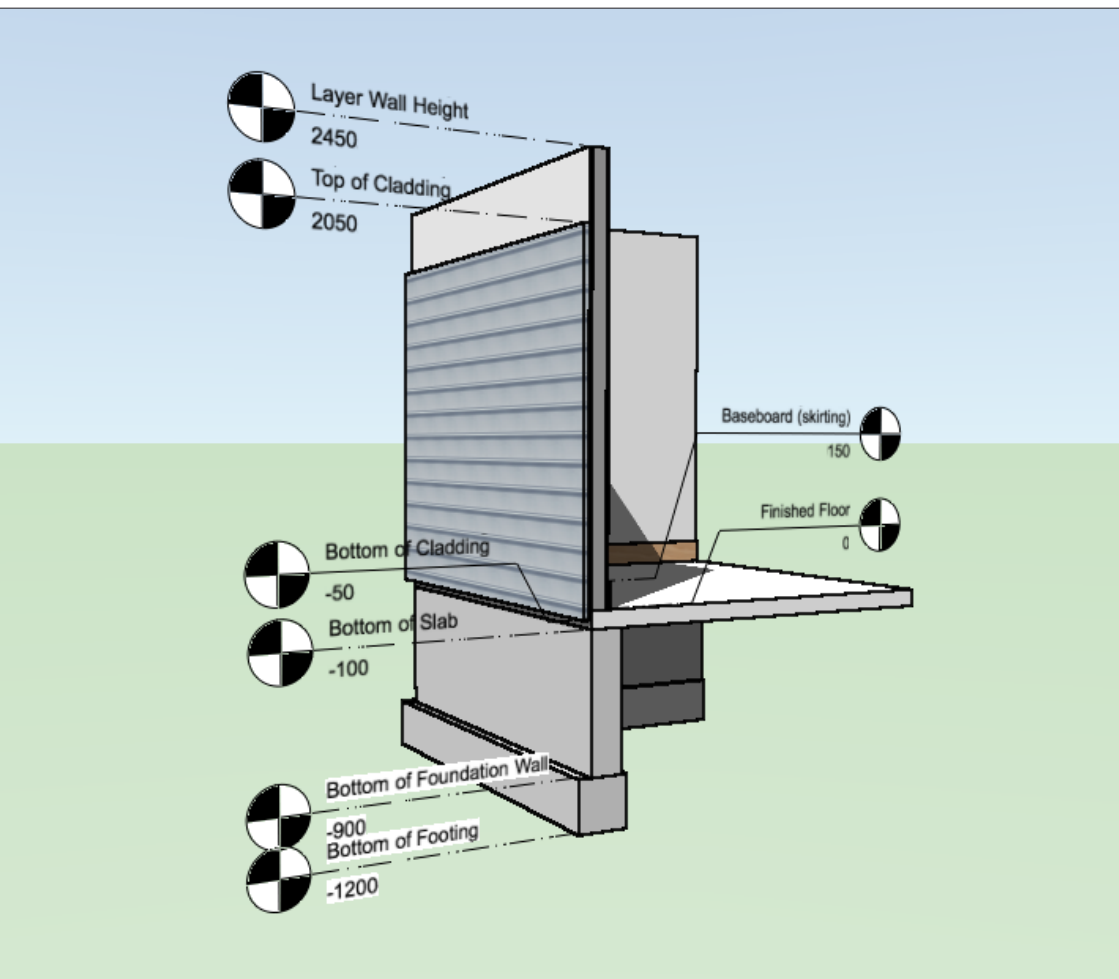
SHORT SHARP MANUALS

1411 Walls



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Introduction

I believe it is very important to learn to draw walls regardless of your profession. I believe that walls are useful for architects, landscapers, set designers, and engineers.

If you're doing architectural work, then it should be absolutely clear why you need to use walls to draw your projects, but that's making a large assumption on my part. The reason I assume that you should be using walls if you're doing an architectural project has because walls do such a great job of creating the 2-D plan and 3-D part of your buildings. I know some clients would rather use rectangles to draw their buildings rather than learn how to use the walls properly. This might be all right to create a sort of plan, but it certainly will not help you if you want to create a BIM project. Walls on the other hand can replicate the look that you want in plan, but they will also create a 3-D part that you can use as part of your BIM project.

If you're doing landscape work, you might think that walls are only for architects. But a lot of the landscape work that I see has a building component. For example, I saw a project the other day that had a pizza oven and barbecue built into a structure to shelter the outdoor area from the wind. This project required several walls to create the wind protection, and the structure for the pizza oven. If you want to build a shed, create structure for a deck, or create fencing, the wall tool can be useful.

For set design and engineering, the wall tool may not be so prevalent, but is still useful.

Drawing Walls

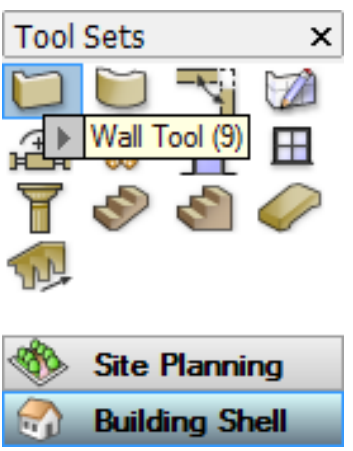
We will start withdrawing simple walls without components and without styles just to make sure that we cover the basics of wall creation.

Remember, even though were starting out using simple walls, the techniques that I'm using apply to complex wall styles as well.

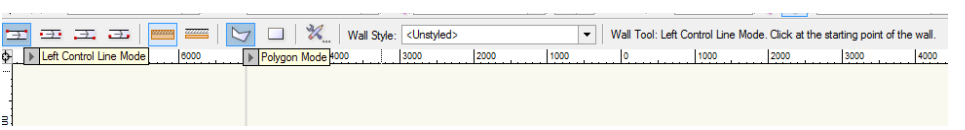
Polygon Mode

If you are using Vectorworks Architect or Landmark, go to the **Building Shell** toolset and click on the **Wall** tool.

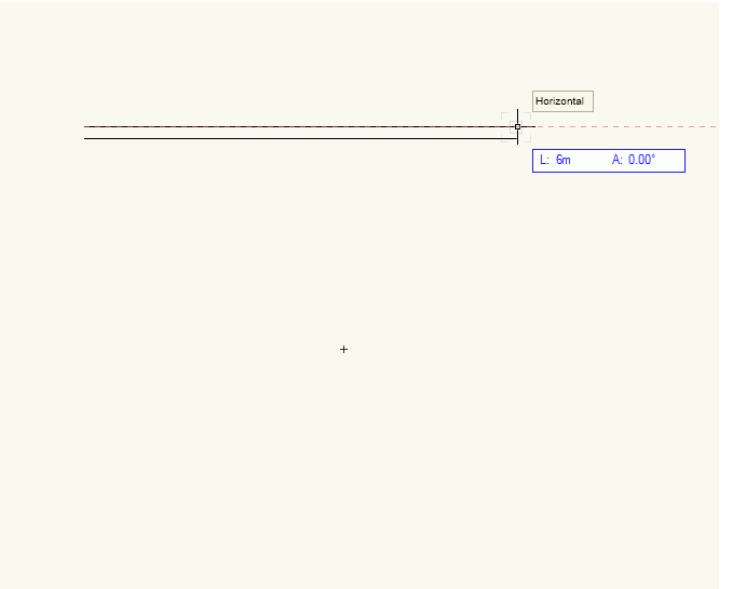
When you choose the **Wall** tool the tool bar will display a series of icons allowing you to change how you insert the wall and what mode you use to create the walls.



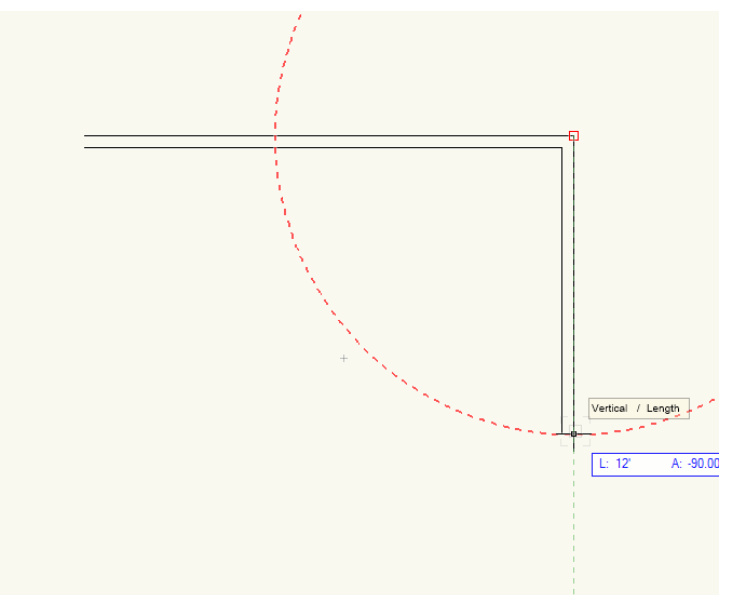
- Go to the **Tool** bar.
- Click on the **Polygon** mode. In this mode you click on each corner of your building, and you double-click to stop.



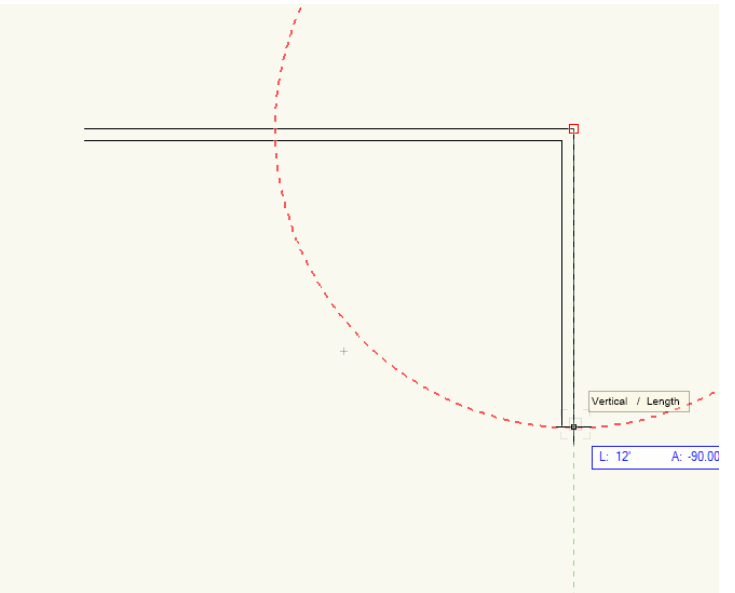
- Click once to start the wall.
- Move your cursor to define the end of the first wall. You can use your floating data bar to control the length and angle of this wall.



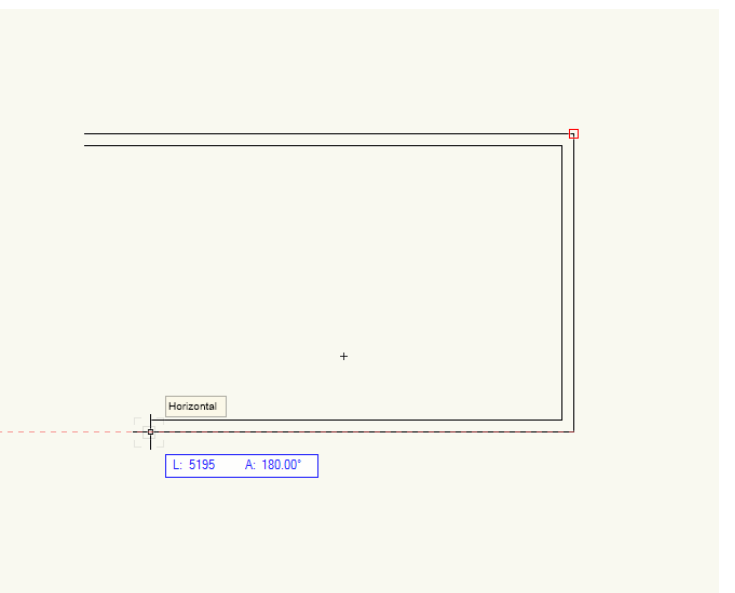
- Click once more.
- Move your cursor to define the end of the second wall. You can use your floating data bar to control the length and angle of this wall.



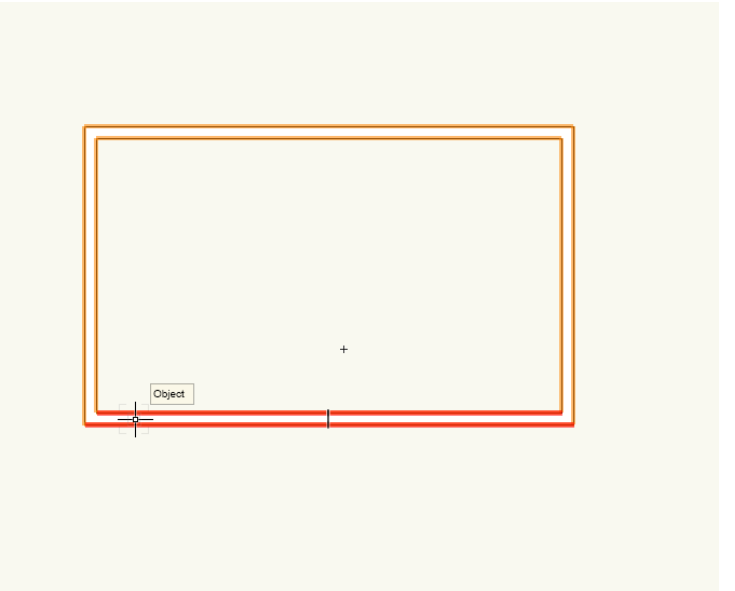
- Click once again to finish this wall.



- Move your cursor to define the direction of the third wall.



- If you are using Vectorworks 2015 you can hit the K key to complete the plan. The K key is used to complete polyline based tools.
- If you are using Vectorworks earlier than 2015, move your cursor to define the end of the third wall, and click once more. Click one last time at your start location to finish drawing the walls.
- If you want to stop drawing walls at any time, double-click.



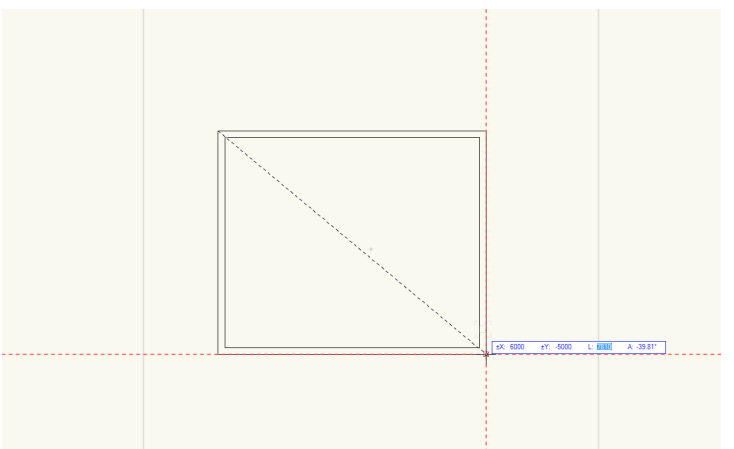
- The new K key to close polyline based objects is the quickest way to close your plan. The direction of the 2nd to last wall is crucial though, because the closing segment between the 2nd to last wall and the final wall is always assumed to be 90°.

Rectangular Mode

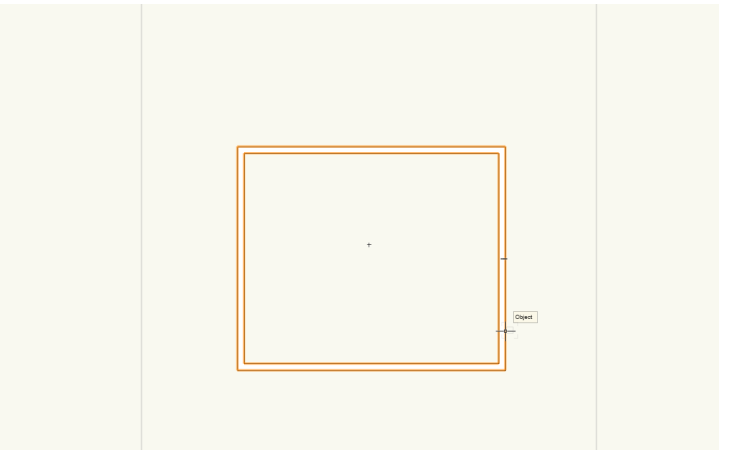
The rectangular mode is one of the quickest ways to draw your walls. Just like the rectangle tool which is so much quicker than during four lines, the rectangular mode for drawing walls will draw four walls with two clicks.

- Select the **Wall** tool.
- Go to the **Tool** bar.
- Click on the **Rectangular** mode.

- Click once to start.
- Use the Floating Data bar to control the size of your rectangle.



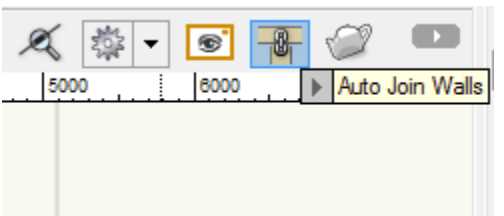
- Click once more to finish. Vectorworks will create a rectangular plan with four walls.


Object

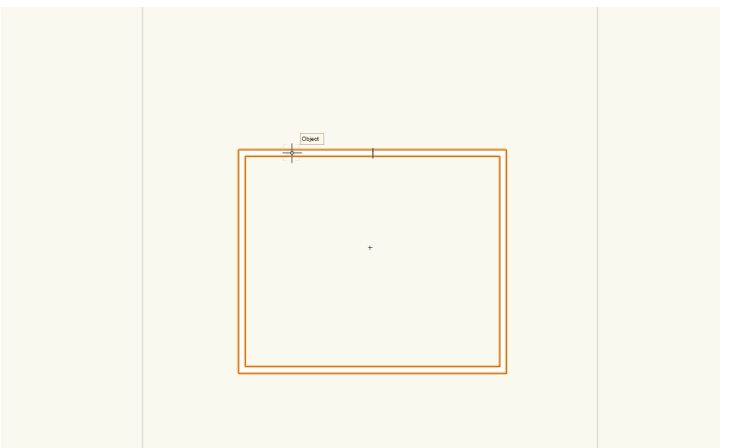
Overlapping Walls with the Rectangular Mode

The rectangular mode for drawing walls also recognizes when your new walls overlap existing walls, and will remove the walls required to create a neat plan.

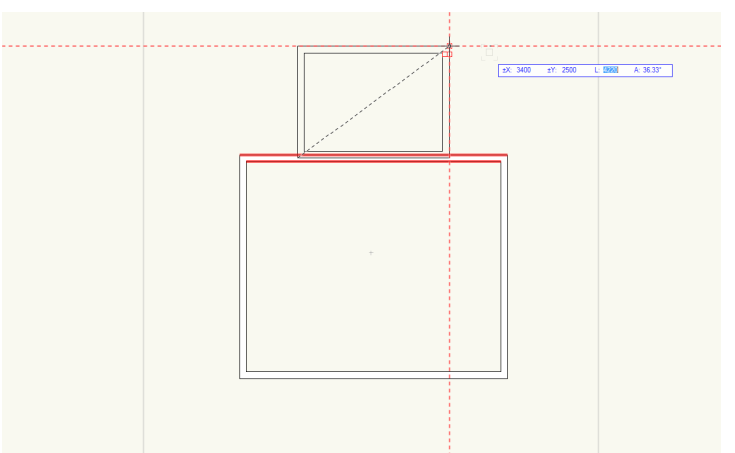
- For this to work correctly you need to turn on Auto Join Walls on your quick preferences.



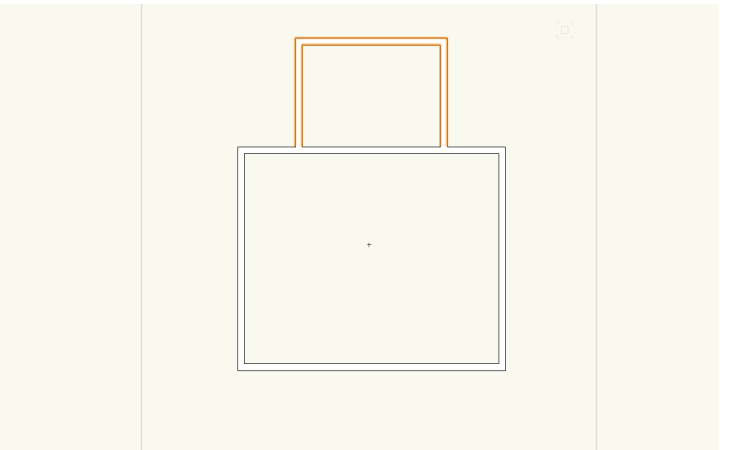
- Start drawing walls with the rectangular mode where they overlap walls that have already been drawn.



- Use the Floating Data bar to control the size of your rectangle.

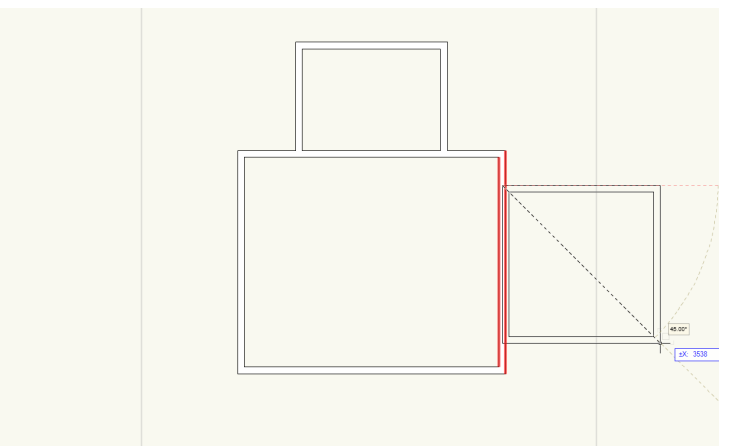


- Click once more to finish. Notice how Vectorworks has removed the wall that would have overlapped the existing plan. Not only that, Vectorworks has also joined the new walls to those existing walls

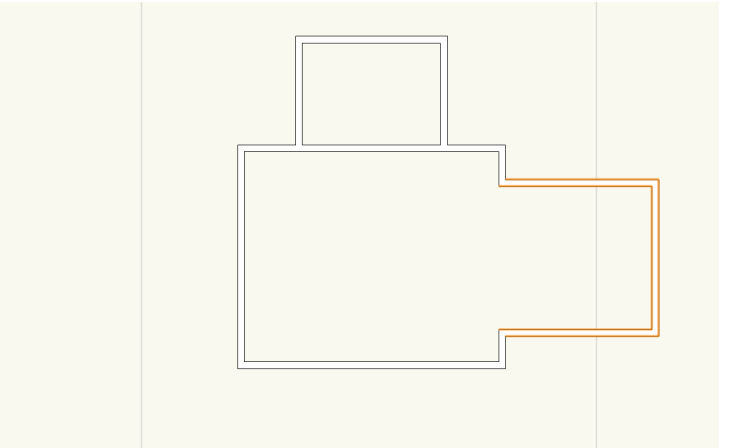


Vectorworks also has a modifier key mode. If you hold down the alt or option key when you are drawing your overlapping walls, Vectorworks will remove all of the overlapping walls in that area.

- Start drawing walls with the rectangular mode where they overlap walls that have already been drawn.
- Use the Floating Data bar to control the size of your rectangle.



- Hold down the alt or option key and click once more to finish. Notice how Vectorworks has removed all the walls that would have overlapped in the existing plan.



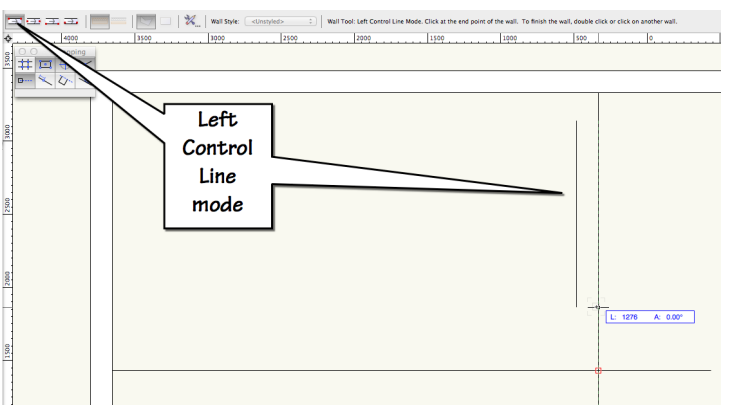
This technique makes it much faster to draw your plans and I recommend you get used to using this new rectangular mode. I even use the rectangular mode to draw the internal rooms, even when I only have two walls to draw.

Left/Right/Central Control Mode

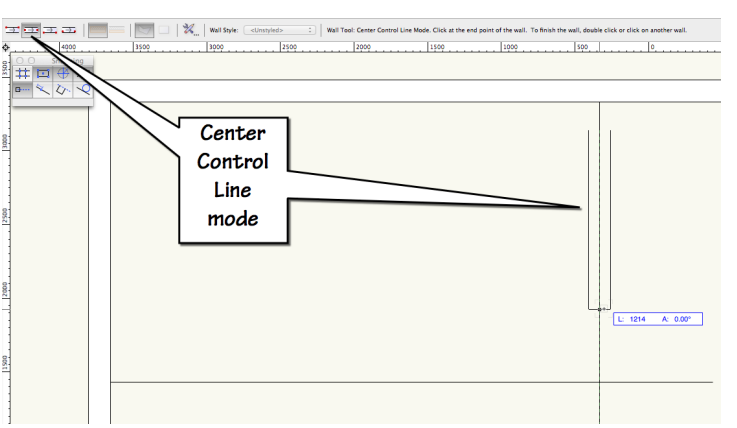
When you start to draw walls you will notice that you have 4 options for the alignment of the walls, these are called the control lines. As you draw your wall you can use the left control line mode, the center control line mode, the right to control line mode, or the custom control mode (which uses a manual offset from the wall settings).

- Select the **Wall** tool.
- Go to the **Tool** bar.
- Click on the **Left Control Line** mode.

The left control line mode will use the exterior face of the wall if you are drawing in a clockwise direction. If you set up your walls with multiple components, the left control line mode will be drawing the face of component number one. I often use this is the exterior face of my walls.

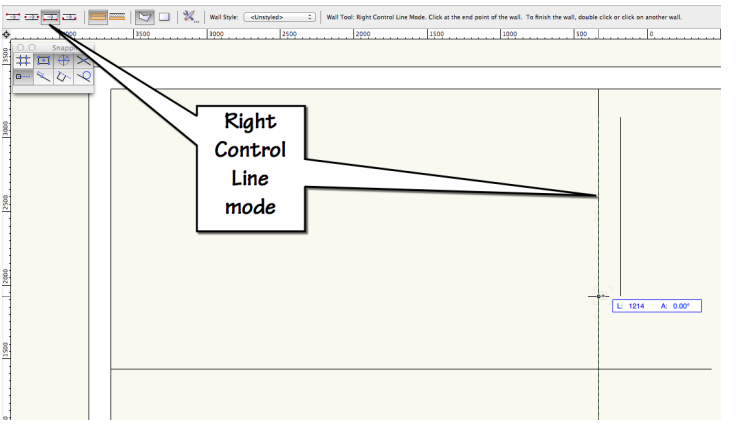


The center control line mode will set your control line to the center of the wall. This mode can be useful when you need to make sure that your wall that your wall is centered from a specific point.

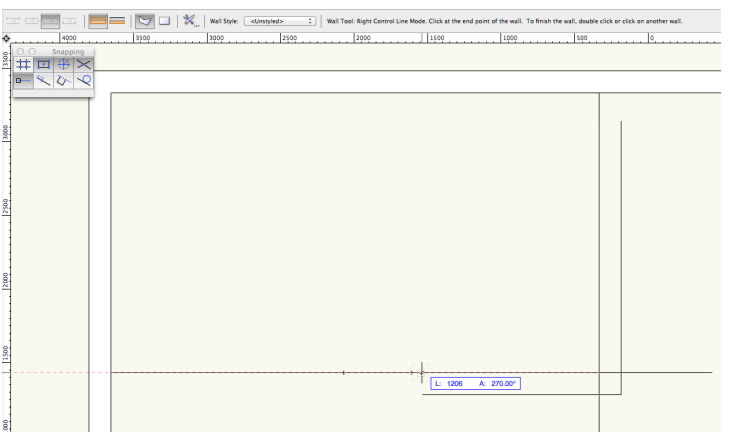


- The right control line mode is used to control the wall from the right side, if you set up your wall styles like I do, this relates to the internal

face of the wall.



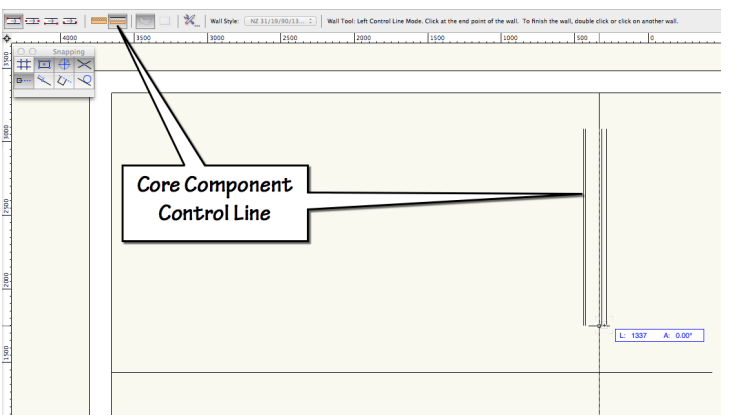
- You can use a hotkey (U) to change the control line mode of the wall up until your first click. After you have clicked for the end of the first wall, Vectorworks grays out the wall control line modes, preventing you from changing.



Core Component Control Line

Many clients tell me that they would use components with their walls if they had a way control the framing rather than drawing the exterior face of the wall. If you create your wall styles with a core component, you can use this core component to control the drawing of the wall.

- Select the wall tool.
- Go to the Tool bar.
- There are two modes to control with you using the overall wall all the core component with the control line modes. If you select Core Component Control Line Mode, then when you draw your walls you will be drawing with the control line based on the core of the wall. This will give you exactly what you want, the ability to draw the wall based on the framing.



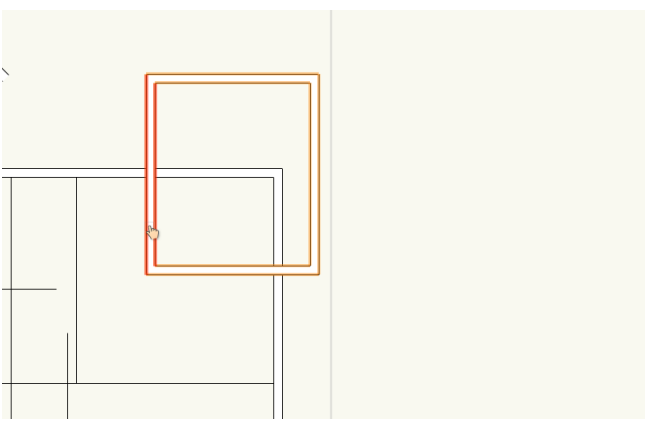
Editing Walls

Once you have drawn the walls you will probably need to edit them. There are several techniques for editing the walls, you can edit them in 3D, edit them to other walls, remove breaks and walls, trim the walls, split them, etc.

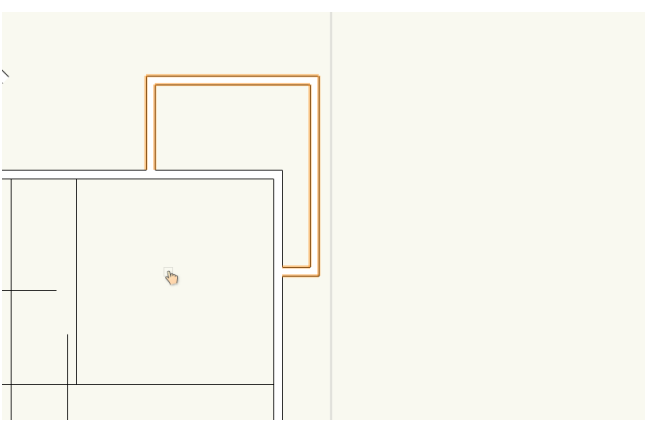
Trim Tool

Vectorworks has made an improvement to the Trim tool for Vectorworks 2015. The improvement is that it now recognizes that it is trimming a wall and it will look for any boundary walls.

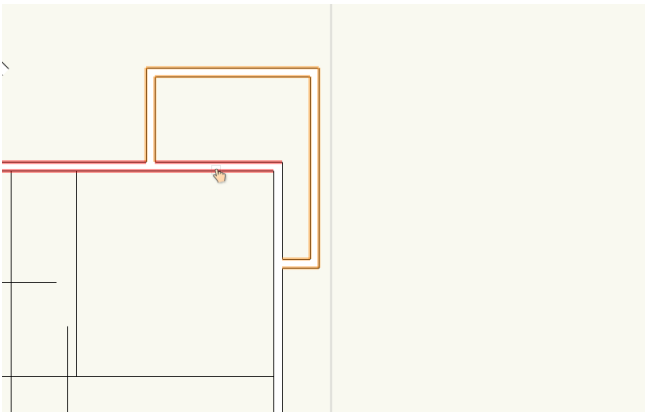
- Go to the Basic toolset.
- Choose the Trim tool.
- Click on the wall that is overlapping other walls.



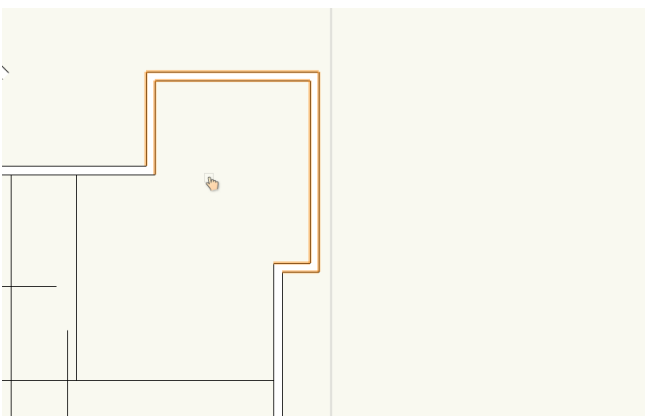
- Notice how Vectorworks tidies up all the walls that are connected.



- Click on the wall that is overlapping other walls.

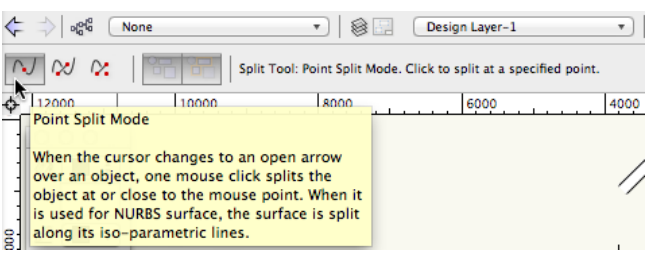


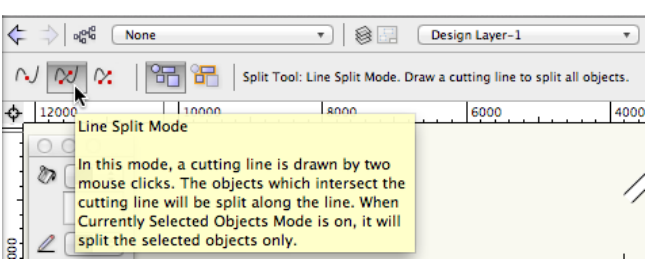
- Notice how Vectorworks tidies up just the walls that are connected.

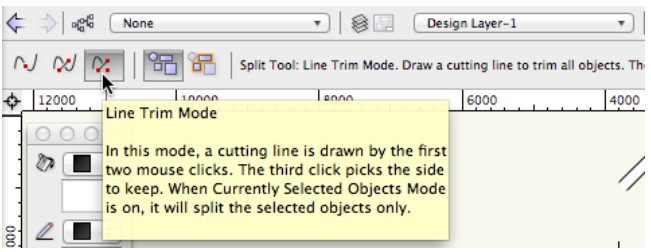


Split Tool

The split tool is useful for splitting your walls and to separate parts. You would use this tool where you have an existing wall that you want to break into two parts, one part to leave as existing and the other part may become a demolished wall. If you do not split your wall into two parts, you are unable to change the graphic style as required.



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Design Layer-1
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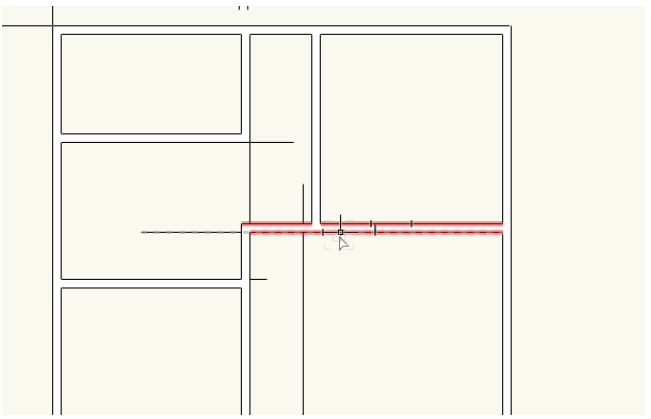
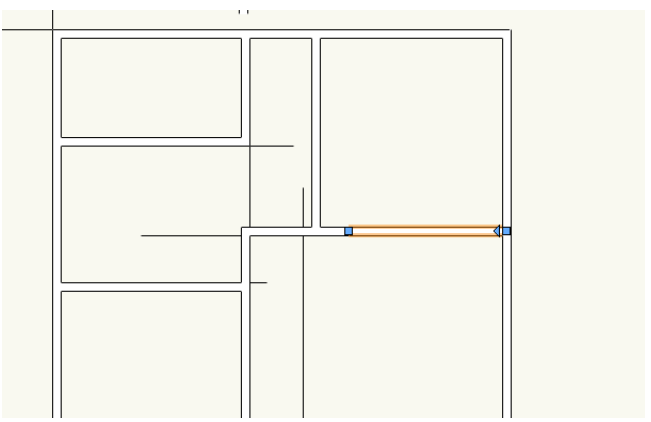
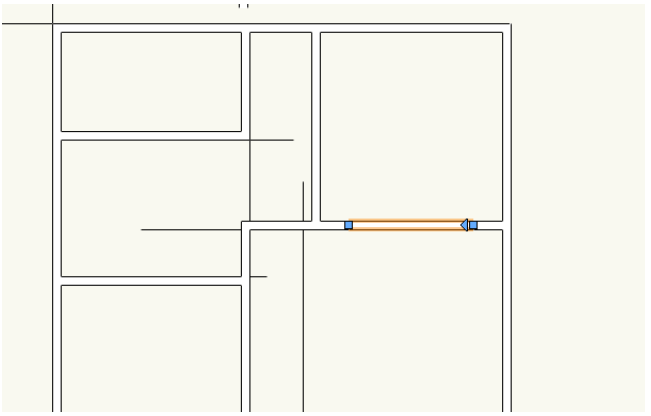
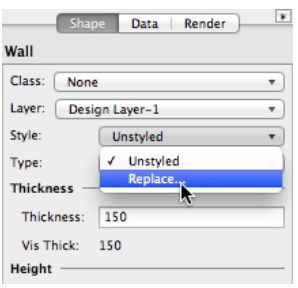
12000
6000
4000
Line Trim Mode
In this mode, a cutting line is drawn by the first two mouse clicks. The third click picks the side to keep. When Currently Selected Objects Mode is on, it will split the selected objects only.








Shape
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Wall
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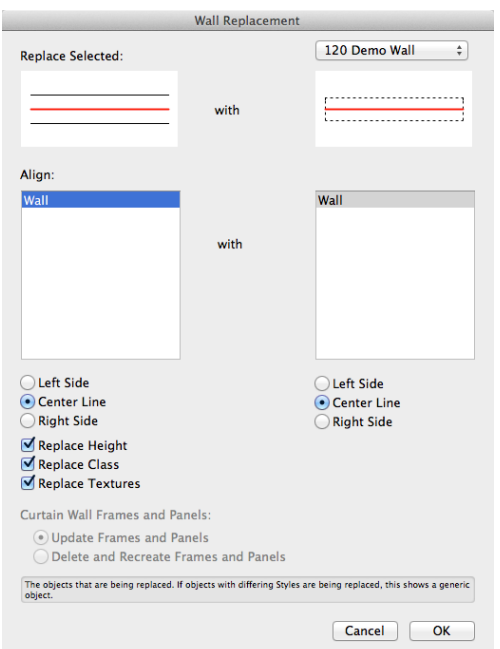
Wall Replacement
Replace Selected:
120 Demo Wall
with
Align:
Wall
with
Wall
Left Side
Center Line
Right Side
Left Side
Center Line
Right Side
Replace Height
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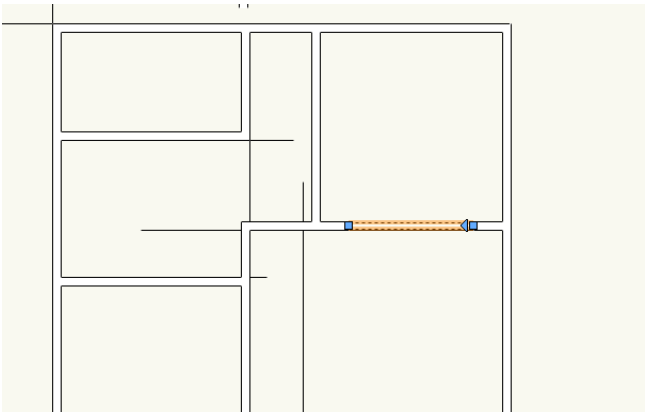
Update Frames and Panels
Delete and Recreate Frames and Panels
The objects that are being replaced. If objects with differing Styles are being replaced, this shows a generic object.
Cancel
OK

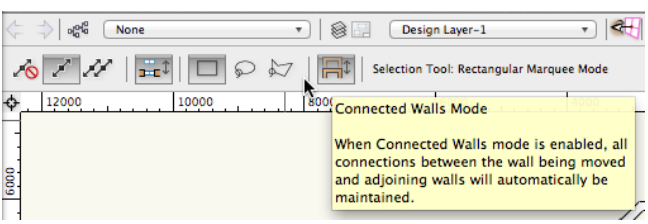


Connected Walls Mode

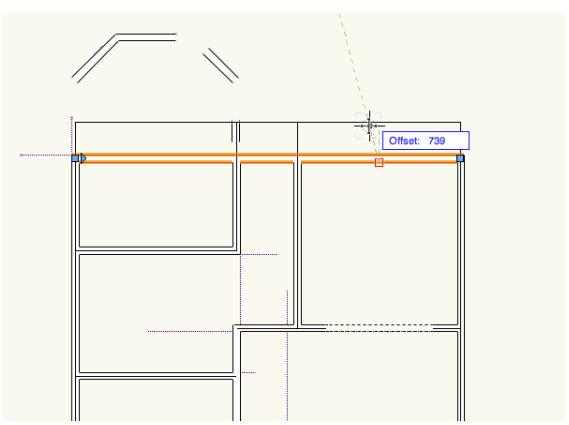
A lot of people forget about the connected walls mode. This mode is part of the selection tool, not part of the wall tool. When you move walls with the selection tool, the connected walls mode ensures that any walls that are connected to it are also extended.

This is a very useful way of stretching your walls.

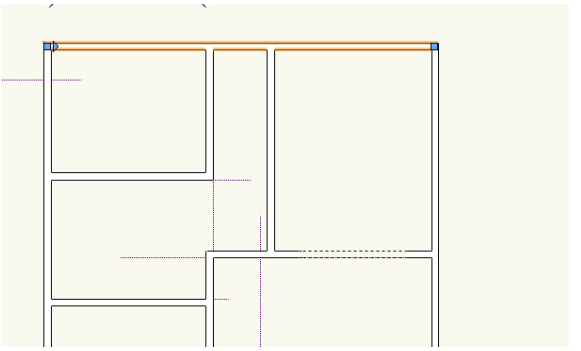
- Go to the **Basic Tool** palette.
- Click on the **Selection** tool.
- Go to the **Tool** bar.
- Move your cursor to the last button on the Tool bar. This is the Connected Walls Mode. This mode connects joint walls together, when you move one wall all of the other connected walls will together. If this mode is not activated, then it will only move the selected wall, and none of the joints live with it.



- Move your cursor to a wall that you want to stretch.
- Click and drag your mouse to move the wall.



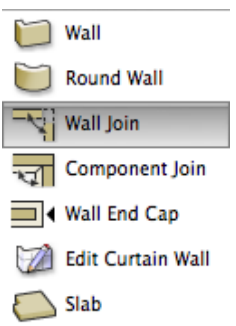
- When you release your mouse button the selected will be in the new location and all the connected walls will have been stretched.



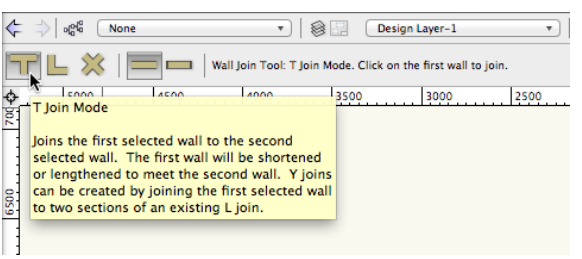
Joining Walls

To use any of the wall joining modes click on the first wall to join then click on the second wall to join. When clicking on the walls it doesn't matter where on the wall you click, you don't have to click on the point that you want to join. Avoid clicking on a point where two walls come together, you will not know which wall Vectorworks will choose.

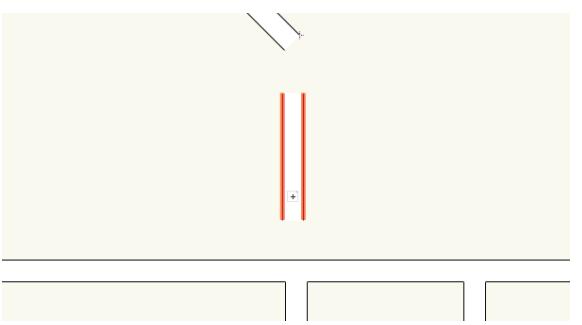
- Select the **Wall Join Tool**. There are 3 modes for the join wall tool and 2 options for the cap on the end of the walls that you join.
- When you select a mode from the first group you then need to select a mode from the second group to tell Vectorworks whether the walls are butt joined (with caps) or mitre joined (without caps).



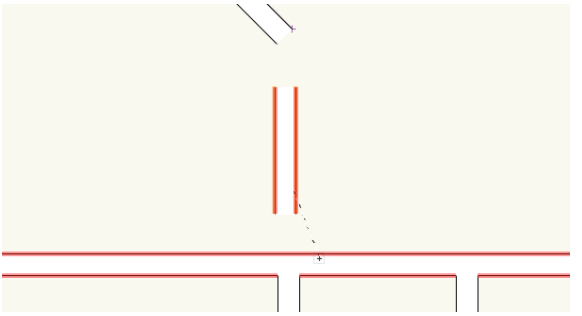
- The first mode is for **T** joining walls. If one of the walls pass beyond the other (even by a small amount) then the join will be a **T** joint.



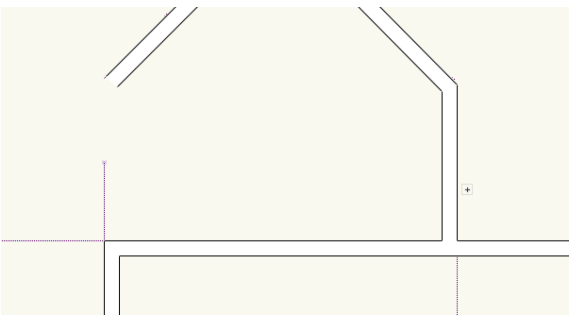
- Click on the first wall that you want to join (the vertical wall).



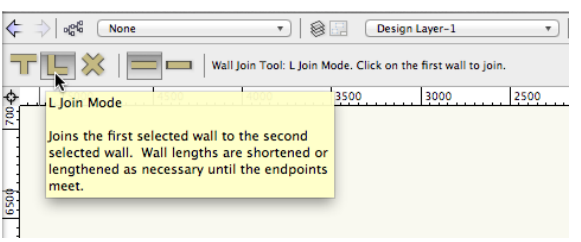
- Click on the wall that you want the wall to join to.



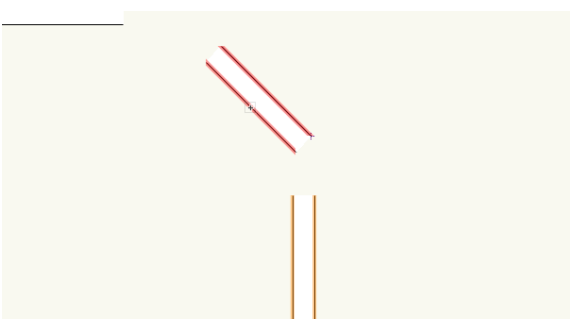
- Vectorworks extends the first wall to meet the second wall.



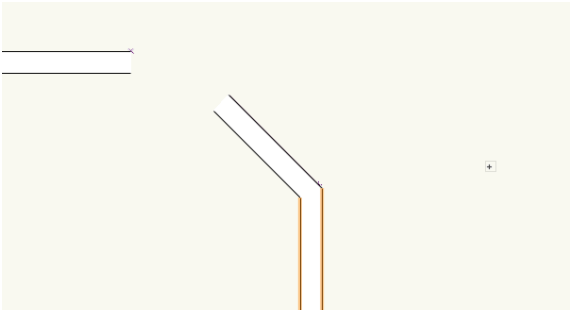
- The second mode is for corner joining walls and the third mode is for joining walls that cross each other.



- Select the second mode then select the uncapped mode (the first mode in the second group). This will create a seamless joint in the two walls.
- Click on the first wall that you want to join (the vertical wall).

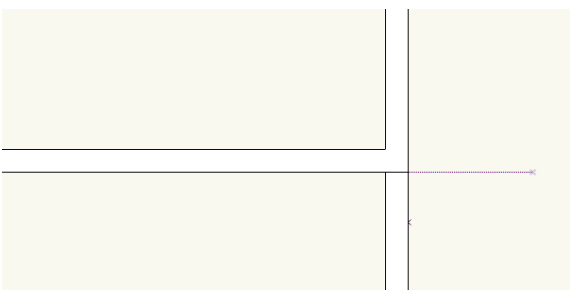


- Click on the other wall that you want to join together.



- Vectorworks extends the both walls to meet each other.

If you use the uncapped mode for joining your walls, the results are quite different from the capped mode. When you use the capped mode the walls look as if they have been butt joined.

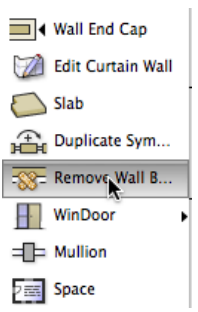


Healing Walls

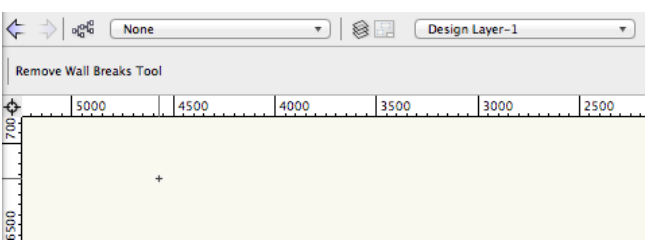
If you join walls and then later you delete one of the walls you may be left with a joint. The joints need to be removed for the walls to draw correctly.

With Architect you get a mode called enabled walls mode. With this mode turned on walls should heal themselves if you move an adjoining wall.

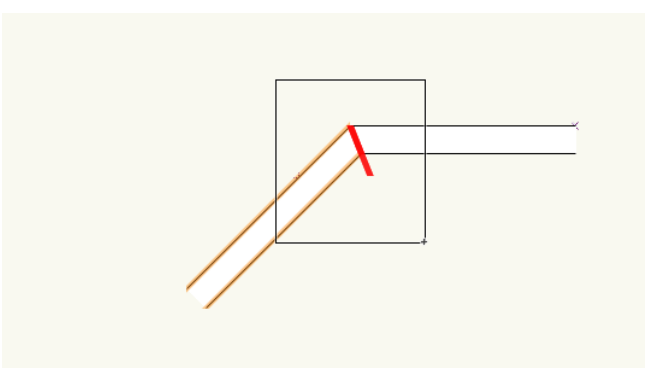
- Go to the **Building Shell** toolset.
- Click on the **Remove Wall Breaks** tool. This tool was used to remove joints in walls. If you have joined tools together that you do not want to have joined use this tool to remove the joints.



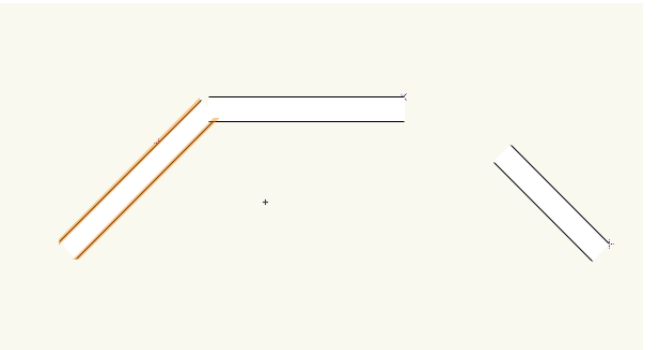
If you go to the tool bar you will notice there are no options for this tool.



- To use this tool drag a marquee around the area that has the breaks that you want to remove.
- Click once to start.



- Click once again to finish.



- Also use it to clean up joints that won't work, you may find a previous joint in the same location.

Editing Walls in 3D

Whether you want your wall to be sloped at the top or have a gable end on it you use the same tool. VectorWorks calls this adding peaks and VectorWorks uses the Reshape tool to add peaks or move the heights of each part of the wall.

We will use the same file as we used in the last section. If this is no longer available you should go back to the last section and recreate it.

When you add peaks to walls you can find the heights for the peaks to the walls in 2 ways:

- Geometrically, where you draw the position that you want the wall peaks to go to;

- Mathematically, where you calculate the position or the wall peak in 3D using trigonometry and use this information in the Data Display bar when you are moving the wall peak.

The first method most often works the best because you can draw in elevation where you want the wall peak to be and then snap the cursor to this when you are using the Reshape tool. Also included in this method is layer linking the roof layer to the walls layer so that you can use the roof to snap to in 3D.

The second method only works if you are able to calculate the position of the walls in 3D using trigonometry. You can use the formula to work out the height of the peak.

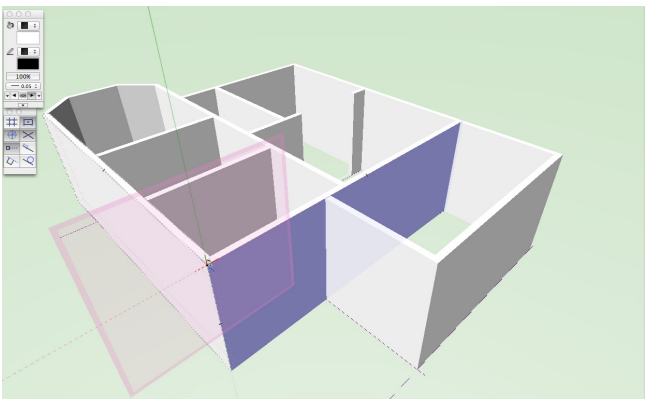
Don't forget to add the starting height of the wall to the answer as well. As you can see, it can be tricky if you are mathematically challenged. That's why I say that it is easier to draw the wall peak that you want.

You can use the technique where you draw the elevation of the wall that you want and then add the peaks to the wall to snap on to the shape that we have drawn.

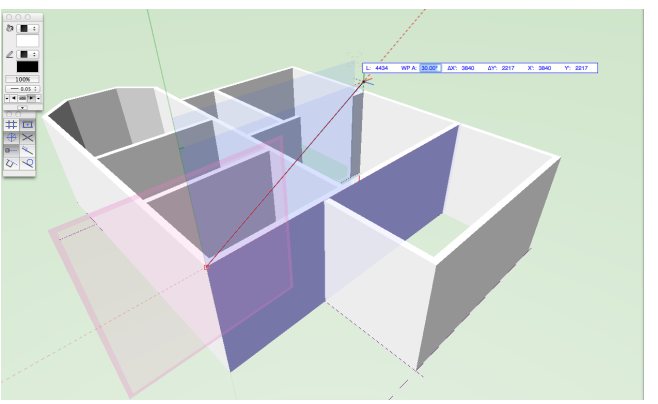
Adding a Peak to a Wall

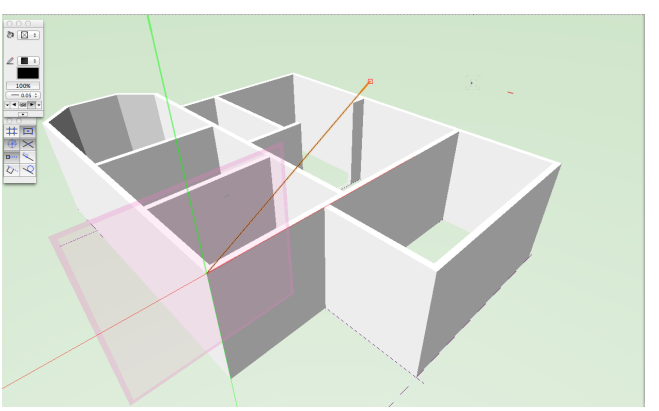
During the elevation of the wall you require in 3D is made easier if you turn on your Automatic working planes.

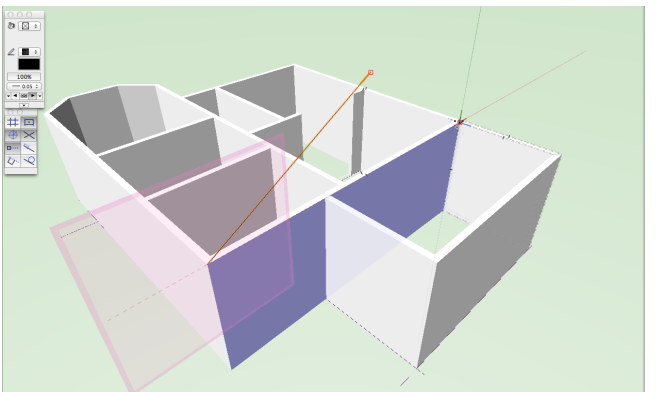
In this image you can see the automatic working plane highlighted on the front of the building.



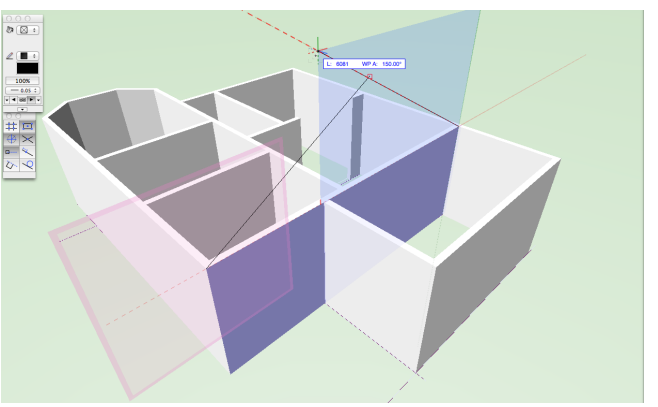
- Use the Line tool to draw a line starting from the top corner of the wall and using the Floating Data bar to input the correct angle.



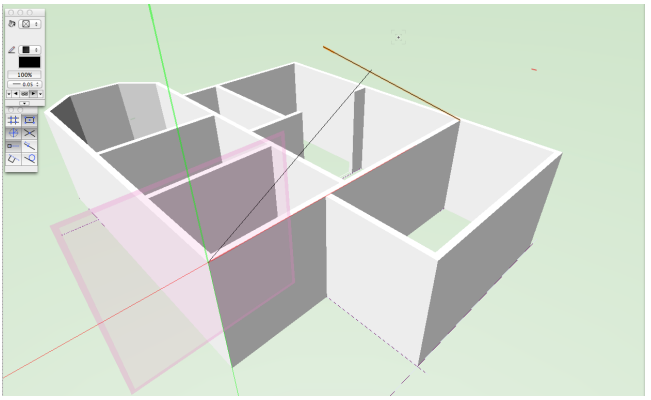




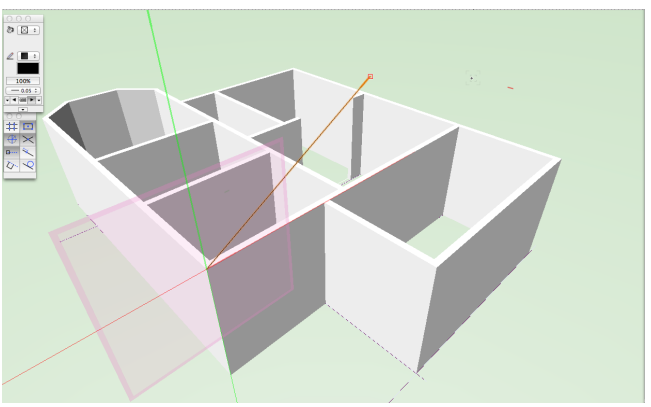
- Click once again to finish drawing the line.
- Go to the other end of the wall. If you are using automatic working planes, you will notice the whole wall highlights.
- Use the Floating Data bar to input the correct angle. You do not need to worry about the length of the line, you can use the Connect/Combine tool to join these two lines together.



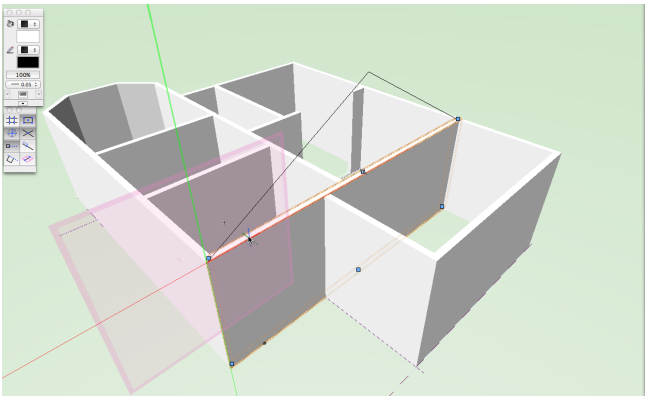
- Click once more to finish the line.



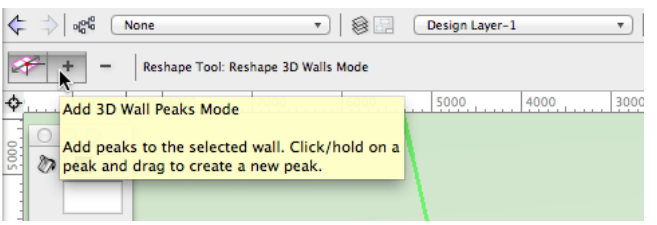
- Use the **Connect/Combined** tool from the Basic tool set to join the two lines together.



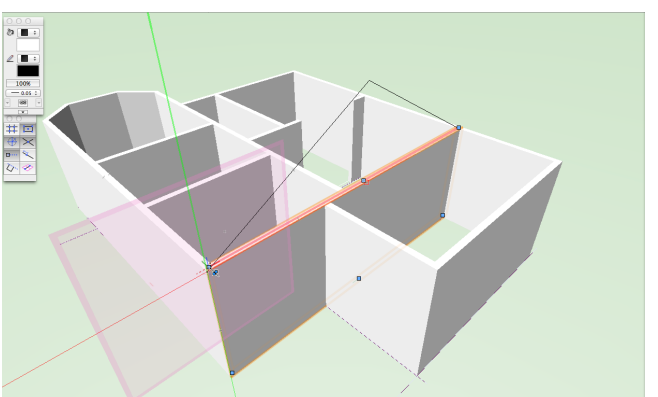
- It is best to draw the two lines and join them together so that you have a point where you want the wall peak (gable end) to finish.
- You could do this work in a front elevation but as there are walls behind, it is easy to select one of the other walls when you are trying to modify the front wall. You will notice that I have set my view to an isometric view in perspective and I have rendered it with OpenGL to make it easy to see. I find it much easier to work in a rendered view rather than in a wireframe view.
- Go to the **Basic** toolset.
- Choose the **Selection** tool.
- Double-click on the wall that you want to edit. Vectorworks will change to the Reshape tool to allow you to reshape the wall.



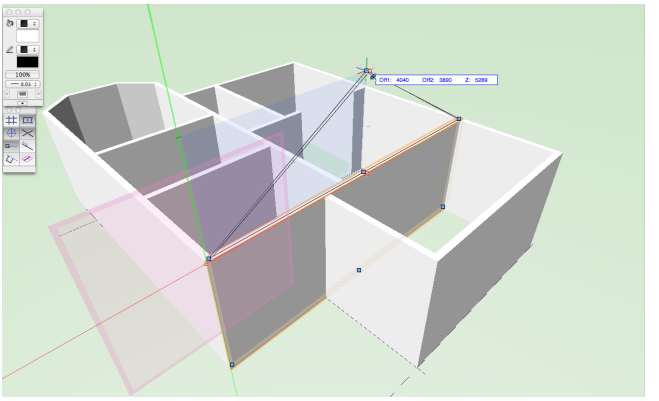
- Go to the Tool bar. There are three modes. The first mode is for moving a peak on a wall (often shown as a blue square). The second mode is for adding a peak. This is the one that you need to use to add the gable end to your wall.



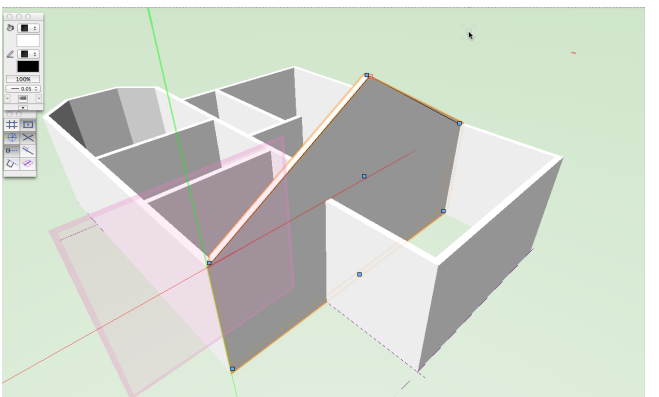
- Choose the second mode.
- Move your cursor to set above the blue handle (blue square) at the top end of the wall. You will notice the cursor changes shape. This is to indicate that you can add a peak to the wall.



- Click once.
- Move your cursor to the intersection of two lines drawn.



- Click once more.

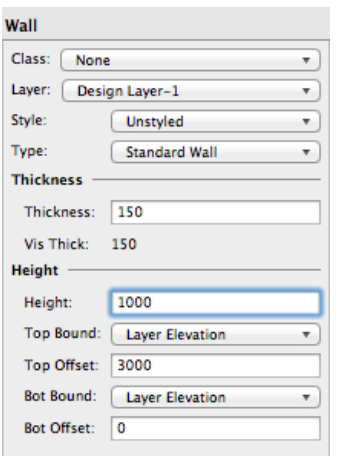


- Remember to delete the two lines if you no longer need them.

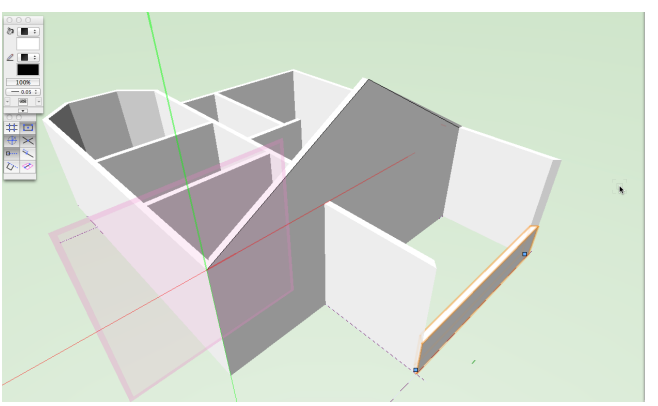
Editing the Height of a Wall

You can change the overall height of a wall by changing the height of the wall on the Object Info Palette. Let's say for example that you want to make the walls at the lower part of the building into balustrade walls.

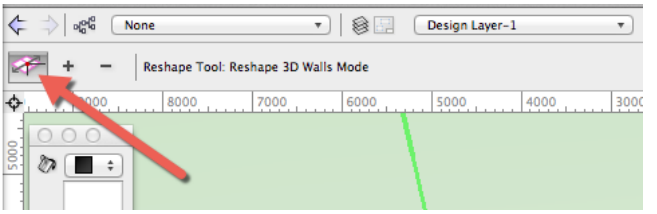
- Select the wall, the long wall, with the 2D Selection tool.
- On the Object Info Palette change the **Height** of the wall to 1000mm (3' 4").



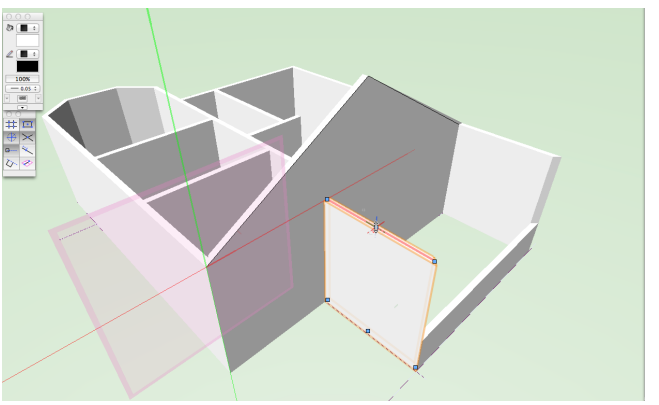
- When you use the Enter or Tab key, the wall will update.



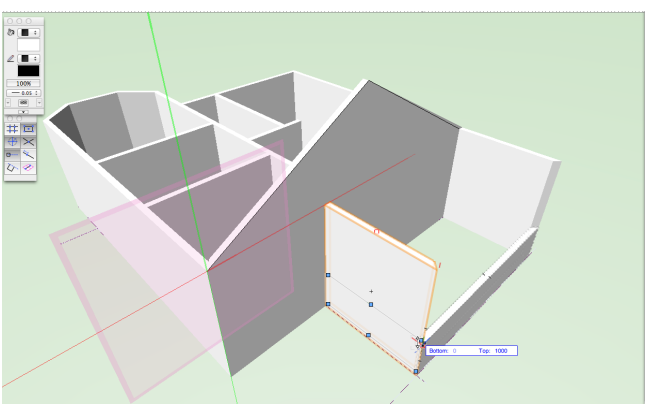
- The other way to change the height of a wall is to use the **Reshape** tool. he easiest way to activate the Reshape tool is to double click on the wall that you want to edit with the Selection tool.
- Go to the **Tool** bar.
- Click on the **first** mode.



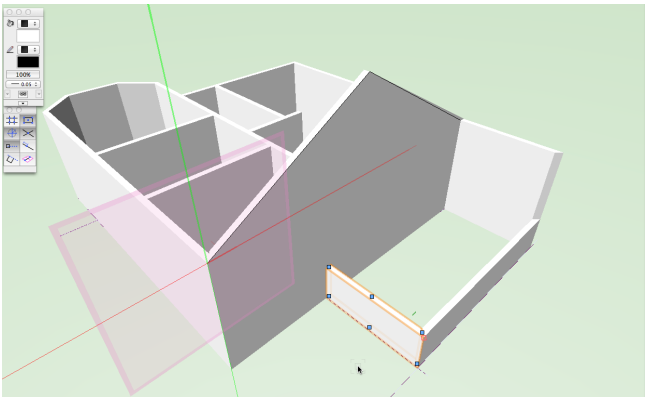
- Move your cursor to the handle at the top end of the wall (in the center of the wall).
- The cursor will change to a double-headed arrow.
- Click once.



- Move the cursor to line with an object, or use the Floating Data Bar to type in the required height.

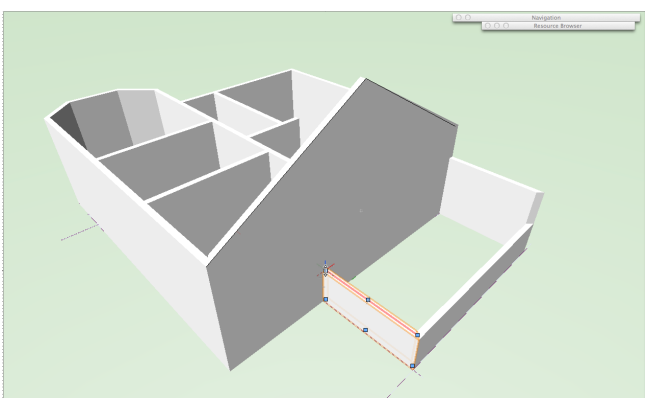


- Click once more to finish.

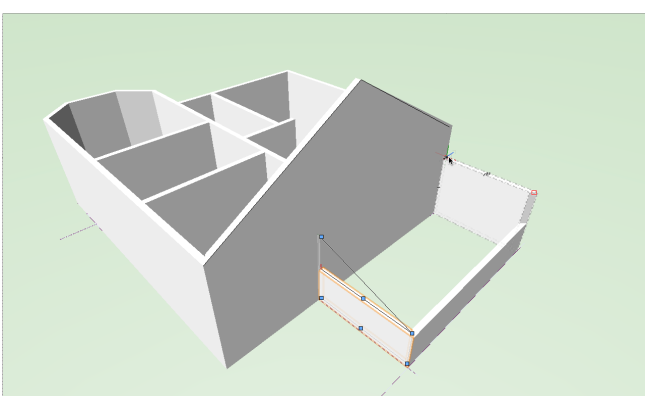


Changing The Height At The End Of A Wall

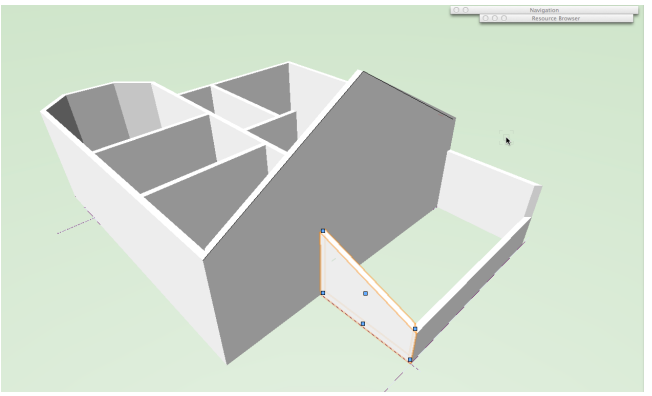
- Double click on the wall that you want to edit with the Selection tool, this is the easiest way to activate the Reshape tool.
- Go to the **Tool** bar.
- Click on the **first** mode.
- Move your cursor to the handle at the top end of the wall. When the cursor changes to a double arrow click and drag the cursor up a little way, then let go of the mouse button.



- Move the cursor up to touch the end of the adjacent wall. The screen hints will say **Endpoint**.



- Click once.

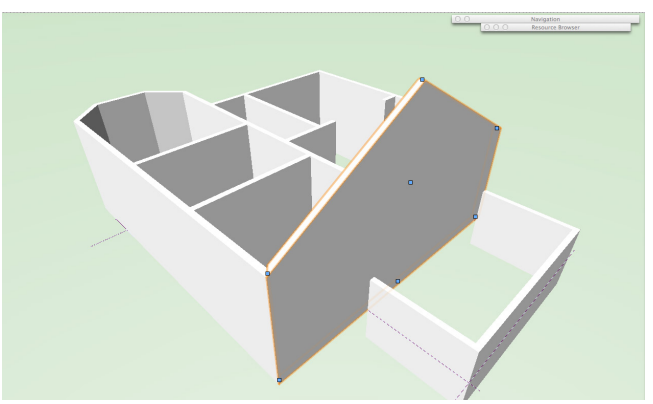


- Sometimes this doesn't seem to work well. It seems hard to find the snap point. If this happens look at the Snapping palette, you will probably find that the constrain to working plane (where the Smart edges are) is turned on. Turn it off and the results are better.
- This has only changed the height of the wall at one end. It has not affected the other end of the wall and it has not affected the other wall at all.

Removing a Peak from a Wall

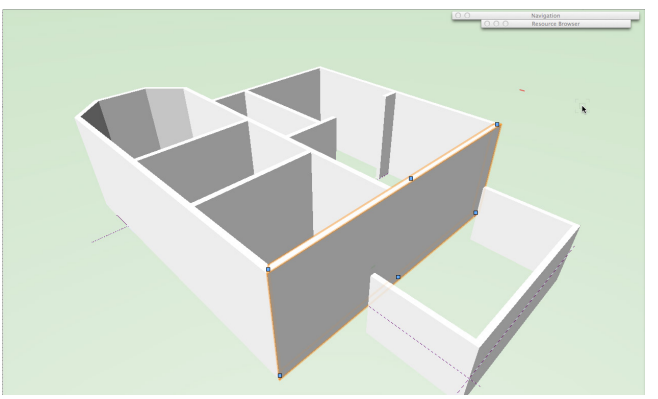
When you have a wall that has unwanted peaks, you can remove them. You use the Reshape tool to do this.

- Double click on the wall that you want to edit with the Selection tool, this is the easiest way to activate the Reshape tool.
- Go to the **Tool** bar.
- Click on the **third** mode.



- Move your cursor to the unwanted handle.

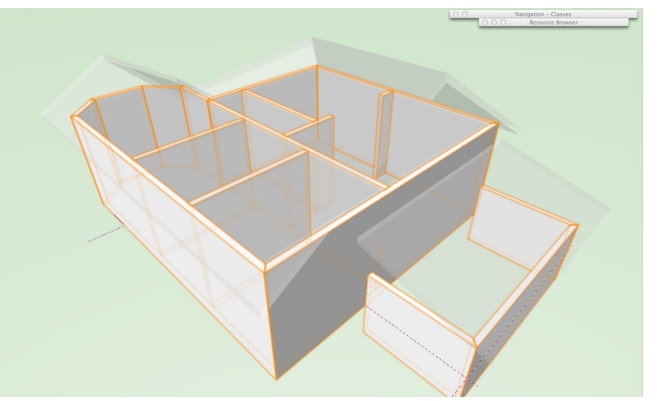
- When the cursor changes to a minus arrow, click once. The peak will be removed.



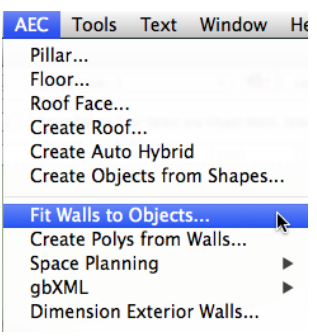
Fit Walls to Objects

An easy way to get the walls to follow the roof is to use the command Fit Walls to Roof from the AEC menu. This command will fit all the selected walls to a 3D object like a roof, extrusion, site model, NURBS curve etc. You have to create the 3D object before you use this command.

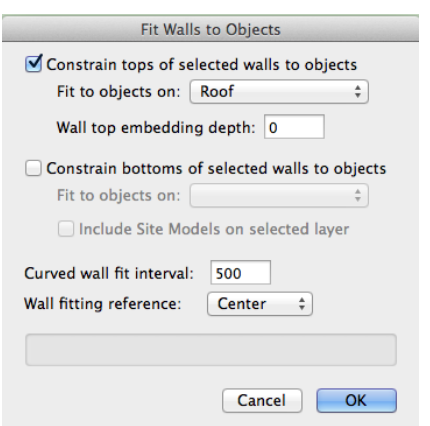
- Select all the required walls.



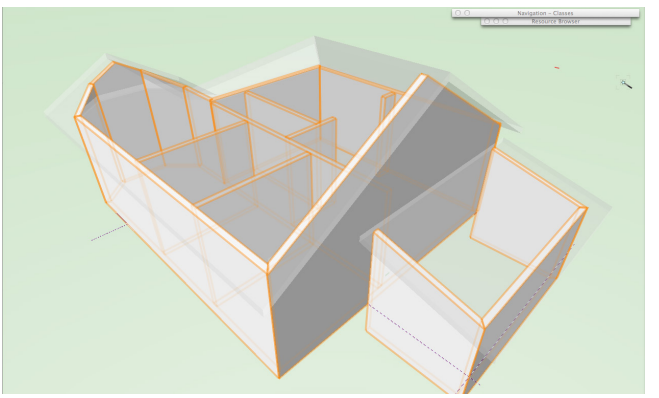
- From the Menu Bar choose **AEC > Fit Wall to Roof...**



- Choose to constrain tops of walls, using the geometry on the **Mod-Roof** layer.



- VectorWorks changes the walls for you. This is quick and effective. Sometimes if the roof is complex you will have to move the wall peaks manually.



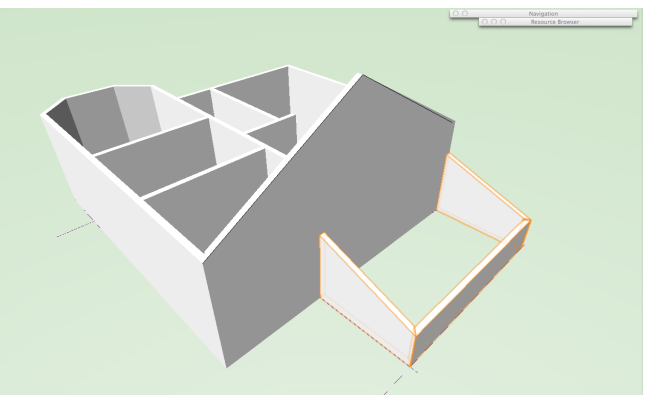
One thing that will help when using Fit Walls to Objects… is to have the objects you are fitting to own a different layer to the walls. With the roof this is easy, just have the roof on another layer. This may not be quite so easy with some of your geometry for the foundations. If you are building is complex it will pay you to have a separate layer for your slabs and foundations, so that you can use these easily to fit the bottoms of your walls to these objects.

Also use classes with your 3-D geometry. Any 3-D geometry that is in an invisible class will not be used by this command. Make sure you turn off the classes of any unwanted objects before using the Fit Walls to Objects… command

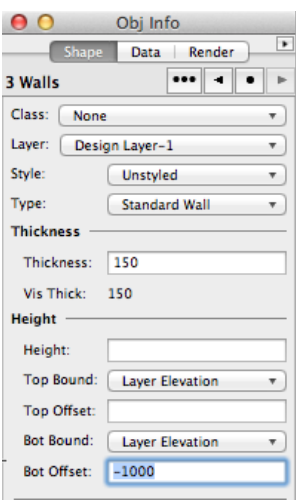
Using Walls On Multilevel Plans

Often you have a plan that has walls on several levels. There are two ways to deal with this, either split your file up into lots of layers, or move the walls once created.

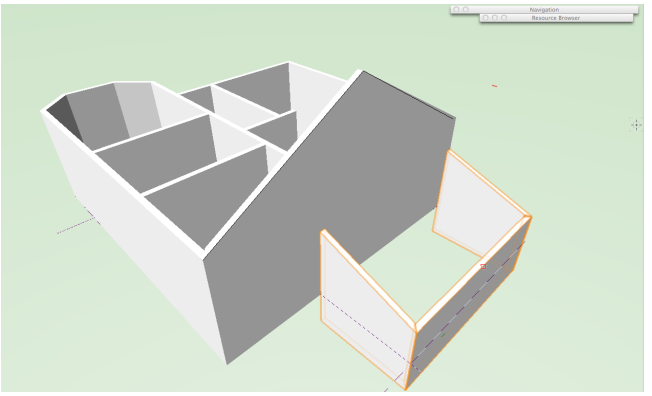
I find that if the different levels are going to be on the same drawing it's easier to put them on the same layer and move the walls in 3D.



- Select the required walls.
- On the Object Info palette, edit the Bottom Offset to the required elevation.



- When you hit the enter, return, or tab key, the walls will adjust.



I often have users asking about drawing their walls on multilevel plans. The common misconception is that every level of the building requires its own layer. My experience shows that putting every level of the building on its own layer will cause trouble when it comes to join walls together. It is also awkward to have to jump between multiple layers to do simple editing of the walls.

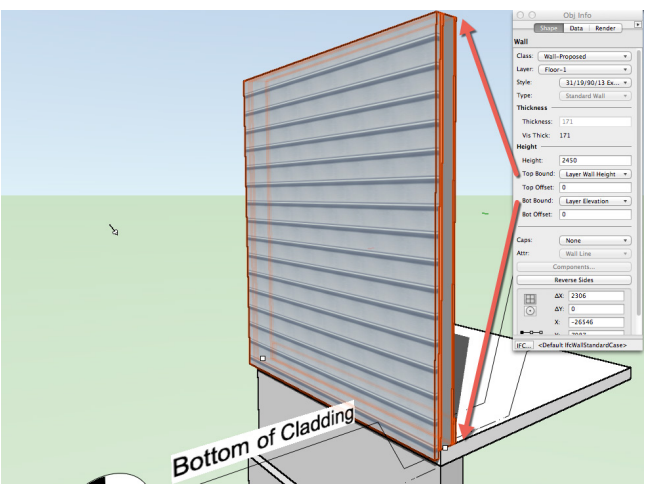
The best solution is to put as many walls as you can on the same layer but use the bottom offset to adjust the walls to the required levels.

If you create a foundation layer with several slabs or the required levels of the building, thing you can easily edit the walls to follow the slabs by using the Fit Walls to Objects… command.

Wall Styles

Wall styles are extremely important for creating walls with consistent components, classes, heights, and materials. Prior to Vectorworks 2015, your walls could be stored in your default content library and be used on any project. After Vectorworks 2015, using walls from your wall library will require that your destination file includes the levels and stories that the wall style requires. This means that from Vectorworks 2015 onwards it is important that you start your projects from a template file that includes the required levels and stories.

Wall styles can be used to save the wall bottom boundary, the wall top boundary, the class you want the wall assigned to, the components of the wall, and the data that you want assigned to the wall. Storing all of this information in one easy to find location will make it fast to create your BIM project.



Once you create a wall with a wall style, you can use the Object Info palette to replace that wall style with another wall style. For example, you can easily swap an existing wall style to a demolished wall style. When you do this, Vectorworks can replace the height, class, graphic styles, and textures. This makes it extremely quick to move your project from an existing plan to propose plan.

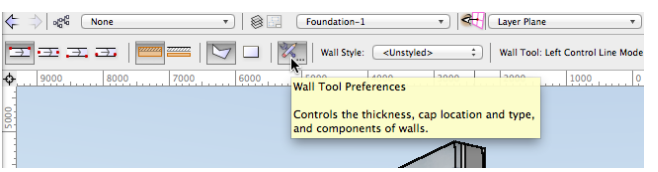
Creating a Wall Style

Creating a wall style is relatively easy, you use the old preferences dialog box and click on the button to save the settings. This creates a wall style. The complicated part is where you create walls with components (will cover this later).

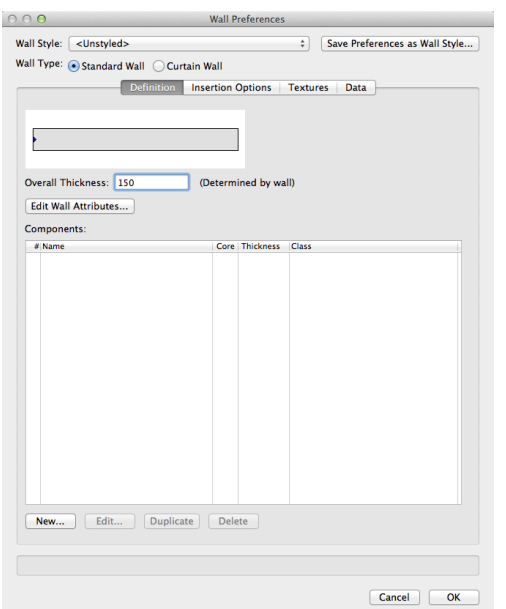
The advantage of creating a wall with previously created wall style is that it will use the settings that you have created previously, saving you the work of setting up that style.

Another advantage of using wall styles is that you can update the wall style (by changing elevation, changing the height, changing textures, adding components, etc.) and all the walls with that style will update automatically.

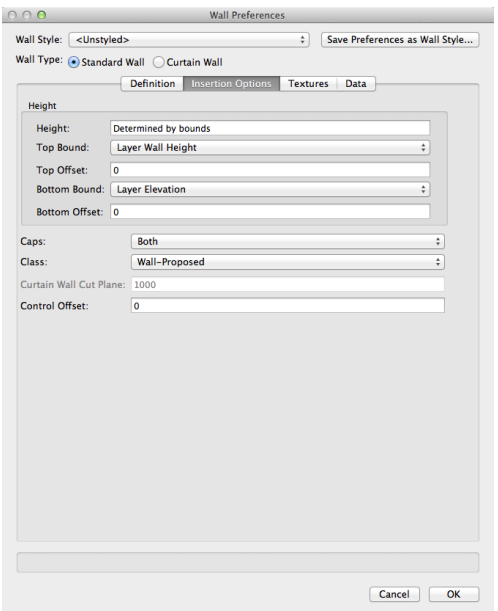
- Go to the **Building Shell** tool set and click on the **Wall** tool.
- Go to the **Tool** bar.
- Click on the **Preferences** button. This will open the wall preferences dialog box where you can set all your options for the wall. Later on in the manual I will be covering wall components, so it the moment I will be covering all the other settings in this dialog box.



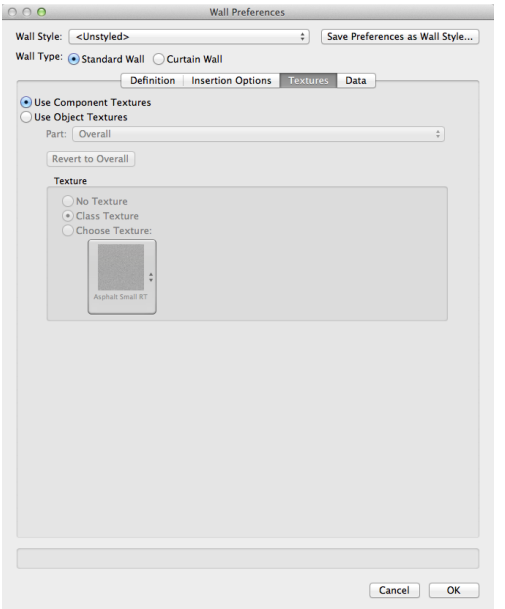
- If it is not already open, click on the **Definition** tab.
- Set the **Overall Thickness** of the wall.



- Choose the option for creating a standard or curtain wall. In this example I will be using a **Standard Wall**. Curtain walls have several choices which I will cover in another manual.
- Click on the **Insertion Options** tab. In this area you can set the height of your wall, how your wall is bound at the top and bottom, offsets to the top and the bottom of the wall, settings for the caps, and settings for the class. It is a good idea to set this wall to automatically be assigned to a specific class. This will save you a lot of time and effort.



- Setting the height of your wall and how it relates to stories is very important. Connecting your wall bounding to the top and bottom of other stories will allow your walls to automatically change the height as you change the story elevations of your project. This will save a lot of time and effort as you change your design during the concept design process.
- Vectorworks 2015 has more control over stories with the ability to create levels to control the heights of your wall. There is a little subtlety to creating your stories and levels to control the walls and I will be covering that in another manual.
- Click on the Textures tab.
- If you have Renderworks you can choose how the textures are assigned. If you are not using components in your wall then click on the option to Use Object Textures. If you are using components in your wall click on the option to Use Component Textures.
- Click on the Data Tab. This tab allows you to fill in information about the wall that you will want to report as part of your BIM project



There are some projects where you should not use styled walls. When you are drawing an existing building you might find that the walls have different widths. This could be a real challenge, requiring you to create several wall styles for each different width. The easy solution is to not use a styled wall, then you can easily change the width of the wall on the Object Info palette.

But do make sure that your walls is setup to use the class to control the graphic style of the wall. When you need to create your demolished wall plan, all you need to do is to change the class of the wall from existing to demolished.

Thank you

We trust that you have enjoyed working through this manual and that it has been informative and constructive.

For more information, please visit: http://www.archoncad.co.nz/. If you just want someone to help you learn Vectorworks, to carry out some Vectorworks contract work, or you want someone to make Vectorworks easier, contact us, as this is a service that we also offer:

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Thank you again,
Jonathan Pickup
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