NEMETSCHEK Vectorworks

Vectorworks® Architect

2011 Getting Started Guide

The contents of this printed guide and accompanying exercise CD were originally created for Nemetschek Vectorworks, Inc. by Steve Hader.

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Introduction

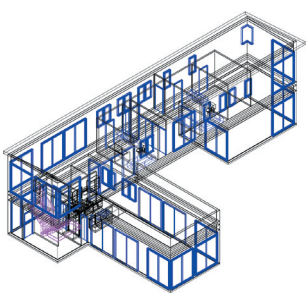
Welcome to Vectorworks Architect! This tutorial will introduce you to key tools and techniques for drawing and editing as well as provide a streamlined workflow to provide the proper framework for exploring the full power of Vectorworks Architect on your own.

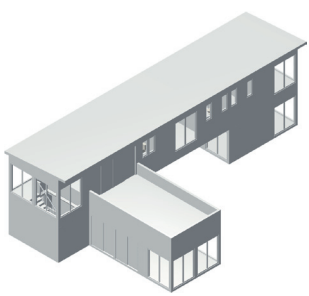
Important: *For free tutorial updates, bonus content, and instructional videos from the Architect Getting Started website, see* www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php.

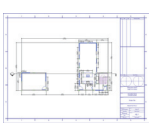
Overview of the Modeling Process

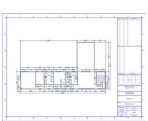
In this thematic tutorial, you use Vectorworks Architect to design a modern vacation home. You begin with a pre-configured (but otherwise blank) starting file, and continue using this single file for all design phases and documents. You complete the project by creating and printing various construction documents:

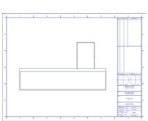
Note: The house design in this tutorial was adapted from the award-winning Dwell Home design by Resolution: 4 Architecture.

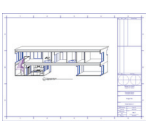












As you work through 11 continuing exercises, you develop the house design using a combination of standard Vectorworks and Vectorworks Architect tools to complete the following design features and documentation processes in order:

- Room layouts (walls)
- Architectural elements (floors, doors, windows, and other symbols)
- Multiple level features (roof)
- Construction documents (commonly used)
- Annotations
- Batch Printing

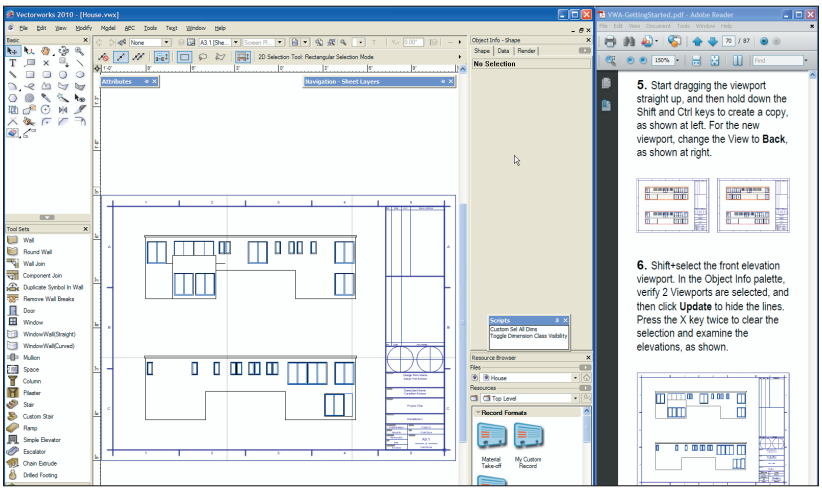
Notes:

1) Starting with *Exercise 3* (p. 16), you can optionally open completed exercise files (from the DVD's Data Set folder or *www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php*) to check your model or to skip ahead to the beginning of the next exercise. For example, open the **GS-VWAx10.vwx** file (completed *Exercise 10*) to start at the beginning of *Exercise 11*. See *General Exercise Tips* (p. 6) for more information.

2) This tutorial focuses on creating or setting up only the most common construction documents for a house design project.

How to Use This Tutorial

This tutorial is also provided as an e-Book in PDF format. You can view the PDF tutorial on-screen for enhanced electronic benefits including navigation links and search features. If you choose to view the tutorial on-screen, you can optionally enable Reflow viewing mode (available from the View menu only in the Adobe Reader 7 or Adobe Acrobat 7 programs, available from the View > Zoom menu in newer versions) to display the text with a wrapping effect similar to a web browser. You can then adjust the Zoom level and resize both the tutorial and Vectorworks windows to display them side-by-side as on p. 6.



Notes:

1) You can review workflow sequencing and locate specific procedures by scanning the process lists at the start of each section. The process lists are also hyperlinked to facilitate navigation.

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—let you revert or repeat navigational changes by page controls, bookmarks, and hyperlinks.

3) The Adobe Reader **Search** tool provides more extensive options for searching text than the **Find** command.

General Exercise Tips

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

- Read each step carefully and make sure your results match the figures. If your results vary from the figures, stop immediately and review the previous steps. If you can't find the problem quickly, start the exercise over with the appropriate supplied file.

- Alternate methods are shown for activating many tools, commands, and modes. Use the method that works best for you.

- In many cases, you must click in the drawing area after using the Navigation palette before continuing with the next step.

- Watch for SmartCursor cues that appear when you hover your cursor over significant drawing object geometry. Pause briefly over snap points to display the red snap box, and watch for the red confirmation dot displayed temporarily after you complete the snap. 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 (`).

- For some operations, additional view adjustments may be required. For these cases, press the Z key for the **Snap Loupe** shortcut, or use the **Zoom**, **Pan**, 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 a tool or command is active), hold down the Space bar and drag the cursor.

- If you inadvertently cleared a selection required for an active tool or command, press Space bar + X temporarily, and then select the object(s).

- Many tools have different operational 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, but 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 **Undo** command in the Edit menu to revert steps as necessary (both drawing and view changes are reverted).

- For tools that create multiple segments (such as the **Wall** tool), press the Delete key once while the tool is active to revert a single segment, or press it repeatedly to revert additional segments.

- If multiple files are open, you may need to click the Resource Browser's **Home** button  if your house 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  (in the Basic tools palette).

- Save your files often to prevent data loss.

Important:

1) Exercise steps in this tutorial are based on default preference settings from a new installation of the Vectorworks Architect program. Results for some steps may vary from the figures if your preference settings differ from the defaults.

2) Close any open files before you open a completed exercise file (only if you plan on using it to start the next exercise).

Using Metric Units with Exercises

All exercise data set files for this tutorial are set to use imperial units. If you want to use metric values for the exercise steps, enter the values exactly as shown in [square brackets, with the unit mark], and Vectorworks will convert the values accordingly. If you want to measure distances or drawing objects for reference, use the appropriate dimension tool and object snaps to create temporary dimensions, which are set by default to display alternate units in metric values. Delete the temporary dimensions when finished.

Note: For proper exercise operation—and to validate your results with the imperial figures—do not change the document's units setting to metric.

Checking Your Work

The **GS-VWAxCheck.vwx** file is included in the Data Set folder so you can verify the accuracy of your file. If you want to use this file to check your work:

1. Copy the Data Set folder on the DVD to any location on your hard disk.
2. In step 3 of *Exercise 1* (p. 10), open the **GS-VWAx01.vwx** file in the Data Set folder, and then save the file under the name **House.vwx** in the Data Set folder on your hard disk.

Notes:

1) Before you use any of the supplied files to start any other exercise, save your current file under a different name, and then open the read-only file (from the Data Set folder on your hard disk) and save it as **House.vwx** in the Data Set folder.

2) You must name your file "House" and save it in the Data Set folder to ensure the **GS-VWAxCheck.vwx** file works properly.

3. After saving your **House.vwx** file at the end of exercises 3 through 11, open the **GS-VWAxCheck.vwx** file from the Data Set folder on your hard disk, and then follow the exercise-specific checking instructions exactly as shown in the last steps of the exercise.

Keyboard Shortcuts

All keyboard shortcuts included in this guide are based on the Windows operating system. If you're using a Macintosh, use the Option key instead of the Alt key, and use the Cmd key instead of the Ctrl key. Refer to the Vectorworks 2011 Shortcuts PDF file (available from the Online Help) to print a complete list of your own keyboard shortcuts.

Section 1: Program Installation and Setup

In this section, you start by installing the Vectorworks Architect program. Following installation, two exercises cover the following program setup and interface adjustment processes:

In these exercises, you activate (or reset) the Vectorworks Architect interface, and then you adjust program preference settings and adjust the interface.

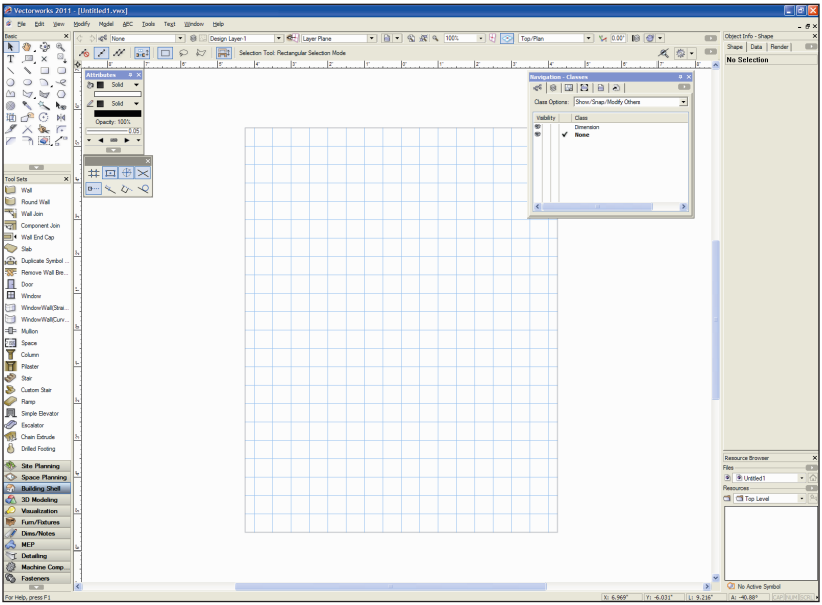
Installing the Vectorworks Architect Program

Note: If you have already installed Vectorworks Architect, start with step 2 below.

1. Follow the installation instructions in the **ReadMe** file located in the root folder of your installation DVD.
2. Start the program. You can do this by selecting **Programs > Vectorworks2011 > Vectorworks2011** from the Windows Start menu.
3. From the menu, select **Help > Check for Updates**. If updating is necessary, follow the on-screen instructions.
4. Close Vectorworks (if it's still running) to reset the program.

Exercise 1: Launching the Program and Opening the Starting File

In this exercise, you launch the application and activate the Vectorworks Architect workspace. After a brief orientation of the Architect interface, you then open the supplied starting file.



Activating the Architect Workspace

You start by launching the Vectorworks program.

1. From the Windows Start menu, select **Programs > Vectorworks2011 > Vectorworks2011.**

2. From the menu, select **Tools > Workspaces > Architect**. If the Architect workspace is already active, select it again to reset the interface. Position the Navigation palette where shown, and examine key areas of the interface identified in the following figure.

Opening the Starting File

Next, you open the supplied starting file. To save time, this starting file contains many pre-configured resources, and is already fully set up for creating a two-story structure without a basement.

Note: Before you open the supplied starting file, see Checking Your Work (p. 8).

3. From the menu, select **File > Open**. In the Open Vectorworks Drawing dialog box, open the Data Set folder and open the (read-only) **GS-VWAx01.vwx** file. The page boundary is displayed, and it's ready for laying out the first floor room areas.

4. From the menu, select **File > Save As**, and save the file under the name **House.vwx**.

You can now skip ahead to *Exercise 2* (p. 12), or you can use the Online Help system to review the following commands that were used to set up this file:

- **Document Setup** – Specifies layer scale, drawing area (page setup), sheet border, and title block settings used by the Create Standards Viewports command.
- **Model Setup** – Creates basic design layers, with appropriate height settings for 3D objects.
- **Create Standard Viewports** – Creates design layer, sheet layer, sheet layer viewport, and class schemes appropriate for selected construction documents. Also creates matching "working" views, which you use throughout the project to facilitate file navigation.
- **Standard Naming** – For enabling the Auto-classing option to assign class names and attributes to many of the objects you create. Visibility of these classes is handled automatically in sheet layer viewports and saved views generated by the Create Standard Viewports command.

Notes:

1) Design layers are used in architectural projects as spatial containers for creating drawing objects.

2) Sheet layers provide a 2D-only page layout environment for printing.

3) Sheet layer viewports are individual 2D "live camera view" objects that reside on sheet layers but display 2D and 3D drawing objects on design layers. When you modify drawing objects on a design layer, the viewport itself doesn't change, but it displays the changes in the design layers.

4) Classes are used to control display properties of drawing objects.

Important: *As you start the tutorial, do not be concerned if you don't fully understand the file structure and setup commands. As you progress through the exercises, you will see how the file structure works in context of a design project. For step by step file setup instructions from the Architect Getting Started website, see www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php.*

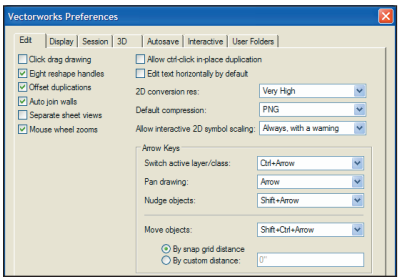
Exercise 2: Adjusting Preference Settings

In this exercise, you verify and adjust program preferences.

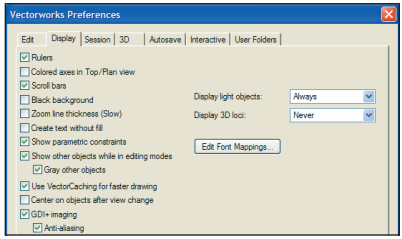
Adjusting Vectorworks Preferences

Next, you verify or adjust key application preference settings to ensure proper exercise operation, turn on scroll bars to facilitate navigation, and increase the maximum number of undos so you can revert exercise steps if necessary.

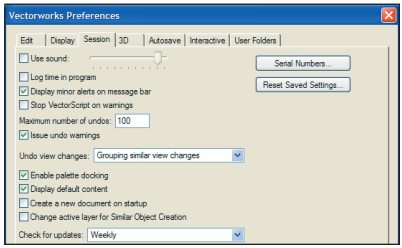
1. Click on the far right side of the Tool bar and select **Vectorworks Preferences**. In the Vectorworks Preferences dialog box, select the Edit tab, and then verify or adjust settings as shown (keep the dialog box open for the next three steps).



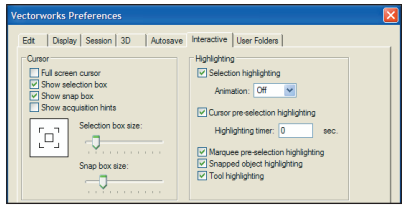
2. Select the Display tab, and enable the Scroll bars option, and then verify or adjust other settings as shown.



3. Select the Session tab, and then enter 100 in the **Maximum number of undos** field. Verify or adjust other settings as shown.

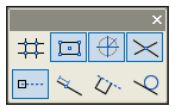


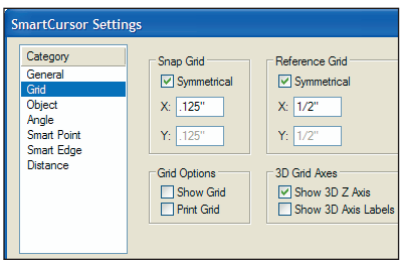
4. Select the Interactive tab, and then change the cursor's Selection box size and Snap box size, and verify or adjust other settings as shown at right. Click **OK** to save the settings and close the dialog box.

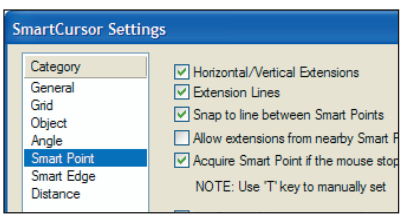


Adjusting Snapping Settings

5. Verify or adjust options in the Snapping palette (as shown at right), and then click the X in the palette's upper right corner to close it.







Adjusting Grid and Smart Point Settings

6. Press Ctrl + 8 to display the SmartCursor Settings dialog box. If a tip is displayed, click **OK** and then select **Grid** from the Category list. Clear the **Show Grid Lines** and **Print Grid Lines** checkboxes, and verify or adjust other settings (.125" [3.18mm], 1/2" [12.70mm]) as shown at left. From the Category list, click **Smart Point**, and verify or adjust settings as shown at right. Click **OK** to close the dialog box and save the changes.

Setting the Default Font

Next, you adjust the default font.

7. From the menu, select **Text > Font > Arial** to set the default font (if it's not set to Arial already), and then select **Text > Size > 12** to set the default font size to 12 point (if it's not set to **12** already).

Adjusting the Navigation Palette Display

8. If your Navigation palette is not already displayed, from the menu, select **Window > Palettes > Navigation**. If necessary, expand the Navigation palette by dragging the lower right corner to resize it.

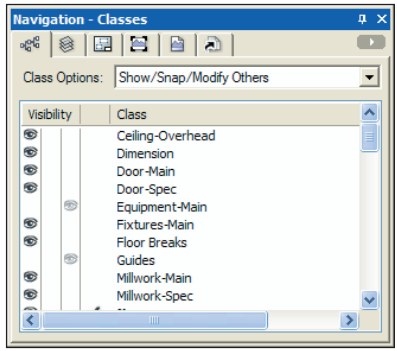
9. In the Attributes and Navigation palettes, turn on **Auto Hide** (Windows only).

Adjusting Quick Prefs

Next, you display appropriate Quick Prefs on the Tool bar for instant access at all times when any file is open.

10. Click on the far right side of the Tool bar, and then from the Quick Prefs menu:

- Select **Auto Join Walls** to display the **Auto Join Walls** button on the Tool bar.
- Select **Hide Details** to display the Hide Details button on the Tool bar.



Section 2: Laying Out Room Areas

In three exercises, this section covers the following processes in the home design project:

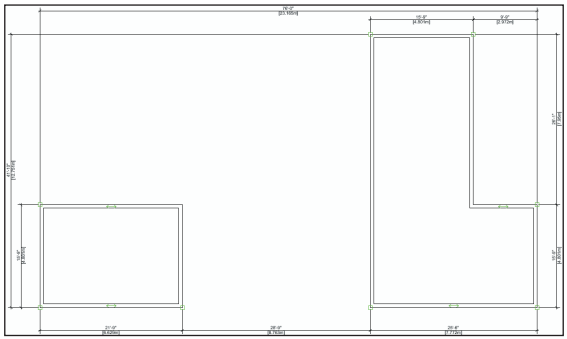
In these exercises, you work on design layers as you start the design by drawing wall objects (using unique wall styles for maximum flexibility) in approximate proportions. You then:

- Place geometric constraints on related walls.
- Automatically create associative dimensions for all walls.
- Use a combination of dynamic and precise methods to progressively tighten the accuracy and define basic spatial relationships of the rooms.

Note: Although you can also use space planning tools and massing models, this tutorial covers tools for drawing walls directly.

Exercise 3: Drawing Exterior Walls

In this exercise, you draw the exterior walls to define the first floor envelope. The completed exercise is shown in the following figure.



Drawing Connected Walls

You start the exercise by setting an appropriate zoom level, and then you draw four walls using the **6.5" [165.1mm] Generic Ext** style to represent the storage room. You use this wall style as a unique placeholder for exterior walls until you replace it with the final configuration in *Exercise 9* (p. 60). To create this wall style, a default content wall style was duplicated and renamed (the original style was not modified) to avoid:

- Conflicts for other users who may already be familiar with the properties of the default content style.
- Unintentionally replacing other walls in a project that may have the default content style property.

1. If you did not complete Exercise 2—or you are unsure of your file's accuracy—open the **GS-VWAx02.vwx** file.

2. From the View bar, click **Fit to Page Area**. From the Building/Shell tool set, click **Wall**. In the Tool bar, select **6.5" [165.1mm] Generic Ext** from the Wall Style drop-down list (if it's not already active).

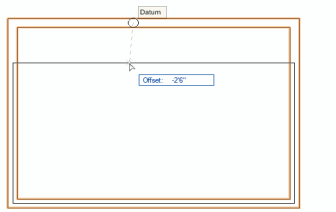
Note: Before you continue, view the animation of steps 3 through 9 (*AGSx03_03-09.mov* file from the DVD's Movies folder or *www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php*).

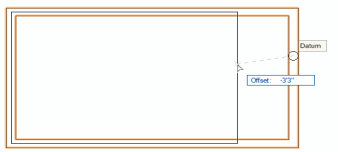
3. Draw four connected walls in clockwise order, starting at the lower left corner, approximately where shown at left (use the page border for approximate positional reference): Draw the first two segments, and then use angle snaps and acquire a Smart Point (see Note 2 on p. 17) at the starting vertex to control the length of the third segment to keep the walls square.

Notes:

1) Drawing exterior connected walls in a clockwise direction ensures that the interior and exterior sides are oriented correctly.

2) Before you draw the last segment, pause the cursor briefly over the starting vertex until the Smart Point is acquired (red box displayed). Pause the cursor one time to acquire a Smart Point; pause the cursor a second time to clear a smart point.

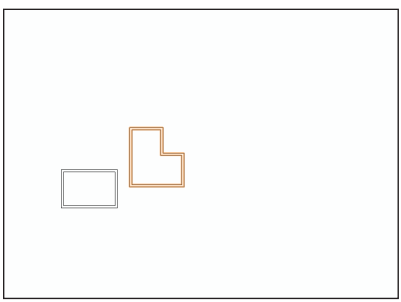




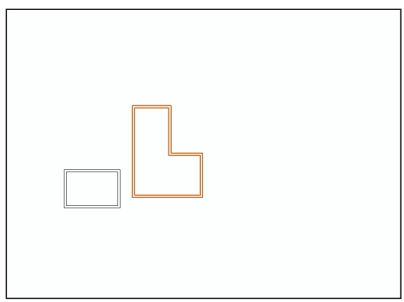
4. From the Basic tools palette, cclick the **Selection Tool**  . In the Tool bar, make sure the **Enable Connected Walls Mode**  option is enabled. Drag two of the walls to verify the connections, as shown at right.

Next, you draw the L-shaped exterior walls that define the perimeter of the functional area and living room.

5. Press the 9 key for the **Wall** tool shortcut. Use the same drawing technique to draw six connected walls in clockwise order, starting at the lower left, approximately where shown.

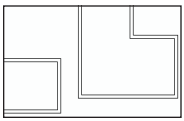


6. Press the X key for the **Selection Tool** shortcut. Drag various walls from the L-shaped room to verify the connections, as shown.

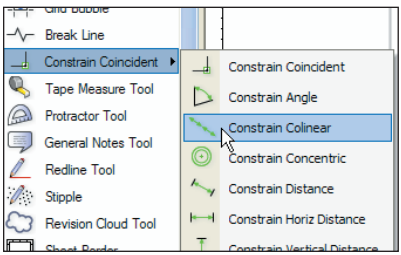


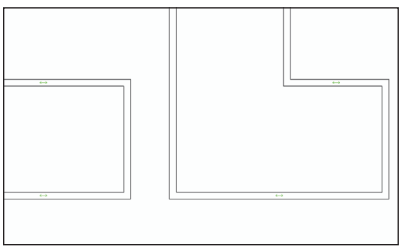
Applying Geometric Constraints to Walls

Next, you apply colinear constraints to four walls to maintain the distance between them and their alignment.

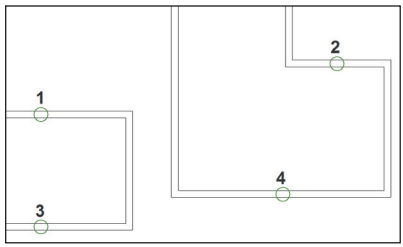


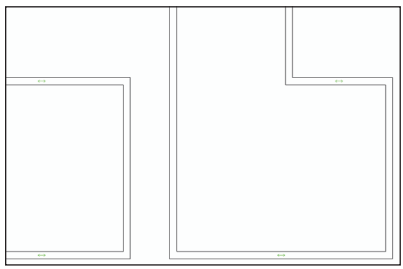
7. Press the X key twice to clear the current selection. click the **Zoom** tool  . In the Tool bar, make sure **Marquee Zoom Mode**  is active, and then draw a marquee around the area shown (at left) to zoom in. From the Dims/Notes tool set, hold down the left mouse button on the **Constrain Coincident** tool  to open the flyout palette, and then click **Constrain Colinear**  , as shown below.





8. Click the midpoints of the wall segments in order, (shown below) to place colinear constraints between the midpoints and constrain the walls along their centerlines (notice the horizontal colinear constraint indicators ⟷), shown in the next figure. If either constraint fails, zoom in and try again.



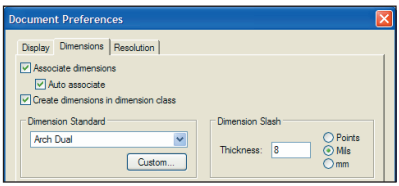


9. Press the X key and then drag one of the upper and one of the lower constrained walls to verify the constraints (both constrained walls move together), as shown at left. Press the X key twice to clear the current selection. From the View bar, click **Fit to Page Area**  to adjust the display.

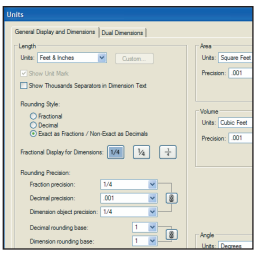
Adjusting Dimension Preferences

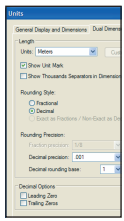
Next, you verify or adjust dimension creation and precision preferences.

10. Right-click a blank area and select Document Preferences. In the **Document Preferences** dialog box, select the Dimensions tab. Verify or adjust settings (8 Mils [.2032mm]) as shown, and then click **OK**.



11. From the menu, select **File > Document Settings > Units**. In the Units dialog box, select the General Display and Dimensions tab. Verify or adjust settings, as shown at left. Select the Dual Dimensions tab, and then verify or adjust settings as shown at right. Click **OK** to save the settings.





Dimension Notes:

1) Associative dimensions "attach" themselves to drawing objects by placing parametric constraints on vertices of selected geometry. Parametric constraints let dimensions move and update values when you move or resize associated geometry, or (for linear and chain dimensions only) modify associated geometry if you change the Length parameter.

2) To turn off display of the parametric constraints, select **Tools > Options > Vectorworks Preferences** from the menu, and then select the Display tab and turn off the Show **Parametric Constraints** option (leave the display on for these exercises).

3) If the **Associative Dimensions** option is disabled, any dimensions you create will not be attached to—or control—geometry you snap to.

4) The **Dimension Exterior Walls** command optionally creates associative dimensions, but it cannot create them for all objects.

5) Refer to the Online Help's Associative Dimensioning topic for more information.

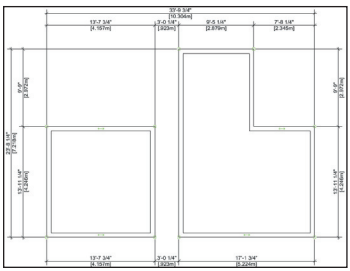
6) In your own files, you can create or import custom dimension standards and use them individually or replace default standards (in the active drawing only) if you need to adjust any parameters such as Offset Text size. Refer to the Online Help's Using Custom Dimension Standards topic for more information.

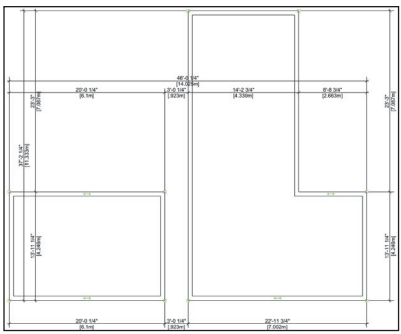
7) For your own drawings with dimensions based on multiple standards, you can set the current dimension standard from the Tool bar when any dimension tool is active.

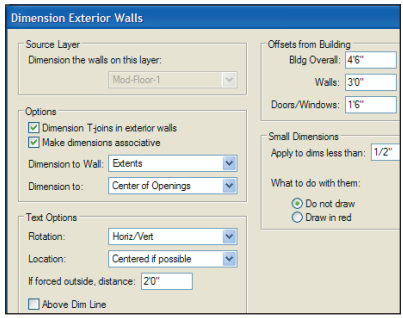
Dimensioning Walls

Next, you use the **Dimension Exterior Walls** command to automatically dimension the first-floor exterior walls.

12. From the menu, select **AEC > Dimension Exterior Walls**. In the Dimension Exterior Walls dialog box, adjust settings as shown at right, and then click **OK** to create the dimensions. Press the X key twice to clear the current selection. Examine the completed dimensions, shown below (your values will vary; you remove duplicate dimensions later in this exercise).







Dynamically Adjusting the Layout

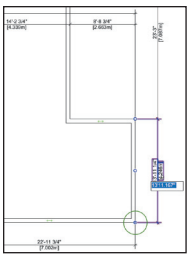
Next, you use different methods to dynamically resize and reposition the exterior walls as you continue to refine the building envelope.

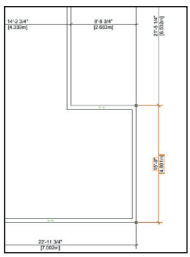
13. From the Basic tools palette, click the **Selection Tool**  . In the Tool bar, make sure the **Enable Connected Walls Mode**  option is active. Drag individual connected wall segments, starting with the vertical walls from right to left, and then the horizontal walls from top to bottom, approximately as shown at left. As you would when you dynamically refine spatial relationships in your own designs, try to get within ±1'-0" [.305m] of the dimensions shown (do not reposition dimensions until later in this exercise). Notice that the dimensions update to reflect changes and provide instant positional and size feedback as you adjust the layout (leave the **Selection Tool** active for the next four steps).

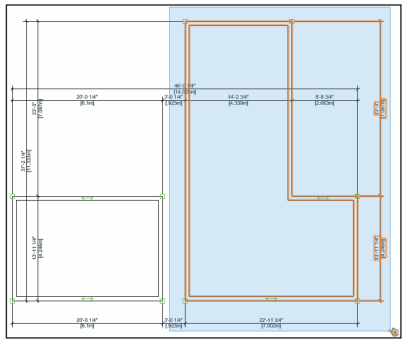
14. In the Tool bar, click the click the **Enable Connected Walls Mode** option to disable it, and then make sure the **Enable 2D Cursor Rectangular Selection Mode** option is enabled. Draw a marquee selection as shown at left. Move the entire selection by dragging any selected wall to the right until the distance between the rooms is between 27'-0" [8.230m] and 29'-0" [8.839m], as shown at right (notice that all selected walls and dimensions move together). Now that the "closed loop" move operation is complete, reset the default status of the **Enable Connected Walls Mode** option by pressing the P key to toggle (enable) it.

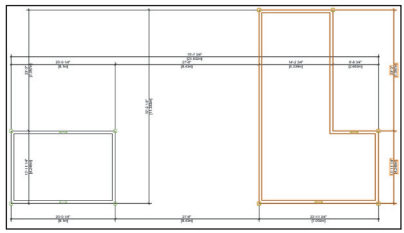
Warning: *Drag closed loops with the* ***Enable Connected Walls Mode*** *option disabled only when all connected walls are selected. Partial selections will be disconnected from unselected walls.*

Tip: You can use the **2D Reshape** tool to resize subsets of selected walls. For step by step instructions from the Architect Getting Started website, see *www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php*.









Precisely Adjusting the Layout

Next, you edit the length parameter of key dimensions to precisely adjust the size and position of all walls.

15. Double-click the vertical dimension text to activate editing mode, as shown at the far left. Click the bottom fix point (circled for clarity) to select it, or press the Tab key repeatedly to toggle fix points until the bottom fix point is selected. Enter a new value of 15'9" [4.801m], and then press Enter to accept the new value. The dimension and walls update to reflect the change, as shown in the next image.

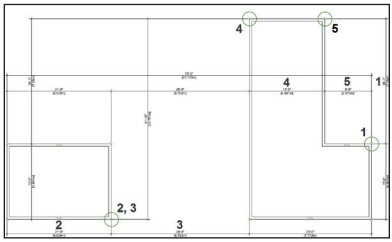
16. Repeat the length parameter editing process for the other five key dimensions in the order shown. Click or use the Tab key to control the fixed positions (circled, with corresponding key dimension numbers) as required (see Note below).

- Dimension 1: 26'1" [7.950m]
- Dimension 2: 21'9" [6.629m]
- Dimension 3: 28'9" [8.763m]
- Dimension 4: 15'9" [4.801m]
- Dimension 5: 9'9" [2.972m]

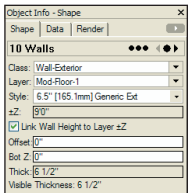
Note: Your initial dimensions may vary. If a dimension edit causes an unintentional change to another dimension, press Ctrl + Z for the **Undo** command shortcut to revert the change, and try again with a different fix point.

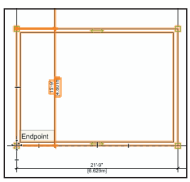
Next, you use the **Selection Tool** and the floating data bar to index the house position with the file's origin.

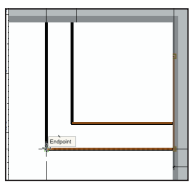
Note: You move the layout to ensure proper operation with the supplied exercise checking file. In your own designs, you may find it helpful to index the design with the origin for more meaningful world coordinates (because the entire design resides in the positive XY quadrant for Cartesian coordinates), and for more predictable results when referencing files.



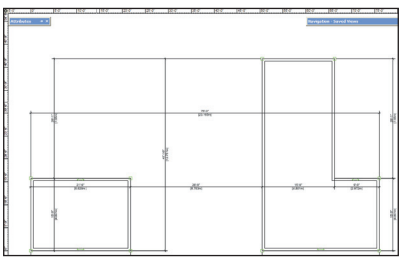
17. From the Basic tools palette,click the **Select Similar** tool  . Click one of the walls (away from the dimensions), and then confirm that all 10 walls are selected in the Object Info palette, as shown at right. Press the X key, and then press the P key to toggle off **Enable Connected Walls Mode**. Start dragging the lower left corner endpoint (shown below at left; if necessary, press the Z key and make sure you drag the endpoint, as shown below at right).





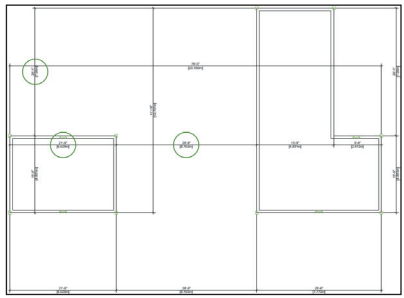


Move your cursor slightly (do not release the left mouse button) and then press the Tab key five times to highlight the X value in the floating data bar. Enter 0 (zero) for the value, and then press the Tab key and enter 0 (zero) for the Y value. Press Enter twice to move the selected walls. Press the P key to toggle **Enable Connected Walls Mode** on, and press the X key twice to clear the selection. Press Ctr l + 6 for the **Fit to Objects** shortcut to see the entire layout. Notice that the rulers confirm the lower left corner is on the origin (0,0), as shown below.

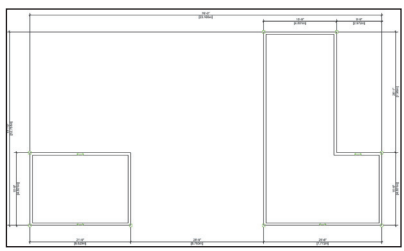


Tip: Use the Snap Loupe whenever you need to temporarily zoom in and select a point. For best Snap Loupe performance, press Ctrl + 8, select the **General** Category, and then disable the Z**oom Line Thickness in Snap Loupe** option.

Next, you delete duplicate dimensions, and then you reposition the remaining dimensions to clean up the drawing.



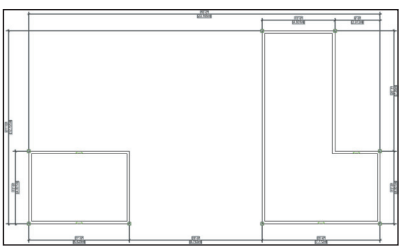
18. Right-click the text of the dimensions circled at left (one at a time), and select **Delete Dimension** from the context menu to remove them from the drawing. Drag the remaining dimensions (by dimension lines; not text) into place, approximately where shown at top below.



Next, you lock all dimensions to prevent inadvertent changes.

Note: The walls won't change position or resize when you lock all associated dimensions, but you can still modify wall properties and insert objects into them.

19. From the menu, select **Window > Script Palettes > Scripts**. Drag the Scripts palette to the left of the Navigation palette, and then double-click the **Custom Select All Dims** script. All dimensions are now selected. Right-click the text of one of the dimensions, and select **Lock** from the context menu. The selection highlight color turns gray (and the Object Info palette updates) to indicate all selected objects are locked, as below.



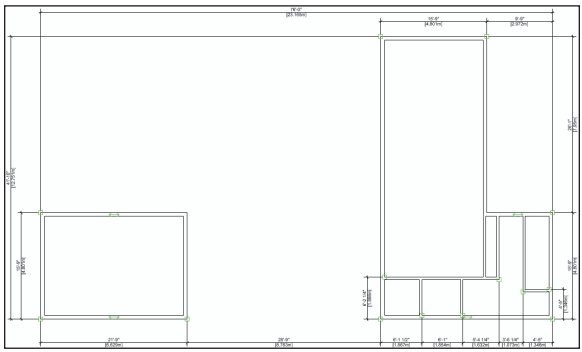
20. Press the X key twice to clear the selection, and then press Ctrl + S to save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

21. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the 01 Floor Plan-1 saved view to activate it, and then double-click the **Check EX03** saved view to activate it.
22. Use the **Zoom** and **Pan** tools (in the Basic tools palette), and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects (check dimensions for completeness; ignore dimension alignment).
23. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Exercise 4: Drawing Interior Walls

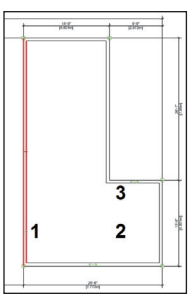
In this exercise, you draw and dimension the internal walls. The completed exercise is shown in the following figure.

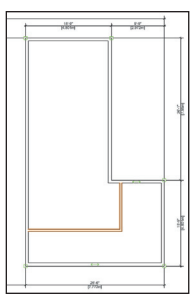


Drawing the Functional Area Walls

You start the exercise by drawing walls using the **4.5" [114.3mm] Generic Int** placeholder (see p. 16) wall style.

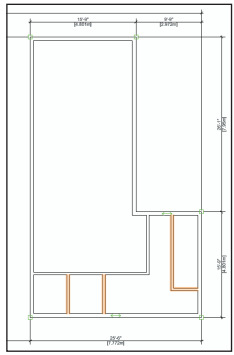
1. If you did not complete Exercise 3—or you are unsure of your file's accuracy—open the **GS-VWAx03.vwx** file.





2. Press the 9 key for the **Wall** tool shortcut. In the Tool bar, select the **4.5" [114.3mm] Generic Int** wall style. To start the first segment, move your cursor over the left vertical wall, and then click the wall (when it's highlighted), approximately where point 1 is shown at left. Complete the first segment by holding down the Shift key and clicking approximately where point 2 is shown at left. Complete the second segment by holding down the Shift key to vertically constrain the cursor, and then snap to the existing wall approximately where point 3 is shown at left (when the exterior wall is highlighted). Notice that the internal walls were automatically joined at the corner, and to the existing walls on both exterior ends, as shown at right (leave the **Wall** tool active for the next two steps).

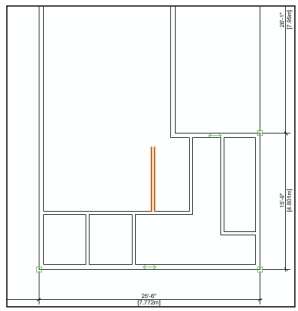
3. With the **Wall** tool still active, use the Shift key to draw two vertical wall segments and another L-shape series with a corner connection, approximately where shown (highlighted for clarity; to start and terminate connections with existing wall, click when existing walls highlight).



Drawing the Pantry Wall

Next, you draw a vertical interior wall segment for the pantry wall.

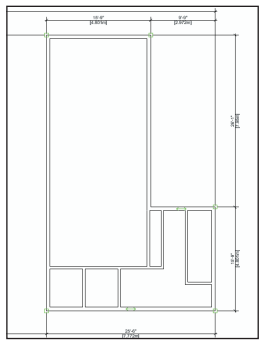
4. With the **Wall** tool still active, use the Shift key to draw a vertical wall segment—from top to bottom—connected with the vertical segment, approximately where shown.



Completing a Wall Y-Join with a Geometric Constraint

Next, you complete a Y-join corner by connecting the interior pantry wall to the exterior wall corner with a coincident constraint.

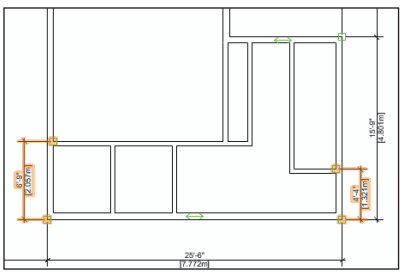
5. From the Dims/Notes tool set, hold down the left mouse button on the **Constrain Colinear** tool  to open the flyout palette, and then click **Constrain Coincident**  . Click the top left corner of the pantry wall segment and then click the inside corner of exterior walls to connect the vertices by placing a coincident constraint between them, as shown.



Dimensioning Walls

Next, you create linear dimensions, add dimensions to an existing chain dimension, and then modify the length values to precisely position the interior walls.

6. From the Dims/Notes tool set, click **Constrained Linear Dimension** . In the Tool bar, make sure **Constrained Linear Mode** is active. Snap to the appropriate wall endpoints (see Notes below figure) to create two constrained linear dimensions, as shown (highlighted).



Notes:

1) Snap to the endpoints marked with green squares, which indicate the parametric constraint points of associative dimensions.

2) The first two clicks determine dimension points (if prompted, accept default wall selections); the third click orients and places the dimension.

3) Pick up points of existing dimension geometry, and then use SmartCursor cues to align new dimensions as you create them.

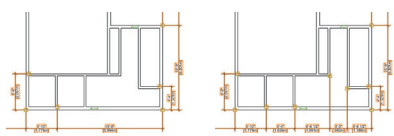
4) Make sure the dimensions you create are associative (green squares are displayed on both ends). If not, press Ctrl + Z and try again.

5) Press the X key, and then drag dimension lines or text if you need to move either. You can also select multiple dimension objects, and then drag their dimensions lines together.

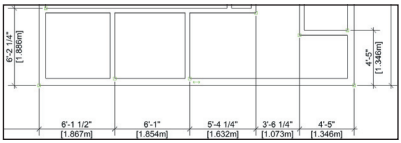
6) In your own drawings, you can dynamically or precisely adjust witness line lengths for one or more dimension objects. Refer to the Online Help's "Editing Dimensions with the Mouse" and "Editing Dimension Properties" topics for more information.

Next, you unlock two of the existing chain dimensions so you can add dimensions for the new interior walls.

7. In the Scripts palette, double-click the **Custom Select All Dims** script to activate it. Right-click any of the selected dimensions, and select **Unlock** from the context menu. Leave all dimensions selected, and then right-click the 25'-6" [7.772m] dimension text and select **Add Dimension** from the context menu (the cursor changes shape to indicate that the added dimension's endpoint must be specified). Snap to the vertical wall's endpoint to add a dimension, as shown at left. Repeat the process to add three more dimensions (to the right-most dimension) by snapping to appropriate wall endpoints to complete the chain dimension, as shown at right.



8. Press the X key, and then double-click each dimension and change the values to match the following figure (change the fixed point as necessary; see Notes below figure).



Notes:

1) You only need to adjust the four left chain dimensions; the 4'-5" [1.346m] dimension on the right side will be corrected automatically.

2) If you experience a bug that alters any wall T-joins when you change dimension values, use the **Wall Join** tool with **T Join Mode** to re-create the joins.

Next, you lock all dimensions.

9. In the Scripts palette, double-click the Custom Select All Dims script. Right-click one of the selected dimensions, and select Lock from the context menu.

10. Press the X key twice to clear the selection, and then press Ctrl + S to save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

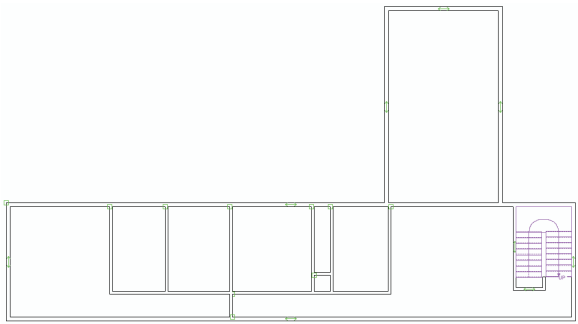
11. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the 01 **Floor Plan-1** saved view to activate it, and then double-click the **Check EX04** saved view to activate it.

12. Use the **Zoom** and **Pan** tools (in the Basic tools palette), and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects (check dimensions for completeness; ignore dimension alignment).

13. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Exercise 5: Drawing Second-Floor Walls and Adding a Stair

In this exercise, you copy a subset of walls from the Mod-Floor-1 layer, and then you paste them in-place on the Mod-Floor-2 layer to start the second-floor plan. Next, you clean up wall intersections, and then you constrain the exterior second-floor walls to the mating first-floor walls. You then complete the exercise by inserting a stair object and modifying the layout to fit the stair configuration. The completed exercise is shown in the following figure.

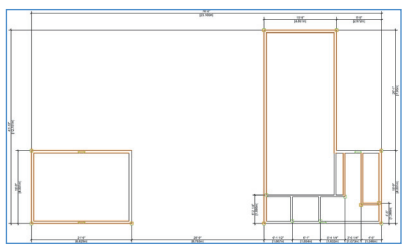


Copying Walls for the Second-Floor Plan

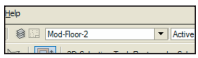
You start the exercise by copying ten walls, and then you paste them in place in the Mod-Floor-2 layer to start the second-floor plan.

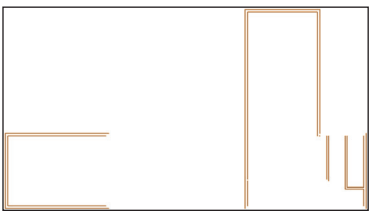
1. If you did not complete Exercise 4—or you are unsure of your file's accuracy—open the **GS-VWAx04.vwx** file.

2. Press Ctrl + 6 to display the entire floor plan. Press the X key, and then hold down the Shift key and select the ten walls shown.



3. In the Object Info palette, verify that ten walls are selected, and then press Ctrl + C to copy them. In the Navigation palette, select the Saved Views tab, and then double-click the **Floor Plan-2** saved view to activate it (in the View bar, notice the Mod-Floor-2 layer is now active, as shown at right). From the menu, select **Edit > Paste** in Place to copy the walls to the same X and Y coordinates on the second floor, as shown below

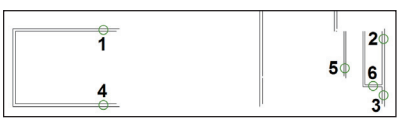


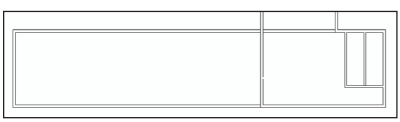


Joining Walls

Next, you use the **Wall Join** tool to clean up wall intersections and corners.

4. Press the X key twice to clear the current selection. From the Building Shell tool set, click **Wall Join**, then click **L Join Mode** in the Tool bar. Click wall segments in order, approximately where shown The wall corners are joined and trimmed, as shown.

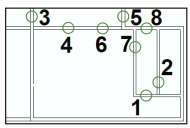


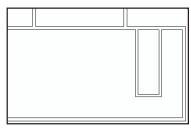


Important: *Avoid clicking too close to the end of each wall segment. If you click at the end of the segment, the walls will not join properly.*

Note: If you experience a bug that alters any existing wall joins in the previous or next steps, use the **Wall Join** tool with either **L Join Mode** or **T Join Mode** as appropriate to re-create the join.

5. With the **Wall Join** tool still active, click wall segments 1 and 2 in order, approximately where shown at left, and then click **T Join Mode** in the Tool bar. Click wall segments 3 through 8 in order, approximately where shown at left. Press the X key twice to clear the current selection. You can now see that all wall corners are appropriately joined and trimmed, as shown at right.



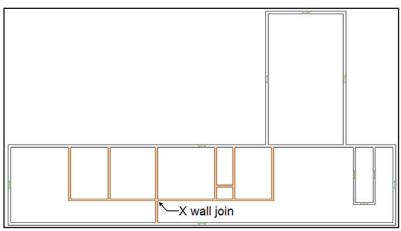


Note: To save time, you skip the repetitive process of applying geometric constraints to the second floor walls to link their length and position with mating walls on the first floor. If you want to apply these optional constraints or learn about related design benefits not covered in this tutorial, save your file now and refer to the step-by-step instructions from the Architect Getting Started website; see *www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php*. After applying the constraints, you can continue with the next step.

Drawing Remaining Walls

Next, you draw the remaining interior second-floor walls in their approximate positions.

6. From the Building/Shell tool set, click **Wall** . In the Tool bar, make sure the **4.5" [114.3mm] Generic Int** wall style is still active. Use the Shift key to draw the remaining the interior walls approximately where shown (highlighted for clarity).



Dimensioning Walls

Next, you use the same dimension/modification technique as the previous two exercises (with minimal instruction) to complete the second floor layout.

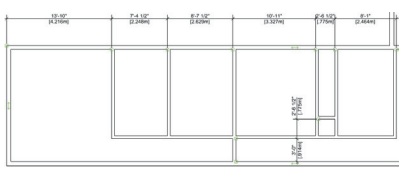
7. Use either the **Dimension Exterior Walls** command or the **Constrained Linear Dimension** tool with **Constrained Chain Mode** (see Notes below figure) to create associative dimensions, and then change the length and fixed points as necessary to precisely position the interior walls from the previous step, as shown at right (with chain dimensions).

Notes:

1) The dimensions shown are the only dimensions required to complete the second-floor interior wall layout (see Note 3). The other walls were copied from the first floor and pasted in the correct position on the second floor. To save time in this exercise, you skip the repetitive process of creating dimensions for all second-floor walls normally required for construction documentation.

2) To automatically associate dimensions with T-joined wall intersections with the **Dimension Exterior Walls** command, select **Centerlines** from the Dimension to Wall drop-down list, and select **Center of Openings** from the Dimension drop-down list in the Dimension Exterior Walls dialog box. If you prefer dimensions to wall edges, use the **Constrained Linear Dimension** tool , and double-click the snap point in the chain to terminate the dimension string.

3) If you applied the optional constraints after step 5 (p. 30), any dimensions associated with second-floor exterior walls will also control mating (constrained) walls on the first floor, even though the first-floor walls already have dimensions associated with them. Vectorworks allows multiple-dimension control (from dimensions in design layers and sheet layer viewport annotations) over associated objects.



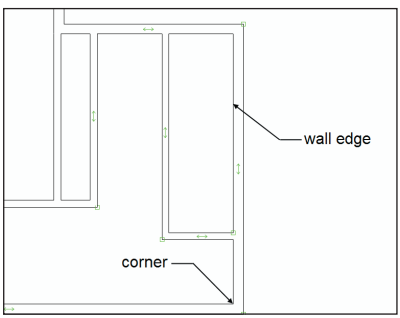
Inserting a Stair Object

Next, you insert a custom stair plug-in object. You then drag and nudge the stair object into position.

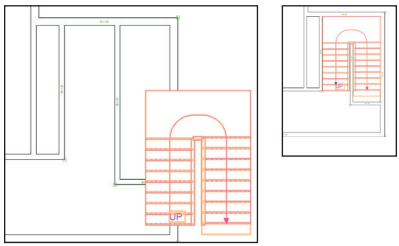
8. In the Navigation palette, double-click the **Floor Plan-1** saved view to activate it. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions.

Note: You can use the **Toggle Dimension Class Visibility** script at any time in any of the exercises to check dimensions or hide them to reduce clutter.

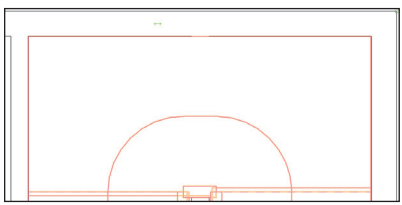
9. From the Building Shell tool set, click **Custom Stair**  . In the Tool bar, click **Wall Insertion Mode**  , if it's active, to turn it off, and then enable the **Align Object Left**  option. Snap first to the corner and then snap to the wall edge, where shown.



The stair object is created (shown above at left). Press the X key, and then move the stair object by dragging the upper right corner of the platform and releasing it on the top right inside corner of the stairwell, as shown at right.



Note: The **Custom Stair** tool was pre-configured for this file. The Stair Settings dialog box would normally be displayed for the first custom stair object inserted in a file. For subsequent insertions in your own files, click Preferences  from the Tool bar before placing the custom stair to set default parameters. If you change Stair Settings dialog box parameters, all subsequent insertions are affected.

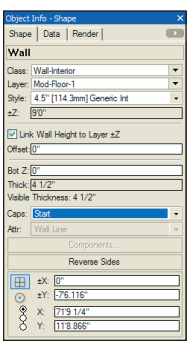


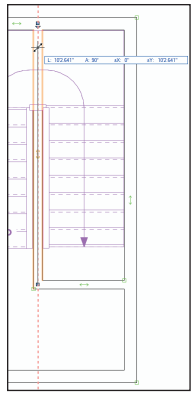
10. Zoom in on the stairs by pressing Ctrl + 6 for the **Fit To Objects** shortcut, and then hold down the Shift key and press the Left and Down arrow keys one time each to make sure the stairs are close to the walls but not touching them, as shown above.

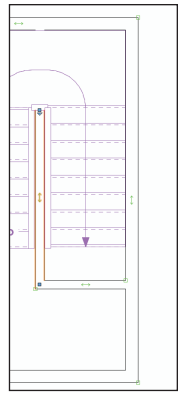
Modifying the Stairwell, Foyer, and Deck Walls

Next, you shorten the stairwell divider wall to accommodate the stair platform and handrails.

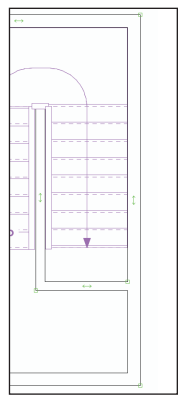
11. From the View bar, click **Previous View**, and then press the X key and select the stairwell divider wall below the stair (notice the selection highlight is visible under the stair object). Click the top grip when the resize cursor and SmartCursor point cue is displayed to "pick up" the endpoint (do not snap to another point after you click the top grip, or the wall will not remain vertical). Move your cursor, press the Tab key three times and enter 0 for the **±X** value, and then press Enter. Notice the vertical constraint indicator, as shown at top left. Move your cursor to the inside edge of the horizontal stair handrail, and then press the Z key for the Snap Loupe shortcut (to temporarily zoom in). Click the midpoint of the stair handrail's inside edge to resize the wall (and close the Snap Loupe), as shown at top right. In the Object Info palette, select **Start** from the **Caps** drop-down list, as shown at left.





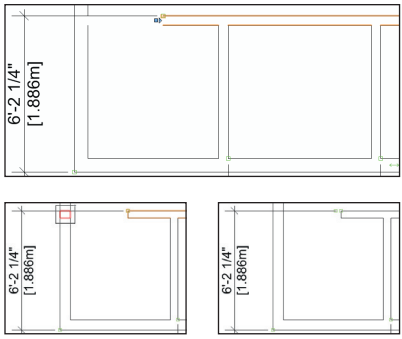


Click in a blank area of the drawing to clear the selection and examine the wall cap, shown at right.



Next, you use the **2D Reshape** tool to shorten the kitchen wall's left edge to make a 3' wide opening into the foyer.

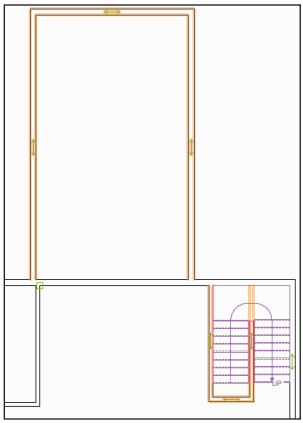
12. In the Scripts palette, double-click the Toggle Dimension Class Visibility script to show all dimensions. Right-click the 6'-2 1/4" [1.886m] dimension and select **Unlock** from the context menu. From the Basic tools palette, click **2D Reshape**  . Make sure that the **Move Polygon Handles Mode**  is active in the Tool bar. Select the horizontal kitchen wall. Click the left grip to "pick up" the endpoint, and then move the cursor to display the floating data bar. Type 3' for the **±X** value, press Tab and enter 0 (zero) for the **±Y** value, and then press Enter twice to complete the reshape operation, as shown at top. In the Object Info palette, select **Start** from the **Caps** drop-down list. From the Building Shell tool set, click **Remove Wall Breaks**  . Draw a marquee from lower left to upper right, approximately as shown at bottom left (see Note below figure). Notice that the wall break was removed (the wall line is now continuous). Lock the 6'-2 1/4" [1.886m] dimension, and then press the X key twice to clear the selection. Examine the shortened wall, as shown at bottom right.

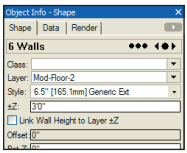


Note: Remove only the wall break of the vertical wall (do not remove the wall break on the left edge of the horizontal kitchen wall).

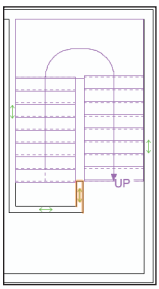
Next, you change the height of the deck and stairwell walls to make balustrade walls. You then shorten the stairwell wall.

13. In the Navigation palette, double-click the **Floor Plan-2** saved view to activate it. Notice that the custom stair object inserted in the **Mod-Floor-1** layer is also displayed in the (currently active) **Mod-Floor-2** layer. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide dimensions. Press the X key twice, and then hold down the Shift key and select the six walls shown below. In the Object Info



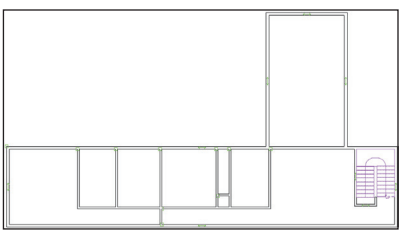


palette, disable the **Link Wall Height to Layer ±Z** option, and then change the ±Z value (3'0" [.914m]), as shown.



Click a blank area, and then select the stairwell wall. Click the top grip, hold down the Shift key, and then click the right front stair edge to resize the wall. Use the **Remove Wall Breaks** tool to remove the break at the resized end, and then select **Start** from the Caps drop-down list in the Object Info palette to complete the stairwell wall, as shown at left.

14. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to show the dimensions. Press the X key twice to clear the selection, and then press Ctrl + 6 to adjust the display. Examine the completed second-floor walls, as shown.



15. Save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

16. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the **01 Floor Plan-1** saved view to activate it, and then double-click the Check EX05 saved view to activate it.

17. Use the **Zoom** and **Pan** tools (in the Basic tools palette), and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects.

18. In the Navigation palette, double-click the **02 Floor Plan-2** saved view to activate it, and then double-click the **Check EX05** saved view to activate it.

19. Use the **Zoom** and **Pan** tools (in the Basic tools palette), and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in blue, and the master file's drawing objects are displayed in their default colors. You should see your blue drawing objects overlaid directly on top of the master file's drawing objects.

20. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Section 3: Creating Architectural Elements

In two exercises, this section covers the following processes in the home design project:

- Creating Floor Slabs from the First-Floor Exterior Walls (p. 38)
- Saving Settings for the **Select Similar T**ool (p. 39)
- Changing Foor Slab Properties (p. 40)
- Inserting Doors (p. 41)
- Copying a Door Using Ctrl + Drag (p. 41)
- Creating Different Door Types (p. 42)
- Creating a Cased Opening (p. 44)
- Inserting Windows (p. 44)
- Examining the Design in a 3D View (p. 46)
- Saving a 3D Reference View (p. 47)
- Creating Floor Slabs from the Second-Floor Exterior Walls (p. 48)
- Copying and Inserting the Remaining Doors and Windows (p. 49)
- Examining the Design in Various 3D Views (p. 52)

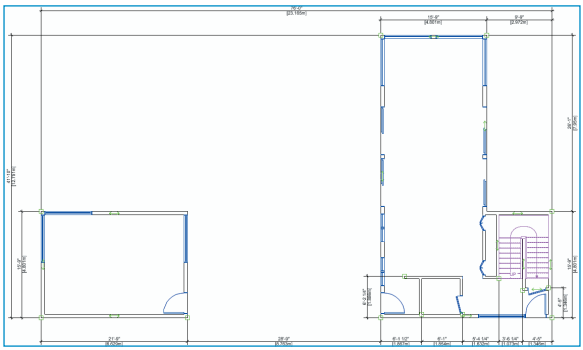
In these exercises, you continue working in 2D floor plans (on design layers) as you:

- Create auto-bounded floor slabs from existing walls.
- Refine the house design by inserting a variety of architectural elements (intelligent plug-in objects).

After inserting architectural elements, you use simple view controls to examine the 3D objects that were created automatically by the 2D tools.

Exercise 6: Creating the First-Floor Plan

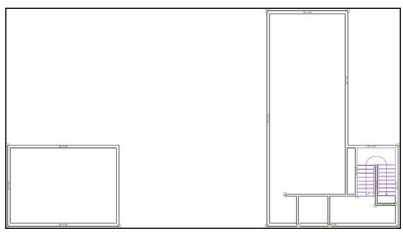
In this exercise, you create slab objects, and then you place common architectural elements in the first-floor plan. The completed exercise is shown in the following figure:



Creating Floor Slabs from the First-Floor Exterior Walls

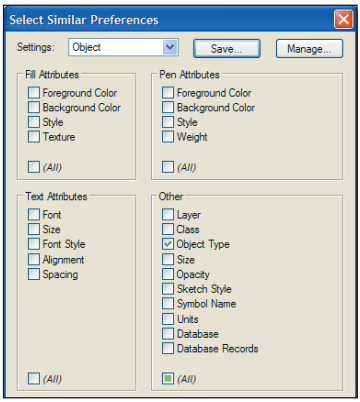
You start by creating two auto-bounded floor slab objects from the first floor's exterior walls using the **Ground** slab style. As you did with wall styles (see p. 16), you use this slab style as a unique placeholder for the first floor's slabs until you replace them with the final configuration in *Exercise 9* (p. 60).

1. Open the **GS-VWAx05.vwx** file in the Data Set folder. In the Navigation palette, activate the **Floor Plan-1** saved view. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions.



2. From the Building Shell tool set, click the **Slab** tool. In the Tool bar, enable **Picked Walls Mode**, and then select **Ground** from the Slab Style drop-down list. In the drawing area, click the four storage (rectangular) room walls, and then click **Press to Complete Operation** in the Tool bar to create the slab, as shown at top right. With the **Slab** tool still active, click the six exterior walls that form the L-shaped perimeter of the functional area and living room, and then click **Press to Complete Operation** to create the slab, as shown at bottom right.

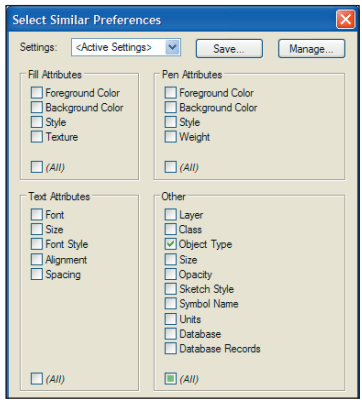
Notice that even though both slab objects reside below the Z height of the walls, they are displayed on top of them due to the creation order (or *stacking order)* of objects in the Mod-Floor-1 layer.

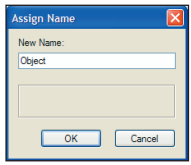


Saving Settings for the Select Similar Tool

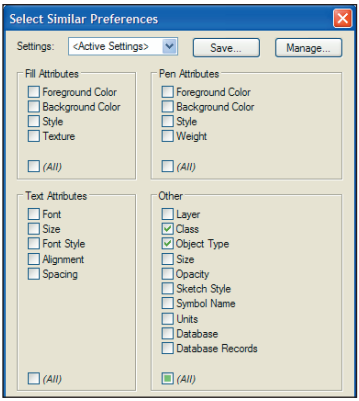
Next, you save two configurations of attribute matching settings for the **Select Similar** tool.

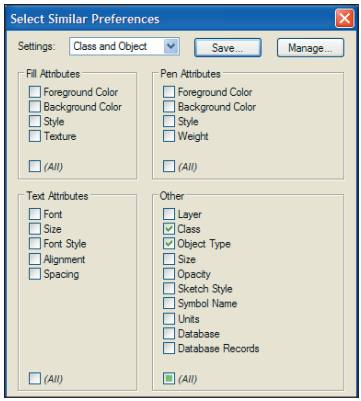
3. From the Basic tools palette, click the **Select Similar** tool. In the Tool bar, click **Select Similar Preferences**. In the Select Similar Preferences dialog box, verify or adjust settings as shown below.

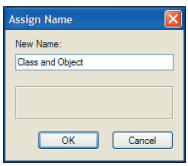




In the Selection Options section, click **Save**. In the Assign Name dialog box, enter **Object** for the name, as shown. Click **OK** to save the settings. Notice that the **Object** saved setting is now displayed in the Use Saved Settings drop-down list (and is now active), as shown at left. Keep the Select Similar Preferences dialog box open.







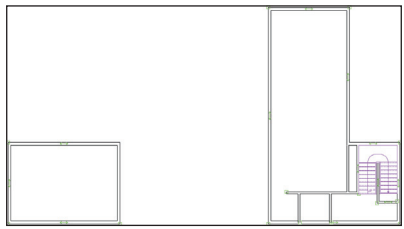
4. In the Other section, enable the **Class** option, as shown above. Click **Save** and save the settings as **Class and Object,** as shown. With the new **Class and Object** saved setting active (as shown at top right), click **OK** to save the settings (leave the **Select Similar** tool active).

Changing Floor Slab Properties

Next, you change the slab objects' class and layer properties.

5. With the **Select Similar** tool still active, click either of the two slab objects. In the Object Info palette confirm that two slabs are selected and then change the following:

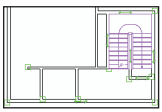
- Slab objects' class property to **Structural-Slab** (if a message dialog box is displayed, enable the **Always do the selected action** option, and click **Yes**).
- Slab objects' layer property to **Mod-Slab-1**. The slab objects seemingly disappear (see Note below figure) but are actually present under the walls because of the layer order saved in the Floor Plan-1 view, as shown.



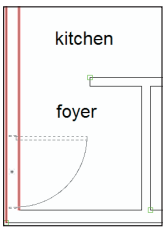
Note: The slab objects no longer appear selected because of the Floor Plan-1 saved view's layer option settings. If you were to activate the Mod-Slab-1 layer (***do not activate it now***), you would see that the floor object is still selected.

Inserting Doors

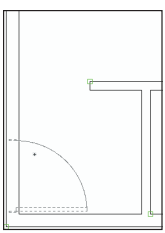
Next, you use the **Door** tool to insert a plug-in object.

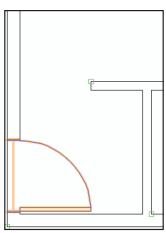


6. Zoom in on the kitchen and functional area, as shown at left. From the Building Shell tool set, click the **Door** tool  .



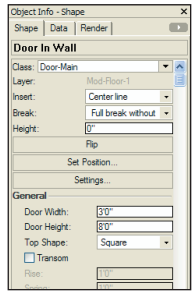
- Click the foyer wall approximately where shown at left.
- Move your cursor to orient the door as shown below at left (notice how your cursor position flips the door side and swing), and then click to place the door plug-in object, as shown below at right.





Note: The **Door** tool was pre-configured for this file. The Door Settings dialog box would normally be displayed for the first door object inserted in a file. For subsequent insertions in your own files, click **Preferences**  from the Tool bar before placing the door to set default door parameters. If you change the Door Settings dialog box settings, all subsequent insertions are affected.

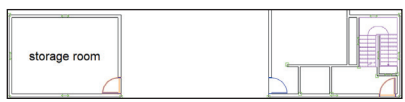
7. In the Object Info palette, verify a "Door In Wall" is selected (as shown). If it isn't drag the door to reinsert it in the wall. Leave the door selected for the next step.



Copying a Door Using Ctrl + Drag

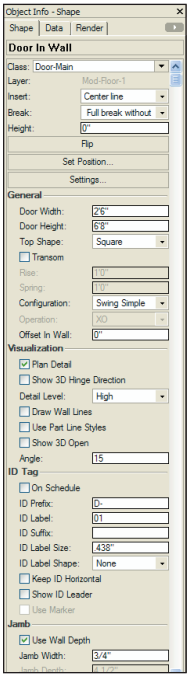
Next, you create two more doors by copying the existing door object dynamically by dragging it while pressing the Ctrl key.

8. Hold down the Alt key, and then click **Zoom In/Zoom Out**  (repeatedly if necessary) until the storage room is visible. Press the X key, and then hold down the Shift and Ctrl keys and drag the foyer door (drag it from its insertion point: the middle of the door's wall break) to create a copy (highlighted at left) in the storage room wall. If your copied door doesn't break the wall, try again and release the mouse button when the Object/Horizontal SmartCursor cue is displayed. In the Object Info palette, click the **Flip** button one time to change the swing as shown. Hold down the Ctrl key, and drag the foyer door to create the front door, approximately where shown (highlighted) at right.



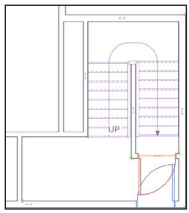
Creating Different Door Types

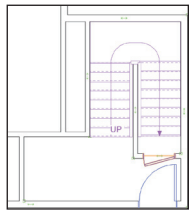
Next, you copy one of the 3'-wide door objects and then modify the copy to create a door that is 2'6" [.762m] wide.



9. Press the X key twice, and then use the Ctrl + drag method to copy the front door (by its insertion point: the midpoint of its wall break) to the center of the stairwell closet wall, as shown above at left. In the Object Info palette (shown at right), adjust the new door's settings:

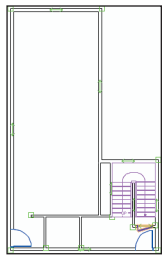
- Change the Door Width to 2'6" [.762m].
- Change the Door Height to 6'8" [2.032m].
- Change the Open Angle to 15, and then press Enter to incorporate the change.
- Click the **Flip** button as necessary to orient the door as shown above at right.

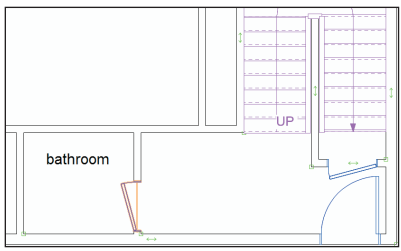




Note: You change the open angle to 15 degrees so you can easily distinguish the 2'6" [.762m]-wide door.

10. Zoom in on the area shown at left. Press the X key, and then use the Ctrl + drag method to copy the stairwell closet door to the bathroom wall, approximately where shown below.



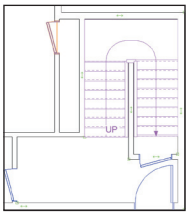


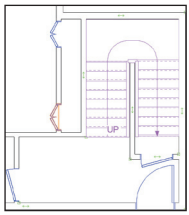
Next, you use the same copy and modify method to create a bi-part pantry door and slider doors for the living room.

11. Use the Ctrl + drag method to copy the bathroom door to the pantry wall, as shown below at left. In the Object Info palette, change the following details of the new door.

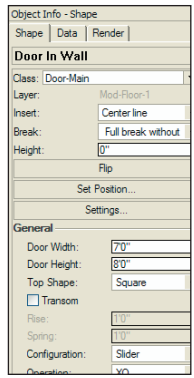
- Width to 2’0” [.610m]
- Configuration to **Swing Bi-part**
- Open Angle to 30

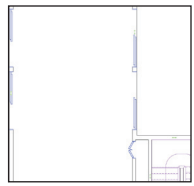
Drag the bi-part door if necessary to reposition it, and then use the Ctrl + drag method to create a second bi-part door in the pantry wall, approximately where shown (highlighted) below at right.





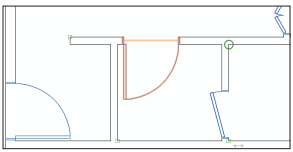
12. Use the Ctrl + drag method to copy the 3’ [.914m]-wide foyer door to the left living room wall, approximately where shown below at left. In the Object Info palette, edit the new Door Width (7’0” [2.134m]) and Configuration properties, as shown. Use the Ctrl + drag method to create a copy above, and then select both and use Shift + Ctrl + Drag to copy both to the opposite wall to create a total of four slider doors in the orientations (use the Flip option as necessary) and approximate positions, as shown below at right.



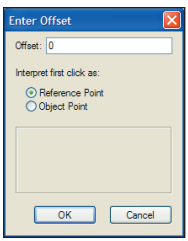


Creating a Cased Opening

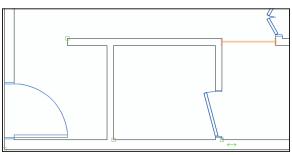
Next, you use the 3'-wide door to create a cased opening.



13. Use the Ctrl + drag method to copy the 3'-wide foyer door to the horizontal bathroom wall, approximately where shown above. In the Object Info palette:



- Change the Configuration to **Cased Opening.**
- Scroll down, and change the Jamb Width to 0 (zero) and press Enter to incorporate the change.
- Scroll up and click **Set Position**. Click the wall corner (circled at left) for the reference point, and then click the cased opening's lower left vertex for the object point. Adjust settings in the Enter Offset dialog box, as shown above at left. Then click **OK** to set the cased opening's jamb flush with the wall edge, as shown below.

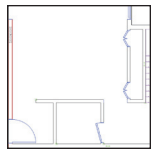


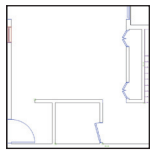
Inserting Windows

Next, you activate the Window tool, and then you insert two windows.

14. Press the X key twice to clear the selection, and then from the Building Shell tool set, click the **Window t**ool .

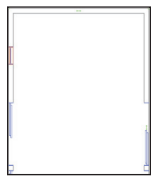
- Click once to position the window in the left kitchen wall, approximately where shown at right.





- Click outside and to the left of the kitchen to specify the rotation. The window plug-in object is created, as shown at left

- With the **Window** tool still active, insert another window in the wall (click outside to specify rotation), as shown at right.

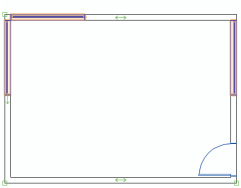


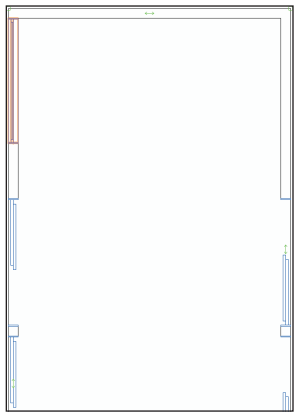
Note: The **Window** tool was pre-configured for this file. The Window Settings dialog box would normally be displayed for the first window object inserted in a file. For subsequent insertions in your own files, click **Preferences** from the Tool bar before placing the window to set default window parameters. If you change the Window Settings dialog box settings, all subsequent insertions are affected.

Next, you change properties of the last window to create a 7’ [2.134m]-wide picture window.

15. With the window still selected, confirm in the Object Info palette that the window is in the wall, and then:

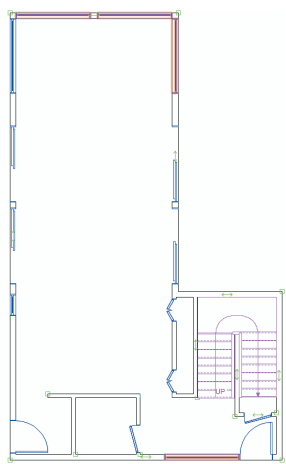
- Change the Overall Width to 7’0” [2.134m].
- Change the Overall Height to 8’0” [2.438m].
- Scroll down and change the Num V Muntins to 1.
- Change the Muntin Width to 4” [101.60mm].
- Change the Muntin Depth to 1” [25.40mm], and then press Enter to update the window settings.
- Drag the window so that its outside top jamb edge is flush with the inside edge of the living room wall, as shown at right.





16. Press the X key, and then use the Shift + Ctrl + drag method (and the Ctrl + drag method) to copy the 7’ [2.134m]-wide picture window seven times (highlighted for clarity) for a total of eight picture windows, as shown below (see Note).

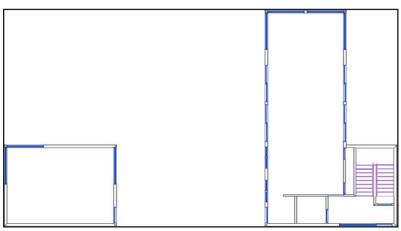
Note: Ctrl + drag automatically orients window exteriors.

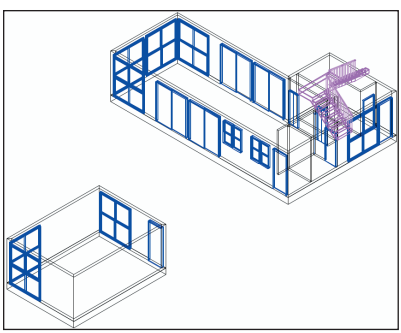


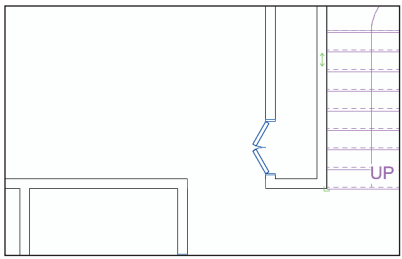
Next, you copy the 2' [.610m]-wide window.

17. Use the Ctrl + drag method to copy the small window one time, and then select both and use Ctrl + drag to copy both windows to create a total of four 2' [.610m]-wide windows, approximately where shown (highlighted for clarity).

Note: In your own designs, you would now create associative dimensions for the windows and doors, (and edit length values as necessary). To save time, you skip this step in this exercise and in *Exercise 7*. Instead, you optionally create window and door dimensions later in *Exercise 11* (p. 81).







Examining the Design in a 3D View

Next, you activate different 3D views so you can examine the architectural elements you just inserted.

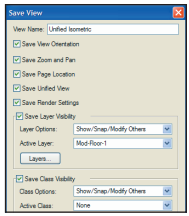
18. From the menu, select **View > Standard Views > Top**. Press the X key twice, and then press Ctrl + 6 to adjust the display. Notice that 2D object details (such as door swings and wall breaks) disappear in this 3D top view, as shown at top left. From the View bar, select the **Left Isometric** view from the Standard View drop-down list, and then press Ctrl + 6 to adjust the display. The viewing angle is changed, as shown at bottom left.

Notice that even though you were previously working in 2D, Vectorworks Architect automatically created 3D objects.

Note: Do not be concerned about the inappropriate single hung windows; you change properties of all windows later in *Exercise 9* (p. 60).

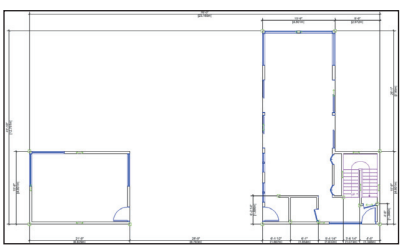
Saving a 3D Reference View

Next, you save a view with the current display attributes that you use in other exercises later in the tutorial.



19. In the Navigation palette, select the Saved Views tab, and then right-click the blank area below the list and select **New**. In the Save View dialog box, change the View Name and Layer Options, and confirm (or adjust) other settings as shown at top right, and then click **OK** to save the view. Notice that the new view is now displayed in the list with the 3D view icon , as shown at bottom right.

20. In the Navigation palette, activate the **Floor Plan-1** saved view, and then press Ctrl + 6 to adjust the display, as shown.



Tip: You can optionally create a design layer section viewport (with an offset section line) to examine the house in a 3D cutaway view as the design evolves. For step by step instructions from the Architect Getting Started website, see *www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php*.

21. Save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

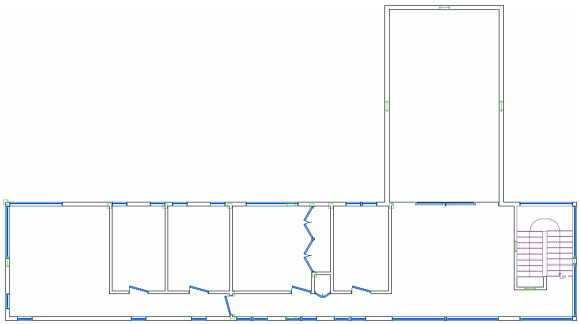
22. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the 01 Floor Plan-1 saved view to activate it, and then double-click the **Check EX06** saved view to activate it.

23. Use the **Zoom** and **Pan** tools (in the Basic tools palette) and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects.

24. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Exercise 7: Creating the Second-Floor Plan

In this exercise, you use a variety of 2D and 3D tools and techniques to complete the second-floor plan. The completed exercise is shown in the following figure:



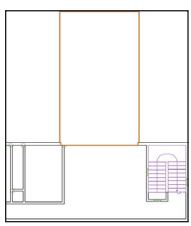
Creating Floor Slabs from the Second-Floor Exterior Walls

You start by creating two auto-bounded floor slab objects from the second floor's balustrade and exterior walls using the **Mechanical** placeholder (see p. 38) slab style.

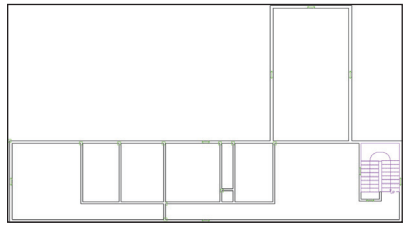
1. If you did not complete Excercise 6—or you are unsure of your file's accuracy—open the **GS-VWAx06.vwx** file.

2. In the Navigation palette, activate the **Floor Plan-2** saved view. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions. Press the X key twice to clear the current selection, and then press Ctrl + 6 to adjust the display.

3. From the Building Shell tool set, click the **Slab** tool  . In the Tool bar, make sure that **Picked Walls Mode**  is enabled, and then select Mechanical from the Slab Style drop-down list. Click the three balustrade walls and the bordering exterior wall, and then click **Press to Complete Operation**  to create the deck slab, as shown at left. With the **Slab** tool still active, repeat the process with the same slab style to create the second floor slab from the four exterior second floor walls, as shown at right.



4. Hold down the Shift key, and then select the other second floor slab object (both should now be selected). In the Object Info palette, change the Slab objects' Class property to **Structural-Slab** and their Layer property to **Mod-Slab-2** to correct the display order, as shown.



Notes:

1) You notch the second-floor slab to accommodate the stairwell later in *Exercise 9* (p. 60).

2) You could combine the deck floor slab with the second-floor slab, but they are created separately in this tutorial because of their structural and functional differences.

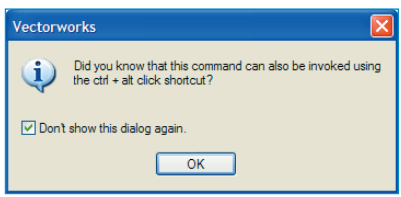
3) Although the deck surface would normally have a slightly lower elevation than the floor surface for drainage purposes, they are both the same elevation (both slabs are the same thickness) in this tutorial for display purposes.

4) To save time in this tutorial, you ignore the overlapping area between both slab objects. If you want to fix this in your model, you can optionally create a virtual wall segment as a surrogate auto-boundary for the slab. To do this, delete the deck slab you just created, and then draw a horizontal virtual wall segment (with zero height) connected to the vertical balustrade walls slightly above the horizontal exterior wall. Create the auto-bounded slab by picking all three balustrade walls and the virtual wall, and then change the slab's class and layer properties. Use the **Constrain Colinear**  tool to place a collinear constraint between the virtual wall and the outside edge of the second floor's exterior wall.

Copying and Inserting the Remaining Doors and Windows

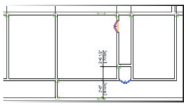
Next, you copy doors and windows from the first floor (that you created in Exercise 6), and then you copy and modify them as necessary to complete the second-floor plan.

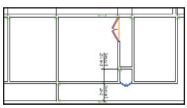
5. In the Navigation palette, activate the **Floor Plan-1** saved view. Press the X key twice, and then right-click one of the bi-part pantry doors, and select **Create Similar Object** from the context menu. If a message dialog box is displayed (as shown), enable

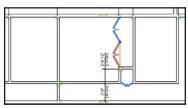


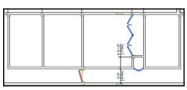
the **Don't show this dialog again** option, and then click **OK**. In the Navigation palette, activate the **Floor Plan-2** saved view. Insert the bi-part door into the middle of the hall closet wall and orient it as shown at right.

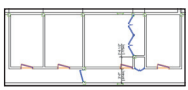
6. Press the X key, and then use the Ctrl + drag method to copy the bi-part door into the guest bedroom closet wall, as shown above (use the Flip option if necessary). With the new closet door still selected, change the Door Width to 4’2” [1.270m] in the Object Info palette. Drag the new door into position, as shown below at left. Use the Ctrl + drag method to copy the 4’2” [1.270m] door, approximately where shown below at right.





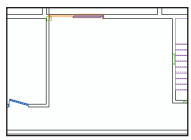


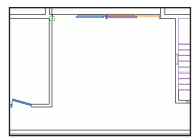




7. Repeat the **Create Similar Object** process (step 5) to create a 2’6” [.762m]-wide door from the first floor and position it in the middle of the second floor’s master bedroom hallway wall and orient it as shown above at top. Press the X key, and then use the Ctrl + drag and **Flip** option to copy the 2’6” [.762m]-wide door four times (highlighted for clarity) in the orientations and approximate locations as shown above at right.

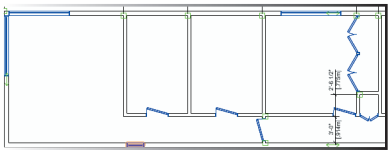
8. Repeat the Create Similar Object process to create a 7’ [2.134m] slider door from the first floor and position it in the second floor’s family room wall and orient it as shown at left. Press the X key, and then use the Ctrl + drag method to create an adjacent copy of the 7’ [2.134m] slider, approximately where shown at right. Use the Flip control as necessary.





9. Repeat the **Create Similar Object** process to create a 7’ [2.134m]-wide picture window from the first-floor plan and position it in the second floor’s master bedroom wall, and then click outside the wall to orient it as shown at left. Use the Ctrl + drag method to copy the 7’ [2.134m]-wide picture window eight times, approximately where shown at right (highlighted for clarity).

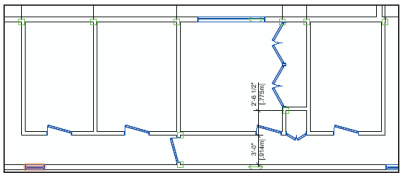
10. Repeat the **Create Similar Object** process to create a 2' [.610m]-wide window from the first-floor plan and position it in the second floor's master bedroom hallway wall, and then click outside the wall to orient it as shown (leave the window selected for the next three steps).



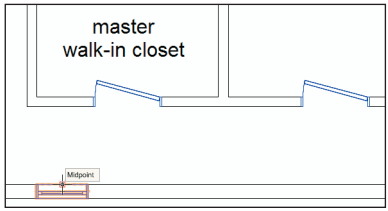
Tip: In your own designs, you can adjust layer visibilities (with **Show/Snap Others** layer mode active), and then Ctrl + Alt + click objects on other layers to activate the **Create Similar Object** command.

Next, you use the **Move by Points** tool to precisely move and copy the 2'-wide window in the master bedroom hallway wall to complete the floor plan.

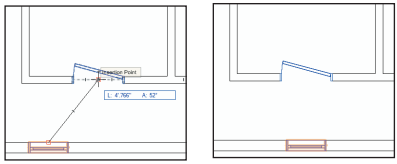
11. Zoom in on the area shown.



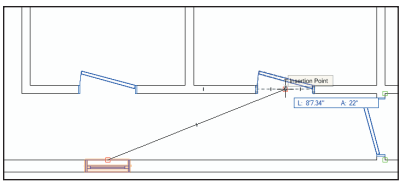
12. Press Shift + M for the **Move by Points** tool shortcut. In the Tool bar, enable **Move Mode**  . For the start point, click the selected window's midpoint, as shown below.

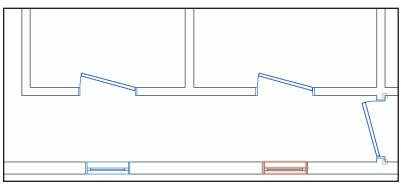


For the end point, click the insertion point of the master bedroom walk-in closet's door, as shown at left. The window stays in the wall and is now centered with the walk-in closet's door, as shown at right (leave the window selected for the next step).



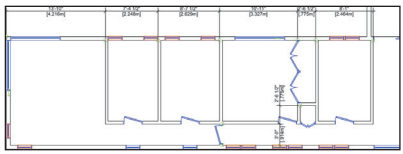
13. With the **Move by Points** tool still active, snap to the same midpoint on the window as the previous step, and then hold down the Ctrl key and snap to the insertion point of the master bathroom door's opening, as shown at left. The window is copied, and the copy is now centered with the master bathroom's opening, as shown at right (leave the copied window selected and the **Move by Points** tool active for the next step).





Note: Holding down the Ctrl key temporarily enables the Retain option for the original object.

14. Use either the Ctrl + drag method or the **Move by Points** tool  to create fourteen additional copies of the 2'-wide window, where shown (highlighted for clarity).

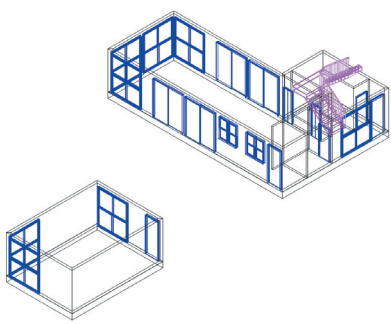


Note: In your own designs, you would now create associative dimensions for the windows and doors (and edit length values as necessary). To save time, you skip this step in this exercise (as you did in Exercise 6). Instead, you optionally create window and door dimensions later in *Exercise 11* (p. 84).

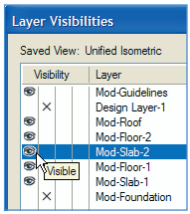
Examining the Design in Various 3D Views

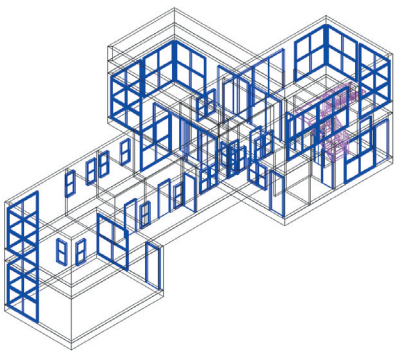
Next, you edit the Unified Isometric saved view to display additional layers and classes, and then you examine the new elements with the Flyover tool.

15. In the Navigation palette, activate the Unified Isometric saved view. Press the X key twice to clear the selection. Notice that the saved view does not show objects on the second floor, as shown.



16. In the Navigation palette, right-click the **Unified Isometric** saved view and select **Edit**. In the Edit Saved View dialog box, click **Layers**. Adjust visibilities as shown at right, and then click **OK**. Click **Classes**, and turn on visibility of the **Roof-Main** class. Click **OK** twice to save the edits. Double-click the saved view to see the change, and then press the X key twice to clear the selection, as shown.

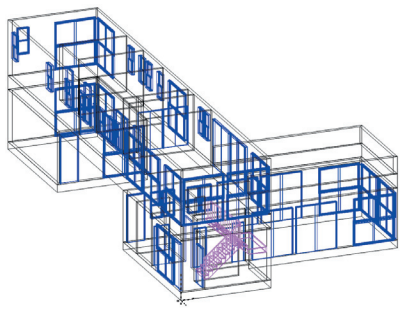


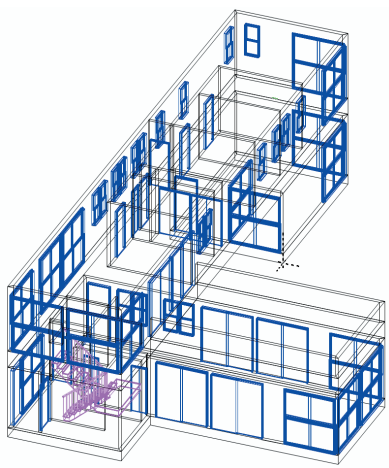


Note: To save time, you just turned on visibility for objects that don't exist yet, but you create them later in the tutorial.

17. From the Basic tools palette, click the **Flyover** tool. In the Tool bar, make sure **Interactive Origin Mode** is enabled. Start dragging the cursor to dynamically examine the model. Press Ctrl + 6 to re-center the view. Click to stop the motion, and change the center of rotation by clicking on various object vertices (on the active layer), and then continue dragging the cursor to change the viewing angle.

18. In the Navigation palette, activate the





Floor Plan-2 view. From the menu, select **View > Align Layer Views**. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions. Press Ctrl + 6 to adjust the display.

19. Save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

20. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the **02 Floor Plan-2** saved view to activate it, and then double-click the **Check EX07** saved view to activate it.

21. Use the **Zoom**  and **Pan**  tools (in the Basic tools palette), and the **Previous View** tool  (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in blue, and the master file's drawing objects are displayed in their default colors. You should see your blue drawing objects overlaid directly on top of the master file's drawing objects.

22. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Section 4: Working with Multiple Levels

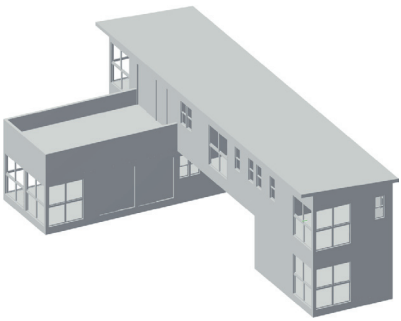
In two exercises, this section covers the following processes as you continue the home design project:

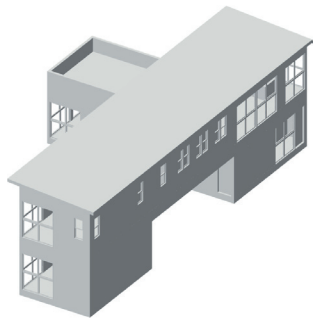
In these exercises, you:

- Create a ceiling slab for the top floor and a slanted roof by modifying default roof edge settings.
- Fit affected walls to the slanted roof.
- Modify windows.
- Convert two windows into a corner window.
- Notch the second floor’s floor slab.
- Replace the placeholder wall and slab styles and create wall end caps.

Exercise 8: Creating and Modifying the Roof

In this exercise, you create a flat roof object, and then you modify its configuration. The completed exercise is shown in the following figure:





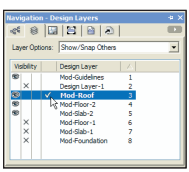
Saving a "Working" View for the Roof

Next, you save a view to facilitate working with the roof later in the development cycle.

1. If you did not complete Exercise 7—or you are unsure of your file's accuracy—open the **GS-VWAx07.vwx** file.

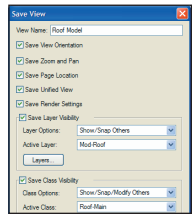
2. In the Navigation palette:

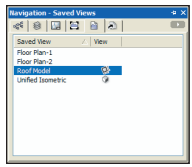
- Select the Classes tab, and turn on visibility of the **Roof-Main** class.
- Select the Design Layers tab, turn on visibility of the **Mod-Roof** layer, and then make it the active layer, as shown at left.



- Select the Saved Views tab, right-click the blank area below the list and select **New**.

In the Save View dialog box, adjust the View Name and Active Class settings as shown at right and then click **OK** to save the view.



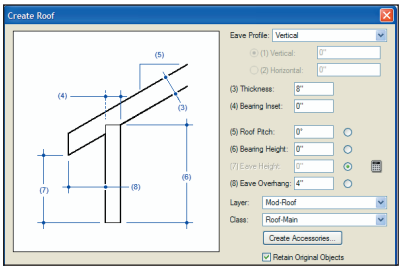


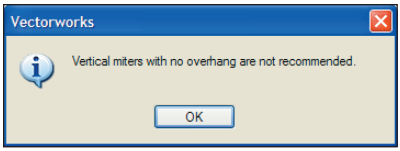
- Notice that the new view is displayed in the list, as shown at left.
- Double-click the **Roof Model** saved view to activate it (in the View bar, notice that **Roof-Main** is now the active class).
- Select the Design Layers tab and make the **Mod-Floor-2** layer active.

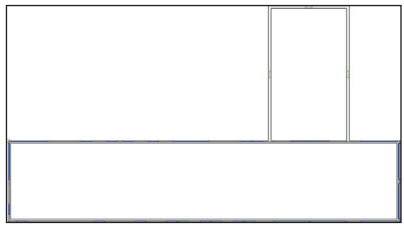
Creating the Ceiling Slab

Next, you create an auto-bounded ceiling slab object from the second floor's exterior walls.

3. From the Building Shell tool set, click the **Slab** tool. In the Tool bar, make sure that **Picked Walls Mode** is enabled, and then select **Ceiling** from the Slab Style drop-down list. Click the four exterior second-floor walls, and then click **Press to Complete Operation** to create the ceiling slab, as shown at top right. In the Object Info palette, change the Slab object's Class property to **Structural-Slab** and its Layer property to **Mod-Roof** to position its elevation correctly. The slab is no longer selected, as shown at bottom right.







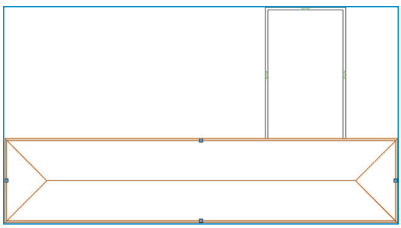
Creating the Roof

Next, you create a slanted roof object from the second floor's exterior walls.

4. Press the X key, and then select any one of the second floor's four exterior walls. From the menu, select Edit > Select Connected Objects, and then confirm that four walls are selected in the Object Info palette. From the menu, select **AEC > Create Roof**. In the Create Roof dialog box, change settings as shown at left (click OK if the message dialog box shown at right is displayed).

Tip: In your own designs, you can specify either a Rise:Run ratio (in inches), or angle value (in degrees) for the Roof Pitch.

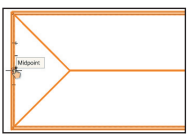
5. Click **OK** to create the roof. Notice that the Mod-Roof layer is now active and that two objects are selected (the new ceiling and roof objects). Press the X key twice to clear the current selection, and then select only the roof. The roof's control points are now displayed, as shown.

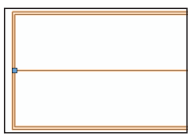


Creating Gabled Ends on the Slanted Roof

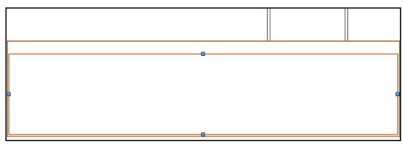
Notice that Vectorworks created a hip roof by default. Next, you modify the roof to create the desired gabled ends and pitch.

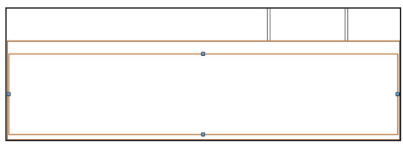
6. Select the roof's left control point, as shown at left. In the Edit Roof Settings dialog box, select the **Gable** option, and then click **OK** to create the gabled end, as shown at right. Repeat the process to change the right side to a gable end.





7. Select the roof's rear side control point (near the left vertical balustrade wall). In the Edit Roof Settings dialog box, select the **Gable** option, change the Eave Overhang to **2'6"**, and then click **OK** to update the roof, as shown below at top. Select the roof's front side control point (directly opposite the rear side control point). In the Edit Roof Settings dialog box, leave the Roof Edge Shape's **Eave** option selected, change the Pitch to **4.00°**, change the Bearing Height to **0'6"** [Step test: Verify if this is reqd], change the Eave Overhang to **1'0"**, and then click **OK**. In the Object Info palette, disable the **Create Gable End Walls** option to complete the roof, as shown below at bottom.

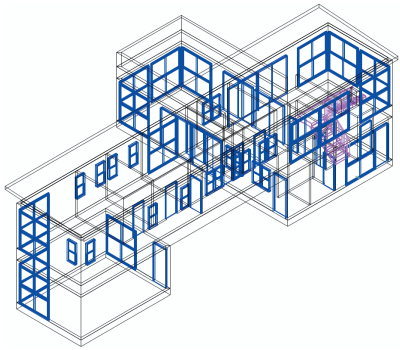


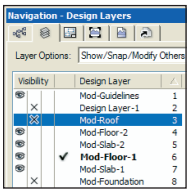


Next, you use the **Fit Walls to Roof** command to extend the second floor's exterior walls to the roof bottom.

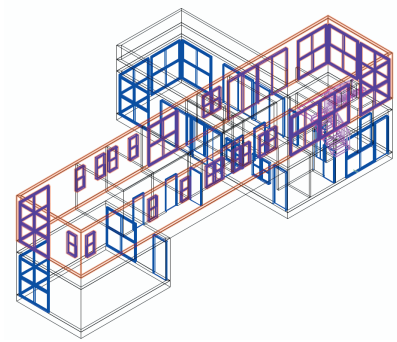
8. In the Navigation palette:

- Select the Saved Views tab and activate the **Unified Isometric** saved view. Press the X key, and then click in a blank area of the drawing to clear the current selection. Notice the slanted roof, as shown at top right.

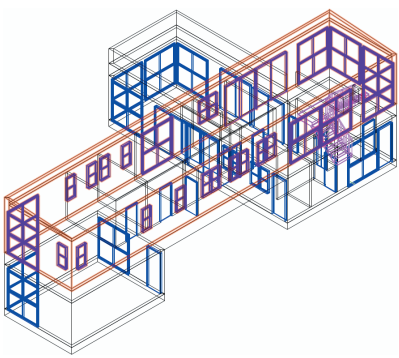




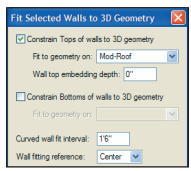
- Select the Design Layers tab, and then turn off visibility of the **Mod-Roof** roof layer, as shown.



Hold down the Shift key and select the four exterior walls, as shown at bottom right.



9. From the menu, select **AEC > Fit Walls to Roof.** Enable the **Constrain Tops of walls to 3D geometry** option, and then select the **Mod-Roof** layer from the drop-down list, as shown at right. Click **OK** to complete the operation, as shown at left.



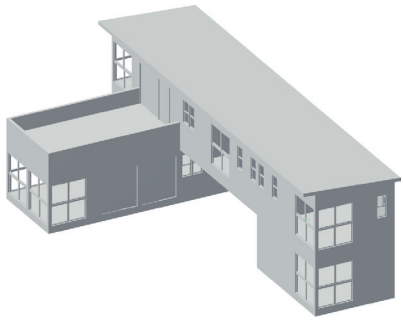
Examining the Completed Roof

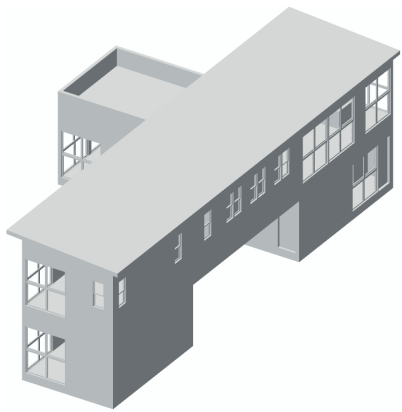
Next, you examine the flat roof in various 3D views.

10. In the Navigation palette, select the Saved Views tab and activate the **Unified Isometric** saved view. Press the X key, and then click in a blank area of the drawing to clear the current selection. From the View bar, select **OpenGL** from the Current Render Mode drop-down list. Switch to various standard 3D views, or use the **Flyover** tool to examine the completed roof, as shown.

11. In the Navigation palette, activate the **Floor Plan-2** view. From the menu, select **View > Align Layer Views**. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions. Press Ctrl + 6 to adjust the display.

12. Save the file.





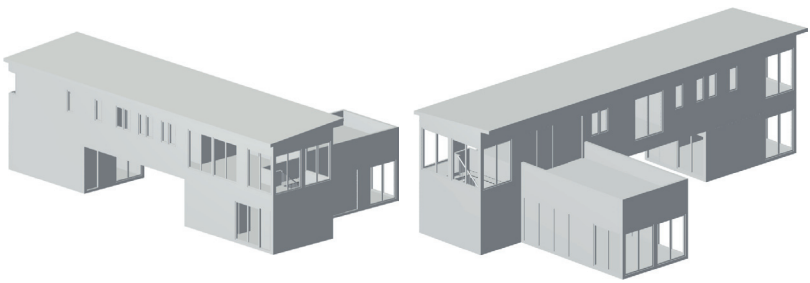
If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

13. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the **03 Roof Model** saved view to activate it, and then double-click the **Check EX08** saved view to activate it. Your roof is displayed in green, and the master file's roof is displayed in its default color. You should see your green roof overlaid directly on top of the master file's roof.

14. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Exercise 9: Editing Architectural Elements

In this exercise, you edit various architectural elements to complete the basic house design. The completed exercise is shown in the following figure:



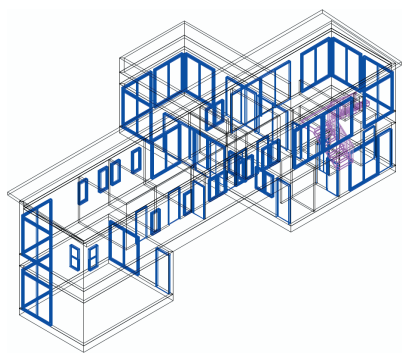
Editing Windows

You start the exercise by simultaneously modifying properties of all windows.

1. If you did not complete Exercise 8—or you are unsure of your file's accuracy—open the **GS-VWAx08.vwx** file.

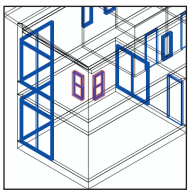
2. In the Navigation palette, activate the **Unified Isometric** saved view. From the Basic tools palette, click the **Select Similar** tool  . In the Tool bar, select **Object** from the Active Settings drop-down list, and then click any window. In the Object Info palette:

- Verify 37 window objects are selected.
- Change the Sash Operation to **Casement** (wait a few seconds for the windows to update after each change).
- Scroll down and change the **Sash Width** to 3" [76.20mm], and press Enter.
- Change the **Sash Depth** to 4" [101.60mm], and then press Enter. Press the X key twice, and notice that all windows were modified, as shown.



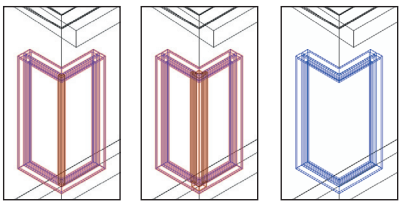
Creating a Corner Window

Next, you change properties of the two smaller master bedroom windows to create a corner window.



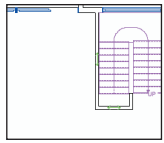
3. Hold down the Shift key, and then select the two windows shown at left. Press Ctrl + 6 to zoom in, then scroll down to the bottom of the Object Info palette, and then:

- Enable the **Corner Window** option. Notice that both windows automatically move to the corner position.
- Select **Mitered Sash** from the Corner Condition drop-down list, and examine the mitered sash, as shown below at left.
- Select **Corner Post** from the Corner Condition drop-down list, and change the size to 5" [127.00mm]. Press Enter to update the windows, and examine the corner post, as shown in the next figure.
- Select **Flush Glass** from the Corner Condition drop-down list, and then click in a blank area to clear the selection. The completed corner window is shown below at right.

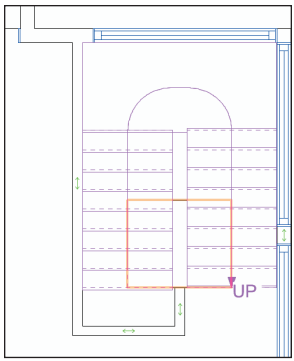


Notching the Second Floor's Floor Slab

Next, you notch the second floor's floor slab at the stairwell.

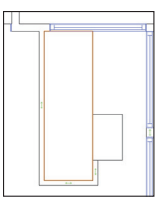


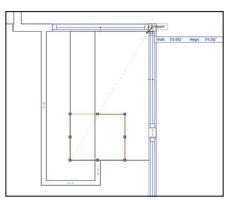
4. In the Navigation palette, activate the **Floor Plan-2** view. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions. Press Ctrl + 6 to adjust the display, and then zoom in on the area shown above (notice the window sash width and depth changes from step 2). Right-click the floor to the left of the stairwell balustrade, and select Force Select. The Mod-Slab-2 layer is automatically activated. From the Basic palette, click **Rectangle** and then enable **Rectangle Mode** in the Tool bar. Draw a rectangle by snapping to the point of the stair's up arrow and then snapping to the bottom flight's up line anywhere above the first point, approximately where shown.

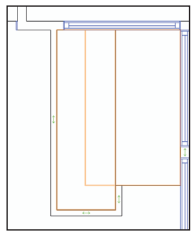


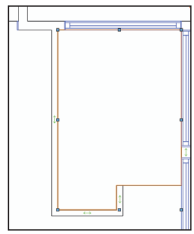
From the Basic tools palette, click **Visibility** . In the Tool bar, click the **Visibility for Classes** and **Invisible** buttons to enable them. Click the stair object to turn off visibility of its class. Press 4 for the **Rectangle** tool shortcut, and then snap to balustrade wall vertices to draw a second rectangle, as shown below at left. Press the X key and select the first rectangle, and then resize it by clicking its top right grip and snapping to the inside wall corner (you can optionally press the Z key to temporarily zoom in), as shown below at right.

5. Shift + select the stairwell rectangle to add it to the selection (two rectangles should be selected), as shown at left. Right-click the selection, and then select **Add Surface** to combine both rectangles into a single polygon, as shown at right.



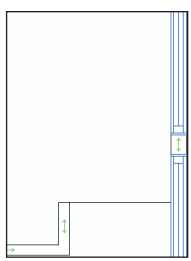


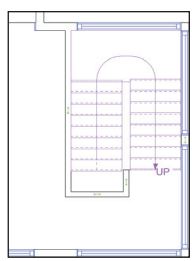




6. Hold down the Shift key, and select the floor object to add it to the current selection. From the menu, select **Modify > Clip Surface** to clip the polygon from the floor slab. Press the X key twice to clear the current selection, and notice the floor's stairwell notch (shown at left). Click **Previous View** in the View bar to display the stairs, as shown at right.

Note: The polygon is now part of the slab object's profile.

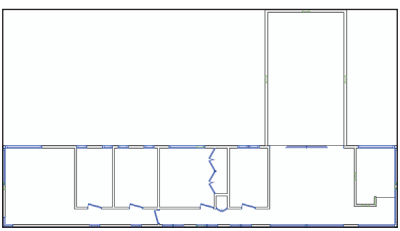


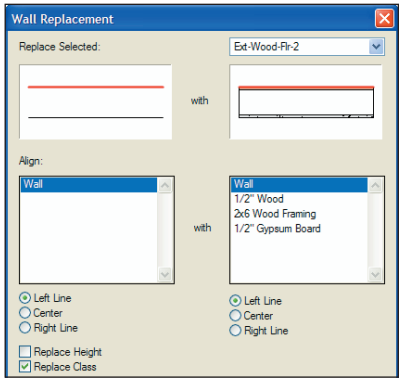


Replacing Wall Styles

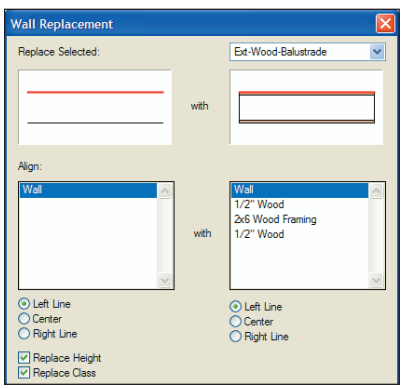
Next, you replace the generic (placeholder) wall styles from *Exercise 3* (p. 16) with the final styles.

7. Press Ctrl + 6 to adjust the display, and then right-click any one of the second floor's four exterior walls (not the balustrade walls) and select Force Select from the context menu. From the menu, select **Edit > Select Connected Objects**. In the Object Info palette, confirm that four walls on the Mod-Floor-2 layer are selected and then select **Replace** from the Style drop-down list. In the Wall Replacement dialog box, select **Ext-Wood-Flr-2**, and then adjust other settings as shown at left. Click **OK** to replace the wall style. After several seconds, all exterior walls are updated. Clear the current selection so you can see the new exterior wall style with additional components, as shown at right.





8. Repeat the **Select Connected Objects**/style replacement process for the three balustrade walls. Select **Ext-Wood-Balustrade** for the new style, and enable the **Replace Height** option in the Wall Replacement dialog box settings as shown, and then click **OK** to complete the replacement.



9. In the Navigation palette, activate the **Unified Isometric** saved view. From the Basic tools palette, click the **Select Similar** tool . In the Tool bar, select **Class and Object** from the Active Settings drop-down list, and then click any interior wall. In the Object Info palette:

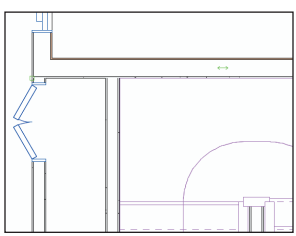
- Verify that 19 wall objects are selected.
- Select **Replace** from the Style drop-down list, and then select **Int-Gypsum Bd** for the new style, and specify the remainder of the Wall Replacement dialog box settings the same as you did for step 7.

Click **OK** to complete the replacement.

10. In the Navigation palette, activate the **Floor Plan-1** saved view. With the **Select Similar** tool still active, click one of the exterior walls. In the Object Info palette:

- Verify that ten wall objects are selected.
- Select **Replace** from the Style drop-down list, and then select **Ext-Wood-Flr-1** for the new style, and specify the remainder of the Wall Replacement dialog box settings the same as you did for step 8.

Click **OK** to complete the replacement. Press the X key twice to clear the current selection, and then zoom in on the stairwell/pantry area shown at left. Notice the new wall style components, as shown at right.



Notes:

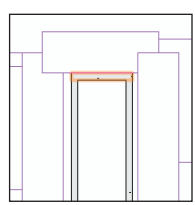
1) It's not necessary for this exercise, but you can optionally use the **Wall Join** tool with **T Join Mode** to re-create any incorrectly displayed component intersections on both floors.

2) To save time in this tutorial, you replaced the placeholder wall styles with styles that have a compatible overall thickness. When you replace wall styles with different sized components in your own designs, you can align edges of various wall components (or the entire wall) as required.

Creating Wall End Caps

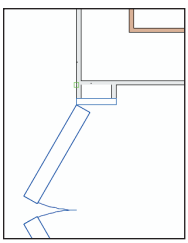
Next, you create wall end caps for the stairwell wall and pantry wall.

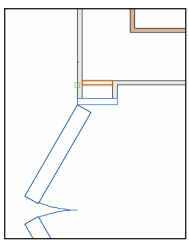
11. From the, click **Wall End Cap** . From the Tool bar, enable **Component Wrap Mode** , and then click **Wall End Cap Preferences** . In the Wall End Cap preferences dialog box, make sure the **Extend Cap Past Wall Endpoint** option is disabled (because this design is based on overall wall thicknesses), and then click OK. Click in the middle of the stairwell wall's gray gypsum components close to the wall cap (but do not click the edges) to create the wall end cap which wraps them continuously around the end as shown. If your end cap does not match the figure, undo the wall end cap, and then zoom in and try again.



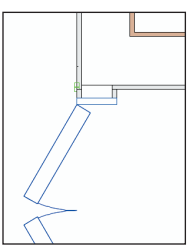
Next, you draw a rectangle, and then you use the **Wall End Cap** tool's **Add Mode** to join the rectangle to the pantry wall's core so that it extends to the exterior wall's core. You use the **Wall End Cap** tool because the **Wall Join** tool can't join these components in this particular configuration.

12. Zoom out, and then zoom in on the corner where the pantry wall meets the exterior walls, as shown at left. Press 4 for the **Rectangle** tool shortcut, and then snap to endpoints to draw a rectangle between the pantry wall's core and the exterior wall's core, as shown at right.

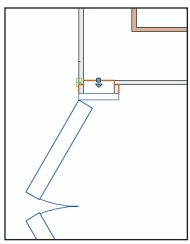


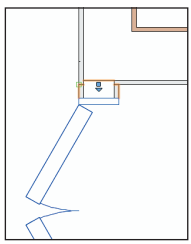


13. From the Building Shell tool set, click **Wall End Cap**  , and then enable **Add Mode**  in the Tool bar. Click the middle of the pantry wall core (near its top edge), and then click inside the rectangle. The area of the rectangle is added to the core, as shown at left.



Press the X key, and then select the pantry wall below the end cap. Notice that the start point is now at the end of the wall cap, as shown below at left. Select only the wall end cap near its top edge. In the Object Info Palette, enable the **Extend Cap Past Wall Endpoint** option to complete the end cap. Select only the pantry wall and notice that the start point is now correctly at the edge of the exterior wall, as shown at right.

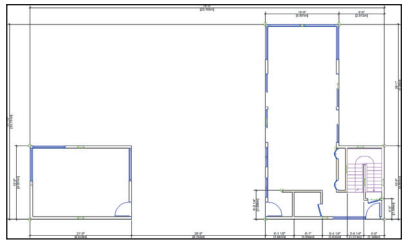




Note: The **Wall End Cap** tool's **Clip Mode**  can't clip the exterior horizontal wall's gypsum component because of the joined end. If it wasn't a joined end, you would clip the rectangle from the exterior wall's gypsum component before you add it to the pantry wall's core component. In this particular case you could break the corner L- join, but it would alter the shape of the auto-bounded slab associated with these walls.

Now that all wall and slab components are in their final configurations for accurate data extraction purposes (not covered in this tutorial), you hide component details for drawing clarity.

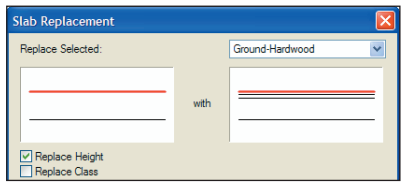
14. Press the X key twice to clear the current selection, and then press Ctrl + 6 to adjust the display. On the far right side of the Tool bar, enable the **Hide Details** quick pref. All individual wall components are now hidden, as shown at right.

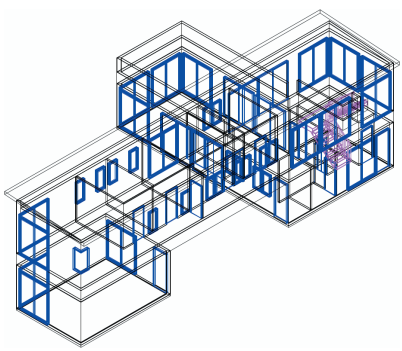


Replacing Slab Styles

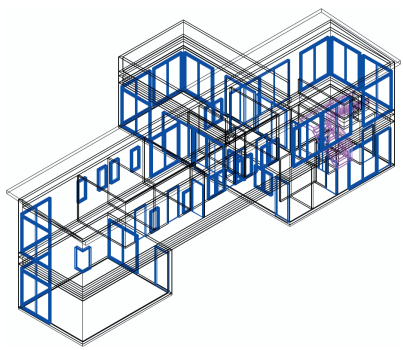
Next, you replace the generic (placeholder) floor slab styles from *Exercise 6* (p. 34) and *Exercise 7* (p. 48) with the final styles.

15. In the Navigation palette, activate the **Unified Isometric** saved view. Press the X key twice, and then hold down the Shift key, and select both floor slabs on the Mod-Slab-1 layer. In the Object Info palette, select **Replace** from the Style drop-down list. In the Slab Replacement dialog box, select **Ground-Hardwood**, and adjust other settings as shown at left, and then click **OK** to replace the slab style. Clear the current selection so you can see the new slab style with additional components, as shown at right.



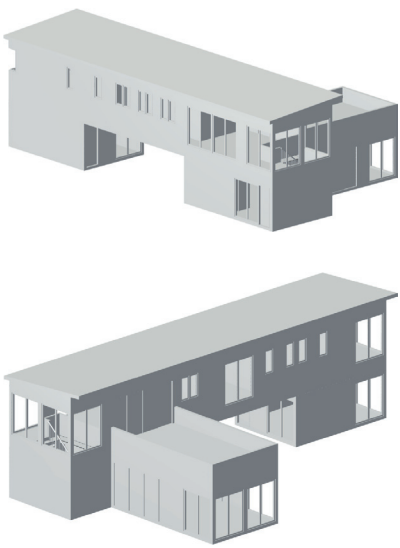


16. Repeat the Shift + select and replacement process for the second floor's floor slabs (select the **Mechanical-Duct Gap** slab style, and enable only the **Replace Height** option in the Slab Replacement dialog box). Clear the current selection so you can see the new slab style with additional components, as shown.



Note: The auto-boundary edge settings for the final slab styles' components automatically adjust wall component heights and/or slab component widths to create and maintain accurate junctions where walls meet floor and ceiling slab objects. You will see these junctions clearly after you complete the "Creating a section viewport" section (p. 72) and "Editing section viewport display properties" section (p. 74) in *Exercise 10*.

17. Use 3D view controls and **OpenGL** render mode to examine the model (as shown). In the Navigation palette, activate the **Floor Plan-1** saved view. From the menu, select **View > Align Layer Views**. Press Ctrl + 6 to adjust the display.



18. Save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

19. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the **01 Floor Plan-1** saved view to activate it, and then double-click the **Check EX09** saved view to activate it.

20. Use the **Zoom** and **Pan** tools (in the Basic tools palette), and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects.

21. In the Navigation palette, double-click the **02 Floor Plan-2** saved view to activate it, and then double-click the **Check EX09** saved view to activate it.

22. Use the **Zoom** and **Pan** tools (in the Basic tools palette) and the **Previous View** tool (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in blue, and the master file's drawing objects are displayed in their default colors. You should see your blue drawing objects overlaid directly on top of the master file's drawing objects.

23. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Section 5: Creating Construction Documents

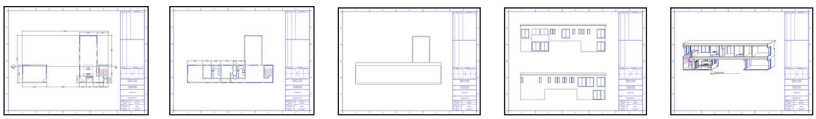
In two exercises, this section covers the following processes in the construction documentation stage of the home design project:

In these exercises, you use a variety of 2D and 3D tools to create basic versions of commonly used construction documents from *viewports* (that display objects on multiple design layers) on *sheet layers.* For some documents, you also work with external files or create corresponding architectural and annotation objects as required. After completing the drawings, you save batch export PDF sets, and then you export a saved set to a PDF file.

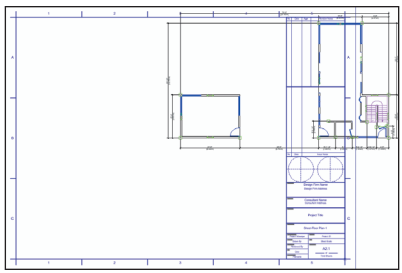
Note: Depending on the type of construction document, you create annotations in design layers or directly inside the viewport (in viewport annotation mode) based on suggested best practices.

Exercise 10: Generating Construction Drawings

In this exercise, you complete the initial setup steps of commonly used construction drawings by arranging and modifying viewports to display your model. The completed exercise is shown in the following figure:



Note: To save time, you skip the process of creating fully detailed construction documents.

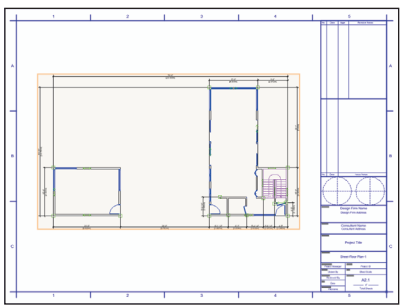


Creating Floor and Roof Plans

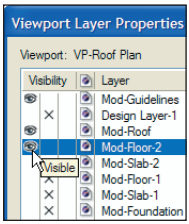
You start by activating the floor and roof plan sheets and arrange or modify the viewports as necessary.

1. If you did not complete Exercise 9—or you are unsure of your file's accuracy—open the **GS-VWAx09.vwx** file.

2. In the Navigation palette, activate the **Sheet-Floor Plan-1** sheet layer, and then clear the current selection (if anything is selected). Press Ctrl + 6, and notice that the viewport is not centered, as shown at left. Drag any object in the floor plan to reposition the viewport in the approximate center of the drawing sheet, as shown at right.



Note: For illustration clarity, all pre-configured sheet layer viewports in this file have their **Show Wall Components** advanced property option disabled. These sheet layers and viewports were created with the **Create Standard Viewports** command, which enables this option by default.



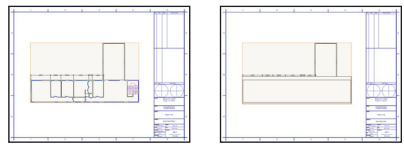
3. Repeat the process for the **Sheet-Floor Plan-2** sheet layer. In the Navigation palette, activate the **Sheet-Roof Plan** sheet layer. Select only the viewport, and then click **Layers** in the Object Info palette. In the Viewport Layer Properties dialog box, turn on visibility of the **Mod-Floor-2** layer (shown at left) and then click **OK**. Reposition the viewport approximately where shown at top right.

Creating Elevations

Next, you adjust the viewport in the Sheet-Elevations-1 sheet layer to show the front elevation. You then copy the viewport to create the rear elevation.

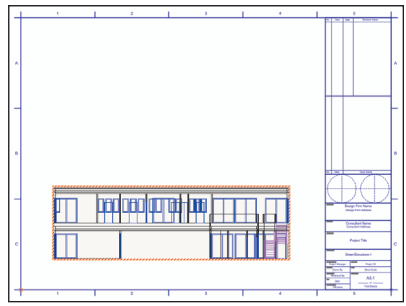
4. Activate the **Sheet-Elevations-1** sheet layer. Select only the viewport, and then in the Object Info palette:

- Disable the **Display Planar Objects** option.
- Click **Classes**. Hold down the Alt key, and click in the first column to turn on visibility of all classes, and then click **OK**.
- Change the View to **Front**.



- Change Background Render to **Hidden Line**. Notice the striped highlighting around the viewport (indicating that it needs to be updated).

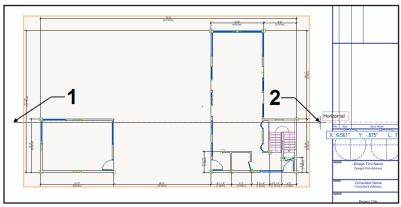
Reposition the viewport, as shown.

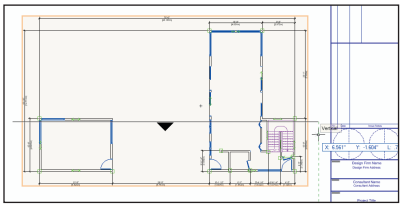


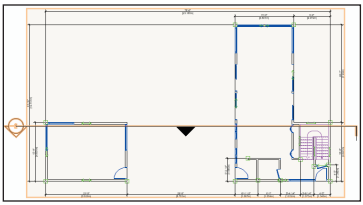
5. Start dragging the viewport straight up, and then hold down the Shift and Ctrl keys to create a copy, as shown at left. For the new viewport, change the View to **Back**, as shown at right.

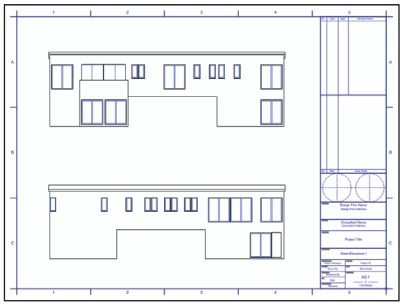
6. Shift + select the front elevation viewport. In the Object Info palette, verify that two Viewports are selected, and then click **Update** to hide the lines. Click in a blank area of the drawing to clear the selection and examine the elevations, as shown.

Note: In your own designs, you would repeat this process to create right and left elevation viewports on other sheets as necessary. To save time in this exercise, you skip the repetitive process of creating additional elevation viewports.









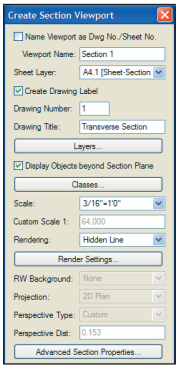
Creating a Section Viewport

Next you create a live section viewport of the house.

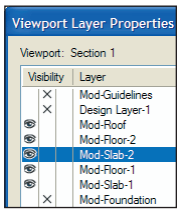
7. In the Navigation palette, select the Viewports tab, and then double-click the **VP-Floor Plan-1** viewport to select it (and activate the Sheet-Floor Plan-1 sheet layer). With the viewport still selected, select **View > Create Section Viewport** from the menu. To define the section line, click point 1, and then hold down the Shift key (the preview line should be just inside the exterior wall) and click point 2, where shown at top left. Move the cursor to see how to control the view direction, and then double-click below the line (when the view direction arrow points down), as shown at middle. Notice that the section marker is created (shown at bottom left),

8. In the Create Section Viewport dialog box:

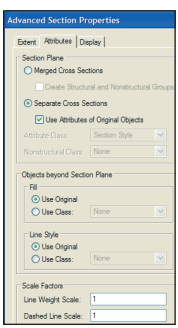
- Disable the **Name Viewport as Dwg No./Sheet No.** option.

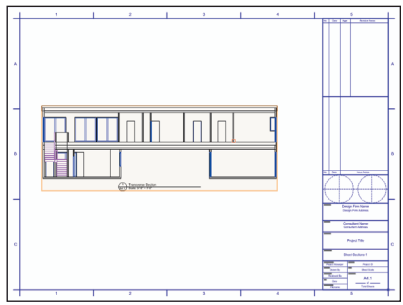


- Adjust other field values, as shown at left.
- Click **Layers**, and adjust visibilities as shown in the next figure, and then click **OK.**
- Click **Classes**, and turn on visibility of the **Roof-Main** class, and then click **OK**.



- Click **Advanced Section Properties**. In the Extent tab, select **Infinite** for the Length Range, Depth Range, and Height Range. Select the Attributes tab, and select the **Separate Cross Sections** option, enable the **Use Attributes of Original Objects** option, and then verify or adjust other settings as shown above at right. Select the Display tab, and disable the **Cast Shadows of Objects Removed by Section** option, enable the **Show Wall and Slab Components** option, and then click OK twice. After several seconds, the viewport—with drawing label—is created, the Sheet-Sections-1 sheet layer is activated (identified in the view bar as A4.1 [Sheet-Sections-1]), and the viewport is placed in the center of the sheet by default. Click in a blank area to clear the selection, and then select and delete the non-section viewport. Drag the section viewport into position, approximately where shown below.





Notes:

1) The existing viewport was created when the **Create Standard Viewports** command was used to set up this file.

2) To optionally fix the ceiling/wall junction, edit the Ceiling slab definition and set the Rafters' Auto-Bound edge offset to **Inner face of wall core**.

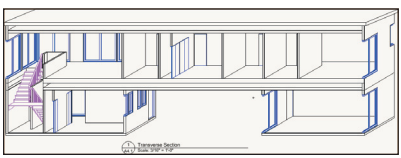
3) The drawing label automatically picked up the sheet number because automatic drawing coordination is enabled.

4) To optionally fix the drawing label length, right-click the drawing label and select **Edit Annotations**. Select the drawing label, and then in the Object Info palette, select **Auto-Fit** from the Line Length Mode drop-down list. Click the orange **Exit Viewport Annotation** button (in the upper right corner of the drawing area) to return to the sheet layer.

Editing Section Viewport Display Properties

Next, you add depth to the section by changing the section viewport's Projection setting and then you change the viewport properties to improve legibility.

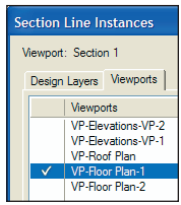
9. In the Object Info palette, select **Oblique Cabinet 30** from the Projection drop-down list, and then click **Update** to incorporate the change. Press Ctrl + 6 to see the completed section viewport, as shown (leave the section viewport selected for the next step).

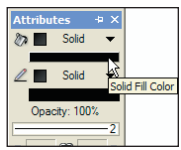


Tip: You can also create offset section sheet layer viewports (but you cannot change their projection). If you create an offset design layer section viewport, you can set up any 3D view or projection in the design layer and display the design layer section viewport in a sheet layer viewport. For step-by-step instructions for creating an offset section design layer viewport from the Architect Getting Started website, see *www.nemetschek.net/training/2011/architect-2011-getting-started-guide.php*.

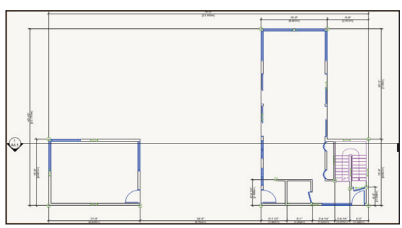
Next, you navigate back to the section line instance from the section viewport, and then you adjust section line properties.

10. In the Object Info palette, scroll down and click **Section Line Instances**. In the Section Line Instances dialog box, select the **Viewports** tab, and then select the **VP-Floor Plan-1** viewport, as shown at to right (the check mark identifies a section line instance).





Then click **Activate**. Viewport annotation mode for the VP-Floor Plan-1 viewport is automatically activated, and the section line is object selected. Press Ctrl + 6 to see both section line markers. In the Attributes palette, select Solid for both the Fill Style and Pen Style, and then select black for the Solid Fill Color, as shown at bottom right. In the Object Info palette, select **Dwg No. over Sheet No.** from the Text Style drop-down list (see Tip below figure). Click the orange **Exit Viewport Annotation** button (in the upper right corner of the drawing area), and then press Ctrl + 6 to adjust the display. Examine the completed section line, as shown below.



Tip: It's not necessary for this exercise, but you can optionally change the ending marker to match the beginning marker. To do this, click **Section Marker Style(s)** in the Object Info palette. In the Set Marker Style(s) dialog box, select **Match Beginning** and then click **OK**.

Inserting Appliance Symbols

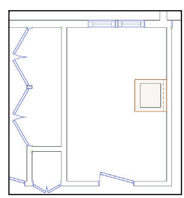
Next, you insert appliance symbols in the upstairs hall bathroom. You can choose to optionally follow steps 11 through 19, where you insert various symbols and plug-in objects in both floor plans. Or to save time, you can close your file and open the **GS-VWAx10-Step20.vwx** file (with the symbols and plug-in objects already inserted) and skip ahead to step 20 (p. 79).

11. Open the **Equip-Residential Appliances-Imp.vwx** file in the Data Set folder (keep this file open through step 18—don't close your house file—see Note below). In the Resource Browser, click **Home** to activate the **Equip-Residential Appliances-Imp** file.

Note: This file is also included with Vectorworks Architect in the following folder:
[Vectorworks application folder]\Libraries\Objects-Building Architecture & Interior

12. From the Window menu, select your house file to activate it. In the Navigation palette, activate the **Floor Plan-2** saved view. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions. Press Ctrl + 6, and then zoom in on the hall bathroom. In the Resource Browser, notice that the **Equip-Residential Appliances-Imp** file is still active, and then open the Symbols/Plug-in Objects folder (if it's not already open). Double-click the **Clothes_Washer_Top** symbol to activate the **Symbol Insertion** tool. In the Tool bar, enable **Wall Insertion Mode** (if it's not already enabled) and **Align Actual Insertion Point Mode**, and then move your cursor—with phantom preview—over the wall, approximately where shown at left. Double-click to complete the insertion, as shown at center. In the Object Info palette:

- Make sure that Symbol in Wall is displayed (or undo the placement and try again).
- Select **Left Edge** from the Insert drop-down list.
- Select **No Break** from the Break drop-down list.
- Click **Set Position**, and then for the reference point, snap to the wall's top left inside corner. For the object point, snap to either corner on the top edge of the clothes washer. In the Enter Offset dialog box, specify an offset of 3'10" [1.168m], and then click OK to move it into its final position, where shown. See Symbol Insertion Notes (after step 18) for additional information.



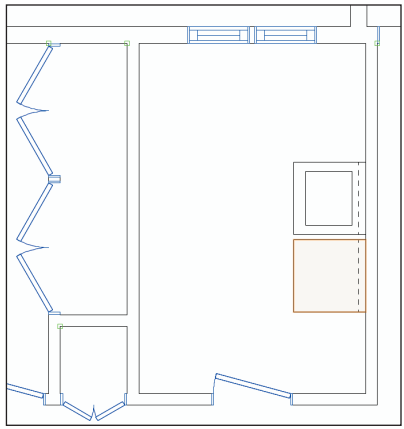
13. Press the X key twice to clear the current selection, and repeat the previous step to insert the **Clothes_Dryer_Sm** symbol with an offset of 2" [50.80mm] between the clothes washer (as shown), and then press the X key twice to clear the selection.

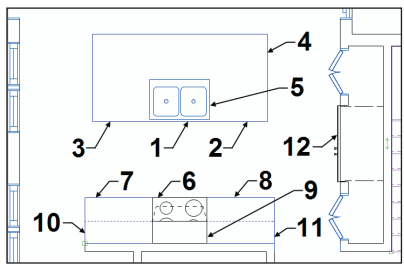
Inserting Kitchen Symbols

Next, you insert various symbols and plug-in objects (with minimal instruction) to complete the kitchen.

14. In the Navigation palette, activate the **Floor Plan-1** saved view. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions. Press Ctrl + 6, and then zoom in on the kitchen area. Insert kitchen symbols in the order listed below. To do this, note the source VWX file of the symbol, and then if the symbol is located in:

- Your **House.vwx** file: Double-click the symbol in your **House.vwx** file's Resource Browser and insert it where shown at right (and also shown in p. 77 below the table in a bird's-eye perspective view for clarity).
- Another file: Open the **VWX File** specified (in the Data Set folder—see Note below lower figure; keep VWX files open through step 18), and then switch the focus back to the house file. In the Resource Browser, activate the **VWX File** you just opened (if necessary, open the symbol folder, and scroll down), and then double-click the symbol and insert it where shown. See Symbol Insertion Notes (after step 18) for additional instructions. Use the **Move by Points** tool as necessary.



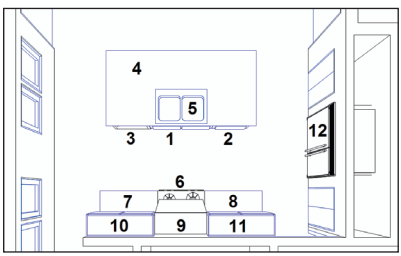


Note: The Equip-Residential Appliances SubZero USA.vwx file is also included with Vectorworks Architect in the following folder: **[Vectorworks application folder]\Libraries\Objects-Building Architecture & Interior.**

Order	Source VWX File	Symbol or Folder > Symbol
1	House	2CompSinkCabinet
2	House	IslandCornerCabinet
3	Equip-Residential Appliances-Imp	Dishwasher
4	House	IslandCountertop
5	House	2CompSink
6	Equip-Residential Appliances-Imp	Range_30_Gas
7,8	House	*RangeBaseCabinet
9	Equip-Residential Appliances-Imp	Range Hood 30
10,11	House	RangeWallCabinet
12	Equip-Residential Appliances SubZero USA	Built-in Refrigeration > **642 Stainless

*After you insert item 7, use the **Mirror** tool with **Duplicate and Mirror Mode** enabled to create item 8.

Insert this symbol in the center of the pantry wall and then in the Object Info palette; change the Class to **None, and select **Full break with caps** from the Break drop-down list.

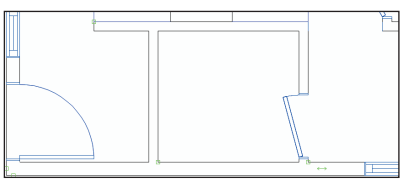


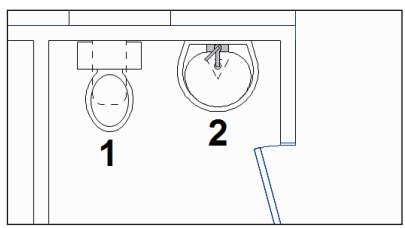
15. Zoom in on the bathroom as shown.

16. Open the **Sanitary-Fixtures.vwx** file in the Data Set folder. In the Resource Browser, activate the **Sanitary-Fixtures.vwx** file (scroll down as necessary), and then double-click symbols in the order listed in the table below at left and place them in the bathroom where shown. See Symbol Insertion Notes (after step 18),

Inserting Plumbing Fixture Symbols

Next, you insert plumbing fixture symbols (with minimal instruction) in the first and second floor plans.

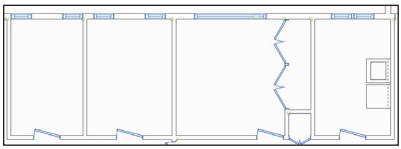




Order	Symbol
1	WC Wall Floor Tank
2	Lav Pedestal

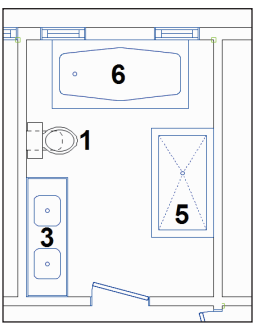
Note: The **Sanitary-Fixtures.vwx** file is also included with Vectorworks Architect in the following folder: **[Vectorworks application folder]\Libraries\Objects-Building Services.**

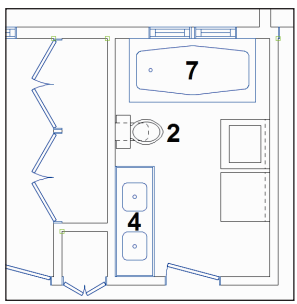
17. In the Navigation palette, activate the **Floor Plan-2** saved view. In the Scripts palette, double-click the **Toggle Dimension Class Visibility** script to hide all dimensions, and then press Ctrl + 6, and zoom in on the area shown below.



18. Insert symbols and plug-in objects in the order listed in the table below and place them in the bathrooms where shown below. See Symbol Insertion Notes for additional instructions.

Order	Source VWX File	Symbol
1, 2	Sanitary-Fixtures	WC Wall Floor Tank
3, 4	House	VanitySink
5	House	Shower
6, 7	House	Bathtub





Symbol Insertion Notes:

1) You can drag symbols out of the Resource Browser and drop them into the drawing, but you double-click them to make them active so you can use the cursor's phantom preview to facilitate accurate placement.

2) Make sure **Wall Insertion Mode** is active when inserting symbols. You don't have to insert symbols in walls, but if you do, the symbols will move along with the walls when you drag wall segments to move or resize them.

3 Use Insert = **Left edge** (or **Right edge**), and Break = **No break** options as required.

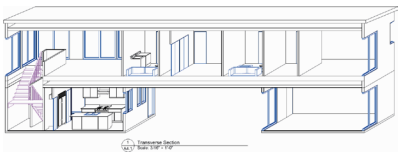
4) Click the **Selection Tool** to terminate the **Symbol Insertion** tool after each symbol insertion, and then drag symbols and/or use the **Flip** and **Set Position** controls as necessary to orient and move them into their correct position. You can also use temporary associative dimensions to position symbols.

5) In some cases, you may have to insert the symbol in another location away from other symbols, and then drag and snap it—or use the **Set Position** control—to move it into its correct position.

6) When correctly inserted, all symbols should display the "In Wall" suffix after the symbol name in the Object Info palette.

19. Close all three symbol files.

20. If you skipped steps 11 through 19, open the **GS-VWAx10-Step20.vwx** file. In the Navigation palette, select the Viewports tab, and then double-click the **Section 1** viewport to activate it. Press Ctrl + 6 to zoom in on the selected viewport. With the viewport still selected, click Update in the Object Info palette. Press the X key, and then click in a blank area to clear the selection. Notice that the viewport updated with the appliance, kitchen, and plumbing fixture symbols, as shown.



Note: You can move the section line if the sectioned bathtubs outside walls block the view inside both bathtubs, or if you want to examine the model at a different section point. To do this, right-click the VP-Floor Plan-1 viewport and select **Edit Annotations**, and then press the X key and drag the section line to move it. With the section line selected, click **Navigate to Section Viewport** in the Object Info palette, and then press Ctrl + 6 to adjust the display. Click **Update** in the Object Info palette to see the change.

21. Save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

Note: The methods used in the **GS-VWAx-Check.vwx** file to compare your drawing file with the master files cannot compare viewports. You must manually check the accuracy of all of your viewports and any objects you created in viewport annotation editing mode.

22. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the **01 Floor Plan-1** saved view to activate it, and then double-click the **Check EX10** saved view to activate it.

23. Use the **Zoom**  and **Pan**  tools (in the Basic tools palette), and the **Previous View** tool  (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects.

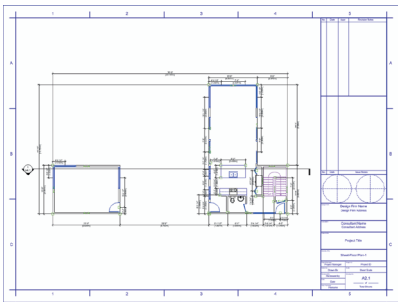
24. In the Navigation palette, double-click the **02 Floor Plan-2** saved view to activate it, and then double-click the **Check EX10** saved view to activate it.

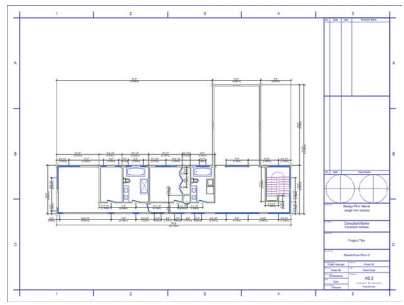
25. Use the **Zoom**  and **Pan**  tools (in the Basic tools palette) and the **Previous View** tool  (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in blue, and the master file's drawing objects are displayed in their default colors. You should see your blue drawing objects overlaid directly on top of the master file's drawing objects.

26. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active). If your drawing is inaccurate, close your file and continue with the next exercise by starting with the supplied file.

Exercise 11: Adding Annotations

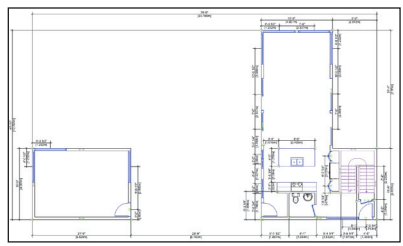
In this exercise, you complete the first and second floor plans by adding dimensions, and then you simultaneously adjust dimension visibility in a viewport and saved view. The completed exercise is shown in the following figure:

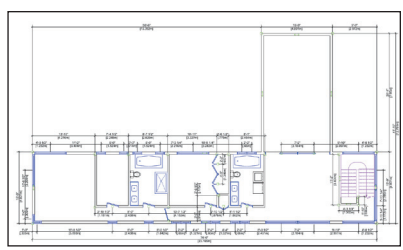




Creating Dimensions

You start the exercise by creating linear and chain dimensions for architectural objects on both floors.





1. If you did not complete Exercise 10—or you are unsure of your file's accuracy—open the **GS-VWAx10.vwx** file.

2. Activate the **Floor Plan-1** saved view, and then press Ctrl + 6 to adjust the display. Use the **Constrained Linear Dimension** tool with either **Constrained Chain Mode** or **Constrained Linear Mode** (see Notes) as necessary to create the remaining associative dimensions, approximately where shown at right. Activate the **Floor Plan-2** saved view, and then repeat the process to create the remaining associative dimensions, approximately where shown at bottom right.

Notes:

1) Click window and door insertion points (the plug-in object will pre-highlight to confirm the insertion point will be selected) to create associative linear and chain dimensions. It's not necessary for this exercise, but you can optionally change dimension length values as desired.

2) You can unlock existing dimensions and reposition the dimension or text (by dragging), as necessary. See also Notes on p. 27.

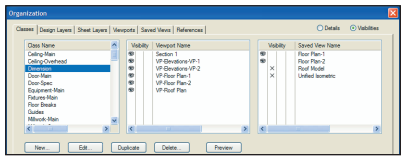
3) If you haven't created specific dimensional relationships (optional in previous exercises), you can alternately run the **Custom Select All Dims** script, and then press the Delete key to remove all dimensions from the drawing. You can then run the **Dimension Exterior Walls** command to re-create all dimensions on both floors. To automatically associate dimensions with T-joined wall intersections with the **Dimension Exterior Walls** command, select **Centerlines** from the Dimension to Wall drop-down list. Then select **Center of Openings** from the Dimension drop-down list in the Dimension Exterior Walls dialog box.

4) Refer to Exercise 13 in the "Getting Started with Vectorworks Fundamentals" guide for an overview of creating a text block and a callout

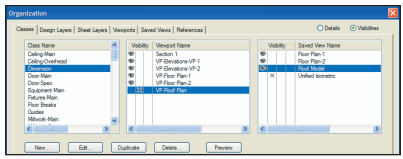
Adjusting Dimension Visibility in Multiple Viewports and Saved Views

Next, you use the Organization dialog box to simultaneously adjust visibilities in a viewport and saved view to hide or show dimension objects.

3. In the Navigation palette, select the Classes tab, and then right-click the Dimension class and select **Visibilities**. The Organization dialog box is displayed with the Dimension class selected (in Visibilities mode). Resize the Organization dialog box (if necessary) so you can see the entire list of viewports and saved views. The Dimension class is visible by default in all saved views and viewports automatically created with the **Create Standard Viewports** command (but not the two saved views that you created), as shown.



4. Turn off visibility for the VP-Roof Plan viewport, and then turn on visibility for the Roof Model saved view, as shown. Click **OK** to close the Organization dialog box and save the changes.



5. Examine the changes in the floor plan sheet layers, and then save the file.

If you set up your files as instructed in the Checking Your Work section (p. 8), you can now optionally check the accuracy of your file.

6. Open the (read-only) **GS-VWAxCheck.vwx** file. In the Navigation palette, double-click the **01 Floor Plan-1** saved view to activate it, and then double-click the **Check EX11** saved view to activate it.

7. Use the Use the **Zoom**  and **Pan**  tools (in the Basic tools palette), and the **Previous View** tool  (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in red, and the master file's drawing objects are displayed in their default colors. You should see your red drawing objects overlaid directly on top of the master file's drawing objects.

8. In the Navigation palette, double-click the **02 Floor Plan-2** saved view to activate it, and then double-click the **Check EX11** saved view to activate it.

9. Use the Use the **Zoom**  and **Pan**  tools (in the Basic tools palette), and the **Previous View** tool  (in the View bar) as necessary to examine the drawing. Your drawing objects are displayed in blue, and the master file's drawing objects are displayed in their default colors. You should see your blue drawing objects overlaid directly on top of the master file's drawing objects.

10. After checking your file's accuracy, close the active file (your **House.vwx** file should now be active).

Exercise 12: Printing Construction Drawings

In this exercise, you save a batch of export PDF sets, and then export one of the saved sets to a PDF file.

Saving Batch Export PDF Sets

You start the exercise by saving a batch export PDF set of floor plans from various sheet layers in multiple drawing files.

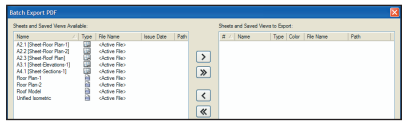
1. If you did not set up your files as instructed in the Checking Your Work section (p. 8), copy the Data Set folder on the DVD to any location on your hard disk. Open the **GS-VWAx11.vwx** file from the Data Set folder on your hard disk, and then save the file under the name **GS-VWAx12.vwx** in the same folder.

2. From the menu, select **File > Export > Export PDF (Batch)**. In the Batch Export PDF dialog box:

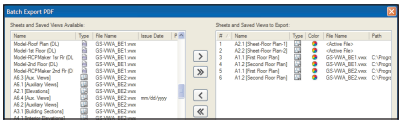
- Drag the lower right corner to increase the dialog box's height and width, and then move it as high up on the screen as possible.
- Notice the available sheets and saved views from the <Active File> on the left side.
- Double-click the right edge of the Name column's header to fit the column width to the text, as shown.
- Click **Select Folder**, and navigate to the Data Set folder on your hard disk. Click the **Data Set** folder name to open it, and then click the **Batch Export** folder. Click **OK** to add the sheets and saved views from files in the Batch Export folder to the available list.

3. Hold down the Ctrl key, and select the following sheets. Then click the > arrow to move them to the Sheets and Saved Views to Export list, as shown:

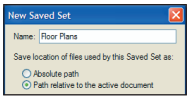
- <Active File>: A2.1 [Sheet-Floor Plan-1]
- <Active File>: A2.2 [Sheet-Floor Plan-2]
- **GS-VWA_BE1.vwx**: A1.1 [First Floor Plan]
- **GS-VWA_BE1.vwx**: A1.2 [Second Floor Plan]
- **GS-VWA_BE2.vwx**: A1.1 [First Floor Plan]
- **GS-VWA_BE2.vwx**: A1.2 [Second Floor Plan]



In the Sheets and Saved Views to Export list, double-click the right edge of the Name and File Name column headers, and then drag the number in the # column of various sheets as required to reorder them as shown.

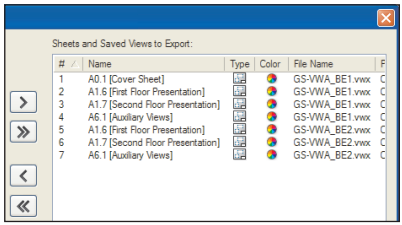


4. Click **Save a Set**. In the New Saved Set dialog box, change the name to **Floor Plans**, and select the **Path relative to the active document** option, as shown, and then click **OK** to save the new set. Leave the Batch Export PDF dialog box open for the next step.

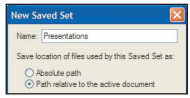


Next, you save a batch export PDF set of presentation drawings.

5. Click the << arrow to clear the Sheets and Saved Views to Export list. Repeat the selection/move/column resize/reorder process to populate the Sheets and Saved Views to Export list as shown.



6. Click **Save a Set**. In the New Saved Set dialog box, change the name to **Presentations**, select the **Path relative to the active document** option, and then click OK to save the new set.



Exporting a Saved Set to a PDF File

Next, you export the Floor Plans set saved to a PDF file.

7. Click **Manage Sets**. In the Manage Saved Sets dialog box, select the **Floor Plans** saved set, and then click **Recall**. The Manage Saved Sets dialog box is automatically closed, and only the sheets from the Floor Plans saved set are now displayed in the right side of the Batch Export dialog box, as shown.

8. Make sure that the **Export as separate files** option is disabled, and then click **Export**. In the Export PDF dialog box, adjust settings as shown, and then click Export. In the Export as PDF Document dialog box, navigate to the Batch Export folder, and then change the default (active VWX) file name to **Floor Plans.pdf**. Click **Save** to create the PDF file. After several seconds, the PDF file is created and opened in your default PDF viewer. Examine the multi-sheet PDF file, and then close your viewer when finished.

9. Congratulations! You have now completed the tutorial!