

Getting Started Guide

Vectorworks Landmark

2015

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originally created by Nemetschek Vectorworks, Inc.

Vectorworks Landmark Getting Started Guide

Created using: Vectorworks Landmark 2015 with Renderworks

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Table of Contents

Vectorworks Landmark Getting Started Guide	2
Table of Contents	3
Introduction.....	8
Overview of This Guide	8
How to Use This Tutorial.....	8
General Tutorial Tips	9
Metric or Imperial?	9
Keyboard Shortcuts	9
Section 1: Landmark Setup	10
Objectives for Section One	10
Example Files Required For This Section:	10
Navigate the Landmark Workspace.....	10
Get to Know the Workspace	11
Accessing Landmark Resources	12
Add Favorite Resource Files	12
Setting Up the Drawing Area	13
Setting the Page Size	13
Setting the Unit of Measure	13
Setting the Drawing Scale	14
Showing/Sizing the Grid	14
Turn On Auto-classing	14
Save These Settings For Future Projects.....	15
Setting Vectorworks Preferences	15
Section 2: Plotting the Existing Site	16
Objectives For Section Two	16
Example Files Required For This Section:	16

Exercise 1: Importing Files From External Sources.....	16
Importing a DWG file	16
Examine the File Structure	17
Change the Scale	17
Understand the Origin	17
Rotate the Plan.....	17
Exercise 2: Drawing Up The Site.....	18
Triangulate to Locate a Boundary Point	18
Draw the Boundary.....	19
Creating the Boundary/Property Line	19
Exercise 3: Draw a Building.....	20
Draw the Garage	20
Draw the House Walls	21
Insert Doors	21
Insert Windows	22
View Textures On The Rendered Model.....	22
Create a Roof	23
Exercise 4: Existing Trees	24
Place an Existing Tree.....	24
Exercise 5: Set the Sun Position	26
Add a Heliodon.....	26
Section 3: Hard Landscaping	28
Example files required for this section:.....	28
Exercise 1: Explore the Hard Landscaping File.....	29
Examine the Structure of the File	29
Examine the Terrace.....	30
Exercise 2: Create Hard Landscaping Areas.....	31
Create Lawns	31
Create the Paved Areas	32
Exercise 3: A Hardscape Report.....	32
Exercise 4: Create Steps.....	34

Exercise 5: Draw and Edit Stepped Walls	36
Use the Wall Tool to Draw Walls	36
Create a Stepped Wall.....	36
Model Coping For the Wall	37
Exercise 6: Model Stepping Stones.....	37
Create a Hybrid Symbol	37
Exercise 7: Add Furniture	41
Place Some Library Symbols	41
Examine the Water Feature.....	41
Exercise 8: Draw Pillars, Posts and a Roof Structure.....	42
Extrude the First Pillar and Post	42
Mirror the Pillar and Post.....	43
Extrude the Roof.....	43
Shape the Planting Structure.....	43
Create the 2D Plan View	44
Exercise 9: Add Dimensions to the Structure	44
Use the Linear Dimension Tools in 3D.....	44
Summary	45
Section 4: Planting Design	46
Example Files Required For This Section:	46
Exercise 1: Explore the Planting File and Plant Graphics	46
Examine the Resources	46
Examine the Layers.....	46
Examine the Classes.....	46
Control Plant Tag Visibility	46
Control Plant Graphics	47
Manage Sketchy Outlines and Shadows.....	47
Exercise 2: Placing Plants	48
Use the Plant Tool.....	48
Complete the Planting Plan	49
Align the Plant Tags.....	49

Exercise 3: Define a New Plant	51
Choose a 2D Symbol.....	51
Add the Plant Data	51
Set Default Outline and Shadow Effects.....	52
Review the Plant Data	52
Override Insertion Options and Set Tag Options	52
Edit the 3D Plant.....	53
Exercise 4: Create a Landscape Area	54
Explore a Landscape Area	54
Create a New Landscape Area.....	55
Exercise 5: Create a Plant Report	57
Choose a Schedule	57
Summary	58
Section 5: Presentation and Publishing.....	59
Objectives For This Section.....	59
Exercise Files Required For This Section:.....	59
Exercise 1: Create Sheet Layers	59
Create Sheets.....	59
Add a Sheet Border	60
Exercise 2: Create a Plan Viewport.....	62
Create a Plan Viewport.....	62
Exercise 3: Create a 3D Rendered View	63
Set up the View.....	63
Render the 3D View.....	64
Add Drawing Labels	64
Exercise 4: Create Additional Viewports.....	65
Create a Hard Landscaping Plan	65
Create a 3D Construction Drawing.....	65
Add Hard Landscaping Worksheet.....	65
Create a Planting Plan.....	66
Add the Plant Schedule	66

Exercise 5: Publish the Design	66
Print the Plan	66
Export to PDF	67
Publish a Set of Sheets in Different Formats	67
Summary	68
Section 8: Introduction to Sloping Sites	69
Example Files Required For This Section:	69
Exercise 1: Create a Simple Slope	70
Create the Levels	70
Place Plants on the Model	70
Exercise 2: Explore an Example File	71
Examine the Layers	71
Examine the Source Data for the Site Model	71
Explore the Complete Design	72
Summary	72
Next Steps	72
Vectorworks Help	73
Vectorworks Service Select	73
Vectorworks Cloud Services	73
Vectorworks Training Guides	73
Further Training	73
About the Author: Tamsin Slatter	74

Introduction

Welcome to Vectorworks Landmark 2015! The purpose of this guide is, quite simply, to get you started using the software. Just as landscape design is a huge and varied discipline, Vectorworks Landmark is a huge and wonderful tool. Its wide range of features enable you to produce graphically beautiful, informative, and intelligent documents to support your design process. One of the enormous benefits of Vectorworks is that it is not prescriptive and does not force you to design in a particular way. This guide will use several short example tutorials to quickly introduce you to the key features of Vectorworks Landmark and get you up and running.

When you first open the program, it can seem a little daunting, particularly if you're making the move from paper. This guide will enable you to overcome some of that fear and start making the most of the software. Vectorworks Landmark so much more than a tool for producing beautiful plans and models. Used wisely, it can become the backbone of your design business and help out so many more business-critical tasks such as producing specifications and quantities.

Overview of This Guide

Each section of this guide will introduce you to different features that are key to landscape design. The exercises in this guide will familiarize you with these tools so that you use them in your own design projects.

It is not necessary for you to complete each section before moving to the section that specifically interests you. Having said that, it will do no harm to work through the exercises from start to finish, to get a full overview of the design process. The exercises include images and short movies for you to watch to see the exercises in action. The exercises will cover the following topics:

- setting up the software and accessing resources
- creating the existing site, including importing surveys, drawing buildings, and locating items on site such as existing vegetation
- hard landscaping/hardscape plans, including quantity reports
- creating planting plans including the plant schedule
- creating presentation plans including 3D views, title blocks, and borders.

How to Use This Tutorial

This tutorial is also provided as a series of videos, supported by this guide in a PDF format. You can view the PDF tutorial on-screen for enhanced electronic benefits, including navigation links and search features.

1. Each section will start with an objective and a list of the stages of the design process the section will cover. This overview is hyperlinked, as is the table of contents, so that you can quickly navigate to sections of interest.
2. If you view the tutorial on-screen, look for the Previous View and Next View tools at the bottom of the screen (or available in the Page Navigation Tool bar in newer versions). These useful tools—available in Adobe Reader and Acrobat—enable you revert or repeat navigational changes by page controls, bookmarks, and hyperlinks. Similar controls are available in Preview on the Macintosh.
3. The Adobe Reader Search tool provides more extensive options for searching text than the Find command does.

General Tutorial Tips

As I mentioned earlier, I recommend that you first work through the Getting Started Guide to Vectorworks Fundamentals. This guide provides a good grounding in the basic drawing functions. You can then use this guide to put your drawing skills into context for landscape design.

Use the following tips to facilitate working with your exercise drawing files:

- Menu commands are written as follows:
Edit > Copy
which means click on the Edit menu and then the Copy command on that menu.
- Read each step carefully and make sure your results match the figures. If your results vary from the figures, review the previous steps and try to work out which value has led you astray. If you can't find the problem quickly, start the exercise over with the appropriate supplied file.
- Vectorworks offers many different ways to draw. Some users like to complete dialog boxes while some prefer the freedom of drawing with the mouse and typing dimensions as they go. Others prefer to draw and then refine measurements using the Object Info palette. There is no right or wrong method. The correct method is the one that works best for you.
- When you hover your cursor over objects you have drawn, pause briefly over snap points, (corners and midpoints), to display a red snap box. A red confirmation dot is displayed temporarily to show that your cursor has "snapped" to that point. Moving the cursor away will produce guidelines to assist you in aligning objects to others in your design. This system is known as SmartCursor cues.
- When too many red snap boxes are displayed in congested areas, you can press the Esc key once to clear the display, or you can temporarily disable all snaps by holding down the backquote key (`).
- While drawing, you may need to adjust your view. Press the Z key for the Snap Loupe shortcut (a temporary zoom), or use the Zoom, Pan (press and hold the Space bar), and Fit to Objects tools as required. If you have a mouse wheel, use it to zoom in and out.
- To pan across the drawing at any time (even if you are midway through drawing something), hold down the Space bar and then click and drag with your left mouse button.
- If you inadvertently cleared a selection required for an active tool or command, press Space bar+X temporarily while you select the object(s).
- Many tools have different ways of doing things. These are called modes, which you can select in the Tool bar (located above the drawing window).
- Keep the Object Info palette open. To open it, select **Window > Palettes > Object Info**. It displays valuable information and provides access to key properties of selected objects.
- Press the Esc key to cancel any operation. If you are using a tool, it will still be active. You can then start drawing again or choose another tool. Sometimes, you must press the Esc key before you use a keyboard shortcut to activate another tool.
- Use the **Edit > Undo** command to revert steps as necessary (both drawing and view changes are reverted). The shortcut for Edit > Undo is Ctrl+Z (Windows) or Command+Z (Macintosh).
- For tools that create multiple segments (such as the Polyline tool or the Wall tool) press the Delete key once while the tool is active to remove the last click without losing the entire object. Press the Delete key repeatedly to delete additional segments.
- When multiple files are open, you may need to click the Resource Browser's Home button if your landscape file isn't active.
- Object artifacts may remain in the drawing area after some drawing and editing operations. To refresh the screen and clear the artifacts, double-click the Pan tool (on the Basic palette).
- Save your files often to prevent data loss, and employ a backup strategy for your computer.
- Important: Exercise steps in this tutorial are based on default preference settings from a new installation of the Landmark program with Renderworks. Results for some steps may vary from the figures if your preference settings differ from the defaults.

Metric or Imperial?

- All exercise data set files for this tutorial were designed using metric values. However, I have included imperial measurements too, so use whichever you prefer. As each exercise section is standalone, it is not critical that you change your ways and convert to metric or imperial. Remember, Vectorworks Landmark is a flexible tool and you can use whichever is best for you.
- Imperial measurements are shown thus [1' 6"], (square brackets, with the unit mark), and Vectorworks will convert the values accordingly.

Keyboard Shortcuts

Although I use an Apple Macintosh, all keyboard shortcuts included in this guide will show both Windows and Macintosh. This will be written with the Microsoft Windows key first, followed by the Macintosh key. For example:

1. Press Ctrl+5 (Windows) or Command+5 (Macintosh) to restore Top/Plan view.

Refer to the Vectorworks 2015 Shortcuts PDF file (available from the Help system) to print a complete list of your own keyboard shortcuts.

Section 1: Landmark Setup

Objectives for Section One

After following the exercise steps in this section, and watching the accompanying movies, you will be able to:

- Name the different elements of the Landmark workspace and set basic Preferences
- Access the libraries of content provided with Vectorworks Landmark from your workspace, while working in any file
- Set the page size, set your drawing scale, and use the grid settings to control the size and visibility of the grid.

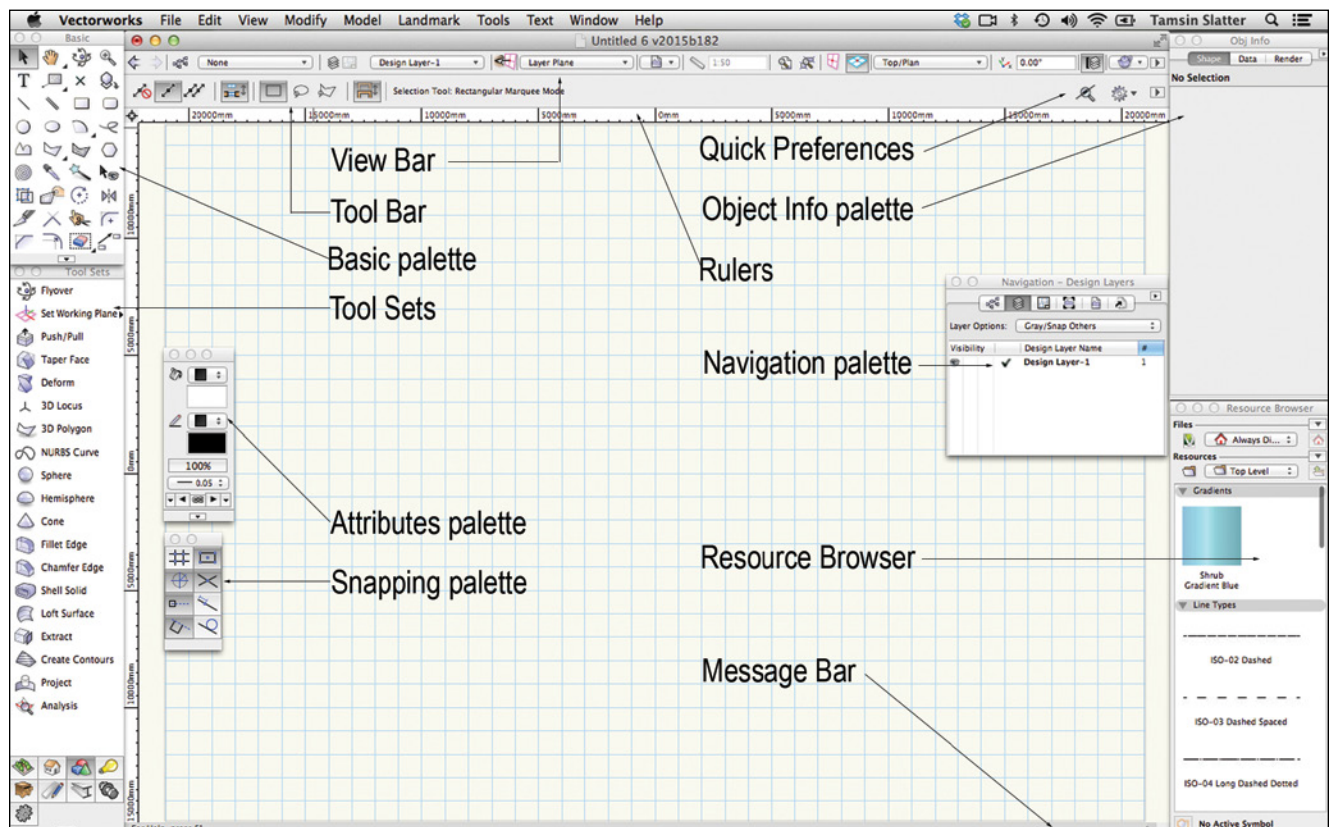
Example Files Required For This Section:

- There are no specific examples required for this exercise, other than the Vectorworks resource files installed with your software.

Navigate the Landmark Workspace

Once your Vectorworks licence is activated, you will be presented with either the Vectorworks Landmark workspace, or the Vectorworks Designer workspace (if you have an Evaluation or Educational License). When first confronted with any new software application, it can seem a little terrifying. This is perfectly normal, so do not let it overwhelm you.

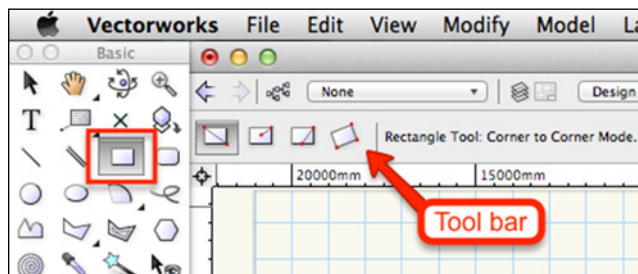
In this section we'll take a look at the Landmark workspace, name the different areas, and learn the headline functions of those palettes. Then we will customize some preferences, a process that is a little like organizing your desk. You choose how you want things arranged and what things you want to have easy access to while working.



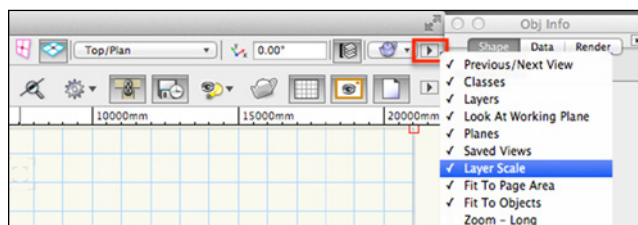
The drawing area has a semi-transparent background color that helps you determine if objects are filled. This background color will not appear on your final drawings, and you can change it if you don't like it. There may be a grid visible on your drawing area. This can be hidden and displayed as required. The labelled areas on the workspace are described as follows:

Get to Know the Workspace

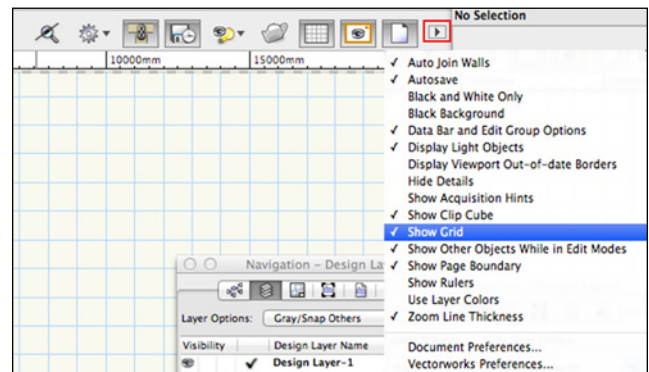
1. If you are using an evaluation or educational license, choose **Tools > Workspaces > Landmark** and wait a moment for the Landmark workspace to load.
2. On the left of the workspace you will find two tool palettes. The **Basic palette** contains 2D tools for drawing simple, regular shapes and more complex irregular shapes. Many of these objects can quickly be converted to 3D using the Push/Pull functionality built into their tools. Click on some of the tools. Notice that the Tool bar changes as you choose different tools.
3. The **Tool bar** provides different options, known as modes, for each tool. For example, click the **Rectangle** tool, you'll see the Tool bar change to offer you four different ways to draw a rectangle. Click the **Selection** tool again, or press **X** as a shortcut to return to the Selection tool.



4. The **Tool sets** palette, below the Basic palette, contains buttons to activate more industry-specific tools for performing more specific tasks. Click the **Building Shell** tool set icon and notice the tools for creating walls, doors, and windows. Many of these tools are "hybrid" in nature, which means they contain both a 2D and 3D representation of the object. These tools also store information about the object—so you can produce schedules directly from your design. Click the **Wall** tool. On the Tool bar, click the button with a wrench and pencil icon. This will open the Wall Preferences dialog, where you can specify the kind of wall you want to draw. Click Cancel. You'll learn more about Walls later. Many of the tools in the Tool Sets will have a Tool Preferences button just like this.
5. The **View bar** can be customized to include different elements but is used to control the current class, layer, and scale. It has menus for saving views and for zooming the view. It has menus for changing to preset 3D views and rendering your 3D model. Click on the **Utility** menu and add **Layer Scale** to your View bar. If you don't have a large screen, you can also remove Zoom long from the View bar.



6. The **Attributes palette** has a menu for assigning different fill colors and styles to 2D objects. It has a menu for changing the pen weight, color, and style to objects. You can also use it to vary the Opacity/Transparency of objects on your plan.
7. The **Snapping palette** has controls to help you draw with accuracy and precision. For example, the Snap to Object facility will highlight the names of points on objects when the mouse is held over them. The Smart Points option draws temporary helpful guidelines on the screen to assist you in aligning new objects with existing elements in the design.
8. The **Quick Preferences** area on the right of the Tool bar is for preferences you may wish to change frequently. Click on the arrow to the right to access a list of features that can be added to the Quick Preferences area. Select **Auto Join Walls**, **Display Light Objects**, **Show Clip Cube**, **Show Grid**, **Show Other Objects in Edit Modes**, **Show Page Boundary**, and **Show Rulers**. Note that you can also access further Document Preferences and Vectorworks Preferences. Document Preferences are specific to the current file, whereas Vectorworks Preferences remain active for every Vectorworks session.



9. The **Navigation palette** is used to manage and navigate the organizational structure of the drawing. More about this later.
10. The **Object Info palette** is similar to a properties palette or an inspector palette that you may have used in other applications. Click the **Rectangle** tool on the Basic palette and draw a rectangle any size, anywhere on the drawing area. The rectangle will remain "selected." Look at the Object Info palette and notice that it displays information about the rectangle. Change the values in the Height and Width fields. Notice the rectangle changes size. Press Del/Backspace on your keyboard to delete the rectangle. Click the **Selection** tool again.
11. The **Resource Browser** is used to access and manage libraries of objects you can use in your design. There is further information on the Resource Browser in the following section.
12. The **Message bar** at the bottom of the screen is often overlooked. If Vectorworks is unable to complete the task you have requested, it will

display helpful information about the failure here to help you determine the problem.

Accessing Landmark Resources

In addition to a wide range of drawing features, Vectorworks comes with libraries of ready-made items that you can use in your design. The term “resource” in Vectorworks is a collective name for a variety of different elements, including:

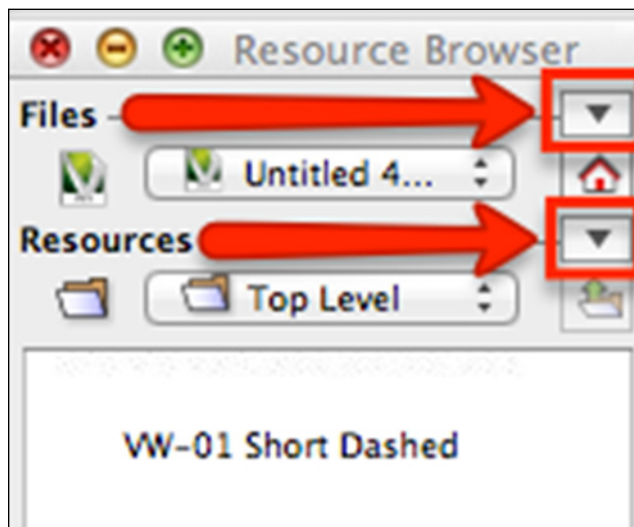
- Line Types
- Symbols
- Tiles
- Renderworks Textures
- And much more...

In this exercise, you'll add the Landmark specific resources as “favorites” so you can quickly gain access to them from any file.

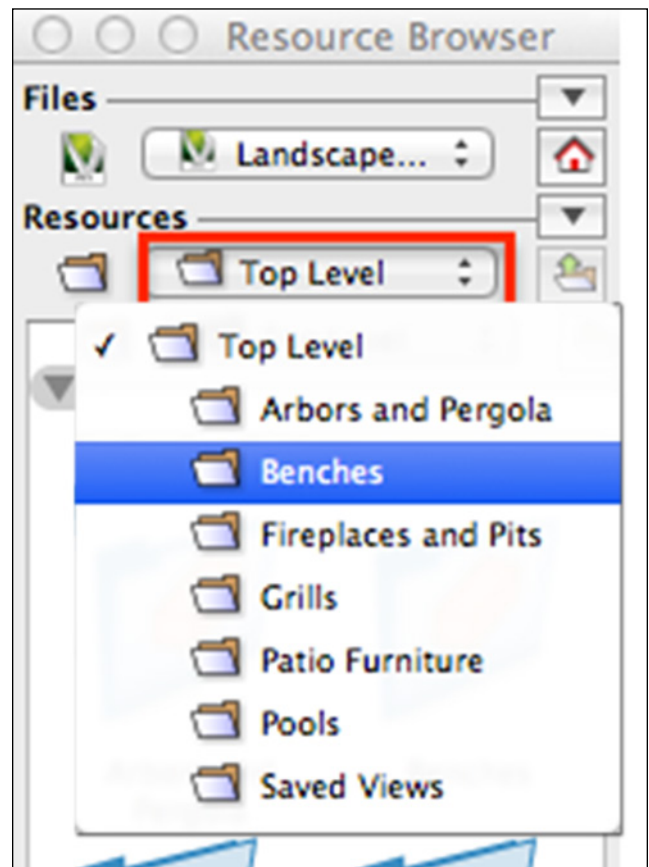
When you installed Vectorworks, you were offered the opportunity to visit a website and download Vectorworks content. If you chose not to do this, you should now visit the Vectorworks Help menu and choose Download Content. Instructions are included on this web page, so follow those, and once you have downloaded and installed this content, follow the instructions below, to make this content permanently available on your Vectorworks Landmark workspace. This process covered in this video applies equally to libraries downloaded from the Vectorworks Service Select portal, or any other Vectorworks files that contain resources you want to use on a regular basis.

Add Favorite Resource Files

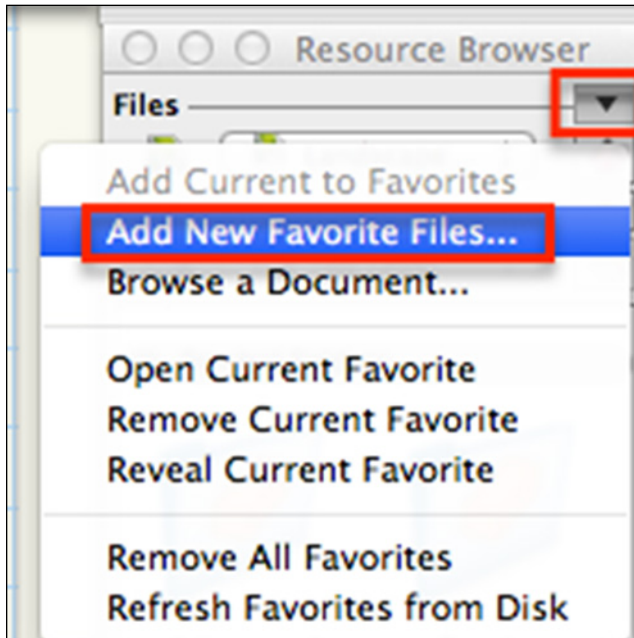
1. The Resource Browser has its own utility menu system. The top menu is for managing resource files (the **Files** menu), and the lower menu is for making changes to specific resources (the **Resources** menu).



2. The Resource Browser also has two drop-down menus. The top menu is for navigating to different resource files, and the lower menu is for navigating the folder structure within a specific resource file.

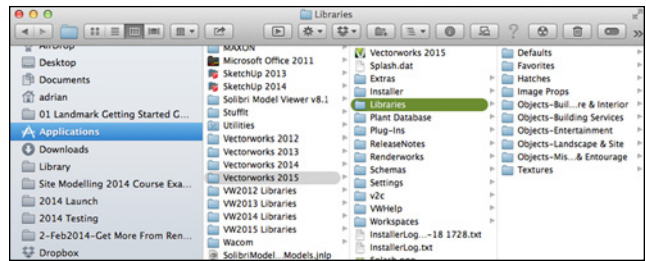


3. On the **Files** menu, choose **Add New Favorite Files**.



- When the Explorer (Windows) or Finder (Macintosh) window opens, notice that it has taken you to the location where Vectorworks is installed:

- C:/Program Files/Vectorworks 2015 (Windows)
- /User/Applications/Vectorworks 2015 (Macintosh)



- Double-click the **Libraries** folder.
- Double-click the **Objects-Landscape and Site** folder. Highlight all the file names in this folder, and click **Open**.
- Repeat the process until you have added the contents of the following folders:
 - Textures (Renderworks is required to use Textures.)
- On the Resource Browser, click the **Files** list. You will see a list of Favorites. Click on any of the file names to review its contents in the window below. Click the **Home** button on the right of the palette to return the Resource Browser to a view of the current file.

Setting Up the Drawing Area

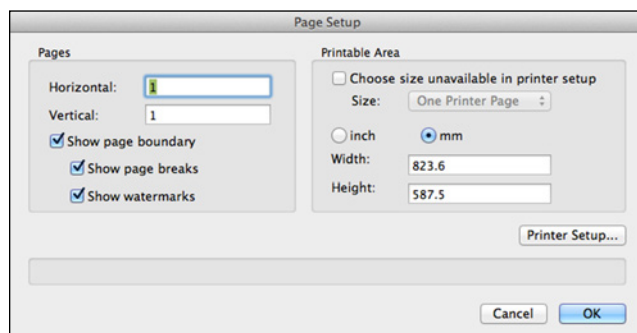
Vectorworks Landmark has some very sophisticated tools for laying out presentation drawings. These tools typically come into play at the end of the design project, so setting up a specific page size at the start is not essential. But I generally find that new users, who might be moving from paper-based design, have a strong desire to see a page on the screen at the beginning of the project. The process is covered here to reassure you! To complete this part of the design process on paper, you would need to choose a physical piece of paper for your drawing board, decide on the unit of measure you're going to use, choose the appropriate architectural scale, and place a sheet of graph paper under your design to help you with proportions.

This exercise is not a precursor to any of the design exercises. Rather, it is a stand-alone set of instructions to help you set up your new projects.

Setting the Page Size

- Create a new file, using **File > New**, and then choose Use Document Template. Choose one of the Landmark templates and click OK.

To change the size of the Drawing Area, choose **File > Page Setup**.

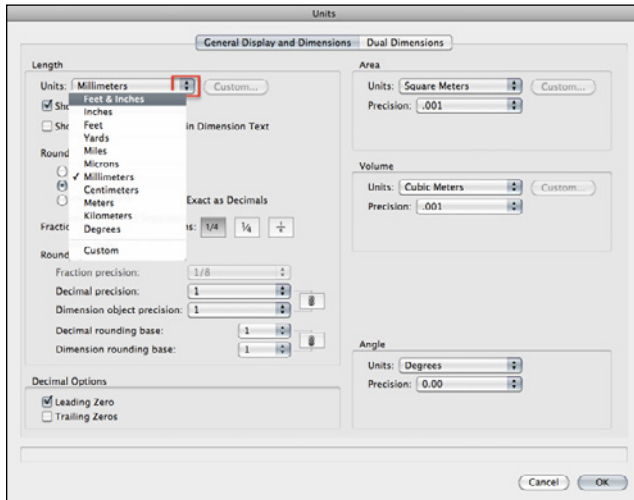


- If you will be printing on a printer already installed in your office, choose **Printer Setup** and then choose the printer and relevant paper size. In the size field, ensure **One Printer Page** is selected.
- If you will be sending the file electronically for printing on an unknown printer, check **Choose size unavailable in printer setup**, and then choose a standard paper size to suit your needs. The list includes US sizes and international metric standard sizes.

- Click OK. The page will resize. Click **Fit to Page** on the **View bar** to see the page boundary. Click **Show/Hide Page Boundary** on the Quick Preferences bar to control the visibility of the page boundary.
- Choose **File > Page Setup** and uncheck **Show Page Breaks**. Click OK.

Setting the Unit of Measure

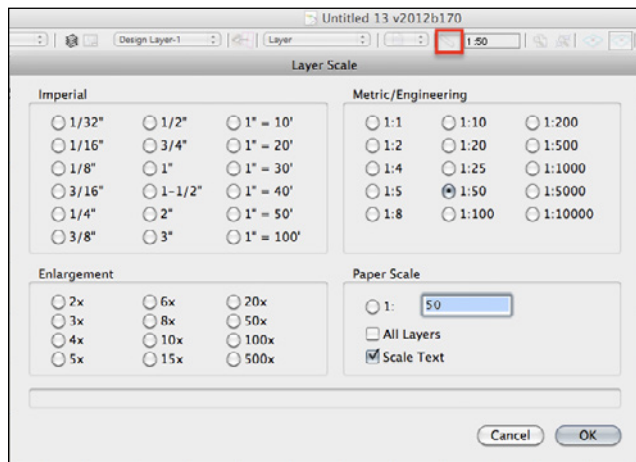
- Choose **File > Document Settings > Units**.



2. Choose appropriate Length, Area, Volume and Angle units of measure for your geography and the project. Click OK. The ruler displays your chosen units.

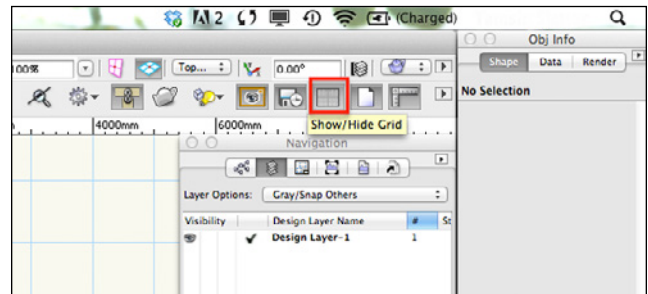
Setting the Drawing Scale

1. Click the **Layer Scale** button you added to the View bar earlier. Choose an appropriate scale for your page setup and project. Click OK.
2. You will see the scale is displayed on the View bar. The ruler is resized to accommodate your scale change.

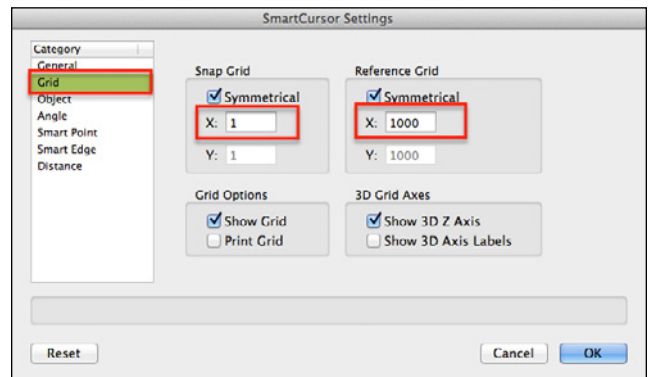


Showing/Sizing the Grid

1. To turn the Grid on or off, use the **Show/Hide Grid** Quick Preference button that you added to the View bar above. You may need to zoom closer to the drawing area to see the grid. Use the mouse wheel if you have one, or two fingers on your trackpad if you are using a Macintosh.



2. To change the grid size, double-click the **Snap to Grid** button on the Snapping palette. When Vectorworks offers the handy hint that you can disable all snaps using the back quote key, click OK. The Snap Grid is always invisible, but when Snap to Grid is on, it forces your drawing to fit to the snap grid.
3. Set the Snap Grid to something small (for example, **1 mm [1/16"]**). This ensures that if Snap to Grid is turned on, you will still be able to draw small lengths.
4. The Reference Grid is the blue grid visible on the screen and does not control drawing functions. It is there simply for your reference. Change the size to **1000 mm [3']**.
5. Click OK to close the dialog.
6. It's my recommendation that you work with Snap to Grid turned off unless you have a specific need to use it. Click **Snap to Grid** on the Snapping palette, to turn it off.



Turn On Auto-classing

Vectorworks uses Auto-classing to automatically classify certain objects you draw to help you distinguish them from other types of objects on the screen. You'll see classes in action later.

1. To turn on Auto-classing, choose **File > Document Settings > Standard Naming**.
2. On the dialog, check the **Enable Auto-classing** box. Click OK to close the dialog box.
3. On the resulting dialog box, click **Yes**.

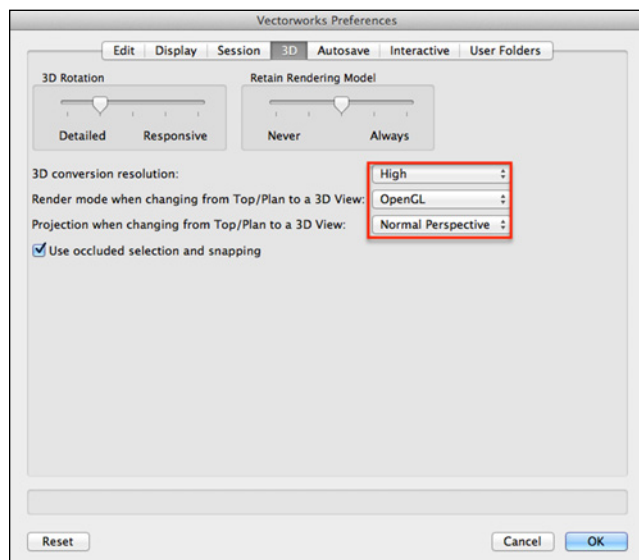
Save These Settings For Future Projects

1. To save these settings for use on future projects, choose **File > Save As Template**.
2. Name the file **"My Template.sta."** Allow Vectorworks to save the file where it wants to. Click OK.

Setting Vectorworks Preferences

The changes you have made to this document affect only this document, or any new documents that you create from the template. However, there are other preferences you can set within Vectorworks which affect how it works every time you use it. Before continuing to the rest of the tutorial, it's **very important** that you make the following changes to your Vectorworks Preferences so that they match mine.

1. Choose **Tools > Options > Vectorworks Preferences**.
2. Click the 3D tab and make the following changes:
 - 3D conversion resolution: **High**
 - Render mode when changing from a Top/Plan to a 3D View: **OpenGL**
 - Projection when changing from a Top/Plan to a 3D View: **Normal Perspective**



These changes will ensure that when you change your view in the files provided for the tutorials, you will always see a rendered perspective view. For your own projects, of course you can change these preferences and use whatever you prefer, but it is important for the success of the tutorial for these settings to match mine.

3. Click the Autosave tab.

- Confirm before save: **Uncheck**

This change will ensure that Vectorworks does create automatic backups of your work, but does not ask for permission each time. It will create the backup silently, every 15 minutes. Feel free to adjust the settings to create a backup more or less frequently in the future, according to your needs. And remember, it's important to have a system wide backup strategy in place when depending on your computer for business.

4. Click OK to close the Vectorworks Preferences dialog. You're now ready to proceed with the remaining tutorials.

Section 2: Plotting the Existing Site

Objectives For Section Two

After completing the exercises in this section, you will be able to do the following:

- Import both a DWG and a PDF file to use as a base plan
- Use triangulation to locate positions on a site
- Create a floor and a property line for your model
- Use the Wall, Door, and Window tools and the Create Roof command to create a simple building
- Document existing trees on the site
- Set the position of the sun and create a shadow analysis

Example Files Required For This Section:

- 1-Sample DWG Import.dwg
- 2-Locating the Boundary.vwx
- 3-Create Building.vwx
- 4-Create Roof.vwx
- 5-Add Existing Trees.vwx

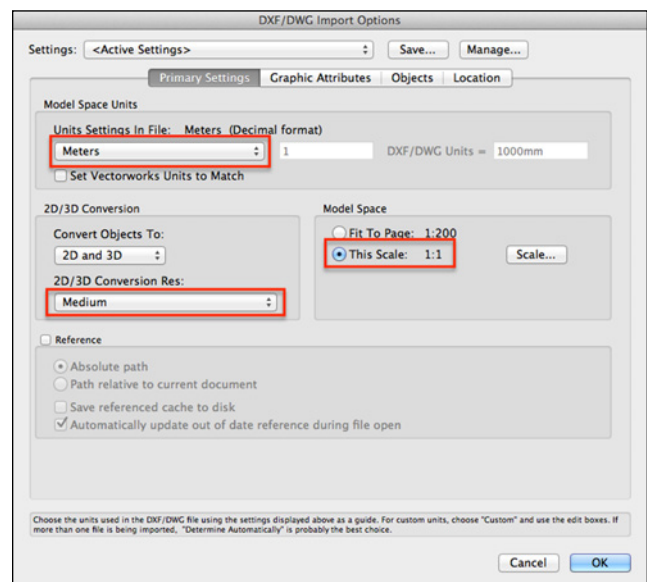
Exercise 1: Importing Files From External Sources

Even if you measure your own surveys on site, there will also be times when you need to start the design process by importing files from external sources. These could be AutoCAD files from a professional surveyor, an architect, or a map provider. Alternatively, you might have a PDF of a site. This exercise will take you through the import process and show you how to incorporate a survey file in AutoCAD format.

Importing a DWG file

1. Create a new blank file, choosing **File > New** and check **Use Document Template**. Choose any of the standard Landmark templates that came with your software. Click OK.
2. Use the previous exercise as a reference to change the settings to suit your preferred way of working. My example file already has my preferred settings.
3. Choose **File > Import > Import Single DXF/DWG File**.
4. Within the sample files, locate the file **1-Sample DWG Import.dwg** and click **Open**.
5. On the Import dialog, change the following settings:

- Unit Settings in File: **Meters**
- This Scale: **1:1**
- Convert Objects to: **2D and 3D**
- 2D/3D Conversion Resolution: **Medium**

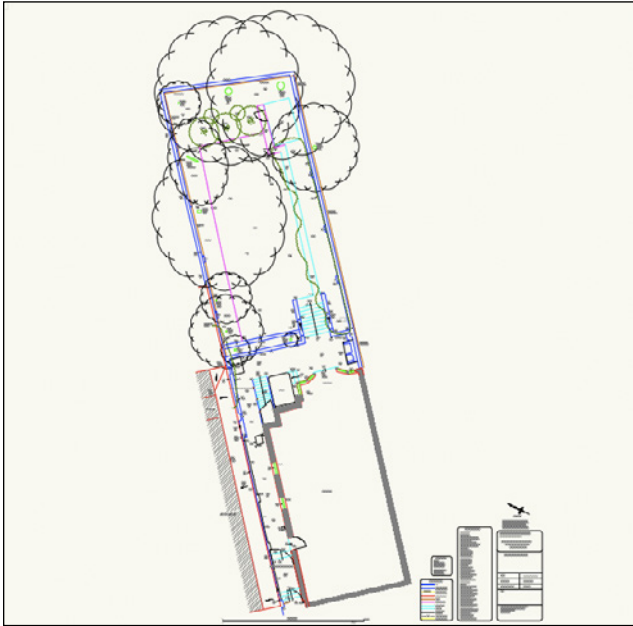


It is critical that the Unit Settings in File field be set to the Unit measurement of the incoming file.

6. Click the Graphic Attributes tab and change the settings as follows:

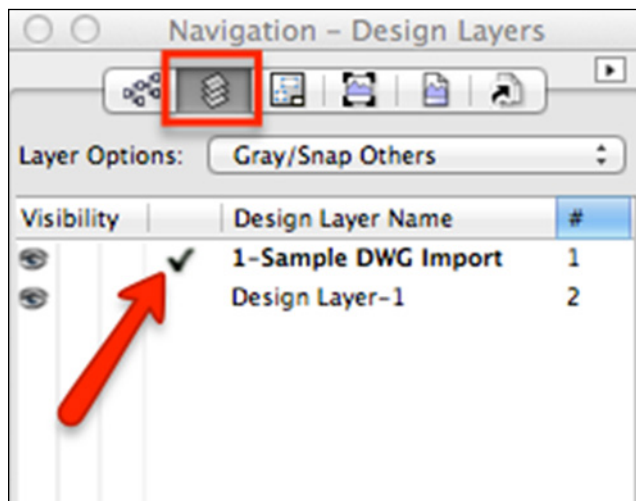
- Map colors to Line weights: **Uncheck**
- Add Prefix to Imported DXF Layers: **Check**
- Prefix: Enter the word **“Survey.”**

7. Click OK. If the Font mapping dialog appears, click OK to accept the default mapping of fonts not present on your machine.



Examine the File Structure

1. Turn your attention to the Navigation palette. Click on the **Design Layers** button.
2. Design Layers represent the piece of paper on which you are drawing. They are usually used to separate items in 3D space (think of the floors of a building) or to separate stages of the design process. This file contains the original Design Layer-1 and a new layer with the same name as the imported DWG file, which is the Active Layer.



3. Click on the **Classes** button on the Navigation palette. If you're familiar with AutoCAD®, these classes are the equivalent of DWG layers. Classes are a classification system used to distinguish different types of objects from each other. There are many classes in the file, their names all prefixed with "Survey-" so that you can distinguish them from your own classes.

4. Press and hold the Alt key (Windows) or Option key (Macintosh) and click the "disclosure arrow" to the left of the Survey class. Press and hold the Alt key (Windows) or Option key (Macintosh) and click on the "disclosure arrow" to open the list of classes.

5. Three columns to the left of each class name represent Visible, Invisible, and Gray. Locate the class **Survey-LEVEL_VALUE**, and click on the **Invisible** column to its left. All elements on the drawing belonging to this class are now invisible. Restore their visibility by clicking on the **Visible** column.

Both Design Layers and Classes can have their visibility controlled using the Navigation palette. However, they have different purposes: Design Layers are the physical location of the drawn objects while Classes are like a club membership, used for classifying different types of objects. You can edit classes to add graphic attributes to them so that all members of that class look the same.

Change the Scale

After you import the file at 1:1, you may wish to change the scale. 1:1 is a good starting point, as that's likely the scale at which the file was created. But you may wish to work at a different scale.

1. Click on the **Scale** button on the View bar.
2. Choose the scale you want to work in and check the **All Layers** box. Also check **Scale Text** and then click OK.
3. Click the **Fit to Objects** button on the View bar to adjust the plan to fit on your screen.

Do not be concerned if the imported site does not fit on the drawing area. You can change the scale of your layer at any time, but you will see later that you can present the drawing at any scale when your design is complete.

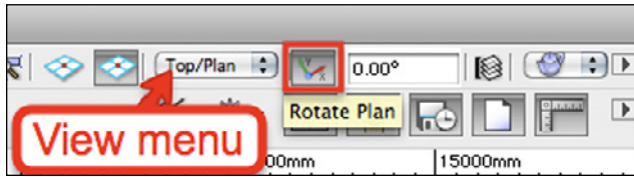
Understand the Origin

Notice the coordinates of the site on the ruler. Vectorworks has preserved the coordinates of the original file—in other words, the geometry is in the same place as the surveyor or architect originally drew it. This is important if you will be coordinating drawings at a later stage in the project.

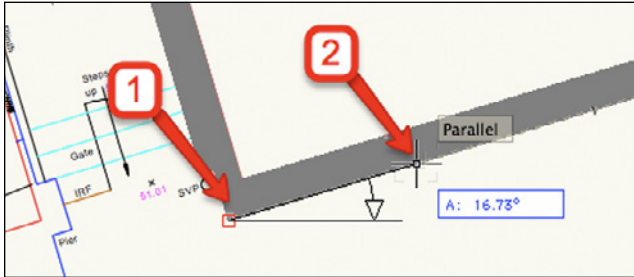
Rotate the Plan

The plan has been drawn at an angle. To be able to draw orthogonally (square to the page), you can rotate the whole page temporarily, to line up with the rulers, as if you were drawing with a parallel motion.

1. Click the **Rotate Plan** button on the Tool bar.



2. Click on the lower left corner of the house, and then click again anywhere along the lower edge of the house. The entire drawing will rotate to line up the house with the bottom of the drawing area.



3. Tools such as the Rectangle tool, Wall tool, and so forth, will now easily snap horizontally and vertically and line up with the house, if that is desirable for your design.
4. To return to a Top/Plan view, use the View menu on the View bar, shown in the screenshot after step 1.
5. Save your file if you wish, using **File > Save**. We will not be using it again as it is a stand-alone example designed to teach you this process alone.

An important part of the import process is to always check the size of the imported elements. The use of an incorrect import unit will result in a file that is the wrong size.

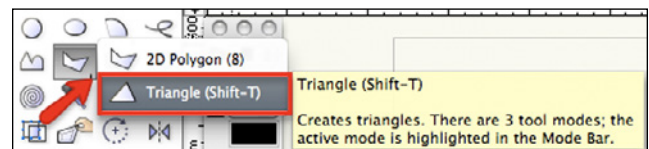
Note that PDF files or image files (scanned hand-drawings for example), can also be imported. Examine the **File > Import** menu to see the range of file types that can be imported.

Exercise 2: Drawing Up The Site

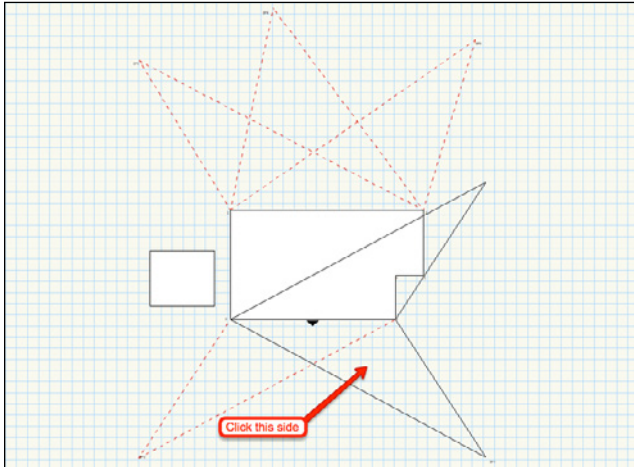
Now we'll use example files to look at how to locate points on site and to draw simple buildings. The sample file you'll use contains two simple polylines representing the footprint of a building. Later, you'll turn these into a building. There are also some triangles that represent triangulation points to the boundary. In this exercise, you'll learn how to use the Triangle tool to locate the final boundary point. In some geographies, triangulation is used with the building as a starting point for finding other points on the site. In other geographies, you may start from the boundary and triangulate inward to find the buildings. Whatever is the case where you work, the principle of triangulation is the same, and the tools you use are the same.

Triangulate to Locate a Boundary Point

1. Open the file **2-Locating the Boundary.vwx**.
2. On the Navigation palette, click the **Design Layers** button. There are two layers. The active layer is the Boundary layer. The two polylines are on the Buildings layer and the Layer Options menu is set to Show/Snap Others so that you can see the building shapes but not select them.
3. Still on the **Navigation palette**, click on the **Classes** button. I have set up some classes for you to use in this file. Using a system of classes is best practice, as it helps to organize the objects you draw so that you—and other professionals—can distinguish them from one another.
4. The active class is **Survey-Triangulation**. Right-click (Windows) or Ctrl+click (Macintosh), and choose **Edit**. Note that this class has been set up with a red dashed line to make these lines distinct from others. Click **Cancel**.
5. Look at the **Polygon** tool on the **Basic** palette. Click and hold on the small triangle in the bottom-right of the tool. A menu will open showing another tool hiding behind the Polygon. Click on **Triangle**. On the Tool bar, choose the first mode: **Triangle by Three Sides Mode**.



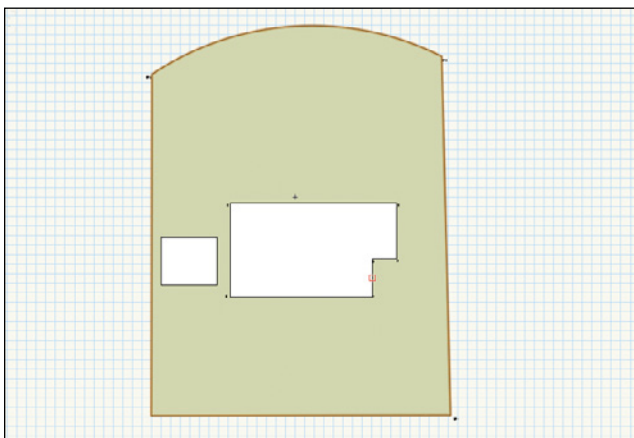
6. Click on Point A on the building and then click on Point B. This sets the first side of the triangle. Press Z to help zoom to the points.
7. On the dialog, enter the following values and then click OK.
 - Side 1 (A to B): **Do not change**
 - Side 2 (A to BP1): **14804 mm [48' 6 7/8"]**
 - Side 3 (B to BP1): **26096 mm [85' 7 3/8"]**
8. Vectorworks offers two triangles either side of the edge A to B. Click on the lower triangle. Vectorworks creates a triangle with its apex marking the point we were seeking.



Draw the Boundary

Now that each boundary point is drawn on the plan, you will use the **Polyline** tool to draw the boundary line. When drawing around a shape like this, you can use the Space bar to temporarily activate the **Pan** tool. This will enable you to move to drawing around to reach points not on the screen. You can also use the **Snap Loupe** (the Z key), to temporarily zoom the area under the cursor, and aid accurate drawing.

1. Use the **Navigation palette** to make **Survey-Site Floor** the active class.
2. Choose the **Polyline** tool in **Corner Vertex mode**. Click on the new point BP1, and then click on BP2. Click on BP3. Now use the U key on your keyboard, pressing it four times, to "shortcut" to the Polyline's **Point on Arc mode**.
3. Click on Point BP4 and then on BP5. Press the K key on your keyboard to draw the final segment and close the polyline.



4. Select the Polyline if it is not already selected. Choose **Edit > Copy** and then **Edit > Paste in Place**. We will convert one of these objects to a floor and the other to a Property Line object.
5. Choose **Landmark > Architectural > Floor**. Click OK to create a Floor with a thickness of 0 and a height also of 0. The Floor is a

"hybrid" object that can display a 2D appearance in Top/Plan view and a different appearance in a 3D rendered view.

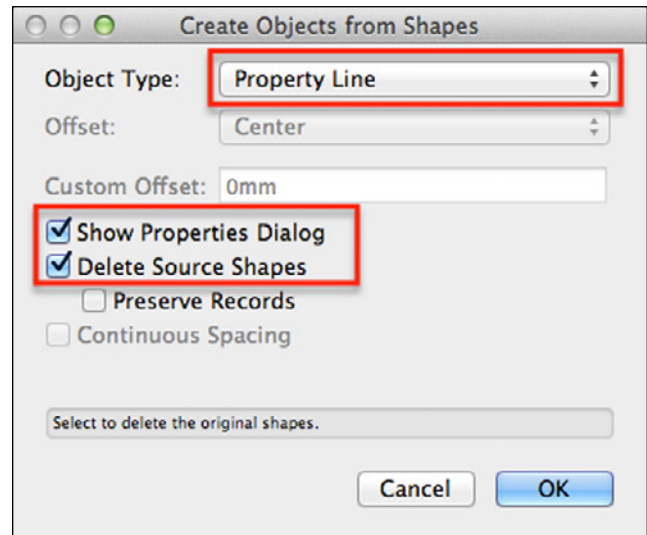
6. Choose **Modify > Send > Send to Back** to send the Floor object to the bottom of the stack of objects.
7. Double-click on a blank part of the drawing area to return to the Selection tool and click to de-select the Floor object.

Creating the Boundary/Property Line

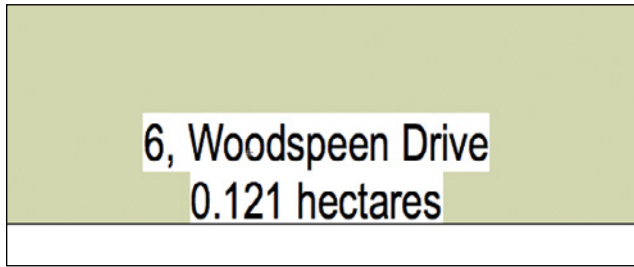
Property Line is a useful tool for displaying data about the site, including its area and the dimensions of the boundaries.

1. On the **Navigation palette**, make **Survey-Property Line** the active class.
2. Select the duplicate Polyline. Choose **Landmark > Create Objects from Shapes**. Complete the dialog as follows:

- Object Type: **Property Line**
- Show Properties Dialog: **Check**
- Delete Source Shapes: **Check**
- Click OK.

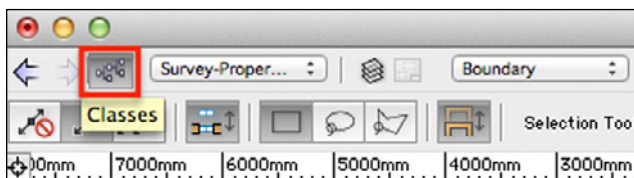


3. On the resulting dialog, change the following fields, leaving the others unchanged from their defaults:
 - Name: **6 Woodspeen Drive**
 - Click OK.
4. The polyline is replaced with a Property Line in the same shape. Examine the Property Line. It shows valuable information about the area of the site and the boundary lengths.



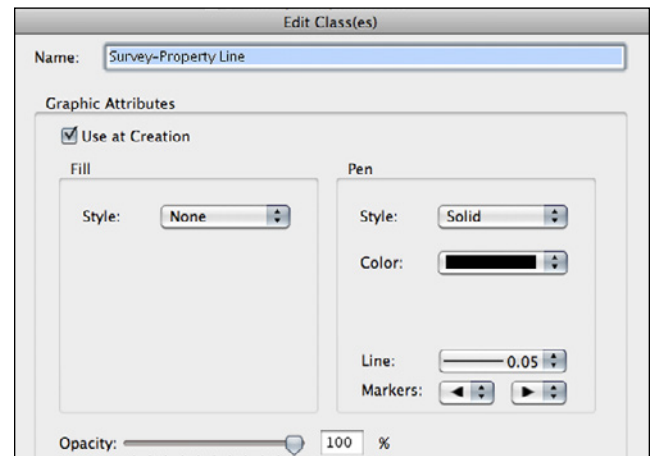
- Click the **Classes** button on the View bar to open the **Organization** dialog again, this time on the Classes tab.

- Examine the list of classes in this file.



- Select the class called **Survey-Property Line** and click **Edit**.
- The graphic attributes of this class are displayed. In this case, the Property Line has a Fill Style of None, allowing the Floor color to show through it.

- Click OK to close the Edit Class dialog and OK again to close the Organization dialog.



- On the Navigation palette, click on the **Classes** button. To the left of the name **Survey-Triangulation**, click in the center column to make all members of this class invisible. The objects are still present in the file, and can be used for reference at any time, simply by restoring the visibility of the class.

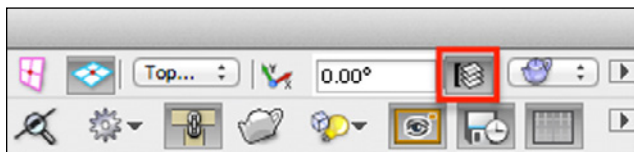
- Choose **File > Close**. There is no need to save the file as I have provided the file for the following exercise.

Exercise 3: Draw a Building

In this section, you'll learn two different ways to create a building. The first method uses the Massing Model tool. The Massing Model tool produces a simple building mass with a roof. It cannot have doors and windows or other detail, but it is ideal for showing neighboring buildings or garages where the simple mass of the building is important for sun studies, but detail is not. Then, I'll show you how to put together a more detailed building that includes walls, doors, windows, and a roof. The Vectorworks Wall object is very powerful. It allows windows and doors to be inserted directly into it. It is a hybrid object, containing both a plan and a 3D representation. If you have Renderworks, you'll see textures applied to these objects.

Draw the Garage

- Open the file **3-Create Building.vwx**.
- Ensure that the Unified View button is pressed on the View bar. This will ensure that when changing to a 3D view, all design layers will move in unison.
- On the **Navigation palette**, ensure that **Buildings** is the active layer and that **Layer Options** are set to **Show/Snap Others**. This means you can see objects on other layers but not select or modify them.
- Click the **Classes** button and make **Survey-Garage Walls** the active class.
- Click the Site Planning tool set, and then click **Massing Model**.
- On the Tool bar, click **Massing Model Tool Preferences**.
- Set the following preferences, leaving other settings on their defaults:
 - Name: **Garage**
 - Show in Plan: **Roof**
 - Label: **No Label**
 - Height: **3000 mm**
 - Floor Count: **1**
 - Wall Class: **Survey-Garage Walls**
 - Roof Class: **Roof-Main**
 - Pitched Roof: **Check**
 - Eave Style: **Vertical**
 - Display Shadow in Plan View: **Check**
 - Click **Shadow Settings** to open the Document Preferences dialog
 - Offset: **0.2 Factor of Object Height**
 - Angle: Use the slider to control the angle of plan shadows
 - Color: Choose a color for the shadows



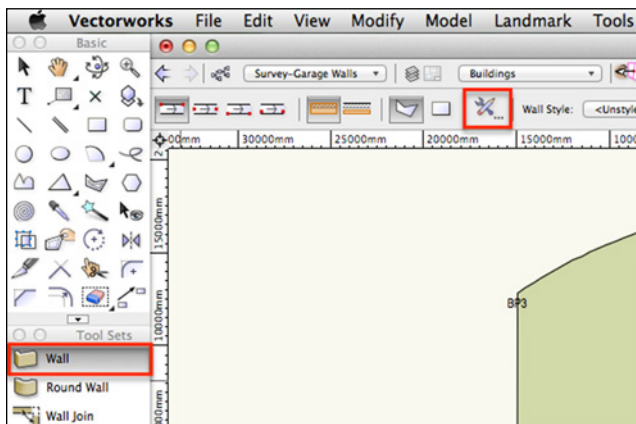
- Opacity: **50%**
- Click OK to return to the Massing Model Object Properties
- Use Site Modifiers: **Uncheck**
- Use Grade Limits: **Uncheck**
- Click OK

8. Click on the lower left corner of the rectangle labelled Garage. You can use the Z key on your keyboard to zoom to the point if necessary.
9. Move clockwise to the next corner of the garage rectangle and click again. Continue to click on each point of the rectangle up to the penultimate point. Press K to draw the final segment and close the shape. The shadow displayed by the Massing Model is useful. You'll use these document shadows later on a planting plan.

The massing model is created. If you have Renderworks, the walls and roof will be textured differently, because we have applied different classes to them. I have previously edited these classes to apply my chosen textures. You'll see this later, when the main building is finished.

Draw the House Walls

1. On the **Navigation palette**, make **Survey-House Walls** the active class.
2. Click on the **Building Shell** icon on the Tool sets palette to open the Building Shell tools. Click the **Wall** tool and then click on the **Wall Tool Preferences** button on the **Tool bar**.



3. Set the following preferences:

- Overall thickness: **300 mm [11 3/4"]**
- Click the **Insertion Options** tab.
- Height: **5500 mm [9' 10"]**
- Click OK.

This has defined a wall with a thickness of 300 mm and a height of 5500 mm.

4. Click on the lower left corner of the house polyline labeled "House" (point B). You can draw in a 2D or 3D view—whichever you prefer.

You can use the Z key to ensure you are snapping on the correct points. Continue in a clockwise direction, and click on all the other corners up to the penultimate point. Press K to close the shape. You have drawn six walls.

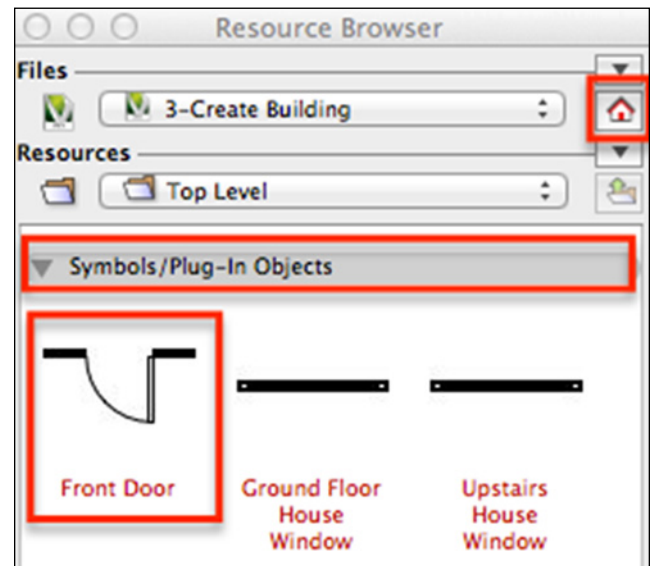
Note: As you draw, notice that the blue Data bar is displayed for each wall segment. You can use this to control the length of each segment if you are drawing a building from a series of measurements taken on site.

5. Using **View > Standard Views > Right Isometric**, change to a 3D view. Note that the walls and massing model also have a 3D representation. The building is displayed in a perspective view and is rendered using OpenGL mode by default.

Insert Doors

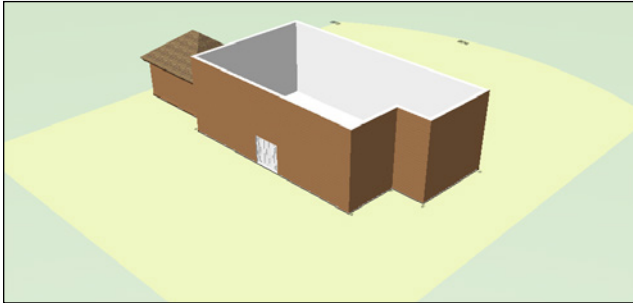
The Door and Window tools, also found in the Building Shell tool set, have a Preferences button on the Tool bar that allows you to configure a wide variety of door and window styles. These can be inserted into walls at the correct position to properly represent access to the landscape and to represent the building in 3D.

1. On the Resource Browser, click on the **Home** button to the right of the palette to ensure you are looking at the resources of the current file.
2. Scroll through the Resource Browser window until you see the heading **Symbols/Plug-in Objects**.

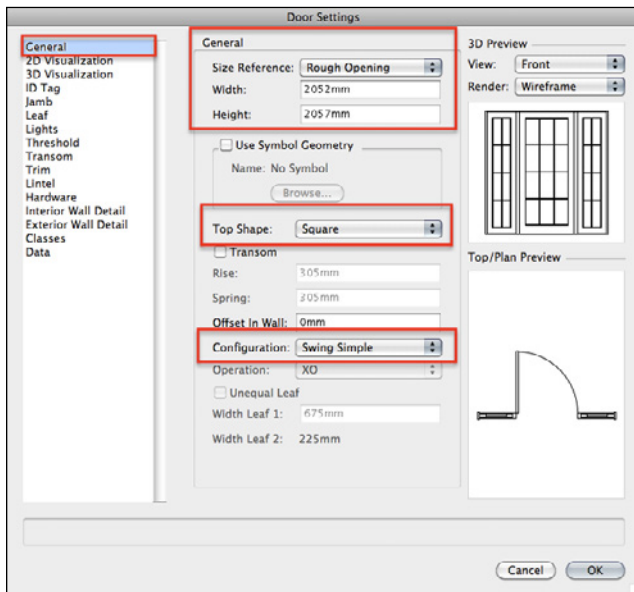


3. Double-click the **"Front Door"** symbol to make it the active symbol. Notice this has activated the Symbol Insertion tool on the Basic palette and that the symbol name is displayed on the bottom of the Resource Browser palette.
4. Bring the cursor to the center of the front house wall, looking for the Midpoint cue. The wall will highlight in red to indicate that you are about to insert a symbol into it.

- Click once to set the position of the door in the wall. Click again on the outside of the wall to complete the insertion.



- Click the **Selection** tool. Select the front door. On the Object Info palette, click **Settings**. The Door Settings dialog opens.



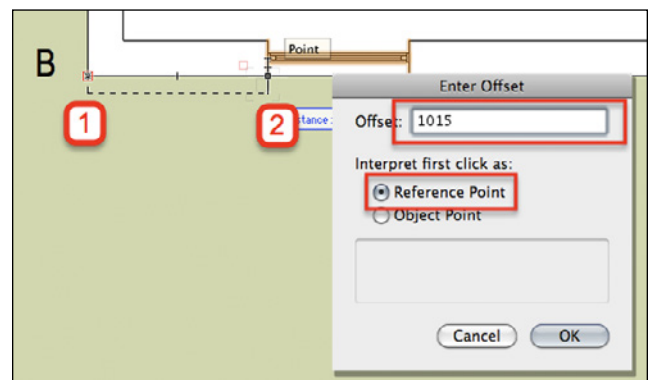
- Click the **General** tab on the left, and examine the range of settings available for doors. In particular, notice that the Size Reference is set to Rough Opening, meaning the width of the doorway is being measured across the entire opening. This dialog is also displayed when clicking the Door Preferences button on the Tool bar. Click Cancel to close the dialog without making any changes.
- Choose **View > Standard Views > Top Plan** to return to Top/Plan view bar, (or use the Standard View menu on the View bar).
- Click **Flip** on the **Object Info palette** to change the opening direction of the door.

Insert Windows

- On the **Resource Browser**, double-click the symbol named **Ground Floor House Window**. Move your mouse onto the wall. It will

highlight red. Click anywhere on the front house wall, to the left of the front door, and again on the outside (left edge) of the wall.

- The window is inserted into the wall.
- Click on the **Settings** button on the **Object Info palette** and note the range of settings for windows. Click Cancel.
- On the **Object Info palette**, click **Set Position**.
- Click on the lower left corner of the house (B), and then click on the left edge of the window. The **Enter Offset** dialog opens. It shows the current distance between the two clicked points. Change the Offset value to **1015 mm [3' 4"]**.
- Click OK. The window moves to the desired position in the wall.



View Textures On The Rendered Model

Note: You can only apply textures and use Renderworks modes if you have Renderworks installed.

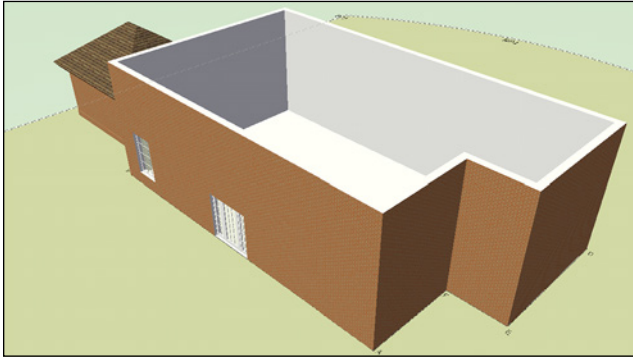
- Change to Right Isometric view using the View menu on the View bar.

The default render mode in any 3D view is OpenGL. If you have Renderworks, you'll see the model with textures including a brick texture, with glass in the windows..

- Click the **Selection** tool. Click on one of the walls.
- On the **Object Info palette**, click on the **Render** tab. Change the following fields:

- Part: **Left**
- Texture: **Class Texture**

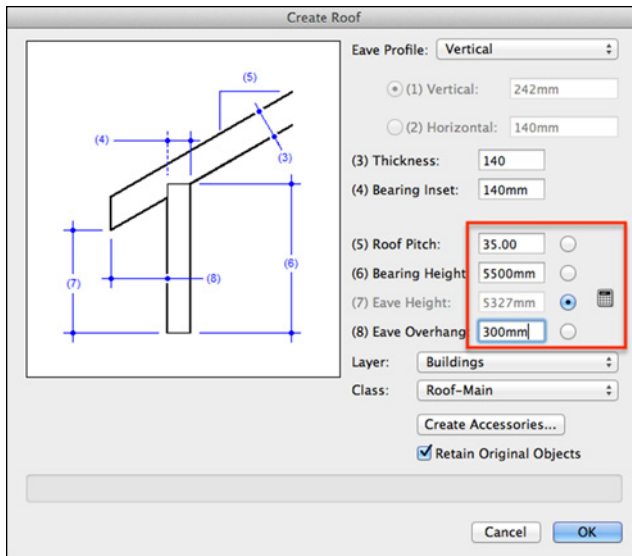
- If you have Renderworks, choose **View > Rendering > Fast Renderworks**. This will change the model from OpenGL to a Renderworks mode. You will see the Brick texture applied to the outside of the house, and the quality will be better than the OpenGL render. This is the texture I have previously added to the properties of the class Survey-House Walls.



I will complete the remaining windows and doors in this model.

Create a Roof

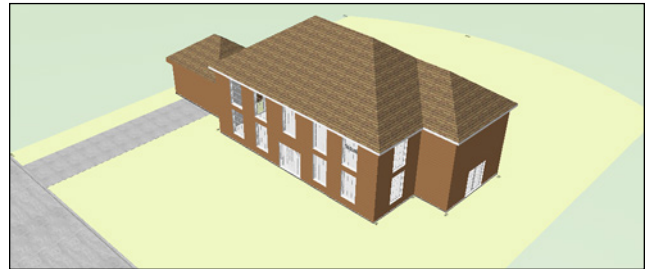
1. Open the file **4-Create Roof.vwx**. In this file, the remaining windows and doors have been inserted to save you time. The textures have been applied and a driveway has been added using the Hardscape tool. You'll learn about the Hardscape tool later. The Roadway (Straight) tool was used to create the road.
2. Choose the **Select Similar** tool from the **Basic** palette. Click **Select Similar Tool Preferences** button on the Tool bar. Check **Class** and **Object type** and then click OK.
3. Click on one of the house walls. All the house walls are selected.
4. Choose **Landmark > Architectural > Create Roof**.



5. Complete the dialog as follows:

- Eave Profile: **Vertical**
- Thickness: **140 mm [5 ½"]**
- Roof Pitch: **35°**
- Bearing height: **5500 mm [9' 10"]**
- Eave overhang: **300 mm [11 ¾"]**
- Notice that Vectorworks will create the roof on the active design layer, and in a class called Roof-Main.
- Click OK.

The roof is created and is made of six separate roof faces.



6. With the **Selection** tool, select the roof. Click on the Object Info palette's **Render** tab.

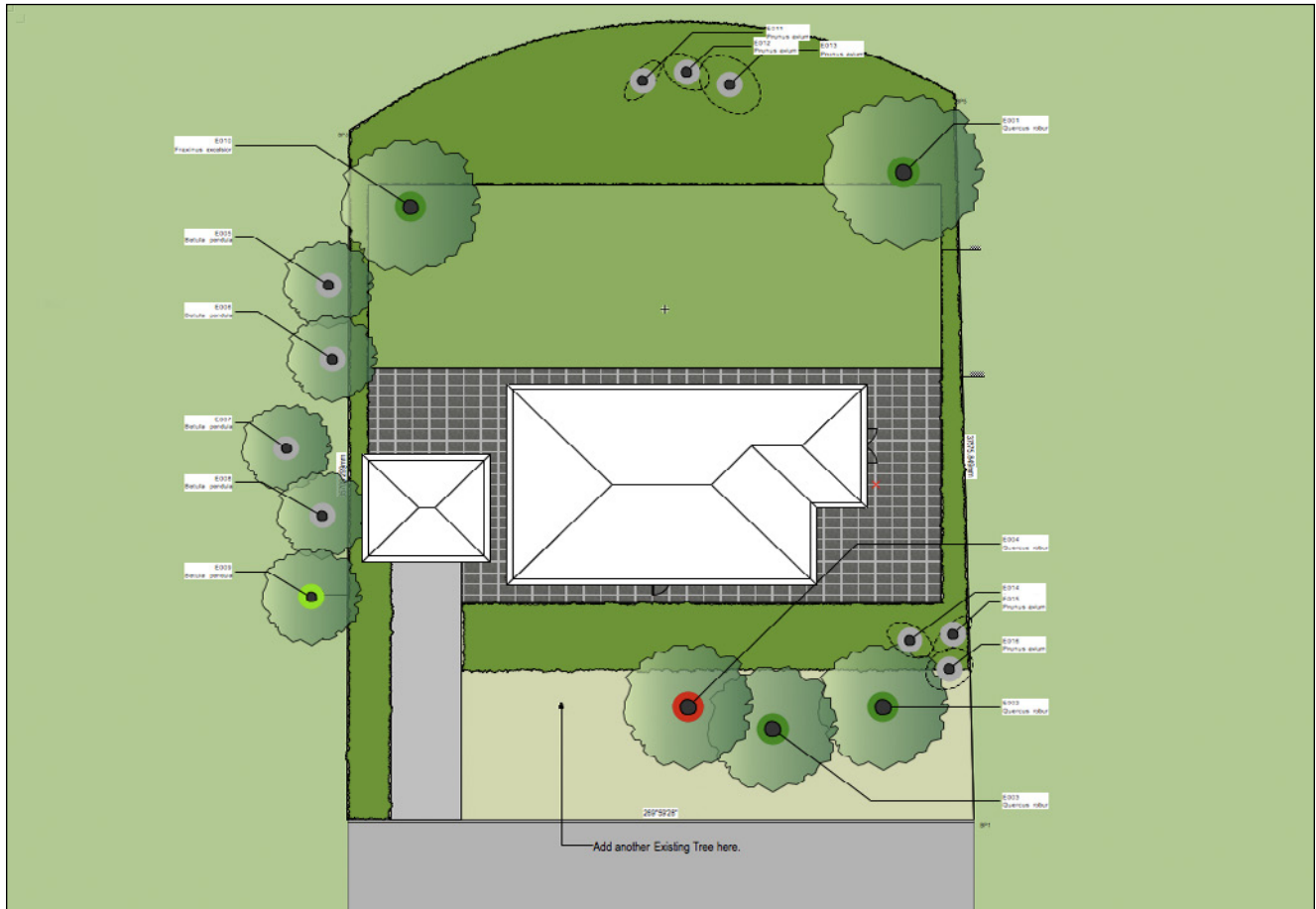
Notice that the Top part of the Roof is textured with Class Texture. The Roof texture is derived from the properties I have set up within the Roof-Main class. (Renderworks is required for these steps.)

7. Click the Shape tab on the Object Info palette.

8. Choose **File > Close**. There is no need to save the file.

Exercise 4: Existing Trees

Vectorworks Landmark includes a tool for documenting existing vegetation and for documenting the ultimate action for this vegetation. The tool, called Existing Tree, is located in the Site Planning tool set. In this exercise, you'll edit some trees already placed on the plan and place a tree on the plan. The file you'll work in contains extra elements, to give you a sense of completeness when working with the site. These objects were drawn with the Landscape Area tool and the Hardscape tool—both found in the Site Planning tool set. You'll see more about these in future exercises, but feel free to select them and examine their settings on the Object Info palette to get a feel for their functionality.



Place an Existing Tree

1. Open the file **5-Add Existing Trees.vwx**.
2. Using the **Navigation palette**, click the **Design Layers** button. There are many more layers in this file, to allow the easy separation of different phases of the design process.
3. Ensure **Existing Trees** is the active layer. Ensure **Exist Tree-Retain** is the active class.
4. Click the **Site Planning** tool set. Click the **Existing Tree** tool and then choose the **Existing Tree Tool Preferences** button on the Tool bar.
5. On the Object Properties dialog, define the tree as follows:

- Click **Get Species Data** and then choose **Quercus robur** from the list. Click OK.

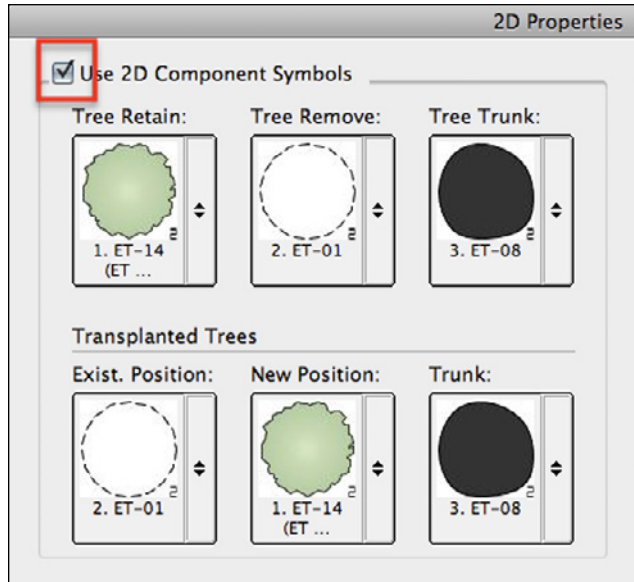
- Click **Tag and Number Options** and ensure that Auto-numbering is on. This tree will be numbered sequentially with a prefix of E. Click OK.

- Continue working on the Object Info palette completing the following fields:

- Origin: **Native**
- Height: **12500 mm [41']**
- Canopy Max. Diam.: **6500 mm [21' 4"]**
- First Branch Hgt: **1700 mm [5' 7"]**
- DBH: **800 mm [2' 8"]**
- Leave all other fields unchanged, but do not yet click OK.

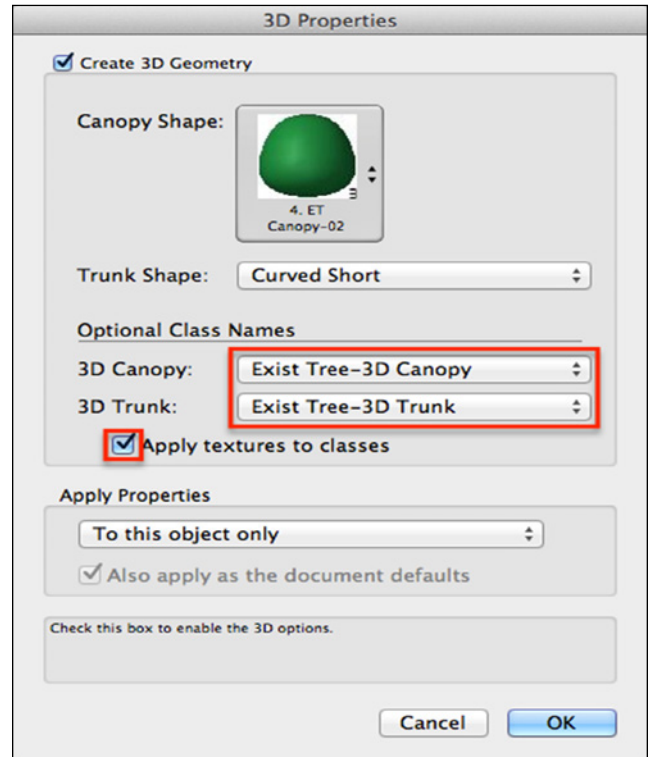
6. Click **2D Properties**.

- Check **Use 2D Component Symbols**.



- Note the different options for displaying trees with different tree actions.
- Click OK.

7. Click **3D Properties**.



- Check **Create 3D Geometry**
- Under Optional Class Names, choose **Exist Tree-3D Canopy** and **Exist Tree-3D Trunk**.
- Apply Textures to Classes: **Check**
- Click OK.
- Click OK again.

8. Click once on the drawing and again to place the tree as indicated in the plan.

9. Press X to return to the **Selection** tool. The new tree is still selected.

10. On the **Object Info palette**, scroll to the bottom and change the Action field to **Retain**.

11. Notice the tree's graphic has changed. Change the Action field to **Remove**. The graphic changes again.

12. Select some of the other trees and examine their properties on the **Object Info palette**. Scroll to the bottom of the list of properties and click Additional Fields. Note that you can add fields to record any information necessary for your design process and legal requirements.

13. Choose **Tools > Reports > Choose Schedule**. On the dialog:

- Select **Existing Tree Schedule w/Images**
- Check **Place worksheet on drawing**.
- Click OK.

14. The cursor changes to a target. Click on the drawing area below the road. A report is displayed on the drawing that lists all the trees on the site. You can use this report on the drawing or export it to use in other project documentation.

15. Choose **File > Close**. There is no need to save the file.

Exercise 5: Set the Sun Position

Vectorworks Landmark includes the Light tool that has many modes for providing different lighting effects to your model. For landscape design, the most important light source is the sun. The **Heliodon** tool, provides sunlight based on the location of the site, the date, and the time of day. It can also be used to create a solar animation movie.

Add a Heliodon

1. Open the file **6-Create Sunlight.vwx**.

2. On the **Visualization** tool set, click **Heliodon**. Click **Heliodon Tool Preferences** on the Tool bar.

3. On the dialog, choose the following:

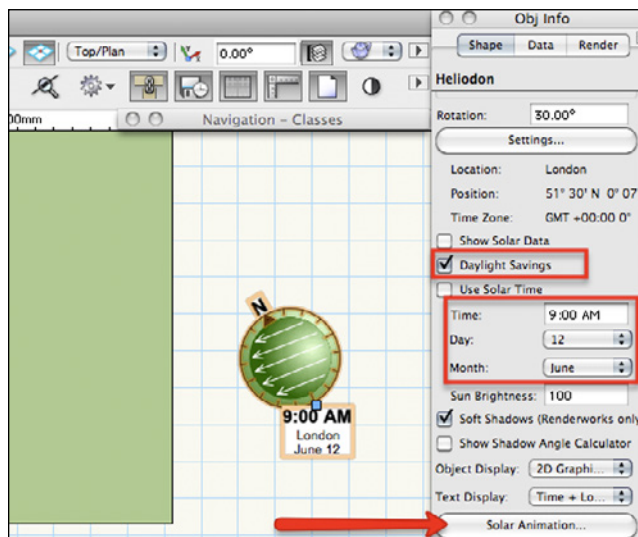
- The time format you prefer.
- A symbol for your plan that will represent the sun and mark the direction of North.
- The location of your site by choosing the region and the city. You can add other cities using the Edit Cities checkbox.
- Click OK.

4. Click on the drawing once to position the Heliodon marker. Rotate the symbol so that its top points toward North. Click again to set the rotation.

5. Press X to return to the **Selection** tool.

6. On the **Object Info** palette, make the following adjustments:

- Daylight Savings: Check (if appropriate)
- Change the Time, Day, and Month settings to today's date.



7. Change the view to Right Isometric. Click **Fit to Page** on the **View bar** to display the entire site on the screen. The scene is

automatically rendered in OpenGL, in a perspective view, but there are no shadows.

8. Click the Rendering menu and choose **OpenGL Options**.

9. Change the following:

- Detail: **Very High**
- Use Shadows: **Check**
- Quality: **High**
- Click OK.

(Note: You will only be able to use shadows in OpenGL if you have Renderworks.)



10. Select the Heliodon if it is not already selected.

11. Click the **Flyover** tool on either the Basic palette, or the Visualization tool set. Click the first mode on the tool bar, and click once on the corner of the house to set the center of rotation.

12. Click and hold with the left mouse button to change the view to a pleasing view.

13. On the Object Info palette, click **Solar Animation**. On the Solar Animation dialog, use the lower slider to change the time of day and assess the shadows falling across the site.

14. Click Cancel.

15. Choose **File > Close**. There is no need to save the file.



Section 3: Hard Landscaping

Objectives For This Section

After following the exercise steps in this section, you will be able to:

- Use the **Hardscape** tool to draw hard landscaping/hardscape
- Produce a worksheet showing hard landscaping quantities
- Create and use symbols within the design
- Use the **Custom Stair** tool to create steps
- Create free-standing garden walls
- Model a simple 3D structure and add dimensions to it

Example files required for this section:

- **1-Start Hard Landscaping.vwx**

In this section, you'll use a partly configured file to model some hard landscaping features. The aim of this section is to familiarize you with the **Hardscape** tool and the **3D Modeling** tool set so that you can use the **Push/Pull** facilities within Vectorworks to model something unique such as this structure to host a "green roof." (You'll learn about planting later.)

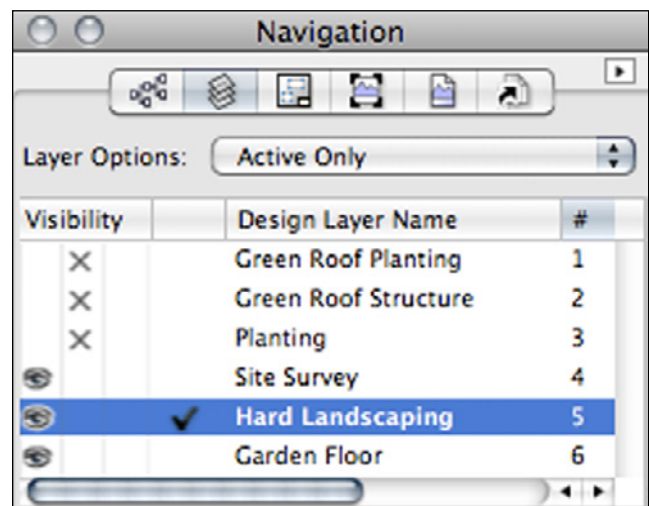


Exercise 1: Explore the Hard Landscaping File

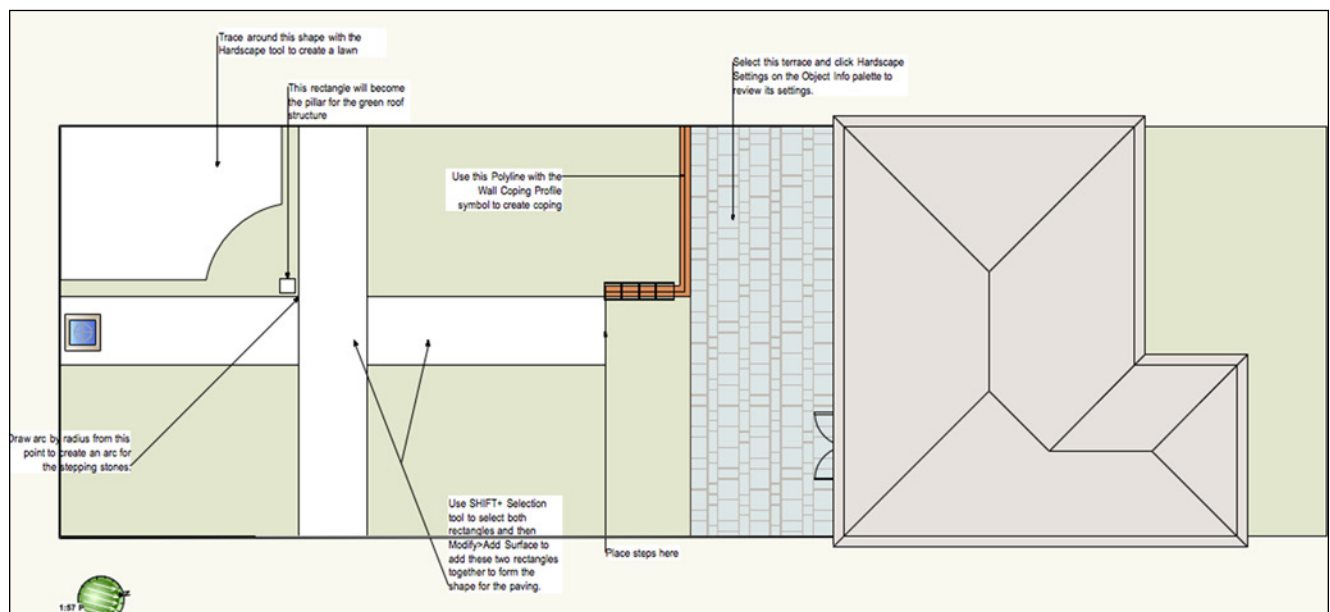
The file has many more layers and classes now. As stated earlier, the more you can structure your design workflow, the more flexible your file will be for presenting different aspects of the design.

Examine the Structure of the File

1. Using **File > Open**, open the file **1-Start Hard Landscaping.vwx**.
2. On the View bar, click the **Layers** button. Notice the design layers Site Survey and Garden Floor have a Z elevation of 0. The layers named **Hard Landscaping**, **Planting**, and **Green Roof Structure** are at different Z elevations, -650 mm [-2' 1 5/8"]. Design Layers are like horizontal planes, that can have their elevation set to different heights. Objects drawn on a specific design layer will adopt the elevation of the layer on which they are drawn.
3. On the Navigation palette, click on the **Design Layers** tab. The active layer is **Hard Landscaping**. This layer contains some 2D shapes that you will use to create a design as well as some previously completed objects. It also contains some instructions that you will be able to hide when you have completed the steps. Additionally, there is a ready-made water feature—which we will discuss later.
4. The **Layer Options** menu is set to **Active Only** so that you can see clearly what is on each layer.
5. Click on the **Site Survey** layer to make it active. There is a building with a roof and a very simple boundary, created with walls. A **Heliodon** object has been placed, siting this garden in London, UK.
6. Click on the **Garden Floor** layer to make it active. There are two **Floor** objects to act as a base for different levels in our model. Click on each in turn and notice the different Z values on the Object Info palette.
7. Click on the **Green Roof Structure** layer to make it active. There is nothing on this layer yet. You will be modeling something here soon.
8. The **Planting** and **Green Roof Planting** layers contain partially completed planting plans. You'll work with them fully in Section 4 of this guide.
9. Make **Hard Landscaping** the active layer, on the Navigation palette.

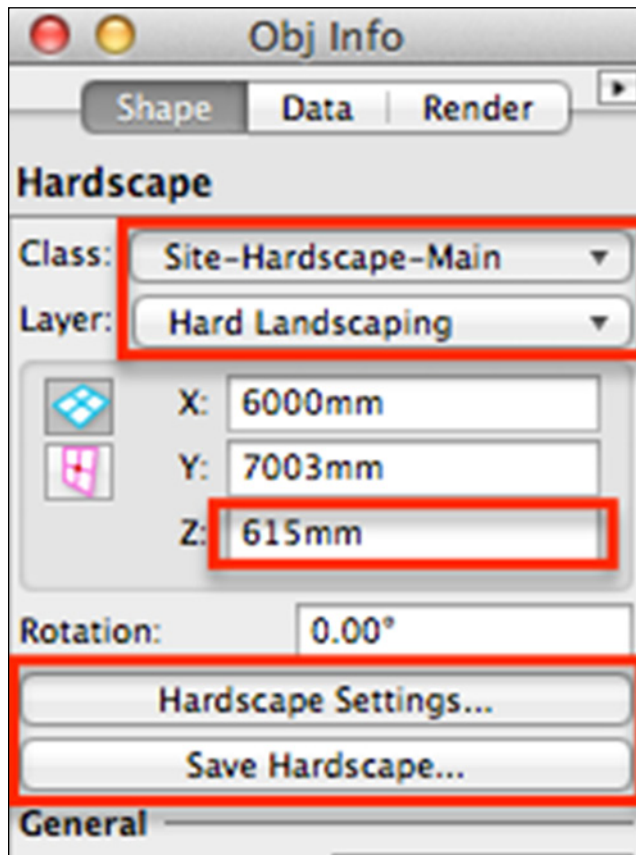


There is a terrace already completed in the file so you can examine its settings, before creating your own.

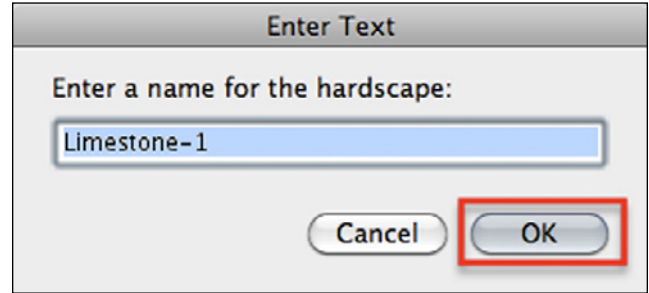


Examine the Terrace

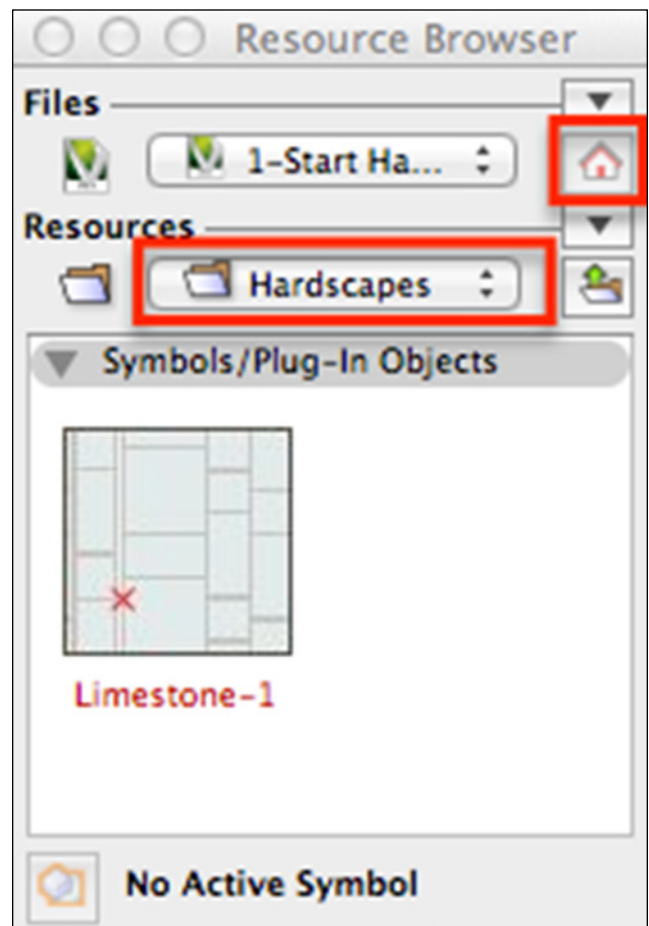
1. The terrace is already completed, so that you can look at the settings before creating your own.
2. Click the **Selection** tool, and select the existing terrace. Remember at the start of this exercise, we saw that the design layers are at different elevations. On the Object Info palette, notice this is a Hardscape object, drawn on the layer Hard Landscaping, which is positioned at -650 mm [-2'1½"]. However, the Z field shows the object positioned at 615 mm [2']. This object is therefore positioned 615 mm [2'] higher than the layer on which it is drawn. It has a thickness of 35 mm, so its top surface is at 650 mm. Click OK.
3. Click on the **Hardscape Settings** button on the Object Info palette. The Hardscape Object Settings dialog opens. This Hardscape Object has been created for you in advance, and certain elements have been configured, such as the joint pattern, the thickness in 3D, and the Renderworks Texture that will be applied in a rendered view. You'll learn more about these settings in a moment. Click OK to dismiss the dialog.



4. On the Object Info palette, click the **Save Hardscape** button. Click OK when prompted to name the Hardscape, and use the default name that Vectorworks Landmark offers.



5. On the Resource Browser, click the **Home** button to ensure you are looking at the contents of the current file. Under the word **Resources**, choose **Hardscapes** from the folder menu. The Hardscape definition has been saved, and you will re-use it later.



6. Keep the file open to use in the following exercise.

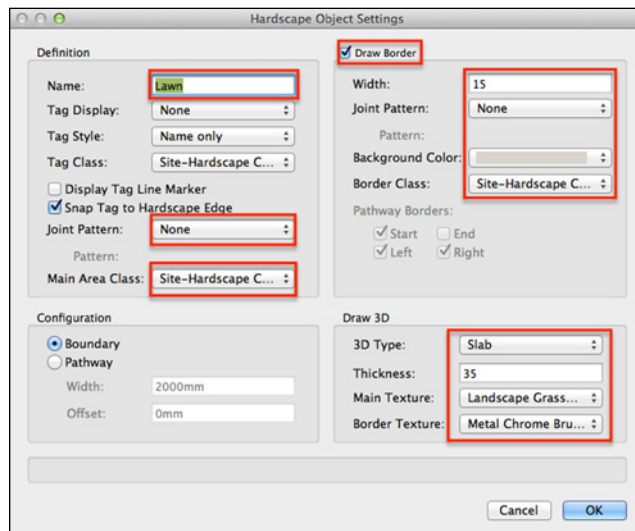
Exercise 2: Create Hard Landscaping Areas

Now, you will learn how to create a Hardscape Definition and draw with the Hardscape tool. The Hardscape tool is a very powerful tool for creating 2D and 3D representations of Hard Landscaping. You can draw with it, or create Hardscape from existing shapes. It can also keep track of the materials used in your design. In this exercise, you'll use the Hardscape tool to create a lawn. But maybe you are thinking that a lawn is surely a softscape. Well, I use Hardscape for lawn, because it's an easy way to create a 2D/3D lawn, and to quantify the area.

Create Lawns

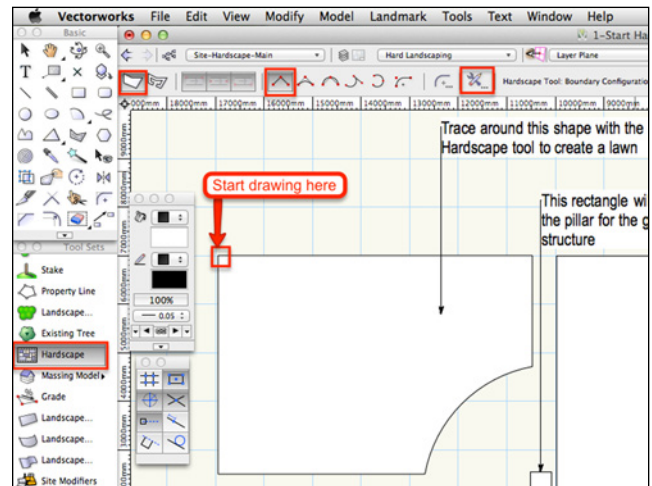
- Using the Navigation palette, make **Site-Hardscape-Main** the active class.
- On the **Site Planning** tool set, click the **Hardscape** tool. Look at the **Tool bar**. There are two modes for drawing **Boundary Mode** and **Pathway Mode**, for drawing areas and paths, respectively. There are also exactly the same modes as you have used with the Polyline tool.
- Choose **Boundary mode**, and then **Corner Vertex mode**, and then click on the **Hardscape Tool Preferences** button.
- Complete the Hardscape Object Settings dialog as follows, leaving all other settings unchanged:

- Hardscape Name: **Lawn**
- Joint Pattern: **None**
- Main Area Class: **Site-Hardscape Comp-Lawn**
- Draw Border: **Check**
- Width: **15 mm [5/8"]**
- Joint Pattern: **None**
- Background Color: Choose a pale Gray.
- Border Class: **Site-Hardscape Comp-Border Joint**
- 3D Type: **Slab**
- Thickness: **35 mm [1 3/8"]**
- Main Texture: **Landscape Grass Fairly Green**
- Border Texture: **Metal Chrome Brushed**
- Click OK to close the dialog.

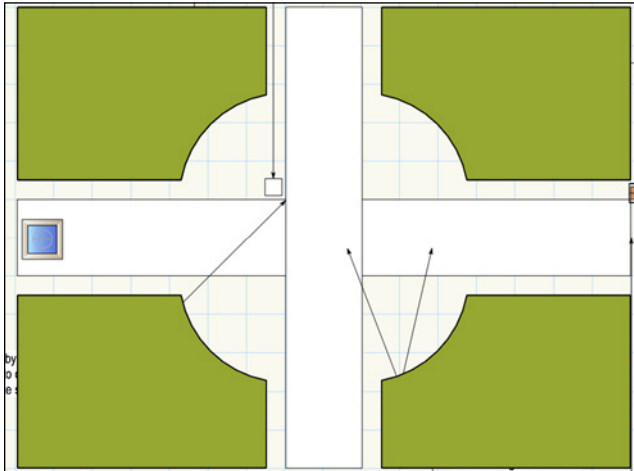


- As indicated above on the screenshot, click on the top left point on the shape. Move the cursor to the right, and click. Move the cursor down to the next point and click. Remember you can use the Snap Loupe (Z key), to zoom to each point without changing your overall view.

- On the Tool bar, change the drawing mode to **Point on Arc** mode. Click anywhere on the arc and again at the end of the arc.
- Change the drawing mode to **Corner Vertex** mode and click on the next point.
- Press **K** on your Keyboard to close the shape and complete the Hardscape object.

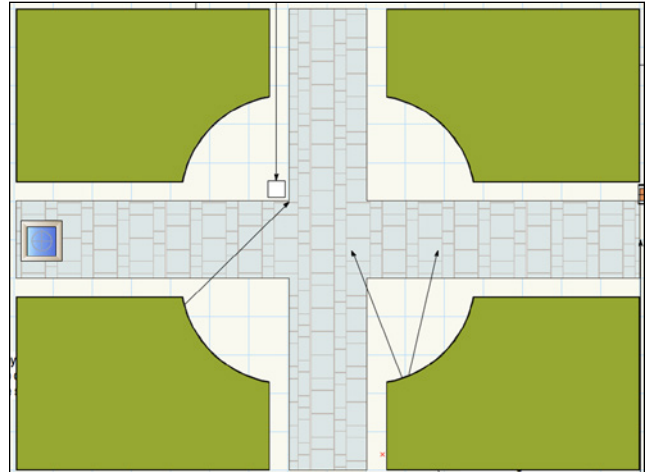


- Choose the **Mirror** tool from the Basic palette. Click once on the center point on the two rectangles crossing the site. Move the cursor upward, snapping to the vertical cue, and click again. The Hardscape object will be mirrored.
- Using the **Selection** tool together with the Shift key, click on the original hardscape object so that both are selected.
- Use the **Mirror** tool again, this time drawing a horizontal reflection line through the center of the horizontal rectangle.



Create the Paved Areas

1. Click the **Selection** tool and click on the drawing area to deselect the hardscapes. Press the Shift key. Select the two rectangles that cross the site horizontally and vertically.
2. Choose **Modify > Add Surface** to add these two shapes together and form a single Polygon.
3. Choose the **Landmark > Create Objects from Shapes** command. Complete the Create Objects from Shapes dialog as follows:
 - Object Type: **Hardscape**
 - Delete Source Shapes: **Check**
 - Click OK to close the dialog and create the Hardscape.
4. The resulting Hardscape will have the same settings as the Lawn, but we will change that now. Look at the Object Info palette and confirm that the object has become a Hardscape.
5. On the Resource Browser, locate the **Hardscape Limestone-1** resource that you created earlier. Drag the hardscape resource onto the new hardscape to transfer the settings.
6. Click the **Selection** tool and select the Hardscape. Choose **Modify > Send > Send to Back** to place the Hardscape below the water feature.

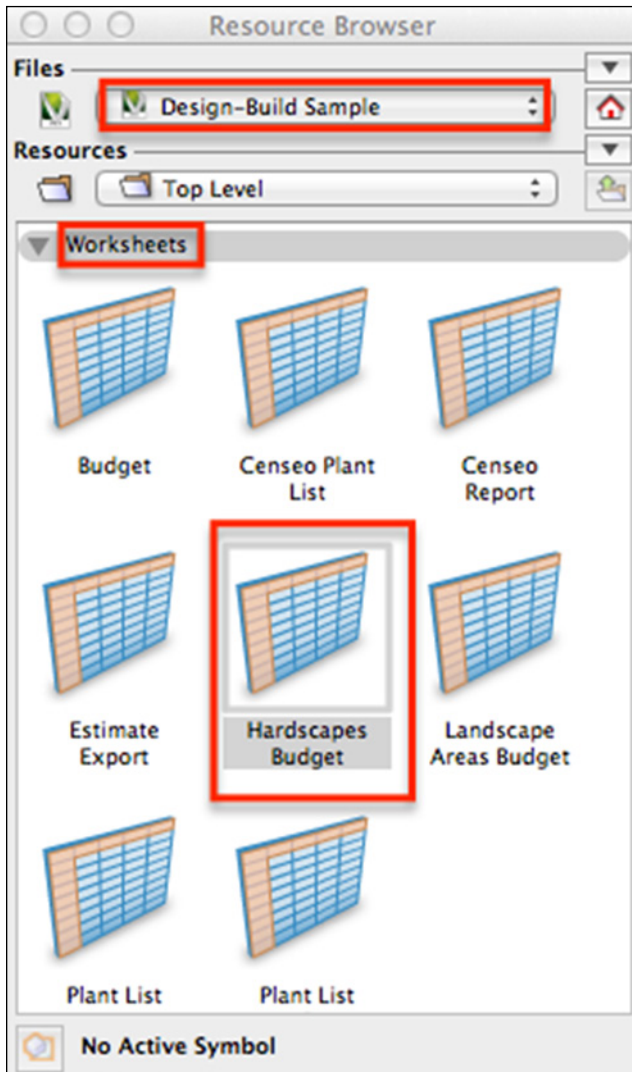


7. Keep the file open to continue working with it in the following section.

Exercise 3: A Hardscape Report

As well as producing beautiful plans and 3D models, Vectorworks can count things, so you don't have to. In this exercise, you'll learn how to use one of the prebuilt worksheets to list the quantity of hardscape materials used in these areas. You will learn how to change the formatting of this worksheet to suit your own unit of measure and currency.

1. Make **Notes-Reports** the active class, on the Navigation palette.
2. On the Resource Browser, use the **Files** menu to list the contents of the **Design-Build Sample.vwx** file.
3. Scroll down to the Worksheets heading and locate the Worksheet called **Hardscapes Budget**.

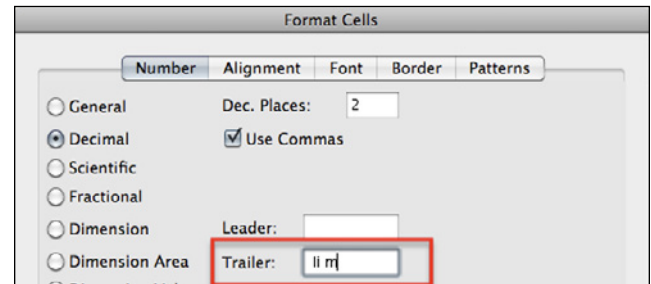


4. Drag this worksheet onto your drawing. Notice that it lists by name each area created with the **Hardscape** tool, with its perimeter, area (in the current document area unit setting), price (per sq ft), and the total cost.

Hardscape Budget				
Hardscape Name	Perimeter	Area	Price/sq ft	Total
Limestone	55.90 li ft	51.9 sq m	\$0/sq ft	\$0
Limestone	31.00 li ft	49.5 sq m	\$0/sq ft	\$0
Lawn	20.85 li ft	25.66 sq m	\$0/sq ft	\$0
Lawn	20.85 li ft	25.66 sq m	\$0/sq ft	\$0
Lawn	20.85 li ft	25.66 sq m	\$0/sq ft	\$0
Lawn	20.85 li ft	25.66 sq m	\$0/sq ft	\$0
Total				\$0

5. Double-click the worksheet on the drawing to open it in its own window. If you're a spreadsheet user, many of the functions in worksheets are similar, but without as many fancy buttons as a modern spreadsheet.
6. Choose **View > Database Headers**. A new row opens that contains all the clever calculations needed to read your design and list your hardscapes.

7. Click in cell B3, just below the word "Perimeter." Choose **View > Format Cells**.
8. If appropriate to your geography, change the Trailer field to "li m" (to represent linear meters), and then click OK.



9. The new trailer will display on the worksheet.
10. Click on cell D3, directly below Price/sq ft.
11. Choose **Format > Cells** again and change the Leader and Trailer fields to appropriate currency symbol and area unit for your geography, and then click OK.
12. Repeat the process for the Price column and cell E4 at the bottom of the Price column.
13. Row 2 contains simple text as headings. Click on each cell that needs changing, and then edit the text in the edit box at the top of the worksheet window, and then press Enter.

	A	B	C	D	E
1	Hardscape Budget				
2	Hardscape Name				
3.1	Limestone	33,009.21 li m	54.02 sq m	\$0/sq m	\$0
3.2	Limestone	55,898.61 li m	51.9 sq m	\$0/sq m	\$0
3.3	Lawn	20,852.88 li m	25.65 sq m	\$0/sq m	\$0
3.4	Lawn	20,852.88 li m	25.65 sq m	\$0/sq m	\$0
3.5	Lawn	20,852.88 li m	25.65 sq m	\$0/sq m	\$0
3.6	Lawn	20,852.88 li m	25.65 sq m	\$0/sq m	\$0
4	Total				\$0

14. Click on cell D3.1. Enter a price per area measurement—for example 50. Notice the Total cost for this row increase, and the Total at the bottom increase.

This worksheet has been set up to calculate the total price for each area based on the cost per square area. The values are correct wherever you are working, because of the unit settings in your file.

15. Choose **View > Database Headers** again to hide the row with all the clever bits (worksheet functions).
16. Close the worksheet window by clicking on the red button at the top left of the window (Macintosh) or clicking the x at the top right of the window (Windows). The updated worksheet displays on the drawing. For now, select and delete the worksheet. It is now a resource of this file, and we will use it later.

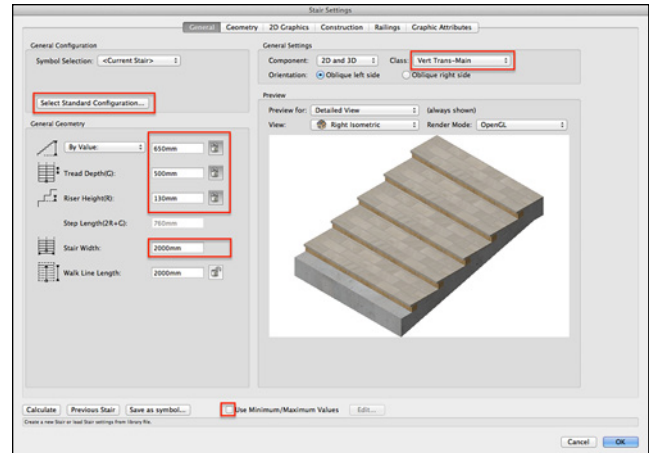
Exercise 4: Create Steps

The Stair tool is new to Vectorworks Landmark. Previously, it was only available to Vectorworks Architect or Vectorworks Designer users. It is a powerful and flexible tool, with many built-in configurations, all of which can all be customized to suit different scenarios. In this exercise, you'll learn how to create a simple, straight flight of stairs.

Create a Straight Run of Steps

1. From the **Building Shell** tool set, choose the **Stair** tool. On the **Tool bar**, click on Insert Mode and then **Stair Tool Preferences**.
2. Click the **General** tab. On the right of the dialog, notice that the class for this stair is Vert Trans-Main. This class is automatically assigned because we have Auto-classing switched on in this file.
3. Click **Select Stair Configuration**.
4. The Select a Stair Configuration dialog box opens. Change following:
 - Click **Straight, Single Flight/Run**
 - Under Transfer settings from current stair: Uncheck everything
 - Click OK

This will ensure that this will be a fresh stair, that we will define from scratch.



5. On the **General** tab, set the following:

- Use Maximum/Minimum Values: **Uncheck**
- Height: **650 mm [2' 1 5/8"]** and click the **Lock icon**
- Tread Depth (G): **500 mm [1' 7 7/8"]** and click the **Lock icon**
- Riser Height (R): **130 mm [5 1/8"]** and click the **Lock icon**
- Stair Width: **2000 mm [6' 6 3/4"]**

These values set the basic geometry for the stair. In this example, we are setting the desired geometry very precisely. Note, however, that you can use the Use Minimum/Maximum Values dialog to apply constraints to the stair, such as building regulations for your geography, to enable Vectorworks to calculate the appropriate size of different parts of the stair as required.

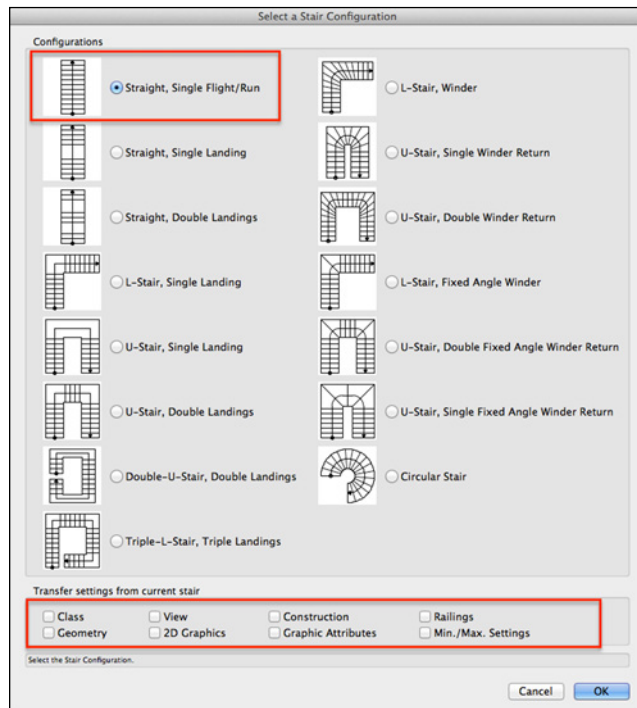
6. Click the **Geometry** tab. Most of the desired geometry for our stair is already set. However, we will enable the top tread to be drawn and set its size. Note that you may not always want a top tread, as the top tread will be the surface onto which the stairs lead.

- Draw Top Tread: **Check**
- Set the size of the top tread to **500 mm [1' 7 7/8"]**

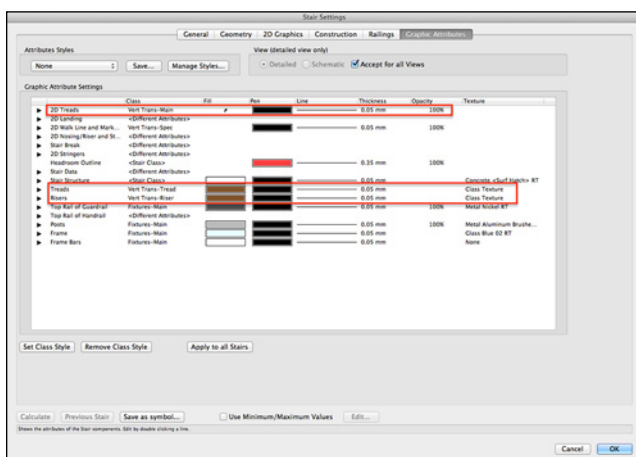
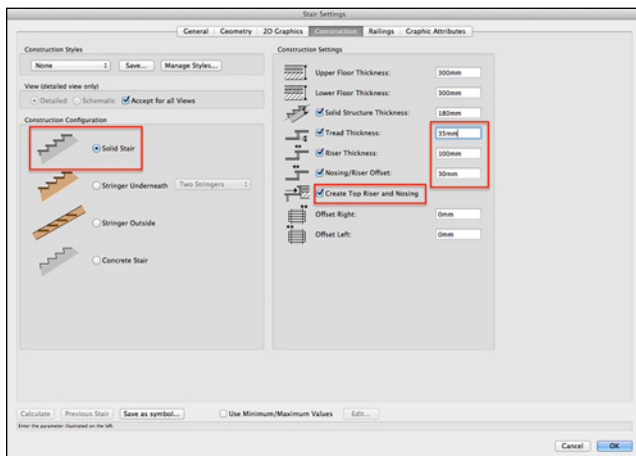
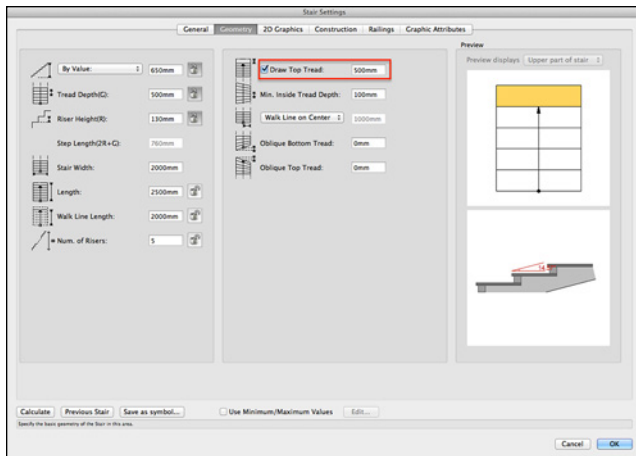
7. Click the **Construction** tab. Make the following choices:

- Construction Configuration: **Solid Stair**
- Solid Structure Thickness: **250 mm**
- Tread Thickness: **35 mm [1 1/4"]**
- Riser Thickness: **100 mm**
- Nosing/Riser Offset: **30 mm [1 1/8"]**

8. Click the **Railings** tab. Here you can configure a variety of railing and panel styles. For this stair however, we will not need railings as the stair will be enclosed by walls.



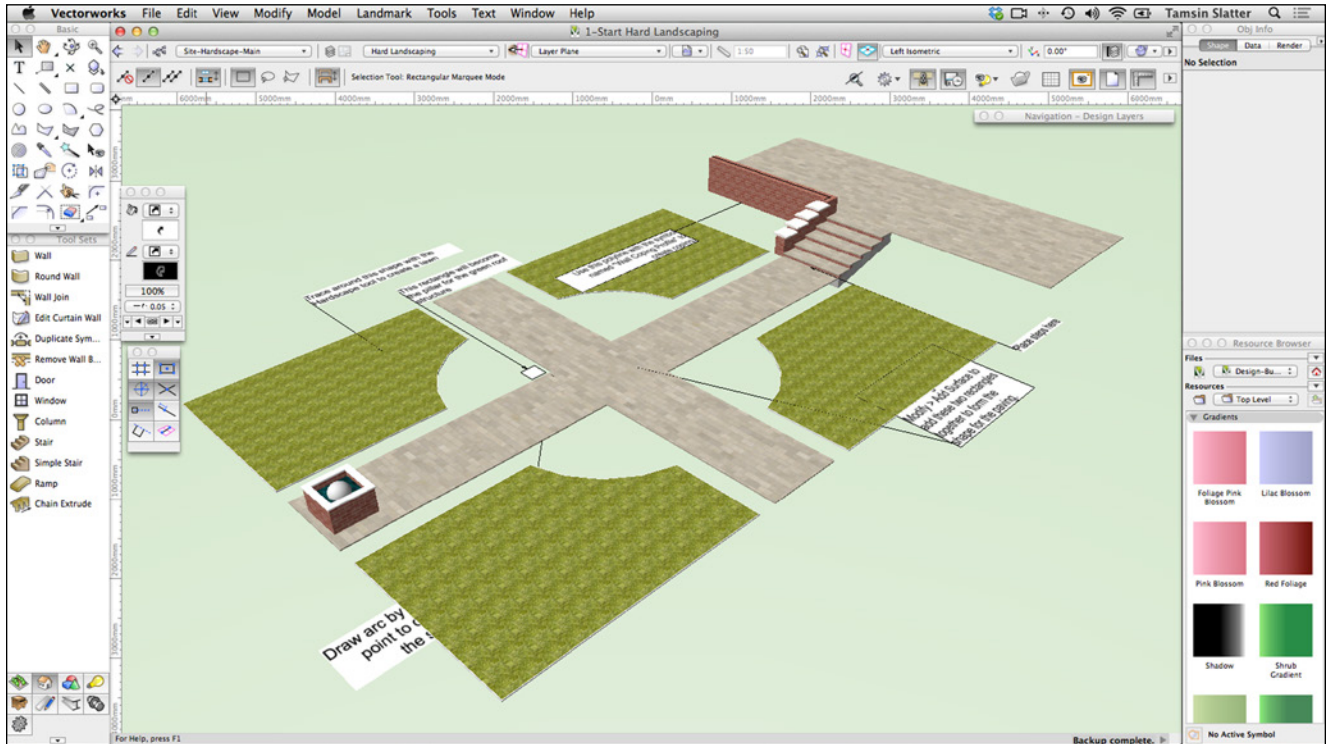
- Check **Both Sides** to ensure your choices apply to both sides of the stair.
- Click **Handrail** on the left and the uncheck Show Handrail.
- Click **Guardrail** and uncheck Show Guardrail.



9. Click the **Graphic Attributes** tab. Here you can set the display preferences for both the 2D and 3D parts of the stair. In this case, I have pre-defined classes that contain the 2D fill (the same as the Hardscape), and the Renderworks Textures that represent the 3D parts0. Double-click each of the following parts and then set the appropriate class:

- **2D Treads:** Class: **<Stair Class>**, Fill: **Class Style**. Click OK.
- **Treads:** Class: **Vert Trans-Treads**, Fill: **Class Style**, Texture: **Class Style**. Click OK
- **Risers:** Class: **Vert Trans-Risers**, Fill: **Class Style**, Texture: **Class Style**. Click OK.

10. You have now set the preferences for the Stair. The General tab will display a preview of the stair, if you wish to look at it. Click OK to close the Stair Preferences dialog.
11. The cursor has a set of steps attached to it, with the insertion point at the center of the bottom of the steps.
12. Click on the drawing to the right of the paving, and click again to rotate the steps in a horizontal orientation so that they lead to the terrace.
13. Press **X** to shortcut to the **Selection** tool. Choose **Modify > Send > Send to Back** to place the stairs below the wall coping on the plan.
14. On the **View bar**, click the **Classes** button. Highlight the **Vert-Trans-Main** class and click **Edit**.
15. Review the settings for this class. This class determines the 2D view for the stair. Click Cancel.
16. Highlight the class **Vert Trans-Treads** and click **Edit**. Review the settings for this class. This is the class that determines the Renderworks texture that will be applied to the 3D treads. Click Cancel.
17. On the **View menu** on the **View bar**, select **Left Isometric**. The objects you have drawn on this layer all have 3D counterparts and you can now view them in an OpenGL rendered mode.



Exercise 5: Draw and Edit Stepped Walls

In this exercise, you'll draw the remaining wall to retain the other half of the terrace and the steps. You will also learn how to step the walls so that they follow the incline of the steps. Then, you'll model some coping.

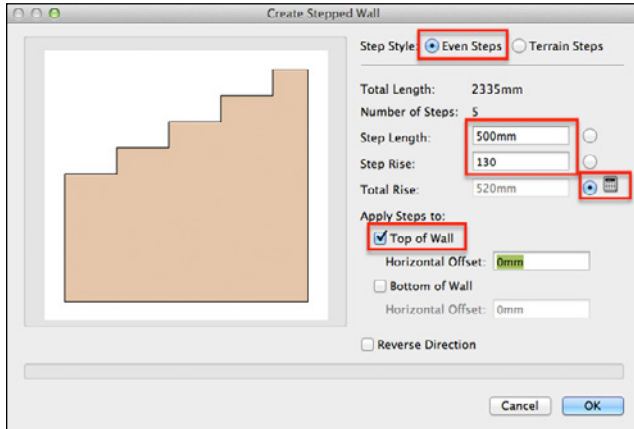
Use the Wall Tool to Draw Walls

- Return to Top/Plan view using either the View menu on the View bar or Ctrl+5 (Windows) or Cmd+5 (Macintosh).
- Use the Navigation palette to set the active class to **Walls-Brick**.
- From the **Building Shell** tool set, choose **Wall**. On the Tool bar, click **Wall Tool Preferences** and change the settings as follows:
 - On the Definition tab, click **Standard Wall** and set Overall Thickness: **330 mm [1' 1"]**
 - On the Insertion Options tab, set Height: **1150 mm [3' 9 1/4"]**
 - On the Textures tab, click **Use Object Textures** and then use the Part dropdown list to select in turn **Overall**, **Right** and **Left**, then click **Choose Texture** and select **Bricks**.
 - Click OK.
- Starting at the lower left corner of the steps, click once to start drawing the wall. Click again on the lower right corner of the steps. Move the cursor down, and double-click on the end of the terrace to complete the walls.
- Check the 3D view again and note that the wall sits on the active layer (with a Z value of -650 mm [2' 1 5/8"]) and extends 500 mm [1' 7"] above the level of the terrace and the design layer.

Create a Stepped Wall

To match the wall on the other side of the steps, you'll now learn how to create a stepped wall.

- Click the **Selection** tool and click on the drawing area to deselect the walls.
- Select the Wall that sits to the right of the steps.
- On the Object Info palette, change Height to **630 mm [2' 0 3/4"]**. This will become the starting height for the wall.
- Choose **Landmark > Architectural > Create Stepped Wall**.
- Change the following settings:
 - Step Style: **Even Steps**
 - Total Rise: **Check** to have Vectorworks calculate this.
 - Step Length: **500 mm [1' 7 7/8"]**
 - Step Rise: **130 mm [5 1/8"]**
 - Apply Steps to Top of Wall: **Check**
 - Apply Steps to Bottom of Wall: **Uncheck**
 - Click OK.



Model Coping For the Wall

I have created coping on the stepped wall on the left side of the steps. You'll now use a profile shape that I've prepared for you and a polyline I've also prepared, to create coping for the long section of wall. Then, you'll mirror the coping to the other side of the steps.

1. Make **Walls-Stucco** the active class.
2. On the Resource Browser, click the **Home** button to ensure you are looking at the resources in the current file.
3. Locate the "Wall Coping Profile" symbol.
4. Double-click the symbol to make it active. Click twice on a blank space on the drawing area to insert a copy of the symbol. You'll learn more about symbols in the next exercise.

5. Click the **Selection** tool. Select the polyline along the top of the wall. Press Shift and also select the coping profile.

6. Choose **Model > Extrude Along Path**.

7. Press **Next** and then **Previous** to ensure that the polyline along the top of the wall is highlighted in red. This ensures the polyline will be the "path" object. Click OK.

The profile is extruded along the length of the wall to create a coping stone. Notice that the coping has sunk into the surface of the wall.

8. Double-click the coping. On the Edit Extrude Along Path dialog, click **Profile** and click OK. The Profile editor is displayed.

9. Click **Fit to Objects** if necessary to bring the profile into the center of the screen.

Notice that the center of the profile is on 0, 0. This is the part of the profile that is currently aligned with the original path polyline, or, in other words, the top of the wall.

10. Click on the bottom center of the profile shape and drag it up to snap onto the origin, (0,0).

11. Click the orange **Exit Profile** button at the top right of the screen. The coping is now positioned correctly on the wall.

12. Click **Select Similar**. Click on one of the Extrude Along path objects to select them all.

13. Click the **Mirror** tool. Draw a horizontal mirror line through the center of the steps to mirror the coping to the opposite walls.

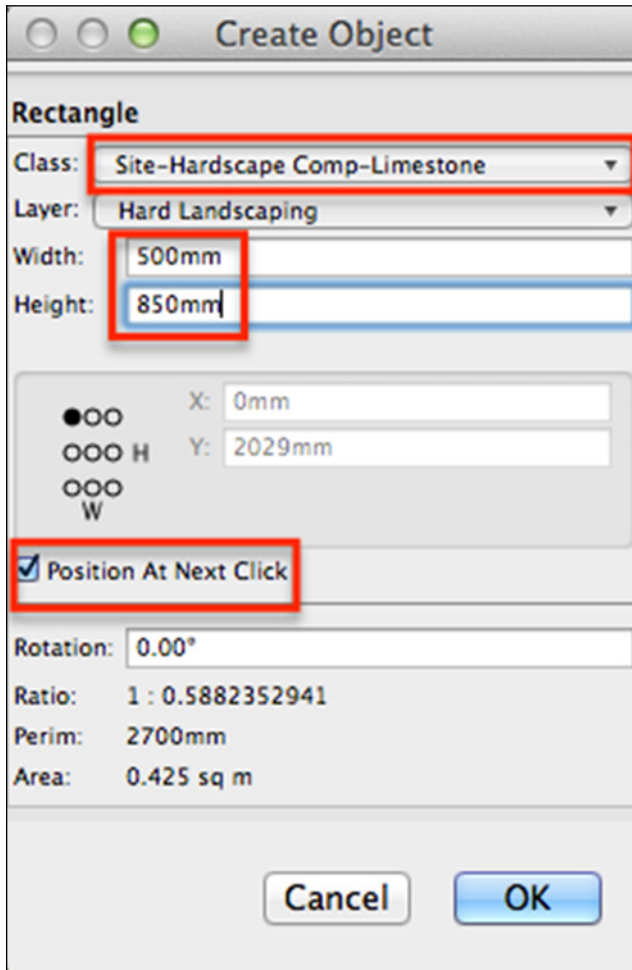
14. Return to Top/Plan view.

Exercise 6: Model Stepping Stones

In this exercise, you'll model a simple paving stone to use as stepping stones around the garden. You'll learn how to use the Duplicate Along Path command to accurately place and space objects along a curve. The symbol will be both 2D and 3D.

Create a Hybrid Symbol

1. Double-click the **Rectangle** tool on the Basic palette.
2. When the Create Object dialog opens, set the following fields, leaving all other fields unchanged:
 - Class: **Site-Hardscape Comp-Limestone** (to pick up the graphic attributes from this class).
 - Layer: **Hard Landscaping**
 - Width: **500 mm [1' 7 7/8"]**
 - Height: **850 mm [2' 9 1/2"]**
 - Position at Next Click: **Check**
 - Click OK.
3. Click on the drawing away from the garden area—this is a temporary rectangle. The rectangle will be placed on the drawing area where you click.

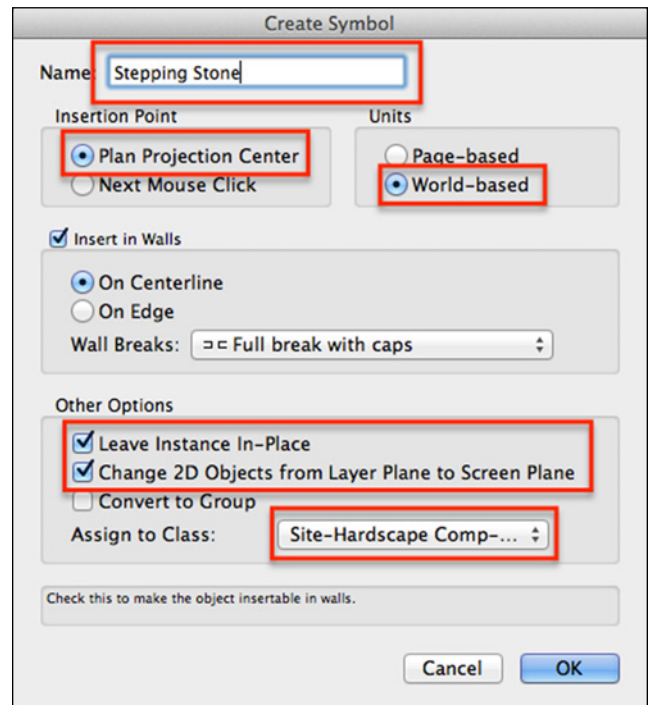


4. Choose **Edit > Copy** and then choose **Edit > Paste in Place**. You now have two rectangles, one sitting on top of the other, with the most recently drawn rectangle selected.
5. On the Navigation palette, click the **Classes** button and make **Site-Hardscape Comp-Limestone** the active class.
6. Choose **Model > Extrude**. In the Create Extrusion dialog, enter an extrusion value of **35 mm** [1 3/8"], leaving the other fields unchanged. Click OK.
7. With the extruded rectangle still selected, click on the **Object Info** palette's **Render** tab. Notice that the Texture is set to Class Texture, which means that the class texture is being picked up from the **Site-Hardscape Comp-Limestone** class. Click the Shape tab.
8. Using the **Selection** tool, click and drag around both the rectangle and extrude to ensure they are both selected.
9. Choose **Modify > Create Symbol**. On the Create Symbol dialog, complete the fields as follows, leaving all other fields unchanged:

- Name: **Stepping Stone**
- Insertion Point: **Plan Projection Center**
- Units: **World-based**
- Leave Instance in Place: **Check**

- Change 2D Objects from Layer Plane to Screen Plane: **Check**
- Assign to Class: **Site-Hardscape Comp-Limestone**
- Click OK

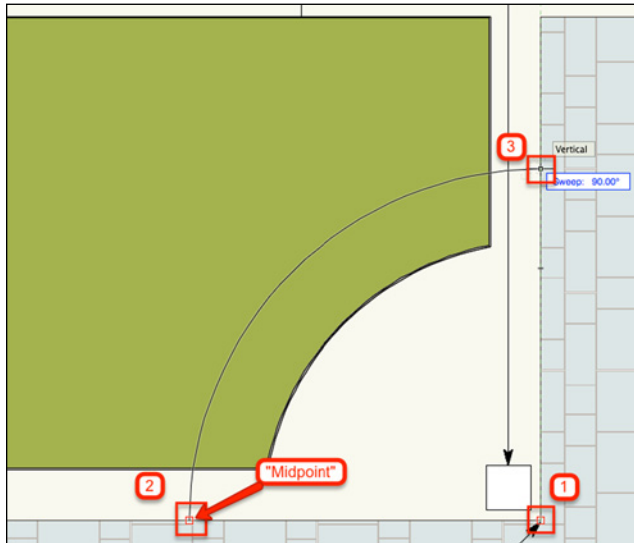
10. When prompted, choose to place the new symbol in the Hardscapes folder on the Resource Browser and click OK again.



This has created a new symbol, with one instance of the symbol still on the drawing area, with a definition sitting in the Resource Browser. Each time this symbol is used, it will belong to the Site-Hardscape Comp-Limestone class, and you will not have to remember to classify it.

Next, you will duplicate this symbol. When design elements need to be repeated, symbols are an efficient way to keep the file size down. On the **Object Info** palette, the object type has changed from Rectangle and Extrude to 2D/3D Symbol.

11. Make **None** the active class.
12. On the Resource Browser, click the **Home** button on the right of the palette to ensure you are looking at the resources of the current file. Open the Hardscapes folder and verify that the symbol has been created.
13. From the Basic palette, choose **Arc**, and then choose **Arc by Radius** mode on the Tool bar.
14. Click on the point indicated on the screenshot and by the text in the file. This is the center of the arc.
15. Move the cursor to the left, and snap to the top center of the left "arm" of the paving, and then click.
16. Move the cursor upward and to the right to draw an arc that meets the vertical path and then click.

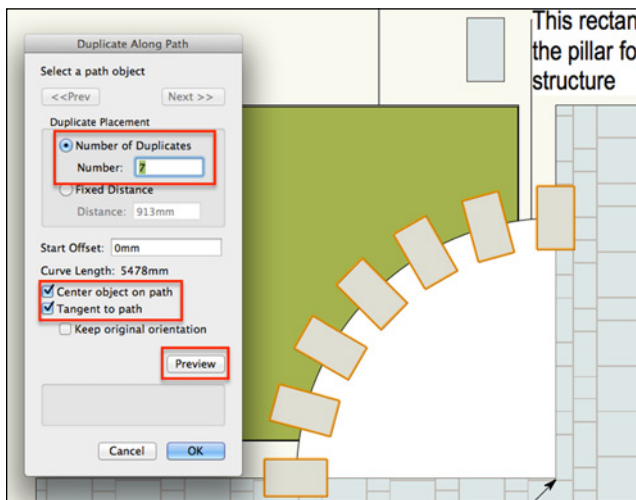


17. Use the **Selection** tool + Shift key to select both the symbol and arc.

18. Choose **Edit > Duplicate Along Path**.

19. On the Duplicate Along Path dialog, enter the following information, leaving all other fields unchanged:

- Number of Duplicates: **7**
- Center object on path: **Check**
- Tangent to path: **Check**
- Click **Preview** to see the effect.
- Click **OK** to complete the operation and close the dialog.



20. Use the **Selection** tool to select the arc and then delete it using the Delete or Backspace key on your keyboard.

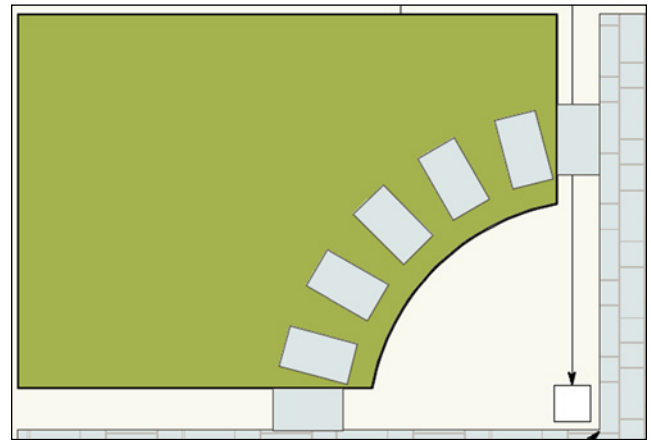
21. Notice that the first and last symbol instances have been centered on the start and end of the arc. Use the **Selection** tool to click on one of the end symbols.

22. From the Basic palette, click the **Move by Points** tool and then choose the first mode, **Move** mode. Ensure that **Object Retention**

mode is not clicked and that only one copy will be made. Move by Points can be used to copy objects, but on this occasion you will just move objects.

23. Move the mouse along the top edge of the symbol, looking for the Center Left cue, and click (remember, the symbol has been rotated when copied, but remembers its original orientation). Move the cursor vertically, to the edge of the lawn hardscape, and click again. The symbol now fits neatly into the planting border.

24. Move the cursor to the symbol instance at the other end of the arc. Press Ctrl (Windows) or Cmd (Macintosh) to select it (with the Move by Points tool still selected). Repeat the move process to move the paver horizontally.



25. From the Basic palette, choose the **Select Similar** tool (often referred to as the "magic wand"). On the Tool bar, click on the **Select Similar Tool Preferences** button (the wrench and pencil icon). Check **Symbol Name** and then click OK.

26. Click on one of the symbol instances. They will all be selected.

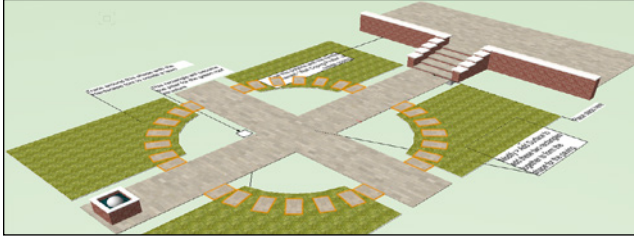
27. From the Basic palette, choose the **Mirror** tool. Draw a vertical reflection line as you did earlier to mirror the lawn, using the top Midpoint cue of the central vertical path to find the center of the design. Notice the preview of the mirror operation that is displayed before the second click.

28. Click **Select Similar** again, with the same settings, and select all of the symbols.

29. Use the **Mirror** tool again to reflect these through a horizontal reflection line, using the Midpoint cue on the horizontal path to find the center of the design.

30. The symbols have been placed on the **Hard Landscaping** layer, as have the lawn hardscapes. Both elements have a thickness of 35 mm [1 3/8"]. In a 3D view, their surfaces will be level, which makes it hard for Vectorworks to determine what to show. Using the **View menu** on the Tool bar, choose **Left Isometric**. Use the **Select Similar** tool to select all of the paving symbols.

31. On the Object Info palette change Z to **10 mm [3/8"]** to set the pavers slightly above the lawn.



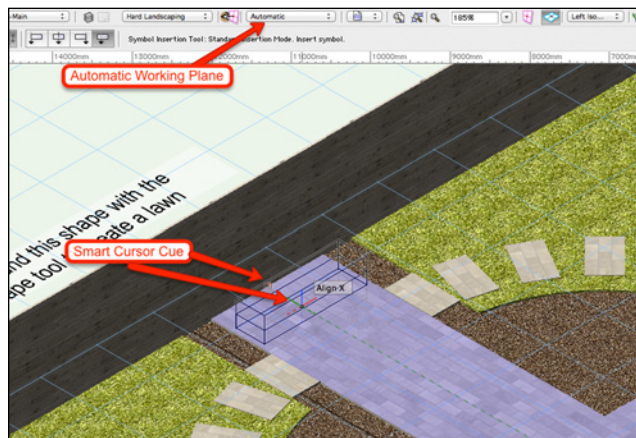
32. Choose **File > Save** but keep the file open so you can continue working.

Exercise 7: Add Furniture

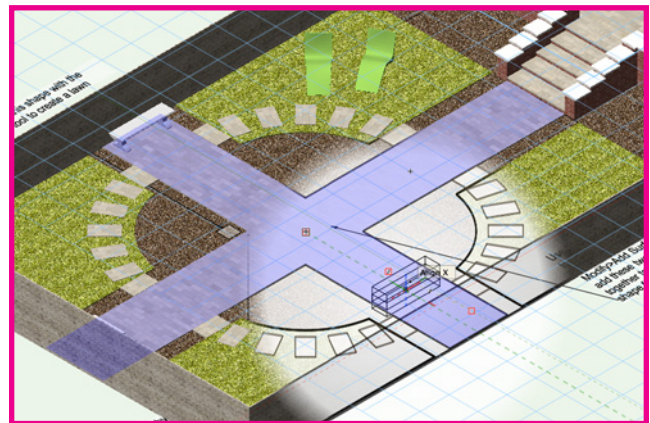
To add some interest to the scene, you'll now add some benches and loungers from the symbol libraries. I have already imported the relevant symbols into the file for you to use. The Concrete Straight Bench is from the **Objects-Landscape and Site.vwx** file that is a favorite file on your Resource Browser. The lounger symbol (SiteFurn-Landscape Forms CL350-00) is from a larger library of Landscape Forms furniture, which is available to download from the Vectorworks Service Select portal, for Vectorworks Service Select subscribers only. Remember, you learned how to add Resource files to your Resource Browser in the Installation and Setup section: Accessing Landmark Resources.

Place Some Library Symbols

1. On the Navigation palette, change Layer Options to **Show/Snap Others**.
2. On the Render mode menu on the View bar, choose **OpenGL Options**. Change the following settings:
 - Detail to **High**.
 - Use Shadows: Uncheck.
 - Click OK.
3. Use the mouse or trackpad to zoom and pan the model so that you can clearly see the lower area of the space.
4. Make **Fixtures-Main** the active class.
5. On the Resource Browser, double-click the **Concrete Straight Bench** symbol to make it the active symbol.
6. Move the cursor to the top of the vertical path, and use the SmartCursor to obtain a snap on the center of the path. Notice the surface of the paving highlights in blue. Vectorworks is using Automatic Plane mode to detect the 3D surface of the paving.
9. On the Object Info palette, notice that the Z value is already set to 35 mm, as Automatic Working Plane mode detected the surface of the paving.
10. On the Resource Browser, locate the symbol **SiteFurn-Landscape Forms CL350-00**, and then double-click it to make it active.
11. Bring the cursor onto the upper right lawn and click to place the first lounger. Move the cursor to rotate the symbol into a position you are happy with, and then click again to complete the symbol instance insertion.
12. Repeat to place another lounger on this lawn. Again, these symbols will be sitting on the surface of the lawn.

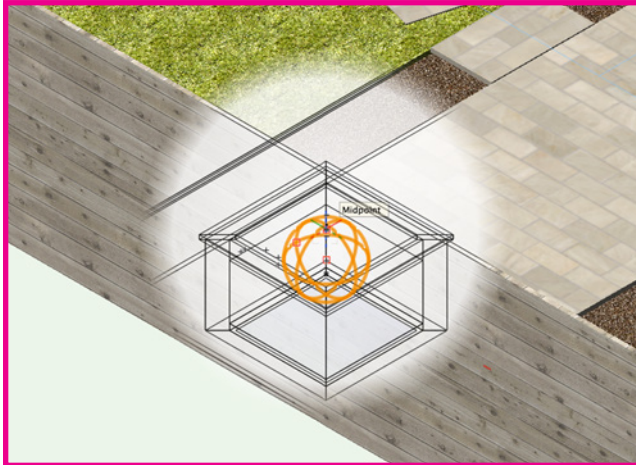


7. Click once to place the center of the bench. Click again without moving the cursor to complete the insertion.
8. Move the cursor to the lower part of the vertical path. Note that the OpenGL render will prevent you from snapping to surfaces that are behind others. Most of the time, this is a very useful feature, but in this case, we need to be able to see through the fence to be able to snap to the paving. Press and hold the **B** key on your keyboard. This invokes X-Ray mode to make modelling easier. Place a second bench at the bottom of the vertical path.



Examine the Water Feature

1. Press B again to invoke X Ray mode on the lower left of the garden to see through the fence.
2. On the left end of the horizontal path is a water feature that has been created for you. Select each of the elements in turn with the **Selection** tool and examine its properties on the Object Info palette.



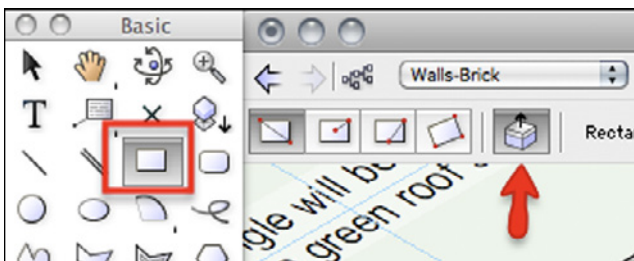
3. The walls have been drawn with the Wall tool. The coping has also been drawn with the Wall tool—but with a greater offset from the layer at the bottom—and a different height and thickness. The body of water has been created by drawing a rectangle and then extruding it. The sphere was created with the **Sphere** tool in the **3D Modeling** tool set. You'll learn more about 3D modeling in the following exercise.
4. Save the file.

Exercise 8: Draw Pillars, Posts and a Roof Structure

In this exercise, you'll gain some experience of using the direct modeling facilities within Vectorworks to create a simple structure that is somewhere between a pergola and a building. The top section of the structure will form a tray that will later host a green roof, and could perhaps also filter rainwater for irrigation.

Extrude the First Pillar and Post

1. If your model is not already in a 3D view, change to Left Isometric view.
2. Make **Walls-Brick** the active class.
3. Locate the small rectangle in the top left quadrant of the garden (the one labeled to become a pillar for the green roof).
4. Choose the **Rectangle** tool from the Basic palette, and on the Tool bar choose the first mode. Note the **Push/Pull** mode which displays when you use 2D tools in a 3D view. This mode should be on by default, but if it is not, turn it on.



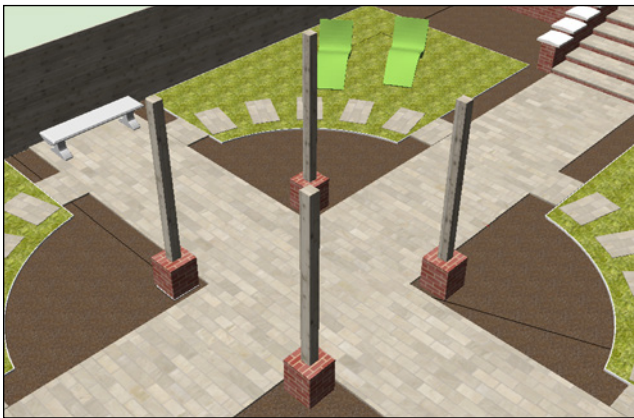
5. Trace over the existing rectangle by clicking on one corner and then on the diagonally opposite corner.
6. Immediately, move the cursor onto the face of the rectangle—it will highlight in red. Click on the face, and move the cursor up to Push/Pull the rectangle into an Extrude. Press Tab, and in the Data bar, enter **525 mm [1' 8 7/8"]**, press Enter on your keyboard, and then click to complete the extrude.
7. Make **Wood** the active class, using either the View menu, the Classes button on the View menu, or the Navigation palette. On the Tool bar, change the mode to **Center to Corner** mode. Move the cursor onto the top of the pillar and watch for the surface plane to be acquired. Draw another rectangle in the center with Center to Corner mode, slightly smaller than the original. After the second click, on the Object Info palette, refine the size: Set Width to **150 mm** and Height to **150 mm**.
8. Click on the surface and tab into the Data bar. Type **2475** and press Enter, then click to complete the extrude.
9. Click the Selection tool and hold down the Shift key. Select both the brick base and the post.





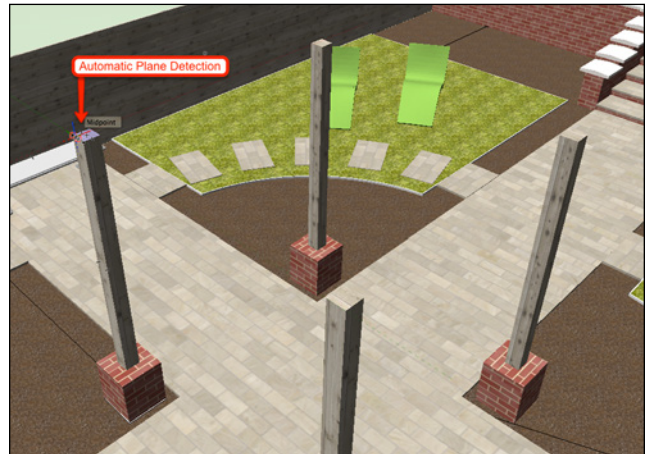
Mirror the Pillar and Post

1. Choose the **Mirror** tool, and mirror the pillar through the center of the path.
2. Using the **Selection** tool, select both pillars and posts, and then use the **Mirror** tool again to mirror through the center of the path on the opposite axis.
3. You will now have four pillars around the center of the paving. The textures set up in the Walls-Brick and Wood classes have been applied because the extrudes have been created in this class.



Extrude the Roof

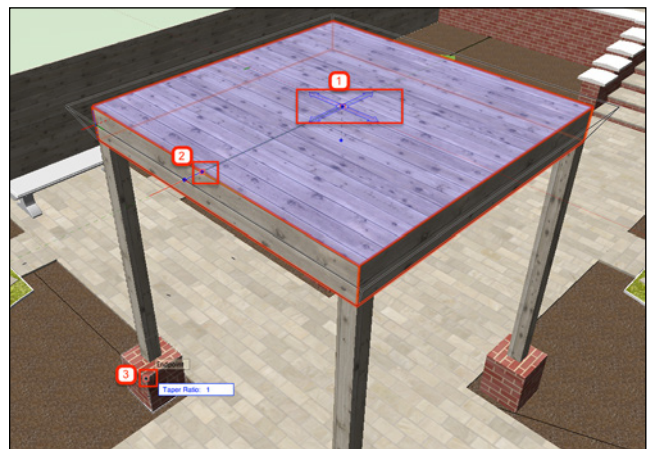
1. Click **Rectangle** on the Basic palette. On the Tool bar, click **Corner to Corner** mode.
2. Hover the cursor over the top surface of the left-most pillar in the 3D view. Notice the automatic plane detection spring into action again, coloring the top surface blue. Click on the outer-most corner of the rectangle and then draw a rectangle across all four posts to form the base of the roof structure.



3. Click on the surface of the new rectangle and pull the rectangle up. Press Tab and type **300 mm [1']** into the blue Data bar type, press Enter on your keyboard and then click the mouse to complete the extrude.

Shape the Planting Structure

1. Click the **3D Modeling** tool set. Click the **Deform** tool. Click **Taper Solid** mode and then select **Symmetric** mode. Click on the roof structure and then click on the center of the top surface. Click on one of the edges and start to move the top surface outward. Move the cursor down to the edge of the brick column base to snap to it. Click to complete the taper action.



2. Now, we'll hollow out the structure so that our green roof planting can sit inside it. On the **3D Modeling** tool set, click the **Shell Solid** tool. On the Tool bar click **Shell Solid Tool Preferences**. Change the following:
 - Shell: **Inside**
 - Thickness: **40 mm**
 - Click OK.
3. Click on the top surface of the roof structure. It will highlight red. Click the green tick tool on the Tool bar, or press Enter to complete the Shell Solid operation.

- With the roof top selected, click on the Object Info palette's Render tab. Scroll down until you find the Rotation field and type **90**. Press Enter. The wood texture will rotate 90°. Click the Shape tab.



- Change the view to Top/Plan.

Create the 2D Plan View

The structure is complete in a 3D view, but in Top/Plan, it doesn't display any fills, unlike the other objects on this design layer, which are both 2D and 3D. Now, you'll learn how a 2D plan view of a 3D model can be generated automatically.

- Make **Fixtures-Main** the active class.
- Click the **Selection** tool. Click and drag around the structure to select all its elements.

- Choose **Landmark > Architectural > Create Auto Hybrid**.

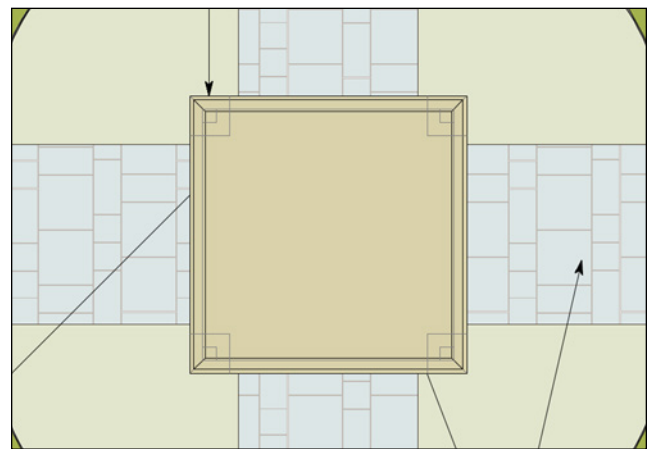
- Notice that Vectorworks has created a 2D plan view of the structure. Currently, only the pillars of the structure are visible on the plan. Notice on the Object Info palette that the cut plane is set at a height of 1000 mm.

- On the Object Info palette, change Cut Plane to **3300 mm [10' 10"]**—the overall height of the structure.

- Click **2D Appearance** and change the following:

- Below Cut Plane tab: Dashed Hidden Line: **Check**

The 2D display is updated to show the structure as it looks at the new cut plane height. Notice that the cut plane displays in the colors of the original objects, in this case derived from their classes.

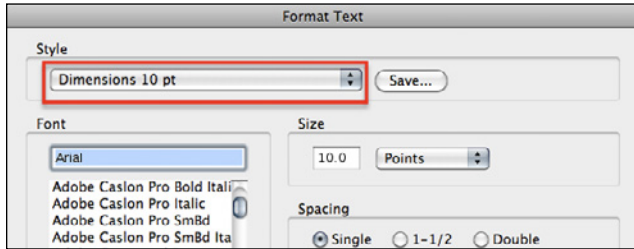


Exercise 9: Add Dimensions to the Structure

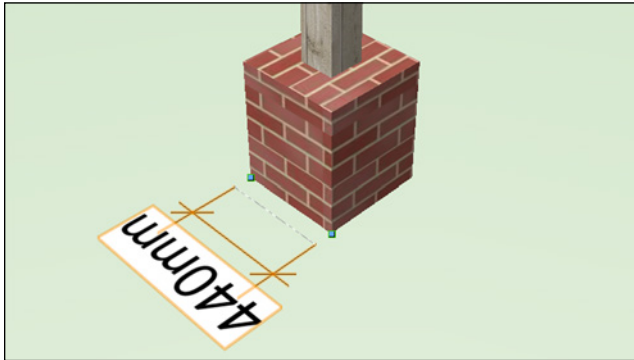
Now that the 3D structure is complete, you'll add dimensions to show you can use the model for construction detailing. You'll move the entire structure to a new layer so it can be isolated easily from the rest of the design. Usually, I'd encourage you to avoid placing dimensions onto your design layers. Best practice is to place dimensions and text as annotations on a viewport. You'll learn more about this later. However, 3D dimensions, such as those we're about to create, need to be created on the design layer.

Use the Linear Dimension Tools in 3D

- Change the view to Left Isometric.
- Click the **Layers** button on the View bar to open the **Organization** dialog. Highlight the layer **Green Roof Structure** and then click Edit.
- Note that the Green Roof Structure layer is at the same elevation as the Hard Landscaping layer, that is the lower level of the garden. Click **Cancel** and click **Cancel** again to close the Organization dialog.
- Click the **Selection** tool and select the structure. As all the elements have been enclosed within a single Auto-Hybrid object, one single click selects it.
- On the Object Info palette, change the Layer field to **Green Roof Structure** to place the object on that layer. The object will no longer display.
- Make **Green Roof Structure** the active layer.
- Change Layer Options to **Active Only** to hide the rest of the design.
- The Auto Hybrid object is still selected after being moved to this layer. Click the **Selection** tool, and click on a blank space on the drawing to de-select it.
- On the **Dims/Notes** tool set, choose **Constrained Linear Dimension**. On the Tool bar, change **Dim Std** to **Arch** (there are many different dimension styles for you to experiment with).
- Choose **Text > Format Text**. On the Format Text dialog, from the Style menu, choose **Dimensions, 10 pt**. This is a predefined series of settings that are displayed in the rest of the dialog.
- Click OK.



12. Click on two points at the base of one of the pillars. Move the cursor away from the base and click to place the dimension on the model.



13. Place dimensions to show the span of the pillars.

14. Continue to add dimensions to the pillar and posts. Dimensions can be placed on any 3D plane.

Vectorworks includes a wide range of dimensioning tools for different types of geometry. It's not appropriate to place all dimensions for this structure as 3D objects. Because of the angled planes of the roof, we'll add further dimensions later when we create presentation sheets for the design.

15. On the Navigation palette, click on the **Classes** button. In the visibility column, to the left of the **Dimension** class, click in the middle column to hide the dimensions. Dimensions are automatically assigned to the Dimension class.

16. On the Navigation palette, click the Layers button and change **Layer Options** to **Show/Snap Others**. Return to Top/Plan view.

17. On the Navigation palette, notice the small x beside the Green Roof Structure layer. The layer is currently invisible. Click in the left-most column under **Visibility**, to restore the visibility of this layer when you work on other layers.

18. Save your file and enjoy a sense of achievement. Maybe have a cup of tea to celebrate.

19. Alternatively, you can open the file provided for the next section.

Summary

Congratulations! You've covered a lot in Section Three. Think back to the objectives we set at the start of the section. Within this sample garden, you can now:

- Use the Hardscape tool to draw Hard Landscaping/Hardscape areas
- Produce a worksheet showing Hard Landscaping quantities
- Create symbols and use ready-symbols within the design
- Use the Custom Stair tool to create steps
- Create free-standing garden walls, stepped and with coping
- Model a simple 3D structure
- Add Dimensions to the 3D structure.

In the following section, you'll complete a planting plan for the planting beds and create the planting for the green roof on the structure.

Section 4: Planting Design

Objectives For This Section

After following the exercise steps in this section, you will be able to:

- Use classes to change the display properties of the planting plan
- Use the different modes of the Plant tool, to place plants into a design scheme
- Create a new Plant Definition
- Create a Landscape Area for calculating plant mixes
- Create a Worksheet to list the plants used in the scheme

Example Files Required For This Section:

- 1-Start Planting.vwx.

Exercise 1: Explore the Planting File and Plant Graphics

Examine the Resources

1. Open the file **1-Start Planting.vwx**.
2. Click on the **Home** button on the right of the Resource Browser, to ensure you are looking at the contents of the current file.
3. Scroll through the Resource Browser and notice many plant symbols already present in the file. I have created these in advance, but you'll learn how to make your own soon.
4. Notice that the symbols have their names displayed in red. This means they are more "intelligent" than ordinary symbols and have an association with a specific tool (in this case, the Plant tool).

Examine the Layers

1. On the Navigation palette, click on the **Design Layers** button. Notice that there are two layers you have not worked with yet: **Planting** and **Green Roof Planting**.
2. These layers are currently invisible. Click on the left-most column under the **Visibility** heading next to these layers, to make them visible. The planting plan is displayed that you will complete in this section.
3. Make **Planting** the active layer.

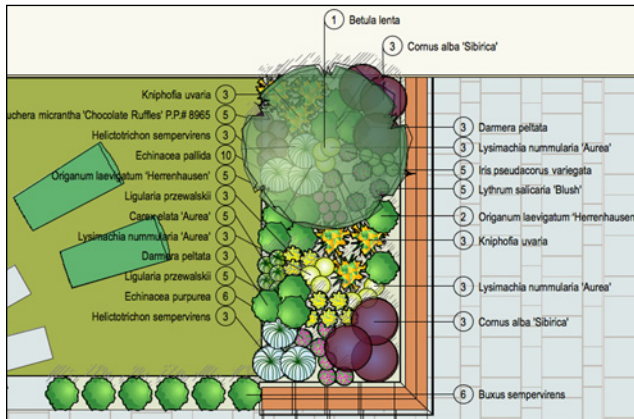
Examine the Classes

1. Click on the **Classes** button on the Navigation palette. Take a look at the classes in a little more detail.
2. There is a series of classes called **Plants-Component-...** You will use these to control the way the plant symbols look.

The symbols you see on the drawing are included with Vectorworks, and can be customized to look just as you want them. This exercise will take you through the different ways you can display these symbols, and the part that classes play in this process. For example, plants can display shadows, sketchy outlines, and reduced detail. This section will introduce you to some of those options before you learn how to create your own plant definitions.

Control Plant Tag Visibility

1. On the Navigation palette, click on the **Classes** button. Locate the **Plants-Component-Tags** and make the class invisible. Make them visible again. Note that the class enables you to control the tags independently of the symbol.
2. The plant tags, displayed by the plants can have different configurations and you'll see how to change them soon. I have arranged their position previously, and as the planting beds are all the same, I have only labelled one bed of each type.

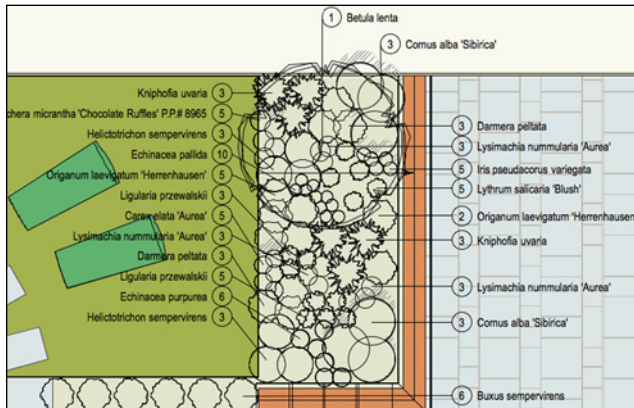


Control Plant Graphics

1. Zoom the view to display the plants in the top **left** planting area.

2. Make the following classes invisible and notice the effect on the drawing. The use of classes make things very flexible:

- Plants-Component-Bloom
- Plants Component-Canopy
- Plants-Component-Color Fill
- Plants-Component-Interior Linework

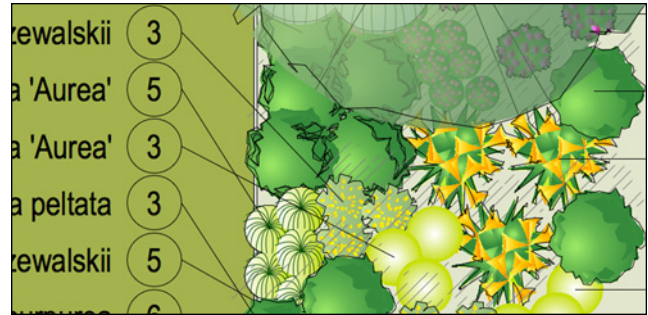


3. Make the classes visible again. Classes within the plant symbols offer control over what displays on the planting plan.

Manage Sketchy Outlines and Shadows

1. Make the **Plants-Component-Outline** class invisible.

2. The individual outlines around the plant symbols within groups have been hidden. Notice, however, that the groups of plants have a sketchy outline around them



3. Click **Selection**. Select one of the plant groups.

4. On the Object Info palette, scroll down to the Annotation/Render heading. Change Outline to **Two Sketch Outlines**. Now try **Tight Outline** and notice how the tight outline is more representative of the original outline of the symbol.

The combination of the sketchy outline render and the hidden Plants-Component-Outlines class is one way to display groups of plants. Now, we'll explore another.

5. Make the **Plants-Component-Outline** class visible.

6. On the Object Info palette, check **Mass Plants**. This method of massing hides everything from the symbol apart from the rear-most polyline within the plant graphic, so you may lose background color. If you need more control, use the class visibility method.

7. Uncheck **Mass Plants** to restore the graphic.

8. Select one of the "**Betula lenta**" trees on the plan.

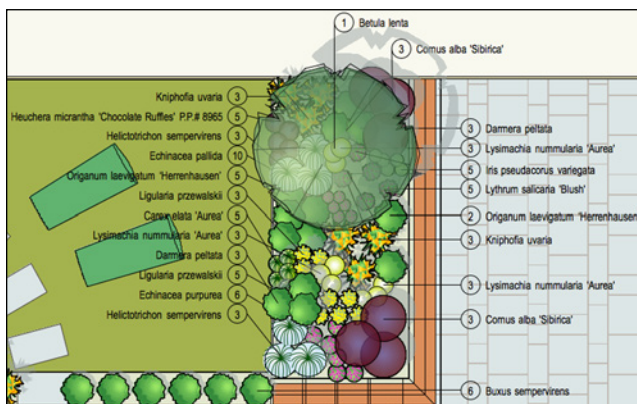
9. Uncheck **Plant Shadows in Plan View**. Notice the shadows are no longer displayed. Check the box again to restore the shadows.

10. Choose **File > Document Settings > Document Preferences**. Click Plan Shadows. The plants have been set up to display shadows according to this document-wide preference. Change the following:

- Offset: **0.2, Factor of object height**
- Angle: Slide the button to the right to place shadows at around 45°
- Fill Style: **Solid Color**
- Color: Choose a Cool Gray from the Standard Vectorworks Colors palette
- Opacity: **50%**
- Click OK and wait for a moment while the shadows update. (Remember, there are a lot of plants for Vectorworks to update).

The plants now display soft gray shadows, at a 45° angle, but the shadows are also sized according to the height of each plant group. (Remember—any changes to the plant shadows through Document Preferences will also affect any Massing Models you have used in your design scheme.)

11. Save your file before continuing to the following exercise.

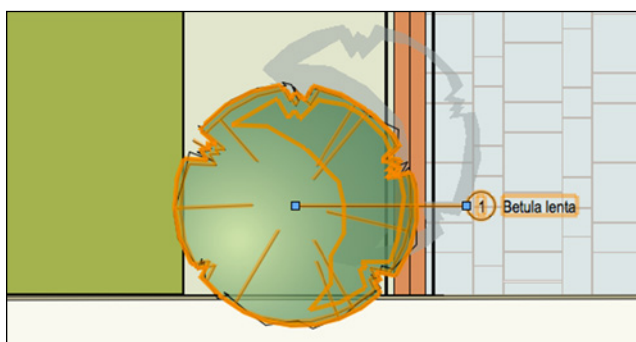


Exercise 2: Placing Plants

Now that you've seen how the plant symbols that are included with Vectorworks Landmark are set up to make an attractive and flexible drawing, you'll learn how to place new plants in the scheme using the Plant tool. You are going to plant the empty bed to the right of the bottom right lawn.

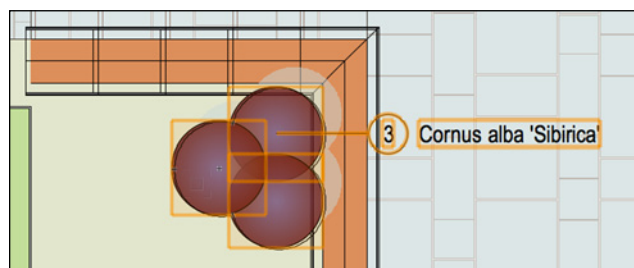
Use the Plant Tool

1. Choose **Text > Format Text**. On the Format Text dialog, choose the style **Plant Tags Arial Narrow 10pt**. Click OK.
2. On the **Site Planning** tool set, click on the **Plant** tool. (The first time you click on the tool, the Plant Settings dialog will open automatically. After that, you will need to use the Plant Tool Preferences button on the tool bar.)
3. On the left, click **Definition**. Select the **Betula lenta** symbol. (Do not change any other fields.) Click OK.
4. On the Tool bar, notice the different modes available for placing plants.
5. Click the first mode: **Single Plant Placement Mode**.
6. Click once on the planting bed to place a single instance of the **Betula lenta**. Notice the tag is produced automatically, on the right of the symbol, with an approach angle of 0°.



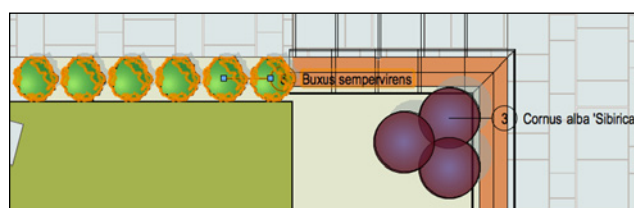
7. On the Tool bar, click on the second mode button: **Poly-Vertex Placement** mode. Click **Plant Tool Preferences** again and select **Cornus alba 'Sibirica'**. Click OK.

8. Click on the drawing in the upper right corner of the planting bed to place the first plant. Move the cursor to where you would like to place the second plant, and click again. Move the cursor to the position of the third plant. Double-click to complete the group.



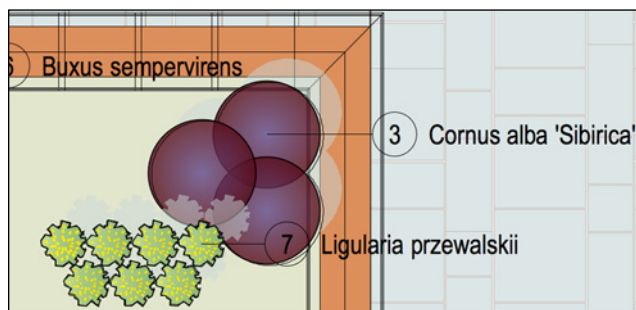
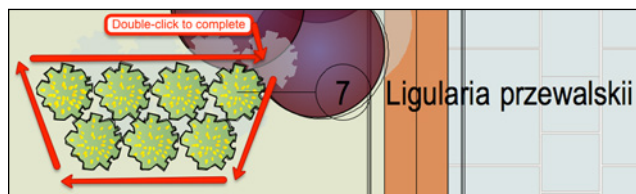
9. Still using the Plant tool, select the third mode: **Poly-Edge Spaced Mode**. On the Tool bar, to the right of the Plant Tool Preferences button, you will find a menu listing the plants available in this file. Select **Buxus sempervirens** from the list.

10. To the left of the wall and below the path, notice there is an unplanted strip. The Buxus will be planted here. Click at one end of the strip and then move the cursor to the other end of the strip. Double-click to complete the row of plants. Vectorworks Landmark has spaced the plants using the spacing value already set up in this plant. You will see how to do this yourself soon.



11. On the Object Info palette, change Spacing to **550 mm [1' 10"]**. Notice the number of plants increases to fill the space.
12. Choose **Plant** and then choose **Triangular Array** mode on the Tool bar. Click **Plant Tool Preferences** and click **Definition**. Choose **Ligularia przewalskii**. Click **Insertion Options**. Change the following:
 - Custom Spacing: check and type **300 mm [1']**
 - Notice that you can also override the Spread and Height values from the default for the plant as required for the design.
 - Click OK.
13. Click on the planting bed where you would like to place a group of Ligularia. With this mode, you draw the outline of the space you want to fill with plants. Continue to click around the area you want to plant, returning to the start point and double-click to complete.
14. The plants are drawn automatically within the space and take on the spacing set up within the Plant Settings.

Rectangular Array mode works in the same way as the Triangular Array mode but places the plants on a rectangular grid instead of triangular.



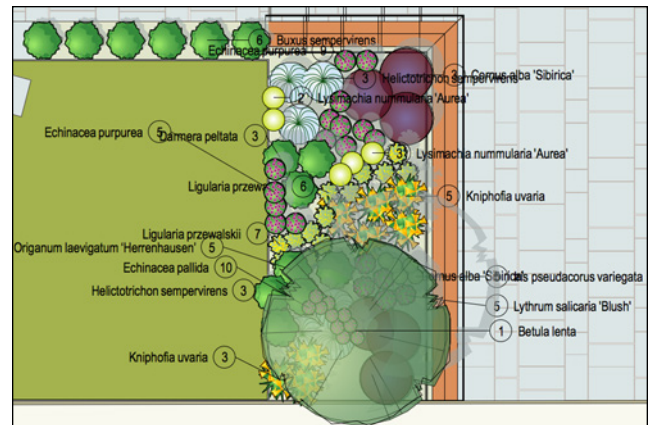
Complete the Planting Plan

The easiest way to complete the plan, when you have a number of plants in the scheme, is to use the Pick-Up Mode of the Plant tool.

1. When placing plants, you may find it useful to suspend snapping temporarily. Hold down the Back quote key to do this.
2. Choose **Plant** and then choose **Pick-Up Mode** on the Tool bar. The cursor changes to an eyedropper.
3. Click on another plant grouping in the scheme and look at the Tool bar. The active plant is now the one you clicked on. The mode the plant was placed in has also been selected.
4. Click on the planting bed to place the plant in the appropriate way.

You can also add plants to the scheme directly from the Resource Browser.

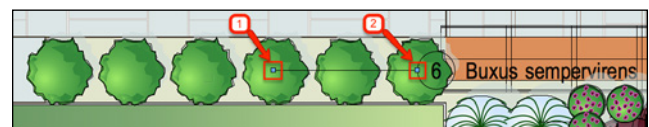
5. Click the **Home** button on the Resource Browser. Scroll through the resources and locate any of the plants. Double-click the plant symbol to make it the active symbol. Click on the plan to place the plant using the appropriate mode.
6. Continue planting using either method to complete the scheme, and although the plant tags look a mess, don't worry about it.
7. Using the **Selection** tool, click on the tree—the very first tree you placed in the scheme. Choose **Modify > Send > Send to Front**. This will bring the tree canopy graphic above the rest of the plants.



Align the Plant Tags

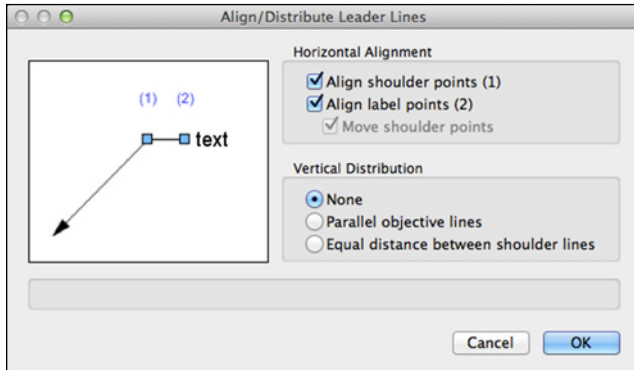
Now that the plants are placed, you will be wondering about the tags. If you used the Pick Up mode of the plant tool, the plant tag position (left or right) will also be copied. Each tag can be moved individually, with the Selection tool. However, we can also use the Align/Distribute Leader Lines command to do the bulk of the work.

1. Click **Selection**. Select the row of Buxus sempervirens that you placed earlier.
2. Click on the blue handle at the plant end of the tag (labeled 1 in the image below). Move the cursor onto a different plant within the same group and then click to place the handle in its new location.
3. Click on the blue handle at the text end, labeled 2 on the image below), move the cursor to the right, and click again.



4. Click and drag around the lower right planting bed, press Alt and while still pressing Alt, release the mouse. All the plants in this bed will be selected.
5. Choose **Modify > Align > Align/Distribute Leader Lines**.
6. On the Align/Distribute Leader Lines dialog, change the following:

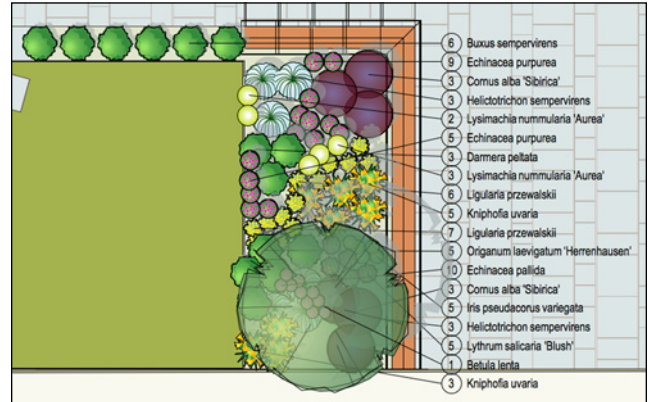
- Horizontal Alignment: **check both options**
- Vertical Distribution: **None**.
- Click OK.



7. Zoom so that you can see the tags of the plants in the bed above. Click on the left of the lowest bubble of the plants. Move the cursor down the page to create a vertical line and click again.
8. Vectorworks will take a moment to work out the tags as you've given it a complex task. When it's complete, the tags will be aligned to the right, but not evenly spaced.
9. With the plants still selected, choose **Modify > Align > Align/Distribute Leader Lines**. On the Align/Distribute Leader Lines

dialog, under Vertical Distribution, click Equal distance between shoulder lines and click OK.

10. Draw the alignment line again and wait for the command to complete. The plant tags are aligned and evenly spaced. Vectorworks uses the spacing between the top two tags as its reference when spacing the tags.



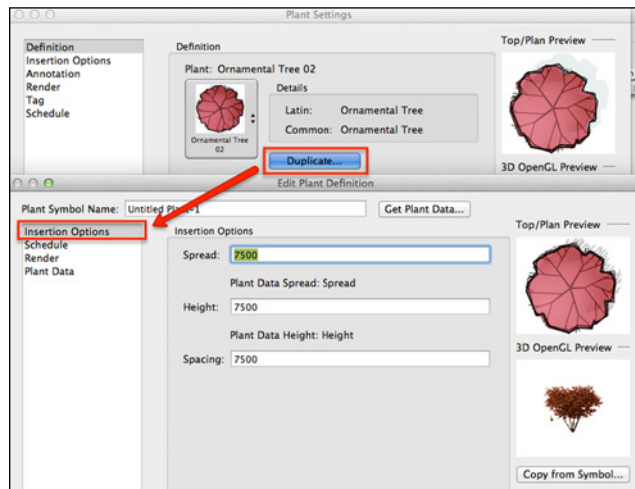
To save time, we've moved all the tags to the right. However, you could have selected only the plants on the left of the planting bed, and used the Align/Distribute Leader Lines command. Then, you could have repeated the process for the tags on the left.

Exercise 3: Define a New Plant

Now that you've seen many of the different options for displaying and placing plants on the plan, you'll see how to use the Plant tool to create a new plant definition. The process requires you to choose the 2D symbol you would like to use for the plant, add relevant data so that the symbol knows which plant it is representing, and, optionally, add your choice of 3D representation.

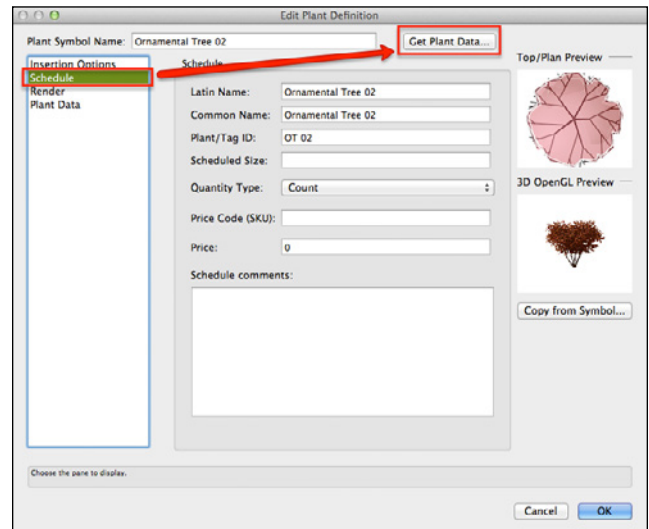
Choose a 2D Symbol

1. Click the Site Planning tool set. Click **Plant**.
2. Click **Plant Tool Preferences** on the tool bar.
3. Click **Definition**. On the Plant Settings dialog, under Show Plants from the following file, click **Plant Objects.vwx**. Click the symbol selector, and choose the **Ornamental Tree 02** symbol.
4. The default plant definition named Ornamental Tree 02 is loaded and you can see the 2D plan graphic for the plant and a preview of the default 3D representation for this plant.
5. Click **Duplicate** to create a new plant definition based on this generic plant.
6. Click **Insertion Options** and change the following fields:
 - Spread: **7500 mm [25']**
 - Height: **7500 mm [25']**
 - Spacing: **7500 mm [25']**

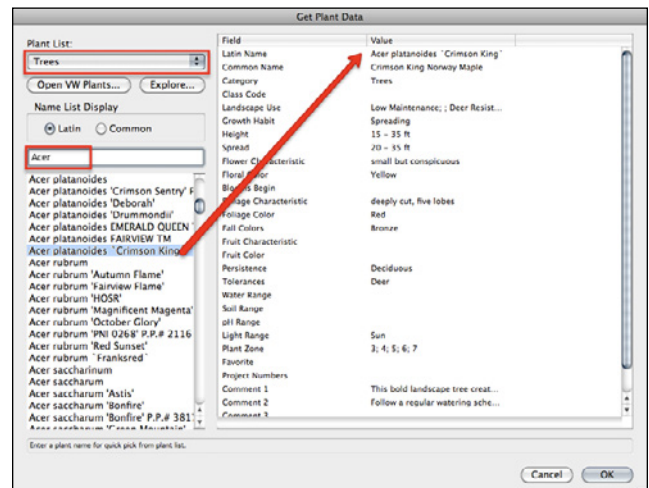


Add the Plant Data

1. Click **Schedule**.



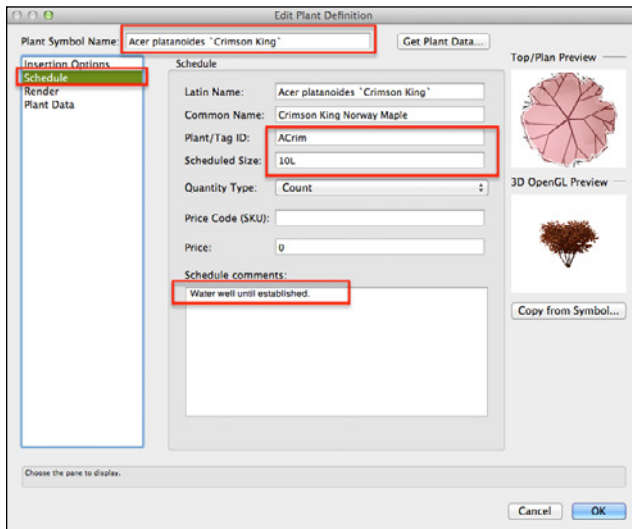
2. Click on the **Get Plant Data** button.



3. Under Plant List, select **Trees**. The list of trees from the database is loaded.
4. In the name box, type "**Acer**," to take you directly to the Acers in the list. Scroll through the list and locate **Acer platanoides 'Crimson King'**, clicking on its name to highlight it.
5. The data for this plant are displayed in the pane on the right of the dialog box. Review the information, then click OK.
6. The plant data have replaced some the generic information that was present in the generic plant. You can add information here to show on

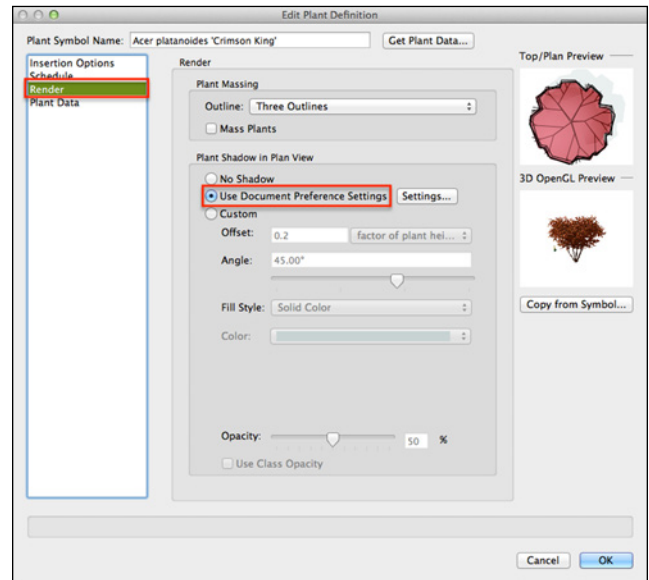
your Plant Schedule. Only add information if you need to show it at a later date:

- Plant/Tag ID: **ACrim** (This can be any code you prefer, but it must be unique.)
 - Scheduled Size: **10L** (This can be any text to describe the proposed purchase size.)
 - Schedule Comments: **Water well until established.**
7. Highlight either the Latin Name or the Common Name—whichever is most appropriate in your geography—and copy it using Ctrl+C (Windows) or Cmd+C (Macintosh).
 8. Move the cursor onto the Plant Symbol Name field. Click and drag the cursor to highlight the contents and then press Ctrl+V (Windows) or Cmd+V (Macintosh) to paste the plant's Latin Name or Common Name into the field. This is the name by which the symbol will be known on your Resource Browser.



Set Default Outline and Shadow Effects

1. Click **Render**.
2. Below **Plant Shadows in Plan View**, click **Use Document Preference Settings**. By default, this plant will respond to whatever document preferences you have set in whichever project you use this plant.



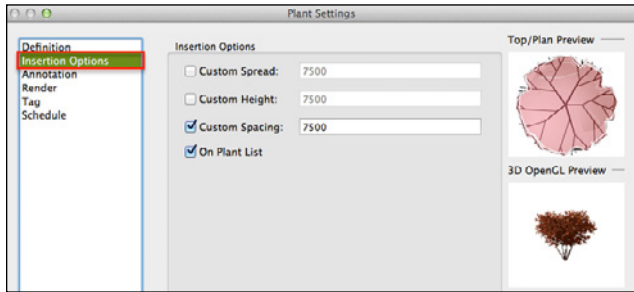
Review the Plant Data

1. Click **Plant Data**. The data you attached earlier, from the plant database is displayed.
2. Select **Floral Color** and then click **Edit**. Change the data to "**Bright yellow.**"
3. Click **OK**. The base definition of the plant has been set and the above settings have become the default for each time the plant is used.
4. The remaining tabs on the left of the dialog enable changes to the default settings, as you'll see in a moment.
5. Click **OK**. Click **Single Plant Placement** mode on the Tool bar.
6. Click once on the top right corner of the plot, at the front of the house. The plant is placed. Press X to return to the **Selection** tool.

Override Insertion Options and Set Tag Options

Now we'll look at how the default settings can be overridden whenever this plant is placed.

1. With the plant selected, click **Plant Settings** on the Object Info palette.
2. Click **Insertion Options**. Notice the default Height, Spread and Spacing fields are displayed. Each value can be customized so that each instance of the plant can differ from the default if required.



- Click **Annotation**. Here, you can further customize the plant annotation, adding lines to connect plants in a group, and add a cross into the center. Plants can also be rotated in groups or rotated along a path. They can also be scaled so that each plant appears a slightly different size. Leave the settings as they are.

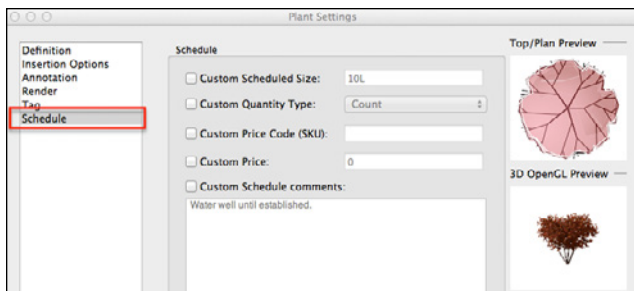
- Click **Render**. You can change the render settings from the default also. Leave the settings as they are.

- Click **Tag**. Change the following fields, leaving all others unchanged:

- Display: **Right**
- Approach Angle: **0°**
- Tag Bubble: **Circle (Quantity Only)**
- Tag Top: **Latin Name**
- Tag Center: **None**
- Tag Bottom: **None**
- Enable Tag Shoulder Line: **Do not check**

These settings will create the same style of tags that have been used in the remainder of this design. The tag settings are not stored with the plant definition. Rather, they are set at the time of using the Plant tool and it may be a good idea to set your favorite tag style within your template.

- Click **Schedule**. Here you can override any of the schedule settings that are stored within the plant definition.



- Click OK. The design no longer fits on the page. Don't worry: in Section 4, you'll learn how to present plans at any scale on any sheet size.
- Look at the Resource Browser and click on the **Home** button to ensure you are looking at the contents of the current file.
- Under **Symbols/Plug-in Objects**, locate the Acer symbol. Notice also all the other plants we have used in this scheme.

Edit the 3D Plant

The 3D element of the plant can be made from:

- Modeled 3D geometry, or
- An Image Prop (Renderworks only)

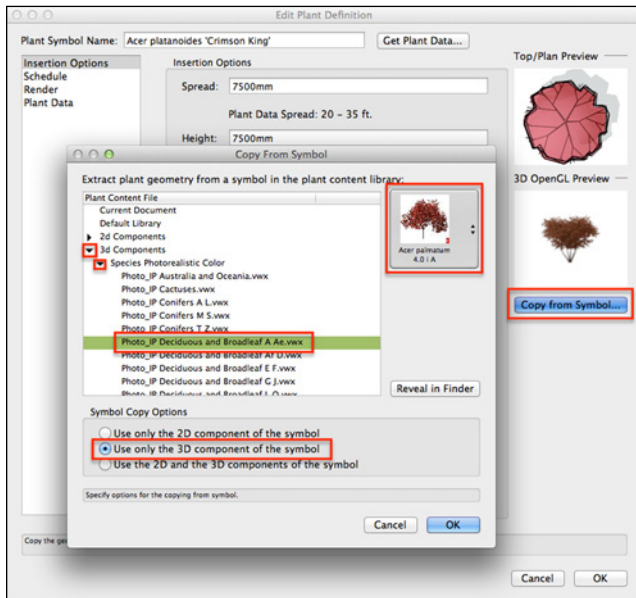
An Image Prop is the most efficient method, and there are many library files of image props for planting. You can also make your own if you have an image editing application and the skills to remove the background from a plant photograph.

Image Props are flat images, stuck onto two crossed 3D planes. They have a "transparent mask" around them so that their background is obscured and they cast the correct shadows when rendered.



The following steps are dependent upon Renderworks being part of your licensed installation. If you do not have Renderworks, you can skip these steps and move to the following exercise.

- Change the view to Left Isometric.
- As the plants are hybrid (2D and 3D) objects, they are now displaying their 3D element.
- Click the **Selection** tool and select the Acer. On the Object Info palette, click **Plant Settings**.
- On the Plant Settings dialog, click **Edit Definition**. Notice the 2D and 3D preview of the plant. Click **Copy from Symbol**.
- Click the arrow to the left of 3D Components and then click the arrow to the left of Species Photorealistic Color. Click **Photo_IP Deciduous and Broadleaf A Ae.vwx**. Click the symbol selector and choose "**Acer palmatum 4.0 i A.**" Click Use only the 3D component of the symbol. Click OK, click OK, and click OK again to return to the drawing area.



- Click on a blank space on the drawing area to ensure nothing is selected. On the View bar, click **Fit to Objects** to center your scene on the screen.
- Save your file.

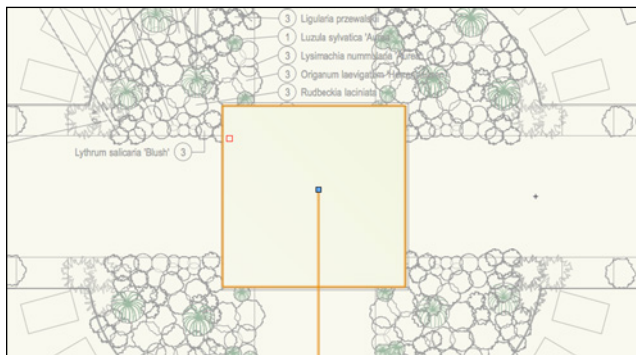


Exercise 4: Create a Landscape Area

You've now learned how to place individual plants into a scheme, and to place them in groups, using classes and plant styles to change the display options. But what if you want to plant a larger area, or a standard mix of plants? The Plant tool is not ideal for this, as it would be very laborious to have to place each individual plant. Instead, Vectorworks offers the Landscape Area. The Landscape Area uses the same Plant definitions as the Plant tool, so you still need to set up the plants as before, but it enables you to mix them by percentage, at specific planting rates. It's ideal for larger areas, bulb mixes, wildflower mixes, and much more. In this exercise, you'll see a ready-made Landscape Area, examine its settings, and then learn to create your own.

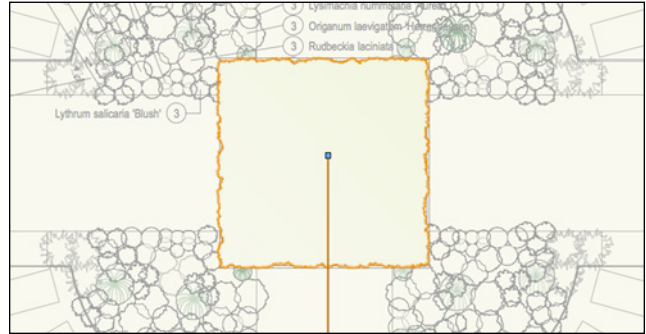
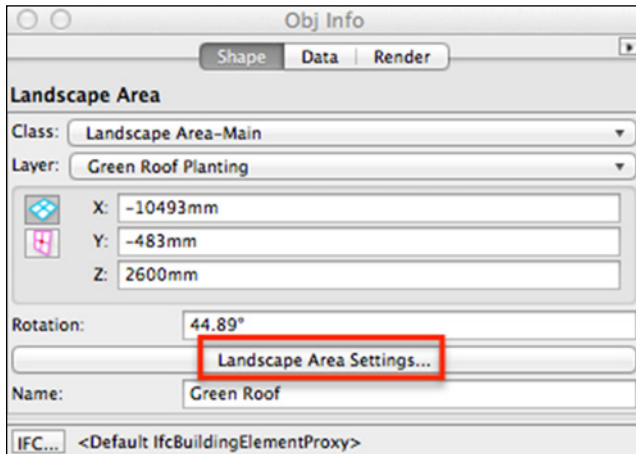
Explore a Landscape Area

- Return to Top/Plan using either the **View > Standard Views > Top/Plan** menu command or the Standard Views menu on the View bar.
- On the Navigation palette, make **Green Roof Planting** the active layer. Change **Layer Options** to **Gray/Snap Others**.
- On top of the roof structure that you created in the Hard Landscaping Section, you will find a green rectangle with a tag on it.
- With the **Selection** tool, click on the rectangle to select it.



Green Roof
20%-AchilTomen
20%-Gver
20%-OnitaeHerr
20%-Helictotrichon sempervirens
20%-SedRedCul

- Look at the Landscape Area tag. This area contains five plant species, 20% of each. The name of the area is shown at the top.
- Look at the Object Info palette. This object is a Landscape Area. The Landscape Area has a Z elevation (position in 3D space) of 2600 mm [8' 6 3/4"].
- Click on the **Layers** button. The Green Roof Planting layer has a Z elevation of 0. Click OK to dismiss the dialog. The Z elevation of the Landscape Area is relative to 0. Elements on the Planting and Hard Landscaping layer are relative to their Z elevation of -650 mm [2' 1 1/2"]. The Landscape Area sits on top of the roof structure.
- On the **Object Info** palette, click on the **Landscape Area Settings** button to open the Landscape Area Settings dialog.



12. Look at the **Object Info** palette. The Landscape Area is a member of the **Landscape Area-Main** class. Click on the **Classes** button on the View bar to open the Organization dialog.

13. Click in the **Landscape Area-Main** class and then click **Edit**. Notice the fill style is set to Gradient, and a green gradient has been selected. The Pen is a solid pale brown.

14. Click OK and then OK again to return to the drawing area.

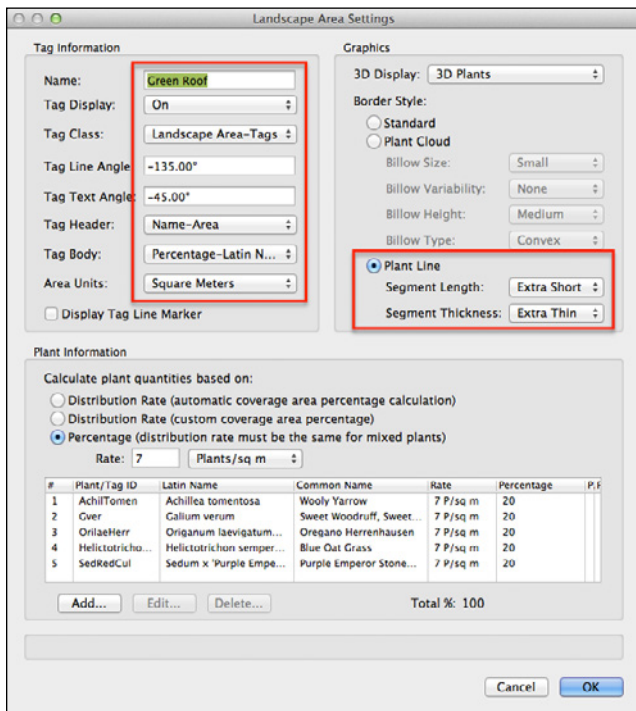
15. Change your view to Left Isometric. Notice that the plants are showing as Image Props, like the other plants in the scheme. (If you don't have Renderworks, there will be no Image Props in the scene.)

16. On the Object Info palette, click on **Landscape Area Settings** again. Change the following:

- 3D Display: **3D Poly**
- Click OK.

17. The 3D Plants are hidden, and replaced with a flat 3D plane. Click **Landscape Area Settings** again and return the setting to **3D Plants**. Click OK.

The Texture Bed option is for working with a Site Model, which is beyond the scope of this Getting Started Guide.



9. Take a look at the settings. This Landscape Area has a name, that appears in its tag. The tag is on, but it needs a separate class so it can be controlled independently.

10. Make the following changes:

- Tag Class: **Landscape Area-Tags**
- Tag Header: **Name-Area**
- Tag Body: **Percentage-Latin Name**
- Area Units: **Choose the most appropriate for your geography**
- Border Style: **Plant Line**
- Click OK

11. The tag now displays the area of the object as well as the name. The border is now a pretty, wiggly, plant line.

Create a New Landscape Area

1. Return to Top/Plan View.

2. Using the Navigation palette, make **Landscape Area-Main** the active class.

3. From the **Site Planning** tool set, click on the **Landscape Area** tool and then click on the **Landscape Area Tool Preferences** button on the Tool bar.

4. Adjust the following settings:

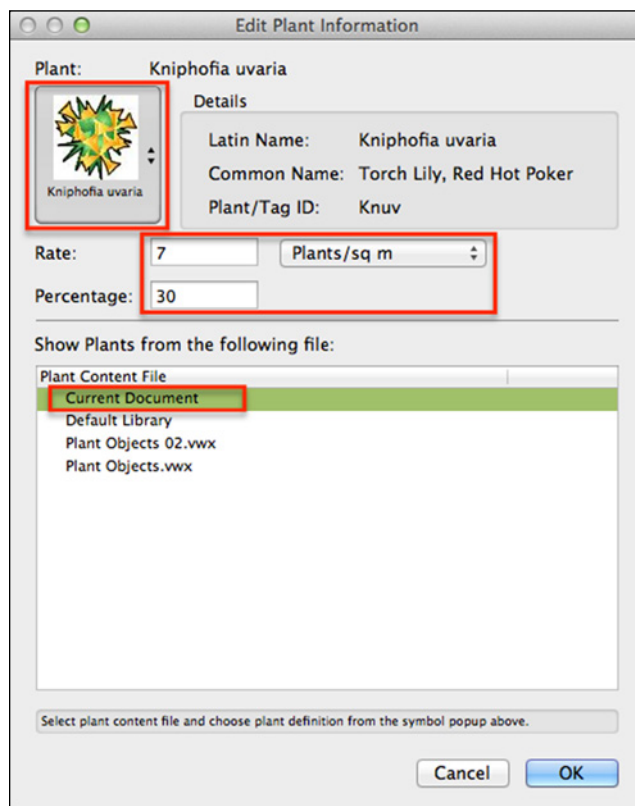
- Name: **Mixed Planting**
- Tag Display: **On**
- Tag Class: **Landscape Area-Tags**
- Tag Header: **Name-Area**
- Tag Body: **Percentage-Latin Name**
- Area Units: **Square Meters/Feet**
- 3D Display: **3D Plants**
- Border Style: **Plant Line**

5. Now you will add plants to the area. There are three different ways that plant quantities can be calculated. In this case, we will have control over the percentage of the area that each plant will cover, and the planting rate for each plant. Select:

- Plant Information: **Distribution Rate (custom coverage percentage)**

6. To add Plants, click **Add** and complete the Edit Plant Information dialog as follows:

- Show Plants from following file: **Current Document**
- Plant: **Kniphofia uvaria**
- Rate: **7/sqm**
- Percentage: **30**
- Click OK.



7. Repeat the process, adding the following plants and settings:

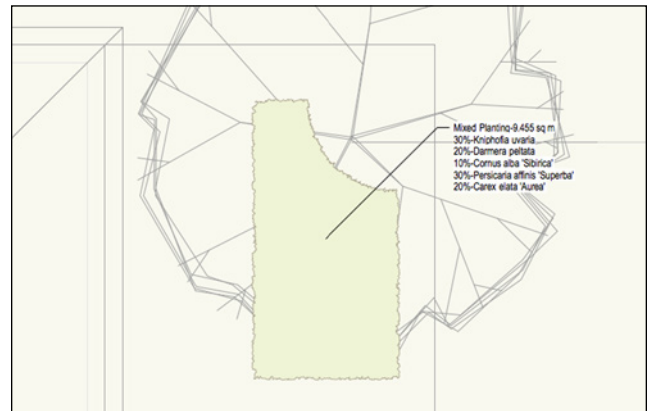
- Plant Symbol: **Darmara peltata**; Rate: **5/sqm**; Percentage: **20**
- Plant Symbol: **Cornus alba 'Sibirica'**; Rate: **1/sqm**; Percentage: **10**
- Plant Symbol: **Persicaria affinis 'Superba'**; Rate: **5/sqm**; Percentage: **30**
- Plant Symbol: **Carex elata 'Aurea'**; Rate: **5/sqm**; Percentage: **20**

8. Click OK to close the Landscape Area Settings dialog.

9. Note that, like the Hardscape tool, the Landscape Area tool has all the same drawing functions as the Polyline tool, which enables you to draw complex shapes, by changing modes as you draw.

10. Move the cursor to the front garden. On the Tool bar, choose **Point on Arc** mode and start to draw an arc around the center of the tree.

Change to Corner Vertex mode and complete a shape for the front planting bed, similar to this one. Remember, you can use the **k** key on your keyboard to close the shape.



The Acer tree symbol is now behind the Landscape Area, because it is on the Planting layer, which is below the Green Roof Planting Layer in the stack.

11. Make **Planting** the active layer using the Navigation palette.

12. Click the **Selection** tool. Select the Acer. On the Object Info palette, change its Layer to **Green Roof Planting**. The tree moves to the layer and displays above the Landscape Area. It has also associated itself with the elevation of the new layer, thus bringing it to the level of the house and front landscape area.

13. Change Layer Options to Show/Snap Others. Change the view to Right Isometric and confirm that the tree is at the same level as the front garden.



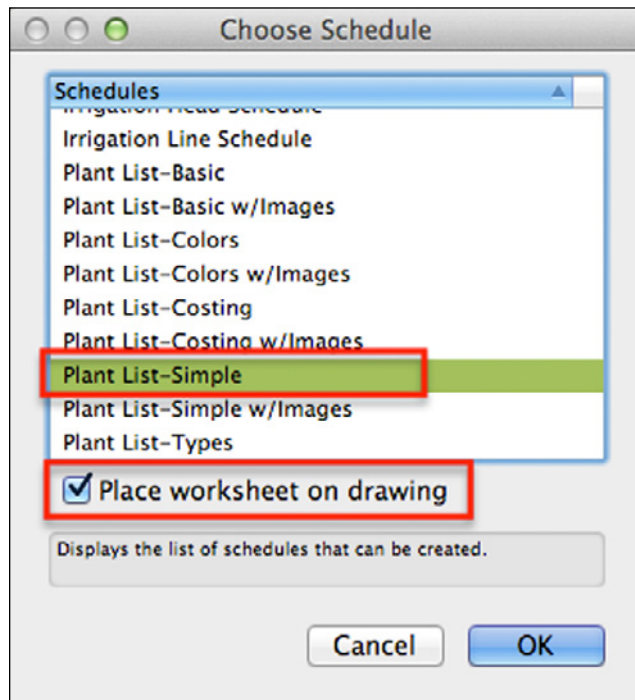
14. Return to Top/Plan view.

Exercise 5: Create a Plant Report

Remember the Hardscape worksheet that you created earlier? The one that conveniently listed the areas of different materials used? You can do the same with your planting plan. Many objects in Vectorworks have a "record" attached to them, and the Plant is a perfect example. Think about the information you attached to the Plant symbol. Reports can be created to pull any of this information into a table that can be either placed on the plan, or exported to a spreadsheet application or other project documentation. As well as providing excellent reporting, they are also a very efficient way of updating information on the plan. In this section, you'll learn how to generate a simple plant schedule, and use it to update the information attached to the plants.

Choose a Schedule

1. Make **Notes-Reports** the active class.
2. Choose **Tools > Reports > Choose Schedule**.
3. On the Choose Schedule dialog, choose **Plant List-Simple**, check **Place Worksheet on Drawing**, and then click OK.



4. The cursor changes to a small target. Click on the drawing area where you would like to place the schedule.
5. This schedule lists all the plants used in the drawing, including those within the Landscape Areas.

Plant List - Simple				
ID	Qty	Botanical Name	Common Name	Scheduled Size
Achille1	12	Achillea tomentosa	Woolly Yarrow	1 L
Acrim	1	Acer platanoides 'Crimson King'	Crimson King Norway Maple	
BstLen	8	Betula lenta	Sweet Birch	5L
GAur	10	Carex elata 'Aurea'	Golden Variegated Sedge	1L
Csib	12	Cornus alba 'Sibirica'	Red Twin Dogwood	5L
Opelt	12	Dianthus petalis	Umbrella Plant	2L
Egal	10	Echinacea pallida	Pink Coneflower	2L
Epur	12	Euboea purpurea	Purple Coneflower	2L
Gvar	12	Galium verum	Sweet Woodruff	2L
Helictot	49	Helictotrichon sempervirens	Blue Oat Grass	2L
HeuCho	10	Heuchera moranatha 'Chocolate'	Chocolate Huettes Coral Bells	2L
Irspv	50	Irish yarrow	Yellow Pine, Pale yellow iris	2L
Knur	60	Kochia laetifolia	Scarlet Lily, Red Hot Poker	2L
LAur	20	Laubholz 'Aurea'	Snowy Wood Bush	2L
Lippr	52	Ligularia przewalskii	Ragwort	2L
LyBio	78	Lythrum salicaria 'Buen'	Purple Loosestrife	2L
Lymma	81	Lysimachia nummularia 'Aurea'	Cressna Jenny	2L
OrileetH	28	Ornithoglossum ibicifolium 'Heretic'	Onion Lily, Star of David	2L
PerGup	44	Persicaria affinis 'Superba'	Piecee Flower	2L
Rtae	24	Rudbeckia hirta	Cutleaf Coneflower	2L
SedRed	12	Sedum x Purple Emperor	Purple Emperor Stonecrop	2L

6. Double-click the worksheet to open it in a separate window.
7. In the Scheduled Size column, click in the Acer platanoides 'Crimson King' row. Replace the existing text with **"Heavy Standard,"** and press Enter.
8. Close the worksheet window.
9. Make Green Roof Planting the active layer.
10. Select the **Acer platanoides 'Crimson King'** symbol on the plan. On the Object Info palette, click **Plant Settings**.
11. Click **Schedule**. Notice Custom Scheduled Size field has been checked. The Heavy Standard text is overriding the original schedule information from the definition. The worksheet displays the plant record, but it can also update it.
12. Click Cancel. Make Planting the active layer.
13. Click the **Selection** tool, select the plant schedule and delete it. We will place it on our presentation plans in the following section.
14. Save the file. Review my file 2-Planting Complete if you wish to compare your results with mine.

Summary

So, that's another section completed! You've covered a lot in this section and have seen how symbols can be used to represent elements of your design, but not just visually. Elements of your design can store information, and you can retrieve this information to support your design and build process.

As a reminder, here's what you've learned how to do in this section:

- Use classes and plant settings to change the display properties of the planting plan
- Use the different modes of the Plant tool, to place plants into a design scheme
- Create a new Plant Definition
- Create a Landscape Area for calculating plant mixes
- Create a Worksheet to list the plants used in the scheme

In the next section, you'll learn how to pull all the different elements together to create presentation plans, technical details, and perspectives. You'll also learn the different options for printing.

Section 5: Presentation and Publishing

Objectives For This Section

After you complete the exercises in this chapter, you will be able to:

- Create Sheet Layers and amend their properties
- Add a Title Block to a Sheet Layer
- Create Viewports of your design, showing it in different orientations
- Render a Viewport using a Renderworks Style
- Publish your design in a variety of formats including Print, PDF and DWG

Until now, you have been working on a series of stacked design layers, used to separate different stages of the process and to provide different 3D planes on which to place objects. You have also used Classes to distinguish between different types of objects and to apply different graphics to their members. Now, you'll learn how to make full use of all these elements to prepare all the project drawings you need.

Exercise Files Required For This Section:

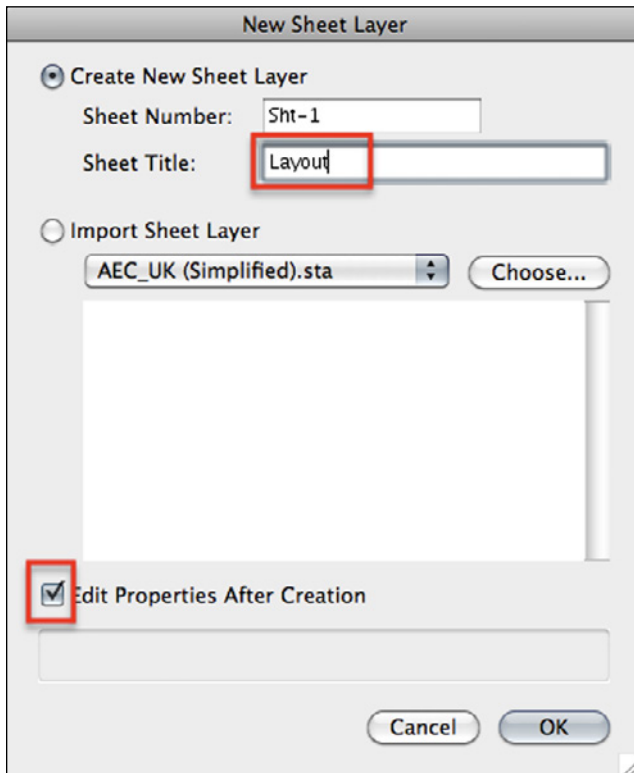
- 1-Start Presentation.vwx

Exercise 1: Create Sheet Layers

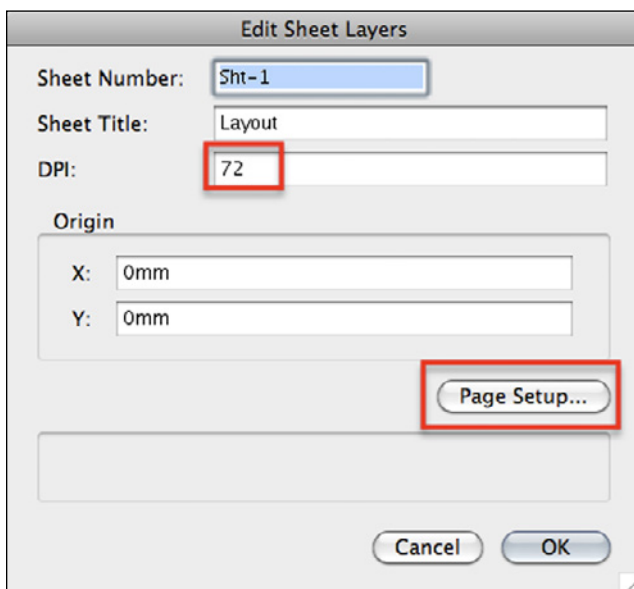
Although we set the scale on the layer and set the page size, I've mentioned several times that it really doesn't matter about page size on a Design Layer. Ultimately, on a Sheet Layer you can present your model from any angle, at any scale with as much information visible as you choose, on a Sheet Layer. A Sheet Layer is much more representative of a physical sheet of paper than a design layer.

Create Sheets

1. Open the file **1-Start Presentation.vwx**.
2. Using the Navigation palette, make sure **None** is the active class.
3. Click the **Layers** menu on the View bar and notice you can create new layers directly from this menu. Choose **New Sheet Layer**.
4. In the New Sheet Layer dialog, complete the fields as follows:
 - Sheet Number: **Sht-1**
 - Sheet Title: **Layout**
 - Edit Properties After Creation: Check
 - Click OK.



- On the Edit Sheet Layers dialog, note that you can set the DPI (dots per inch) for the layer. This setting affects the quality of any rendered images. Higher values will produce higher quality images, but they will increase rendering time. For now, leave this at 72 DPI, but be aware that you may want to increase it later.



- Click **Page Setup**. You saw this dialog at the start of this guide when setting up your Design Layers. Check **Use Size Unavailable in Printer Setup** and then select **ISO A1 [US Arch D]**. Click OK.

- Click OK again. Return to the layers menu to create two more Sheet Layers with the following settings:

- Sht-2 Hard Landscaping; Page Size: ISO A1 [US Arch D]
- Sht-3 Planting; Page Size: ISO A1 [US Arch D]
- Use the Layers menu, or the Navigation palette, to make Sht-1 Layout the active layer.
- Click OK.

- Click **Fit to Page**. Don't worry that you can't see your design anymore. It's all still there, on the Design Layers, and we'll return to it soon.

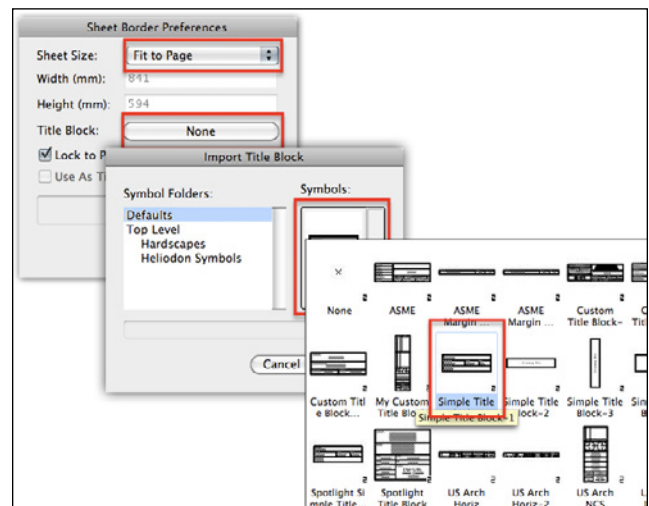
- Notice that the Sheet Layer looks a little different than a Design Layer. It has a more distinct border and looks like a physical page. It has a scale of 1:1 that cannot be changed. The Viewports themselves (when we've created them), will display objects at a chosen architectural scale.

Add a Sheet Border

- Open the **Dims/Notes** tool set. Click on the **Sheet Border** tool, and then click **Sheet Border Tool Preferences** on the Tool bar.

- When the Sheet Border dialog opens, change the following:

- Sheet Size: **Fit to Page**
- Title Block: Click **Defaults**, then click the symbol preview and choose **Simple Title Block-1**
- Click OK, and then click OK again.



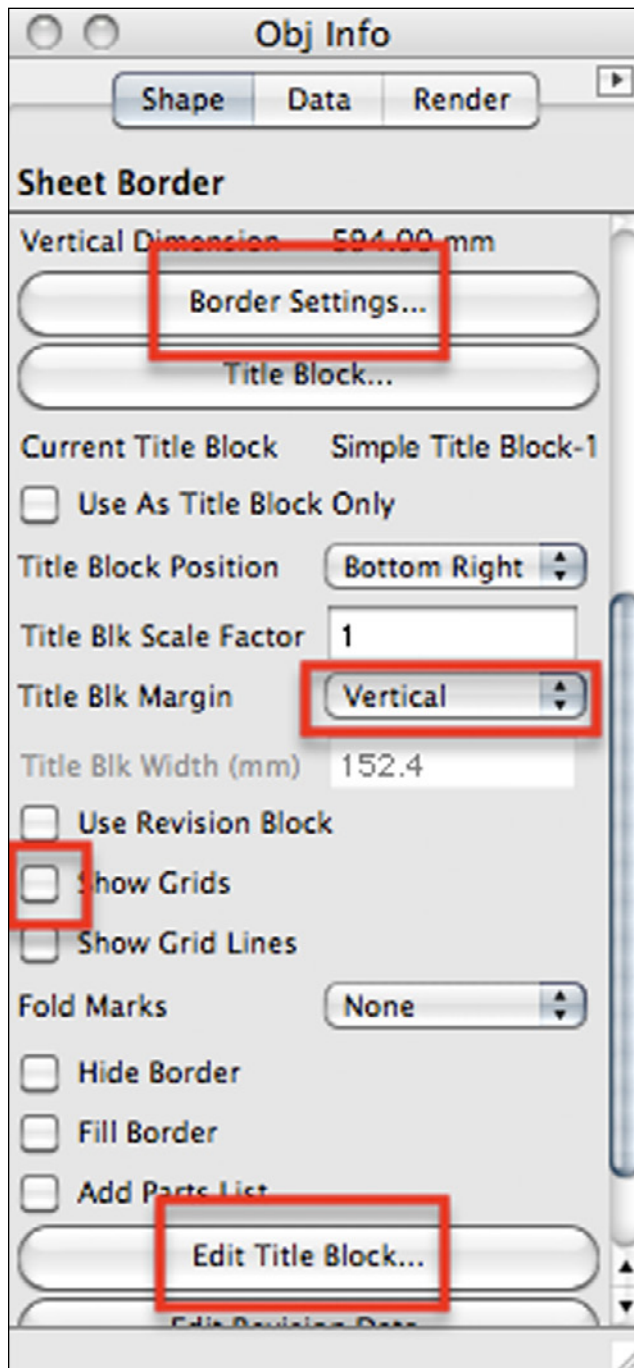
- The cursor is now carrying a "ghosted" Sheet Border and Title Block. Click once on the center of the page and again to set the rotation.

- Press **X** on your keyboard to return to the **Selection** tool and avoid placing further Sheet Borders on top of this one.

- On the Object Info palette, click **Border Settings** and adjust all four of the margins of the Sheet Border to **10 mm [3/8"]**. Click OK.

6. On the Object Info palette, change the following fields:

- Title Block Margin: **Vertical**
- Show Grids: **Uncheck**

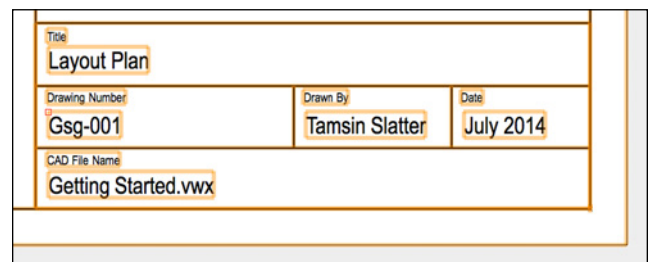
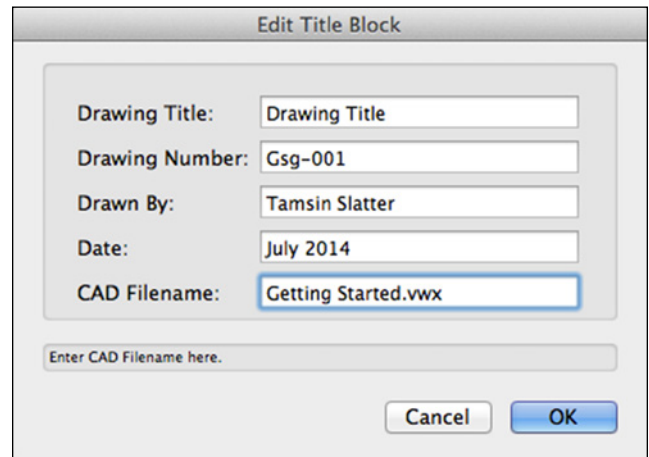


7. Choose **Text > Format Text** and set **Style** to **Plant Tags Arial Narrow 10pt**. Click OK.

8. On the Object Info palette, click **Edit Title Block** and enter the following information into the fields:

- Drawing Title: **Layout Plan**
- Drawing Number: **GSG-001**

- Drawn by: **Tamsin Slatter** (You can add your own name if you prefer!)
- Date: **June 2014**
- CAD Filename: **Getting Started.vwx**
- Click OK.



9. Notice the fields have updated on the Sheet. (Don't worry about the color—the border is only orange because it's selected!)

10. Choose **Edit > Copy**.

11. On the Navigation palette, click the **Sheet Layers** button. Make **Sht-2** the active layer.

12. Select **Edit > Paste in Place**. On the Object Info palette, click **Edit Title Block** and change the following details:

- Title: **Hard Landscaping Plan**
- Drawing Number: **GSG-002**
- Click OK

13. Repeat the copy and paste process to place a sheet border on Sht-3. Click **Edit Title Block** and change the following details:

- Title: **Planting Plan**
- Drawing Number: **GSG-003**
- Click OK

The sheets are now prepared and ready to display viewports.

Exercise 2: Create a Plan Viewport

Now you are going to present the Plan in a number of different ways on the same sheet of paper, using Viewports. Viewports are effectively saved views of the drawing, with their own class and design layer visibility settings, and render settings. Viewports are a live link to the design. As the design is amended, the Viewports will show the updated changes.

Create a Plan Viewport

1. Click the **Design Layers** tab and make **Green Roof Planting** the active layer. The design will be displayed.
2. Ensure you are looking at your design in Top/Plan view, using the View menu on the View bar. Use the **Selection** tool to click on a blank space to ensure nothing is selected.
3. Choose **View > Create Viewport**.
4. On the Create Viewport dialog, complete the following fields, leaving all other fields blank:
 - Viewport Name: **1**
 - Drawing Title: **Master Layout**
 - Create on Layer: Choose **Sht-1 [Layout]**
 - Notice, but do not change, the Layers and Classes button, the Scale, and the View menus. You'll use these in moment to edit what's visible in the Viewport.
 - Click OK.
5. The Viewport is created and placed on Sht-1 Layout, which is now the active layer. The viewport is selected. The viewport scaled at 1:50 is too large for the sheet.

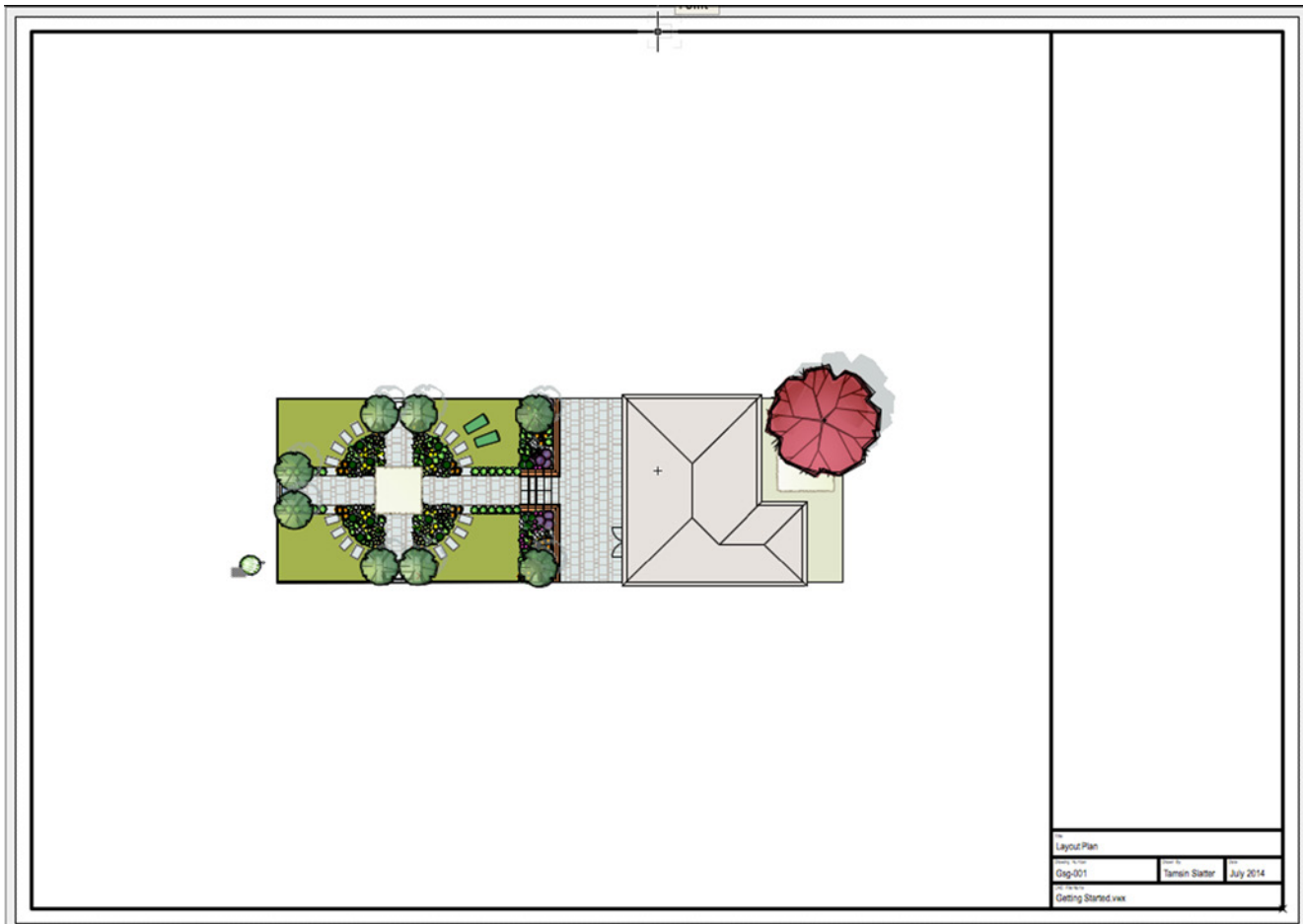
The 'Create Viewport' dialog box is shown with the following settings:

- Viewport Name: 1
- Drawing Title: Master Layout
- Create on Layer: Sht-1 [Layout]
- Source: Current Document
- Display Planar Objects: ☒
- Project Screen Objects: ☒
- Scale: 1:50
- Custom Scale 1: 50.000
- View: Top/Plan
- Rendering: Wireframe
- Projection: 2D Plan
- Perspective Type: Custom
- Perspective Dist: 8.720

6. On the Object Info palette, change Scale to **1:100**. The Viewport shrinks to 1:100.
7. Using the **Selection** tool, click and drag on the Viewport to center it on the main area of the page.

8. With the Viewport still selected, click **Classes** on the Object Info palette. Turn the **Plants-Component-Tags** class and the **Landscape Area-Tags** class to **Invisible** and then click OK.

9. The Viewport now shows a beautiful overview plan of the design.



Exercise 3: Create a 3D Rendered View

Set up the View

1. Use the Navigation palette to make any design layer the active layer.
2. Change the view to **Left Isometric**.
3. Click the **Flyover** tool on the Basic palette. Click OK to dismiss the helpful dialog. On the Tool bar, click **Interactive Origin** mode.
4. Click once somewhere toward the center of the garden to set the center of rotation. Click and drag on the left mouse button to change the view to something pleasing. Remember you can use Fit to Objects to bring the scene back onto your screen and the Pan facility (the space bar) to move the model on the screen.
5. Choose **View > Create Viewport**.
6. Complete the Create Viewport dialog as follows, leaving other settings on their defaults:

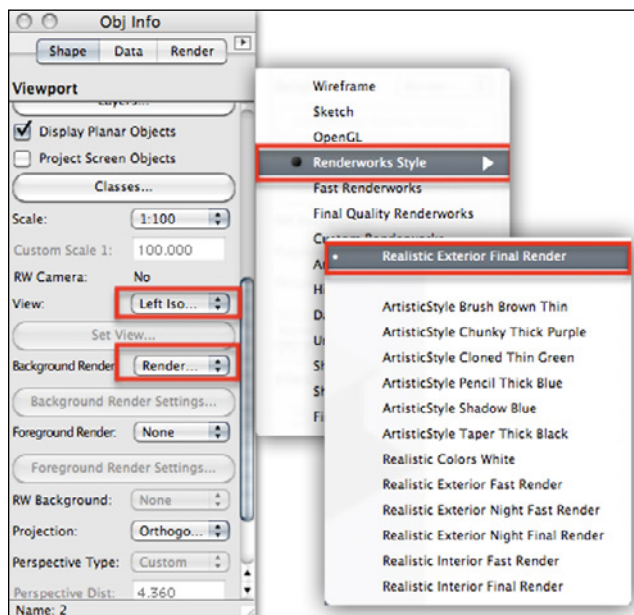
- Viewport Name: **2**
- Drawing Title: **3D Perspective View**
- Create on Layer: **Sht-1 [Layout]**
- Click **OK**

The perspective viewport is displayed in Wireframe mode, on the same sheet as the plan viewport. The Viewport will display a red striped border, indicating that it needs updating. Rendering on a Sheet Layer only occurs when you update the Viewport. However, we're now going to improve the render before updating the viewport (Renderworks is required for this.)

7. Click the **Selection** tool. Click and drag on the Viewports to move them and create a pleasing layout on the sheet.

Render the 3D View

1. Choose **File > Document Settings > Document Preferences**. Click on the Display tab and ensure that **Save viewport cache** is checked. This will ensure that once the viewport is rendered, it will be saved in this state so you do not have to render each time you open the file. Click OK.
2. Select the perspective viewport. On the Object Info palette, change the following field:
 - Background Render: **Renderworks Style > Realistic Exterior Final**.



3. On the **Object Info** palette, click **Update**. The Viewport will turn black and take some time to render (this is dependent on your computer's specification), but the result will be very pretty! If you don't want to wait, you can press Escape to cancel the render process, but you can continue to work while the scene renders. Notice the teapot-shaped indicator that shows you rendering is processing.
4. Click the Home button on the Resource Browser. This built-in rendering style contains settings ideal for rendering outdoor scenes and uses the new physical sky that links the Heliodon sun object to a sunny sky background. Notice the Render style and the Physical Sky background have been imported into the file.

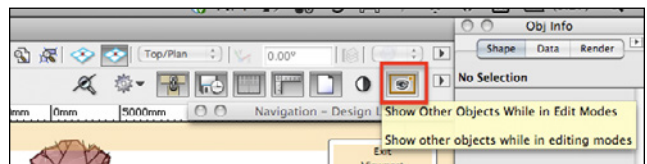


Rendered with Renderworks

5. You can add more text, directly onto the Sheet layer. You can also add supporting images to the Sheet layer using **File > Import > Import Image File**.

Add Drawing Labels

1. Double-click on the Plan viewport. When the Edit Viewport dialog opens, click **Annotations** and then click OK.
2. Notice that the other viewport's footprint is visible, but gray. If it is not visible, turn on **Show Other Objects in Edit Mode**, on the right of the Tool bar, above the Exit Viewport Annotation button.



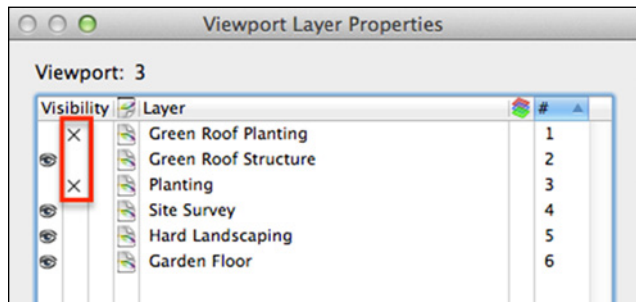
3. Click the **Dims/Notes** tool set and click **Drawing Label**. There is no need to change the preferences.
4. Click once on the drawing to position the Drawing Label and again to set its rotation. Notice that the label automatically picks up the Viewport name, number, and scale.
5. Click **Exit Viewport Annotation** at the top right of the screen.
6. Repeat the process to add a Drawing Label to the perspective viewport. Once inside the Viewport editor, you can continue to use the SmartCursor to assist in aligning objects, so that your plan will look well laid out.

Exercise 4: Create Additional Viewports

In this exercise, you'll duplicate the plan viewport and change the settings of the copy so that it presents only hard landscaping information. You'll then add the Hardscapes Budget report to the sheet.

Create a Hard Landscaping Plan

1. Click on the first viewport—the one showing the Top/Plan view. Select **Edit > Duplicate**.
 - View: **Left Isometric**
 - Background Render: **Hidden Line**
2. Select the copy if it is not already selected. On the Object Info palette, change Layer to **Sht-2 Hard Landscaping**.
3. Using the Navigation palette, click the Sheet Layers tab and make **Sht-2 Hard Landscaping** the active layer.
4. Select the viewport. On the Object Info palette, change the following fields, leaving all other fields unchanged:
 - Drawing Title: **Hard Landscaping Layout**
 - Click the **Layers** button and make **Green Roof Planting** and **Planting** invisible. Click OK.
 - Click the **Classes** button and make **Dimension** visible. Click OK.
4. Double-click the viewport and select **Annotations**. Click OK.
5. Use **Select Similar** to select the dimensions you placed in the viewport above and delete them as they are not appropriate to this view. Press **X** to return to the **Selection** tool.
6. Select the Drawing Label and use the Object Info palette to change the Drawing Number to **2**. Move the label to a position beneath the structure.
7. From the **Basic** palette, choose the **Callout** tool, next to the Text tool.
8. Click on a space to the right of the structure and then click on the top of the structure. In the Notes Manager Callout dialog, enter the text "Reclaimed timber." Click OK.
9. Place another callout, labeling the Brick pillar with the text "Brick pillar." Click OK.
10. Click **Exit Viewport Annotation** again to return to the Sheet Layer. Press **X** to return to the **Selection** tool.
11. On the Object Info palette, click **Update** to render the viewport.



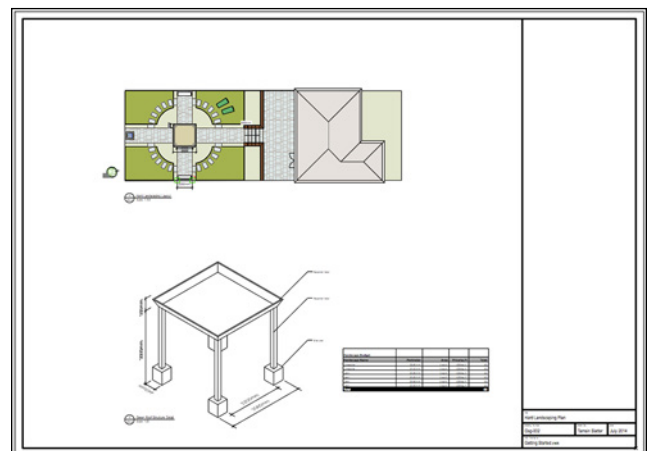
5. The Viewport is now displaying only Hard Landscaping Information, and the dimensions created earlier are visible. Double-click the viewport and click **Annotations**. Click OK.
6. Select the Drawing Label. On the Object Info palette, change Number Style to **Drawing and Sheet**.
7. From the **Dims/Notes** Tool set, choose **Constrained Linear Dimension**. Add further dimensions to show the width of the path and the tread depths of the steps.
8. Click **Exit Viewport Annotations**.

Create a 3D Construction Drawing

1. Duplicate the Hard Landscaping Layout viewport.
2. Move the copy downward on the page so it is below the original.
3. Using the Object Info palette, change the following:
 - Drawing Title: **Green Roof Structure Detail**
 - Layers: Turn off all layers except Green Roof Structure
 - Scale: **1:25**

Add Hard Landscaping Worksheet

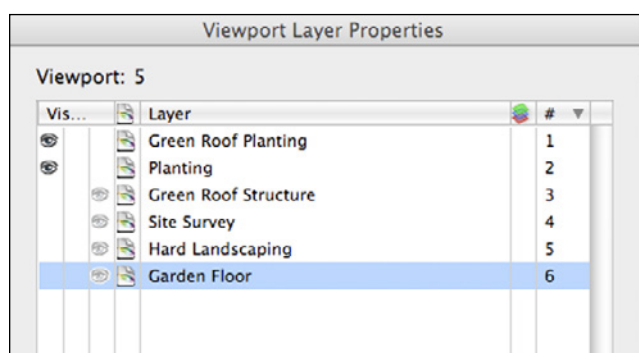
1. On the Resource Browser, click the **Home** button.
2. Scroll to the bottom of the Resource Browser and locate the **Worksheets** heading. Double-click the Hardscapes Budget worksheet. It will display on the Sheet Layer.
3. Using the **Selection** tool, click and drag the worksheet to move it where you want on the sheet.



You can add additional text to a Sheet Layer if you wish.

Create a Planting Plan

1. Duplicate the Hard Landscaping Layout viewport as you did earlier, using **Edit > Duplicate**.
2. On the Object Info palette, change the layer to **Sht-3 Planting** to move the Viewport to this layer.
3. Make **Sht-3 Planting** the active layer. Select the Viewport.
4. On the Object Info palette, click the **Layers** button. Change the visibility of all layers except **Planting** and **Green Roof Planting** to Gray. Click OK.



5. On the Object Info palette, click the **Classes** button to change the visibility of the following classes, and then click OK:

- Dimension: **Invisible**
- Landscape Area-Tags: **Visible**

- Plants-Component-Bloom: **Invisible**
- Plants-Component-Canopy: **Invisible**
- Plants-Component-Color Fill: **Invisible**
- Plants-Component-Interior Linework: **Invisible**
- Plants-Component-Outline: **Invisible**
- Plants-Component-Tags: **Visible**

6. On the Object Info palette, make the following changes:

- Drawing Title: **Planting Plan**
- Scale: **1:50**

7. The viewport is, once again, too large for the sheet. Double-click the viewport and choose **Edit Crop**. Click OK.
8. Choose the **Rectangle** tool from the **Basic** palette. Draw a rectangle around the rear garden planting area, including the tags. Click **Exit Viewport Crop** at the top-right of the screen.
9. The Viewport now displays only the area within the cropping rectangle.
10. Edit the annotations of the viewport and change the Drawing Label number if you wish.

Add the Plant Schedule

1. On the Resource Browser, click the **Home** button to ensure you are looking at the contents of the current file. Locate the worksheet **Plant List-Simple**, and double-click it. The worksheet will be displayed on the Sheet.
2. Using the **Selection** tool, click and drag on the worksheet to move it to a position below the Planting Plan.

Exercise 5: Publish the Design

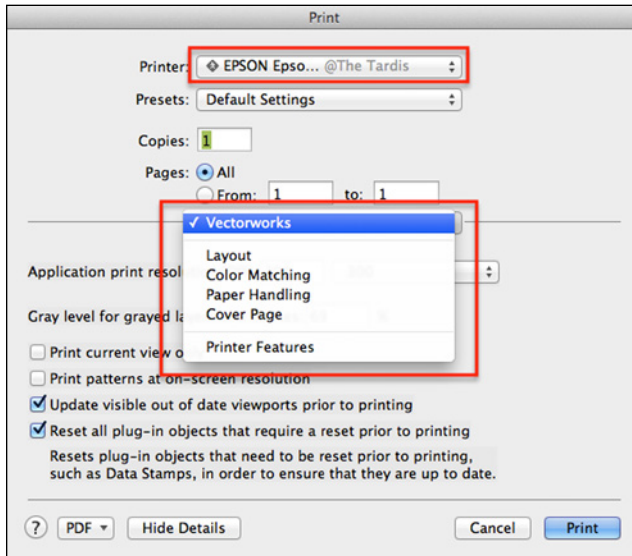
Once a project is completed, or has reached the stage where you need to issue the latest set of revisions, Vectorworks offers a variety of different formats for your files. You may wish to print them, or create Portable Document Format (PDF) files. Alternatively, you may need to produce documents in DWG format so that they can be imported into AutoCAD®. If you are printing from your own office, using your own printer, the process is simple. Your page size for the Sheets will already have been set up correctly during the Page Setup process, and, therefore, the plan will print to scale on the chosen media. If you don't have a large format printer in your office, your best option is to create a PDF of your sheets and then send those to be printed via e-mail, or a large-file transfer service. Alternatively, you could consider not printing at all, and instead share documents electronically with your clients and project colleagues, using a service such as Vectorworks Cloud Services with the Nomad app.

Print the Plan

With your own printer available, printing is simple, as long as your page area matches the page sizes available through your printer driver. It's important to ensure that the printer does not apply any scaling to the document, as the drawing is already at the correct scale.

1. Choose **File > Print** to open the Print dialog and set the following options:

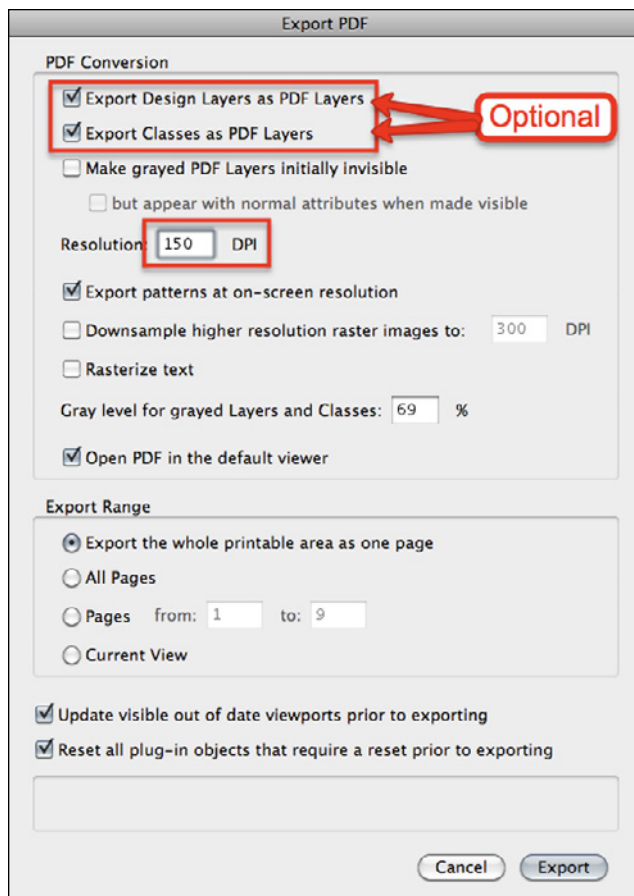
- Printer: Choose your printer
- Settings menu: Choose the appropriate settings for your printer. Each printer will offer different options.
- Click Print.



Export to PDF

PDF files can be created from either the Design Layer, with the active visibility settings, or from a Sheet Layer. You can create a single PDF, or create a series of PDF files from selected sheets as a batch process.

1. Choose **File > Export > Export PDF**. The Export PDF dialog opens.

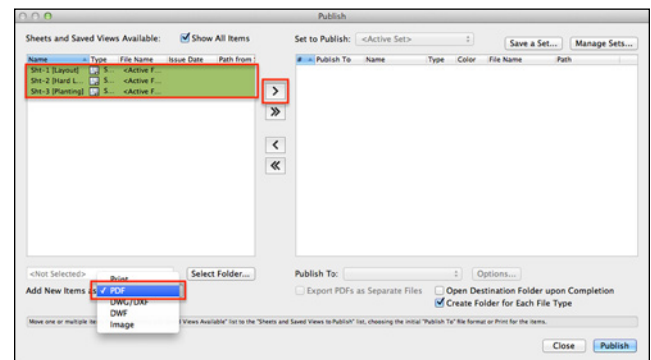


2. Check **Export Design Layers as PDF Layers**. This will allow you to create an interactive document, where you can turn elements on and off in your PDF, (provided that your PDF viewer application supports this).
3. Check **Open PDF in the default viewer** to see the file when it has been created.
4. Choose the Resolution setting you want for the final image. Remember that the higher the DPI setting, the larger the file will be. If the PDF DPI setting is higher than the current Sheet Layer, the document will render as part of the export process.
5. Click **Export**.
6. Choose a file name and location for the PDF file, such as "Planting Plan." Click **Save**.
7. The PDF file will open in your default PDF viewer application.
8. Return to the Vectorworks application.

Publish a Set of Sheets in Different Formats

In this case, we have several sheets that make up the project. Using the publish facility, you can export your Sheet Layers individually, or as a single, multi-page PDF file. You can also choose a mixture of PDF, Print and DWG as the export destination for the sheets.

1. Choose **File > Publish**.



2. At the bottom of the dialog, choose the default export type. In this case, choose PDF.
3. Press Shift and select each of the sheets that will be published—in this case, all of them. Click the arrow button to move the selected sheets to the right side of the dialog.
4. At the top of the dialog, click **Save a Set**. Name the set **Publish to PDF**. Click **OK**.
5. Click **Publish**. Choose the location for the exported files and click **OK**.
6. Once the files are published, they will open in your default PDF viewer. Notice that the PDF is a multi-page PDF. By default, the batch export process will create a single, multi-page file. However, check

Export as Separate Files if you wish to create separate PDF documents.

7. Return to Vectorworks and click OK to dismiss the Publish dialog.
8. Choose **File > Publish** again.
9. Select one of the sheets. To publish a black and white copy of a sheet, click in the Color column to change the setting for the file.
10. Select one of the sheets on the right side of the dialog. Change Publish To to **DWG/DXF**. Although the default publish choice on the left of the dialog is PDF, it is still possible to override the settings for individual sheets in the set.
11. Click **Publish** to start the export. As you have changed the settings from your original saved set, you will be prompted to save the set so

that you can recall these new settings later. To save time on this occasion, click **No**, but for future exports, this is something you should consider to save time in recalling settings.

12. Choose a file name and location for the published set of files and click **Open**.
13. The PDF file will be displayed in the default PDF viewer. The DWG file will be in a folder under the save location you specified in 12 above. To view the DWG file, you would need a copy of AutoCAD® software or a DWG viewer.

With this small project, containing only three sheets, individual exports will be easy, but with more complex projects, creating files in the desired output format can be time consuming. The Publish facility makes it easy to create multiple types of output in a single command.

Summary

Well, that's the final exercise in our quick tour of the Vectorworks Landmark tools. Let's revisit the objectives of this section. At the end of this section, using the exercise files provided, you will be able to:

- Create Sheet Layers and amend their properties
- Add a Title Block to a Sheet Layer
- Create Viewports of your design, that allow you to show it in different orientations
- Create a sunny exterior render of a Viewport using a Renderworks Style
- Publish a PDF document and a DWG file containing your design
- Print your design

You've seen the value of creating a structured drawing, and building a 3D model as part of your design process. Sheet Layers and Viewports enable you to present that information in a wide variety of formats, without having to redraw anything at all. Sheet layers are used to pull together all the aspects of the design that you want to present. Sheet layers can include images, text, and worksheets, as well as the elements designed within Vectorworks. Now move onto to final chapter to see an introduction to working with sloping sites.

Section 8: Introduction to Sloping Sites

Objectives For This Section

After following the exercise steps in this section, you will be able to:

- Use the Stake tool to mark spot heights / levels on the site
- Create a simple slope from Stakes
- See how design elements learned about earlier in the Getting Started Guide interact with the surface of a site model

Example Files Required For This Section:

- **1-Create Simple Site.vwx**
- **2-Sloping Site.vwx**

In the main body of the Getting Started Guide, you have learned how to create many different landscape elements, all of which include a 3D component. In the example file, we used design layer elevations to create two distinct planes in a simple terraced garden. This was an ideal way to get started, so that you could concentrate on learning how the different landscaping element tools work. However, in reality, most landscapes are not flat. Nor do they fall neatly into distinct flat planes at different levels. How does Vectorworks handle sites that slope and how can you represent these slopes in your model?

Well, Vectorworks includes a very powerful suite of tools for creating and editing site models. You can use a site model to represent the existing site and then use a series of site modifier tools to apply your design changes to the site and even calculate the cut and fill volumes resulting from your changes. This process is far more detailed than I can cover in this short demonstration, so instead, I'm going to show you how to create a site from your own measured levels, and then use a finished model to show you how the landscape elements integrate with the surface of this model.



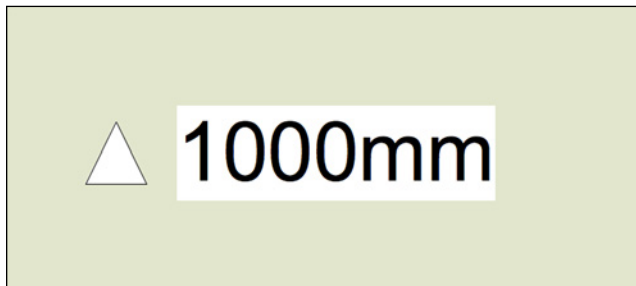
The key to creating a successful site model is to have accurate height data. This could be information that you derive from your own survey, an imported survey, or it could be the spot heights or contours that you have determined as part of your design process.

Exercise 1: Create a Simple Slope

A site model can be created from stakes or loci that represent individual height measurements. Alternatively, it can be created from 3D polygons that represent contours. In this exercise, you will create a simple slope from stakes representing individual level measurements.

Create the Levels

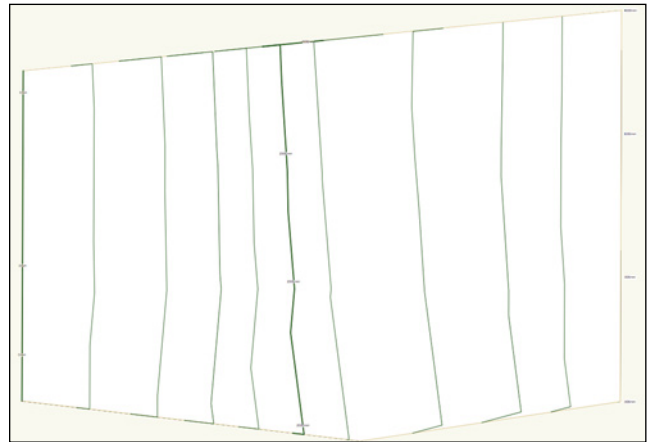
1. Choose **File > Open** and open the file **1-Create Simple Site.vwx**.
The file contains a simple 2D Polyline which represents the plan view of the outline of a site. We'll add some levels to this file and then create a 3D representation of the site.
2. On the Site Planning tool set, click the **Stake** tool. On the tool bar, click **Standard Insertion Mode**. Click **Stake Tool Preferences**. Change Mode to **Include as Site Model Data** and then click OK. On the tool bar, change Elevation to **0 mm** and press Enter.
3. On the left edge of the Polyline, click at the corners and two points in between, to create four stakes, that represent the elevation of 0.
4. On the tool bar, change elevation to **1000 mm**. Roughly one quarter along the length of the shape, place a vertical line of four stakes. Notice the elevation is displayed by the Stake's marker.



5. On the tool bar, change the elevation to **2500 mm**. Roughly half way along the shape, place another vertical arrangement of four stakes on the polyline.
6. On the tool bar, change the elevation to **3000 mm** and place a further arrangement of four stakes, roughly three quarters along the shape.
7. On the Tool bar, change the elevation to **4000 mm** and place a final set of stakes along the right edge of the shape.

On a real site, you would clearly take more care over the positioning of the stake.

8. Click the **Select Similar** tool and click on one of the Stakes to select them all.
9. Choose **Landmark > Create Site Model** or **AEC > Terrain > Create Site Model**.
10. Leave all the default settings and click OK.
11. In Top/Plan view, you'll see a contour plan of the site.

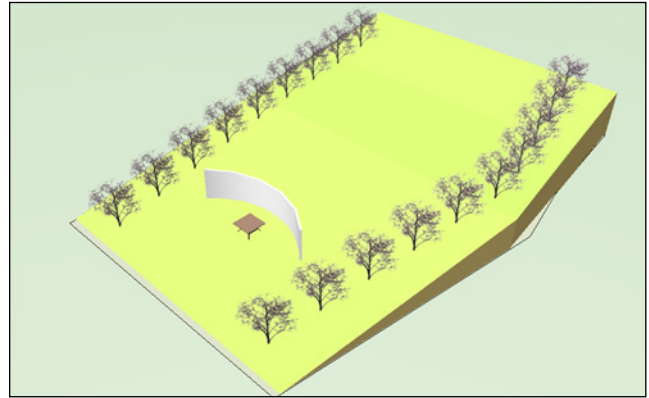


12. Change the view to Left Isometric. The site still displays as simple contours. On the Object Info palette, change 3D Style to **Mesh Solid**.
[Render the site with OpenGL:](#)

Place Plants on the Model

1. Return to Top/Plan view.
2. On the Site Planning tool set, click **Plant**. Choose **Poly Edge-Spaced** mode. From the Plants drop down list, choose '**Cercis siliquastrum**.'
3. Place a row of Cercis siliquastrum on the site, moving up the slope.
4. Repeat this on another part of the slope.
5. Change the view to Left Isometric again, and notice that the 3D elements of the plants are automatically sitting on the surface of the site model.
6. Return to Top/Plan View and select the **Round Wall** tool from the Building Shell tool set. Choose **Radius** mode and draw a round wall on the site.
7. On the Resource Browser, locate the **Wicker Table 60x60** symbol. Double-click the symbol to make it active.
8. Click twice to place an instance of the symbol, perhaps within the arc of the round wall . .
9. Change the View to **Left Isometric** again.

- Choose **Landmark > Send to Surface**. Select the round wall and run the **Landmark > Send to Surface** command again. Notice that both elements now sit on the surface of the site and the base of the wall has been adjusted to suit the site.



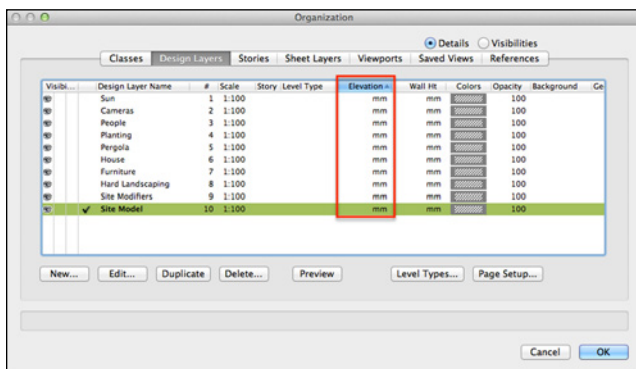
- Close the file — save it if you wish, but you won't need it for the following section.

Exercise 2: Explore an Example File

Now you've seen how you can use measured levels to create a representation of a sloping site, we'll take a quick look at a completed design so you can see how all the elements fit together.

Examine the Layers

- Open the file 2-Sloping Site.vwx.
- Click the Layers button and look at the list of layers. The layer structure is similar to the layers you've seen in the other parts of the Getting Started Guide, but the file also includes a Site Model layer. This time, the design layers don't have different elevations. They are all set at zero. Elements on these layers will sit on the surface of the site model. In this case, the site model surface has been created with Stakes but has been adjusted to suit the design. This is achieved with the use of Site Modifiers, which are beyond the scope of this guide. However, note that they enable you to impose your design onto the site and determine the changes, including Cut and Fill volumes. Click Cancel.

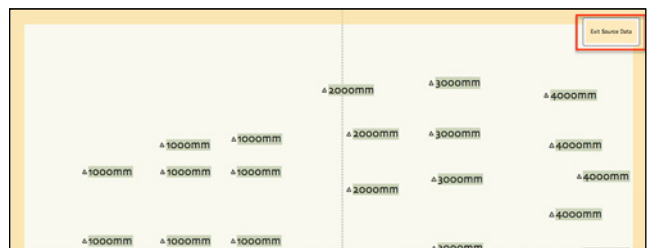


elements. The surface of this object changes as the levels of the site change.

Examine the Source Data for the Site Model

Like the earlier simple slope, this example model was also created from a series of "spot heights" measured across the site and entered into Vectorworks with the Stake tool.

- Right-click on the model with the Selection tool and choose **Edit Site Model Source Data**.
- The model itself and the design will be hidden, but in its place, you will see the data that were used to create the model.
- Change the view to Front and notice that each Stake represents a specific point in 3D space. These are the points that Vectorworks has connected to create the surface of the model.

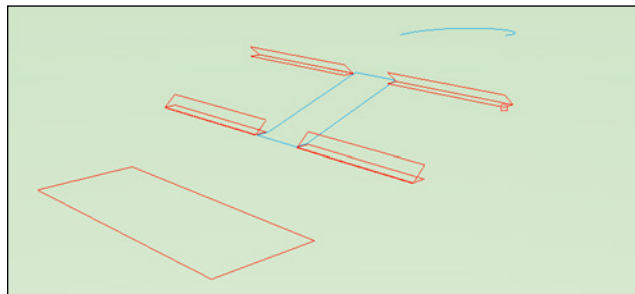


- Make Site Model the active layer.
- Select the Site Model. Where earlier in the tutorial we created Floor objects at different elevations to represent the site, here the entire site is represented by one single object that sits below all the design

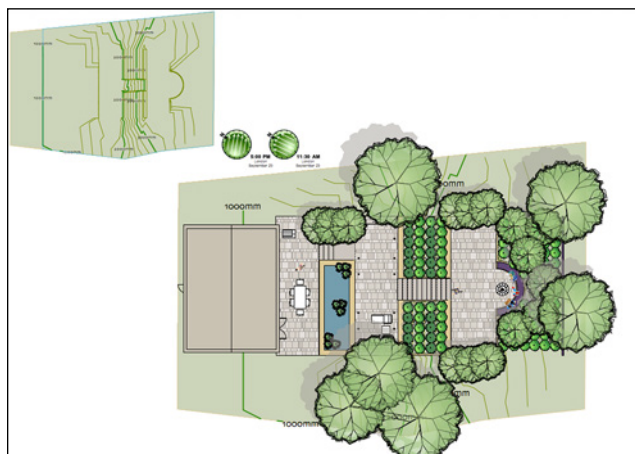
- Click **Exit Source Data** to return to the drawing area.

Explore the Complete Design

1. Make Hard Landscaping the active layer. Click the Selection tool and click on the elements of this layer. There are Hardscapes, Walls and Custom Stair objects. Look at the Object Info palette and notice that each object has a Z value and it has been placed on the surface of the model. The objects have either been positioned with the Send to Surface command, or they have been placed at the correct elevation by typing the elevation into the Z field.
2. Select a Hardscape object and click **Hardscape Settings** on the Object Info palette.
3. Notice that the 3D Type is **Pad Modifier**. This is a special kind of object that flattens the site beneath the Hardscape, and adjusts the contours accordingly to accommodate the new design elements. Click Cancel.
4. Make Planting the active layer. Notice that each plant is sitting at the correct elevation on the site model, but the Z value on the Object Info palette remains at 0. Plants automatically sit on the surface and you don't have to do anything special to make this happen.
5. Set Layer Options to **Active Only**. Finally, make Site Modifiers the Active Layer. This layer contains a series of other "modifiers," which are objects that can change the surface of the site model. For example, the pad toward the bottom of the slope creates a flat area on which the raised pool sits.



6. Change Layer Options to **Show/Snap Others** to see the entire site.
7. Make the sheet layer Sht-1 [3D Views] active. This sheet contains 4 viewports of different parts of the site. Creating a site model gives a much more accurate depiction of your design intent.
8. Make Sht-2 [Plan View] the active layer. The Site Model is a hybrid object and in Top/Plan view forms the base for the design drawing. It also displays the proposed contours for the scheme.



Summary

That's the end of this introduction to working with slopes. It really is intended as a starting point only, but you can see from the demonstration file that a site model plays host to the design elements, and site modifiers are used to adjust the surface of the model to accommodate the design elements. You can find more information about working with tools that can adjust a site model, within the Vectorworks Service Select portal. To summarize, you've seen:

- How to create a Site Model from simple height points
- How Landmark design elements such as hardscapes and plants can be set to sit on the surface of the model
- An introductory awareness of the concept of site modifiers, which can change the surface of the model to accommodate a design.

I hope you've found it useful.

Next Steps

So, you've completed this tutorial and have seen some of the wonderful things that Vectorworks Landmark can do to become the backbone of your design practice. Of course, as the name of the guide suggests, you've only just started! So, what's out there to help you move forward and look at Landmark in a lot more depth?

Vectorworks Help

1. Choose **Help > Vectorworks Help**. It will open in a separate window. Here you can search for full details on all the tools and menu commands to gain a much more in-depth knowledge of Vectorworks Landmark.

The Help menu also provides access to the following services where you will find further assistance and functionality to extend your use of Vectorworks:

Vectorworks Service Select

Vectorworks Service Select is a valuable source of information, including tech-tips and longer tutorials. There are also many more resources available for use in your plans. Vectorworks Service Select is a subscription service.

Vectorworks Cloud Services

Vectorworks Cloud Services is available to members of Vectorworks Service Select. Store your Vectorworks documents in the Vectorworks Cloud Services folder on your computer and they will upload to the cloud. Sheet Layers will automatically be exported to PDF and any Viewports will be rendered in the cloud, freeing up your own computer for design work. Cloud rendering does require a Renderworks licence. Once PDF files have been produced in the cloud, you can share with your customers and colleagues. You can also view and annotate the sheets with the Vectorworks Nomad app which is available for a range of tablet devices, including iPad, Android and Kindle Fire HD.

Vectorworks Training Guides

If you like to learn at your own pace, or want a far more detailed guide to Vectorworks Landmark, you might find Tamsin Slatter's "**Residential Garden Design with Vectorworks Landmark**," a good read. It's also a great resource to have with you after a training course to give you a detailed overview of the landscape design process in Vectorworks Landmark. To find out more, please visit: www.vectorworks.net/training/guides.php

Further Training

Nemetschek Vectorworks, Inc offers training at its headquarters and at other locations. There is a wide range of classroom offerings and one-to-one options. There are also many specialist third party trainers to help you move forward with Vectorworks.

About the Author: Tamsin Slatter



After a twenty year career in the IT industry, with roles spanning support, training, sales, and marketing, Tamsin retrained as a landscape designer in the UK. The change offered Tamsin a welcome escape from the corporate world, the chance to work with nice people, learning about plants and how to draw. However, throughout her training, she had a nagging doubt about the viability of such a business. As one person, chained to a drawing board, Tamsin realized that business growth was limited by the amount of time dedicated to the speed of drawing and updating as well as the inability to share work with other professionals. Tamsin looked at a number of CAD packages before she chose to use Vectorworks Landmark.

Thanks to the growing interest in Vectorworks across the industry and to her mastery of Vectorworks for her own design practice, Tamsin was asked to write a training course. This she did and thus a business was born. Now Tamsin runs a team of trainers, who show other designers the delights of working faster, more efficiently, and finishing drawings on time! Her organization, Design Software Solutions Ltd, based in the UK, offers training to individuals, large and small practices and educational establishments. Training across the entire Vectorworks product range, Tamsin never tires of the software, as it makes such a difference to her clients' businesses, large and small. Vectorworks Training runs one-to-one training, group training, online training, and master classes and consulting that cover specific topics in-depth. The company also supplies and implements Vectorworks software.

Tamsin is the author of "**Residential Garden Design with Vectorworks Landmark**," (published by Nemetschek Vectorworks, Inc.), which covers the landscape design process in great detail.