflections of light around a scene, generally resulting in softer, more natural shadows and reflections.

The first part of the global illumination process involves finding those element surfaces that are visible to direct light and calculating how much light is transferred to each element. Some elements will receive more light than others depending on their surface properties, and different surfaces will reflect different amounts of light. Still, each element will absorb some of the light, so the total amount reflected back into the scene will be less than that emitted by the light fixtures.

*Raytracing* is a direct illumination algorithm that traces the path taken by a ray of light from the camera through the scene, then calculates the reflection, refraction, or absorption of the ray when it intersects objects in the scene.

The process begins by finding the element that reflects the most light. The element is considered a secondary light source, so we need to calculate how much of its light is transferred to other elements in the scene. Multiple *passes* are performed until the amount of light remaining in the scene is negligible in comparison to the light originally emitted by the light fixtures. When the passes have been completed, that's when raytracing can begin.

Material properties define how light reflects off a surface. Direct light and ambient light levels define the light that is reflected. Direct light is light that is emitted from light fixtures. It has a specific color, intensity and direction. Ambient light

can be thought of as a general level of light that is everywhere in the scene. Every light in a scene contributes to the overall ambient light in a scene.

All of this may seem complicated, but Envisioneer takes care of it all in one mouse click.

## Setting the Viewpoint for a Rendering

When you create a 3D RealView™ rendering, your model is captured at the angle currently shown on the screen. Some topics you may want to look at:

Displaying 3D Camera Views on page 234

Changing Your Viewpoint on page 235

Changing the Viewing Field Angle on page 237

## Setting the Lighting for a Rendering

Even though creating a 3D RealView™ rendering involves nothing more than a mouse click, there are a few things you should consider beforehand.

### Exterior Shots

If you want to do an exterior shot, the most important factor to consider is sunlight. This is determined by your global position and time of day. By adjusting these settings, you control how much sunlight is in the scene, and from what angle it shines.

### Night Shots

To create a night shot, you need to first set your background to a night scene. Once your background is set, all you need to do is set the time to a time of day when there is no sun. If you do want to create a night shot, you will probably want to insert some exterior lighting in your design.

### Interior Shots


When creating interior shots, light comes from light fixtures that you have inserted in the room, and can also come through the windows if it is daytime. You can turn lights on and off as well as change their bulbs for different light intensity and effect.

## Defining Your Location

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Setting your global position determines how much daylight there will be in a scene relative to the time of day in the scene's properties.

### To define your location:

1. Select **Settings > Document Settings**, or click  on the Settings toolbar. You can also click the **Options** button in the **3D RealView** dialog.
2. In the left pane, select **Global**.
3. Select a country and city from the appropriate drop boxes. You can add or edit a city if needed. Just click the **Add** or **Edit** button. You will need to know the longitude, latitude and time zone of the city.
4. To set the angle from true north, enter a value in the **Angle** edit box, or simply click and drag the arrow indicator to rotate it.

This is the "geographic" North, as opposed to the "magnetic" North which you see on a compass. The value you specify determines where North is on your screen, and affects the angle of the sun for daylight rendering. The number in degrees that you enter is in relation to the 90° perpendicular orientation of your drawing. A value of 1° makes the top of the screen North. A value of 90° makes the top of the screen East, and the left side of the screen North.

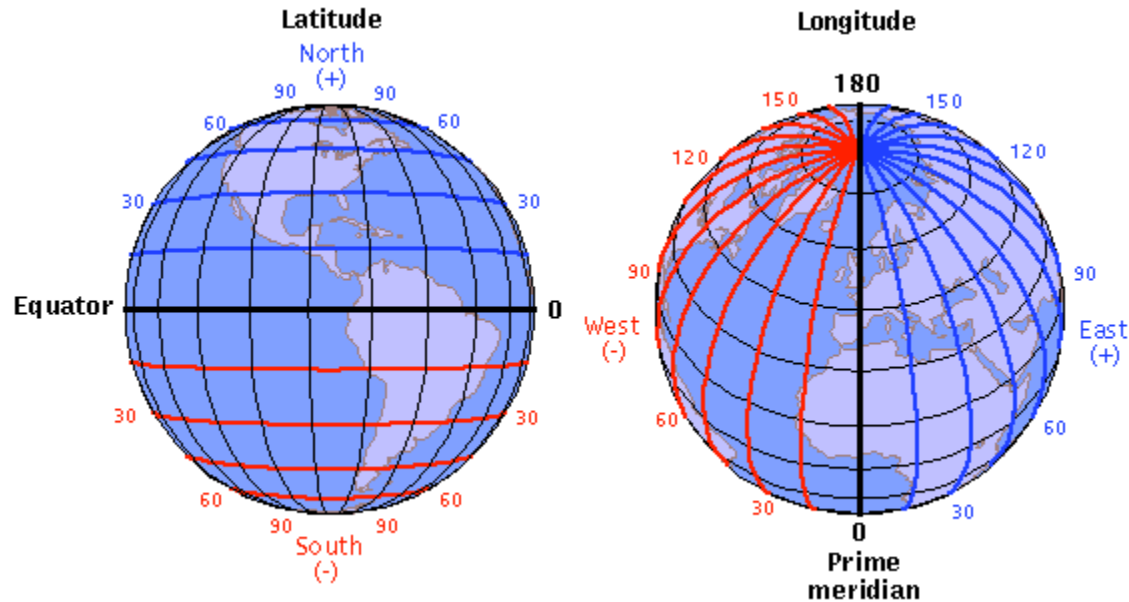
It is assumed that information regarding building orientation to True North can be taken from, or calculated from, a surveyor's certificate. However, True North can be calculated from a Magnetic North reading taken at your building site. See *Calculating True North from Magnetic North* in the online help.

5. Click **OK**.

## Calculating True North from Magnetic North

### What is True North?

True North is the geographic North Pole. It is located at 90° North latitude and all lines of longitude converge at the pole. The Earth's axis connects the north and south poles. The Earth's axis is the line around which the Earth rotates. The North Pole is approximately 450 miles (725 km) north of Greenland in the middle of the Arctic Ocean.



### What is Magnetic North?

Magnetic North is the magnetic north pole. It is the focus of the planet's magnetic field and is the point magnetic compasses point toward. Unlike the geographic North Pole, the magnetic north pole moves (even daily). It moves approximately 9 miles (15 km) each year. It is presently located about 1000 miles (1600 km) south of the geographic North Pole at 78° 18' North and 104° West (southwest of Nunavut in Northern Canada).

### How do you calculate True North from Magnetic North?

The difference between Magnetic North and True North is called the variation. To convert magnetic readings to true, you need to find the variation for your particular location. Maps such as U.S. Geological Survey maps, aviation charts and marine charts all list the variation. Because variation changes from location to location, you need to get a map for your area. Variation is listed in terms of degrees east or west. If it is east variation, you subtract the number of degrees from the magnetic direction to obtain the true direction. If it is west variation, you add the number of degrees to the magnetic direction to obtain the true direction.


**Note:** If you use a compass to determine Magnetic North in relation to the building line that you plan to orient at 90° to the perpendicular in your drawing, and factor in your local variation, you should easily be able to calculate True North in relation to your plan.

## Setting the Season

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Setting the season can determine how plants will look in a rendered scene, relative to your global location.

### To set the season:

1. Select **Settings > Document Settings**, or click  on the Settings toolbar. You can also click the **Options** button in the **3D RealView** dialog.
2. In the left pane, select **Global**.

3. Click the **Plant Season** drop box and select either **Summer, Winter, Fall, or Spring**.
4. Click **OK**.

## Creating a 3D RealView™ Rendering

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You can render any 3D view in a matter of minutes, with the click of a button. The result is an impressive, photo-like image that incorporates light, shadows, reflections, and other realistic attributes.

The 3D RealView tool uses both global illumination and raytracing to produce an image of exceptional quality. The 3D RealView feature begins by reading in the model's geometry, and then proceeds with the global illumination calculation, which occurs in multiple passes. *Global illumination* is an algorithm that simulates the many reflections of light around a scene, resulting in soft, natural shadows and reflections. Once global illumination is complete, raytracing begins automatically. *Raytracing* is a direct illumination algorithm that traces the path taken by a ray of light from the camera through the scene, then calculates the reflection, refraction, or absorption of the ray when it intersects objects in the scene.

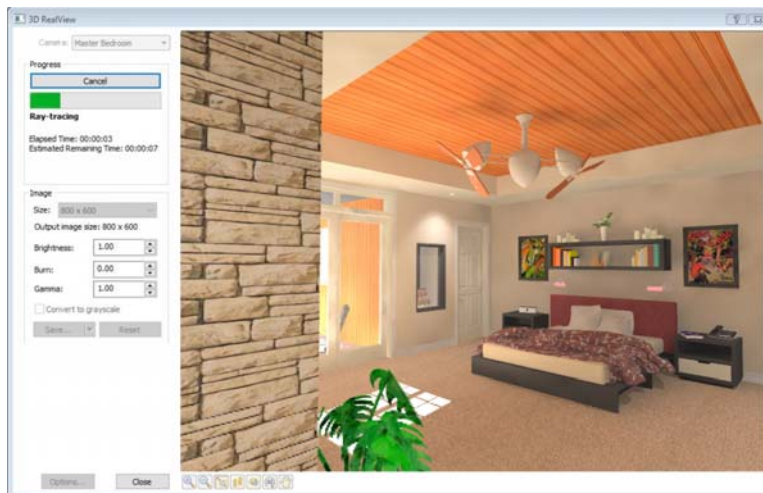
The 3D RealView dialog lets you see the progress of the rendering in real time, and lets you know how much time is remaining in each pass. You can adjust the brightness of the image, as well as the intensity of highlighted areas. Once the rendering is complete, you can save the image, open it in an editing application, or reset the view and render again.

### To create a 3D RealView rendering:

1. Display the 3D view that you want to render.
2. Select **View > Render 3D RealView**.
3. In the **3D RealView** dialog, make sure the scene is how you want it to appear. You can change the scene using tools below the preview window, such as Zoom In, Zoom Out and Walk Around.



4. To define the image output size, make a selection from the **Size** drop box in the *Image* area. You can select one of the common output sizes or select **Custom Size** to define a custom size. The dialog box will resize accordingly.
- Note:** If you select a size that is larger than your screen, the image will be rendered in pieces or *tiles* off-screen. The rendered tiles will be put together behind the scenes to form a complete image that will be saved at the specified size.
5. Click the **Start render** button to begin.



First, the model's geometry is analyzed. Once that is done, the global illumination calculation begins. Global illumination determines how much light is given off by the sun or by lighting fixtures, and how much light is reflected off the surface of elements. Global illumination occurs in two or more passes. Once global illumination is complete, raytracing begins automatically. The view is updated in real time during these calculations, and the **Remaining Time** and **Elapsed time** of each pass is displayed in the *Progress* area.



6. To adjust the overall brightness of the image, adjust the value in the **Brightness** edit box. Lower values darken the image, while higher values make it brighter.
7. To adjust the intensity of highlighted areas, adjust the value in the **Burn** edit box. This can be a decimal value between 0 and 1. Lower burn values will decrease the intensity of the highlights to avoid “burned out” areas in the image.
8. To control the overall brightness of an image, adjust the **Gamma** value.  
When the rendering is complete, the message **Render Complete!** appears in the *Progress* area. Now you can either save the image, open it in an editing application, or reset the view and render again.
9. If you want to create a grayscale image, enable the **Convert to grayscale** check box before saving. This will produce a monochromatic image containing varying shades of gray.
10. To save the rendered image to a file, click **Save**. In the **Save As** dialog, navigate to the location where you want to save the image, select a file type (BMP, JPG or TGA) from the **Save as type** drop box, and then type a name for the file in the **File name** edit box. Click **Save** to save the image.
11. To open the image in an image editing application, where you can edit or enhance it further, click the down arrow next to the **Save** button and select **Launch Viewer**. The application that launches is the one that is associated with image files in *Windows Explorer*. For example, a BMP file may open in *Microsoft Paint*, or whatever program that normally launches when you attempt to open a BMP file from *Windows Explorer*.
12. If you do not want to keep the rendered image, click **Reset**. This resets the view to its original state, and you can render again if you wish.
13. If you want to make changes to the actual scene, like add a light fixture or apply a different material to an element, click **Close**, and then make the desired changes. When you are ready to render again, select **View > Render 3D RealView**. If you want to return to the camera position and zoom level that you were at when you first rendered the scene, select **Last Camera Position** from the **Camera** drop box at the top of the dialog.
14. When you are finished viewing the 3D RealView rendering, click **Close**.

## Rendering a Panoramic View for VR Viewing

Use the Render Panoramic View tool to generate a rendered, wide-angle view that can be viewed using the Envisioneer VR app. The resulting image incorporates light, shadows, reflections, and other realistic attributes for the ultimate virtual reality experience.

The Render Panoramic View tool uses some of the same algorithms as the Render 3D RealView tool to produce an image of exceptional quality. The rendering process occurs in two distinct stages, and each stage may include multiple passes.

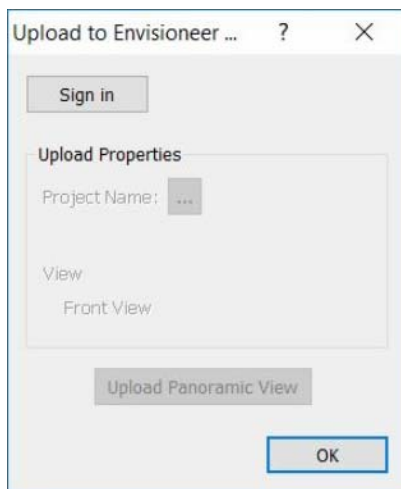
Once the view has been generated, you will be prompted to upload it for viewing with the Envisioneer VR app. For more information visit <https://www.cadsoft.com/products/virtual-reality/>.

### To render a panoramic:

1. Display the 3D view that you want to render.
2. Select **View > Render Panoramic**.
3. In the **Generate Panoramic View** dialog, click the **Step #1 Generate GI** button to begin. The Global Illumination calculation begins. Global illumination determines how much light is given off by the sun or by lighting fixtures, and how much light is reflected off the surface of elements. Global illumination occurs in two or more passes. Once global illumination is complete, raytracing begins automatically. The view is updated in real time during these calculations, and the **Remaining Time** and **Elapsed time** of each pass is displayed in the *Progress* area.



4. When the first stage is complete, click the **Step #1 Generate Faces** button.
  5. To adjust the overall brightness of the image, adjust the value in the **Brightness** edit box. Lower values darken the image, while higher values make it brighter.
  6. To adjust the intensity of highlighted areas, adjust the value in the **Burn** edit box. This can be a decimal value between 0 and 1. Lower burn values will decrease the intensity of the highlights to avoid “burned out” areas in the image.
  7. To control the overall brightness of an image, adjust the **Gamma** value.
- When the rendering is complete, the message **Render Complete!** appears in the *Progress* area. Now you can either save the image, open it in an editing application, or reset the view and render again.
8. If you do not want to keep the rendered image, click **Reset**. This resets the view to its original state, and you can render again if you wish.
  9. If you want to make changes to the actual scene, like add a light fixture or apply a different material to an element, click **Close**, and then make the desired changes. When you are ready to render again, select **View > Render Panoramic View**.
  10. When the panoramic rendering is complete, you will be prompted to upload it for viewing with the Envisioneer VR app:



## Setting the Rendering Quality

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By default, the quality level chosen for the ray trace quality is Level 2 - Low (fast). You can select a different quality level before rendering if you want. Note that the higher level of quality you choose, the longer the rendering process takes. You can set the default quality level for all renderings in your Program Settings. If you want you can override the default quality level directly within the 3D RealView dialog when creating a rendering.

### To set the default rendering quality for the project:

1. Select **Settings > Document Settings**.
2. In the **Document Settings** dialog, select **3D RealView** in the left column.
3. In the *Ray Trace Quality* area, select the quality level you want from the **Level** drop box.
4. Click **OK**.

### To adjust the rendering quality for a particular rendering:

1. Select **View > Render 3D RealView**.
2. In the **3D RealView** dialog, click the **Options** button.
3. In the **Document Settings** dialog, select **3D RealView** in the left column.
4. In the *Ray Trace Quality* area, select the quality level you want from the **Level** drop box.
5. Click **OK** to return to the **3D RealView** dialog.

## Using Antialiasing in Rendering

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Antialiasing blends pixels in areas where two colors or two materials meet to reduce artifacts (or “stair steps”) and produce a more natural look to the scene. By default, antialiasing is set to 1 to increase rendering speed. You can select varying levels of antialiasing. You can set the default antialiasing value for all renderings in your Program Settings. You can also override the default antialiasing value for a particular rendering while the 3D RealView tool is active.

### To set the default antialiasing value:

1. Select **Settings > Document Settings**.
2. In the **Document Settings** dialog, select **3D RealView** in the left column.
3. Use the arrow keys next to the **Antialiasing** edit box to increase or decrease the level of antialiasing. The higher the level, the cleaner the image, but the longer the rendering process takes.
4. Click **OK**.

### To adjust the antialiasing for a particular rendering:

1. Select **View > Render 3D RealView**.
2. In the **3D RealView** dialog, click the **Options** button.
3. In the **Document Settings** dialog, select **3D RealView** in the left column.
4. Use the up arrows key next to the **Antialiasing** edit box to increase the level of antialiasing. The higher the level, the cleaner the image, but the longer the rendering process takes.
5. Click **OK** to return to the **3D RealView** dialog.

## Adjusting the Noise Reduction Level When Rendering

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Noise in a rendered image refers to areas of graininess. This can happen in interior scenes that mix sunlight and interior lighting, or when sunlight comes through a skylight. If you see noise in a rendering, you can increase the noise reduction level in your 3D RealView settings, and then render the view again. Note that increasing the noise reduction level may increase the rendering time.

### To set the default noise reduction level:

1. Select **Settings > Document Settings**.

2. In the **Document Settings** dialog, select **3D RealView** in the left column.
3. Adjust the **Electrical lights noise reduction** and **Skylight noise reduction** values using the scroll arrows.
4. Click **OK**.

**To change the noise reduction level for a particular rendering:**

1. Select **View > Render 3D RealView**.
2. In the **3D RealView** dialog, click the **Options** button.
3. In the **Document Settings** dialog, select **3D RealView** in the left column.
4. Adjust the **Electrical lights noise reduction** and **Skylight noise reduction** values using the scroll arrows.
5. Click **OK** to return to the **3D RealView** dialog.

## Controlling the Intensity of Trees and Billboards

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You can adjust the brightness and contrast of trees and billboards in a rendered scene by editing your rendering settings.

**To set defaults for tree/billboard intensity:**

1. Select **Settings > Document Settings**.
2. In the **Document Settings** dialog, select **3D RealView** in the left column.
3. Adjust the **Tree and billboard intensity** value.
4. Click **OK**.

**To specify the tree/billboard intensity for a particular rendering:**

1. Select **View > Render 3D RealView**.
2. In the **3D RealView** dialog, click the **Options** button.
3. In the **Document Settings** dialog, select **3D RealView** in the left column.
4. Adjust the **Tree and billboard intensity** value.
5. Click **OK** to return to the **3D RealView** dialog.

## Setting the Global Illumination Sample Density

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Global Illumination is a group of algorithms that are designed to add more realistic lighting to 3D scenes. These algorithms take into account not only the light that comes directly from a light source (direct illumination), but also light that is bounced off of surfaces onto other surfaces.

The Global Illumination sample density is the number of reference points in the model used for generating the "baked" lighting in a rendering. The higher the density, the longer the calculation time.

**To set the default Global Illumination sample density:**

1. Select **Settings > Document Settings**.
2. In the **Document Settings** dialog, select **3D RealView** in the left column.
3. Adjust the **Presentation GI Sample Density** slider.
4. Click **OK**.

**To set the Global Illumination sample density for a particular rendering:**

1. Select **View > Render 3D RealView**.
2. In the **3D RealView** dialog, click the **Options** button.
3. In the **Document Settings** dialog, select **3D RealView** in the left column.
4. Adjust the **Presentation GI Sample Density** slider.
5. Click **OK** to return to the **3D RealView** dialog.

## Adjusting the Light Coming from Light Fixtures

To adjust the color or intensity of light coming from a light fixture, you can add light bulbs, change a light bulb to a different type, adjust the intensity of the light, select a different color for the light, or turn a light off completely.

See the following topics:

Editing a Light Fixture's Light Source on page 132

Turning a Light On or Off on page 132

## Editing the Surface Properties of Materials

Different materials have different finishes. Surface finishes include Dull, Low Gloss, Semi Gloss, High Gloss, Liquid, Fully Reflective, Partially Reflective, Shiny, Fully Transparent, and Partially Transparent. The finish determines how much a material reflects, emits and absorbs light. These factors can affect the lighting in a rendered scene.

### To edit the surface properties of an element's materials:

1. Select the element in your drawing.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the properties dialog, select the Appearance tab.
4. On the Appearance page, click the **Select** button, or click the texture swatch to access the **Materials** dialog.
5. In the **Materials** dialog, select the material to edit, then select **Edit > Edit Material**, or right-click and select **Edit Material**.
6. To change the surface finish of the material (dull, shiny, etc.), make a selection from the **Preset Effects** drop box. If you want to specify a custom surface finish, select **Custom** in the list, then enable the **Display settings details** check box.
7. Specify the properties of the finish. These are described below.

**Specular.** Reflection that creates highlights on materials, making them appear shiny.

**Emissive.** The amount of light given off by a material. The more emissive a material is, the more self-luminous it appears.

**Color Bleed.** The degree to which different colors blend where they meet.

8. Click **OK** in the **Material Properties** dialog.
9. Click **OK** in the **Materials** dialog.
10. Click **OK** in the properties dialog.

## Troubleshooting a 3D RealView™ Rendering

### Problem: Rendering is too light or too dark

If you find that your rendering is too light or too dark, or that you want to create different lighting effects, consider the following concepts:

**Time of Day.** Your location and time of day determine how much daylight is in a scene.

**Light Fixtures.** You may need to add interior light fixtures or exterior light fixtures to increase the amount of light in a scene. This is particularly important for interior shots and night shots. Note that rooms without light fixtures will be illuminated by the camera's headlight when viewing and navigating in 3D, but this light is not used in rendering.

**Light Sources.** You can change the bulbs in your light fixtures to achieve different lighting effects. For example, you can choose a bulb with a stronger or weaker wattage, or one that is a different color.

**Turning Lights Off.** If you have light fixtures in your scene and want to decrease the amount of light in the scene, you can turn selected light fixtures off.

**Gamma.** Gamma correction controls the overall brightness of an image. Lower values darken the image, while higher values make it brighter. Images that are not properly corrected can look either bleached out, or too dark.

**Scene Properties.** You can adjust certain options in your Scene Properties to control factors such as daylight and brightness. For example, you can edit the sun and sky conditions.

Problem: The quality of the rendering is poor

If your rendering looks blurry, has areas of graininess, or has jagged edges, try the following:

**Quality Level.** There are five quality levels to choose from. By default, the **Low (fast)** quality level is used. Selecting a higher quality level may improve the general appearance of your rendering.

**Antialiasing.** During the raytracing process, antialiasing blends pixels in areas where two colors or two materials meet to reduce artifacts (or “stair steps”). By default, antialiasing is set to 1 to increase rendering speed. To reduce jagged edges and create a more natural-looking scene, try increasing the antialiasing value.

**Noise reduction level.** Noise in a rendered image refers to areas of graininess. This can happen in interior scenes that mix sunlight and interior lighting, or when sunlight comes through a skylight. Increasing the noise reduction value will reduce noise in your renderings.

Problem: A wall looks black instead of textured

Sometimes when a single wall is drawn (to fill in a gable end, for example), it appears black when rendered because it is seen as an interior wall instead of an exterior wall. You can force either side of a wall to be exterior by editing the wall’s settings. The wall will then be rendered with the proper materials.

To force wall sides to be exterior, go into the wall’s properties (select the wall and then right-click and select Properties), then enable the **Force Surface To Be Exterior** check box in either the *Left Interior Surface* or *Right Interior Surface* area. For more information see Forcing Wall Sides to be Exterior on page 43.

## Animations

Animations are like movies — series of images that, when viewed in rapid succession, create the illusion of movement through a scene. Animations are the perfect way to walk a client through their home and give them a true feel for the design.

To create an animation, you need to draw a path through your 2D plan for the camera to follow. You can draw more than one path if you want, and specify the order of paths for the camera to follow. You can edit a path if necessary and even add sounds to it, such as a voiceover or doorbell ringing. You can then preview the animation and record it to a file.

When you record an animation, it is output to an AVI file. You can control the animation’s speed, video compression, resolution and frame rate. You can also opt to ray trace the animation for optimal effect.

## Drawing an Animation Path


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The first step in creating an animation is defining a path for the camera to follow. You can specify where you want the camera to look (along the path or at a specific target), as well as the view angle.

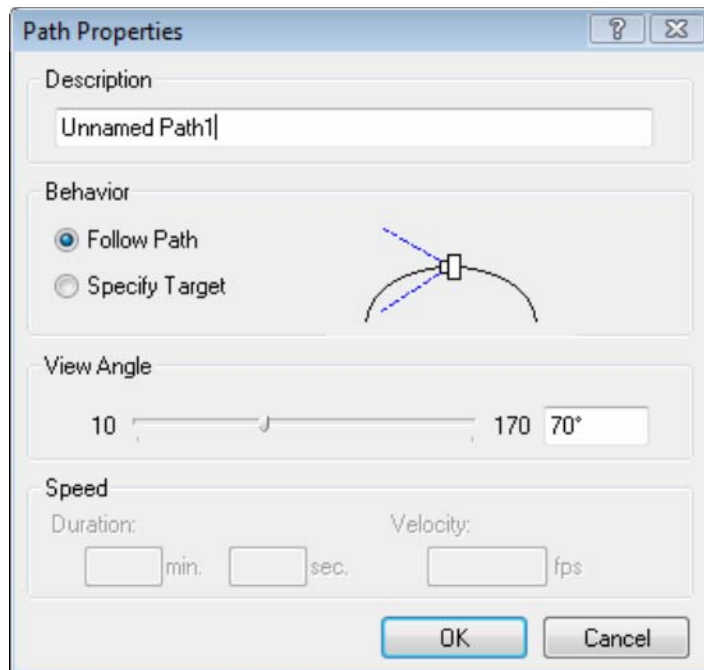
You draw the path by selecting a camera start point and subsequent control points. The path automatically curves between points to create a smooth motion for the camera. Once you have drawn the path, you can add, remove and elevate control points if you want.

You can draw more than one path if you want. By default, all paths will be included in the animation, and will be followed in the order in which they were drawn. You can, however, choose which paths you want to include in the animation, as well as the order of paths for the camera to follow.

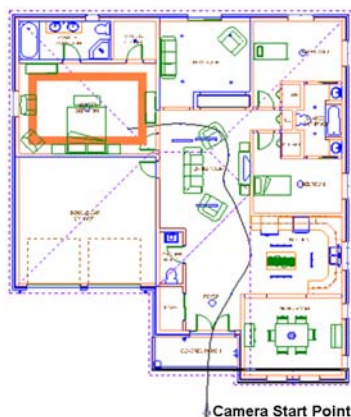
### To draw an animation path:

1. Make sure that the location on which you want to capture the animation is the current building location. Also, it is recommended that you draw the path while in 2D plan view.
2. Select **Tools > Animation > Insert Path**, or click  on the Animation toolbar.





3. In the **Path Properties** dialog, specify a name for the path for identification purposes.
4. In the *Behavior* area, specify what you want the camera to focus on during the animation. If you select **Follow Path**, the camera will focus on a different target along the path in each frame. If you select **Specify Target**, the camera will always point towards a target point that you specify.
5. In the *View Angle* area, specify how wide you want the view angle to be by either sliding the ruler or entering a value in the edit box. Higher values produce a wide-angle view; lower values produce a close-up view.
6. Click **OK**.
7. Select a start point for the camera. For example, if you want to start your animation by walking through the front door, select a point outside the front door.
8. If you selected the **Specify Target** option, select the point you want the camera to remain focused on during the animation.
9. Select the next point of the path. Each point you select is called a control point. The camera will move to each control point and capture an image of the view at that point. Basically, control points are the key to drawing and shaping your path.



10. Continue selecting control points until your path is finished.
11. Right-click and select **Finish**. You can now preview the animation.



## Drawing Separate Camera and Target Paths

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If you want you can draw two paths for an animation: one for the camera to move along (**camera path**), and a separate one for the camera to focus on (**target path**). This would be like watching an airplane from a moving car.

If you want your camera to focus on a target path, you need to draw the camera path using the Specify Target option. Once you have drawn both paths, you need to snap the camera path's target point to the target path.

### Step One: Draw the Target Path

1. Select **Tools > Animation > Insert Path**, or click  on the Animation toolbar.
2. In the **Path Properties** dialog, give the target path a name.
3. Click **OK**.
4. Pick points to define the target path, then right-click and select **Finish**.
5. Select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar.
6. If you do not want to include the target path in your animation, uncheck the **Include** check box beside the target path's name in the **Animation Properties** dialog.
7. Click **OK**.

### Step Two: Draw the Camera Path

1. Select **Tools > Animation > Insert Path**, or click  on the Animation toolbar.
2. In the **Path Properties** dialog, give the camera path a name.
3. Enable the **Specify Target** option.
4. Click **OK**.
5. Select the start point of the camera path.
6. Select a random target point. You will snap the target to the target path later.
7. Select the remaining points of the camera path, then right-click and select **Finish**.

### Step Three: Connect the Paths

1. Click on the camera path to select it.
2. Click and drag the target point (the point at the end of the arrow) to the target path, then release your mouse button. The target point automatically snaps to the camera of the target path. You are now ready to preview the animation.


When you preview the animation, you'll notice that the camera moves along the camera path and focuses on points along the target path as the animation plays.

## Previewing an Animation

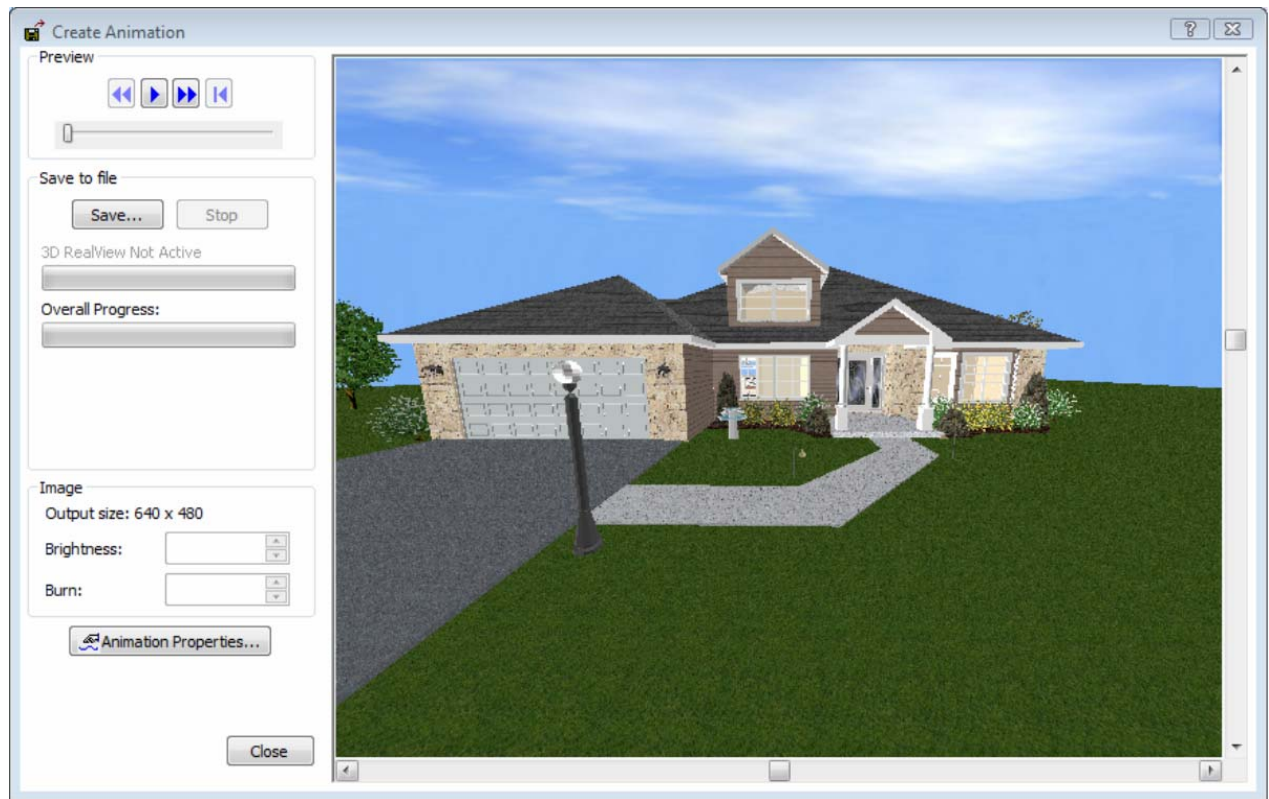
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Once you have drawn one or more paths for your animation, you can preview the resulting animation. You can play the animation automatically, or step through it frame by frame.

### To preview an animation:

1. Make sure you have drawn a suitable path for your camera.
2. Select **Tools > Animation > Create Animation**, or click  on the Animation toolbar.





3. In the **Create Animation** dialog, click  to automatically play the animation. To pause the animation, click .
4. To play the animation manually by stepping through each frame, click . To step back to the previous frame, click . Alternatively you can click and drag the slider to play it manually or skip to specific frames of the animation.
5. To return to the start of the animation so you can play it again, click .

**Note:** By default, the animation plays once during the preview. You can set it to repeat if you want.

**Note:** To be able to view the animation outside of Envisioneer, you need to save the animation to a file.


**Note:** If you enabled the Ray Trace Animation option in your Animation Properties, the ray tracing will not appear in the preview. It will only appear when you save the animation to a file.

## Repeating an Animation During the Preview

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By default, an animation is played once when you preview it. You can set the animation to repeat during the preview, meaning it will play continuously until you close the preview window.

### To repeat an animation during the preview:


1. Select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar. You can also access properties from the Create Animation dialog.
2. In the **Animation Properties** dialog, enable the **Repeat Animation during preview** check box.
3. Click **OK**.

## Changing the Path Order in an Animation

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If you have drawn more than one path for your animation, the paths will be followed in the order in which they were drawn. You can change the path order if you want.

**To change the path order in an animation:**


1. Select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar. You can also access properties from the Create Animation dialog.
2. In the **Animation Properties** dialog, use the **Move Up** or **Move Down** buttons to move selected paths up or down in the list.
3. Click **OK**.

## Choosing the Paths to Include in an Animation

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By default, all animation paths that are present in your drawing will be included in the resulting animation. You can choose to prevent selected paths from being included if you want.

**To choose which paths you want to include in the animation:**


1. Select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar. You can also access properties from the Create Animation dialog.
2. In the **Animation Properties** dialog, uncheck the boxes in the **Include** column for any paths you do not want to include.
3. Click **OK**.

## Moving an Animation Path's Control Points

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You can adjust an animation path by moving its control points. When you move a control point, the path automatically adjusts to maintain a smooth, curved path. If the path was created using the 'Specify Target' option, you can move the target point also.

**To move control points on a path:**


1. Click on the camera or any point on the path to select the path. Blue grips appear at each control point.
2. Hover your pointer over the control point you want to move. This displays the Move cursor. 
3. Click and drag the point to the desired location, then release your mouse button.

## Adding Control Points to an Animation Path

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Once you have drawn a path for your animation, you can easily add control points to the path if you want. Adding control points can help you expand your path where needed, or provide a point to attach a sound to.

**To add a control point to your path:**

1. Select **Tools > Animation > Add Control Point**, or click  on the Animation toolbar.
2. Click where you want to add the control point. A control point is automatically added to the path.

## Removing a Control Point from an Animation Path

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You can easily remove a control point from an animation path using the Remove Control Point tool.

**To remove a control point from a path:**

1. Select **Tools > Animation > Remove Control Point**, or click  on the Animation toolbar.

2. Click on the control point you want to remove.


**Note:** Removing a control point can change the shape of the path slightly depending on the location of adjacent control points to ensure a smooth, curved path.

## Editing the Elevation of a Control Point

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By default, control points are 5'-6" above the floor level of the current building location. You can edit the elevation of a control point on an animation path using the Elevate Control Point tool. This adjusts the path so it goes up or down depending on the elevation you specify. For example, if your path is on the ground floor and you have a control point at either end of a staircase, elevating the top control point will make it seem as if you're walking up the stairs.

### To edit the elevation of a control point:

1. Select **Tools > Animation > Elevate Control Point**, or click  on the Animation toolbar.
2. Click on the control point you want to edit.
3. In the **Elevate** dialog, the value currently shown is the current elevation of the control point. Edit the elevation as desired.
4. Click **OK**.

## Editing the Elevation of the Target in an Animation

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If you used the *Specify Target* option when defining an animation path, you can raise or lower your target point. This essentially changes the tilt of your camera up or down. You can change the elevation of the target point using the Commander.

### To edit the elevation of the target in an animation:


1. Click on the animation path in 2D Plan view to select it. Grips appear at the path's control points and target point.
2. Hover your cursor over the target point, then click and hold down your left mouse button. The Commander becomes active.
3. While holding down your left mouse button, press the TAB key twice to enter the third edit box in the Commander. This is the Z value (elevation).
4. Type the desired elevation for the target point, then press ENTER.

## Adding Sounds to an Animation

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You can add a variety of sounds to your animation, such as a doorbell ringing or the creak of a door opening. Sound is added to an animation by inserting a sound node at a selected path control point, and choosing the sound file you want to play at that point. The sound will be played when the camera reaches that point during the playback of the animation.

### To add a sound to an animation:

1. With your 2D plan displayed, select **Tools > Animation > Add Sound Node**, or click  on the Animation toolbar.
2. Click on the control point on your animation path where you want to insert the sound.
3. In the **Open** dialog, select the sound file you want to insert. Sound files have a \*.wav extension. A number of sounds can be found in the program's Sounds directory. To hear the selected sound, click the **Play Sound** button.
4. Click **Open**. A small node is inserted next to the control point.


**Note:** Sound nodes can only be placed at control points. You can add control points to your path if necessary.

## Removing Sounds from an Animation

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You can easily remove sounds that you have inserted in your animation using the Remove Sound Node tool.

**To remove a sound from an animation:**


1. With your 2D plan displayed, select **Tools > Animation > Remove Sound Node**, or click  on the Animation toolbar.
2. Click on the control point that the sound has been added to. The sound node is removed.

## Saving an Animation to a File

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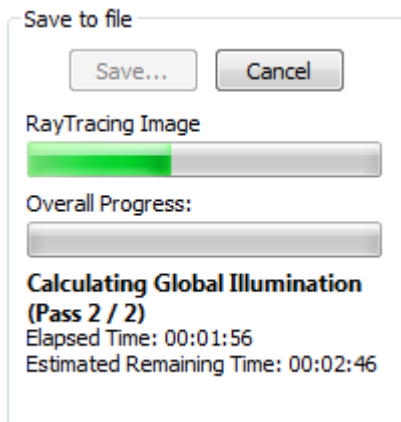
Once you have previewed your animation and are satisfied with it, you can record it to an \*.avi file which can be played using any digital media application that supports the \*.avi file format, such as Windows Media Player. When you save an animation, the 3D view is *rendered* to achieve high quality results. Rendering is a process that involves the calculation of light in a scene, resulting in natural-looking shadows and reflections. For even more photorealism you can enable ray tracing in your Program Settings.

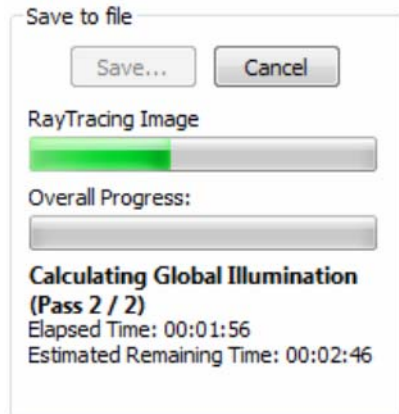
**To save an animation to a file:**

1. Select **Tools > Animation > Create Animation**, or click  on the Animation toolbar.
2. In the **Create Animation** dialog, click **Save**.
3. In the **Save As** dialog, specify a file name and save location for the animation file, then click **Save**. The animation begins recording.

The process begins by reading in the model's geometry, and then proceeds with the global illumination calculation. *Global illumination* is an algorithm that simulates the many reflections of light around a scene, resulting in soft, natural shadows and reflections. If you have specified that you want to ray trace animations in your Program Settings, ray tracing begins immediately after the global illumination calculations have been made. *Raytracing* is a direct illumination algorithm that traces the path taken by a ray of light from the camera through the scene, then calculates the reflection, refraction, or absorption of the ray when it intersects objects in the scene.

The **Create Animation** dialog displays the progress of the recording in real time, and lets you know how much time is remaining in each pass.





4. The process pauses after the first frame of the animation has been rendered, enabling you to adjust the **Brightness** and **Burn** values (described below). When you are ready to resume recording, click **Continue**.

**Brightness** refers to the overall brightness of the scene. Lower values darken the scene, while higher values make it brighter.

**Burn** is a parameter that controls the intensity of highlighted areas. Lower burn values will decrease the intensity of the highlights to avoid “burned out” areas in the animation. This can be a decimal value between 0 and 1.

5. If you click **Cancel** while an animation is being rendered, the rendering will stop, and the view in the preview window will be reset.
6. When the recording is complete, click **Close**.

**Note:** By default, the animation is saved at a size of 640 x 480 pixels. To save it at a different size, see Specifying an Output Size for Animation Files on page 425.


**Note:** You can choose to save the individual frames of your animation as well. See Saving Individual Animation Frames on page 424.

## Editing the Default Name or Save Location of Animation Files

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You can specify the default name and save location of animation files by editing your Program Settings. The name and path you choose will automatically appear in the Save As dialog when you save animations. Note that you can still override the default name and location when saving an animation.

### To edit the default name or save location of animation output files:

1. Select **Settings > Document Settings**, and then select **Animations** in the left pane of the **Document Settings** dialog.  
Alternatively you can select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar, and then click the **Animation Settings** button in the **Animation Properties** dialog. You can also access the **Animation Properties** dialog directly from the **Create Animation** dialog when previewing an animation.
2. In the **Document Settings** dialog, click the browse button next to the **Filename** edit box.
3. In the **Save As** dialog, navigate to the location where you want to save animations, then enter a default name for \*.avi files in the **File name** edit box.
4. Click **Save**.


## Saving Individual Animation Frames

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You can specify that you want to save the individual frames of your animations to individual files by editing your Program Settings. Frame images are saved in JPG format in the same folder where your AVI file is saved.

### To save individual animation frames:

1. Select **Settings > Document Settings**, and then select **Animations** in the left pane of the **Document Settings** dialog.

Alternatively you can select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar, and then click the **Animation Settings** button in the **Animation Properties** dialog. You can also access the **Animation Properties** dialog directly from the **Create Animation** dialog when previewing an animation.

2. In the **Document Settings** dialog, enable the **Save individual frames to disc** check box.
3. Click **OK**.

## Changing the Speed of an Animation

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By default, the speed of an animation is 80 inches per second if working in feet and inches, or 2.032 meters per second if working in metric units. You can speed up or slow down an animation by editing either the duration or velocity setting in a path's properties. Note that a different speed can be set for each path in your drawing.

### To change the speed of an animation:

1. Click on the path whose speed setting you want to change. The path is highlighted with blue grips.
2. Right-click and select **Properties**.
3. In the **Path Properties** dialog, edit either the **Duration** or **Velocity** value. The duration is based on the specified velocity and length of the path. Increasing the duration value will slow the animation down, and decreasing the duration value will speed it up. The velocity determines what distance is covered in one second. Increasing the velocity value will increase animation speed.



4. Click **OK**.

**Note:** The Speed setting affects only the output file. It does not apply to the preview.


## Compressing Animation Files

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By default, animations are uncompressed when you save them. This can result in very large files. Compressing an animation converts the data into a format that requires fewer bits, usually so that it can be stored or transmitted more efficiently. If you would like your animation files to be compressed when you save them, you can specify this in your Program Settings. There is an extensive list of video compression coders that you can choose from.

### To compress animation output files:

1. Select **Settings > Document Settings**, and then select **Animations** in the left pane of the **Document Settings** dialog.

Alternatively you can select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar, and then click the **Animation Settings** button in the **Animation Properties** dialog. You can also access the **Animation Properties** dialog directly from the **Create Animation** dialog when previewing an animation.

2. In the **Document Settings** dialog, select the desired coder from the **Video Compression** drop box.
3. Click **OK**.



## Specifying an Output Size for Animation Files

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By default, animations are recorded at a size of 640 x 480 pixels. You can specify a different output size for animations in your Program Settings.

### To specify an output size for animation files:

1. Select **Settings > Document Settings**, and then select **Animations** in the left pane of the **Document Settings** dialog.

Alternatively you can select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar, and then click the **Animation Settings** button in the **Animation Properties** dialog. You can also access the **Animation Properties** dialog directly from the **Create Animation** dialog when previewing an animation.

2. In the **Document Settings** dialog, select the desired size from the **Size** drop box. Pre-defined sizes include 640 x 480, 800 x 600, and 1024 x 768. Selecting the **Custom** option lets you define a custom size by entering values in the **Width** and **Height** edit boxes.
3. Click **OK**.


## Specifying a Frame Rate for Animations

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The frame rate is the number of images displayed per second. More simply, it is the video playback rate of the AVI animation. The playback rate directly relates to the perceived smoothness of its playback. The higher the number of frames playing per second, the smoother the video playback appears. Lower rates can result in a choppy playback. You can specify the desired frame rate for animations in your Program Settings.

### To specify a frame rate for animations:

1. Select **Settings > Document Settings**, and then select **Animations** in the left pane of the **Document Settings** dialog.

Alternatively you can select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar, and then click the **Animation Settings** button in the **Animation Properties** dialog. You can also access the **Animation Properties** dialog directly from the **Create Animation** dialog when previewing an animation.

2. In the **Document Settings** dialog, enter a value between 1 and 32 in the **Frame Rate** edit box. You can enter a value manually or use the arrow buttons to scroll through a list of values.
3. Click **OK**.

## Ray Tracing an Animation

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Ray tracing involves the calculation and display of light, shadows and reflection for a photorealistic effect. Light comes from lighting fixtures as well as through windows, and is bounced off of surfaces that have reflective properties.

By default, animations are not ray traced. If you want to create a ray traced animation, you need to enable ray tracing in your Program Settings before saving the animation. Note that ray tracing can increase the recording time significantly.

Ray tracing begins automatically after the global illumination calculations.

### To create ray traced animations:

1. Select **Settings > Document Settings**, and then select **Animations** in the left pane of the **Document Settings** dialog.

Alternatively you can select **Tools > Animation > Animation Properties**, or click  on the Animation toolbar, and then click the **Animation Settings** button in the **Animation Properties** dialog. You can also access the **Animation Properties** dialog directly from the **Create Animation** dialog when previewing an animation.

2. In the **Document Settings** dialog, enable the **Ray Trace Animation** check box.
3. Click **OK**.

**Note:** Ray tracing occurs only when you record the animation. It is not applied when previewing the animation. The recording pauses before ray tracing is completed so that you can review the image and make brightness adjustments if needed.

## Turning Animation Paths On and Off

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You can instantly hide or show all animation paths using the Animation Paths On/Off tool.

**To turn animation paths on or off:**

1. Select **View > Viewing Aids > Animation Paths On/Off**, or click the down arrow next to the Viewing Aids button  on the View Control toolbar and select **Animation Paths On/Off**.

## Deleting an Animation Path

You can remove an animation path from your drawing in a couple of easy steps.

**To delete an animation path:**

1. Click on the path to select it.
2. Press the **Delete** key on your keyboard, right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.

## Sounds

Attaching sounds to your drawing is a fun way of adding realism and excitement to your project. For example, you can attach the sound of a doorbell ringing to your front door.

You can use the **Attach Sound File** tool to attach sounds to elements in your drawing, or elements in your catalog. If you attach a sound to an element in the catalog, the sound will automatically be attached to the element when you insert it in your drawing.

Once you have attached a sound to an element, you can play the sound with the Play Sound tool.

**Note:** The method of adding sounds to animations is different than the method of adding sounds to elements. In animations you need to add a sound node to your animation path.


## Attaching Sounds to Elements in Your Drawing

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Attaching sounds to elements is a great way to add realism and excitement to your design. You can use the Attach Sound File tool to attach

sounds to selected elements in your drawing. For example, you can add the sound of a doorbell or even a voice-over to your front door.

**To attach a sound to an element in your drawing:**

1. Select **Tools > Sounds > Attach Sound File**. The Sounds cursor is displayed .
2. Click on the element you want to add the sound to. You can select multiple elements if you want using Shift+click.
3. In the **Open** dialog, select the \*.wav file you want to attach, then click **Open**. Note that there are a number of pre-defined sounds in the program's Sounds directory. You can also use your own \*.wav files if you want. A dialog appears telling you that the sound was attached successfully.
4. Click **OK**.

**Note:** Only one sound can be attached to an element. If you attempt to attach a sound to an element that already has a sound attached to it, the new sound will replace the old sound.

## Attaching Sounds to Elements in the Catalog



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You can use the Attach Sound File tool to attach sounds to elements in your catalog. For example, you can add the sound of a door creak to an interior door. Each time you insert the element in your drawing, it will have the sound attached to it.

**To attach a sound to an element in the catalog:**

1. Select **File > Catalogs > Element Manager**, or right-click any element in the catalog panel and **Element Manager**.
2. In the **Element Manager**, select the element that you want to add a sound to.



3. Click  below the properties pane, then select **Attach Sound File**.
4. In the **Open** dialog, select the \*.wav file you want to attach, then click **Open**. Note that there are a number of pre-defined sounds in the program's Sounds directory. You can also use your own \*.wav files if you want. A dialog appears telling you that the sound was attached successfully.
5. Click **OK**. The name of the sound file is displayed next to the Sounds button.
6. To test the sound, click  again and select **Play Sound**.
7. Click **OK**.


**Note:** Attaching a sound to an element in the catalog affects only future insertions of that element. Elements that already exist in your drawing are not affected.

## Playing Sounds

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If you have attached a sound to an element, you can play the sound by selecting the Play Sound tool, then clicking on the element with the attached sound.

### To play a sound:

1. Select **Tools > Sounds > Play Sound**. The Sounds cursor is displayed. 
2. Select the element with the sound attached to it. The sound plays.


**Note:** A notification dialog appears if the element does not have a sound attached to it.

## Removing Sounds from Elements in Your Drawing

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If you have attached a sound to an element in your drawing, you can remove it using the Remove Sound tool.

### To remove a sound from an element in your drawing:


1. Select **Tools > Sounds > Remove Sound**. The Sounds cursor is displayed. 
2. Click on the element. A dialog tells you that the sound has been successfully removed.
3. Click **OK**.

## Removing Sounds from Elements in the Catalog

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If you have attached a sound to an element in the catalog, you can remove it by editing the element's properties. Note that this does not remove the sound from elements already inserted in your drawing.

### To remove a sound from an element in the catalog:


1. Select **File > Catalogs > Element Manager**, or right-click any element in the catalog panel and select **Element Manager**.
2. In the **Element Manager**, select the element you want to remove the sound from.
3. Click  below the properties pane, then select **Remove Sound**. A dialog tells you that the sound has been successfully removed.
4. Click **OK**.

## Selecting a Default Sounds Directory

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By default, the program's Sounds folder is displayed in the Open dialog when attaching sounds to elements or animations. You can select a different default directory to display if you want.

**To select a default Sounds directory:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the General pane, click on the **Sounds Directory** in the *File Paths* area.
3. Click **Modify**.
4. In the **Browse For Folder** dialog, select the directory you want to use as your default temporary files directory, then click **OK**.
5. Click **OK** in the **Program Settings** dialog.

# Chapter 26: Drawing Aids

While designing you have a variety of powerful drawing aids at your fingertips that can help you insert elements easily and precisely where you want them in your drawing. If you want you can display a drawing grid in your drawing area, as well as set up a snap grid so that your cursor snaps to the grid when you are inserting elements. The Object Snap feature automatically snaps your pointer to existing objects, and the Angle Snap snaps your pointer to specified angles. Snap tracking helps you draw objects at specific angles or positions relative to other objects. The Collision Control feature prevents you from inserting elements where they do not fit. You can set up drawing aids in your program settings, and toggle them on and off using the buttons on the Status bar.


For very precise control when inserting or editing elements, you can use a tool called the Commander, which lets you view or enter exact values for distance, direction and angles. It is especially handy for users with some CAD experience.

## Setting Up a Drawing Grid

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A drawing grid is simply a set of horizontal and vertical lines that can help you orient objects to one another. By default, the spacing between grid lines is 4', but you can change this if you want. You can also control the color and style of the grid. Note that the drawing grid is a visual aid only, and will not be included in printouts. By default a grid is displayed in the drawing area, but you can turn it off if you like.

### To set up a drawing grid:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, select **Drawing Aids** in the left column.
3. In the *Grid* area, check the **Enable (F7)** check box.
4. Click the **Color** swatch, then select a color for the grid from the **Color** dialog.
5. From the **Style** drop box, select a style for the grid — **Dots** or **Lines**.
6. Specify the desired distance between vertical grid lines in the **X Spacing** edit box.
7. Specify the desired distance between horizontal grid lines in the **Y Spacing** edit box.
8. By default, the grid is 160' x 160', which is the default size of the terrain. To change the overall size of the grid, enter the desired width in the **X Limit** edit box, and the desired height in the **Y Limit** edit box.
9. Click **OK**.

## Turning the Drawing Grid On and Off


You can toggle the drawing grid on and off in one of two ways:

- Press **F7** on your keyboard
- Click the **GRID** button on the Status bar

## Using the Grid Snap

The Grid Snap feature snaps your pointer to an invisible grid when inserting elements. By default, the spacing between the grid lines in the invisible grid is 4', but you can change this if you want. If you enable the **Match Grid** option, the invisible snap grid becomes the same size as the drawing grid. This will make it seem like you are snapping to the drawing grid while drawing.

### To set up a snap grid:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, select **Drawing Aids** in the left column.
3. To turn the grid snap on, enable the **Grid Snap (F4)** check box.

4. If you want the snap grid to be the same size as the drawing grid, check the **Match Grid** check box in the *Grid Snap* area.
5. To specify a custom distance between vertical grid lines, enter a value in the **X Spacing** edit box.
6. To specify a custom distance between horizontal grid lines, enter a value in the **Y Spacing** edit box.
7. Click **OK**.

**Tip:** You can toggle the grid snap on and off by clicking the GRIDSNAP button on the drawing aids toolbar or pressing F4 on your keyboard.

## Turning the Grid Snap On and Off

You can toggle the grid snap on and off in one of two ways:

- Press **F4** on your keyboard
- Click the **GRIDSNAP** button on the Status bar

## Using Ortho

The Ortho feature restricts your cursor movement to 90-degree angles when you are inserting elements. This can be especially helpful when drawing elements like walls.

By default, Ortho is enabled. You can toggle it on and off using one of three methods.

### To turn Ortho on or off:

- Press **F8** on your keyboard, or
- Click the **ORTHO** button on the Status bar, or
- Select **Settings > Document Settings**, then on the Drawing Aids pane, check or uncheck the **Ortho (F8)** check box

To temporarily disable Ortho while drawing, press and hold the **Shift** key. When you release the **Shift** key, Ortho mode will resume.

## Using Object Snaps in Model View

When inserting an element, the Object Snap feature makes your cursor automatically snap to common points on existing elements in your drawing. This allows you to select an insertion point or start point more easily and precisely. When the Object Snap is turned on, the Endpoint, Midpoint, Nearest and Perpendicular snaps become active. Your cursor icon changes when your cursor comes close to a snap point, providing a visual indicator that snapping is occurring.

**Endpoint.** Snaps to the endpoint of an object.

**Midpoint.** Snaps to the midpoint of an object.

**Nearest.** Snaps to a point directly on an object.


**Perpendicular.** Snaps to a point on an object that forms a perpendicular from the current point to the selected object.

You can set the pixel search distance for the object snap, which determines how close your pointer needs to be to an element for it to snap to the element.

### To turn the Object Snap on or off:

- Press **F5** on your keyboard, or
- Click the **OBJSNAP** button on the Status bar, or
- Select **Settings > Document Settings**, then on the Drawing Aids pane, check or uncheck the **Object Snap (F5)** check box in the *Snap Behavior* area

### To set the pixel search distance:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, select **Drawing Aids** in the left column.
3. Below the *Object Snap (F5)* setting, type the desired number of pixels in the **Pixel Search Distance** edit box, or use the arrows to scroll up or down through a list of values.
4. Click **OK**.

## Using Angle Snap


When the Angle Snap feature is turned on, your cursor snaps to specific angles when rotating an element. If you set your snap angle to  $10^\circ$ , for example, your cursor will snap at  $10^\circ$  intervals as you rotate the element.

By default, the Angle Snap is on and is set to  $15^\circ$ .

### To turn the Angle Snap on or off:

- Press **F6** on your keyboard, or
- Click the **ANGLESNAP** button on the Status bar, or
- Select **Settings > Document Settings**, then on the Drawing Aids pane, check or uncheck the **Angle Snap (F6)** check box

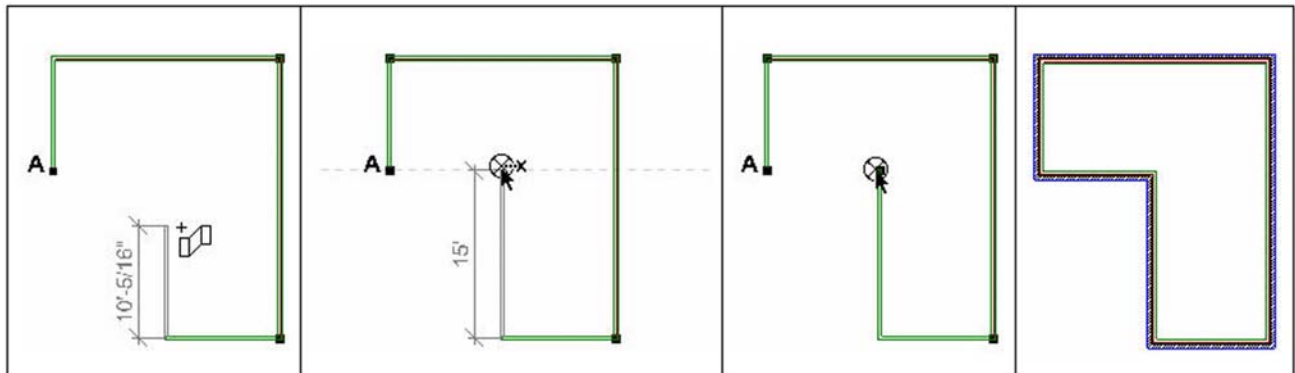
### To change the snap angle:

1. Select **Settings > Document Settings** or click  on the Settings toolbar.
2. In the **Document Settings** dialog, select **Drawing Aids** in the left column.
3. In the *Snap Behavior* area, type the desired snap angle in the **Snap Angle** edit box, or use the arrows to scroll up or down through a list of values.
4. Click **OK**.

## Object Snap Tracking

The Snap Tracking feature helps you draw objects at specific angles or positions relative to other objects. When snap tracking is turned on, temporary alignment paths appear that are based on object snap points, such as endpoints and midpoints. Such points are marked with a small, solid square when you move your cursor over their drawing paths. You can acquire points on up to five elements at one time. Alignment paths are horizontal and vertical, and can also be angled if your Angle Snap is turned on. Snap tracking can be turned on and off as needed. In order for snap tracking to work, the Object Snap (OBSNAP) must be enabled. Snap tracking is available in both Model View and Worksheet View.

Let's say in the following example that we want the end of the wall being drawn to be in alignment with point **A**. When you hover over point **A** and then stretch your wall towards the drawing path of point **A**, a horizontal dotted line appears indicating the path of alignment with point **A**. This makes it easy to select an end point for the wall that is aligned with point **A**.



### To turn Snap Tracking on or off:

- Press **F3** on your keyboard, or
- Click the **SNAPTRACK** button on the Status bar, or
- Select **Settings > Document Settings > Drawing Aids**, then check or uncheck the **Snap Tracking** check box

## Collision Control

The program's intelligent Collision Control feature prevents objects from being inserted where they do not fit. By default, Collision Control is on, but you can turn it off whenever you like using one of three methods.

**To turn Collision Control on or off:**

- Press **F9** on your keyboard, or
- Click **COLLISION** on the Status bar, or
- Select **Settings > Document Settings**, then on the Building Aids pane, check or uncheck the **Enable Collision Control (F9)** check box

**Note:** Collision control affects building elements on the current building location only. It does not affect landscape elements.

## Using the Commander

The Commander can be a very useful tool when inserting or editing elements. Using the Commander you can:

- Specify the insertion height of an element before it is inserted
- Select a precise insertion point for an element
- Specify a precise length and direction for elements like walls and railings
- Specify a precise distance and direction when stretching or moving an element
- Specify a precise angle when rotating an element
- Specify a precise radius/included angle when curving a wall, ceiling, deck or opening

Even if you don't want to enter precise values, you can still use the Commander to view measurements as you draw and edit elements. The values in the Commander are linked to your cursor movement and update as you proceed through a command.

The Commander becomes instantly active when inserting elements. It is most useful for things like walls and railings, because it lets you enter a precise length for the element.

The Commander also becomes active when you are moving, stretching or rotating elements. If you have started moving, stretching or rotating an element using your mouse, the Commander displays the move distance or rotation angle as you move your mouse. If you want to be able to enter values in the Commander when moving, stretching or rotating an element, you need to first select an appropriate editing tool from the right-click menu or Edit > Modify Elements menu such as Move, Stretch, Lengthen, or Rotate.

## Turning the Commander On or Off


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The Commander is a multi-functional tool that lets you enter precise values when inserting or editing elements. Even if you don't need a high level of precision, you may want the Commander displayed so you can see lengths and angles as you draw or edit elements.



The Commander is displayed in the lower part of the screen, just above the Status Bar. Initially the Commander will look grayed out because it is inactive. It will become active when you insert or edit elements.

**To turn the Commander on or off:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. Check or uncheck the **Commander** check box.
4. Click **OK**.


## Displaying the Coordinate Icon

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The Coordinate Icon marks the current point from which an action will be performed. In other words, it identifies the current reference point when using the Commander. By default, this icon is turned off. If you plan to use the Commander while working, you should turn on the Coordinate Icon.



### To display the Coordinate Icon:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Visual Aids* area, check the **Show Coordinate Icon** check box.
4. Click **OK**.

## Specifying the Insertion Height of an Element Before Inserting It

If you have the Commander turned on, it will display a **Base Height** edit box as soon as an insertion tool becomes active.



The value shown in the **Base Height** edit box is the height at which the element will insert in your drawing. You can change the insertion height before selecting an insertion point for the element by typing a value in the **Base Height** edit box and pressing ENTER. If the element is a building element, the height is measured from the floor level of the current building location to the element's insertion point. If the element is a landscape element, the distance is measured from the terrain to the element's insertion point. Most elements have their insertion point at the bottom of the element. Exceptions are windows and wall openings, in which the insertion point is located at the top of the element. In the case of windows and wall openings, the edit box reads "Head Height".

## Selecting a Reference Point When Inserting and Editing Elements

To use the Commander, you must first specify a reference point, or base point, from which values can be measured. If you are drawing a wall, for example, the first point you click on the screen is considered the reference point. The Commander then becomes active, and you can enter a Distance and Direction (or X and Y values) for the wall.

If you want to use the Commander to edit an element (e.g. move or rotate it), you must select a point from which to measure the move distance/direction, or rotation angle. Most often you would select one of the element's grab handles, which are the small blue squares that appear on the major points of an element when you select the element.

## Entering Values in the Commander

The Commander is intelligent and changes depending on the tool you are using. For example, if you are drawing walls, the Commander's edit boxes become *Distance* and *Direction*. If you are curving walls, however, the edit boxes change to *Radius* and *Included Angle*. You can move easily from one edit box to the next using your Tab key. Pressing Enter after typing a value completes the current action.

When entering values in the Commander, especially when inserting or moving elements, it is important to be aware of the current coordinate system in the Commander.

The Commander offers two coordinate systems. In the Polar system, you enter a distance and direction. In the Cartesian system, you enter X, Y and Z coordinates.

Note that you can switch between the Polar and Cartesian coordinate system once you have selected a reference point to draw from or move from. You do this by making a selection from the coordinate system drop box on the left side of the Commander.

**Note:** If moving, stretching or rotating elements, and you want to enter values in the Commander, you need to first select an appropriate editing tool from the right-click menu or Edit > Modify Elements menu such as Move, Stretch, Lengthen or Rotate.

## Specifying Distance and Direction in the Commander

The Polar coordinate system becomes active in the Commander once you have selected a reference point to draw from, or start a move from. In the Polar coordinate system, you specify a distance and direction (angle) when drawing or moving an element.



**Distance.** Enter a positive value to specify the length of the element, or the move distance.

**Direction.** Enter the direction you want the element to run, or the direction in which you want to move an element. For information about how direction is specified, see *Direction and Angle of Rotation*.

**Z.** This value is only available when inserting members. Enter the distance you want to move the member vertically. You can enter a positive or negative value to move it up or down. The Z value is measured from the floor level of the current building location.

## Defining X, Y and Z Coordinates

While using the Commander to insert or edit elements, you may choose to work in the Cartesian coordinate system instead of the Polar coordinate system. This lets you specify a precise reference point to draw or move from by entering X and Y coordinate values.

To switch to the Cartesian coordinate system, select **Cartesian** from the Commander's left drop box.



**X.** Enter an X coordinate to specify a horizontal (left/right) distance in 2D plan view.

**Y.** Enter a Y coordinate to specify a vertical (up/down) distance in 2D plan view.

**Z.** This coordinate is only available when inserting members. Enter a Z coordinate to indicate elevation, or height. The Z value is measured from the floor level of the current building location.

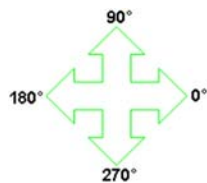
Remember that the coordinates are measured from the current reference point, which is marked by the Coordinate Icon if it is enabled.

In the Cartesian system, you can enter both positive and negative values for any of the coordinates.

## Direction and Angle of Rotation

Direction in a drawing is specified in degrees of an angle. The angle is calculated counterclockwise from the positive X axis.

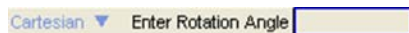
### The Four Primary Drawing Directions



Although the four primary drawing directions are the ones you will probably be working with the most, any angle is possible. If you disable Ortho and Angle Snap, and move an element randomly in your drawing area, there is no restriction on angles at all. Even if Ortho and Angle Snap are enabled, you can enter any angle you want in the Commander.

## Rotating Elements Using the Commander

When you select the Rotate tool from the right-click menu or Edit > Modify Elements menu, then select a base point for the rotation, the Commander displays an **Enter Rotation Angle** edit box.



To specify the desired angle of rotation for the element, type the angle in the **Enter Rotation Angle** edit box and press ENTER. For information on how angles are measured, see *Direction and Angle of Rotation*.



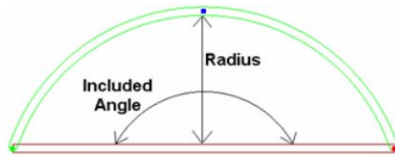
## Curving Elements Using the Commander

When curving an element such as a wall or floor opening, you can use the Commander to specify a precise curve angle.



**Radius.** The distance from the element (in its uncurved state) to the center point of the curve.

**Included Angle.** The angle formed between two radius lines extending from the center of the circle implied by the curve out to the endpoints of the arc. The larger the angle, the rounder and larger the curve.




It is not necessary to enter both the Radius and Included Angle values. If you enter one, the program automatically supplies the other. Also, if you enter a value and nothing happens after you press ENTER, then the value is not valid in relation to the dimensions of your element.

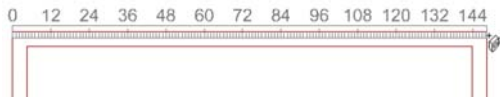
## Measuring Distance in Model View

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Use the Measure tool to measure the distance between any two points in your 2D plan.

**To use the Measure tool:**

1. Select **Tools > Measure**, or click  on the Tools toolbar.
2. Click your first point on the screen.
3. Move your cursor in the direction you want to measure. A ruler is displayed that stretches as you move your cursor.



4. Click your second point on the screen. The distance is shown on the ruler as well as on the Status bar at the bottom of the screen.
5. Once you have measured your first distance, you can keep selecting points to measure additional distances from the last point selected. A running total is displayed on the Status bar.

Pick next point on screen: < Distance: 12'-4", Total Distance: 12'-4" >


6. When you have finished measuring, right-click and select **Finish**.

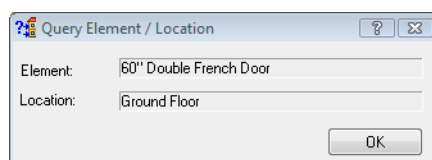
## Querying Elements

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Using the Query Element/Location tool you can select any element in your drawing and instantly view its name and building location.

**To query an element/location:**

1. Select **Tools > Query Element/Location**.
2. With the Query Element/Location cursor active , click on the element you want to inquire about. The **Query Element/Location** dialog displays the element's name and building location.



3. When you are finished viewing the element and location information, click **OK**.

**Note:** For landscaping and terrain elements, which are associated with the terrain, the Location box displays *Terrain* rather than a building location.

**Note:** The Query Element/Location tool can only be used on elements that were inserted from the catalog. You cannot use it on drafting objects.

# Chapter 27: Project Management

Envisioneer offers the standard Open tool for opening saved projects. Save features include Save, Save As, and Save All.

Each view in your project has its own set of Print Properties. These include settings for the printer selection, paper size, scaling, and print quality. These settings will automatically appear in the Print dialog when you print the view. You can print across multiple sheets of paper if needed, and print to a file. The Batch Printing tool lets you process the printing of multiple views at the same time.

There are a number of different items that you can import into your drawing. Use the Project Trace Image tool to import a BMP, JPG or TGA file, such as a scanned floor plan, and then trace over it using real 3D elements. The Photo Board Wizard lets you import digital photographs or scanned images that are then oriented vertically in 3D view.

Perhaps one of the most versatile tools is the Object Import Wizard, which lets you quickly import custom 3D objects in DWG, DXF, SKP or 3DS format.


You can export your drawing to different 2D and 3D file formats. To export to a BMP, JPG or TGA file, use the 2D Image export tool. To export your 2D plan to a DWG or DXF file, use the 2D Drawing export tool. To export your 3D model to a DWG or DXF file, use the 3D Model export tool.

To specify general project information, such as the project name, type and number, fill out the fields in the Project Manager. This dialog also has a Work History tab where you can keep track of who has done what, and when.

## Opening a Saved Project

You can open any saved project using the Open tool.

### To open a saved project:

1. Select **File > Open**, or click  on the Standard toolbar.
2. In the **Open** dialog, navigate to the location where you saved the project.
3. Select the project to open, then click **Open**.

**Tip:** If the project you want to open is one that your recently worked on, it may be listed in the recently used file list near the bottom of the **File** menu, or in the Projects section on the Startup screen. Just select it to open it. You can also open a saved project from the Startup screen by selecting **Open Existing**.


**Note:** For information about opening projects from older versions of the program, see Opening a Project from an Older Version on page 6.

## Changing the Number of Files on the Recently Used File List

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By default, a maximum of four projects are listed in the recently used file list near the bottom of the **File** menu. You can increase or decrease this number if you want.

### To change the number of files in the recently used file list:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the *General* pane, type the maximum number of files to display in the **Recently used file list** edit box, or use the arrows to select a number. You can list a maximum of 9 files.

## Repairing Damaged Projects

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Occasionally a drawing may become damaged, usually when drawing walls. The Repair Project tool scans the project for elements that have caused damage, and either fixes or removes them.

### To repair a damaged project:

1. Select **File > Repair Project**.

If the recovery is successful, a dialog appears with the message, "Recovery Successful".

If the recovery is not successful, a dialog appears telling you why it was not successful.

## Saving Projects


The program has three save functions: Save, Save As and Save All. They are located on the File menu. When saving a new project for the first time, or when saving a project under a different name, you have the option of saving it in a format that is compatible with an older version of Envisioneer.

If you plan to share the project with others, you can choose to pack any resources that it uses, and include them in the saved project.

By default, projects are stored in the following location:

*C:\Users\\*username\*\Documents\Envisioneer\Projects*

### To save a project:

1. To save the current project for the first time, or save changes to a project that you have already saved, select **File > Save**, or click  on the Standard toolbar. To save the project under a different name (and create a copy of it), select **File > Save As**.
2. If you are saving for the first time, or saving under a different name, the **Save As** dialog appears. Type a name for the file in the **File name** edit box.
3. If you want to save the file in a format that is compatible with an older version of Envisioneer, click the **Save as Type** drop box and select the desired version.
4. If you want to pack resources with the saved project, such as textures and linestyles, enable the **Pack Resources** check box. This enables you to share the project with others who may not have those resources on their system.
5. Click **Save**.

### To save all currently open projects:

Select **File > Save All**, or click  on the Standard toolbar.

## Sharing Projects

If you would like to share a project with other Envisioneer users, you can simply send them a copy of the original .bld file. Note the following considerations:


- If a user has an older version of Envisioneer, you can use the **Save As** tool to save a copy of the project in an older format. In the **Save As** dialog box, the **Save as type** drop box contains a list of previous version formats.
- If your project uses any custom resources that may not be available on other users' systems, such as custom textures or linestyles, use the **Save As** tool to save a copy of the project. In the **Save As** dialog box, make sure that you enable the **Pack Resources** check box. Although this will result in a larger file size, you can be assured that others will be able to properly visualize all aspects of your project.

## Setting the Automatic Save

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The Auto Save option saves your project for you at regular intervals. This is a great way to make sure you save your changes regularly and avoid any loss should a power failure or system error occur.

### To set the Automatic Save:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the *General* pane, enable the **Auto Save** check box.
3. From the **Save time (min)** drop box, select the desired save interval in minutes, or use the arrows to select a value.

4. Click **OK**.

**Note:** Disabling the Auto Save applies to the current project only. It is turned on by default for all new projects.

**Note:** If you have not saved your project yet, the Auto Save will save the project to a temporary *autosave.bld* file.

## Setting the Number of Backups


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By default, one backup drawing is created when you save your drawing. You can choose to save multiple backups if you want.

Backup files are saved in the same folder as your project files. The format of the first backup file is *ProjectName\_1.bkp*. If you choose to save additional backups, the number increments by one for each backup file (e.g. *ProjectName\_2.bkp*).

The first backup file is always a copy of the drawing as it is saved currently. If the number of backups is set to 2, the second backup drawing is a copy of your drawing as it was at the previous save. If the number of backups is set to 3, the third backup drawing is a copy of your drawing two saves back, and so on.

### To set the number of backups:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Number of Backups** edit box on the *General* pane, type the number of backup files you would like to save, or use the arrow keys to increase or decrease the number.
3. Click **OK**.

## Specifying a Default Save Location for Projects


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By default, new (unsaved) projects are saved in the following folder unless you specify otherwise:

*C:\Users\\*username\*\Documents\Envisioneer\Projects*

You can specify a different default save directory if you want.

### To specify the default save location:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the *General* pane, click on the **Projects Directory** in the *File Paths* area.
3. Click **Modify**.
4. In the **Browse For Folder** dialog, select the directory you want to use as your default save directory, then click **OK**.
5. Click **OK** in the **Program Settings** dialog.

## Saving a Project as a Template

By default you are prompted to select a template when starting a new project. A template determines what settings new projects will have. These include the following:

- Building Location Settings
- Program Settings (unit of measure, drawing aids, etc.)
- View Window Setup
- Wall Framing Configurations
- Dimension Settings
- Drafting Preferences

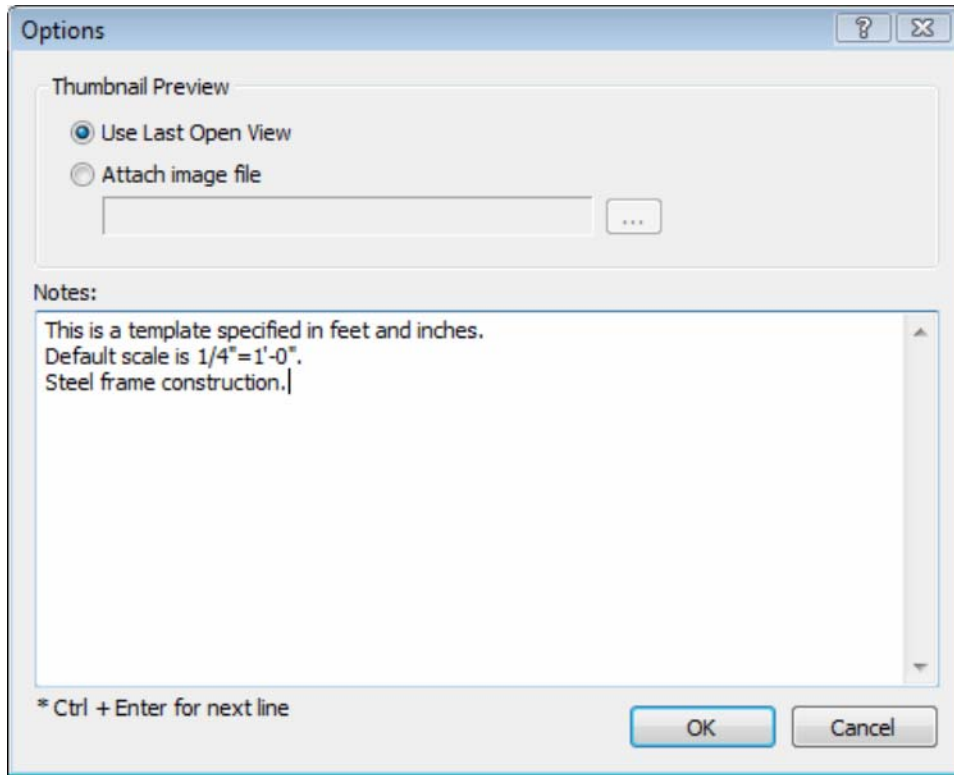
You can even include drafting objects and building elements in a template if you want. For example, if you use a standard set of drawing borders and title blocks in all your projects, you can insert them on your worksheets and save them in your template so that they are already present when new projects are started.


You can create a template out of any drawing by simply saving it in your Templates directory. If you want to use the same template for every new project, you can specify this in your startup options.

**To create a template:**

1. Unless you have already created the drawing you want to use as a template, start a new project (**File > New**).
2. Specify the settings you want to save with the template, such as your building locations and program settings. Note that any elements in your drawing will be saved as well, so unless you want these elements to appear in new projects, you should delete the elements from your drawing.
3. By default, the last open view is used as the thumbnail for the template. Template thumbnails are displayed in the **New** dialog that appears when you start new projects. If you want to create a thumbnail image of one of the project’s views, make sure that view is current before saving the project. (Note that you can attach an image file such as a BMP or JPG instead.)
4. Select **File > Save As**.
5. In the **Save As** dialog, navigate to the program’s Templates folder. By default, this is in the following location:  
*C:\ProgramData\Cadsoft\Envisioneer\Templates*
5. In the **File name** edit box, type a name for the template.
6. To create a thumbnail and/or a description of the template which will be displayed in the **New** dialog box when you

start new projects, click  .



To create a thumbnail based on the project’s last open view, enable the **Use Last Open View** radio button in the *Thumbnail Preview* area. To create a thumbnail based on an image file, enable the **Attach Image File** radio button, then click  to browse for and select the desired image. You can attach a BMP, JPG, PNG or GIF image to the template.

To create a description of the template, type the desired information in the *Notes* pane, pressing **CTRL + Enter** for each new line of text. Click **OK**.

7. When you are ready to save the project as a template, click **Save**.

**Note:** If you do not save a template in the Templates folder (or the folder that is selected as the default templates folder in your program settings), it will not be immediately available in the **New** dialog when starting new projects. You will have to browse for it every time.

## Setting the Path to the Templates Directory


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If you have moved your Templates directory, or have chosen to store your templates in a different directory, you should reset the path to the template directory in your Program Settings. The path you set determines which templates are displayed in the New dialog when you start new projects as well as the default folder displayed when browsing for templates.

By default, your templates are stored in the following directory:

*C:\ProgramData\Cadsoft\Envisioneer\Templates*

**To set the path to your templates directory:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the *General* pane, click on the **Templates Directory** in the *File Paths* area.
3. Click **Modify**.
4. In the **Browse For Folder** dialog, select the directory containing your templates, then click **OK**.
5. Click **OK** in the **Program Settings** dialog.

## Selecting a Directory for Temporary Files


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Certain functions of the program create temporary files which are stored in a directory on your computer system. By default, the path to the temporary directory is as follows:

*C:\Users\\*username\*\AppData\Local\Temp*

You can specify a different directory to store your temporary files in if you want.


**To set a different temporary files directory:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the *General* pane, click on the **Temporary Directory** in the *File Paths* area.
3. Click **Modify**.
4. In the **Browse For Folder** dialog, select the directory you want to use as your default temporary files directory, then click **OK**.
5. Click **OK** in the **Program Settings** dialog.

## Closing Projects

Projects remain open until you close them or exit the program. You can close the active project without exiting the program. If you have more than one drawing open, make sure the drawing you want to close is the active one.

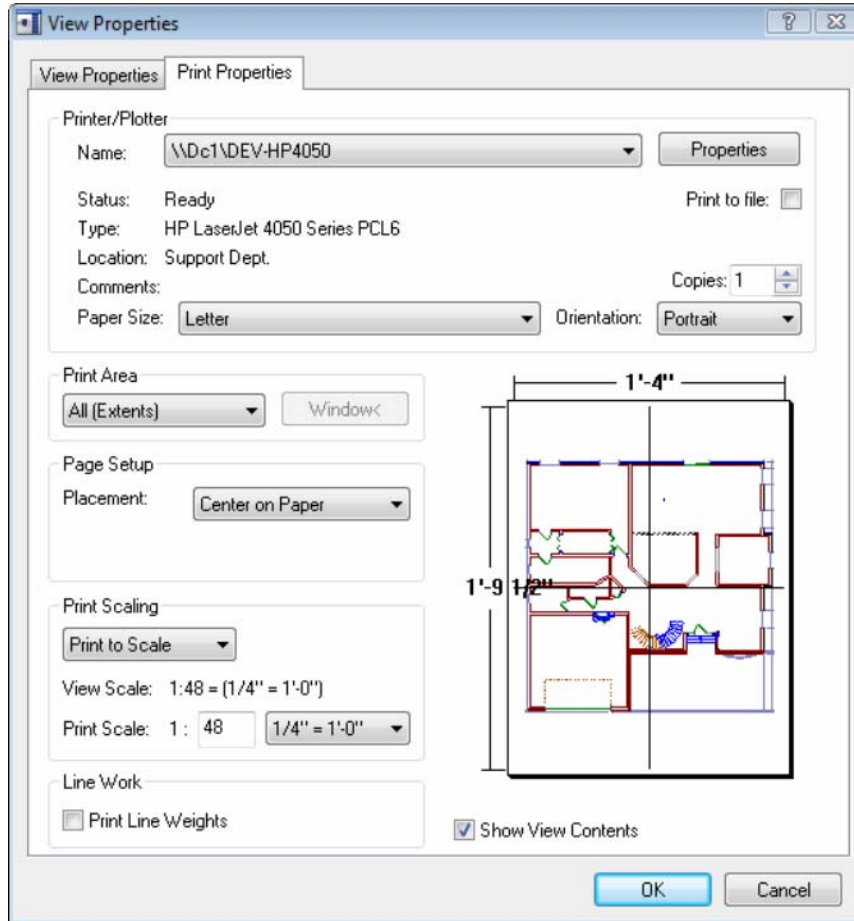
**To close a drawing:**

1. Select **File > Close**, or click  on the Standard toolbar.
2. In the dialog, click **Yes** or **No** when you are asked to save changes.
3. If you haven't named the project yet and you clicked **Yes** in the previous step, specify a name for the project in the **Save As** dialog, then click **Save**.

## Defining a View's Print Properties

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Each view window in your project, whether it be a Model View or Worksheet View window, has its own set of print properties. These properties include the printer/plotter selection, paper size, print area, page setup, print scaling, print quality, and line weight printing.



Having view-specific print properties lets you define and save unique print properties for each view, and therefore eliminates the need to specify print settings every time you want to print a view. It also makes it possible to perform batch printing, where a number of different views (with different print settings) can be printed at once.

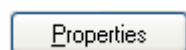
You can access a view's print properties using the View Properties tool, or through the View Manager.

### To define a view's print properties:

1. Right-click in the view window and select **View Properties**, or select **View > View Properties**. Or, select **View > View Manager** and select the view window whose properties you want to define.
2. Select the **Print Properties** tab.
3. Define the view's print properties. The properties are described below.

#### Printer/Plotter

**Name.** Click this drop box to select the printer or plotter to use when printing this view.



Click to define various properties for the currently selected printer such as paper and output settings, and print quality.

**Paper Size.** Click this drop box to select the size of paper you want to print on.



**Orientation.** Choose either **Portrait** or **Landscape**. The Portrait option gives the paper a vertical orientation, while the Landscape option gives it a horizontal orientation.

**Print to file.** If enabled, the view is printed to a print file, such as a Postscript file, rather than a printer.

**Copies.** The number of copies you want to print.

#### Print Area

**All (Extents).** Prints the entire view, even if part of it is currently not visible.

**Window.** Prints a selected area of your drawing. To select the area, click the Window button. Note that this option is not available for 3D perspective views.

**Display.** Prints exactly what you see on the screen in the current view. If only part of your drawing is currently visible, only that part will appear in the printout.



Click to temporarily access your drawing area and draw a selection window around the area you want to print. This button is only available if the *Window* print area option is selected.

#### Page Setup

**Placement.** The **Lower Left** option prints the image in the lower left corner of the paper. The **Center on Paper** option centers the image on the paper.

**Print all colors as black.** (*Worksheet View only*) If enabled, this will produce a black-and-white printout.

#### Print Scaling

**Fit to Page.** Scales the drawing to fit the selected paper size. Note that this is the default setting for 3D views, since 3D views are not affected by changes in scale.

**Print to Scale.** Prints the current view according to the **Scale** set below, regardless of the paper size. This option does not work with 3D views, since 3D views cannot be scaled.

**View Scale.** The drawing scale of the current view as set on the View Properties page in the view's properties. This is the ratio of units on paper to real-world units. For example, if the view scale is  $1/4" = 1'-0"$  (or 1:48), this means that every  $1'-0"$  of your actual model is represented by  $1/4"$  on paper. If you are using the Print to Scale option, this gives you a sense of how you are scaling the drawing. For example, if your view scale is set to  $1/4" = 1'-0"$  and you set the print scale to  $1/2" = 1'-0"$ , you know that you are scaling the drawing up in the printout. The drawing would be larger when printed at the  $1/2" = 1'-0"$  scale than it would at the  $1/4" = 1'-0"$  because every  $1'-0"$  of the model is being represented by  $1/2"$  on paper instead of only  $1/4"$  on paper.

**Print Scale.** Click the drop box to select a print scale for the view (if using the **Print to Scale** option). When you change the print scale, things like text and dimensions will be scaled in such a way that they are proportional to the rest of the drawing.

Note that if you change the print scale, your 2D plan does not scale on the screen. It will only be scaled on paper when you print the drawing. Changing the print scale has no effect in 3D views, neither on the screen nor in printouts, unless it is an elevation view. This is because a model being viewed in 3D does not have concrete measurements like a flat, 2D view has.

#### Line Work

**Print Line Weights.** Prints the lines in your drawing using the weight (thickness) assigned to them in element properties. Otherwise, all lines print with the same thickness.

#### Preview


**Show View Contents.** Disabling this check box turns off the view inside the preview window. You may want to take advantage of this feature if you are having issues with your graphics display (if graphics are slow to load or refresh, for example). Your choice will also be applied in the Print dialog and Batch Printing dialog.

## Printing Drawings

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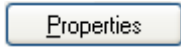
The program uses the standard *Windows* Print routine with a few added features, such as a print preview, print area selection, scaling options, and paper placement. When you open the Print dialog, the print settings in the dialog reflect the print settings defined for the current view window.

**To print a drawing:**

1. Select **File > Print**, or click  on the Standard toolbar.
2. In the **Print** dialog, specify your print settings.

Printer/Plotter

**Name.** Click this drop box to select a printer or plotter to use when printing this view.



Click to define various properties for the currently selected printer such as paper and output settings, and print quality.

**Paper Size.** Click this drop box to select the size of paper you want to print on. Note that if you are printing to scale, and the scale of the drawing is too large for the selected paper size, the drawing will be automatically tiled across multiple sheets of paper.

**Orientation.** Choose either **Portrait** or **Landscape**. The Portrait option gives the paper a vertical orientation, while the Landscape option gives it a horizontal orientation.

**Print to file.** If enabled, the project is printed to a print file rather than a printer.

**Copies.** Select the number of copies to print.

Print Area

**Print Area -All (Extents).** Prints the extents of your drawing, which is the portion of your drawing that currently contains elements. As you add new elements, the extents update automatically.

**Print Area - Display.** Prints exactly what you see on the screen in the current view. If only part of your drawing is currently visible, only that part will appear in the printout.

**Print Area - Window.** Prints a specific area of your drawing that you define by drawing a bounding window around it. Click the **Window** button, then click two points in your drawing to define the selection window. You can snap the window to elements in your drawing if desired. The preview in the **Print** dialog will update automatically. Note that the Window option is not available for 3D perspective views.

Page Setup

**Placement.** If you select **Lower left**, the image is printed in the lower left corner of the paper. If you select **Center on paper**, the image is centered on the paper.

**Print all colors as black.** (*Worksheet View only*) If enabled, this will produce a black-and-white printout.

Print Scaling

**Fit to Page.** Scales the drawing to fit the selected paper size. Note that this is the default setting for 3D views, since 3D views are not affected by changes in scale (unless they are elevation views).

**Print to Scale.** Prints the current view according to the **Scale** set below, regardless of the paper size. This option does not work with 3D views, since 3D views cannot be scaled.

**View Scale.** The drawing scale of the current view as set on the View Properties page in the view's properties. This is the ratio of units on paper to real-world units. For example, if the view scale is 1/4" = 1'-0" (or 1:48), this means that every 1'-0" of your actual model is represented by 1/4" on paper. If you are using the Print to Scale option, this gives you a sense of how you are scaling the drawing. For example, if your view scale is set to 1/4" = 1'-0" and you set the print scale to 1/2" = 1'-0", you know that you are scaling the drawing up in the printout. The drawing would be larger when printed at the 1/2" = 1'-0" scale than it would at the 1/4" = 1'-0" because every 1'-0" of the model is being represented by 1/2" on paper instead of only 1/4" on paper.

**Print Scale.** Click the drop box to select a print scale for the view (if using the Print to Scale option). When you change the print scale, things like text and dimensions will be scaled in such a way that they are proportional to the rest of the drawing.

Note that if you change the print scale, your 2D plan does not scale on the screen. It will only be scaled on paper when you print the drawing. Changing the print scale has no effect in 3D views, neither on the screen nor in printouts. This is because a model being viewed in 3D does not have concrete measurements like a flat, 2D view has.

When you change the print scale, things like text and dimensions will be scaled in such a way that they are proportional to the rest of the drawing.

### Line Work

**Print Line Weights.** Prints the lines in your drawing using the weight (thickness) assigned to them in element properties. Otherwise, all lines print with the same thickness.

### Preview

The preview window on the right displays a preview of how the drawing will fit on the paper. If the drawing is too large for the selected paper size, it will be automatically tiled across multiple sheets of paper. Separation marks will then appear in the preview indicating where the drawing will be divided.

**Show View Contents.** Disabling this check box turns off the view inside the preview window. You may want to take advantage of this feature if you are having issues with your graphics display (if graphics are slow to load or refresh, for example). Your choice will also be applied in the Batch Printing dialog and View Properties dialog.

3. Click **OK**.


**Note:** If you click Apply in the Print dialog, the dialog's print settings will be applied to the view's Print Properties.

## Printing Across Multiple Sheets of Paper

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You may want to print out your drawing at a large scale, but do not have a piece of paper big enough to fit it. In this case you can print the drawing in sections onto smaller sheets of paper, then attach the sheets together after printing. You can specify paper and print scale settings in the Print dialog, or in a view's print properties.


### To set print settings in the Print dialog:

1. Select **File > Print**, or click  on the Standard toolbar.
2. In the **Print** dialog, click **Properties** to select the paper size to use.
3. From the **Print Scaling** drop box, select **Print to Scale**.

The print preview displays separation marks representing the individual sheets of paper. You can adjust the print scale if you want.

4. Click **OK**. The drawing is printed onto multiple sheets of paper.

### To set print settings for a specific view:

1. If the view is current, right-click in the drawing area and select **View Properties**. Otherwise, select **View > View Manager**, or click  on the View Control toolbar. In the left pane of the **View Manager** dialog, select the view whose print properties you would like to define.
2. Select the **Print Properties** tab.
3. From the **Paper Size** drop box, select the paper size that you want to use.
4. In the *Print Scaling* area, select **Print to Scale** from the drop box. You can adjust the print scale if you want.
5. Click **OK**. You can proceed with printing the view.


## Printing to a File

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When you print to a file, you need to first determine which printer — for example, a PostScript printer — will ultimately print the file. This way you can specify an appropriate file type to print to (e.g. \*.ps).

A print file allows others to print your Envisioneer drawing, even if Envisioneer is not installed on their computer. All they need is a printer that prints the specified file type.

### To print to a file:

1. Select **File > Print**, or click  on the Standard toolbar.
2. In the **Print** dialog, enable the **Print to file** check box.
3. Click **Print**.
4. In the **Save As** dialog, navigate to the folder where you want to save the print file.

5. In the **File name** edit box, type a name and extension for the print file (e.g. *Project1.ps*).
6. Click **Save**. The project is written to the print file.


## Creating a PDF File

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To create a PDF file of a view you need to have a PDF writer installed on your computer. This is like a special print driver or utility that has the capability of producing PDF files. When a PDF writer is installed on your system it will appear in the list of printers in the Print dialog, just like any other printer.

Some PDF writers are free and can be downloaded from the Internet, and some can be purchased from companies such as Adobe. Check out the following web sites, or do a search on the Internet: [www.adobe.com](http://www.adobe.com), [www.cutepdf.com](http://www.cutepdf.com), or [www.pdf995.com](http://www.pdf995.com).

### To create a PDF File:

1. Display the view that you would like to print.
2. Select **File > Print**, or click  on the Standard toolbar.
3. In the **Print** dialog, select the PDF print driver in the list of available printers.
4. Make sure the **Print to File** option is disabled.
5. Once you have defined your print settings, click **Print**.
6. In **Save PDF File As** dialog, select a save location for the PDF file, then type a name for the file in the *File name* edit box.
7. Click **Save**. The PDF file is created in the specified location.

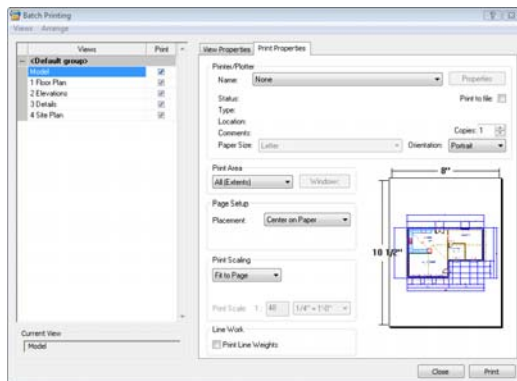
## Batch Printing

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Batch printing refers to the process of printing multiple views or worksheets at the same time. When using the Batch Printing tool, all you need to do is select the views that you want to print, define the print settings that you want to use for each view, then click Print.

### To batch print:

1. Select **File > Batch Printing**.



2. In the **Batch Printing** dialog, enable the views that you want to print by clicking the check boxes beside the view names. To make all views printable, select **Views > Make All Printable**, or right-click in the left pane and select **Make All Printable**. To make all views non-printable, select **Views > Make All Non-Printable**, or right-click in the left pane and select **Make All Non-Printable**.

Views in the **Batch Printing** dialog are organized in the same way that they are organized in the View Manager. You can expand a group by clicking its plus sign (+), or collapse a group by clicking its minus sign (-). To expand or collapse all groups you can use the **Expand All** or **Collapse All** options on the **Arrange** menu (or right-click menu).

3. Views print in the order in which they appear in the left pane. To change the print order of views use the **Move Up** or **Move Down** tools on the **Arrange** menu (or right-click menu).

4. To set a view as current in the drawing area, select the view in the list, and then select **Views > Set Current**.
5. To define a view's print properties, such as the printer/plotter selection, paper size and print scale, select the view in the list, and then select the **Print Properties** tab in the right pane. For more information about these settings, see *Defining a View's Print Properties* on page 442.
6. Click **Print**. Batch printing begins.

## Vector Printing vs. Raster Printing

Vector graphics use geometrical primitives such as points, lines, curves and polygons to represent objects on your screen. By default, the Print tool in Envisioneer uses **vector printing** when printing from Worksheet View. This means that only actual objects will be included in the output. Non-objects, such as the background color, will not be printed. Because vector printing is vector-based and resolution-independent, your output will be sharp and high-quality regardless of any scaling you do.

If you disable vector printing in your program settings, **raster printing** will be used instead. Raster images (also known as bitmap images) represent objects as an array of pixels, as in a photograph. Pixels are tiny dots of individual color that make up what you see on your screen. The size and quality of a raster image depend on the resolution selected. Resolution refers to the number of pixels in an image, and is measured in terms of DPI (Dots Per Inch). Often, scaling a raster image to a larger size has a negative impact on the image quality. The software has to create pixels and estimate the color values of these pixels. Also, the blending of pixels where one object meets another can often result in blurriness. This does not occur in vector printing since vector images are not pixel-based.


When raster printing is used, everything you see in the view window is included in the output, including the background color. When printing a raster image, the printer requires more image data than your monitor. This is one of the reasons that raster printing results in a larger file size than vector printing.

## Disabling Vector Printing in Worksheet View

*Construction Suite only*

By default, the Print tool uses the vector printing method in Worksheet View. This is a superior form of printing that results in sharp, high-quality images. If for some reason vector printing is problematic for you, you can disable vector printing and revert to raster printing instead.

### To disable vector printing:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Worksheet View Behavior* area, disable the **Enable Vector Printing** check box.
4. Click **OK**.

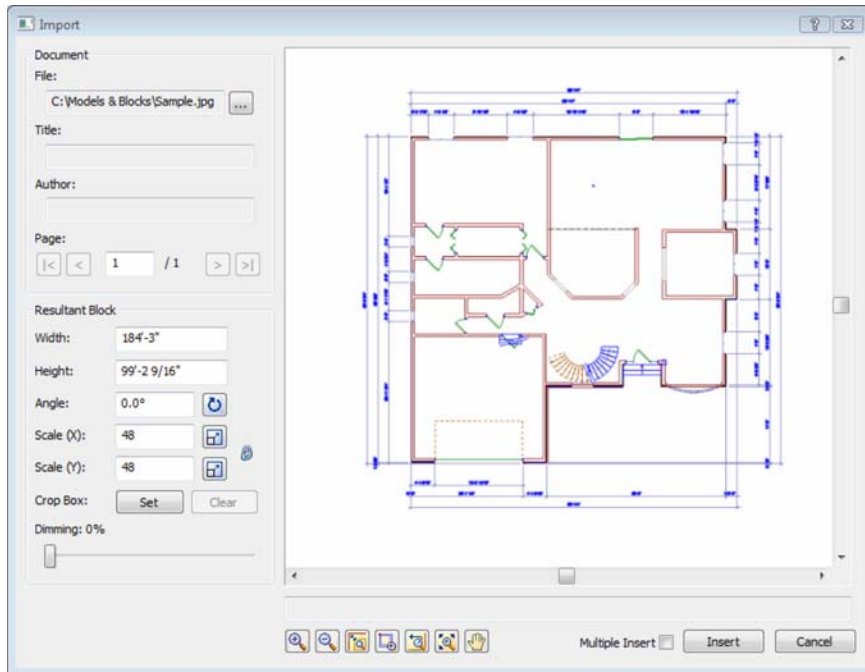
## Importing an Image to Trace

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You can import a BMP, JPG or TGA image, such as a floor plan that you have scanned or sketched out in a drawing program, and trace it using elements from the catalog, creating a true Envisioneer model.


### To import an image to trace:

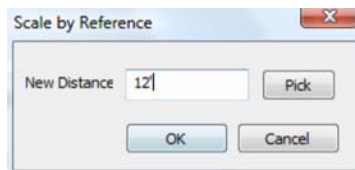
1. In 2D plan view, select **File > Import > Project Trace Image**.
2. In the **Open** dialog, select the file type you are importing from the **File type** drop box. You can import BMP, JPG or TGA files.
3. Locate the file to import, then click **Open**. The image is displayed in the **Import** dialog. You can zoom and pan in the preview pane using the zoom/pan controls below the pane. Note that changing the zoom level inside the preview pane has no effect on the image when it is imported.




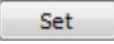
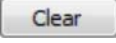
- Before importing the image you will need to define the size or scale of the imported image.

If you are importing a floor plan and you know the scale at which it was drawn originally, you can enter that value in the **Scale** edit boxes. For example, if the plan was drawn at a 1/4" = 1'-0" (1:48) scale, you would enter **48** in the **Scale (X)** or **Scale (Y)** edit box. There are separate X and Y (horizontal and vertical) scale settings. By default, whatever you enter in one edit box will automatically be displayed in the other edit box, maintaining the same scale in both directions. If you want the X scale to be different than the Y scale, you need to click the lock icon beside the **Scale (X)** and **Scale (Y)** edit boxes. With the lock 'unlocked' you can enter a different value in each edit box.

Another way of specifying the scale is to draw a reference line along an existing object in the CAD image and specify the length of that object in real-world units. To do this, click the Pick Scale button  next to the **Scale (X)** or **Scale (Y)** edit box, then pick two points along an object in the image to define a reference line. (If the X scale and Y scale will differ, you should pick points along a horizontal object for the X scale, and pick points along a vertical object for the Y scale.) Then in the **Scale by Reference** dialog, enter the length of the reference line and click **OK**. For example, if you know that a particular wall in your plan is 12' long, draw a line along that wall and then enter 12' in the **Scale by Reference** dialog.



The **Scale** values in the **Import** dialog will then adjust to reflect the scale you defined.

- To specify the angle of the imported image, enter a value in the **Angle** edit box, or click the Pick Angle button  next to the **Angle** edit box and pick two points along an object in the image to define the angle. If you are picking points to define the angle, the **Angle by Reference** dialog appears and reports the angle that you defined. You can edit the angle here if you want.
- If you want to import only a portion of the image, click  next to the **Crop Box** item, then click two points diagonally in the preview window to define a box around the portion that you want to import. A blue box is displayed around the selected portion. To remove the crop box, click , then click **OK** to confirm that you want to clear the crop box.



7. To dim the imported image, slide the **Dimming** slider to the desired dim level. The higher the percentage, the more dim the image will be.
8. If you want the **Import** dialog to appear again after you insert the image so that you can insert another image, enable the **Multiple Insert** check box.
9. To import the image into the current view window, click **Insert**. The image is attached to your cursor.
10. Position the image where you want it, then click to insert it. You can now trace the image.

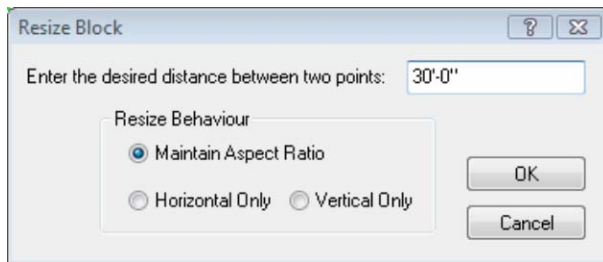
**Note:** Most floor plans are copyrighted, so make sure you have permission to copy them.

## Resizing a Project Trace Image

If you import a project trace image and it is not the right size, you can scale it up or down to match the plan's drawing scale. Having a correct drawing scale is important for tracing purposes so elements can be created at the correct size.

### To resize a project trace image:

1. Select the trace image.
2. Right-click and select **Resize**, or select **Edit > Modify Elements > Resize**.
3. Find a wall with a known length, then select a point at each end of the wall to create a reference line. The length of the reference line is displayed in real-world units in the **Resize Block** dialog.



4. In the **Resize Block** dialog, enter the new length that you want the reference line to represent. Entering a greater value will make the image bigger, and entering a lesser value will make the image smaller.
5. If you want the image to be scaled in both directions, enable the **Maintain Aspect Ratio** radio button.
6. If you want the image to be scaled in only one direction, enable either the **Horizontal Only** or **Vertical Only** radio button.
7. Click **OK**. The image is resized.

## Tracing the Imported Floor Plan

Tracing an imported image is easy — just use the tools on the **Insert** menu. Below are links to topics that may help you:

- [Drawing Walls on page 33](#)
- [Inserting Doors...page 65](#)
- [Inserting Windows...page 69](#)
- [Inserting Wall Openings...page 73](#)
- [Inserting Stairs and Ramps...page 93](#)
- [Inserting Cabinets...page 128](#)
- [Inserting Appliances...page 130](#)


## Displaying/Hiding Project Trace Images


If you have used the Project Trace Image tool to import a plan into your project, you can hide the image if you want using the View Filter. This is an alternative to deleting the image.

### To filter project trace images from view:

1. Select **View > View Filters > View Filter**, or click  on the View Control toolbar.

2. In the **View Filter** dialog, select the Notation tab.
3. In the **Project Trace Images** row, click the eye icon in the *Display* column to turn project trace images on or off.

 Project trace image is turned on

 Project trace image is turned off

4. Click **OK**.

## Deleting a Project Trace Image

Once you're done tracing a floor plan, you can delete the trace image from your drawing, leaving just your Envisioneer model on the screen.

### To delete a project trace image:

1. Select the trace image.
2. Press the **Delete** key on your keyboard, or right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.

**Note:** If you prefer you can just hide the project trace image from view instead of deleting it.

## Importing a Photo Board

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A photo board is simply a digital image that is oriented vertically in your 3D workspace. You can import any image you want — your family, pets, neighbor's house — the only limit is your imagination. The handy Photo Board Wizard does it all in a few quick steps.

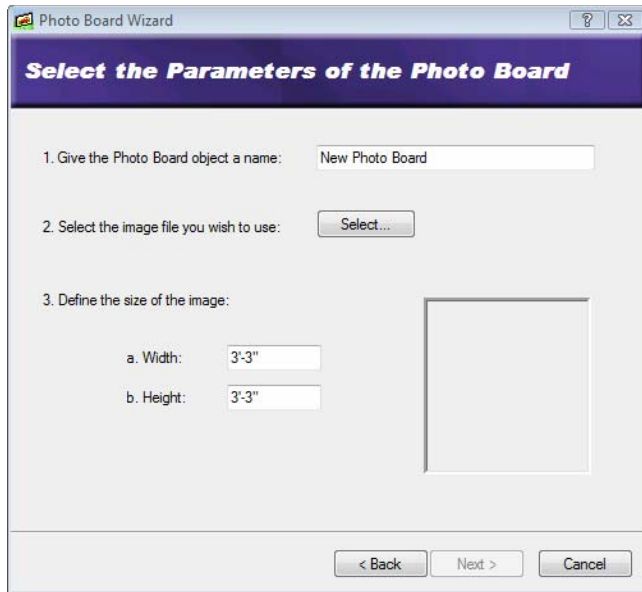
### To import a photo board:

1. Select **File > Import > Photo Board Wizard**.



2. Click **Next**.

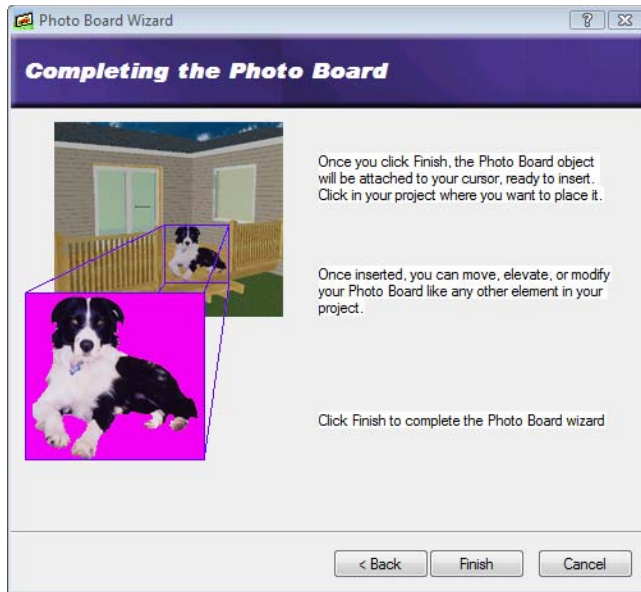




3. Type a name for your photo board.
4. Click the **Select** button, then select the image you want to import. You can import BMP, JPG and TGA files. The image is displayed in the preview window.
5. Define the size of the image by entering values in the **Height** and **Width** edit boxes.
6. Click **Next**.



7. Specify whether you want the photo board to be stationary or active. If **Stationary** is selected, the board will always remain oriented the same way, regardless of changes in your camera angle. If **Billboard** is selected, the photo board will rotate toward the camera so it will always face you in 3D.
8. Click **Next**.




9. Click **Finish**. The photo board is attached to your cursor, ready to be inserted.
10. Position the photo board where you want it, then click to insert it.
11. Right-click and select **Finish**.

## Saving Imported Photo Boards to the Catalog

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You can save a photo board that you have imported using the Photo Board Wizard to your catalog so you can insert it again in any project.

### To save your photo board to the current catalog:

1. Select **File > Catalogs > Save Element to Catalog**. Your pointer changes to a catalog cursor. 
2. Click on the photo board in your drawing.
3. Click **Yes** to save the photo board. The photo board is added to the current catalog.

## Inserting a Photo Board from the Catalog

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The catalog contains a collection of photo boards containing pictures of people, animals, flags, and other objects. If you have saved your imported photo board to the catalog, it is also displayed with the existing photo boards in the catalog.

### To insert a photo board from the catalog:

1. Select **Insert > Photo Board**.
2. In the catalog panel, select the photo board you want to insert.
3. Position the photo board where you want it, then click to insert it.
4. Right-click and select **Finish**.

## Moving a Photo Board

You can move a photo board easily by just clicking and dragging it.

### To move a photo board:

1. Select the photo board.
2. Hover your pointer over the board to display the Move cursor. 

3. Click and drag to move the board.
4. When the board is where you want it, release your mouse button.

## Rotating a Photo Board in 2D

You can use the Rotate tool to rotate a photo board about a selected point in 2D plan view.

### To rotate a photo board:

1. Select the photo board.
2. Right-click and select **Rotate**, or select **Edit > Modify Elements > Rotate**.
3. Hover your pointer over the point you want to rotate the photo board around.
4. Click and drag to rotate the photo board, then release your mouse button.

## Changing the Elevation of a Photo Board

You can raise or lower a photo board using the Elevate tool on the right-click menu.

### To raise or lower a photo board:

1. Select the photo board.
2. Right-click and select **Elevate**, or select **Edit > Modify Elements > Elevate**. The value in the **Elevate** dialog is the current elevation of the photo board.
3. In the **Elevate** dialog, specify the desired elevation of the photo board above the terrain.
4. Click **OK**.

**Tip:** You can also change a photo board's elevation by changing the **Distance above current location or terrain** variable on the photo board's Behavior property page.

## Changing a Photo Board from Stationary to Rotating and Vice Versa

You can choose whether a photo board is stationary or rotating after it has been inserted. A stationary board keeps the same orientation regardless of changes in the camera angle. A rotating board always rotates towards the camera.

### To change a photo board's type:

1. Select the photo board.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. In the *Type* area, click **Stationary** for a stationary photo board, or **Billboard** for a rotating photo board.
4. Click **OK**.

## Editing the Size of a Photo Board

You can edit the height and width of a photo board after it has been inserted.

### To edit the size of a photo board:

1. Select the photo board.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
3. Edit the **Height** or **Width** in the *Properties* area. If **Maintain Aspect Ratio** is checked, the height will automatically change if you edit the width, and vice versa. This ensures the image doesn't get distorted.
4. Click **OK**.

## Deleting a Photo Board

You can delete a photo board in a couple of easy steps.

### To delete a photo board:

1. Select the photo board.
2. Press the **Delete** key on your keyboard, or right-click and select **Delete**, or select **Edit > Modify Elements > Delete**.

## Creating Transparency in Photo Board Images

You may find that you want to make portions of your photo board image transparent for a more realistic effect. If the image is of a person, for example, you may want to make the background in the image transparent so that when you insert the photo board in your drawing, you see just the person in your 3D view.

To create transparency in your photo board image, you need to use a graphic editing program such as Microsoft® Paint to apply a magenta color to those portions you want to make transparent.

The RGB color settings for magenta are as follows:

**Red:** 255

**Green:** 0

**Blue:** 255

Once you have finished editing the image in the graphic editing program, you can re-import the image into Envisioneer using the Photo Board Wizard.

## Importing Custom Objects into Your Drawing

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If you have any custom 3D objects in DWG, DXF, SKP (Google™ SketchUp), 3DS or IFC format, you can import them into your Envisioneer drawing. Many sites on the Internet offer free downloading of objects for your convenience. Typically, these are objects such as furniture and appliances.

You can import a custom object directly into your drawing using the Object Import Wizard. Once inserted, you can edit its properties just as you would edit any element in your drawing.

### To import a custom object into your drawing:


1. Select **File > Import > Object Wizard**.
2. In the first edit box, type a name for the element.
3. From the element drop box, select the type of element you are importing.
4. If you selected Exterior Furniture, Exterior Accessories or Exterior Lighting, you have the option of inserting the element on the floor of the current building location, or the terrain. Select either the **Insert on location** or **Insert on terrain** radio button. (All other element types have one of the options pre-selected for you, with the other option disabled.)
5. Click the **Select** button.
6. In the **Open** dialog, locate and select the file that you want to import, then click **Open**. You can import DWG, DXF, SKP, 3DS and IFC files.
7. Specify how you want the components created by making a selection from the next drop box. For DWG and DXF files you can choose from **Colors** or **Layers**. Since 3DS and IFC objects are essentially an assembly of materials, the only selection for 3DS and IFC objects is **Materials**. (This step does not apply to SketchUp files.)
8. Click **Next**.
9. On the **Orient your element** screen, use the arrows to rotate the model so that it will be oriented correctly when inserted in a drawing.
10. Click **Next**.
11. If the object is a door or window, the **Position the insertion point of your element** screen will appear. Specify where along the object's height (**Z Axis**) you would like to position the object's insertion point. Use the slider to move the insertion point up or down. To offset the door/window frame from the wall surface, enter an offset value in the **Frame Offset** edit box.
12. Click **Next**.
13. For some file types, the program needs to know what units were used to create the object originally so that it can be converted into an appropriate size.


If you know what units were used to create the object, select the units from the units drop box. Otherwise, select the unit of measure that will result in a logical **Resultant Width**, **Resultant Depth** and **Resultant Height**. Selecting **Custom** lets you specify a custom scale in the **Custom Scale** edit box.

The scale is the multiplication factor of the units used for objects in the block. For example, if you're converting a file that you assume was created in feet and inches, the scale is 25.4.

14. Click **Next**.

15. The next screen lists the object's individual components. Specify which components you want to display or hide in 3D by clicking the appropriate eye icons.

 Component is displayed

 Component is not displayed

Enabling the **Show only selected component** check box displays only the currently selected component in the object preview. This helps you distinguish between the object's individual components.


To rename a component, double-click it, then type the new name and press Enter.

13. Click **Next**.

14. The next screen lists the object's components again, but this time you can specify which components you want to display or hide in 2D plan view.

To create a custom plan view, select either **Outline** or **Slice** below the preview window to specify how the plan view is to be created. To create a simple outline based on the footprint of the object, select **Outline**. To create a slice through the object, select **Slice**, and then use the slider control next to the preview window to specify the position of the slice.

To control the visibility of components within the custom plan view, click  next to the drop box, then specify which components you want to hide or show in the **Display Components to Generate Plan View** dialog.

Once the plan view has the desired appearance in the preview window, click  to add the view to the list of components. You can delete custom plan views from the list if desired, but you cannot delete components of the original object.

15. Click **Next**.

16. Click **Finish**.

17. Click to insert the new element in your drawing.

18. Right-click and select **Finish**.

**Tip:** You can save the imported element in your catalog using the Save Element to Catalog tool.

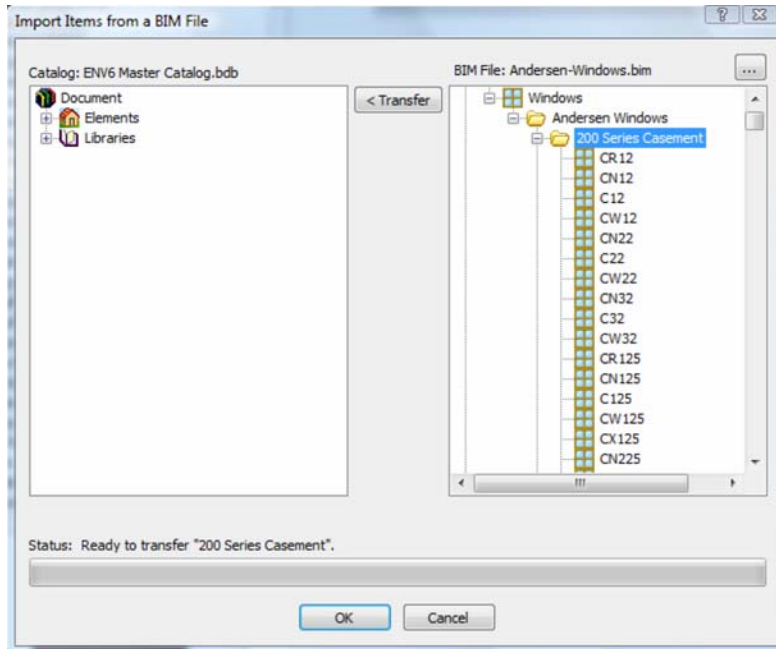
## Importing Catalog Content from a BIM File

Personal Architect | Pro Architect | Building Essentials | Construction Suite

Any catalog content that has been exported to a BIM file can be imported into another catalog using the Import BIM to Catalog tool.

### To import catalog content from a BIM file:

1. Make sure that the catalog into which you want to import content is the current catalog.
2. Select **File > Import > BIM to Catalog**. You can also launch this feature from the Element Manager or Library Manager by selecting **File > BIM File > Import**.
3. In the **Open** dialog, select the BIM file from which you want to import items, then click **Open**.
4. In the right pane of the **Import Items from BIM File** dialog, select the group or item that you want to transfer into the current catalog.



5. Click **Transfer**.
6. When you are finished transferring items into your catalog, click **OK**.

## Importing Project Content from a BIM File

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If you have exported project-specific content such as layer definitions to a Building Information Modeling (BIM) file, you can import the custom content contained in that BIM file into another project.

### To import project content from a BIM file:

1. Select **File > Import > BIM to Project**.
2. In the **Open** dialog, select the BIM file from which you want to import items, then click **Open**.
3. In the right pane of the **Import Items from BIM File** dialog, select the folder or item that you want to transfer into the current project.
4. Click **Transfer**.
5. When you are finished transferring items into your project, click **OK**.

## Importing an IFC File

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When you import an IFC file, Envisioneer intelligently interprets the building and construction data and transforms it into a true 3D model comprising actual wall, door and window elements.

To import an IFC file:

1. Select **File > Import > Import IFC File**.
2. In the warning dialog, note that importing an IFC will delete all existing building elements in the current project. When you are ready to proceed, click **Yes**.
3. In the **Component Options** dialog, specify how you would like colors and linetypes to be displayed. If **By Layer** is selected, the resulting image will use the colors and linetypes assigned to the layers of the CAD drawing. If **By Color** is selected, it will use the colors and linetypes of individual entities in the CAD drawing.
4. Click **OK**.
5. In the **Open** dialog, select the desired IFC file, then click **Open**. The model is imported.

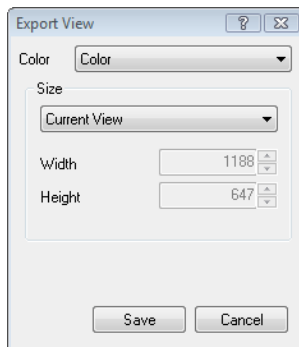
## Exporting the Current View to a 2D Image File

Personal Architect | Pro Architect | Building Essentials | Construction Suite

The 2D Image export tool lets you save the current view to a BMP, JPG or TGA file, which can be opened in most graphic editing applications.

### To export a view:

1. Select **File > Export > 2D Image**.
2. In the **Save As** dialog, click on the **Save as type** drop box and select the file format you want to export to.
3. Locate the directory where you want to save the exported file.
4. In the **File name** edit box, type a file name.
5. Click **Save**. The **Export View** dialog appears.



6. From the **Color** drop box, select the desired color setting. Choose from *Grayscale*, *256 Color*, *High Color (16-bit)*, *High Color (24-bit)* or *True Color (32-bit)*.
7. From the **Size** drop box, select the desired output size. By default, *Current View* is selected, which saves the image at the size currently shown on the screen. You can choose from a list of preset sizes, or select *Custom* and enter the desired values in the **Width** and **Height** edit boxes.
8. Click **Save**. The view is exported.

**Note:** This tool is only available in Model View windows.

## Exporting the 2D Drawing to a 2D AutoCAD File

Personal Architect | Pro Architect | Building Essentials | Construction Suite

The 2D Drawing export tool saves your 2D plan or 2D worksheet in a 2D, vector drawing format that can be opened in AutoCAD or any application that accepts DWG and DXF files.

### To export your 2D drawing:

1. Select **File > Export > 2D Drawing**.
2. Select the directory where you want to save the exported file.
3. In the **File name** edit box, type a file name.
4. Click **Save**. A dialog appears confirming the model has been exported successfully.
5. Click **OK**.

**Note:** If you are exporting to the DWG or DXF file format, the layers assigned to elements in your model will be replicated in AutoCAD, providing a seamless transition between the two applications.

## Exporting the 3D Model

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The 3D Model export tool lets you save your 3D model to the following formats:

- AutoCAD Drawing (\*.dwg)
- AutoCAD DXF (\*.dxf)

- Autodesk 3D Studio (\*.3ds)
- SketchUp (\*.skp)
- VRML (\*.wrl)
- Art\*Lantis (\*.opt)
- Lightscape (\*.lp)
- IFC File (\*.ifc)

When you open the file in its associated application, you will see an actual 3D model in that application.

**To export your 3D model:**

1. Select **File > Export > 3D Model**.
2. In the **Save As** dialog, click on the **Save as** type drop box and select the file format you want to export to.
3. Click **Browse Folders** and select the directory where you want to save the exported file.
4. In the **File name** edit box, type a file name.
5. Click **Save**. A dialog appears confirming the model has been exported successfully.
6. Click **OK**.

**Note:** If you are exporting to the DWG, DXF or SKP file format, the layers assigned to elements in your model will be replicated in AutoCAD or Sketchup, providing a seamless transition between the two applications.

## Exporting to Weyerhaeuser Javelin®

Construction Suite only

Javelin software allows Weyerhaeuser dealers to specify optimized combinations of residential engineered wood products and dimension lumber in floor, wall and roof layouts. You can export your 3D Envisioneer model to a Javelin XML file and then open the file in Javelin.

**To export to Javelin:**

1. Select **File > Export > Weyerhaeuser Javelin .BIMXML**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.

## Exporting to CSD iStruct™

Construction Suite only

You can export your 3D Envisioneer model to an XML file and then open the file in CSD iStruct™.

**To export to CSD iStruct:**

1. Select **File > Export > CSD iStruct .BIMXML**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.

## Exporting to MiTek® SAPPHIRE Structure™

Construction Suite only

Based on its legacy TrussFramer application, MiTek's SAPPHIRE Structure™ application provides powerful structural modeling, editing, and estimating functionality. You can export your 3D Envisioneer model to an MXF file that can be opened in SAPPHIRE Structure™.

**To export to MiTek SAPPHIRE Structure™:**

1. Select **File > Export > MiTek SAPPHIRE Structure™ .MXF**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.



## Exporting to Boise BC Framer®

Construction Suite only

Boise BC Framer® is software that helps users create floor and roof framing layouts. You can export your 3D Envisioneer model to an MXF file that can be opened in BC Framer.

### To export to Boise BC Framer:

1. Select **File > Export > Boise BC Framer® .MXF**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.

## Exporting to Keymark® GS Software Suite

Construction Suite only

Keymark® GS Software Suite is a suite of building design and engineering software for light gauge steel. You can export your 3D Envisioneer model to a LAY file and then open the file in GS Software Suite.

### To export to Keymark GS Software Suite:

1. Select **File > Export > Keymark GS Software Suite .LAY**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.
4. In the **Floor Location Associations** dialog, match the building locations in your 3D Envisioneer model to floor names in GS Software Suite, then click **OK**.

## Exporting to Simpson Component Solutions®

Construction Suite only

You can export your 3D Envisioneer model to a LAY file and then open the file in Simpson Strong-Tie® Component Solutions® software.

### To export to Simpson Component Solutions:

1. Select **File > Export > Simpson Component Solutions .LAY**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.
4. In the **Floor Location Associations** dialog, match the building locations in your 3D Envisioneer model to floor names in Component Solutions, then click **OK**.

## Exporting to 20-20 Design

Personal Architect | Pro Architect | Building Essentials | Construction Suite

20-20 Design is 3D interior design software that allow designers, remodelers, and builders to communicate with the kitchen and bath design industry. You can export your 3D Envisioneer model to a 2020XML file and then open the file in 20-20 Design.

### To export to 20-20 Design:

1. Select **File > Export > 20-20 Design .XML**.
2. In the **Save As** dialog, specify a save location and filename for the file.
3. Click **Save**.

## Exporting to Sketchfab

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Sketchfab is a website where you can publish and share interactive 3D files. If you have an account on Sketchfab, you can use the **Sketchfab Export** tool in Envisioneer to upload your 3D Envisioneer model to Sketchfab. To learn more about Sketchfab, visit <https://sketchfab.com/>.

**To export to Sketchfab:**

1. Select **File > Export > Sketchfab Export**.
2. In the **Upload to Sketchfab** dialog box, specify the settings described below. Settings with an asterisk (\*) are required settings.

**Title \***. The name of the model as you would like it to appear in Sketchfab.

**Description**. A brief description of the model.

**Tags**. Keywords or phrases that users can use to search for your model. Note that the tags 'Cadsoft' and 'Envisioneer' will be automatically applied to the model.

**Visibility**. Select **Public** if you want the model to be visible to everyone, or **Private** if you want it to be visible only to users who have the specified **Password**. Note that the **Private** option is only available if you have a premium Sketchfab account.

**Email Address \***. The email address associated with your Sketchfab account.

**Password \***. The password for your Sketchfab account.

**Exporting Catalog Content to a BIM File**

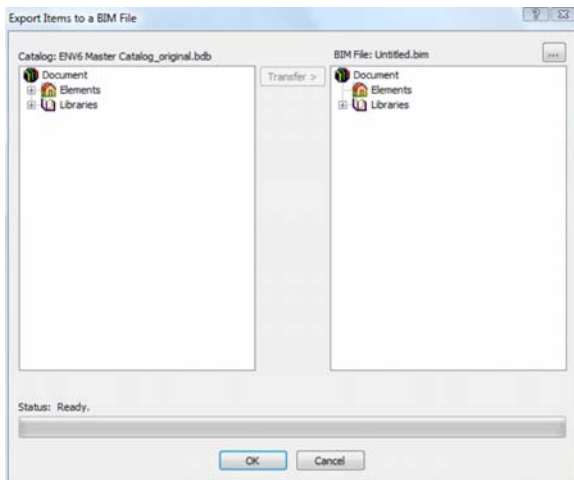
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If you would like to transfer elements or libraries in the current catalog to another catalog, you first need to export the desired content to a BIM (Building Information Management) file. You can then use the Import BIM File tool to import the content into the other catalog.

By exporting content to a BIM file you can also share your catalog content with other Envisioneer users by simply giving them the BIM file.

**To export catalog content to a BIM File:**

1. Make sure that the catalog from which you want to export content is the current catalog.
2. Select **File > Export > Catalog to BIM**. You can also launch this feature from the Element Manager or Library Manager by selecting **File > BIM File > Export**.



3. By default, the content will be copied to a new, blank BIM file. If you want to export the content to an existing BIM file (i.e. add to a BIM file), click  above the right pane and open the BIM file that you want to export to.
4. In the left pane of the **Export Items to BIM File** dialog, select the content that you want to export to a BIM file. To expand a group, click its plus sign (+). You can select an entire element group (e.g. Windows), individual groups (e.g. Fixed Windows), or individual elements within a group (e.g. 4' x 4' Fixed Window). The same goes for libraries.
5. Click **Transfer**. The selected content is copied to the BIM file in the right pane.
6. Continue transferring content if desired.
7. When you are finished transferring content, click **OK**.

8. In the **Save As** dialog, type a name for the BIM file in the **File name** edit box, then click **Save**.

**Note:** When you transfer a group or item to a BIM file, other content may be copied as well. This additional content is associated with the items you are transferring, and is necessary for the items to be properly defined. For example, if you copy the Doors group to the BIM file, the Parts group will copy over as well, because doors have parts such as hinges and doorknobs included as assemblies in their properties. Similarly, if you copy the Materials library to the BIM file, other libraries such as Patterns, Line Styles and Manufacturers will copy over as well because materials have patterns, line styles and manufacturers defined in their properties.

**Note:** When you copy individual groups or items to a BIM file, the structure which the group or item is part of is mimicked in the BIM file pane. For example, if you copy the 4' x 4' Fixed Window to the BIM file pane, it will appear in a folder named "Fixed", and the Fixed folder will appear under a "Windows" folder.

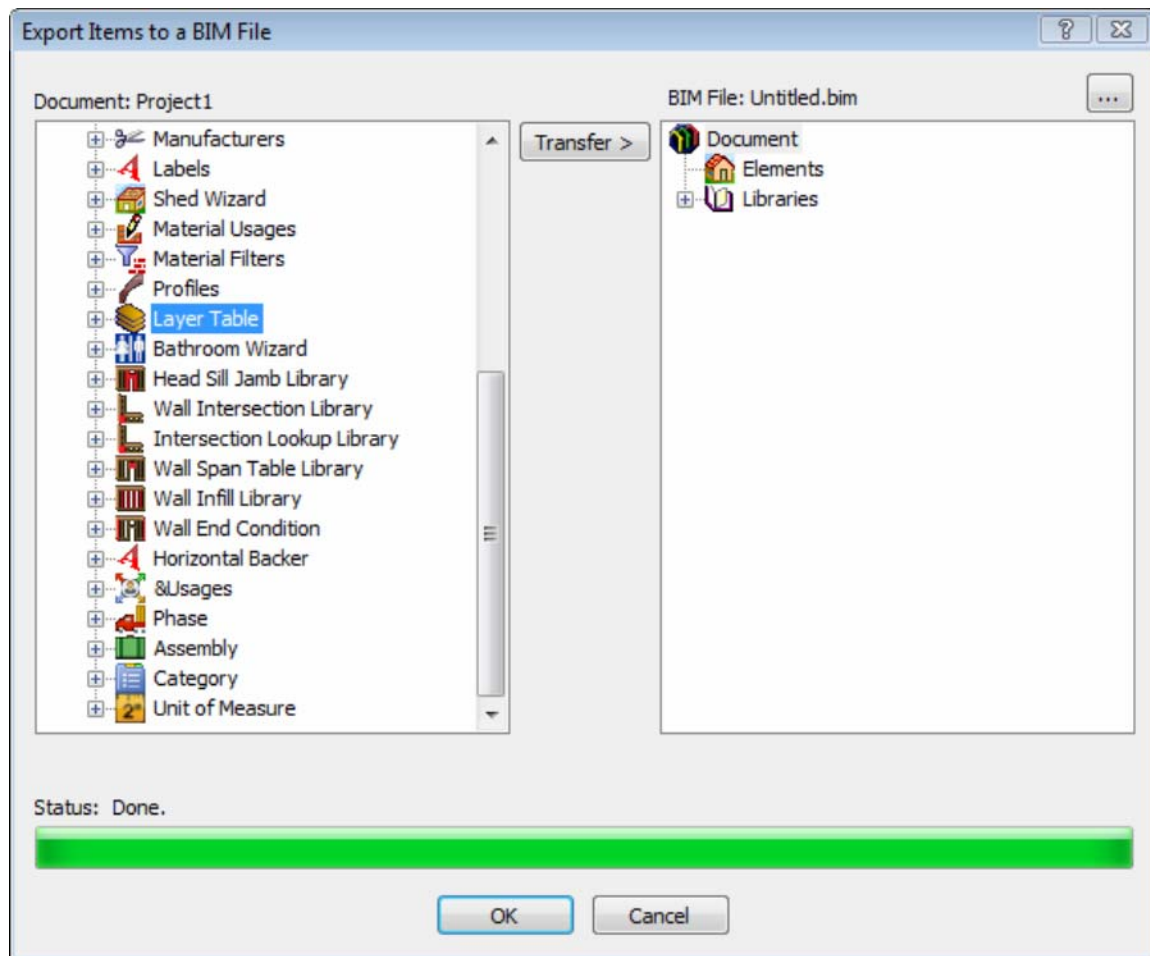
## Exporting Project Content to a BIM File


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If you have customized content in your project and would like to use that content in another project, you can export the custom content to a Building Information Modeling (BIM) file for import into other projects. For example, if you have edited layer definitions in Worksheet View, which are project-specific, you can export those layer definitions to a BIM file and then import the BIM file into other projects to make those layer definitions available in those projects.

### To export project content to a BIM file:

1. Open the project whose content you want to export to a BIM file.
2. In Model View, select **File > Export > Project to BIM**. The **Export Items to a BIM File** dialog box appears.



3. By default, the content will be copied to a new, blank BIM file. If you want to export the content to an existing BIM file (i.e. add to a BIM file), click  above the right pane and open the BIM file that you want to export to.
4. In the left pane of the dialog, select a folder or item that you want to export. Note that the left pane will only contain elements that exist in the current project.
5. Click **Transfer** to add the item to the BIM file in the right pane.
6. Continue transferring content if desired.
7. When you are finished transferring items, click **OK**.
8. In the **Save As** dialog, type a name for the BIM file in the **File name** edit box, then click **Save**.

**Note:** When you transfer a group or item to a BIM file, other content may be copied as well. This additional content is associated with the items you are transferring, and is necessary for the items to be properly defined. For example, if you copy a Layer Table to the BIM file, the Line Types and Line Weights used in the table’s layer definitions will be also copied to the BIM file.

## Accessing the Project Manager

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You can use the Project Manager to capture basic project information, such as the project name, company address and phone numbers. You can also use it to keep track of who has worked on the project, and when.

### To access the Project Manager:

1. Select **File > Project Manager**.

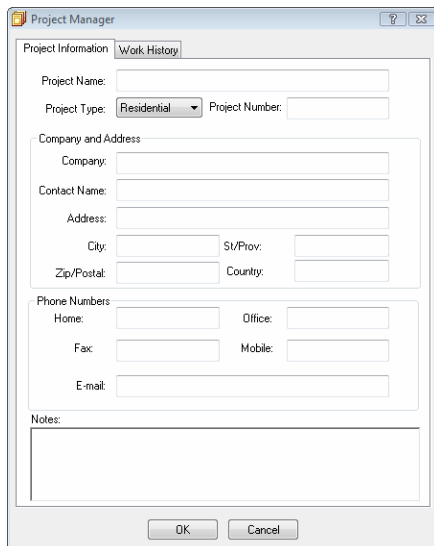
## Specifying Project Information

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The Project Information page of the **Project Manager** dialog lets you capture basic information about your project, such as the project name, project number, company name, company address, and important phone numbers. You can also enter notes about the project.

### To enter project information:

1. Select **File > Project Manager**.



2. In the **Project Manager** dialog, select the Project Information tab.
3. Enter the project information.
4. Click **OK**.

## Keeping Track of Revisions

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The **Project Manager** dialog's Work History page lets you keep track of who has worked on the project, and when. You can make note of what was worked on, as well as enter additional notes. This provides a detailed system of revision control that can be accessed by anyone working on the project.

### To enter a revision:

1. Select **File > Project Manager**.
2. In the **Project Manager** dialog, select the Work History tab.
3. Click **Add**.
4. In the **Author** edit box, enter your name or the name of the person who completed the work.
5. In the **Date** edit box, verify the date of the revision. The current date is shown by default.
6. In the **Subject** edit box, enter the general subject of the revision.
7. In the **Notes** window, enter details about the work that was completed.
8. Click **OK**.
9. Click **Yes** to add the revision to the work history list.
10. Click **OK**.



# Chapter 28: Catalogs

When you start the program, a catalog of elements is displayed on the right side of the screen. This is where you choose the elements that you want to insert. A catalog also contains various libraries, such as Materials, Text Styles and Dimension Styles libraries.

The Element Manager lets you add, edit and delete elements in a catalog to suit your needs. You can also customize the way a catalog is organized by adding, deleting or renaming groups.

The Library Manager lets you customize any library in the catalog by adding, editing and deleting library items.

You can create new, custom catalogs that contain a specific selection of elements.

You can export the content of a catalog to a TXT file, edit the items in the TXT file, and then import the edited content back into the catalog in Envisioneer.

You can export selected libraries and elements to a BIM file for import into other catalogs. You can also import content from any external BIM file.


You can view or edit catalog properties such as the catalog's name and author. You can lock a catalog to prevent others from making unwanted edits to the catalog. While designing you can open any catalog you want to gain access to the elements you want.

## Adding a Group or Subgroup to a Catalog

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Most elements and library items are organized by group. For example, walls are organized into groups such as Brick Veneer, Interior Partition, and Poured Concrete. This helps you locate specific element types quickly. You can add groups to any catalog or library using the Add Group tool. To create a deeper level of organization you can add a subgroup to any existing group using the Add Subgroup tool.

### To add a group or subgroup to the current catalog:


1. Open either the Element Manager or Library Manager depending on where you want to add the group.  
To open the Element Manager select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.  
To open the Library Manager select **File > Catalogs > Library Manager**.
2. Select the element catalog or library that you want to add a group to.
3. Select the category that you want to add a group to, then select **Edit > Add Group**, or right-click and select **Add Group**.  
To add a subgroup to an existing group, select the group then select **Edit > Add Group**, or right-click the group and select **Add Group**.
4. Type a name for the group, then press ENTER.

## Moving a Subgroup to the Root

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In an element catalog or library, if you have a group within a group, you can move that subgroup to the root of the tree. In other words, you can promote the subgroup to a group.

### To move a subgroup to the root:

1. Open either the Element Manager or Library Manager depending on where the group resides.  
To open the Element Manager select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.  
To open the Library Manager select **File > Catalogs > Library Manager**.


2. Display the element catalog or library that you want to edit.
3. Click and hold down your mouse button over the subgroup that you would like to move, then drag it to the root folder.

## Renaming a Group in a Catalog

Personal Architect | Pro Architect | Building Essentials | Construction Suite

In an element catalog or library, you can change the name of any group using the Rename Group tool.

### To rename a group:


1. Open either the Element Manager or Library Manager depending on where the group resides.  
To open the Element Manager select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.  
To open the Library Manager select **File > Catalogs > Library Manager**.
2. Open the element catalog or library containing the group that you want to rename.
3. Select the group that you want to rename, then select **Edit > Rename Group**, or right-click it and select **Rename Group**.
4. Type the new name and press ENTER.

## Deleting a Group from a Catalog

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You can delete a group in an element catalog or library provided it contains no elements or objects.

### To delete a group in a catalog:



1. Open either the Element Manager or Library Manager depending on where you want to add the group.  
To open the Element Manager select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.  
To open the Library Manager select **File > Catalogs > Library Manager**.
2. Display the element catalog or library that you want to edit.
3. Select the group that you want to delete. Note that the group can only be deleted if it contains no elements or objects.
4. Select **Edit > Delete Group**, or right-click and select **Delete Group**.

## Saving Edited Elements in Your Drawing to a Catalog

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If you have edited the properties of an inserted element, you can save that element (and its custom properties) to the current catalog.

### To add an edited element from your drawing into the current catalog:

1. Select **File > Catalogs > Save Element to Catalog**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Save Element to Catalog**. Your pointer changes to a catalog cursor. 
2. Select the element in your drawing.
3. Click **Yes** to save the element. You are asked if you want to save another element to the catalog.
4. Click **Yes** if you want to save another element to the catalog, or **No** to finish.

**Note:** If the element that you select already exists in the catalog, you will be asked if you want to create a copy in the catalog to work with. If you click **Yes**, a copy of the element is created in the catalog, with a number appended to its name to differentiate it from the original.




## Importing Custom Objects into Your Catalog


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If you have any custom 3D blocks in DWG, DXF, SKP (Google™ SketchUp), 3DS or IFC format, you can import them into your Envisioneer catalog so that they are available to be inserted in your drawing. Many sites on the Internet offer free downloading of objects for your convenience. Typically, blocks are objects such as furniture and appliances.

### To import a custom object into your catalog:

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and **Element Manager**.
2. Open the element folder that you want to add the object to.
3. Select **Edit > Add Element**.
4. In the **Define Element** dialog, select the **Custom Block** option.
5. Click **OK**.
6. In the **Open** dialog, select the appropriate file type from the **Files of type** drop box (DWG, DXF, 3DS, SKP, IFC).
7. Locate and select the file to import, then click **Open**.
8. In the **Block Import Options** dialog, specify what you want the components created from by making a selection in the **Create Components From** drop box. For DWG and DXF files you can choose from *Colors* or *Layers*. Since 3DS and IFC objects are essentially an assembly of materials, the only selection for 3DS objects is *Materials*. (This step does not apply to SketchUp files.)
9. On the **Orient your element** screen, use the arrows to rotate the model so that it will be oriented correctly when inserted in a drawing.
10. If the object is a door or window, the **Position the insertion point of your element** screen will appear. Specify where along the object's height (**Z Axis**) you would like to position the object's insertion point. Use the slider to move the insertion point up or down. To offset the door/window frame from the wall surface, enter an offset value in the **Frame Offset** edit box.
11. For some file types, the program needs to know what units were used to create the object originally so that it can be converted into an appropriate size. If you know what units were used to create the object, select the units from the **Convert File From** drop box. Otherwise, select the unit of measure in the **Convert File From** drop box that will result in a logical **Resultant Width**, **Resultant Depth** and **Resultant Height**. Selecting *Custom* lets you specify a custom scale in the **Custom Scale** edit box. (This step does not apply to SketchUp files.) Once logical dimensions are displayed, click **OK**.
12. The next screen lists the object's individual components. Specify which components you want to display or hide in 3D by clicking the appropriate eye icons.

 Component is displayed

 Component is not displayed


Enabling the **Show only selected component** check box displays only the currently selected component in the object preview. This helps you distinguish between the object's individual components.

To rename a component, double-click it, then type the new name and press Enter.

13. Click **Next**.
14. The next screen lists the object's components again, but this time you can specify which components you want to display or hide in 2D plan view.

To create a custom plan view, select either **Outline** or **Slice** below the preview window to specify how the plan view is to be created. To create a simple outline based on the footprint of the object, select **Outline**. To create a slice through the object, select **Slice**, and then use the slider control next to the preview window to specify the position of the slice.

To control the visibility of components within the custom plan view, click  next to the drop box, then specify which components you want to hide or show in the **Display Components to Generate Plan View** dialog.

Once the plan view has the desired appearance in the preview window, click  to add the view to the list of components. You can delete custom plan views from the list if desired, but you cannot delete components of the original object.

15. Click **Next**.
16. Click **Finish**.
17. In the **Element Manager**, enter a name for the element in the **Name** edit box.
18. Define the element's properties. The element will already have size properties assigned to it that are taken from the original file, but you can change these. You may need to edit the orientation of the element so that it inserts correctly in the drawing.
19. If you want to select a different file to apply to your new element, click the **Select** button in the *Imported Element* area of the Basic property page.
20. Click **OK**. The new element is added to the catalog.



## Creating a New Catalog

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If you plan to edit or add elements in the Master Catalog, you may want to create a new catalog instead of editing the existing one. That way, the custom elements you create are distinguishable from the defaults and are stored in one place. When you create a new catalog, you specify a name and where you want to store the catalog.

Once you have created a new catalog it becomes the current catalog in the catalog panel. Initially the catalog will be empty. You can import content into it from another catalog using the BIM File Import tool. You can also add elements to it using the Element Manager, and library items using the Library Manager.

### To create a new catalog:

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.  
The New Catalog tool is also available in the Library Manager (**File > Catalogs > Library Manager**).
2. Select **File > New Catalog**.
3. In the **Create a new catalog** dialog, type a name (without extension) in the **File Name** box.
4. Click  next to the **Location** edit box and select the directory where you want to store the new catalog. The default is the program's Catalogs directory, which is where you should store all catalogs.
5. From the **Type** drop box, select the unit of measure you would like to use for elements in the catalog.
6. From the **Precision** drop box, select the level of precision you would like to use for measurements. For example, selecting **#'-# #/16"** sets the level of precision to 1/16th of an inch when working in feet and inches.
7. In the **Name** edit box, type your name.
8. In the **Company** edit box, type the name of your company, if applicable.
9. If you want to prevent the catalog from being edited by unauthorized persons, enable the **Lock Catalog to Editing** check box. Then, enter and re-enter a password in the **Password** dialog.
10. Click **OK**. A new, blank catalog is created.


You can now add groups and elements to the catalog, or import elements from another catalog. Remember to save the catalog after you make changes to it.

## Locking a Catalog

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You can prevent a catalog from being edited by unauthorized persons by locking it. Once locked, a password must be entered to unlock it.

### To lock a catalog:


1. Select **File > Catalogs > Catalog Properties**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Catalog Properties**. You can also access catalog properties from the **Element Manager** and **Library Manager** by selecting **File > Catalog Properties**.
2. In the **Catalog Properties** dialog, enable the **Lock Catalog to Editing** check box.
3. In the **Password** dialog, enter the password that you want to use to unlock the catalog. Then, enter the password again in the second edit box to confirm it. For security reasons, the actual characters of your password do not appear as you type them.
4. Click **OK**.

## Unlocking a Catalog

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If a catalog has been locked to editing, you can unlock it by entering the password that was created when the catalog was locked.

### To unlock a catalog:


1. Select **File > Catalogs > Catalog Properties**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Catalog Properties**. You can also access catalog properties from the **Element Manager** and **Library Manager** by select **File > Catalog Properties**.
2. In the **Catalog Properties** dialog, disable the **Lock Catalog to Editing** check box.
3. Enter the password needed to unlock it, then click **OK**.

## Downloading Manufacturer Content

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The Green 3D Home web site contains various BIM catalogs of manufacturer materials that you can download and import into your Envisioneer catalog. Some examples are Anderson windows, Kohler faucets and Maytag appliances.

### To download manufacturer content:

1. Select **File > Catalogs > Browse More Catalog Content** or **Help > Browse More Catalog Content**, or go to <http://www.green3dhome.com/GoGreen/BIMCatalogs.aspx> in your Internet browser. You can also click  on the Help toolbar, or click the **Download More** link in the catalog panel.
2. Locate the BIM catalog that you want to download, then click **Download Catalog**.
3. Download the catalog to your computer.
4. Use the Import BIM to Catalog tool to import the content of the manufacturer catalog into your Envisioneer catalog.

**Note:** You must log in to be able to download catalogs. Registration on the Green 3D Home web site is quick and free.

## Opening a Catalog

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You can use the Open Catalog tool to open any catalog and make it the current catalog in the catalog panel. The Open Catalog tool is also available in the Element Manager and Library Manager.

### To open a catalog:

1. Select **File > Catalogs > Open Catalog**, or click  on the Standard toolbar and select **Open Catalog**. You can also open a catalog in the **Element Manager** or **Library Manager** by selecting **File > Open Catalog**.


2. In the **Open** dialog, locate the catalog that you want to open.
3. Click **Open**. The catalog you opened becomes the active catalog.

## Selecting a Default Catalog Directory

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By default, the program's Catalogs directory is displayed in the Open dialog when opening a catalog. You can select a different default directory to display if you want.

**To select a default catalog directory:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the *General* pane, click on the **Catalogs Directory** in the *File Paths* area.
3. Click **Modify**.
4. In the **Browse For Folder** dialog, select the directory you want to use as your default catalog directory, then click **OK**.
5. Click **OK** in the **Program Settings** dialog.

## Viewing Catalog Properties

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You can view the properties of the current catalog (file name, location, etc.) using the Catalog Properties tool.

**To view the properties of the catalog currently displayed in the catalog panel:**

1. Select **File > Catalogs > Catalog Properties**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Catalog Properties**. You can also access the Catalog Properties tool in the **Element Manager** and **Library Manager** by selecting **File > Catalog Properties**.

## Saving a Catalog

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Whether you have created a new catalog or are editing an existing one in the Element Manager or Library Manager, you will want to save your changes. Note that when you click OK in the Element Manager or Library Manager, the current catalog saves automatically.

**To save the current catalog:**


1. In the **Element Manager** or **Library Manager** dialog, select **File > Save Catalog**.

## Creating a Copy of a Catalog

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You can create a copy of a catalog using the Save Catalog As tool.

**To create a copy of a catalog under a different name:**

1. Make sure the catalog you want to save is the current catalog.
2. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.
3. In the **Element Manager** dialog, select **File > Save Catalog As**.
4. In the **File name** edit box, type the name you want to save under (without extension).
5. Click **Save**.

**Note:** The newly saved catalog becomes the current catalog.

# Chapter 29: Elements

The Master Catalog contains thousands of elements. You can add, edit and delete elements in the catalog using the Element Manager.

When you want to add or edit an element in a catalog, you need to define the element's properties, such as its size and appearance. Some elements will have more settings than others. When you edit an element in a catalog, your changes will be applied to any future insertions of that element.


You can also edit elements that you have inserted in your drawing. When you edit an inserted element, the changes you make are specific to that insertion of the element, and have no effect on the catalog or future insertions of the element.

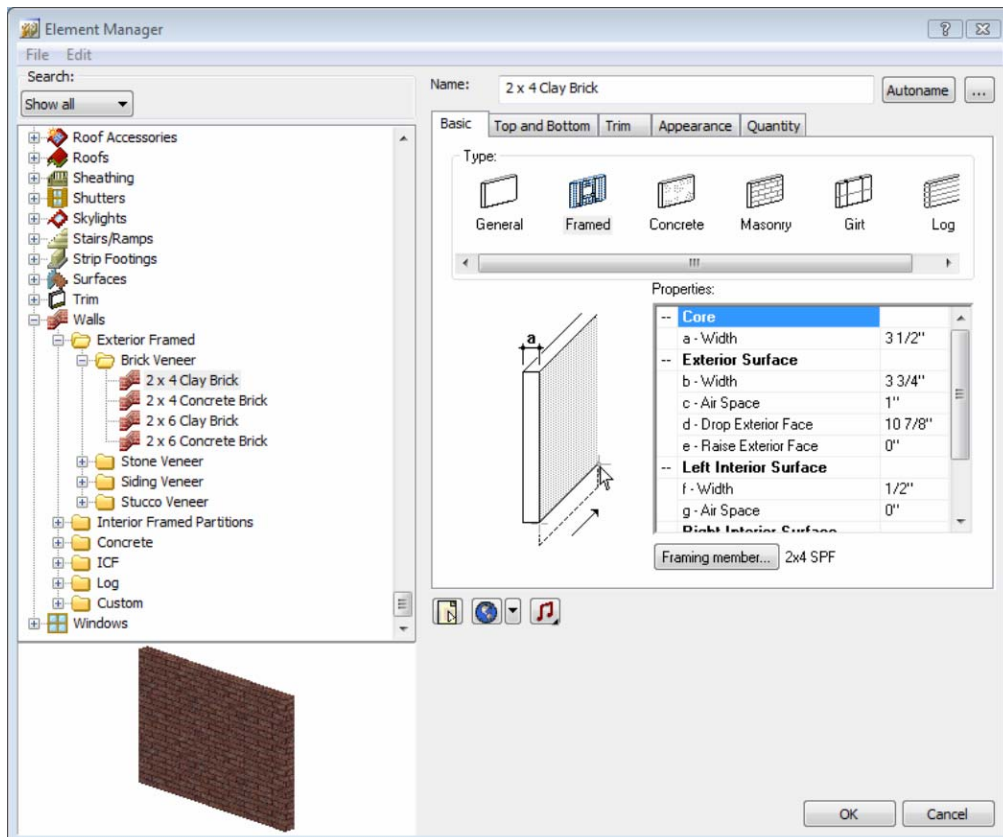
If you have edited the properties of an inserted element, you can save that element (and its custom properties) to the current catalog using the Save Element to Catalog tool.

## Using the Element Manager

The Element Manager contains a list of all the elements in the current catalog. Using the Element Manager you can add and edit elements, import elements from another catalog, and create new catalogs.

### To access the Element Manager:

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.



All catalog elements are found in the left navigation pane. The properties of the currently selected element are displayed on the right side of the dialog. Each set of properties has its own tab (Basic, Appearance, Quantity, etc.). Simply select a tab to view and/or edit those properties.

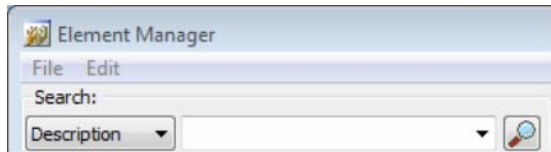
You can find an element by searching through the tree in the navigation pane. Elements are grouped by type (Walls, Doors, Windows, etc.), and each element folder may have sub-folders for additional organization. The Element Manager includes a Search feature above the navigation pane that you can use to quickly find a specific element in the catalog.


## Searching for Elements in the Element Manager

The Element Manager includes a Search feature that you can use to quickly find a specific element in the catalog. You can search by keyword or by part number. If you do a keyword search, the feature will look at element names. If you do a part number search, it will look at the Part No. values assigned to elements on their Quantity property page. Search terms are saved for your convenience so that you can activate them again in the future.

### To search the catalog:

1. Click the drop box in the **Search** area above the navigation pane and select either **Description** to search by keyword, or **Part No.** to search by part number. An edit box appears next to the drop box.



2. In the edit box, enter the keyword(s) or part number to search for, then press Enter or click . If you enter one or more keywords, the search function will search all element names throughout the catalog for the specified text string. The search is not specific to any one type of element, and will display any match that contains the specified text string, even if the string is part of a larger word. For example, if you enter "wood" in the search field, you may see results such as Wood Siding, Wood Rail Edging, Solid Wood Door, Hardwood Floor, and Japanese Dogwood.

Note that if you enter two or more keywords, the keywords must appear consecutively in an element's name in order for the element to appear in the search results. For example, if you enter the keywords "wood edging", an element named Wood Rail Edging would not appear in the search results.

Once search results are obtained they are displayed in the navigation pane.

3. To return the catalog to its default state, where all elements are displayed, select **Show All** from the **Search** drop box.
4. Search terms that you have used are saved in the **Search** window. To activate a search that you performed previously, select the desired search term from the search drop box.

## Viewing Element Properties

Every element has a set of properties that defines the element's size, type and physical appearance. You can customize an element's properties to suit your needs. Property pages vary depending on the element type, as do the properties available on those pages.

You can access element properties through the Element Manager or the catalog panel, or through an inserted element. You can edit the properties of inserted elements as well as elements in the Element Manager.

### To view element properties through the Element Manager:

1. Select **File > Catalogs > Element Manager**, or right-click an element in the catalog panel and select **Element Manager**.
2. Select the element whose properties you want to view. The element's properties appear on the right side of the Element Manager.

### To view element properties through the catalog panel:

1. In the catalog panel, right-click the element and select **Edit Element**.

### To view the properties of an inserted element:


1. Select the element in your drawing.

2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.

## Adding Elements to a Catalog

You can create a new element in a catalog by defining a number of different properties that determine its size, geometry and appearance.


**To add a new element to the current catalog:**

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.
2. In the **Element Manager**, expand the appropriate element type, then select the group that you want to add the element to.
3. Select **Edit > Add Element**, or right-click and select **Add Element**.
4. Elements like furniture, appliances and accessories can be defined based on a set of general parameters, or by importing a DWG, DXF, 3DS or SKP file. If this is the case, you will see the **Define Element** dialog.
5. To define the element by specifying size properties, select the specific element type you want to create (chair, table, etc.), then click **OK**.
6. To import a 3DS, DWG, DXF or SKP block, select the **Custom Block** option, then click **OK**. Some elements, like electronics, will prompt you directly for a file because they do not have a parametric template. For more information, see *Importing Custom Objects into Your Catalog* on page 467.
7. Define the element's properties on the right side of the dialog. (See *Working with Property Pages* on page 474.)
8. If you want to name the element automatically using a pre-defined naming convention, click the **Autoname** button. (See *Using Automatic Name Generation* on page 474.)
9. Click **OK**. The element is added to the catalog.

## Editing Elements in a Catalog

Every element has a number of different properties that determine its size, geometry and appearance. You can edit these properties to suit your needs. The Element Manager contains a list of all elements in the current catalog. You can edit a single element or multiple elements simultaneously.

**To edit an element in a catalog:**

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.
2. In the **Element Manager**, select the element that you want to edit. You can select multiple elements if you want by holding down the Shift key and clicking on elements.
3. If you want to name the element automatically using a pre-defined naming convention, click the **Autoname** button.
4. Edit the properties on the right side of the dialog. If multiple elements are selected, property values that differ are shown in **red**. Values shown in black are common to all the elements selected. Values shown in **red** can still be edited, but be aware that the value will be applied to all elements in your selection set.
5. Click **OK**.


**Note:** Editing elements in a catalog has no effect on elements already inserted in your drawing. It only affects future insertions of the element.



## Deleting Elements from a Catalog

You can delete any element from a catalog.

**To delete an element from a catalog:**

1. Select **File > Catalogs > Element Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Element Manager**. You can also right-click an element in the catalog panel and select **Element Manager**.
2. Select the element that you want to delete.
3. Select **Edit > Delete Element**, or right-click and select **Delete Element**.

## Working with Property Pages

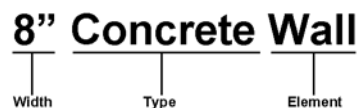
When you access an element's properties, the properties are displayed on various tabbed pages. The tabs and properties vary depending on the element. The most common property pages are Basic, Appearance, Line Work, Quantity and Behavior. The notes and hyperlinks properties are common to all property pages.

A preview of the element is shown in the preview window. By default, the image is displayed in a 3D rendered view. You can switch between 3D and 2D as well as select different display modes by right-clicking in the preview window and making a selection from the menu.

When the image is in a 3D view, you can rotate it around by clicking and dragging with your mouse.

## Using Automatic Name Generation

Names of elements are based on pre-defined formulas. The name 8" Concrete Wall is made up of three variables:



Each variable is separated by a space. These variables and spaces are defined in the name's formula.

If you add or change an element, and select Auto Name, the element's name updates automatically in the catalog. For example, if you create a concrete wall, and define a width of 10", the name automatically becomes 10" Concrete Wall.

Automatic name generation:

- Saves typing a name every time you add or edit an element
- Ensures consistency in catalogs
- Prevents duplicate entries if you forget to change a name

To use automatic name generation when adding or editing an element, click the **Autoname** button next to the **Name** edit box in the element's properties dialog.

**Note:** Even if you have used the Autoname feature, you can still add to or edit the name.

## Modifying the Name Generation Formula


You can modify the formula used to generate an element's name when the **Autoname** feature is used in the catalog or in an element's properties. Formulas are made up of variables (like Element Class and Element Type) and separators (spaces, symbols or characters).

Editing an element's name generation formula sets the formula for any new elements you create of that type. For example, if you edit the name generation formula for an 8" Brick Wall, any new walls you add to the catalog will use the new formula if you use automatic name generation.

**To modify the formula used for an element's automatic name generation:**

1. Select **File > Catalogs > Element Manager**, or right-click an element in the catalog panel and select **Element Manager**. In the catalog, select the element to edit.  
or  
Select an element in your drawing, then right-click and select **Properties**.



2. On the Basic property page, click  next to the **Autoname** button. The **Automatic Name Generation** dialog for that element type is displayed. The right pane (titled *Used Variables* and *Separators*) displays the current formula.
3. To remove a component from the formula, select it and click **Remove**, or press the left arrow key on your keyboard.
4. To add a component to the formula, select the desired variable or separator in the *Available Variables* or *Available Separators* window and click **Add**, or press the right arrow key on your keyboard.
5. To move a component in the formula, select the component and click **Move Up** or **Move Down**.
6. When you have finished modifying the formula, click **OK** to close the **Automatic Name Generation dialog**.
7. Click **OK** to close the **Element Manager**.

## Editing the Size and Composition of an Element

You can edit the physical make-up of an element as well as its dimensions by accessing the element's Basic property page. Some elements have additional property pages that control its composition. For example, cabinets have Leaf and Details property pages.

When you edit the properties of elements that exist in your drawing, only selected elements are changed. Other occurrences of the element in your drawing remain unchanged. You can, however, select and edit multiple elements at the same time provided they share the same properties.

### To edit the properties of an inserted element:

1. Access the element's properties.
2. Adjust the properties as desired. Clicking a dimension marked with an alphabetical character (a, b, c, etc.) highlights the corresponding dimension in the element graphic, and vice versa, if one exists.
3. Click **OK**. The selected elements are updated in the drawing.

**Note:** Editing the properties of an element in your drawing has no effect on the element's property definition in the catalog it came from. Editing an element in a catalog affects all future insertions of that element in your drawing.

## Changing an Element's Orientation

Symbol elements, such as furniture and light fixtures, are oriented in a logical fashion when you insert them in your drawing. For example, tables are inserted in a flat, upright position on the floor, and electrical outlets are inserted in a vertical position on the face of walls. You can edit the orientation of most symbol elements. For example, you may want to flip an air register so that you can insert it on the ceiling in your basement.

### To change an element's orientation:

1. Access the element's properties.
2. On the Basic property page, click the appropriate arrow keys in the *Orientation* area to rotate the element.
  - X Axis:** Rotates the element front to back, and vice versa.
  - Y Axis:** Rotates the element towards its left or right side in 3D.
  - Z Axis:** Rotates the element left or right in 2D plan view.

**Note:** Orientation control is only available for simple block elements like furniture and appliances. It does not apply to elements with customizable components, such as fireplaces or cabinets.


## Controlling What Parts of an Element are Displayed

You can hide certain parts of a block element from view by changing its display properties.

### To control what parts of an element are displayed:

1. Access the element's properties.
2. In the property dialog, click **Display**.
3. To display or hide a component from view in 2D and/or 3D view, select it in the list, then click the appropriate eye icon.

 Component is displayed

 Component is not displayed

4. Click **OK** to return to the properties dialog.
5. Click **OK** in the properties dialog.

**Note:** The Display control feature is only available for simple block elements like furniture and appliances. It does not apply to elements with customizable components, such as fireplaces or cabinets.

## Simplifying an Element

If an element looks too complex in the preview window, you can simplify it by reducing the number of polygons used to display it.

### To simplify an imported element:

1. Access the element's properties.
2. In the property dialog, click **Simplify**.
3. To simplify the element, slide the ruler to the left. The **Number of vertices in object** and **Percentage of simplification** values update accordingly.
4. To put a limit on how much simplification can take place, enter a value in the **Min number of vertices per component** edit box. The larger the number, the less simplified the element will become.
5. Click **OK** to return to the properties dialog.
6. Click **OK** in the properties dialog.

**Note:** The Simplify feature is only available for simple block elements like furniture and appliances. It does not apply to elements with customizable components, such as fireplaces or cabinets.

## Editing an Element's Insertion Point

Some elements have a defined Insertion Point, which is the point on the element that is attached to the cursor when you are inserting the element. For most elements, the insertion point is at the bottom of the element. For windows and wall openings, the insertion point is at the top of the element. When changing the elevation of an element, the distance is measured from the floor or terrain to the element's insertion point.

### To edit an element's insertion point:

1. Access the element's properties.
2. Select the Behavior tab.
3. Edit the values in the **X Axis**, **Y Axis** and **Z Axis** edit boxes, or use the sliders beside these edit boxes.

An X value moves the insertion point left or right. A Y value moves the insertion point forwards or backwards. A Z value moves the insertion point up or down on the element.

4. Click **OK**.

## Editing an Element's Snap Edge

Some elements have a defined Snap Edge, which determines which edge of the element will snap to the wall if you position it near a wall.

### To edit an element's snap edge:

1. Access the element's properties.
2. Select the Behavior tab.
3. Click on the desired snap edge graphic in the *Snap Edge* area. Choose from *None*, *Left*, *Right*, *Front* or *Back*.
4. Click **OK**.

## Editing an Element's Insertion Height

You can change the height at which single-click elements are inserted by editing their behavior properties. The **Distance above current location or terrain** option lets you control the height at which the element is inserted relative to the floor or

terrain. The value entered is the distance from the floor or terrain to the insertion point of the element. (For most elements except windows and wall openings, the insertion point is at the bottom of the element.)

**To edit an element's insertion height:**

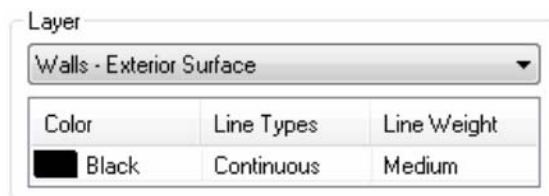
1. Access the element's properties.
2. Select the Behavior tab.
3. Edit the value in the **Distance above current location or terrain** edit box.
4. Click **OK**.

## Editing an Element's Layer Assignments

Each of an element's components has a specific layer assigned to it. Layer definitions determine the color, line type and line weight used to display a component's lines in 2D plan view. You can edit an element's layer assignments on its Line Work property page.

**To edit an element's layer assignments:**

1. Access the element's properties.
2. Select the Line Work tab.
3. In the *Components* pane, select the component whose layer assignment you want to change.
4. Select the desired layer from the **Layer** drop box. The layer's color, line type and line weight are displayed below the drop box.



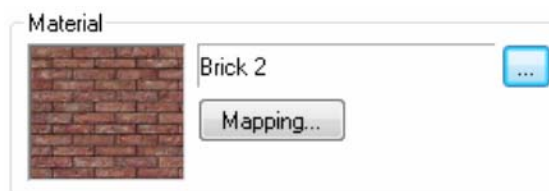
2. To override the layer's **Color**, **Line type** or **Line weight** setting, click on the property that you want to override and then make a selection from the drop box that appears.
5. When you are finished editing layer assignments, click **OK**.

## Editing an Element's Material Settings

An element's material properties are displayed in Rendered and Rendered Outline mode. If you choose to edit an element's material through its Appearance property page, you can select different materials for each of the element's components.

**To change an element's material through the Appearance property page:**

1. Access the element's properties.
2. Select the Appearance tab.
3. In the *Components* pane, select the component whose material you want to change.
4. To select a texture for the component, which will be displayed in Rendered and Rendered outline display mode, click the material swatch or the browse button in the *Material* area, then make a selection from the **Materials** dialog.



5. To edit the way the material is applied to the component in Rendered and Rendered Outline mode, click the **Mapping** button in the *Material* area, then define your mapping settings. These are described below.

*Auto Texture Mapping.* Applies a UV map, which is a flat, 2D representation of the vertices of the 3D model. It defines where the 2D pixels in your texture will be placed on the 3D surface. For imported elements, selecting Auto uses the mapping already applied to the element.

*Face Texture Mapping.* Applies the texture to every single face of the element component. This is the most common texture mapping option used in the program.

*Box Texture Mapping.* Creates a rectangular bounding box around the element, then applies a texture to each of the box's 6 sides. This would be useful for an element such as a sofa.

*Predefined texture mapping.* If using a texture from an outside source, this uses the texture mapping that was assigned to the texture originally.

*Override tile size.* Allows you to specify a custom tile size for the material. Tile height refers to the height of one bitmap tile. The program uses tiled rendering to display images, meaning images are generated in pieces (tiles) vertically and horizontally. Changing the tile height of a brick material, for example, would make the bricks look taller. Changing the tile width would make the bricks look wider.

Note that the *Override tile size* option lets you customize the tile size for this instance only without creating a new material.

*Position.* Allows you to shift the material on the element (left, right, up or down) by clicking the appropriate arrows.

*Rotation.* Specifying an angle here rotates the material on the element in a clockwise direction.

6. When you are finished defining materials, click **OK**.

**Note:** When you edit the material of an element in your drawing, the element's material definition in the catalog does not change. The change only applies to the selected element. Editing an element in a catalog affects all future insertions of that element in your drawing.

## Editing an Element's Pattern Settings

An element's pattern properties are displayed when you view a model in Patterned mode. If you choose to edit an element's pattern settings through its Line Work property page, you can select different patterns for each of the element's components.

### To change an element's pattern settings:

1. Access the element's properties.
2. Select the Line Work tab.
3. In the *Components* pane, select the component whose pattern you want to change.
4. To select a pattern for the component, click the pattern swatch or the browse button in the *Pattern* area, then make a selection from the **Patterns** dialog.
5. To edit the way the pattern is applied to the element in Patterned display mode, click the **Mapping** button in the *Pattern* area, then define your mapping settings. These are described below.

*Rotation.* Specifying an angle here rotates the pattern on the element in a clockwise direction.


*Position.* Allows you to shift the pattern on the element (left, right, up or down) by clicking the appropriate arrows.

6. To specify a color and line weight for the pattern's lines, select **Layer** below the pattern swatch which has the desired color/line weight properties. You can override the color or line weight by clicking the **Color** swatch or the **Line Weight** drop box.
7. When you are finished, click **OK**.

## Adding Notes to an Element's Properties

The Notes function in the properties dialog lets you enter a note about the element. This additional information can be anything you want.

### To add a note to an element's properties:


1. Access the element's properties.
2. Below the properties pane, click .
3. Enter your note in the **Notes** dialog.

4. Click **OK**.

## Adding a Hyperlink to an Element's Properties

When defining an element's properties, you can create a link to an external file (e.g. Word document) or Web address. You can then open the hyperlink any time you are viewing the element's properties. You can add multiple hyperlinks to an element's properties if you want.

### To add a hyperlink to an element's properties:


1. Access the element's properties.
2. Below the properties pane, click , or click the adjacent down arrow and select **Manage Hyperlinks**.
3. In the **Manage Hyperlinks** dialog, click **Add**. A new entry is added to the hyperlinks window. An icon appears to the left of the new hyperlink indicating that it is the current hyperlink.
4. Type a name for the hyperlink in the **Name** field (e.g. My Web Site).
5. Press the Tab key to move to the **Links** field, then type the web address (e.g. http://www.mywebsite.com) or path to the file you are linking to. If you are linking to a file, you can click **Browse** to search through the directories on your computer. Once you've located the file in the **Open** dialog, click **Open**. The path to the file is automatically displayed in the **Links** field.
6. To view the link, select it in the hyperlink window, then click **Open**.
7. To delete a hyperlink, select it in the hyperlink window, then click **Delete**.
8. Click **OK**.

**Note:** You can create a link to another Envisioneer (\*.bld) file. However, if that file uses the same catalog as the current drawing, you cannot access the catalog in the linked file.

## Opening an Element's Hyperlink

If you have attached a hyperlink to an element, you can open the hyperlink when viewing the element's properties.

### To open an element's hyperlink:

1. Access the element's properties.
2. Below the properties pane, click the arrow next to the Hyperlinks button , then select **Open Current Link**. The hyperlink is opened.

**Note:** If you have attached multiple hyperlinks to the element, the one marked current in the **Hyperlinks** dialog will be opened.

## Making a Hyperlink Current

When you attach more than one hyperlink to an element's properties, the current one is marked with an icon in the **Hyperlinks** dialog.



When you use the tools in the **Hyperlinks** dialog (Browse, Open, Delete), they apply to the currently selected hyperlink. Also, when you select the **Open Current Link** tool from the Hyperlinks flyout, it opens the currently selected hyperlink.

To make a specific hyperlink current in the **Hyperlinks** dialog, just click on any of its fields.



# Chapter 30: Libraries

Items such as materials, patterns, text styles and dimension styles are stored in customizable libraries. The Library Manager provides access to all the libraries of items and styles used in the display of elements, text and dimensions. By accessing a library you can add content, or edit existing content. For example, if you access the Text Styles library, you can add or edit a text style.


Library types include Materials, Material Usages, Material Filters, Patterns, Manufacturers, Text Styles, Dimension Styles, Line Styles, Line Types, Line Weights, Light Sources, Framing, Assemblies, Phases, Categories, Usages and Units of Measure, as well as configurations for the House Builder Wizard, Kitchen Builder Wizard, Bathroom Builder Wizard, and Shed Builder Wizard.

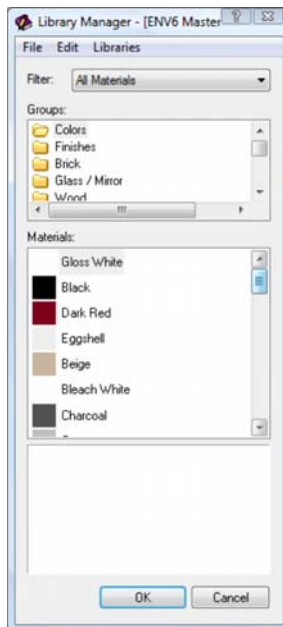
## Using the Library Manager

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The Library Manager provides access to all the libraries of items and styles used in the display or creation of elements, text and dimensions. By accessing a library you can add content, or edit existing content. For example, if you access the Text Styles library, you can add or edit a text style.

### To access the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.



2. To display a library, select it from the **Libraries** menu.

### To add a group:

1. Select **Edit > Add Group**, or right-click in the upper pane and select **Add Group**.
2. Type a name for the group, then press ENTER.

### To rename a group:

1. Select the group in the upper pane.
2. Select **Edit > Rename Group**, or right-click and select **Rename Group**.

3. Type the new name, then press ENTER.

**To delete a group:**

1. Select the group in the upper pane.
2. Select **Edit > Delete Group**, or right-click and select **Delete Group**.

**Note:** A group cannot be deleted if it contains materials.

**To add a new item to the library:**

1. If the library contains a filter, select the appropriate filter from the **Filter** drop box (applies to materials and assemblies).
2. In the upper pane, select the group you want to add the item to (if applicable). Some libraries do not contain groups.
3. Select **Edit > Add [item]**, or right-click in the upper pane and select **Add [item]**.
4. Define the new item, then click **OK**.

**To edit an item:**

1. Select the item to edit.
2. Select **Edit > Edit [item]**, or right-click and select **Edit [item]**.
3. Edit the item's properties.

**To delete an item:**

To delete an item:

1. Select the item to delete.
2. Select **Edit > Delete [item]**, or right-click and select **Delete [item]**.

**Note:** If the item is being used by an element, it cannot be deleted. In this case, a dialog appears telling you this. If you want to see a list of which elements are using the item, click **Yes**.

## Customizing the Materials Library


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The materials library contains a vast array of materials that you can apply to elements. Even so, you may find that you want to customize it at some point in time.


In the materials library, materials are listed in groups (Concrete, Brick, Wood, etc.) so you can organize and find them easily. You can add, rename and delete groups as needed.

You can add new materials to the library, as well as edit and delete existing materials.

**To access the materials library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Materials**.

**To access the materials library through the Materials Paintbrush:**

1. Go into a 3D view or 2D Designer's View.
2. Select **Edit > Materials Paintbrush**, or click  on any tabbed toolbar.

**To access the materials library through an element:**

1. Select an element either in your drawing or in the catalog panel.
2. Access the element's properties.
3. In the properties dialog, select the Appearance tab.
4. Click the material swatch or the **Select** button in the *Material* pane.

**To filter the material list:**

1. Select a filter from the **Filter** drop box. This displays a particular set of material groups and types in the library. You can customize the Material Filters library if you want.



**To add a group:**

1. Select **Edit > Add Group**, or right-click in the upper pane and select **Add Group**.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group in the upper pane.
2. Select **Edit > Rename Group**, or right-click and select **Rename Group**.
3. Type the new name, then press ENTER.

**To delete a group:**

1. Select the group in the upper pane.
2. Select **Edit > Delete Group**, or right-click and select **Delete Group**.

**Note:** A group cannot be deleted if it contains materials.

**To add a new material:**

1. In the upper pane, select the group you want to add the material to.
2. Select **Edit > Add Material**, or right-click in the material list and select **Add Material**.
3. In the **Material Properties** dialog, specify the name and properties of the material, then click **OK**.

**To edit a material:**

1. Select the material to edit.
2. Select **Edit > Edit Material**, or right-click and select **Edit Material**.
3. Edit the material properties in the **Material Properties** dialog.

**To delete a material:**

1. Select the material to delete.
2. Select **Edit > Delete Material**, or right-click and select **Delete Material**.

**Note:** If the material is being used by an element, it cannot be deleted. In this case, a dialog appears telling you this. If you want to see a list of which elements are using the material, click **Yes**.

## Editing Material Properties

When you are adding or editing a material in the materials library, you need to specify the material's properties. These properties determine the texture or color is used to display an element in the Rendered or Rendered Outline display mode, and the texture characteristics (for example, how it interacts with light). Adjusting these properties can help you achieve photorealistic results in 3D RealView renderings.

**To edit the properties of a material:**

1. Select the material to edit in the materials library.
2. Select **Edit > Edit Material**, or click the preview swatch.
3. Edit the properties in the **Material Properties** dialog. The properties are described below.

Properties Tab

**Material Type.** Determines the luminance or reflectance of the surface. When you choose a material type, only those settings that apply to that type are available for editing.

Choose one of the following:

*Generic.* Material used to simulate most surface types. Lets you define each of the available factors (Opacity, Specular, Reflection, etc.) without the restriction of any particular lighting model.

*Diffuse.* Simulates a rough or matte material that appears similarly bright from all viewing directions. Suited for materials such as brick or matte paint.

*Lambert.* Simulates a matte or non-shiny surface with no specular highlights. Ideal for materials such as chalk, pottery, matte paint, or unpolished surfaces.

**Phong.** Simulates a shiny surface with specular highlights. Commonly used for materials such as polished wood floors, and metals.

**Energy Preservation.** Refers to the notion that the outgoing energy cannot be greater than the incoming energy. Based on the combination of diffuse, opacity, and reflectivity components, this value will adjust automatically as you edit these properties. For more realistic materials, this value should be equal to or less than 1.0.

**Diffuse.** The color or texture that you want to apply to the material, as seen in 3D rendered or rendered outline display mode.

Enable the **Color** radio button to display the material in a solid color. Click the color swatch, then select the color you want to use in the **Color** dialog. Use the slider to adjust the luminance of the diffuse color.

Enable the **Texture** radio button to apply a texture to the surface. To select a texture or specify texture mapping properties, click the texture swatch to display the **Texture Map** dialog. See Editing Texture Mapping Properties on page 485.

**Bump.** Simulates bumps and wrinkles through small displacements on the surface. The modified surface is then used for lighting calculations (for example, when using the Phong reflection model), giving the appearance of detail instead of a smooth surface.

To use the texture selected in the **Diffuse** section as the **Bump** texture, ensure that the lock icon next to the **Bump** texture swatch is closed. To select a different texture to use for the **Bump** texture, click the lock icon to unlock it, and then make a selection in the **Texture Map** dialog, ensuring that you set the **Type** to **Normal Map**. See Editing Texture Mapping Properties on page 485.

To control the amount of bump mapping applied, edit the **Bump Scale** value. A value of 0 means no bump mapping will be applied.

**Emissive.** The amount of light given off by a material. Click the **Color** swatch to select the color of light emitted. Use the slider to adjust the level of emissivity. The more emissive a material is, the more self-luminous it appears.

**Opacity.** Determines how transparent the material is. Think of this as a mask being applied over the surface. Click the **Color** swatch to select a color for the opacity mask. Use the **Transparent/Opaque** slider to adjust the level of transparency. Use the **Dull/Glossy** slider to specify the glossiness of the opacity mask.

**Specular.** Reflection that creates highlights on materials, making them appear shiny. Click the **Color** swatch to select a color for the specular highlights. Use the slider to adjust the intensity of the highlight color. The higher the value, the lighter (and therefore shinier) the color. Use the **Dull/Shiny** slider to adjust the size of the highlights.


**Reflection.** Refers to the throwing back of light by a surface. Used to simulate used to reflective objects like mirrors and shiny surfaces. Click the **Color** swatch to select a color for the reflected light. Use the slider to adjust the amount of reflection. Use the **Sharp/Blurred** slider to determine whether the surface reflects the selected color, or its surroundings. Note that the blurred effect may increase rendering time.


**IOR.** The Index of Refraction. This describes the way light bends when crossing the material surface. A value of 1.0 means the light will not change direction. Selecting a material from the drop box (e.g. *Air, Water, Crystal, Glass*, etc.) populates the **IOR** edit box with the Index of Refraction for that material. If you would prefer to specify a custom value, select *Custom* from the drop box, then specify a value in the **IOR** edit box.


**Fresnel.** When enabled, the reflection strength becomes dependent on the viewing angle of the surface. Some materials in nature (glass, etc.) reflect light in this manner. Note that the Fresnel effect depends on the Index of Refraction as well.

**Sphere/Box.** Specifies the way the 2D texture is applied to a 3D object. The basis of **Sphere** mapping is to treat the object as if it were a sphere. A single texture is applied to the whole object, and the texture mapping coordinates are generated based on the angle of the surface at each point. **Box** mapping creates a rectangular bounding box around the element, then applies a texture to each of the box's 6 sides. This would be useful for an element such as a sofa.

#### Information Tab

From the **Material Usage** drop box, select a usage for the material. You can access the Material Usages library by clicking  next to this drop box. Usages can be applied to material filters, which are used for filtering the materials list.

To apply an assembly to the material, click  next to the **Assembly** drop box, then select an assembly from the **Assembly** library. Assemblies enable you to apply pricing information to a material so that it is accounted for in the project cost. You can then see the material pricing in the project estimate, or choose to ignore it if you wish.

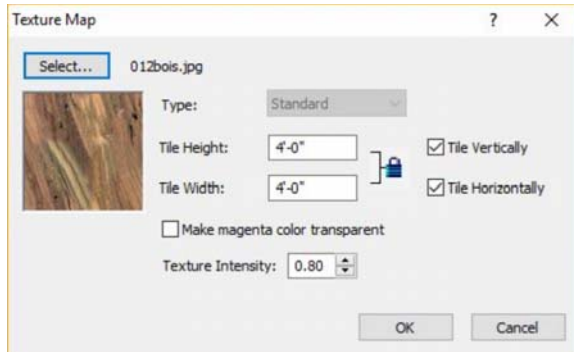
From the **Manufacturer** drop box, select the material's manufacturer. You can access the Manufacturers library by clicking  next to this drop box.

## Editing Texture Mapping Properties

If you are using a texture to represent a material, you can specify a number of settings that determine the appearance of the texture.

You can access texture mapping properties in the **Material Properties** dialog, by clicking a **Texture** switch. (See Editing Material Properties on page 483.)

This displays the **Texture Map** dialog:

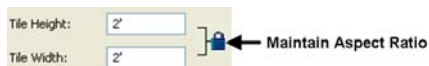


Here you can click **Select** to choose a BMP, JPG, TGA or PNG file from the Textures directory. If you want to use textures from outside sources, see Using Textures from Outside Sources on page 485 for guidelines.

If you are selecting a **Bump** texture, you must set the **Type** to **Normal Map**. Normal mapping is a technique used for simulating the lighting of bumps and dents. The **Standard** mapping type simply maps and wraps the pixels to a 3D surface.

If you want to change the scale of the texture, enter new values in the **Tile Height** and **Tile Width** edit boxes. Tile height refers to the height of one bitmap tile. The program uses tiled rendering to display images, meaning images are generated in pieces (tiles) vertically and horizontally. Changing the tile height of a brick material, for example, would make the bricks look taller. Changing the tile width would make the bricks look wider.

By default, the **Tile Height** and **Tile Width** have the Maintain Aspect Ratio lock closed. When the lock is closed, the Tile Width changes to match the Tile Height, and vice versa. This prevents distortion. If you want to specify different values for each, you need to open the Maintain Aspect Ratio lock by clicking on it.



To repeat the bitmap tile horizontally, enable the **Tile Horizontally** check box.

To repeat the bitmap tile vertically, enable the **Tile Vertically** check box.

If you want to make portions of a texture transparent, use a graphical editor to apply a magenta color to those areas that you want to make transparent. Then, in the **Texture Map** dialog, enable the **Make magenta color transparent** check box.

The **Texture Intensity** setting lets you control the brightness and contrast of the texture. Specify a value from 0.00 to 2.00.

## Using Textures from Outside Sources

When changing a material's texture assignment, you can use textures (bitmaps) from outside sources provided they are appropriately sized and not too large. As a rule, the texture's dimensions should be a power of 2:

2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, etc.

If the dimensions are not powers of 2, the texture will be cropped (from the top and right side) to the next smallest size. For some textures, this will make it look like the texture is cut off.

For example, if your texture is 500 x 500, it will be cropped down to 256 x 256, since 500 is not a power of 2. If the texture were 512 x 512, however, it would not be cropped.

Cropping is not that important if the texture is a grid pattern (such as brick), since such a texture is uniform throughout. However, cropping can have an undesirable result if the texture is something like a tree.

## Filtering the Materials Library

You can use a filter in the materials library to filter the materials list according to specific usages. For example, the Flooring filter will list material types such as carpet, tile, concrete and wood. This can make it easier to find the material you're looking for when editing materials or using the Materials Paintbrush.

### To filter the materials library:

1. In the Materials library, make a selection from the **Filter** drop box.

## Specifying the Location of the Textures Directory


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By default, textures are located in the following directory:

`C:\ProgramData\Cadsoft\Envisioneer\Textures`

If you move your Textures directory to another location on your system, or would like to link to another Textures directory (such as one from an older version of the program), you will need to specify the location of the Textures directory so that textures appear properly in the program.

### To specify the location of your Textures directory:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, select the General tab.
3. In the *File Paths* area, click on the **Textures Directory** to select it.
4. Click **Modify**.
5. In the **Browse For Folder** dialog, locate the folder containing your textures, then click **OK**.
6. Click **OK** in the **Program Settings** dialog.


## Customizing the Material Usages Library

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Material usages are a way of defining what a material is used for. For example, Carpet is typically used for floors and surfaces, but not for doors or walls. Most materials in the materials library have a usage assigned to them in their properties. Usages are used to create *material filters*, which can be used in the materials library to filter the display of materials.

You can add, edit and delete material usages to suit your needs.

### To access the Material Usages library through the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Material Usages**.

### To access the Material Usages library through a material:

1. Select the material in the Materials library, then right-click and select **Edit Material**.
2. In the **Material Properties** dialog, click  next to the **Material Usage** drop box.

### To add a new usage:

1. Select **Edit > Add Material Usage**, or right-click in the Material Usages window and select **Add Material Usage**.

### To edit an existing usage:

1. Select it in the list, then select **Edit > Edit Material Usage**, or right-click in the Material Usages window and select **Edit Material Usage**.

### To define a usage:

1. In the **Material Usage Properties** dialog, specify or edit the usage name in the **Name** edit box.

2. To select or de-select elements to include in the usage, just click on them. Elements marked with a red 'X' will not be included.
3. Click **OK** to return to the **Material Usages** library.

#### To delete a usage from the library:

1. Select it, then select **Edit > Delete Material Usage**, or right-click and select **Delete Material Usage**.

#### To view the properties of an existing usage:

1. Select the usage, then select **Edit > View Material Usage**, or right-click and select **View Material Usage**.
2. Click **OK**.

## Enforcing Material Usages

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By default, you can apply any material to an element. However, if you enable the Enforce Material Usages option in your program settings, you can prevent materials from being applied to an element for which the materials are not intended. For example, you would be warned if you tried to apply a brick material to a roof.

#### To enforce material usages:

1. Select **Settings > Program Settings** or click the Program Settings button on the Settings toolbar.
2. In the **Program Settings** dialog, select **Building Aids** in the left column.
3. Enable the **Enforce Material Usages** check box.
4. Click **OK**.

If the Enforce Material Usages option is enabled and you try to apply a material to an element for which it is not intended, the **Material Usage Conflict** dialog appears. At this point you can click **Yes** to apply the material anyway, or click **No** to select another material to apply.

**Note:** Materials are assigned usages in their properties. Usages are defined in the Material Usages Library.


## Customizing the Material Filters Library

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Material filters are used in the materials library to filter the materials list according to specific usages. For example, the Flooring filter will list material types such as carpet, tile, concrete and wood. This can make it easier to find the material you're looking for when editing materials or using the Materials Paintbrush.

You can add and edit material filters in the Material Filters library to suit your needs.

#### To customize the Material Filters library:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Material Filters**.
3. To add a new filter, select **Edit > Add Material Filter**, or right-click in the Material Filters window and select **Add Material Filter**.
4. To edit an existing filter, select it in the list, then select **Edit > Edit Material Filter**, or right-click in the Material Filters window and select **Edit Material Filter**.
5. In the **Material Filter Properties** dialog, you can specify or edit the filter name in the **Name** edit box.
6. To select or de-select usages, just click on them. Usages marked with a green check mark will be included in the filter. For more information about usages, see Customizing the Material Usages Library on page 486.
7. Click **OK** to return to the **Material Filters** library.
8. To delete a filter from the library, select it, then select **Edit > Delete Material Filter**, or right-click and select **Delete Material Filter**.
9. To view the properties of an existing filter, select it, then select **Edit > View Material Filter**, or right-click and select **View Material Filter**.


10. Click **OK**.

## Customizing the Patterns Library

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The patterns library contains an excellent selection of pre-defined patterns that you can apply to materials. You can create, edit and import patterns to suit your needs.

### To access the patterns library through the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Patterns**.

### To access the patterns library through an element:

1. Access the element's properties.
2. In the properties dialog, select the Appearance tab.
3. In the *Pattern* pane, click the pattern swatch or the **Select** button.

### To add a pattern:

1. Select **Edit > Add Pattern**, or right-click in the Patterns window and select **Add Pattern**.
2. Define the pattern properties, then click **OK**.

### To edit a pattern:

1. Select the pattern in the list.
2. Select **Edit > Edit Pattern**, or right-click in the Patterns window and select **Edit Pattern**.
3. Define the pattern properties, then click **OK**.

### To delete a pattern from the patterns list:

1. Select the pattern in the list.
2. Select **Edit > Delete Pattern**, or right-click and select **Delete Pattern**, or simply click the Delete key on your keyboard.  
**Note:** You cannot delete the pre-existing patterns that come with the program — only those that you have created or imported.

### To import a pattern (PAT file):

1. Click **Load**.
2. In the **Open** dialog, locate the PAT file you want to import, then click **Open**. The pattern is added to the patterns library.  
**Note:** Some pattern files, such as those from applications like AutoCAD®, can be compound pattern files. If importing a compound pattern file, you may see a number of patterns added to your patterns list.

## Editing a Pattern

You can edit a pattern's scale and line definition.

### To edit a pattern:

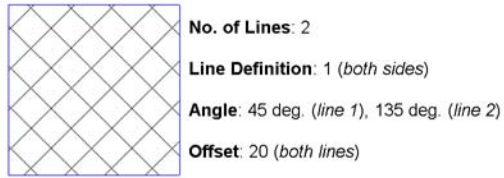
1. In the Patterns library, select the pattern you want to edit.
2. To edit the scale of a pattern, enter a value in the **Scale** edit box. A value of 2 doubles the original scale, while a value of .5 halves the original scale.
3. To edit the pattern's line definition, fill out the fields in the *Pattern Definition* pane.

**No. of Lines.** The number of lines that will repeat in the pattern. Usually, this will be 1 or 2, but it could be more depending on the complexity of the pattern.

**Edit Line.** The line you are currently editing.

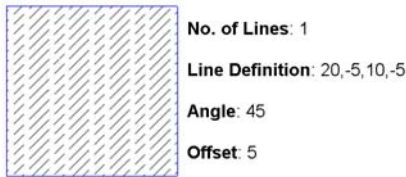
**Definition.** Generally, the segment lengths and spaces in the line's pattern.

A single value (other than 0) creates a solid line.



For dashed patterns, segments and spaces can be different lengths, but spaces must be preceded by a negative sign to indicate they are spaces.

For example, a definition of 20,-5,10,-5 (in Metric) creates the following pattern: 20 mm dash, 5 mm space, 10 mm dash, 5 mm space.



**X Origin.** The point on the X axis the line passes through.

**Y Origin.** The point on the Y axis the line passes through.

**Angle.** The angle of the line in degrees.

**Offset.** The spacing between lines as the line is repeated (offset) parallel to the original throughout the pattern.

**Shift.** The distance each offset line is shifted (left or right) from the origin of the previous line. This creates a staggered effect.



## Setting Up the Manufacturers Library

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The manufacturers library contains several manufacturers of materials found in the materials library. You can add manufacturers to the library, as well as edit and delete existing manufacturers. Each manufacturer has name, logo and contact information. You can then attach manufacturer information to elements and materials.

### To access the manufacturers library directly:

1. Select **File > Catalogs > Manufacturers**. Or, open the Library Manager and select **Libraries > Manufacturers**.

### To access the manufacturer's library through an element:

1. Access the element's properties.
2. In the properties dialog, select the Quantity tab.
3. Click  next to the **Manuf** edit box.

### To access the manufacturers library through a material:

1. Select the material in the Materials library, then right-click and select **Edit Material**.
2. In the **Material Properties** dialog, click  next to the **Manufacturer** drop box.

### To add a new manufacturer to the list:

1. Select **Edit > Add Manufacturer**, or right-click in the list window and select **Add Manufacturer**.



**To edit an existing manufacturer:**

1. Select the manufacturer in the list, then select **Edit > Edit Manufacturer**, or right-click and select **Edit Manufacturer**.
2. In the **Manufacturer Properties** dialog, fill out the name and contact information fields. To select a logo if you have one, click inside the Logo pane, then select the logo file in the **Open** dialog. You can use JPG, BMP and TGA files.
3. Click **OK** to return to the **Manufacturers** dialog.


**To delete a manufacturer, select it in the list:**

1. Select **Edit > Delete Manufacturer**, or right-click and select **Delete Manufacturer**.

## Attaching Manufacturer Information to an Element

You can attach manufacturer information to an element in the catalog, or in the drawing. You can then view the manufacturer information any time you are viewing the element's properties.

**To attach manufacturer information to an element:**

1. Access the element's properties.
2. In the properties dialog, select the Quantity tab.
3. Click  next the **Manuf:** edit box.
4. In the **Manufacturers** dialog, select the manufacturer you want to attach to the element. You can add or edit manufacturers if necessary.
5. Click **OK**.

**Note:** Attaching a manufacturer to an element in your drawing applies the information to that particular instance of the element only. Other instances or future insertions of the element are unaffected.

## Attaching Manufacturer Information to a Material

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You can attach manufacturer information to materials in your materials library. You can then view the manufacturer information any time you are viewing the material's properties.

**To attach manufacturer information to a material:**


1. Access the Materials library.
2. Select the material that you want to edit, then select **Edit > Edit Material**, or right-click and select **Edit Material**, or simply click on the swatch.
3. In the **Material Properties** dialog, click the manufacturer drop box and select the desired manufacturer from the list.
4. Click **OK**.

## Displaying Manufacturer Logos in the Catalog and Property Pages

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If you have attached manufacturer information to elements or materials, and that information includes logos, you can choose to display the logos in the catalog, on the property pages of elements, and in the Materials dialog. The logo appears above the preview of the element or material.

**To display manufacturer logos:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Tool Display* area, enable the **Manufacturer Logos** check box.
4. Click **OK**.



## Customizing the Labels Library

You can add your own pre-defined text labels to the labels library as well as edit and delete the existing labels.

### To customize the labels library:

1. Select a Text tool, then click the **Library** button below the list of pre-defined labels in the **Text** dialog.  
You can also select **File > Catalogs > Library Manager**. In the **Library Manager** dialog, select **Libraries > Labels**.
2. To add a new label to the list, select **Edit > Add Label**, or right-click in the label window and select **Add Label**.
3. To edit an existing label, select it in the list, then select **Edit > Edit Label**, or right-click and select **Edit Label**. You can also click inside the lower pane of the **Labels** dialog.
4. In the **Label Properties** dialog, type a name for the label in the **Name** edit box. Then, enter the label text in the **Label Text** window, or click **Import** to load an existing text file. The name is not necessarily the same as the actual label text. It simply identifies the label in the list of labels. For example, a label named 'Address' can contain your company's full address.
5. Click **OK** to return to the **Labels** dialog.
6. To delete a label in the list, select the label, then select **Edit > Delete Label**, or right-click in the label window and select **Delete Label**.
7. When you are finished customizing the library, click **OK**.

## Customizing the Text Styles Library

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You can add your own text styles to the text styles library as well as edit and delete the existing text styles.

### To customize the text styles library:

1. If you are currently in the **Text** dialog, click the **Text Style** button. If you are not currently in the **Text** dialog you can launch it by selecting a Text tool.  
For direct access to text styles library, select **File > Catalogs > Library Manager**. In the **Library Manager** dialog, select **Libraries > Text Styles**.
2. To add a new text style to the list, select **Edit > Add Text Style**, or right-click in the text style window and select **Add Text Style**.
3. To edit an existing text style, select it in the list, then select **Edit > Edit Text Style**, or right-click and select **Edit Text Style**. You can also click inside the lower pane of the **Text Styles** dialog.
4. In the **Text Style Properties** dialog, type a name for the text style in the **Name** edit box.
5. From the **Font** drop box, select a font to use.
6. From the **Font Style** drop box, select a style for the font. Choices can include Regular, *Italic*, **Bold**, and **Bold Italic**.
7. In the **Height** edit box, specify the desired text height.
8. Click the **Color** swatch to access the **Color** dialog, where you can select a color for the text.
9. Click **OK** to return to the **Text Styles** dialog.
10. To delete an existing text style, select it in the list, then select **Edit > Delete Text Style**, or right-click in the style window and select **Delete Text Style**.
11. Click **OK**.

## Customizing the Dimension Styles Library

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can add your own dimension styles to the dimension styles library as well as edit and delete the existing dimension styles.

### To customize the dimension styles library:

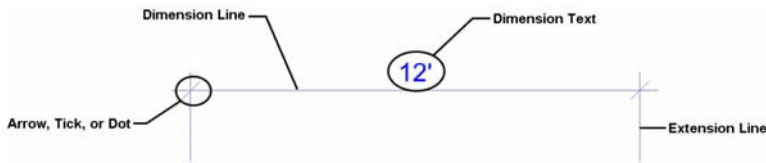
1. If you have inserted dimensions in your current project, you can access the dimension styles library by selecting a dimension, then right-clicking and selecting **Change Style**. If you do not have dimensions inserted yet you can select **Tools > Dimensions > Current Dimension Style** and click **Select** in the **Current Dimension Style** dialog.

For direct access to the dimension styles library, select **File > Catalogs > Library Manager**. In the **Library Manager** dialog, select **Libraries > Dimension Styles**.

2. To add a new dimension style to the list, select **Edit > Add Dimension Style**, or right-click in the dimension style window and select **Add Dimension Style**.
3. To edit an existing dimension style, select it in the list, then select **Edit > Edit Dimension Style**, or right-click and select **Edit Dimension Style**. You can also click inside the lower pane of the **Dimension Styles** dialog.
4. In the **Dimension Style Properties** dialog, type a name for the dimension style in the **Name** edit box.
5. Define the dimension style.
6. To delete an existing dimension style, select it in the list, then select **Delete Dimension Style**, or right-click in the style window and select **Delete Dimension Style**.
7. Click **OK**.

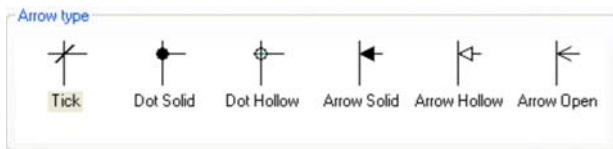
## Dimension Style Properties

### Anatomy of a Dimension



#### Dimension tab

**Arrow Type.** You can select the type of symbol you want displayed at the ends of the dimension line. Choose an arrow, dot or tick for your arrow type.



The properties below the Arrow Type selection window (Extension Offset, Baseline Offset, etc.) vary depending on the arrow type selected. As you make different selections, the dimension updates in the preview window.

a - Extension Offset	1/8"
b - Dimension Lap	1/8"
c - Extension Lap	1/8"
d - Tick Width	1/8"
Baseline Offset	1"

Some of the common properties include:

**Extension Offset.** The distance between the end of the extension line and the object being dimensioned.

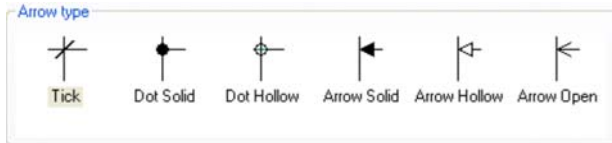
**Dimension Lap.** The distance the dimension line extends past the ends of the dimension. (The "ends" of the dimension are where the dimension line and extension lines intersect.)

**Extension Lap.** The distance the extension lines extend past the dimension line.

**Baseline Offset.** The distance between dimensions when the Baseline Dimension tool is used.

#### Leader tab

**Arrow Type.** You can specify the type of symbol you want to display at the end of leaders. (Leaders are used with the Text with Leader tool.) Choose an arrow, dot or tick for your arrow type.



The properties below the Arrow Type selection window (Arrow Length, Landing Gap, Leader Position, etc.) vary depending on the arrow type selected. As you make different selections, the dimension updates in the preview window.

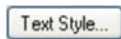
a - Arrow Length	1/16"
b - Arrow Thickness	1/4"
c - Landing Gap	1/2"
Leader Position	Middle

Common properties include:

**Landing Gap.** The distance between the end of the leader line and the object being annotated.

**Leader Position.** The justification of the leader in relation to the text (choose *Top*, *Middle* or *Bottom*). For example, a *Top* leader position aligns the leader with the top of the text.

#### Text tab



Click to select a style for the dimension text. A text style determines the font, font style, text height and color of text.

#### Vertical Text Position

This is the vertical position of the dimension text relative to the dimension line.

**Vertically Centered:** Text is placed inside the dimension line.

**Horizontal Text:** Forces the dimension text to always be horizontal, regardless of the dimension line's angle.

**Above Dimension Line:** Text is placed above the dimension line.

**Distance:** Distance between the text and the dimension line when placing text above the dimension line.

#### Horizontal Text Position

This is the position of the dimension text relative to the ends of the dimension line.

**Centered:** Centers the text inside the dimension line.

**Distance from first end:** Places the text a specific distance from the first end of the dimension. Specify the distance in the *Distance* edit box.

**Distance from the second end:** Places the text a specific distance from the second end of the dimension. Specify the distance in the *Distance* edit box.

#### Units

**Override system units:** Uses the unit of measure specified in the Dimension Style Properties dialog instead of the unit of measure specified in the Program Settings.

**Units\Distance:** The units used for dimensions that measure a distance.

**Type:** Choose from Feet-Inches, Millimeters, Centimeters, Meters or Inches.

**Precision:** For Feet-Inches, the choices are whole units (0, 1/2, 1/4 and so on). For metric units, the choices are number of decimal places you can use.

**Units\Angle:** The units used for angular dimensions.

**Type:** Choose either Decimal Degrees or Degrees/Minutes/Seconds.

**Precision:** Choose the number of decimal places you would like angular dimensions to have (if using Decimal Degrees).

#### Line Styles tab

Refers to the line styles of the dimension line, extension lines and arrows. You can select a different line style for the dimension line, extension lines and arrows. A line style determines the pattern, color and weight of a line.

To assign a different line style to a dimension component, select the component in the left pane, then click **Select** in the center pane to access the **Line Styles** dialog.


## Customizing the Line Styles Library

Personal Architect | Pro Architect | Building Essentials | Construction Suite

A line style defines the pattern, color and thickness of a line. The line styles library contains a wide selection of line styles that you can apply to elements, drafting objects, electrical wiring and dimension styles. You can access the line styles library by editing the properties of an element, drafting object, wiring or dimension style, or through the Libraries menu in the Library Manager.

In the line styles library, line styles are listed in groups so you can organize and find them easily. You can add, rename and delete groups as needed. You can add new line styles to the library, as well as edit and delete existing line styles.

### To access the line styles library through the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Line Styles**.

### To access the line styles library through an inserted element:

1. Select the element.
2. Right-click and select **Properties**.
3. In the properties dialog, select the Appearance tab.
4. Click the **Select** button in the *Linestyle* area.

### To access the line styles library through a drafting object:

1. Select the drafting object (line, circle, etc.).
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.

### To access the line styles library through inserted electrical wiring:

1. Select the wiring in your drawing.
2. Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.

### To access the line styles library by editing a dimension style:

1. Select **Settings > Dimension Styles**. Or, select a dimension in your drawing, then right-click and select **Change Style**.
2. In the **Dimension Styles** dialog, **Edit > Edit Dimension Style**.
3. In the **Dimension Style Properties** dialog, select the Line Styles tab, then click **Select**.

### To add a group:

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

### To rename a group:

1. Select the group in the upper pane.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.

### To delete a group:

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains line styles.

### To add or edit a line style:

1. In the upper pane, select the group that you want to add the line style to, or that contains the line style to edit.
2. To add a new line style, select **Edit > Add Line Style**, or right-click and select **Add Line Style**.

- To edit an existing line style, select it in the list, then select **Edit > Edit Line Style**, or right-click and select **Edit Line Style**.
- In the **Line Style Properties** dialog, define the line style's properties.
 

**Name.** Type a name for the line style as you would like it to appear in the list of line styles.

**Line Type.** Click the browse button to select a line type (continuous, dashed, etc.) from the line type library. You can customize the line types library if needed.

**Line Weight.** Click the browse button to select a line weight (light, heavy, etc.) from the line weight library. You can also customize the line weights library.

**Color.** Click the color swatch to select a color for the line from the Color dialog.
- Click **OK**.

#### To delete a line style:

- Select the line style to delete.
- Select **Edit > Delete Line Style**, or right-click and select **Delete Line Style**.
 

If the line style is being used by an element, a dialog appears telling you this. You can click Yes to view a list of elements using the line style.

## Customizing the Line Types Library

Personal Architect | Pro Architect | Building Essentials | Construction Suite

Line type refers to the style of a line (dashed, dotted, continuous, etc.). It is one of the properties of a line style and a layer. The Line Types library contains a list of pre-defined line types for your convenience. You can add or edit line types to suit your needs.

#### To access the line types library:

- Select **File > Catalogs > Library Manager**. You can also access the line types library while defining a line style or layer.
- In the **Library Manager** dialog, select **Libraries > Linetypes**.

#### To add a new line type:

- Select **Edit > Add Item**, or right-click in the Line Types window and select **Add Item**. A new entry is added to the list.

#### To edit a line type:

- Select the line type in the list.
- In the **Name** edit box, type a name for the line type as you would like it to appear in the list of line types.
- In the **Definition** edit box, edit the line type's definition. Lines are defined by a series of distances separated by commas. Each number represents the length of either a line segment or space. Positive numbers create a line segment of the specified length. Negative numbers create a space of the specified length. For example, a dashed line may have a definition like 1/4", -1/4".
- Once you've edited the line type, click **OK**.

#### To delete a line type from the list:

- Select the line type in the list.
- Right-click and select **Delete Item**, or select **Edit > Delete Item**.

**Note:** You cannot delete the existing, pre-defined line types because they are being used.

## Customizing the Line Weights Library

Personal Architect | Pro Architect | Building Essentials | Construction Suite

Line weight refers to the thickness of a line, and is one of the properties of a line style, as well as a layer. You can add and edit line weights to suit your needs.

#### To access the line weights library:

- Select **File > Catalogs > Library Manager**. You can also access the line weights library while defining a line style or layer.

2. In the **Library Manager** dialog, select **Libraries > Lineweights**.

**To add a new line weight:**

1. Select **Edit > Add Item**, or right-click in the Line Weight window and select **Add Item**. A new entry is added to the list.

**To edit a line weight:**

1. Select the line weight in the list.
2. In the **Name** edit box, type a name for the line weight as you would like it to appear in the list of line weights.
3. In the **Thickness** edit box, type the desired thickness for the line.
4. Once you've edited the line weight, click **OK**.

**To delete a line weight from the list:**

1. Select the line weight in the list.
2. Right-click and select **Delete Item**, or select **Edit > Delete Item**.


**Note:** You cannot delete the existing, pre-defined line weights because they are being used.

## Enabling/Disabling Line Weights

Personal Architect | Pro Architect | Building Essentials | Construction Suite

By default, line weights are not displayed. All lines are displayed using the same thickness. If you enable the Show Line Weights option, line weights will display in your drawing area as well as in printouts.

**To enable or disable the display of line weights:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Linework* area, check or uncheck the **Show Line Weights** check box.
4. Click **OK**.

## Customizing the Layers Library

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can add, edit, rename and delete layers in the Layers Library. When you define a layer you can specify its name, color, line type and line weight. Layers defined in the Layers Library are saved to the catalog and will be available in all projects. Layers can be assigned to element components on the element's Appearance property page. Layers are also used to organize information in Worksheet View.

**To access the layers library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Layers**.


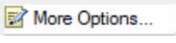
**To access the layers library through an element:**

1. Double-click an element in your drawing or in the catalog panel.
2. In the properties dialog, select the Appearance tab.
3. Click the **Layer** drop box, and then select *Other* in the layer list.

**To access the layers library through the catalog panel:**

1. Right-click in the catalog panel and select **Library Manager**.
2. In the **Library Manager** select **Libraries > Layers**.

**To add or edit a layer:**

1. To create a new layer, click  **Add**, or right-click in the layer list and select **Add**. You can also click  **More Options...** and select **Add**. A new layer called *Layer 1* is added below the currently selected layer.

- To edit an existing layer, select it in the list, then click on the properties that you want to change. These are described below.

**Name.** The name of the layer as you would like it to appear in the list of layers. Double-click to edit, or select it and click




**Color.** The color of objects on the layer. Click the box to display a list of colors. Select the desired color, or select *Other* to access the **Color** dialog.

**Line Type.** The style of line used to display objects on the layer. Click the box to display a list of line types. Select the desired line type, or select *Other* to access the **Line Types** dialog.

**Line Weight.** The weight of the line used to display objects on the layer. Click the box to display a list of line weights. Select the desired line weight, or select *Other* to access the **Line Weights** dialog.

#### To delete a layer:

- Select the layer to delete.
- Click , or right-click and select **Delete**.

## Customizing the Light Source Library


Personal Architect | Pro Architect | Building Essentials | Construction Suite

The light source library contains an assortment of light sources, mainly fluorescent and incandescent light bulbs, that can be applied to lighting fixtures.

You can customize the light source library by adding and editing light sources. Most manufacturers of lighting equipment provide downloadable .IES photometric data files free of charge on their web sites for use in lighting calculations. You can also define a light as a Point or Spot light. Once you've added a light source to your library, you can edit its intensity and color if you want.

Light sources are listed in groups so you can organize and find them easily. You can create, rename and delete groups.

#### To access the light source library in the Library Manager:

- Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
- In the **Library Manager**, select **Libraries > Light Sources**.

#### To access the light source library through an inserted light fixture:

- Select the light fixture.
- Right-click and select **Properties**, or select **Edit > Modify Elements > Properties**.
- In the **Lights** dialog, select the Lights tab.
- Click **Add** or **Edit** to access the light source library.

#### To add a group:

- Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
- Type a name for the group, then press ENTER.

#### To rename a group:

- Select the group to rename.
- Right-click and select **Rename Group**, or select **Edit > Rename Group**.
- Type the new name and press ENTER.

#### To delete a group:

- Select the group to delete.
- Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains light sources.



**To add or edit a light source:**

1. Select the group you want to add the light source to, or that contains the light source.
2. To add a new light source, select **Edit > Add Light**, or right-click and select **Add Light**.
3. To edit an existing light source, select it in the list, then select **Edit > Edit Light**, or right-click and select **Edit Light**.
4. In the **Light Source Properties** dialog, define the light source's properties.

**Name.** Type a name for the light source as you would like it to appear in the list of light sources.

**Type.** Choose either *IES*, *Point* or *Spot*. **IES** files are photometric data files provided by lighting manufacturers for the purposes of lighting calculations. A **Point** light spreads its light out equally in all directions. A **Spot** light spreads light in one direction from its source to the target, and there is no light behind the source. The spot light sheds its light only within a limited cone that grows wider as light moves further away from its origin. A good example of a spot light is a flashlight.



**Load.** If **IES** is selected as the type, click **Load** to select an \*.ies file to apply to the light source. Many \*.ies files can be found in the program's Lights folder.

**Intensity (lumens).** The level of brightness, measured in lumens. Lumens measure how much light you are getting from a bulb. More lumens means a brighter light; fewer lumens means a dimmer light. This value can be edited for **Point** and **Spot** lights only.

**Intensity scale.** This is the intensity of the light expressed as a percentage. For example, if the light source is a 60 Watt bulb, a value of 50% would make the bulb function like a 30 Watt bulb.

**Spot light cone angle.** Available if the light source type is set to **Spot**, this value determines the width of the cone in which light is spread. A wider angle means that the light has a larger spread.

**Color temperature.** A measurement in degrees kelvin that indicates the hue of a light source. Color temperatures over 5,000K are called cool colors (bluish white), while lower color temperatures (2,700–3,000 K) are called warm colors (yellowish white through red).

**Choose color.** To change the color of the light, click the color swatch and select a color from the Color dialog.

5. Click **OK**.

**To delete a light source:**

1. Select the light source in the list.
2. Right-click and select **Delete Light**, or select **Edit > Delete Light**, or just press the Delete key on your keyboard.

**Specifying the Location of the Light Source Directory**

Personal Architect | Pro Architect | Building Essentials | Construction Suite


By default, light sources are located in the following directory:

`C:\ProgramData\Cadsoft\Envisioneer\Lights`

If you move your Lights directory to another location on your system, you will need to specify the location of the Lights directory so that light sources can be accessed by the program.



**To specify the location of your light source directory:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the General pane, click on the **Lights Directory** in the *File Paths* area.
3. Click **Modify**.
4. In the **Browse For Folder** dialog, locate the folder containing your light sources, then click **OK**.
5. Click **OK** in the **Program Settings** dialog.

**Customizing the Door Leafs Library**


Personal Architect | Pro Architect | Building Essentials | Construction Suite

The Door Leafs library contains door leaves that can be applied to doors in the catalog or in your drawing.

You can add, rename and delete door leaf groups, and add new door leaves by importing a DWG, DXF, SKP or 3DS drawing. You can also edit and delete existing door leaves.

You can access the Door Leaf library by editing the properties of a door, or through the Libraries menu in the Library Manager.

**To access the Door Leafs library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Door Leafs**.

**To access the Door Leafs library through an inserted door:**

1. Select the door in your drawing, then right-click and select **Properties**.
2. Select the **Properties** tab, then in the *Type* area, scroll over and select **Custom**.

**To access the Door Leafs library through the catalog:**

1. Select a door in the catalog panel, then right-click and select **Edit Element**.
2. Select the **Properties** tab, then in the *Type* area, scroll over and select **Custom**.

**To add a group:**

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.

**To delete a group:**

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains door leaves.

**To add a new door leaf:**

1. Select the group that you want to add the door leaf to.
2. Select **Edit > Add Door Leaf**, or right-click and select **Add Door Leaf**.
3. In the **Door Leaf Properties** dialog, click **Import New Leaf**.
4. Use the **Door Leaf Import Wizard** to import the door leaf. See Importing a Custom Door Leaf on page 500.

**To edit a door leaf:**

1. Select the door leaf that you would like to edit.

2. Select **Edit > Edit Door Leaf**, or right-click and select **Edit Door Leaf**. See Editing Door Leaf Properties on page 501.

**To delete a door leaf:**

1. Select the door leaf that you would like to delete.
2. Select **Edit > Delete Door Leaf**, or right-click and select **Delete Door Leaf**.

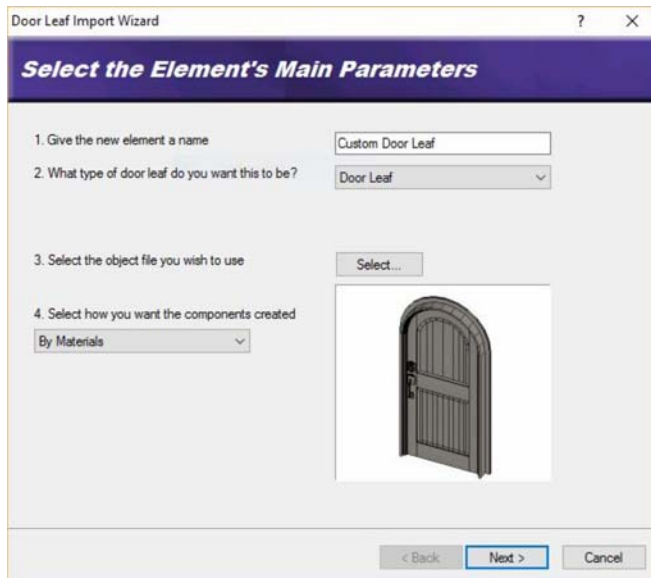
## Importing a Custom Door Leaf

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can use the **Door Leaf Import Wizard** to import a door leaf in DWG, DXF, SKP or 3DS format into the Door Leafs library. Once imported, you can apply the door leaf to any door in your drawing or catalog.


**To import a custom door leaf:**

1. Access the Door Leafs library.
2. Select the group that you want to add the door leaf to, then select **Edit > Add Door Leaf**, or right-click and select **Add Door Leaf**.
3. In the **Door Leaf Properties** dialog, click **Import New Leaf**.



4. In the **Door Leaf Import Wizard**, enter a name for the new door leaf as you would like it to appear in the library.
5. Specify whether the door leaf is to be a **Door Leaf** or **Cabinet Leaf**. This ensures that the leaf will be properly mapped to the object, ensuring a realistic display in your drawing.
6. Click **Select**. In the **Open** dialog, select the file type that you want to import (DWG, DXF, SKP or 3DS), then locate and select the desired file. When you click Open, a preview of the door leaf appears in the preview pane. You can click and drag in the preview pane to rotate the door leaf, and right-click to access various viewing options.
7. For DWG and DXF files, specify how you want the components created by making a selection from the drop box. You can choose from **Colors** or **Layers**. For 3DS and SKP files, the only selection available is **Materials**.
8. Click **Next**.
9. On the **Orient your element** screen, use the arrows to rotate the door so that it will be oriented correctly when inserted in a drawing. In most cases you want to make sure that the door is oriented vertically and sits flush with the wall.
10. Click **Next**.
11. The next screen lists the object's individual components. Specify which components you want to display or hide in 3D by clicking the appropriate eye icons.

 Component is displayed

 Component is not displayed

Enabling the **Show only selected component** check box displays only the currently selected component in the object preview. This helps you distinguish between the object's individual components.

To rename a component, double-click it, then type the new name and press Enter.

12. Click **Finish**.

## Editing Door Leaf Properties

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can edit the name, type and component properties of a door leaf in the Door Leafs library.

### To edit a door leaf:


1. Access the Door Leafs library.
2. In the **Library Manager** dialog, select the door leaf that you would like to edit.
3. Right-click in the *Door Leafs* window and select **Edit Door Leaf**. Or, select **Edit > Edit Door Leaf**.
4. Make your changes in the **Door Leaf Properties** dialog.

**Name.** The name of the door leaf as it appears in the library.

**Leaf Type.** Select either **Door Leaf** or **Cabinet Leaf** to specify how the leaf will be used. This ensures that the leaf will be properly mapped to the object to which it will be applied.

**Components.** Specify which components you want to display or hide in 3D by clicking the appropriate eye icons.

 Component is displayed

 Component is not displayed

To rename a component, double-click it, then type the new name and press Enter.

5. Click **OK**.

## Customizing the Assemblies Library

Personal Architect | Pro Architect | Building Essentials | Construction Suite


The assemblies library contains a variety of pre-defined assemblies that you can customize. Assemblies contain parts and other non-graphical items that are associated with elements, but are not physically present in the drawing. For example, a door may have a Lock Set assembly attached to it which includes a door lock and a set of hinges. A wall may have a Drywall assembly that includes drywall sheets, drywall screws, and paint. If an element has an assembly attached to it in its properties, the parts in that assembly will be reported in the project estimate.

Assemblies are organized by element in the assemblies library. You can add, rename and delete groups as needed. You can add new assemblies to the library, as well as edit and delete existing assemblies.


You can access the assemblies library through an element's Quantity property page, or through the Library Manager.

### To access the assemblies library through the Library Manager:

To access the assemblies library through the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Assembly**.

### To access the assemblies library through an element's properties:

1. Select an element in your drawing, then right-click and select **Properties**. Or, select **File > Catalogs > Element Manager**, then select an element.
2. In the properties dialog, select the **Quantity** tab.
3. In the *Assemblies* area, click  **Add...**

### To add a group:

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.

2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.

**To delete a group:**

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains assemblies.

**To add a new assembly:**

1. Select the group that you want to add the assembly to.
2. Select **Edit > Add Assembly**, or right-click and select **Add Assembly**. See Defining an Assembly on page 502.

**To edit an assembly:**

1. Select the assembly that you would like to edit.
2. Select **Edit > Edit Assembly**, or right-click and select **Edit Assembly**. See Defining an Assembly on page 502.

**To delete an assembly:**

1. Select the assembly that you would like to delete.
2. Select **Edit > Delete Assembly**, or right-click and select **Delete Assembly**.


## Defining an Assembly

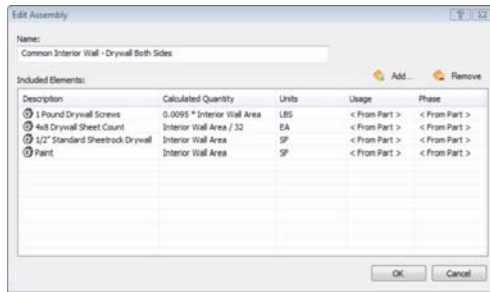
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Assemblies are parts or non-graphical items that are linked to an element, but do not exist in the drawing. For example, a door may have a Lock Set assembly attached to it which includes a door lock and a set of hinges. A wall may have a Drywall assembly that includes drywall sheets, drywall screws, and paint. If an element has assemblies attached to it in its properties, those assemblies will be reported in the project estimate.


Assemblies are stored in a customizable assemblies library. Defining an assembly involves selecting an element from the catalog, then specifying a formula to quantify it. For example, if you wanted to add a dead bolt to a door assembly, you would choose the Dead Bolt from the Parts category in the catalog, then specify a simple Count formula to quantify it since it is a single item of a preset size, and there is one per door.


**To define an assembly in the assemblies library:**


1. Access the assemblies library. You can do this by selecting **File > Catalogs > Library Manager** and then **Libraries > Assembly**. From the **Filter** drop box, select the element type for which you want to define assemblies. You can also access the library from an element's Quantity page. Right-click the element and select **Properties**, then select the Quantity tab.  in the Assemblies area.
2. In the *Groups* pane of the assemblies library, select the group that you want to add an assembly to, or that contains the assembly that you want to edit.
3. If you want to create a new assembly, select **Edit > Add Assembly**, or right-click in the *Assembly* pane and select **Add Assembly**. If you want to edit an existing assembly, select the assembly in the *Assembly* pane, then select **Edit > Edit Assembly** or right-click and select **Edit Assembly**.
4. Define the assembly in the **Edit Assembly** dialog.



To edit the name of the assembly, type or edit the name in the **Name** edit box.

To add an item to the assembly, click  **Add...**, then make a selection from the **Catalog Access** dialog. For example, if you wanted to add a dead bolt to a door assembly, you would select **Parts** from the filter at the top of the **Catalog Access** dialog, then select **Dead Bolt** in the Door Hardware folder.

To remove an item from the assembly, select the item in the list, then click  **Remove...**.

To define a formula for calculating the quantity of the item, click in the item's **Calculated Quantity** field, then click . For items with a single count, such as a dead bolt, you can simply select the 'Count' variable in the **Define Formula** dialog. For items which are quantified differently, you will need to select a different variable or build a formula that quantifies the item correctly. For example, for wall insulation you might select the 'Exterior Wall Area' variable so that the quantity of insulation is reported in terms of square feet or square meters. See *Specifying Formulas* on page 395.

The unit of measure in the **Units** field is the unit of measure that will appear after the calculated quantity in the project estimate. This is taken from the Unit of Measure field on the part's Quantity property page.

To assign a usage to the item, click in the **Usage** field and make a selection from the drop box. Choices are **From Part**, **From Parent**, and **Library**. If **From Part** is selected, the *Usage* assigned to part on its Quantity property page is used. If **From Parent** is selected, the *Usage* assigned to the element to which the assembly is attached will be used. If you select **Library** in the *Usage* field, the **Usages** dialog appears and you can assign any usage you want to the item.

To assign a phase to the item, click in the **Phase** field and make a selection from the drop box. The choices for Phase are the same as the choices for Usage: **From Part**, **From Parent** and **Library**.

5. When you have finished defining the assembly, click **OK** to save your changes.


## Customizing the Usages Library

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An element's usage can help make it more clear what the element is to be used for. For example, one particular member could be used for Basement Beams, while another might be used for Studs. The usages library contains various usages that you can assign to elements on their Quantity property page. Usages may appear in estimates and can be used as a sort key in report templates. You can add, edit and delete groups and usages in the usages library.

You can access the usages library through an element's Quantity property page, or through the Library Manager.

### To access the usages library through the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Usages**.

### To access the usages library through an element's properties:

1. Select an element in your drawing, then right-click and select **Properties**. Or, select **File > Catalogs > Element Manager**, then select an element. You can also select an element in the catalog panel and then right-click and select **Edit Element**, or simply double-click the element.
2. In the properties dialog, select the Quantity tab.
3. Click  next to the **Usage** edit box.

**To add a group:**

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.

**To delete a group:**

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains usages.

**To add a new usage:**

1. Select the group that you want to add the usage to.
2. Select **Edit > Add Usage**, or right-click and select **Add Usage**.
3. In the **Usage Properties** dialog specify a name and ID for the usage, then click **OK**.

**To edit a usage:**

1. Select the usage that you would like to edit.
2. Select **Edit > Edit Usage**, or right-click and select **Edit Usage**.
3. Edit the properties of the usage in the **Usage Properties** dialog, then click **OK**.

**To delete a usage:**

1. Select the usage that you would like to delete.
2. Select **Edit > Delete Usage**, or right-click and select **Delete Usage**.


## Customizing the Phases Library

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The phases library contains various phases that you can assign to elements on their Quantity property page. A phase refers to a stage in the building process. Examples are Foundation, Exterior Construction, and Exterior Finish. Phases are often reported in estimates, and can be used as sort keys in report templates.

You can access the phases library through an element's Quantity property page, or through the Library Manager. You can customize the phases library by adding, editing and deleting groups and phases.

**To access the phases library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Phases**.

**To access the phases library through an element's properties:**

1. Select an element in your drawing, then right-click and select **Properties**. Or, select **File > Catalogs > Element Manager**, then select an element. You can also select an element in the catalog panel and then right-click and select **Edit Element**, or simply double-click the element.
2. In the properties dialog, select the Quantity tab.
3. Click  next to the **Phase** edit box.

**To add a group:**

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.

**To delete a group:**

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains phases.

**To add a new phase:**

1. Select the group that you want to add the phase to.
2. Select **Edit > Add Phase**, or right-click and select **Add Phase**.
3. In the **Phase Properties** dialog specify a name and ID for the phase, then click **OK**.

**To edit a phase:**

1. Select the phase that you would like to edit.
2. Select **Edit > Edit Phase**, or right-click and select **Edit Phase**.
3. Edit the properties of the phase in the **Phase Properties** dialog, then click **OK**.

**To delete a phase:**

1. Select the phase that you would like to delete.
2. Select **Edit > Delete Phase**, or right-click and select **Delete Phase**.


## Customizing the Categories Library

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The categories library contains a variety of categories that you can assign to elements on their Quantity property page. Categories are sometimes used in estimates, and can also be used as a sort key in report templates.

You can add, edit and delete groups and categories in the categories library. You can access the categories library through an element's Quantity property page, or through the Library Manager.

**To access the categories library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Categories**.

**To access the categories library through an element's properties:**

1. Select an element in your drawing, then right-click and select **Properties**. Or, select **File > Catalogs > Element Manager**, then select an element. You can also select an element in the catalog panel and then right-click and select **Edit Element**, or simply double-click the element.
2. In the properties dialog, select the Quantity tab.
3. Click  next to the **Category** edit box.

**To add a group:**

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.



**To delete a group:**

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains categories.

**To add a new category:**

1. Select the group that you want to add the category to.
2. Select **Edit > Add Category**, or right-click and select **Add Category**.
3. Specify a name for the category, then click **OK**.

**To edit a category:**

1. Select the category that you would like to edit.
2. Select **Edit > Edit Category**, or right-click and select **Edit Category**.
3. Edit the name of the category, then click **OK**.

**To delete a category:**

1. Select the category that you would like to delete.
2. Select **Edit > Delete Category**, or right-click and select **Delete Category**.

## Customizing the Units of Measure Library


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The Units of Measure library contains a variety of units that you can assign to elements on their Quantity property page. There are units for measuring single items, area, volume and length. Units are reported for each element in estimates to indicate how they are being quantified. For example, doors are purchased as individual items and will have the 'Each' unit, while something like insulation may be measured in Square Feet.


Each unit of measure has a set of properties that determine how it quantifies the material, including a Conversion Factor for converting measurements from millimeters to the unit you want, Unit Format (Decimal, Feet & Inches, etc.) and a level of Precision. The program will perform the necessary calculations and conversions for you when you generate the project estimate, resulting in an accurate material take-off.

You can add, edit and delete groups and units of measure in the Units of Measure library. You can access the units of measure library through an element's Quantity property page, or through the Library Manager.

**To access the Units of Measure library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Units of Measure**.

**To access the Units of Measure library through an element's properties:**

1. Select an element in your drawing, then right-click and select **Properties**. Or, select **File > Catalogs > Element Manager**, then select an element. You can also select an element in the catalog panel and then right-click and select **Edit Element**, or simply double-click the element.
2. In the properties dialog, select the Quantity tab.
3. Click  next to the **Units** edit box.

**To add a group:**

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.



3. Type the new name and press ENTER.

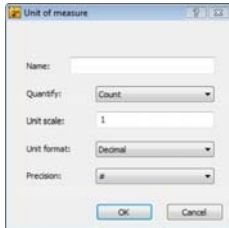
#### To delete a group:

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains units of measure.

#### To add a new unit of measure:

1. Select the group that you want to add the unit to.
2. Select **Edit > Add Unit of Measure**, or right-click in the lower pane and select **Add Unit of Measure**. The **Unit of Measure** dialog appears:



3. In the **Unit of Measure** dialog, define the unit's properties.

**Name.** The name of the unit of measure as it will appear in the Unit of Measure library and in the Units field in the project estimate. This is the text that appears after the numerical value (e.g. SQFT).

**Quantify.** Select either **Count**, **Length**, **Area** or **Volume** to specify what you are quantifying.

**Unit Scale.** Specify the factor that will convert millimeters to the desired unit of measurement. For example, if you wanted to quantify a material in square inches, you would enter a conversion factor of 0.0015500031, because 1 square millimeter = 0.0015500031 square inches.

**Unit Format.** Select the format in which you want the quantity measurement to appear. Select either **Decimal**, **Inches**, **Feet-Inches**, or **Feet-Inches-Sixteenths**.

**Note:** Measurements are always calculated in millimeters initially, regardless of what is selected in the Unit Format field. If you want to quantify a material using a different unit, you must specify a Conversion Factor in the unit's properties.

**Precision.** Select a level of precision for the measurement. For example, selecting a precision of **#'-# #/16"** sets the level of precision to 1/16th of an inch when measuring distances in feet and inches.

4. Click **OK**.

#### To edit a unit of measure:

1. Select the unit of measure that you would like to edit.
2. Select **Edit > Edit Unit of Measure**, or right-click and select **Edit Unit of Measure**.
3. Edit the properties in the **Unit of Measure** dialog, then click **OK**. For more information about the available properties, see the section on adding a unit of measure to the library (above).

#### To delete a unit of measure:

1. Select the unit of measure that you would like to delete.
2. Select **Edit > Delete Unit of Measure**, or right-click and select **Delete Unit of Measure**.

## Customizing the Profiles Library


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The profiles library contains a variety of custom profiles that can be applied to members and columns.

In the profiles library, profiles are listed in groups so you can organize and find them easily. You can add, rename and delete groups as needed. You can add new profiles to the library, as well as edit and delete existing profiles.

You can access the profiles library by editing the properties of a member or column, or through the Libraries menu in the Library Manager.

**To access the profiles library through the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Profiles**.

**To access the profiles library through an inserted member or column:**

1. Select the column or member in your drawing, then right-click and select **Properties**.
2. In the *Type* area of the Basic property page, scroll over and select **Custom**.
3. Click the **Select Profile** button at the bottom of the dialog.

**To access the profiles library through the catalog:**

1. Select the column or member in the catalog panel, then right-click and select **Edit Element**.
2. In the *Type* area of the Basic property page, scroll over and select **Custom**.
3. Click the **Select Profile** button at the bottom of the dialog.

**To add a group:**

1. Right-click an existing group and select **Add Group**, or select **Edit > Add Group**. An entry is added to the list.
2. Type a name for the group, then press ENTER.

**To rename a group:**

1. Select the group to edit.
2. Right-click and select **Rename Group**, or select **Edit > Rename Group**.
3. Type the new name and press ENTER.

**To delete a group:**

1. Select the group to delete.
2. Right-click and select **Delete Group**, or select **Edit > Delete Group**.

**Note:** A group cannot be deleted if it contains profiles.

**To add a new profile:**

1. Select the group that you want to add the profile to.
2. Select **Edit > Add Profile**, or right-click and select **Add Profile**. See *Creating Custom Profiles* on page 508.

**To edit a profile:**

1. Select the profile that you would like to edit.
2. Select **Edit > Edit Profile**, or right-click and select **Edit Profile**. See *Editing a Custom Profile* on page 510.

**To delete a profile:**

1. Select the profile that you would like to delete.
2. Select **Edit > Delete Profile**, or right-click and select **Delete Profile**.


## Creating Custom Profiles

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You can create your own profiles for members, columns and strip footings. To create a custom profile you simply define the length and angle of each of the profile's segments. Segments can be straight or curved.

**To add a profile to the profiles library:**

1. Access the profiles library.
2. In the **Profiles** dialog, right-click in the *Profiles* window and select **Add Profile**. Or, select **Edit > Add Profile**.

3. In the **Profile Properties** dialog, enter a name for the profile in the **Name** edit box. You are now ready to start defining each of the profile's segments. Each segment is automatically joined to the previous one to help you form the shape.
4. To draw a line, click  in the *Properties* area, then enter a length in the **Distance** edit box and a direction in the **Angle** edit box. Click **Insert** to insert the line in the preview window.

Note that the segment lengths you specify are simply units (not inches or millimeters) and have no relation to the actual member size — they determine how long one segment is in relation to another.

5. To draw an arc, click . Enter a length for the arc in the **Distance** edit box. This is the distance between the start point and end point. Enter a direction in the **Angle** edit box. Enter the radius for the curve of the arc in the **Radius** edit box, then select either *Left* or *Right* from the **Arc Direction** drop box to specify the direction in which you want the arc to curve from the start point. Click **Insert** to insert the arc in the preview window.
6. To remove the last segment created, click **Remove**. Clicking **Remove** again continues to remove segments in reverse sequence.
7. To close the shape, click **Close**. A line is drawn from the end point of the last segment created to the start point of the first segment created.
8. When the profile is complete, click **OK**.

## Exporting a Polyline to the Profile Library

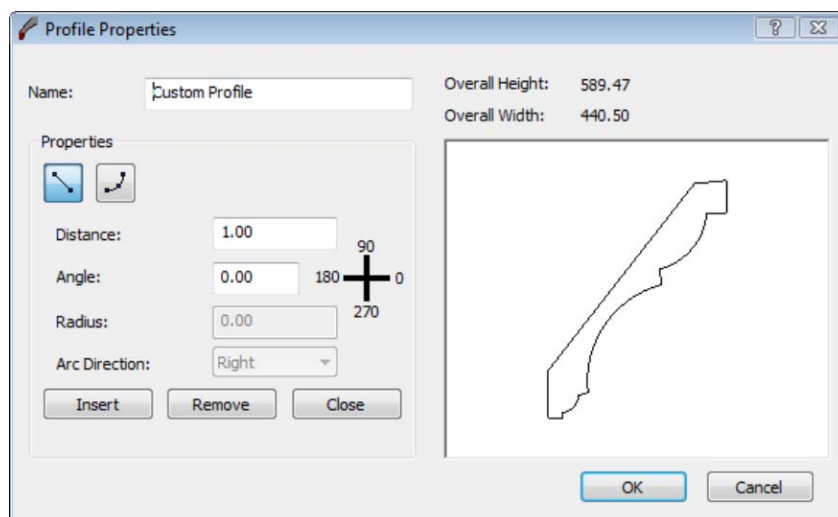
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You can export any polyline or polygon that you have drawn or imported in Worksheet View to the profile library. You can then apply that profile to any member in your drawing or in the catalog. This tool is ideal for creating custom baseboards, crown moulding, chair rail and other types of trim, or any custom member.

Many moulding and millwork companies offer downloadable CAD drawings of their trim profiles on the Internet. You can import these into Envisioneer using the Import CAD File tool in Worksheet View provided they are in DWG or DXF format.

### To export a polyline to the profile library:

1. In Worksheet View, draw a polyline in the desired profile shape, or import a profile using the Import CAD File tool. Note that the shape must be closed and cannot intersect itself. If the profile will be used for trim, make sure that the flat side is on the left and the shaped side is on the right.
2. In Worksheet View, select **File > Catalogs > Export Polyline to Profile Library**.
3. Click on the polyline that you want to export to the profile library. Note that if the polyline is one that you imported, you may need to explode it first.
4. In the **Profile Properties** dialog, type a name for the profile in the **Name** edit box.



5. Click **OK**. The profile is added to the *Imported Profiles* group in the profile library.

- In the **Profile Library** dialog, click **OK**.

## Editing a Custom Profile

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You can edit existing profiles by removing and redrawing segments.

### To edit an existing profile:

- Access the profiles library.
- In the **Profiles** dialog, select the profile that you would like to edit.
- Right-click in the *Profiles* window and select **Edit Profile**. Or, select **Edit > Edit Profile**.
- Make your changes in the **Profile Properties** dialog. Note that you cannot select specific segments to edit. You can remove segments in reverse sequence (starting with the last one drawn) and then insert new segments.
- Click **OK**.

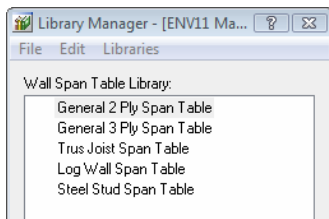
**Note:** Due to the nature in which profiles are created, it may be easier to create a new profile rather than edit an existing one.

## Customizing the Wall Span Table Library


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The Wall Span Table Library contains tables that determine which head/sill/jamb configurations are to be used to frame wall opening spans of varying sizes. Each table contains a list of opening span sizes (2', 4', 6', etc.) with a specific head/sill/jamb configuration assigned to each one.


You can add, edit and delete span tables in the Wall Span Table Library.



### To access the Wall Span Table Library from the Library Manager:

- Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
- In the **Library Manager**, select **Libraries > Framing Libraries > Wall Opening Span Table**.

### To access the Wall Span Table Library from your building location settings:

- Select **Settings > Building Locations**, or click  on the View Control toolbar.
- In the **Building Locations** dialog, click in the **Framing Options** column.
- In the **Location Framing Options** dialog, double-click the span table listing.

### To access the Wall Opening Span Table Library from an inserted opening (in Framing Mode):

- Go into Framing Mode (View > Framing Mode On/Off).
- Double-click an opening, or select the opening and then right-click and select **Properties**.
- In the **Edit Opening Configurations** dialog, enable the **Use custom span table** radio button, and then click the **Select span table** button.

### To edit an existing span table:

- Double-click the span table in the list, or select the span table and select **Edit > Edit Wall Span Table Configuration**, or right-click and select **Edit Wall Span Table Configuration**.
- Edit the configuration in the **Wall Framing Span Table** dialog. See Defining a Wall Opening Span Table on page 511.

**To add a new span table to the library:**

1. Select **Edit > Add Wall Span Table Configuration**, or right-click in the span table pane and select **Add Wall Span Table Configuration**.
2. Define the table in the **Wall Framing Span Table** dialog. See Defining a Wall Opening Span Table on page 511.

**To delete a span table from the library:**

1. Select the table to delete.
2. Select **Edit > Delete Wall Span Table Configuration**, or right-click and select **Delete Wall Span Table Configuration**.

**To view a span table without editing it:**

1. Select the table to view.
2. Select **Edit > View Wall Span Table Configuration**, or right-click and select **View Wall Span Table Configuration**.

## Defining a Wall Opening Span Table

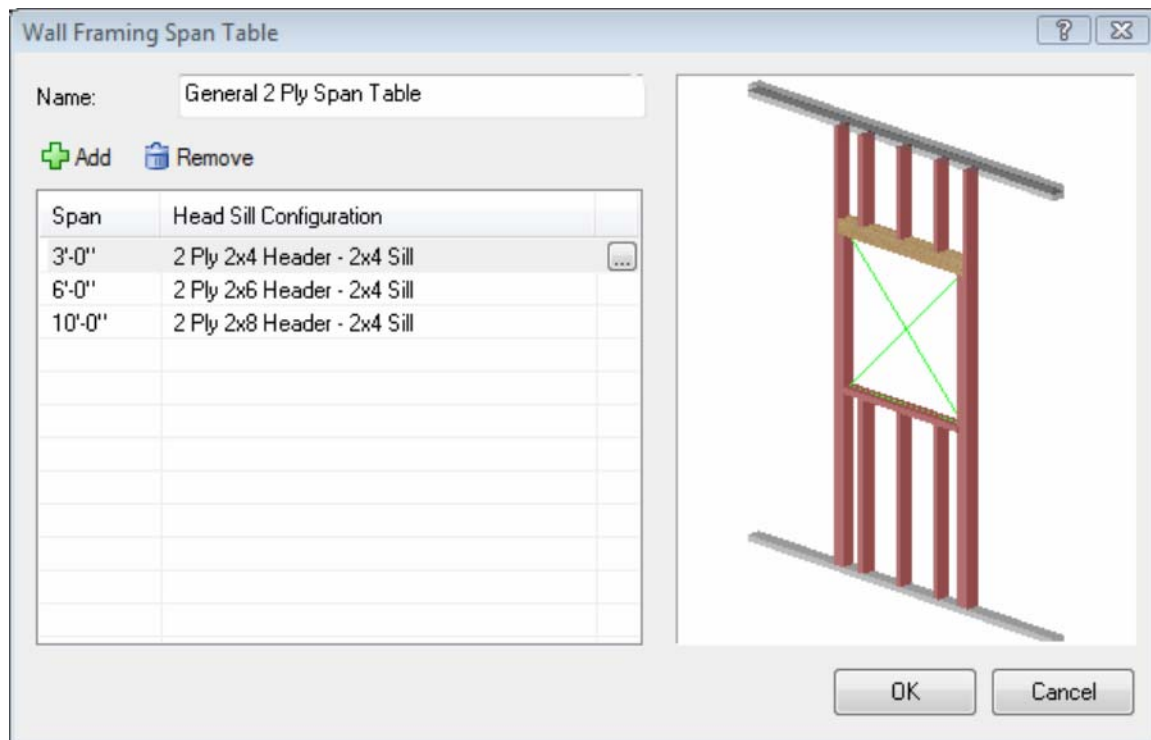
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Wall openings are framed according to wall opening span tables that determine which head/sill/jamb configurations are to be used for opening spans of varying sizes. A span table contains a list of opening sizes (2', 4', 6', etc.) and the head/sill/jamb configuration that is to be used for each size.

Span tables are stored in the Wall Opening Span Table Library. Every building location in your model has a span table assigned to it. You can select a custom span table to use for individual walls in your model, or for individual openings.

**To define a wall opening span table:**

1. Open the Wall Opening Span Table Library, and then select either the **Add Wall Span Table Configuration** or **Edit Wall Span Table Configuration** tool.



2. In the **Wall Framing Span Table** dialog, specify a name for the table in the **Name** edit box as you would like it to appear in the Wall Opening Span Table Library.
3. To add a span to the table, select the span in the list that you want the new one to come after, then click  **Add**. A new span is added below the currently selected one. By default, its width will be an increment higher than the previous one. For example, if you select a 3' foot span in the list and then add a new one, the newly added span will have a width

of 4'. You can edit this value if you want. When you edit a span's width value, the span automatically moves to the correct position in the list to keep the list ordered.

To select a head/sill configuration for the span, simply click the currently assigned head/sill configuration and select the desired one from the drop list. If you want to add, edit or view a head/sill configuration, click the browse button



next to the current head/sill selection to access the Head Sill Jamb Library.

- To edit an existing span you can adjust its width value or assign a different head/sill configuration to it by clicking on the currently assigned configuration and selecting the desired configuration from the drop list.

- To remove a span from the table, select the span, then click Remove.

## Customizing the Head/Sill/Jamb Library

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The Head/Sill/Jamb Library contains head/sill/jamb configurations that can be used to frame openings in walls. Head/sill/jamb configurations are used in wall span tables which determine how openings of various sizes should be framed.

A head/sill/jamb configuration determines what members are used for the king studs, jack studs, header, cripples and window sill, as well as each member's position, alignment, etc.

You can add, edit and delete configurations in the Head/Sill/Jamb Library.



**To access the Head/Sill/Jamb Library in the Library Manager:**

- Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button on the Standard toolbar and select **Library Manager**.
- In the **Library Manager**, select **Libraries > Framing Libraries > Head Sill Jamb Configuration**.

**To access the Head/Sill/Jamb Library through an inserted opening (in Framing Mode):**

- Go into Framing Mode (View > Framing Mode On/Off).
- Double-click an opening, or select the opening and then right-click and select **Properties**.
- In the **Edit Opening Configurations** dialog, select the **Use custom head sill jamb configuration** radio button, then click the **Select configuration** button.

**To add a configuration to the Head/Sill/Jamb Library:**

- Select **Edit > Add Head Sill Jamb Configuration**, or right-click an existing configuration and select **Add Head Sill Jamb Configuration**.

2. Define the configuration in the **Head Sill Configuration** dialog. See Defining a Head/Sill/Jamb Configuration on page 513.

**To edit a configuration in the Head/Sill/Jamb Library:**

1. Double-click the configuration in the list, or select the configuration in the list and select **Edit > Edit Head Sill Jamb Configuration**, or right-click and select **Edit Head Sill Jamb Configuration**.
2. Edit the configuration in the **Head Sill Configuration** dialog. See Defining a Head/Sill/Jamb Configuration on page 513.

**To delete a configuration in the Head/Sill/Jamb Library:**

1. Select the configuration to delete.
2. Press the **Delete** key on your keyboard, or select **Edit > Delete Head Sill Jamb Configuration**, or right-click and select **Delete Head Sill Jamb Configuration**.

**To simply view a configuration without editing it:**

1. Select the configuration to view.
2. Select **Edit > View Head Sill Jamb Configuration**, or right-click and select **View Head Sill Jamb Configuration**.

## Defining a Head/Sill/Jamb Configuration

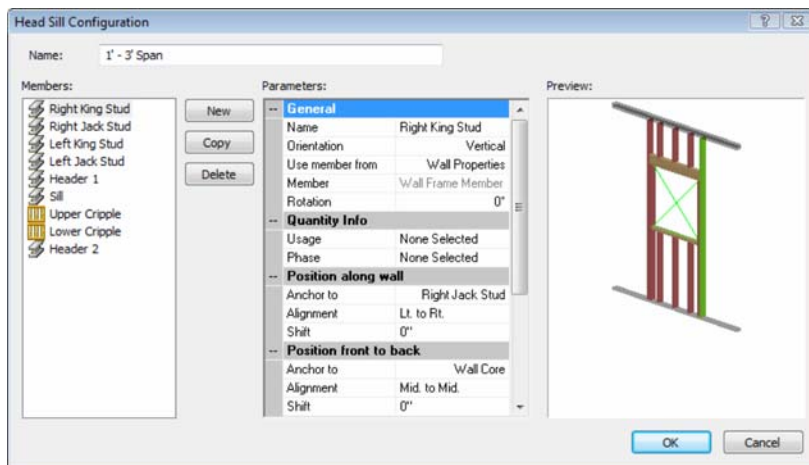
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Used in framing a wall opening, a head/sill/jamb configuration determines what members are used for the king studs, jack studs, headers and window sill, as well as each member's position, alignment, etc. It also defines the cripple regions above and below the opening.

Head/sill/jamb configurations are stored in the Head/Sill/Jamb Library, and are used to define wall span tables.

**To define a head/sill/jamb configuration:**

1. Access the Head/Sill/Jamb Library, then choose either the **Add Head Sill Jamb Configuration** or **Edit Head Sill Configuration** tool.

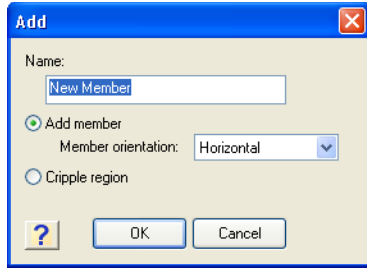




2. To edit a member in the configuration, select it in the *Members* pane on the left side of the **Head Sill Configuration** dialog (e.g. *Left King Stud* or *Header*).
3. To add a new member to the configuration, click . In the **Add Member** dialog, type a name for the member in the top edit box.

If the member is not part of the cripple region, enable the **Add member** radio button, and then select an orientation (**Horizontal** or **Vertical**) from the lower edit box. This determines whether the member is oriented horizontally or vertically in the opening frame.

If you are adding a cripple region, enable the **Cripple region** radio button. **Note:** Cripples are defined as an area of members rather than as individual members.





4. To add a new member by copying an existing one, select the member to copy, then click .
5. To remove a member from the configuration, select the member to delete, then click .
6. Define the member in the *Parameters* pane. The settings vary depending on the type of member. Settings are described below.


Opening Members (King studs, Jack studs, Headers, Sill)

- General -

**Name.** The name of the member as it appears in the configuration's list of members (e.g. *Left King Stud* or *Header 1*).


**Orientation.** The direction of the member in the frame (*Horizontal* or *Vertical*). A header would have a horizontal orientation, while a king stud would have a vertical orientation.


**Use member from.** To use the member type assigned to the wall on the wall's Framing property page, select **Wall Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection on the wall's Framing property page.

**Member.** If *Wall Properties* is selected in the 'Use member from' field, the Member field displays a generic description, 'Wall Frame Member', indicating that the member to be used is the one selected on the wall's Framing property page. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the member about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°).


- Quantity Info -

**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

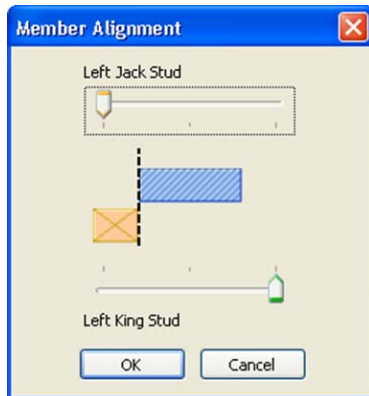
**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

- Position Along Wall/Position Vertically-

**Anchor to.** The component to which the member is anchored when looking at the member's position along the length of the wall (if it is vertical) or vertically in the wall (if it is a horizontal). For example, a Left King Stud is typically anchored to the Left Jack Stud. The header, jack studs and window sill are typically anchored to the opening since they are the members that form the opening.

**Alignment.** The way in which the member is aligned with the anchor member/component. For example, if a Left King Stud is anchored to the Left Jack Stud, and has a 'Rt. to Lt.' alignment, this means that the right side of the king stud is anchored to the left side of the jack stud. If a Header is anchored the opening and has a 'Bot. to Top' alignment, this means that the bottom of the header is anchored to the top of the opening. To change the alignment, click in the Alignment field, then click  to display the Member Alignment dialog.





Use the sliders to adjust the position of the member relative to the anchor component or relative to the alignment line.


**Shift.** The distance the member is shifted from its anchor position. A positive value shifts the member to the right (for vertical members) or up (for horizontal members), while a negative value shifts the member to the left or down depending on its orientation.

- Position Front to Back -

**Anchor to.** The component to which the member is anchored when looking at the member's position within the width of the wall (from the front of the wall frame to the back). In other words, the member's position is relative to the anchor component's position. Most members except for the window sill are anchored to the *Wall Core*, which means their position inside the frame is relative to the wall core. You can anchor a member to a specific component of the wall core, such as the top plate or bottom plate, or to another member in the opening frame.

Note that "wall core" refers to the configuration of studs, top plate, bottom plate and very top plate as a whole.

**Alignment.** The way in which the member is aligned with the anchor component. For example, if a king stud is anchored to the core, and has a 'Mid. to Mid.' alignment, this means that the middle of the king stud lines up with the middle of the wall core. A 'Mid. to Fnt.' alignment would mean that the middle of the king stud lines up with the front of the wall core when looking at the wall frame face-on. If the window sill is anchored to the header, and has a 'Fnt. to Fnt.' alignment, this means that the front of the window sill lines up with the front of the header.

To change the alignment, click in the Alignment field, then click  to display the **Member Alignment** dialog. Use the sliders to adjust the position of the member and/or anchor component to achieve the alignment you want between the front and back of the wall frame.

**Shift.** The distance the member is shifted toward the front or back of the wall frame from its anchor position. A positive value shifts the member toward the back, while a negative value shifts it toward the front.

- Top/Bottom End or Left/Right End -

The labels of the bottom two sections depend on whether the member is oriented horizontally or vertically. A vertical member will display 'Top End' and 'Bottom End', while a horizontal member will display 'Left End' and 'Right End'.

**Anchor to.** The component to which the end of the member is attached. For example, the top of a king stud is typically anchored to the top plate. The left end of a header is usually anchored to the left king stud.

**Align at anchors.** The point on the anchor component to which the member end extends. For vertical members the selections are *Bottom*, *Center* and *Top*. For horizontal members the selections are *Left*, *Center* and *Right*. For example, if the bottom of a king stud is anchored to the bottom plate, and has a 'Top' alignment, this means that the bottom of the king stud sits on the top face of the bottom plate. If it had a 'Bottom' alignment, it would extend down to the bottom face of the bottom plate.

**Extend.** The distance the member end is shifted from its anchor point. For example, if your king stud were anchored to the bottom of the bottom plate but you wanted to raise the end of the stud up by 1/4", you would enter 1/4 in the Extend field. A positive value shifts the member end upward or to the right, while a negative value shifts it downward or to the left from its anchor point (depending on its orientation).


### Cripple Region


- General -

**Name.** The name of the member as it appears in the configuration's list of members (e.g. *Upper Cripple*).

**Double cripple ends.** Inserts double cripple members at each end of the cripple region.

- Quantity Info -

**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

- Top extent -

**Anchor to.** The component to which the top of the cripple region is anchored. Typically the top of an upper cripple region will be anchored to the top plate. The top of a lower cripple region is usually anchored to the sill.

**Alignment.** The part of the anchor member to which the top of the cripple region extends. If the top of an upper cripple region is anchored to the top plate, and a *Bottom* alignment is selected, the top of the cripple region will be aligned with the bottom of the top plate. Other choices are *Center* and *Top*.

**Shift.** The distance the top of the cripple region is shifted from its anchor position. A positive value shifts it up, and a negative value shifts it down.

- Bottom extent -

**Anchor to.** The component to which the bottom of the cripple region is anchored. Typically the bottom of an upper cripple region is anchored to the header. The bottom of a lower cripple region is usually anchored to the bottom plate.

**Alignment.** The part of the anchor member to which the bottom of the cripple region extends. If the bottom of an upper cripple region is anchored to the header, and a *Top* alignment is selected, the bottom of the cripple region will be aligned with the top of the header. Other choices are *Center* and *Bottom*.

**Shift.** The distance the bottom of the cripple region is shifted from its anchor position. A positive value shifts it up, and a negative value shifts it down.

- Left extent -

**Anchor to.** The component to which the left end of the cripple region is anchored. Typically the left end of an upper cripple region is anchored to the Left King Stud, and the left end of a lower cripple region is anchored to the Left Jack Stud.

**Align at anchors.** The point on the anchor component to which the left end of the cripple region extends. Choices are *Left*, *Right* and *Center*. For example, if the left end of an upper cripple region is anchored to the Left King Stud, and a *Right* alignment is selected, the left end of the cripple region will extend to the inside face of the King Stud. If a *Left* alignment were selected, the cripple region would extend to the outside of the King Stud.

**Extend.** The distance the cripple region end is shifted from its anchor point. A positive value shifts it right, and a negative value shifts it left.

- Right extent -

**Anchor to.** The component to which the right end of the cripple region is anchored. Typically the right end of an upper cripple region is anchored to the Right King Stud, and the right end of a lower cripple region is anchored to the Right Jack Stud.

**Align at anchors.** The point on the anchor component to which the right end of the cripple region extends. Choices are *Left*, *Right* and *Center*. For example, if the right end of an upper cripple region is anchored to the Right King Stud, and a *Left* alignment is selected, the right end of the cripple region will extend to the inside face of the King Stud.

**Extend.** The distance the cripple region end is shifted from its anchor point. A positive value shifts it right, and a negative value shifts it left.

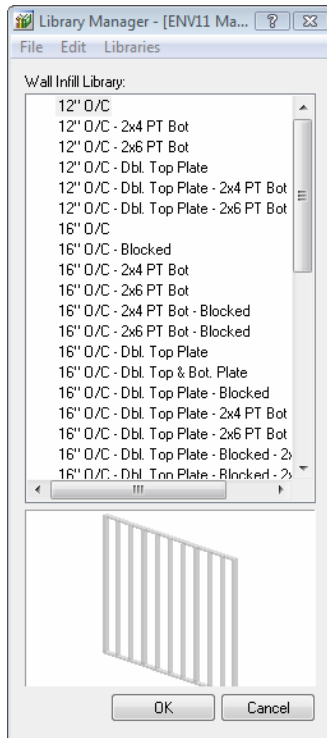
## Customizing the Wall Infill Library

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The Wall Infill Library contains wall infill configurations in both wood and steel that determine how the infill of a wall should be framed. Infill refers to the material that fills the volume of a framed wall — studs, top plate, very top plate, bottom plate and blocking. An infill configuration determines what type of member is used for the infill, the spacing between studs, and the position and alignment of each component in the frame.

Each building location has an infill configuration assigned to it that determines how walls on each location are to be framed. You can override this setting for individual walls in your model by applying a custom infill configuration to a wall in Framing Mode.


You can add, edit and delete infill configurations in the Wall Infill Library.



**To access the Wall Infill Library from the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Framing Libraries > Wall Framing Infill**.

**To access the Wall Infill Library from your building location settings:**

1. Select **Settings > Building Locations**, or click  on the View Control toolbar.
2. In the **Building Locations** dialog, click in the **Framing Options** column.
3. In the **Location Framing Options** dialog, double-click the **Infill configuration** item.

**To access the Wall Infill Library from an individual wall (in Framing Mode):**

1. Go into Framing Mode (View > Framing Mode On/Off).
2. Double-click a wall, or select the wall and then right-click and select **Properties**.
3. In the **Edit Infill Configuration** dialog enable the **Use custom infill configuration** radio button, then click the **Select configuration** button.

**To create a new infill configuration:**

1. In the **Infill Configuration** dialog, select **Edit > Add Wall Infill Configuration**, or right-click in the infill pane and select **Add Wall Infill Configuration**.
2. Define the configuration in the **Infill Configuration** dialog. See Defining a Wall Infill Configuration on page 518.

**To edit an existing infill configuration:**

1. Double-click the configuration to edit, or select the configuration and select **Edit > Edit Wall Infill Configuration**, or right-click and select **Edit Wall Infill Configuration**.
2. Define the configuration in the **Infill Configuration** dialog. See Defining a Wall Infill Configuration on page 518.

**To delete an infill configuration:**

1. Select the configuration to delete.
2. Press the **Delete** key on your keyboard, or select **Edit > Delete Wall Infill Configuration**, or right-click and select **Delete Wall Infill Configuration**.

**To view an infill configuration without editing it:**

1. Select the configuration to view.
2. Select **Edit > View Wall Infill Configuration**, or right-click and select **View Wall Infill Configuration**.

## Defining a Wall Infill Configuration

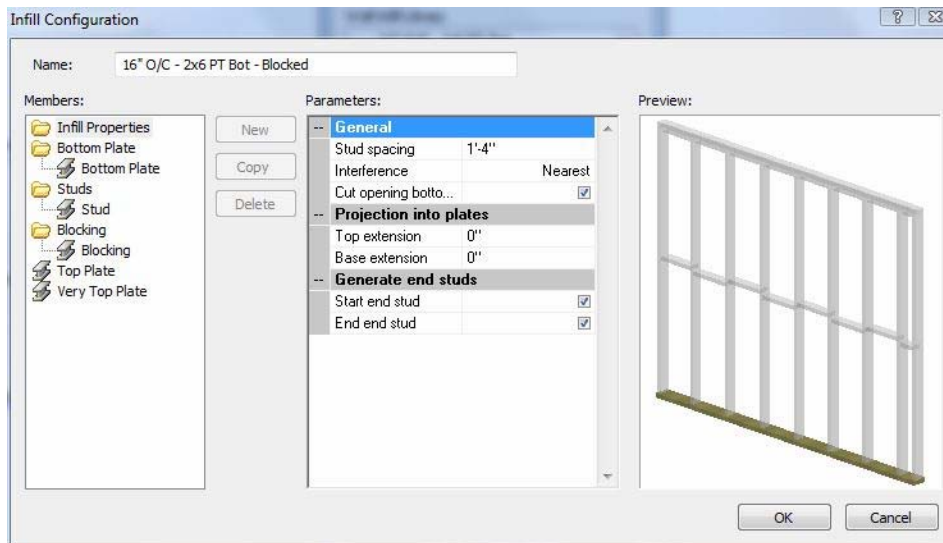
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Infill refers to the material that fills the volume of a framed wall — studs, top plate, very top plate, bottom plate, and blocking. An infill configuration determines what type of member is used for the infill, the spacing between studs, and the position and alignment of each component in the frame. An infill configuration is assigned to each building location in your project, and you can select a custom infill configuration for individual walls in your model using the Infill tool in Framing Mode.

Infill configurations are stored in the Wall Infill Library where you can add and edit configurations to suit your construction needs.

**To define a wall infill configuration:**

1. Open the Wall Infill Library, then choose either the **Add Wall Infill Configuration** or **Edit Wall Infill Configuration** tool.



## **Defining Infill Properties**

To define stud behavior, select **Infill Properties** in the left pane, then define the following settings in the right pane:

**Stud spacing.** The distance between studs.

**Interference.** Refers to the presence of an object (such as another member) where a stud would go. This may occur, for example, where one wall intersects another, or at the end of a wall. Selecting 'Nearest' shifts the stud to one side of the interfering member. Selecting 'Remove' prevents a stud from being inserted where there is interference.

**Cut opening bottom plate.** Cuts the bottom plate out at the bottom of wall or door openings.

Projection into plates

**Top extension.** The distance the studs project into the top plate. This is particularly useful for incorporating framing channels in steel-framed walls.




**Base extension.** The distance the studs project into the bottom plate.

Generate end studs


**Start end stud.** If unchecked, the stud at the start of the wall is removed.

**End end stud.** If unchecked, the stud at the end of the wall is removed.

## **Defining the Bottom Plate**


1. To edit the bottom plate, select a *Bottom Plate* item in the **Bottom Plate** group in the left pane, then define its parameters in the right pane. You can add new members to this group if needed.
2. To add a bottom plate member to the configuration, select the **Bottom Plate** group or an existing Bottom Plate item and click . A new member is added to the list.
3. To add a bottom plate member to the configuration by copying an existing member, select the member to copy and then click .
4. To delete a member from the configuration, select the member to delete and then click .
5. Define the parameters described below.


**Use member from.** To use the framing member assigned to the wall in its properties, select **Wall Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection in the wall's properties.

**Member.** If *Wall Properties* is selected in the 'Use member from' field, the Member field displays a generic description, 'Wall Frame Member', indicating that the member to be used is the one selected in the wall's properties. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the member about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°).




**Double.** If you want the bottom plate to be doubled, click in the Double field and then select **Yes** from the drop box. For a single bottom plate, select **No**.

**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

6. To cut the bottom plate out at the bottom of wall or door openings, select the **Infill Properties** folder in the left pane, then in the right pane, enable the **Cut opening bottom plate** check box.


## Defining the Studs

1. To edit stud properties, select the *Stud* item in the **Studs** group in the left pane. By default there is one stud item listed. This will result in a standard framed wall with a single stud at every spacing interval. If you want multiple studs in the configuration (e.g. double studs), you can add more stud items to the **Studs** group.
2. To add a stud to the configuration, select the **Studs** group or an existing Stud item and click . A new member is added to the list.
3. To add a stud to the configuration by copying an existing stud, select the stud to copy and then click .
4. To delete a stud from the configuration, select the stud to delete and then click .
5. To define parameters for a stud component, select the stud component in the left pane, then define the parameters in the right pane. The parameters are described below.

### General


**Name.** The name of the stud item as it appears in the Studs group in the left pane.


**Use member from.** To use the framing member assigned to the wall in its properties, select **Wall Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection in the wall's properties.

**Member.** If *Wall Properties* is selected in the 'Use member from' field, the Member field displays a generic description, 'Wall Frame Member', indicating that the member to be used is the one selected in the wall's properties. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the member about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°).

### Quantity Info

**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

### Position Along Wall

**Anchor to.** The item that the stud is relative to in defining its position along the length of the wall frame. If there is only one stud in the configuration, the only available option is *Stud Reference Line*, which is like an imaginary chalk line that marks your stud spacing. If there is more than one stud in the configuration, you can anchor the stud to another stud in the list, meaning its position is relative to the stud to which it is anchored.

**Alignment.** The position of the stud relative to the stud reference line or other stud. If the stud is anchored to the Stud Reference Line, you can align the stud on the left side, right side, or center of this line. If the stud is anchored to another stud, you can control which side of the other stud you want to anchor to. For example, a 'Lt. to Rt.' alignment would mean that the left side of the stud is anchored to the right side of the anchor stud. To change the alignment, click in the


Alignment field, then click  to display the Member Alignment dialog. Use the slider controls to shift the anchor position.

**Offset.** The distance the stud is shifted from its anchor position. A positive value shifts the member to the right, while a negative value shifts the stud to the left.

### Position Front to Back




**Anchor to.** The item that the stud is relative to in defining its position within the width of the wall (from the front of the wall frame to the back). If there is only one stud item in the configuration, the studs will be anchored to the *Bottom Plate*. If there is more than one stud in the configuration, you can anchor the stud to another stud in the configuration.

**Alignment.** The position of the stud relative to the anchor item. A 'Mid. to Mid.' alignment means that the middle of the stud lines up with the middle of the anchor stud. A 'Mid. to Fnt.' alignment would mean that the middle of the stud lines up with the front of the anchor stud when looking at the wall frame face-on.

To change the alignment, click in the Alignment field, then click  to display the **Member Alignment** dialog. Use the slider to adjust the position of the stud to achieve the alignment you want between the front and back of the wall frame.

**Offset.** The distance the stud is shifted toward the front or back of the wall frame from its anchor position. A positive value shifts the stud toward the back, while a negative value shifts it toward the front.


## Defining Blocking

1. To edit blocking member properties, select the *Blocking* item in the **Blocking** group in the left pane. By default there is one blocking member listed. If you want multiple blocking members in your configuration, you can add more blocking members to the **Blocking** group.
2. To add a blocking member to the configuration, select the **Blocking** group or an existing Blocking item and click . A new member is added to the list.
3. To add a blocking member to the configuration by copying an existing blocking member, select the blocking member to copy and then click .
4. To delete a blocking member from the configuration, select the blocking member to delete and then click .
5. To define parameters for a blocking component, select the blocking component in the left pane, then define the parameters in the right pane. You The parameters are described below.

### General


**Name.** The name of the blocking item as it appears in the Blocking group in the left pane.


**Use member from.** To use the framing member assigned to the wall in its properties, select **Wall Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection in the wall's properties.

**Member.** If *Wall Properties* is selected in the 'Use member from' field, the Member field displays a generic description, 'Wall Frame Member', indicating that the member to be used is the one selected in the wall's properties. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the member about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°).

### Quantity Info

**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

### Behavior Along Wall

**Break at Stud.** If you select **Yes**, the blocking will be broken at each stud, resulting in separate members between each set of studs. If you select **No**, one solid member will run across the wall.

### Position Bottom to Top

**Placement.** Select the component from which you want to offset the blocking a specific distance - **from bottom plate** or **from top plate**.

**Initial Offset.** The distance the blocking is offset from the top or bottom plate (whichever you selected in the Placement drop box).



**Spacing.** Specifying a value here creates copies of the blocking member vertically within the wall, from the initial offset point. The Spacing value represents the spacing between blocking members.

**Stagger.** If you have set your blocking member to break at studs, selecting **Yes** here will stagger the blocking members across the wall. If you select **No**, the members will all be even with each other. The stagger distance is the thickness of the member.

#### Position Front to Back

**Alignment.** The front-to-back position of the blocking member relative to the stud. A 'Mid. to Mid.' alignment means that the middle of the blocking member lines up with the middle of the stud. A 'Back to Fnt.' alignment would mean that the back of the blocking member is attached to the front of the studs.


**Offset.** The distance the blocking member is shifted toward the front or back of the wall frame from its anchor position. A positive value shifts the member toward the back, while a negative value shifts it toward the front.

### **Defining the Top Plate**

1. To define the top plate, select Top Plate in the left pane, then define the parameters in the right pane. The parameters are described below.


#### General


**Use member from.** To use the framing member assigned to the wall in its properties, select **Wall Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection in the wall's properties.

**Member.** If *Wall Properties* is selected in the 'Use member from' field, the Member field displays a generic description, 'Wall Frame Member', indicating that the member to be used is the one selected in the wall's properties. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the top plate about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°)

#### Quantity Info


**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

#### Position Front to Back

**Anchor to.** (Bottom Plate) The top plate is anchored to the bottom plate. This means that the front-to-back position of the top plate within the frame is relative to the position of the bottom plate (see Alignment below).

**Alignment.** The position of the top plate relative to the position of the bottom plate. For example, a 'Mid. to Mid.' alignment would mean that the middle of the top plate lines up with the middle of the bottom plate. A 'Mid. to Fnt.' alignment would mean that the middle of the middle of the top plate lines up with the front of the bottom plate, and so on and so forth.

To change the alignment, click in the Alignment field, then click  to display the **Member Alignment** dialog. Use the sliders to adjust the position of the top plate relative to the bottom plate.

### **Defining the Very Top Plate**

1. To define the very top plate, select the **Very Top Plate** item in the left pane.
2. Define the parameters in the right pane. The very top plate has the same parameters available as the top plate (see above).

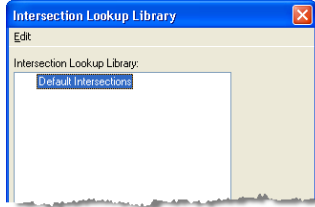


## Customizing the Intersection Lookup Table Library


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The Intersection Lookup Table Library contains a list of intersection lookup table names. If you customize framing configurations for intersections in Framing Mode, you can save your custom configurations to an intersection lookup table that can be used in future projects.


Since intersection framing configurations can only be defined in Framing Mode (with an actual model), the Intersection Lookup Table Library contains only table names. You can add, edit and delete table names in the Intersection Lookup Table Library.



### To access the Intersection Lookup Table Library from the Library Manager:

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Framing Libraries > Intersection Lookup Table**.

### To access the Intersection Lookup Table Library from your building location settings:

1. Select **Settings > Building Locations**, or click  on the View Control toolbar.
2. In the **Building Locations** dialog, click in the **Framing Options** column.
3. In the **Location Framing Options** dialog, double-click the intersection lookup table listing.

### To add a lookup table to the list:

1. Select **Edit > Add Intersection Lookup Configuration**, or right-click in the lookup table pane and select **Add Intersection Lookup Configuration**.
2. In the **Lookup table** dialog, type a name for the table, then click **OK**.

**Note:** Adding a lookup table name to the library is only useful if the lookup table library is empty and you have been prompted for a lookup table. You cannot save custom intersection framing configurations (that you have defined in Framing Mode) to an existing lookup table. You can only create a new one. To create a new table that is populated with intersection configurations, go to Framing Mode and then click on a wall intersection. Then, in the **Edit Intersection** dialog, click **Export**.

### To edit the name of an existing lookup table:

1. Select the table in the list.
2. Select **Edit > Edit Intersection Lookup Configuration**, or right-click in the lookup table pane and select **Edit Intersection Lookup Configuration**.
3. Edit the name in the **Lookup table** dialog, then click **OK**.

### To delete a lookup table from the list:

1. Select the table to delete.
2. Press the **Delete** key on your keyboard, or select **Edit > Delete Intersection Lookup Table Configuration**, or right-click in the lookup table pane and select **Delete Intersection Lookup Table Configuration**.

## Customizing the End Condition Library

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The End Condition Library contains a number of different end condition configurations that you can use when defining framing at wall intersections. End conditions are selected in the Wall Intersection dialog when defining framing options for intersections in Framing Mode.

End condition configurations determine the number of studs at the end of a wall, the rotation of each stud, and the position of each stud relative to the wall core or other studs.


You can add, edit and delete end condition configurations in the End Condition Library.



**To access the End Condition Library in the Library Manager:**

1. Select **File > Catalogs > Library Manager**, or click the down arrow next to the Catalogs button  on the Standard toolbar and select **Library Manager**.
2. In the **Library Manager**, select **Libraries > Framing Libraries > Wall End Conditions**.

**To access the End Condition Library from an intersection in Framing Mode:**

1. Go into Framing Mode (View > Framing Mode On/Off).
2. Double-click an intersection, or select the intersection and then right-click and select **Properties**.
3. In the **Edit Intersection** dialog, click either **Add** or **Edit**.
4. In the **Wall Intersection** dialog, click in the *End Condition* field, then click  in that field.

**To add a new end condition configuration to the library:**

1. Select **Edit > Add End Condition Configuration**, or right-click in the end condition pane and select **Add End Condition Configuration**.
2. Define the configuration in the **End Condition** dialog. See Defining an End Condition Configuration on page 525.

**To edit an existing end condition configuration:**

1. Double-click the end condition in the list, or select the end condition to edit and select **Edit > Edit End Condition Configuration**, or right-click and select **Edit End Condition Configuration**.
2. Define the configuration in the **End Condition** dialog. See Defining an End Condition Configuration on page 525.

**To delete an end condition configuration from the library:**

1. Select the configuration to delete.
2. Press the **Delete** key on your keyboard, or select **Edit > Delete End Condition Configuration**, or right-click and select **Delete End Condition Configuration**.

**To view an end condition configuration without editing it:**

1. Select the configuration to view.

2. Select **Edit > View End Condition Configuration**, or right-click and select **View End Condition Configuration**.

## Defining an End Condition Configuration

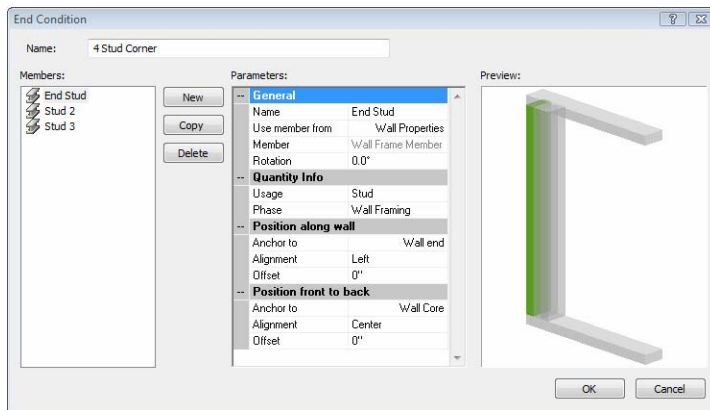
Personal Architect | Pro Architect | Building Essentials | Construction Suite




End condition configurations determine the number of studs at the end of a wall, the rotation of each stud, and the position of each stud relative to the wall core or other studs. End conditions are selected in the Wall Intersection dialog when defining framing options for intersections in Framing Mode.

End condition configurations are stored in the End Condition Library, where you can add, edit and delete configurations.

### To define an end condition configuration:

1. Open the End Condition Library, and then choose either the **Add End Condition Configuration** or **Edit End Condition Configuration** tool.




2. To add a stud to the configuration, click . A new member is added to the list.
3. To add a new stud by copying an existing stud in the configuration, select the stud to copy and then click . A copy of the stud is added to the list.
4. To remove a stud from the configuration, select the stud to remove and then click .
5. To define the parameters of a stud in the configuration, select it in the left pane, and then define its parameters in the right pane. The parameters are described below.

### General


**Name.** The name of the stud as it appears in the list of studs in the end condition configuration (e.g. End Stud).


**Use member from.** To use the framing member assigned to the wall in its properties, select **Wall Properties**. To use a specific member from the member library, select **Member Library**, then make a selection from the **Catalog Access** dialog. The latter option overrides the Framing Member selection in the wall's properties.

**Member.** If *Wall Properties* is selected in the 'Use member from' field, the Member field displays a generic description, 'Wall Frame Member', indicating that the member to be used is the one selected in the wall's properties. If *Member Library* is selected in the 'Use member from' field, the Member field displays the member type to be used (as selected from the Member library). To select a different member, click in this field and then click  to display the **Catalog Access** dialog.

**Rotation.** The rotation of the member about its center line (core). Click the down arrow in this field to select the angle of rotation (0°, 90°, 180° or 270°).

- *Quantity Info* -


**Usage.** What the member will be used for. Usages can be used as sort keys in estimates and reports. To select a usage, click in this field and then click  to display the **Usages** library.

**Phase.** The building stage or process in which this member will be used. Phases can be used as sort keys in estimates and quantity reports. To select a phase, click in this field and then click  to display the **Phases** library.

Position Along Wall

**Anchor to.** The item to which the stud is anchored or lined up with when looking at the stud's position along the length of the wall. If there is only one stud in the list, the only available option is 'Wall End'. If there is more than one stud in the list, you can choose to anchor the stud to the wall end or to another stud in the configuration.

**Alignment.** The position of the stud relative to the anchor object. If the stud is anchored to the Wall End you can position the stud to the left or right of the wall end, or center it on the wall end. If the stud is anchored to another stud in the configuration, you can specify which side you want the stud to be positioned on. For example, if the First Stud is anchored to the End Stud and has a 'Lt. to Rt.' alignment, the left edge of the First Stud is anchored to the right edge of the End Stud. In other words, the First Stud would appear after the End Stud when looking along the length of the wall.

To change the alignment, click in the Alignment field, then click  to display the **Member Alignment** dialog. Use the sliders to adjust the anchor or alignment position.


**Offset.** The distance the stud is shifted from its anchor position. A positive value shifts the stud to the right, while a negative value shifts the stud to the left.

Position Front to Back

**Anchor to.** The component to which the stud is anchored when looking at the member's position within the width of the wall (from the front of the wall frame to the back). In other words, the stud's position is relative to the anchor component's position. If there is only one stud in the configuration, the only choice here is 'Wall Core'. If there is more than one stud in the configuration, you can anchor to the wall core or to another stud in the configuration.

Note that "wall core" refers to the configuration of studs, top plate, bottom plate and very top plate as a whole.

**Alignment.** The position of the stud relative to the anchor item. A 'Mid. to Mid.' alignment means that the middle of the stud lines up with the middle of the wall core or anchor stud. A 'Mid. to Fnt.' alignment would mean that the middle of the stud lines up with the front of the wall core or anchor stud when looking at the wall frame face-on.

To change the alignment, click in the Alignment field, then click  to display the **Member Alignment** dialog. Use the sliders to achieve the alignment you want between the front and back of the wall frame.

**Offset.** The distance the stud is shifted toward the front or back of the wall frame from its anchor position. A positive value shifts the stud toward the back, while a negative value shifts it toward the front.

# Chapter 31: Workspace Settings

You can customize many aspects of your work environment to maximize your design experience and create a space that is tailored to the way you like to do things. For example, you can turn toolbars on and off, move toolbars, move the information panel, and control the toolbar area color and drawing area color.

You can also control the way the program responds graphically, by enabling or disabling Hardware Acceleration, or adjusting Interactive Lighting settings.

If you have problems with your graphics display, see Improving Graphics Display on page 532.

## Displaying/Hiding Toolbars

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There are several toolbars available for display in both Model View and Worksheet View. (By default, not all of them are displayed.) You can hide or show individual toolbars by editing your program settings. When you display a toolbar, it is displayed in one of the toolbar areas which are located directly above and below the drawing area. Note that if you hide a toolbar that is displayed in a tab, the tab is hidden from view as well.

### To hide or show toolbars:

1. Select **Settings > Toolbars**.
2. Click in the *Tabbed* column next to the toolbar's name.
3. To display the toolbar in tabbed format, select **Tabbed** from the drop box.
4. To display the toolbar in non-tabbed (floatable) format, select **Normal**.
5. To hide the toolbar from view, select **Off**.
6. Click **OK**.

**Tip:** If a toolbar is currently floating freely on the screen, you can hide it by clicking the close button on its title bar, or right-clicking its title bar and selecting **Hide**.

## Displaying Toolbars in a Tabbed Format

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You can display any toolbar in tabbed format, meaning a tab will be added to the row of toolbar tabs below the menu bar.

### To display a toolbar in a tab:

1. Select **Settings > Toolbars**.
2. Click in the *Tabbed* column next to the toolbar's name, then select **Tabbed** from the drop box.
3. Click **OK**.

## Displaying Toolbars in a Non-Tabbed Format

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can change any tabbed toolbar to be displayed as a non-tabbed, floatable toolbar.

### To display toolbars in non-tabbed format:


1. Select **Settings > Toolbars**.
2. Click in the *Tabbed* column next to the toolbar's name, then select **Normal** from the drop box.
3. Click **OK**.

## Changing the Color of Toolbar Areas

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The program has two toolbar areas: one directly above the drawing area, and one directly below the drawing area. You can change this color in your workspace Program Settings.

**To change the color of toolbar areas:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. Click the color swatch next to the **Toolbar Areas** option.
4. In the **Color** dialog, select or create the desired color for your toolbar areas, then click **OK** to return to the **Program Settings** dialog.
5. Click **OK**.

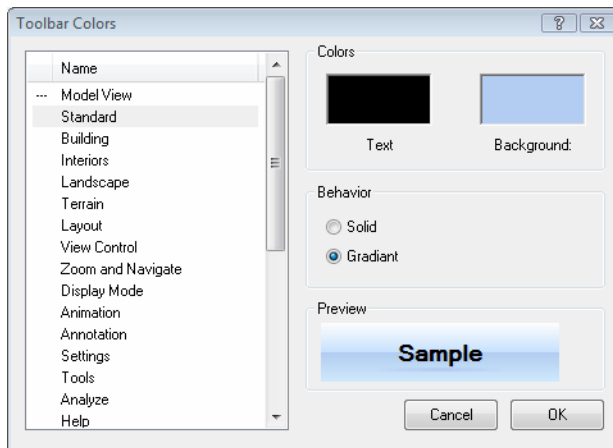
## Customizing Toolbar Colors and Effects

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Every toolbar has a set of advanced settings that control its appearance. These settings include the background color, text color, and whether the background color is solid or has a gradient effect. You can customize the colors and effects of each individual toolbar.

**To customize toolbar colors and effects:**

1. Select **Settings > Toolbars**.
2. In the **Program Settings** dialog, click .



3. In the **Toolbar Colors** dialog, select the toolbar that you want to customize in the left pane.
4. To edit the color of text, click the color swatch above the **Text** item, and then make a selection from the **Color** dialog.
5. To edit the toolbar's background color, click the color swatch above the **Background** item, and then make a selection from the **Color** dialog.
6. To display the background color as a solid, enable the **Solid** radio button.
7. To create a gradient effect with the background color, enable the **Gradient** radio button. A gradient effect involves the gradual transition from one shade to another.
8. Click **OK**.

**Tip:** You can save your toolbar color settings to a \*.theme file that can be loaded at any time. See Saving a Toolbar Color Theme on page 529.

## Saving a Toolbar Color Theme

Personal Architect | Pro Architect | Building Essentials | Construction Suite

If you have customized your toolbar color settings you can save the color settings to a theme file. Once you have saved your color settings to a theme file you can then load the theme at any time without having to set all your toolbars colors again.

### To save a toolbar color theme:

1. Select **Settings > Toolbars**.
2. Set up your toolbar colors as desired. In addition to the background color, you can define advanced settings such as text color and gradient color effects (see Customizing Toolbar Colors and Effects on page 528).
3. In the **Program Settings** dialog, click the **Save Theme** button.
4. In the **Save As** dialog, type a name for the theme in the *File name* edit box. You can also select an existing theme file to overwrite.
5. Click **Save**.

## Loading a Toolbar Color Theme

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You can instantly load any saved toolbar color theme using the Load Theme tool in your toolbar settings.

### To load a toolbar color theme:

1. Select **Settings > Toolbars**.
2. In the **Program Settings** dialog, click the **Load Theme** button.
3. In the **Open** dialog, select the theme you would like to load.
4. Click **Open**.

## Moving Toolbars

You can drag any non-tabbed toolbar to any location on the screen. At window edges, the toolbar will automatically dock itself according to the location. For example, if you drag it to the right edge of the screen, it will assume a vertical orientation.

If you drag it into the drawing window, it will float freely. You can then move it by dragging it by its title bar.

### To move a toolbar:

1. Click and hold your mouse button over the left grip end of the toolbar (or its title bar if it is currently in the drawing area).




2. Drag the toolbar to the desired location.
3. Release the mouse button.

## Displaying/Hiding the Information Panel

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By default, an information panel is displayed on the right side of the screen. When you are in Insertion mode, the panel displays the catalog of elements. In Worksheet View, the panel displays object properties. You can hide the information panel from view if you want.

### To display or hide the information panel:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Tool Display* area, check or uncheck the **Info Panel** check box.
4. Click **OK**.

## Resizing the Information Panel

When the information panel is docked at one side of your screen, you can make it narrower or wider by simply clicking and dragging its edges. If you have moved the panel away from the edge, so it is free-floating, you can resize it by clicking and dragging its corners.

### To resize the information panel if it is docked:

1. Position your pointer over the panel's left outside edge. (If you have moved the panel to the left side of the screen, position your pointer over the right edge.) Watch for the Resize cursor to appear.



2. Click and drag the edge of the panel to stretch it in the desired direction.
3. Release your mouse button.

### To resize the information panel if it is free-floating:

1. Position your pointer over one of the panel's corners.
2. Click and drag to stretch the panel.
3. Release your mouse button.

## Moving the Information Panel

If the information panel is docked on one side of the screen, you can move it by clicking and dragging its outside edge. If you move a panel to the side of the screen, it will automatically dock itself to the edge of the screen. Otherwise, the panel is displayed as a free-floating window.

If the panel is free-floating, you can move it by clicking and dragging its title bar.

### To move the information panel when it is docked:

1. Position your pointer over the panel's outside edge. Watch for the Move cursor.



2. Click and drag the panel to move it.
3. Release your mouse button.

### To move the information panel when it is free-floating:

1. Position your pointer over the panel's title bar.
2. Click and drag the panel to move it.
3. Release your mouse button.


## Displaying/Hiding the Status Bar

Personal Architect | Pro Architect | Building Essentials | Construction Suite

The Status bar is located at the bottom of the screen. It displays helpful prompts while you are working on your design project. For example, if you are inserting a wall, it may display "Pick first insertion point". The Status bar also includes a selection of drawing aid buttons such as ORTHO and OBJSNAP. The Status bar can be toggled on and off as needed.



**To display/hide the Status bar:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Tool Display* area, select or clear the **Status Bar** check box.
4. Click **OK**.

**Changing the Color of the Drawing Area**

Personal Architect | Pro Architect | Building Essentials | Construction Suite

You can select a different color for your drawing area. There are settings for both Model View and Worksheet View.

**To change the color of the drawing window:**


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. To change the color of the drawing area background in Model View, click the color swatch next to the **Model View** option in the *Workspace Colors* area. To change the color of the workspace in Worksheet View, click the color swatch next to the **Worksheet View** option.
4. In the **Color** dialog, select or create the desired color, then click **OK** to return to the **Program Settings** dialog.
5. Click **OK**.

**Displaying/Hiding the Scroll Bars**

Personal Architect | Pro Architect | Building Essentials | Construction Suite

There are scroll bars on the bottom and right side of the drawing area. You can toggle them on and off.

**To display/hide the scroll bars:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Workspace** in the left column.
3. In the *Tool Display* area, select or clear the **Scroll Bars** check box.
4. Click **OK**.


**Note:** Disabling the scroll bars does not disable the auto-scroll feature. The Auto Scroll control is located on the Drawing Aids page of the Program Settings dialog.

**Controlling the Launch of the Startup Screen**

Personal Architect | Pro Architect | Building Essentials | Construction Suite

By default, a Startup screen appears every time you start the program. The Startup screen lets you quickly open new and saved projects, and provides instant access to a variety of learning and support resources. If you prefer you can disable the launch of the Startup screen.

**To control the launch of the Startup screen:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. On the General page of the **Program Settings** dialog, check or uncheck the **Launch Startup Screen** check box.
3. Click **OK**.

**Tip:** If the Startup screen is currently displayed, you can disable its future launch by disabling the **Display on startup** check box at the bottom of the screen. To view the Startup screen any time, select **Help > Launch Startup Screen**.

## Viewing the Startup Screen

The Startup screen lets you quickly open new and saved projects, and provides instant access to a variety of learning and support resources. Any time the Startup screen is not displayed you can launch it instantly through the Help menu.

**To view the Startup screen:**

1. Select **Help > Launch Startup Screen**, or click  on the Help toolbar.


**Note:** To launch the Startup screen automatically on program startup (or prevent it from launching) you need to set the Launch Startup Screen option in your program settings. Launching it from the Help menu or toolbar will not cause it to launch automatically at startup.

## Customizing Keyboard Shortcuts

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Many commands have keyboard shortcuts assigned to them in your Program Settings. You can create and edit shortcuts for all commands in the program.

**To customize a keyboard shortcut:**

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Keyboard** in the left column.
3. From the **Mode** drop box, select either **Model View** or **Worksheet View** depending on where the command is located.
4. Locate the command whose shortcut you would like to specify in the list of available commands. If the command is not listed, it is not eligible for a shortcut.
5. If a shortcut is currently assigned to the command, the shortcut is displayed in the **Current Quick Key for Command** edit box. To remove the current shortcut from the command, click **Remove**.
6. To assign a new shortcut to the command, place your cursor in the **Press Keys** edit box, then press the desired key sequence on your keyboard, just as if you were using the shortcut to execute the command. The keys you press appear in the edit box as you type.
7. Once you've entered the key sequence, click **Assign**. The new shortcut now appears in the **Current Quick Key for Command** edit box.

**Tip:** You can use any character (letter or number) on your keyboard, as well as the SHIFT and CTRL keys when defining your shortcut sequence.

**Note:** If the shortcut that you have entered is already assigned to another command, the command is displayed in the **Currently Used By** drop box. You will need to specify a different shortcut.

8. To save your keyboard shortcut settings to a file, click **Export**. In the **Save As** dialog, type a name for the file in the *File name* edit box, then click **Save**. Shortcuts are saved to a special \*.qck file.
9. To import keyboard shortcuts that you have saved, click **Import**. In the **Open** dialog, locate and select the \*.qck file that you want to import, then click **Open**.

## Improving Graphics Display

The type of graphics card you have in your computer can affect the way the program's graphics are displayed on your screen. If the display seems unstable or contains some graphic **artifacts** Fuzz or distortion in a graphic image or sequence of video images. Large digital pixels (blocks) and jerkiness in the video stream are examples of artifacts., here are some tips on how you may be able to improve the display:

1. Lower your screen resolution (to **1024 x 768**, for example) in the *Windows Display Properties* dialog. To access this dialog, right-click your *Windows* desktop and select **Properties**. In the **Display Properties** dialog, select the **Settings** tab.
2. Lower the color setting in the *Windows Display Properties* dialog box. For example, if your colors are set to **True Color (32 bit)**, change the setting to **High Color (16 bit)**.
3. Disable interactive lighting, which is the real-time lighting effect you see when you insert light fixtures in Rendered or Rendered Outline display mode.

4. Disable tool tips. By default, tool tips are displayed as you hover over elements with your cursor.

## Performing a Graphics System Check

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If you are having issues with the graphics display, or simply want to find out if you can improve graphics display, you can use the system check utility to check which graphics card is installed on your computer, as well as the version of the driver. The utility may then recommend a different driver to use. Installing the recommended driver may improve your graphics display.

### To perform a graphics system check:

1. Select **Settings > Program Settings** and select **Graphics** in the left pane of the **Program Settings** dialog.
2. The **Video Card** pane displays information about the currently installed graphics card and driver.


It also recommends the best driver for graphics performance.

## Changing the Quality Level of Interactive Lighting

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As you insert light fixtures in your design you can see real-time lighting effects if working in Rendered or Rendered Outline display mode. By default, the quality level of interactive lighting is set to *Low*, which provides an adequate lighting display for the average computer. If your computer has a powerful video card, you can select a higher level of quality for your interactive lighting.

### To change the quality of interactive lighting:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Graphics** in the left column.
3. In the *Lighting* area, select either **Low**, **Medium** or **High**.
4. Click **OK**.


**Note:** Selecting a higher quality level can slow down your graphics display.

## Disabling Interactive Lighting

Personal Architect | Pro Architect | Building Essentials | Construction Suite

By default, you can see real-time lighting effects as you insert light fixtures in Rendered or Rendered Outline display mode. If interactive lighting slows down your graphics display, or you simply do not want to use it, you can disable it.

### To disable interactive lighting:


1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Graphics** in the left column.
3. Disable the **Enable interactive lighting** check box.
4. Click **OK**.

## Stereoscopic VR Viewing

Personal Architect | Pro Architect | Building Essentials | Construction Suite

By default, a standard 360° view is produced during virtual reality viewing in Presentation Mode. If you switch to a stereoscopic view, depth data is added between the foreground and background, creating a more immersive experience.

### To enable or disable stereoscopic VR viewing:

1. Select **Settings > Program Settings** or click  on the Settings toolbar.
2. In the **Program Settings** dialog, click **Graphics** in the left column.
3. In the **VR** pane, check or uncheck the **Stereoscopic** check box.
4. Click **OK**.



## Glossary

### 2

#### **2D Designer's Plan**

A flat, overhead view with colors and textures applied. A 2D plan view in rendered display mode.

#### **2D Plan**

A flat, overhead view.

### 3

#### **3D Overview**

A predefined 3D Camera view where the camera is elevated to provide an aerial view of the model.

#### **3D Perspective**

A three-dimensional view in which the scale of an element decreases according to its distance from the viewer. This produces the same impression of distance and relative size as that received by the human eye.

#### **3D QuickView**

A 3D view of your model from a pre-defined angle.

#### **3D RealView**

A rendered image with photorealistic properties such as textures, lighting, and shadows.

#### **3DS File**

3D Studio file. The program can convert these files for use as Furnishings elements.

## A

#### **Aligned Dimension**

A dimension that lies at the same angle as the element it is dimensioning.

#### **Alkaline**

Having a PH of more than 7.

#### **Alt Code**

Alternate Code. An extra identification code that is used to link an element in the program's catalog to the databases of other applications like Timberline.

#### **Ambient Light**

The available light in a scene. Ambient light comes from all directions and has no visible source.

#### **Angle of True North**

The location on the horizon directly below the North Star. In other words, it is the geographic North, as opposed to magnetic North, which is the direction indicated on a compass.

#### **Angle Snap**

Makes elements move/rotate at specific increments (angles).

#### **Animation**

A movie. A series of images that, when viewed in rapid succession, create the illusion of movement through a scene.

#### **Antialiasing**

A method of improving image quality by smoothing out jagged edges. This is achieved by adjusting pixel positions or setting pixel intensities so that there is a more gradual transition between the color of a line and the background color.

#### **Array**

A method of copying an element into a pattern of rows and/or columns.

#### **Artifacts**

Fuzz or distortion in a graphic image or sequence of video images. Large digital pixels (blocks) and jerkiness in the video stream are examples of artifacts.

#### **Aspect Ratio**

The ratio of width to height.

#### **Assembly**

Items or parts that are linked to an element, but do not exist in the drawing. For example, walls have assemblies such as insulation, vapor barrier, and drywall screws.

**Auto Texture Mapping**

Applies a UV map, which is a flat, 2D representation of the vertices of the 3D model. It defines where the 2D pixels in your texture will be placed on the 3D surface. For imported elements, selecting Auto uses the mapping already applied to the element.

**Automatic Save**

Saves your drawing for you at specified intervals without prompting.

**AVI**

Audio Video Interleaved. A common video file format by Microsoft that can be used to record animations.

**Awning Window**

A window having a sash hinged on pins at the two top or bottom corners of the frame. It opens outward.

**B**

**Back Bearing**

The bearing of a back station as observed from the station next in advance.

**Backsplash**

The rear portion of a countertop that sits against the wall, or a splash guard that is fastened to the wall and sits above the countertop.

**Balustrade**

A railing consisting of balusters (spindles) attached to a top rail. Used along stairs, landings, porches, decks, etc. Also called a banister.

**Baseboard**

A board or moulding along the base of a wall. Also called skirting.

**Batch Printing**

A process of printing a number of selected views at once.

**Batt Insulation**

Pre-cut, flexible insulation that fits inside wall cavities between the studs.

**Bay Window**

A window made up of three sash units that project out from the wall. Usually includes a roof structure.

**Beam**

In a deck frame, structural member supported by posts that acts to support the decks floor joists.

**Bearing**

A surveying term used to designate direction. The bearing of a line is the acute horizontal angle between the North meridian and the line.

**Berm**

A mound or bank of soil without formal sides. You often see large berms on the sides of highways, which are used for noise control.

**Bi-Fold Doors**

Narrow doors that are hinged to fold against each other and flat against the jamb.

**BIM File**

Building Information Modeling file. BIM is the process of generating and managing building data.

**Bird's Mouth**

The notch cut in the lower end of a rafter to fit it to the top plate of a wall.

**BLD File**

BUILD file. The drawing file produced by the program. The extension given to the program's drawing files.

**Block**

A single object that is composed of many other objects.

**Blocking**

Members that run perpendicular to studs in order to provide reinforcement, or attachment sites for mounted hardware.

**BMP**

Bitmap. An image file whose bits are referenced to pixels.

**Board-and-Batten**

A type of exterior siding or interior paneling that has alternating wide boards and narrow wooden strips, called battens.

**Bottom Plate**

The bottom member of a framed wall. Also called base plate or sole plate.

**Boundary Hatch**

A tool that lets you define an area with hatching applied to it.

**Bow Window**

A type of bay window made up of several window units set at slight angles to form a curve.

**Box Mapping**

A texture mapping method that creates a rectangular bounding box around the element, then applies a texture to each of the box's 6 sides. This would be useful for an element such as a sofa.

**Bullnose**

A heavily rounded edge usually found on stair treads.

**C****CAD File**

A file created in a Computer-Aided Design program such as AutoCAD. The most common file types are DWG and DXF.

**Casement Window**

A window having a sash hinged on pins at the top and bottom corners of one side. It opens outward by means of a crank.

**Catalog Directory**

The directory containing the Master Catalog and other catalogs that you have created.

**Catalog Panel**

The window on the right side of the screen that displays the contents of the current catalog.

**Category**

A group, often named or numbered, to which items are assigned based on similarity or defined criteria.

**Cathedral Ceiling**

A high, open, usually slanting or pointed ceiling.

**Ceiling Height**

The height of the underside of a ceiling surface relative to the floor level.

**Center Object Snap**

Snaps to the center point of an arc or circle.

**Chair Rail**

A decorative molding applied horizontally to a wall inside a room at a height of about 3 feet. Used to prevent chairs from marring the wall.

**Collision Control**

An intelligent drawing aid that prevents elements from being inserted where they won't fit.

**Color Bleed**

The degree to which different colors blend where they meet.

**Commander**

An editing window that appears when certain functions are chosen. It provides precise control over such things as distance and direction.

**Complexity**

The level of detail shown when elements are displayed.

**Composite Wall**

A wall comprising a structural wall and veneer wall separated by an air space.

**Compression**

The conversion of data into a format that requires fewer bits, usually so that it can be stored or transmitted more efficiently.

**Coordinate Icon**

A small symbol displayed in the drawing area that marks the current point from which an action will be performed when using the Commander.

**Cove Molding**

A molding with a concave face used as trim.

**Crawlspcace**

The shallow area beneath a house enclosed by the foundation walls.

**Cripple**

The short members used to frame under the sill or above the header in a rough opening for a window in a framed wall.

**Crosshairs**

Intersecting lines that represent the two coordinate axes.

**Crown Molding**

A decorative molding along the top of a wall.

**Cut Line**

A standard 2D drafting symbol used to represent a break in the drawing. It indicates that the object continues in the same manner after or between the break lines.

**Cylinder Mapping**

A texture mapping method that creates a cylindrical bounding box around the element. The texture is then mapped to the cylinder. This might be an ideal option for elements such as round columns.

**D**

**Daylight Saving Time**

Time usually one hour ahead of standard time.

**Delimiter**

A character that marks the beginning or end of a unit of data.

**Diffuse**

The amount of color that is reflected when an element is illuminated by a light.

**Display Filter**

A dialog box used for displaying and hiding elements and/or locations.

**Division**

A construction division identification. In North America, CSI divisions are used.

**Double Roof**

A type of hip roof in which the slope to all four sides is broken into two slopes. Both slopes have a pitch.

**DPI**

Dots Per Inch. The measurement of resolution for printers.

**Drag-and-Drop Mode**

The default mode you are in when you select an element for editing. You can move and rotate elements with your mouse when you are in Drag and Drop mode.

**Drawing Aids**

Tools that control the way your cursor works and the way elements are inserted.

**Drywall**

Gypsum, sometimes with additives, made into paper-covered sheets for use as an interior wall or ceiling covering.

**Duplicate**

Copies a selected element on the same location.

**Dutch Gable**

A combination of a hip and gable roof. On either end, the lower segment is a hip roof and the upper segment is a gable end. Also known as a Dutch Hip Roof or a Full Return Gable.

**DWG**

Standard file format for saving vector graphics in applications like AutoCAD.

**DXF**

Drawing Exchange Format. An ASCII or binary file format of a CAD drawing.

**Dynamic Cutaway**

A 3D view of your model that you can strip away by sliding a clipping plane back and forth.

**E**

**Editor**

A software application capable of editing text.

**Element**

A specific type of element, such as a door, having its own distinct properties (size, appearance, etc.).

**Elevation**

1. The front, back and side views of a building. 2. The height of an element above the floor or terrain.

**Emissive**

The amount of light given off by a material. The more emissive a material is, the more self-luminous it appears.

**Estimate**

A report containing a listing of materials, quantities, unit costs, and total cost.



**F****Face Mapping**

A texture mapping method that applies the texture to every single face of the element component. This is the most common texture mapping option used in the program

**Face Slider**

Two or more doors that open by sliding to the side in front or behind each other. Also called bypass doors.

**Fascia**

A flat wood or plywood strip nailed to the overhanging ends of rafters.

**Fillet**

Connects two lines together at a point where they would naturally meet if both were extended.

**Filter**

To exclude an element or location from being displayed, quantified or selected.

**Fixed Window**

A window whose sash is permanently fixed in the frame.

**Floor Level**

The height of a floor (location) above the ground (0).

**Fold-Back Stairs**

Stairs that have two flights separated by a landing and that make a complete 180-degree turn. Sometimes called Scissor Stairs.

**Fold-Up Door**

A door made up of a number of narrow panels that opens overhead by folding up like an accordion.

**Forward Bearing**

The direction of a line segment from the current station. Bearings are measured in degrees (360 in a full circle), clockwise from the North meridian.

**Foundation**

The supporting portion of a structure below the ground floor construction, or below grade, including the footings.

**Frame Rate**

The number of images displayed per second. The video playback rate of an AVI animation.

**Framing Mode**

A special display mode where individual walls, openings and intersections are displayed as "glass boxes" for ease of identification and selection. In this mode you can edit the framing configurations for individual wall openings and intersections.

**Framing Rule**

The direction and order in which walls are framed.

**G****Gable Roof**

A roof with two sloping sides (as opposed to a Hip Roof, with four sloping sides).

**Girt Wall**

A wall built up of horizontal structural members that are suspended between vertical columns. Usually found in industrial buildings.

**Glass Slider**

A door having a wood or aluminum frame fitted with one fixed glass panel and one sliding glass panel. Often called a patio door.

**Global Illumination**

An algorithm used in 3D computer graphics rendering. Global illumination simulates the many reflections of light around a scene, generally resulting in softer, more natural shadows and reflections.

**Grayscale**

An image in which colors are represented by shades of gray.

**Grid**

A visual aid consisting of a pattern of horizontal and vertical lines.

**Grid Snap**

An invisible grid whose lines you can snap to with your cursor when inserting elements.

## H

### **Hardware Acceleration**

Takes advantage of any installed graphics card that supports hardware acceleration, increasing the speed of your graphics display.

### **Hatching**

A pattern of lines used to represent a material, such as wood or concrete. Hatching is only visible in Patterned display mode.

### **Head**

The top member of a window sash or door frame.

### **Head Height**

The height at which the tops of openings, doors, and windows are located relative to the floor level.

### **Header**

The structural members placed horizontally over doors, windows and wall openings.

### **Hidden Line**

A view mode where hidden lines are removed from the view, leaving only surfaces displayed.

### **Highlite**

A pane of glass located at the top of a window or door.

### **Hinged Door**

Any type of door that swings open.

### **Hip Roof**

A roof with four sloping sides (as opposed to a Gable Roof, with two sloping sides).

### **Hopper Window**

A window in which the sash is hinged on pins at the two bottom corners, and which opens inward.

### **Hung Window**

A window having two sashes, and whose lower sash slides up and over the fixed, upper sash on the inside.

### **Hyperlinks**

Jumps (links) to external document files or web addresses.

## I

### **IES File**

Name derived from Illuminating Engineering Society. A photometric data file (Lights file) containing Luminaire definition and information.

### **IFC**

A file format deriving from the Industry Foundation Classes (IFC) data model that describes building and construction industry data.

### **Index of Refraction**

The amount that light bends as it passes from one material to another.

### **Industry Foundation Classes**

A data model commonly used for Building Information Modeling (BIM) which describes building and construction data.

### **Infill**

The framing material that fills the volume of a wall. Usually studs, top plate, bottom plate and very top plate.

### **Info Panel**

The pane on the right side of the screen that displays the catalog in Model View, or object properties in Worksheet View.

### **Insertion Object Snap**

Snaps to the insertion point of text, blocks, imported model views, and imported CAD objects.

### **Interactive Lighting**

Real-time lighting effects displayed while you are inserting light fixtures in Rendered or Rendered Outline mode.

### **Interface**

Program components that you see on the screen and use to perform tasks.

### **Intersection Lookup Table**

An internal library of intersection framing configurations.

### **Intersection Object Snap**

Snaps to the point where objects cross each other.

**J****Jack Stud**

The trimmer that supports a header in a framed wall opening.

**Jamb**

The wood or metal pieces that form the sides and top of a door or window enclosure.

**Joist**

One of a parallel set of structural members used to support floor and ceiling loads. They, in turn, are supported by beams, girders, or bearing walls.

**K****King Stud**

The stud next to a door or window opening to which the jack stud and header are nailed.

**L****Landing**

A platform between flights of stairs or at the termination of a flight of stairs.

**Layers**

Like overlays used in paper-based drafting, layers are used to organize the content of a drawing and group information by function.

**Line Style**

Settings that determine the color, pattern and thickness of a line.

**Line Type**

The pattern of a line, such as dashed or solid.

**Line Weight**

The thickness (or heaviness) of a line.

**Linear Dimension**

A horizontal or vertical dimension.

**Lite**

A pane of glass in a window or door.

**Load-bearing**

A structural member or combination of members, such as a wall, that supports a load in addition to its own weight.

**Locations**

Drawing layers containing definitions for wall height, floor level, head height and ceiling level.

**Louvre Window**

A small, slatted window placed high in a gable end. Used mostly for ventilation.

**Lumen**

A Lumen is equal to one foot-candle (the amount of light one candle generates one foot away) falling on one SQUARE foot of area.

**Luminaire**

The international term for a piece of lighting equipment. The complete unit including lamp, fixture, and other parts.

**L-Winder Stairs**

Stairs that ascend in an L-shape and that use wedge-shaped treads called winders to change direction.

**M****Magnetic North**

Magnetic North is the magnetic north pole. It is the focus of the planet's magnetic field and is the point magnetic compasses point toward.

**Mansard Roof**

A type of hip roof in which the slope to all four sides is broken into two slopes. The upper slope is nearly or completely flat, while the lower slope has a sharp pitch.

**Margin**

% of Retail Price that is Gross Profit.

**Markup**

The % difference between the Cost and Retail price of an item.

**Masonry**

Brick, stone, concrete or concrete block.

**Masonry Section**

A 2D drafting symbol that indicates where masonry is used.

**Material Usages**

Determine which materials are suitable to be applied to specific elements.

**Materials Paintbrush**

A tool for instantly applying a selected material to the surface of an element.

**Member**

Pieces of lumber or steel used in the construction of a building, such as studs, rafters, beams and piers, or as decorative accents, such as baseboards and crown molding.

**Midpoint Object Snap**

Snaps to the midpoint of a line or arc.

**Model View**

A view window with a 3D environment where you create and edit a 3D model.

**Mono Footing**

A pad of masonry, usually concrete, that is wider than the column it supports. Used to transfer the load of the column.

**Mullion**

A thin, non-structural bar between window and door units.

**Muntin Bars**

The vertical and horizontal members that divide the individual panes of glass in a window.

**N**

**Nearest Object Snap**

Snaps to a point on a line, circle, arc or other object that is nearest to the center of the pickbox (where the crosshairs intersect).

**Newel**

The main post to which the end of a railing is attached.

**Niche**

A recess in a wall.

**Non-load-bearing**

A structural member or combination of members, such as a wall, that supports no load other than its own weight.

**Nosing**

The portion of a stair tread that projects over the riser.

**Nudge Distance**

The distance an object moves when you nudge it by pressing the arrow keys on your keyboard.

**O**

**Object Snaps**

Drawing aids that snap your pickbox to common points on objects, such as endpoints and midpoints.

**Open GL**

A 3D graphics Application Programming Interface (API) that includes routines for shading, texture mapping, texture filtering, anti-aliasing, lighting, geometry transformations, etc.

**Opening**

A cutout in a wall.

**Ortho**

A Drawing Aid that restricts drawing to straight up, down, left, or right.

**Orthogonal View**

An alternate name for Parallel View in which all drawing lines are parallel and the effect of distance is eliminated.

Contrasts with Perspective View.

**Overhang**

The part of the roof that extends over the side wall. Also, the distance from the side wall to the fascia.

**P****Pan**

A control that allows you to move the on-screen view by dragging up, down, left, or right.

**Paper Margin Lines**

Displays dashed lines near the edges of the virtual paper, indicating the location of your page margins. They denote the non-printable areas of the paper.

**Paper Shadow**

A virtual piece of paper in the drawing area that represents the paper size selection in the view's Print Properties.

**Parallel View**

A 3D view that eliminates the effect of distance from a view. In Parallel View, all drawing lines are parallel. Contrasts with Perspective View. Parallel View is sometimes called Orthogonal View.

**Parametric**

Having a set of physical properties that determines the characteristics of an element.

**PDF**

Portable Document Format. A file format created by Adobe Systems for the purpose of sharing documents.

**Perpendicular Object Snap**

Snaps to a point on a line, arc or circle that forms a perpendicular from the current point to the selected object.

**Perspective View**

A 3D view in which the scale of an element decreases according to its distance from the viewer. Drawing lines converge to a vanishing point. Perspective View represents the way an element would appear to the human eye.

**Phase**

A stage in the construction process, such as Foundation, Exterior Construction, or Exterior Finish.

**Photo Board**

A digital image that is oriented vertically in 3D view, much like a billboard.

**Photometric Data File**

A file that allows you to define complex light distributions based on physical lamp properties. When loading a photometric file, a photometric web is constructed that defines the intensity of light for any direction from a light source.

**Pickbox**

A square located at the center of the crosshairs, used for selecting objects.

**Pixel**

A word invented by combining the two words picture and element. The smallest unit of color on a computer display. The number of pixels per inch depends on the display device dimensions.

**Pixel Search Distance**

The Pixel Search Distance determines how close your cursor (which is attached to an element you are inserting) needs to be to an existing element before Object Snap occurs.

**Plan View**

A flat, 2D view from above.

**Plate (top plate)**

The top member of a framed wall upon which the rafters and ceiling joists rest.

**Plateau**

A relatively large, flat area of land situated above the adjacent land.

**Pocket Door**

A door that rolls on an overhead track into a frame or pocket hidden in the wall.

**Polygon**

A closed shape with three or more line segments.

**Polygon Hatch**

A tool that lets you draw a polygon (closed shape with 3 or more sides) with a hatch pattern applied to it.

**Polyline**

A continuous, multi-segmented line.

**Portal Frame**

A simple support structure comprising rafters atop a pair of columns.

**Print Scale**

The ratio of units on paper to units on the screen. For example, a scale of 1/4" = 1'-0" means that every foot of the model is represented by 1/4" on paper when the drawing is printed. A wall that is 12' long would be 3" on paper.

**Profile**

An outline of an object seen from the side, as in a section view.

**Project Directory**

The location of the default directory in which projects are stored.

**Project Estimate**

A report containing a listing of materials, quantities, unit costs, and total cost.

**Project Trace Image**

A BMP, JPG or TGA image that you can import into your drawing area.

**Q**

**Quadrant Object Snap**

Snaps to the 0-, 90-, 180- and 270-degree positions on a circle or arc.

**Quantity Report**

A list of the type and quantity of materials in your model. Also known as a Materials List or Bill of Materials.

**Quoins**

Stones or blocks reinforcing or accenting the corners of a building.

**Quote**

A list of products with quantities, pricing and other important information. Used by building material supply retailers, wholesalers, distributors and contractors to facilitate the design, sale and installation of construction projects.

**R**

**Rafter**

Structural members that make up the framing for a roof and roof overhang, and that support the sheathing and roofing materials.

**Raised Heel**

The vertical distance from the support point of a truss to the point where the roof slope intersects.

**Rake**

To incline from the perpendicular.

**Raster**

A digital image, or bitmap. A data file representing a rectangular grid of pixels, or points of color, on a computer monitor, paper, or other display device.

**Raytracing**

A method for rendering 3D computer graphic images. It traces the path taken by a ray of light from the camera through the scene, then calculates the reflection, refraction, or absorption of the ray when it intersects objects in the scene.

**Render**

To generate a photorealistic image of a 3D model using a raytracing and/or radiosity algorithm to perform lighting calculations.

**Rendered Mode**

A display mode where solid textures and colors are applied to surfaces, creating a realistic 3D effect.

**Rendered Outline Mode**

A display mode where solid colors and textures are applied to surfaces, and the surfaces are outlined with a dark line for high definition.

**Retaining Wall**

A wall constructed to contain a lateral force, such as a bank of dirt.

**Revision Cloud**

A cloud shape drawn around an area of your drawing to bring attention to that area.

**Rigid Insulation**

Non-flexible panels often used on roofs and walls to provide thermal insulation.

**Riser**

1. The vertical board placed between the treads of a staircase. 2. A vertical run of pipe.

**Roller Door**

A door made of hinged, horizontal steel or wood panels that move on rollers in overhead and side tracks.

**Room Division**

A tool used to split an automatic floor into multiple floor surfaces, or define an opening in the floor.

**Rough Opening**

The opening created in a wall to receive a door or window frame.

**S****Saddle**

A small, double-sloping roof built behind upper-story walls or the back side of a chimney to divert water around the wall or chimney.

**Sash**

A frame that holds one or more panes of glass and that is set into the window frame.

**Scale (print)**

The ratio of units on paper to units on the screen. For example, a scale of 1/4" = 1'-0" means that every foot of the model is represented by 1/4" on paper when the drawing is printed. A wall that is 12' long would be 3" on paper.

**Schedule**

An itemized report of doors or windows in your project which includes a description and count for each item.

**Seat Cut**

The horizontal cut that is made when cutting a bird's mouth in a rafter.

**Section**

A cross-section view created by cutting through the building. Useful for clarifying construction details.

**Separator**

Any character used to separate words, such as a blank space or punctuation mark.

**Setback**

The amount of space local zoning regulations require between a lot line and a building line.

**Shininess**

The ability of a texture to reflect light.

**Sill**

A member located at the lower side of a rough or finished opening, as a window sill.

**Site Boundary**

A closed line that shows the legal property boundary (lot lines), and is annotated with bearing text, length text and peg numbers. You can specify setbacks as well, which define your building envelope.

**Slab**

Concrete pavement, i.e. driveways, garages, and basement floors.

**Slope**

Ground that forms an incline. Also, the incline angle of a roof surface.

**SmartView**

A view of your 3D model that you insert on a worksheet. It can be a 2D plan, elevation, section, 3D QuickView or 3D Camera view. A SmartView can be instantly updated if you make changes to your model.

**Snap Angle**

The increment angle your cursor will snap at (if Angle Snap is enabled).

**Snap Tracking**

Helps you draw objects at specific angles or positions relative to other objects. When snap tracking is turned on, temporary alignment paths appear that are based on object snap points, such as endpoints and midpoints.

**Soffit**

The area below the eave and overhang. The underside where the roof overhangs the walls.

**Solid Filling**

Solid shading applied between wall lines in 2D plan view.

**Span Table**

A list of wall opening widths (spans) with head/sill/jamb configurations for each.

**Specular**

Reflection that creates highlights on materials, making them appear shiny.

**Split L-Shaped Stairs**

Stairs that ascend in an L-shaped direction and whose landing is split on a diagonal to make the change in direction.

**Spot Point**

A point on a TIN terrain mesh that contains X, Y and Z coordinate data. Determines the elevation of the terrain at that point.

**Spreadsheet**

A table of values arranged in rows and columns.

**Status Bar**

The bar below the drawing area that contains the Help message for the current state or action.

**Stereo Vision**

A 3D view with the added perception of depth when 3D glasses are worn.

**Stringer**

The inclined side of a stair that supports the treads and risers.

**Strip Footing**

A flat, masonry section, usually concrete, that is wider than the wall it supports. Used to transfer the vertical load of the wall.

**Studs**

Members inserted vertically in a wall frame.

**Suspended Ceiling**

A grid of T-shaped bars hung on wires from overhead support framing, into which removable panels are inserted to form a finished ceiling that allows easy access to the area above it. Typically found in office buildings and basements.

**T**

**Tangent Object Snap**

Snaps to a point on an object that forms a tangent between the object and another point.

**Template**

A set of pre-defined properties that determines the setup and outcome of something (like a report).

**Temporary Directory**

The default directory in which temporary files generated by the program are saved.

**Terrain**

A piece of land.

**Texture Mapping**

The way in which a texture (e.g. bitmap image) is applied to the surfaces of an element.

**Tile Height**

The height of one tile in a texture pattern. The program generates large images by tiling texture bitmaps horizontally and vertically.

**Tilt Door**

A door consisting of a single leaf that opens overhead by tilting up (e.g. Tilt Garage Door).

**TIN Mesh**

Triangulated Irregular Network mesh. A representation of the terrain's surface contours based on a set of spot level points.

**Title Block**

A rectangular area in the lower right corner of a construction document which reports information about the drawing, such as the drawing number, drawing title, and name of the person who prepared the drawing.

**Toe Space**

A recessed area between the bottom of a cabinet and the floor that allows you to stand close to the cabinet. Also called a toe kick.

**Top Plate**

The horizontal framing member nailed to the top of the vertical studs.

**Transom**

A small window sash above a door that is hinged at bottom so it can be opened inward.

**Transparency**

The degree to which a texture can be penetrated by light.

**Tray Ceiling**

A ceiling constructed with the sides angling at approximately 45 degrees or curving to another flat ceiling.

**Tread**

The horizontal part of a stair that is stepped on.

**True North**

True North is the geographic North Pole. It is located at 90 degrees North latitude and all lines of longitude converge at the pole. The Earth's axis connects the north and south poles. The Earth's axis is the line around which the Earth rotates.

**Truss**

A variety of members made up into a series of triangles. Used for constructing roofs.

**Twip**

Abbreviation for 'twentieth of an inch point'. A unit of measure that determines the width of something in print or on the screen. It equals 1/1440 inch or 1/567 of a centimeter.



**U****Usage**

What an element is used for. For example, a piece of wood could be used as a stud or a beam.

**UV Mapping**

A UV map is a flat, 2D representation of the vertices of the 3D model. It defines where the 2D pixels in your texture will be placed on the 3D surface.

**U-Winder Stairs**

Stairs that ascend in a U-shaped direction.

**V****Vector Graphic**

The representation of an image through the use of geometric objects such as curves and polygons.

**Vector Printing**

A vector-based, resolution-independent method of printing that yields sharp, high-quality output. In vector printing, non-objects such as the background color are not printed.

**Velocity**

Quickness of motion. The distance covered per second.

**Veneer**

A layer of stone, brick, stucco or other decorative material that is used to cover a framed wall.

**Vent Window**

A window made up of two or more segments with one segment acting as a vent.

**Very Top Plate**

The top member of a framed wall upon which the rafters and ceiling joists rest. Sits above the top plate.

**Video Compression**

The conversion of data into a format that requires fewer bits, usually so that it can be stored or transmitted more efficiently.

**View Filter**

A feature that allows you to turn the display of selected objects on or off as well as control their selectability.

**View Tabs**

Tabs below the drawing area that provide access to open view windows.

**VRML**

Virtual Reality Modeling Language. The open standard for virtual reality on the Internet.

**W****Winder**

One of the wedge-shaped treads that make up a winding or spiral staircase.

**Windowing**

A selection method where you click and drag a rectangle, from left to right, around elements you want to select.

**Wireframe**

The default 3D view where all lines making up elements are displayed. It allows you to see through elements.

**Wood Section**

A 2D drafting symbol used to indicate the presence of wood elements such as blocking or posts.

**Worksheet View**

A 2D drafting mode where you can prepare working drawings for print.

**X****X Axis**

One of the three drawing axes. An X coordinate specifies a horizontal distance.

## Y

### **Y Axis**

One of the three drawing axes. A Y coordinate specifies a vertical distance.

## Z

### **Z Axis**

One of the three drawing axes. The Z coordinate indicates either elevation or depth.

### **Z Buffer**

A block of memory used to store the Z-axis value of a pixel on the screen. Higher depth values improve detail of 3D display but may slow the system.

### **Zenith**

Culminating point.

### **Zoom Realtime**

Magnifies or shrinks the view as you click and drag with your mouse.

### **Zoom to Fit**

Zooms the drawing to the extents of the drawing area, creating a maximized view of your entire design.

### **Zoom Window**

Magnifies an area of your drawing that you select by windowing.

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