Cadsoft™
BIM for Small Business

Introduction to Residential Design

featuring

Cadsoft Envisioneer

Written by Chantale Pitts
Co-written and edited by Alina Rutten

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Overview

Welcome! This book introduces you to the world of residential design and construction, and teaches you how to complete design projects in Cadsoft Envisioneer through hands-on design exercises. Once you have completed the book you will be able to apply what you have learned to your own residential design projects.

How this Book is Organized

Each chapter in the book has the following layout:

Subject Matter. Information about a particular subject.

Hands-on Exercise. Step-by-step instructions for completing a design task in Envisioneer — an easy-to-use design software package.

Review. A summary of the most important points in the lesson.

Additional Activities. Suggested activities for extra practice.

Conventions

Before starting make sure you understand the typographical conventions used to indicate user input when completing the hands-on exercises.

Convention	Type of Information
Select **Menu > Tool**	Tool selection in Envisioneer. For example, **File > Open** means that you should select the 'File' pull-down menu, then select 'Open' from the menu.
Bold type	Words or characters you type, and components you select. For example, if you see "Type **5'** and press **Enter**", type the number 5 followed by the apostrophe symbol ('), then press Enter on your keyboard.
Italic type	Specialized terms. References to file names.

Icon Key

Exercises are hands-on activities for you to try using Cadsoft Envisioneer.

Tips are handy hints or alternate procedures.

Notes offer information to explain options or processes further.

Cross References point you to other relevant sections of the book.

Save Reminders help you remember to save your work frequently.

Chapter

1

Introduction to Envisioneer

Cadsoft Envisioneer is a residential design software package that Architects, Interior Designers, Builders, Designers, Landscape Architects and many other professionals use to develop design ideas and prepare full working drawings.

Since most of the features in Envisioneer are automated, it is very easy to learn and use. You can complete most tasks with a few mouse clicks. And with the built-in power of Cadsoft's advanced design technology, you can count on fast, accurate, professional-level drawings.

The exercises in this book are designed to be completed in Envisioneer.

Let's start by taking a look at the Envisioneer interface.

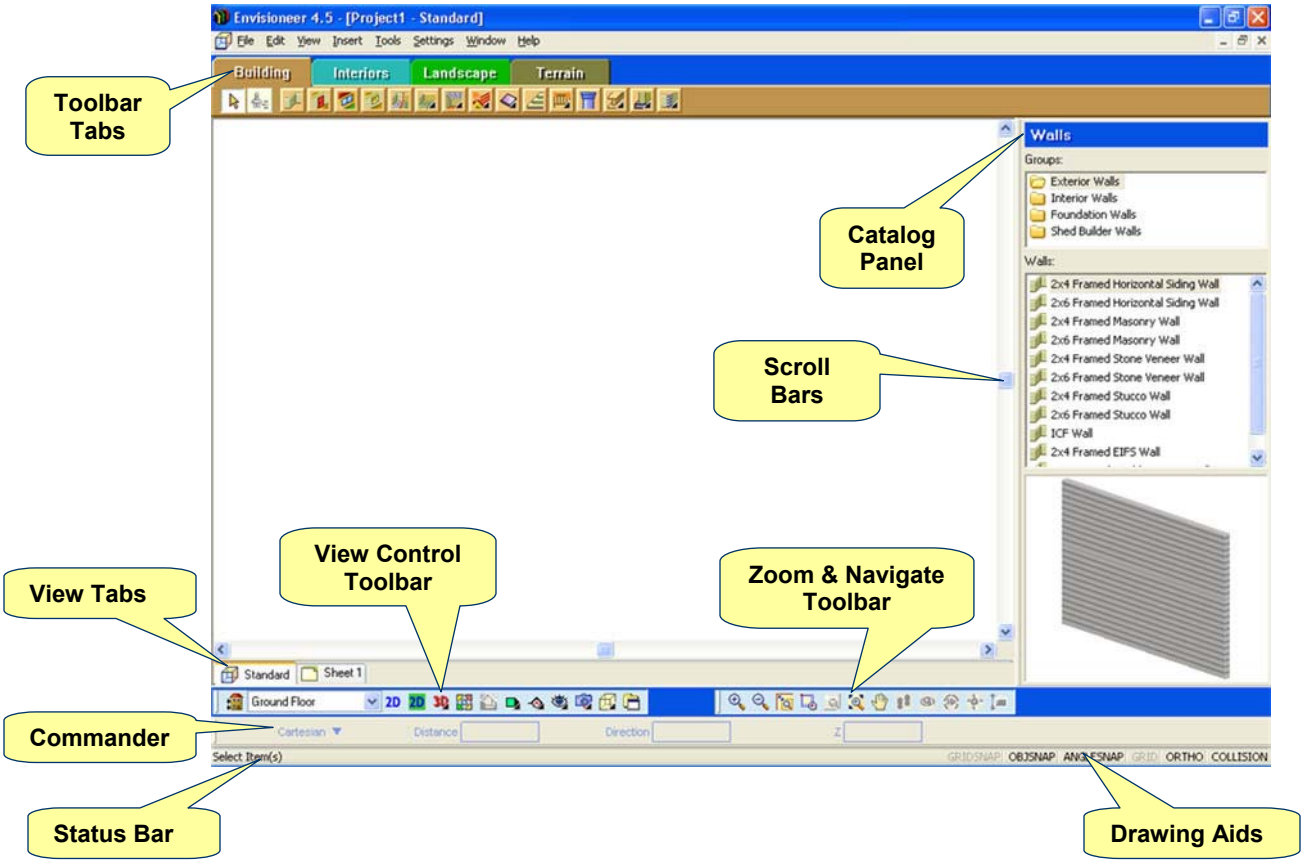
Starting Envisioneer

1. On your *Windows* desktop, double-click the *Envisioneer 4.5* icon, or select **Start > All Programs > Cadsoft > Envisioneer 4.5**.

Icon

Getting to Know the Interface

Here is a brief tour of the Envisioneer interface, followed by a description of each component.



TITLE BAR

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

MENU BAR

The menu bar is located directly below the title bar. This is where you select Envisioneer tools. You can select menu items using either the mouse or keyboard.

TOOLBAR TABS

In Model View, four tabs are located just beneath the menu bar: Building, Interiors, Landscape and Terrain. In Worksheet View there are three tabs: Draw, Modify and Tools.

These are actually toolbars displayed in tabbed format. They provide you with instant access to Envisioneer tools, when you need them.

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, 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.

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 toolbar also provides instant access to the View Manager, where you can create new view windows if you want.

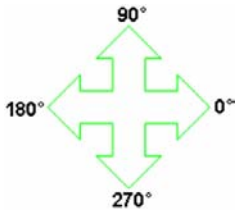
ZOOM AND NAVIGATE TOOLBAR

Zoom tools on the Zoom and Navigate toolbar include Zoom In, Zoom Out, Zoom Realtime, Zoom Window, Zoom Previous, and Pan. The navigation features on the toolbar (Walk Around, Fly Around, Look Around, Slide, 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.

COMMANDER

The Commander lets you enter precise values for length and direction when inserting or editing elements.

Direction is specified as follows:



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 two view tabs displayed to start: **Standard** (a Model View) and **Sheet 1** (a Worksheet View). These view tabs help you easily switch between view windows. If you create new view windows, the tab display updates automatically.

MODEL VIEW VS. WORKSHEET VIEW

When you open a new project, the **Standard** view window is displayed. This is a Model View window. It's where you build, edit and view your 3D model. By default, your project also has a view window called **Sheet 1**. This is a Worksheet View window. When you switch to a Worksheet View window, you go directly into 2D drafting mode. The drafting mode interface contains a number of different drafting tools that help you create professional-looking working drawings.

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.

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.

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".

DRAWING AIDS

Located in the lower right corner of the screen, the Drawing Aids toolbar contains various tools that can help you place objects into a model. When a drawing aid button appears black, the aid is turned on. When it appears to be grayed out, the aid is disabled. Clicking a drawing aid turns it on and off. You can also set your drawing aids by selecting **Settings > Program Settings** and selecting Drawing Aids in the left pane.

Click to toggle drawing aids on and off.

Collision. The program's intelligent Collision Control feature prevents objects from being inserted where they do not fit. If you try to slide an object into an area that it is too small, the object will flip or prevent you from moving it into the area. By default, Collision Control is turned on, but you can turn it off if you want more flexibility with object placement.

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.

Grid. 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 1', 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.

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°, for example, your cursor will snap at 10° intervals as you rotate the element. By default, the Angle Snap is on and is set to 15°.

Object Snap. The object snap enables your cursor to find other elements that are inserted in the model and snap to them. When constructing walls this snap makes it easy to create clean intersections. There is a related pixel search distance variable that determines how close your cursor needs to be to an object before the object snap will find it.

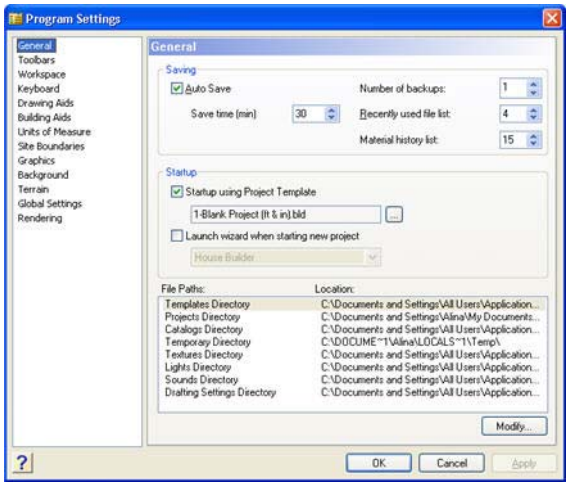
Grid Snap. This snap feature enables your cursor to snap to either an invisible grid or the inserted grid on the drawing screen so the insertion of elements occurs only on the set grid coordinates.

Program Settings

You can customize the Envisioneer interface to suit your individual preferences. There are two different types of settings available in Envisioneer: those that control how the program works and how the screen looks, and those that affect the actual model.

Most program-related settings are found in the Program Settings dialog. Let's look at these now.

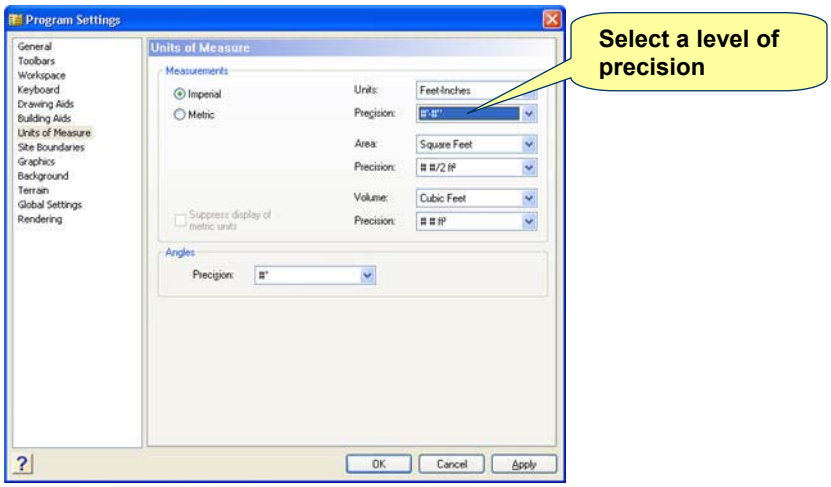
1. Select **Settings > Program Settings**. Notice the list of setting types in the left pane.



Program Settings determine how the screen looks, and how the program works.

2. In the left pane, select **Units of Measure**.

3. Click on the **Precision** drop box below the **Units** drop box, then select the full feet and inches option (#'-#"). This will make drawing walls quick and easy.



4. Click **OK**.

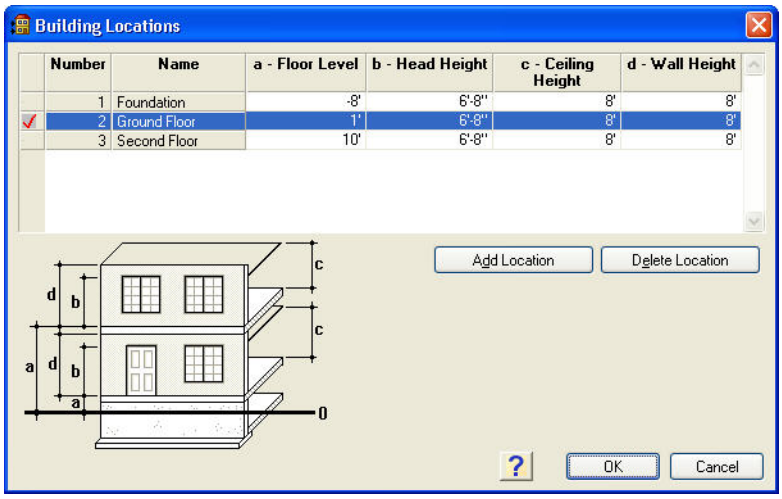
Building Locations

The most important model-related settings are your Building Locations, which determine the heights and levels of your walls and other elements.

1. Select **Settings > 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. 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 the ground (zero)



Number. A reference number for the location.

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

Floor Level. Height of floor above ground level (0).

Head Height. Height of tops of windows 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.

2. Click **OK** to accept the default settings.