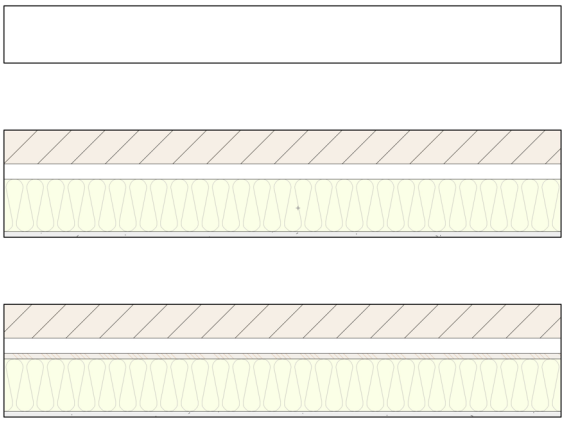
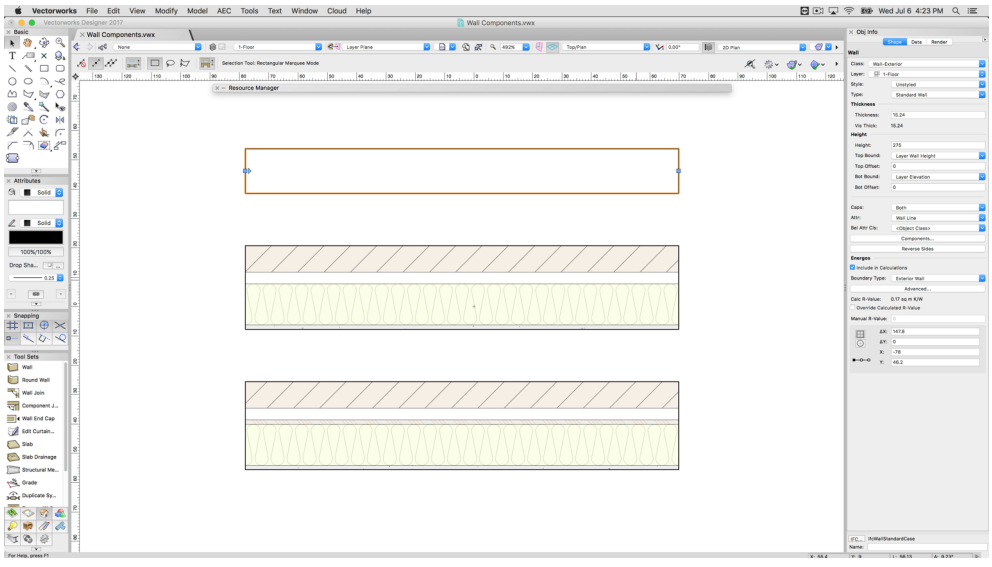
BIM – ARCHITECTUAL
WALL COMPONENTS

INTRODUCTION

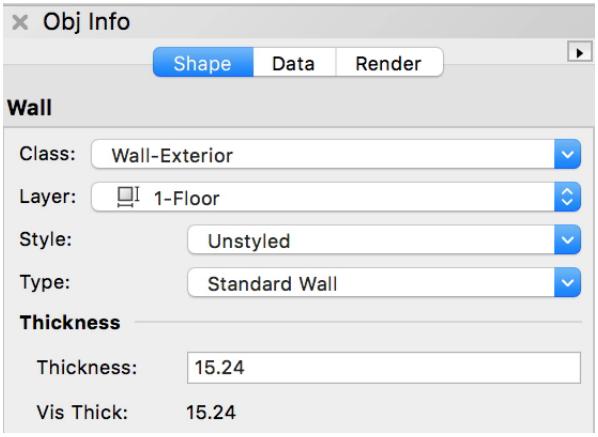
Wall components define the sections that make up a standard wall. For example, to indicate that a wall is made up of framing, inner drywall, outer sheathing, and then a siding material, you will define a component for each of these items to illustrate their location.



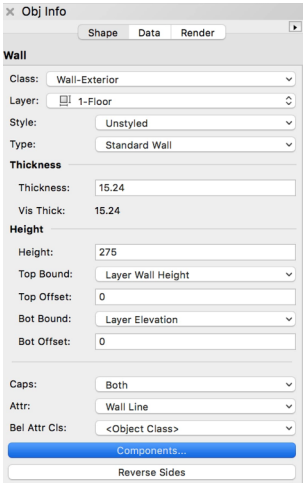
Before we go into configuring Wall Components, let us take a look at the differences between Walls with and without components as well as Styled Walls. In this example, we have three simple walls. The first wall is an Unstyled Wall with no components.

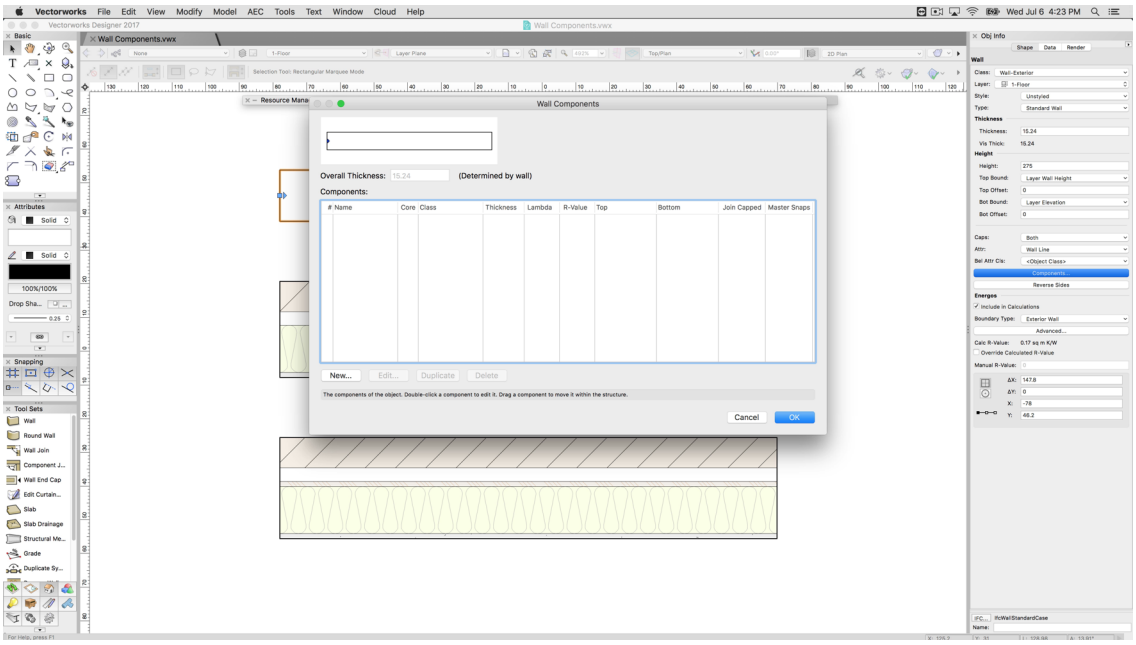


We can tell this by looking in the Object Info Palette. With the Wall selected, under the Shape tab, you will find the Type. As you can see this is an Unstyled Wall.

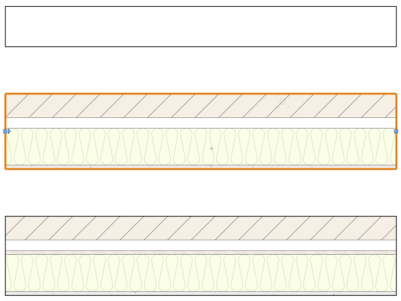


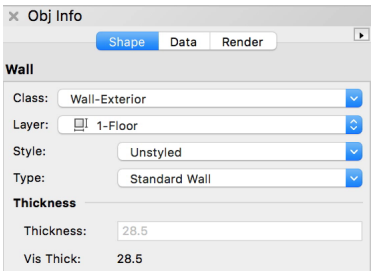
Now, if you look further down in the Object Info Palette, you will see a Components... button. If you click on this button the Wall Components dialog will appear. Here we can see this Wall object does not have any components.



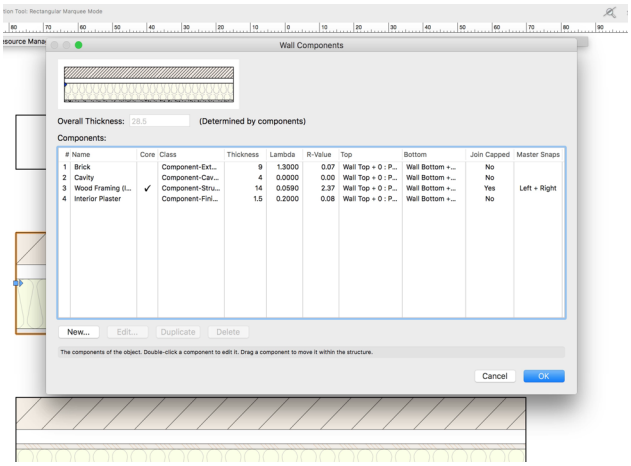


Moving on to the next Wall object, we can see that this has multiple components. Each one represented by a different fill attribute. Again, if we look in the Object Info Palette, we will see this is an Unstyled Wall.

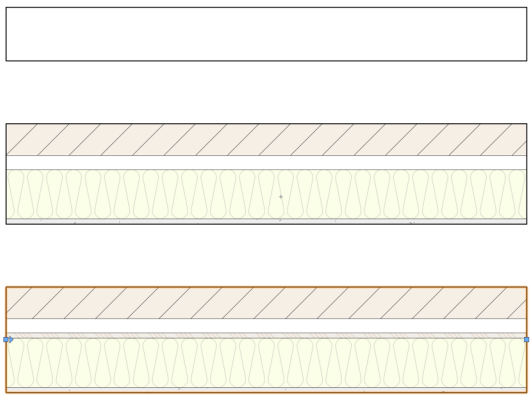


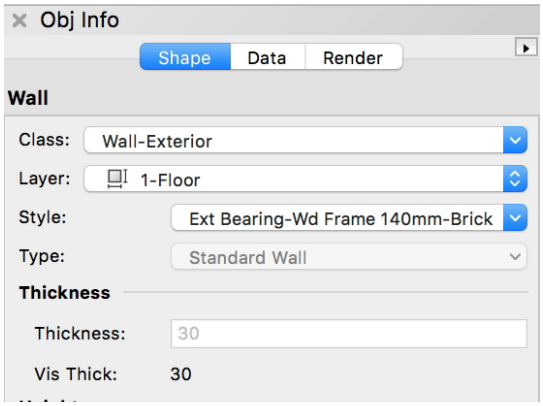


When take a look at it's Components, by clicking on the Components... button in the Object Info Palette, we can see this Wall has multiple components. The components can be directly edited for this Wall here. You can even remove or add new components if desired.

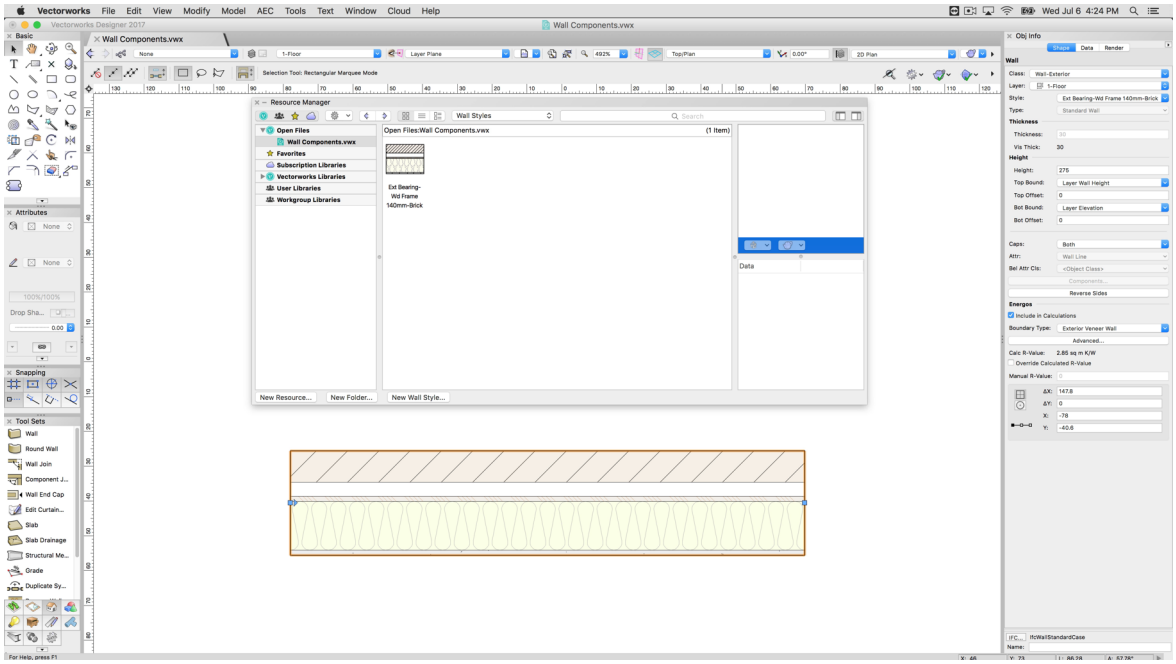


Now, let us look at this last Wall. It appears similar to the previous Wall object. But if you look in the Object Info Palette, you will see it is a little different. This Wall is Styled. This means it's attributes are controlled by a Wall Style resource. In this case, it is using the Ext Bearing-Wd Frame 140mm-Brick style.

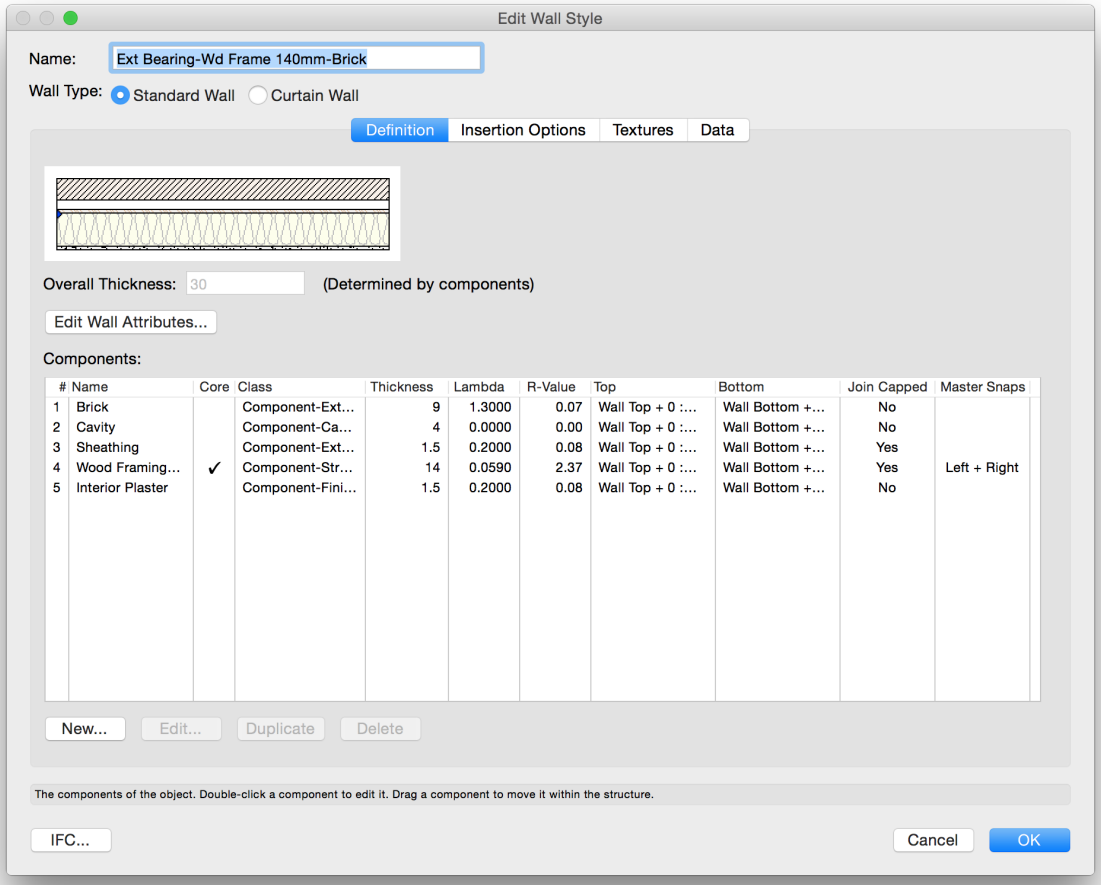




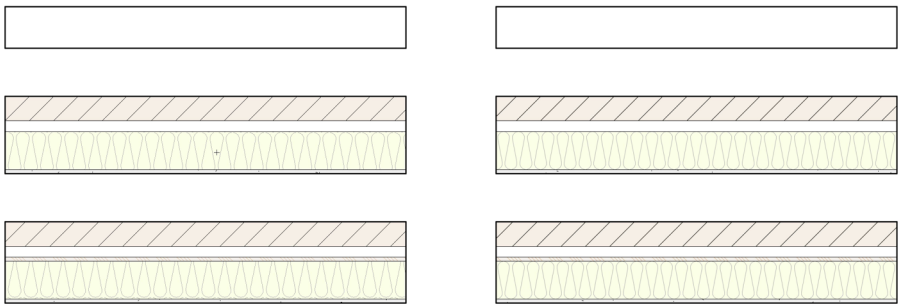
As you can see, the Components… button is grayed out in the Object Info Palette. This Wall's components must be edited through the Wall Style. The Wall Style can be found in the Resource Manager, under Wall Styles.



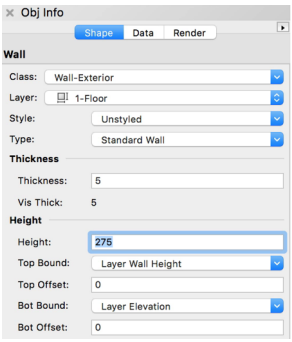
Here in the Edit Wall Style dialog you have a similar options to the Edit Components dialog you looked at earlier, with a few additional options.

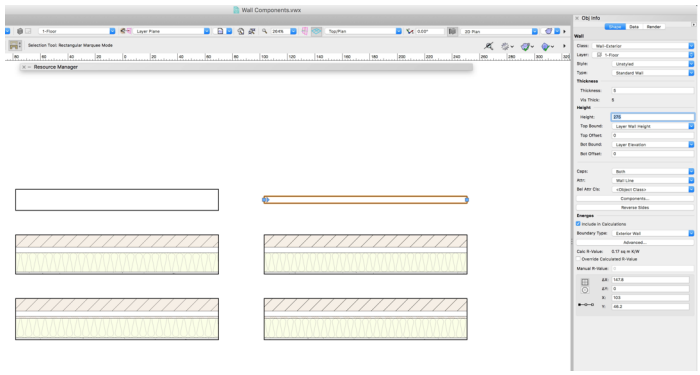


Any changes to components made here, will apply to all Walls using this Style. To illustrate this, here we have two sets of the same three walls.

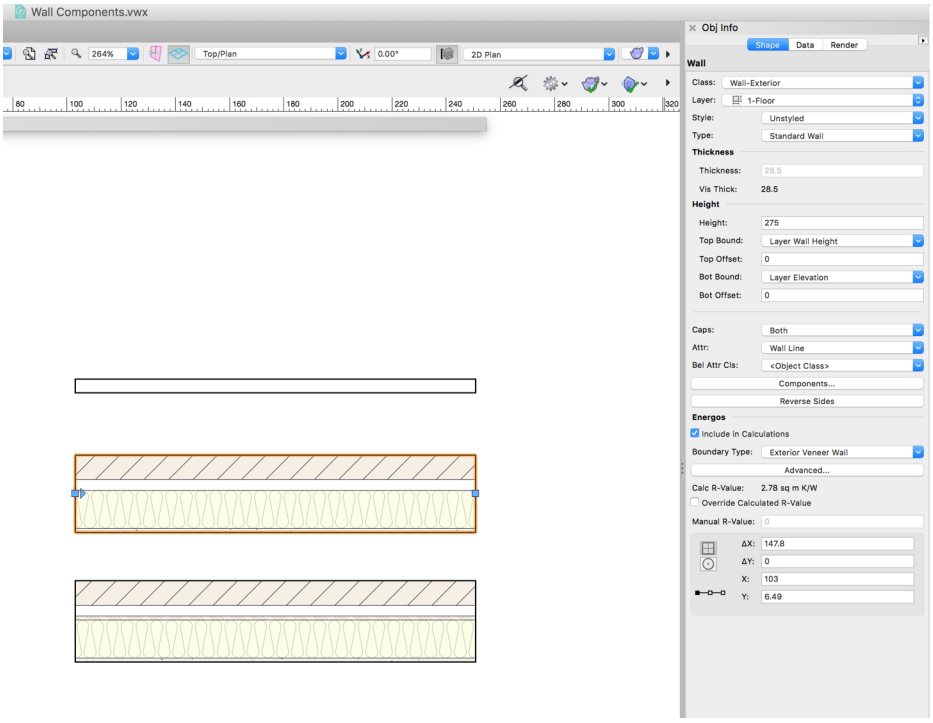


We will start with the first Wall. If you remember, this Wall object does not have any components and it is Unstyled. When edit the Thickness field of this Wall in the Object Info Palette, just the selected Wall changes. It is not linked in any way to the other other Wall object.

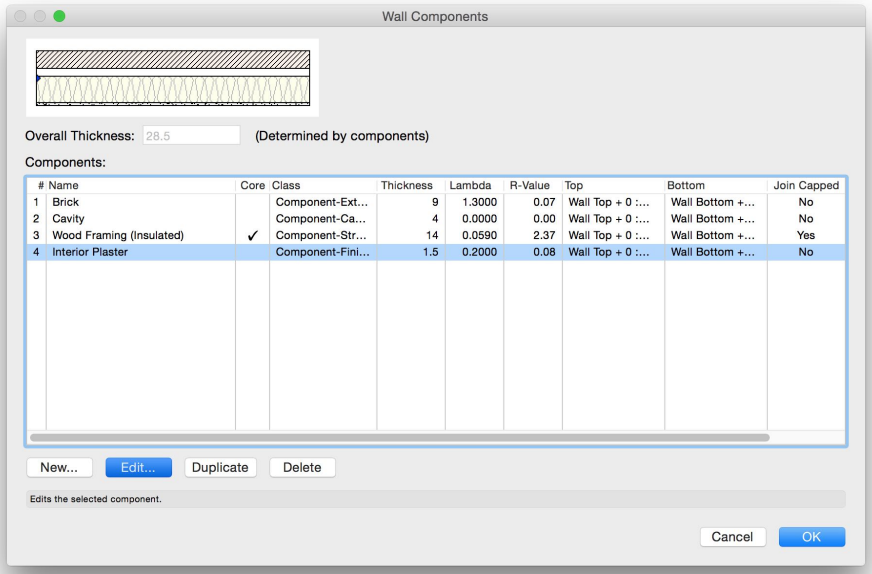




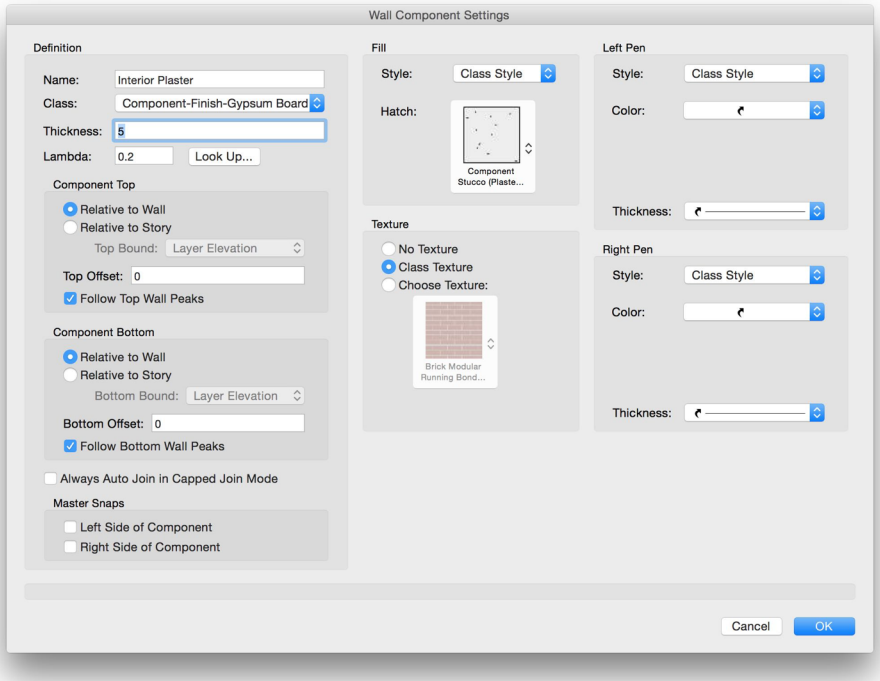
Now, let's try to do the same thing to the Unstyled Wall that has components. You will see that the Thickness field is grayed out. This is because the overall thickness of this Wall object is controlled by the individual thickness of each of its components.



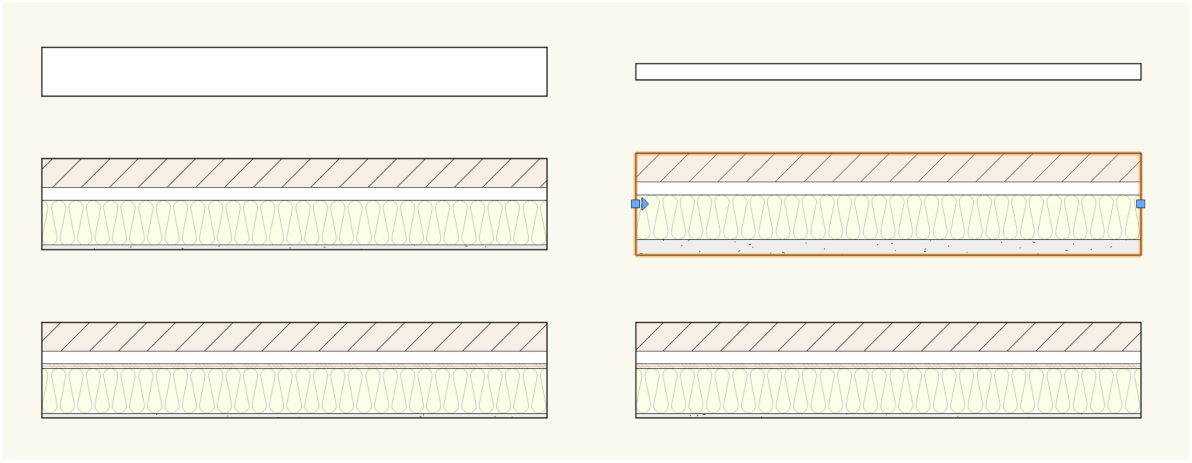
So to change the thickness of this Component Wall, we need to edit the Components. Since this is an Unstyled Wall, we can simply click on the Components… button in the Object Info Palette. In the Wall Components dialog, we can see the four components that make up this Wall object. If we add up the thickness of each component, we will see that it matches the Overall Thickness value shown above the Components list.



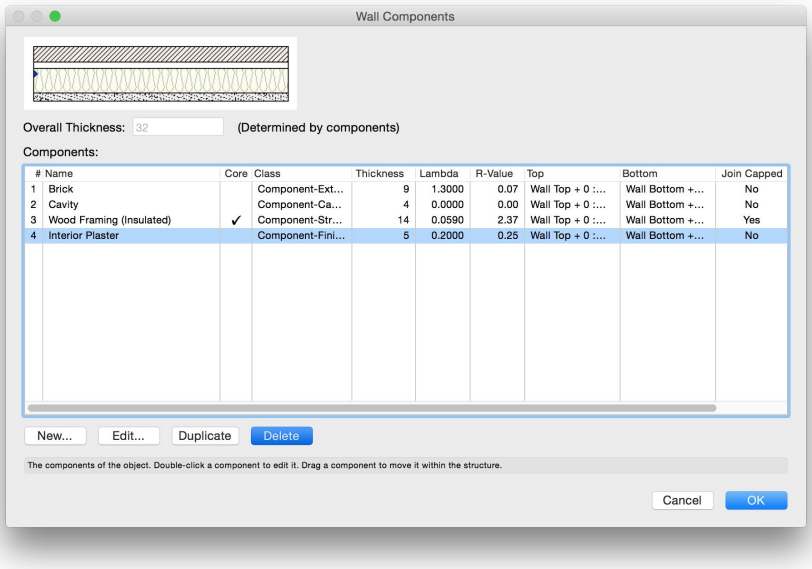
Let's edit the Interior Plaster component. After selecting this component from the list you can click the Edit button to modify this component's settings. The Wall Component Settings dialog will open. Here we can edit its Thickness field. Let's set it to 5mm, so the change will be easily noticeable.



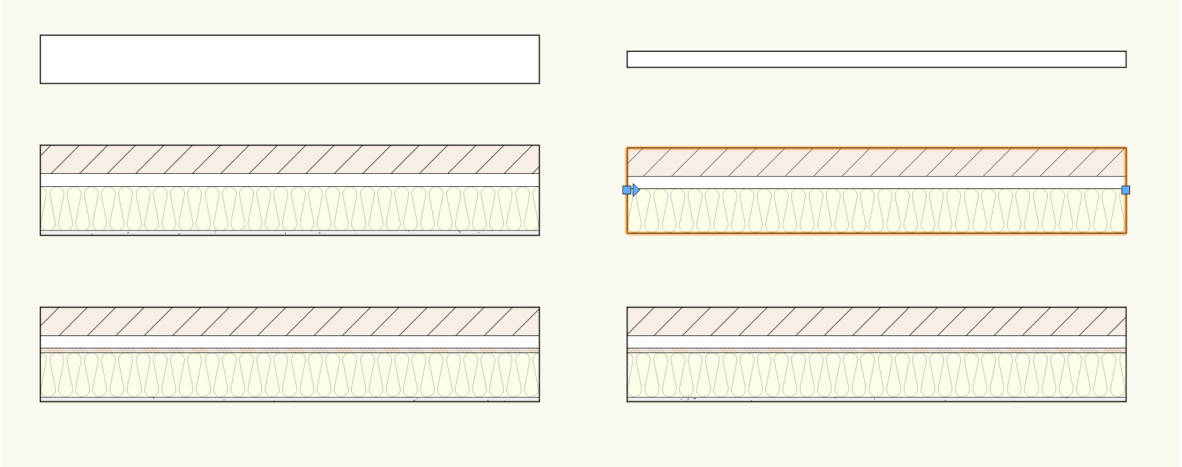
As you can see the Interior Sheathing component increased in thickness. Also, again this change affected the selected Wall object. The other copy of this wall remained unchanged.



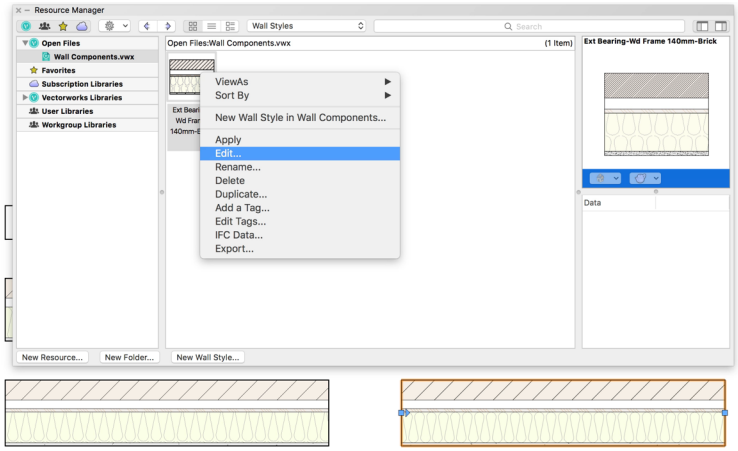
What did you think will happen if we completely delete this component?



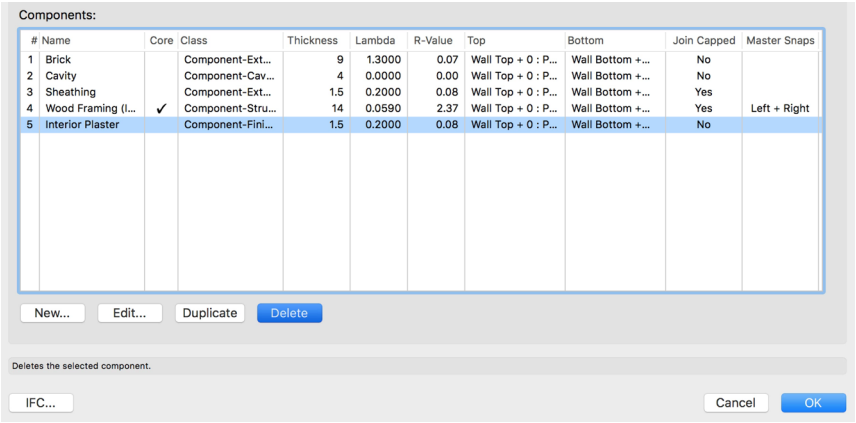
Again only the selected Wall Object is affected.



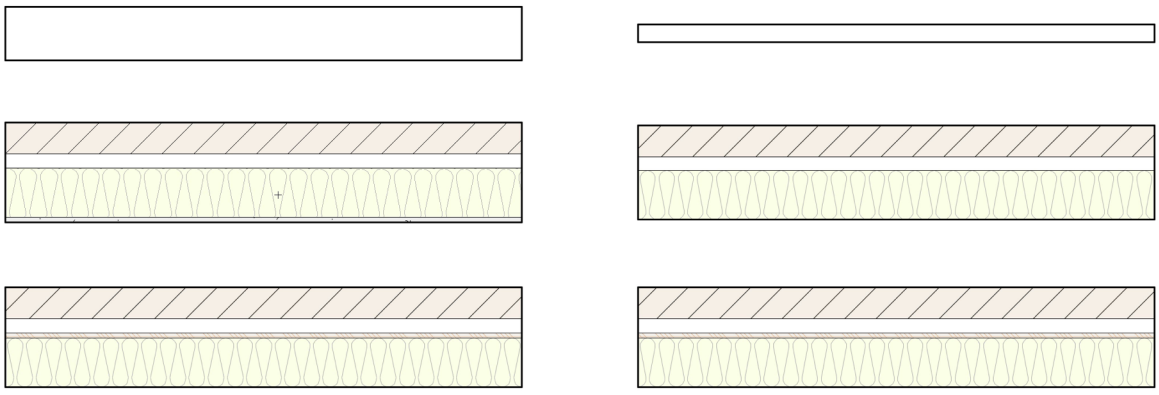
Now for the Styled Wall. Remember, this Wall object and its copy are using a Wall Style. In order to edit any of the components, we need to edit the Wall Style in the Resource Manager.



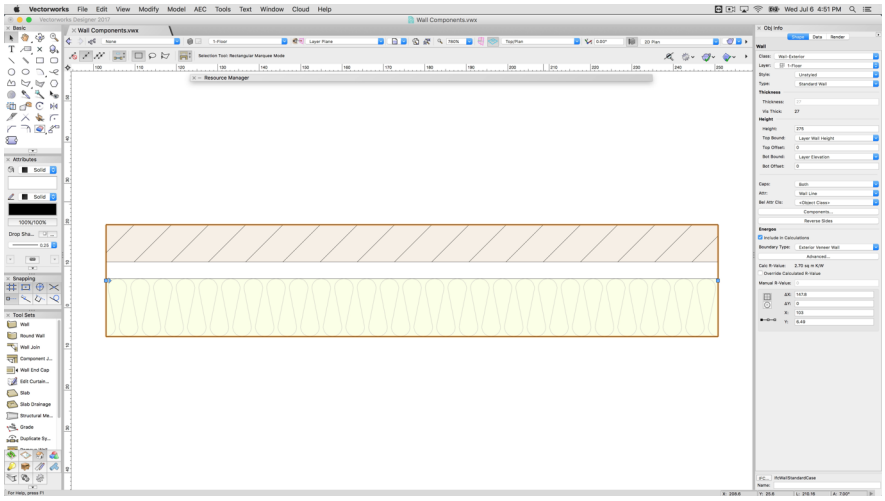
In the Edit Wall Style dialog, let's delete the Interior Plaster component.



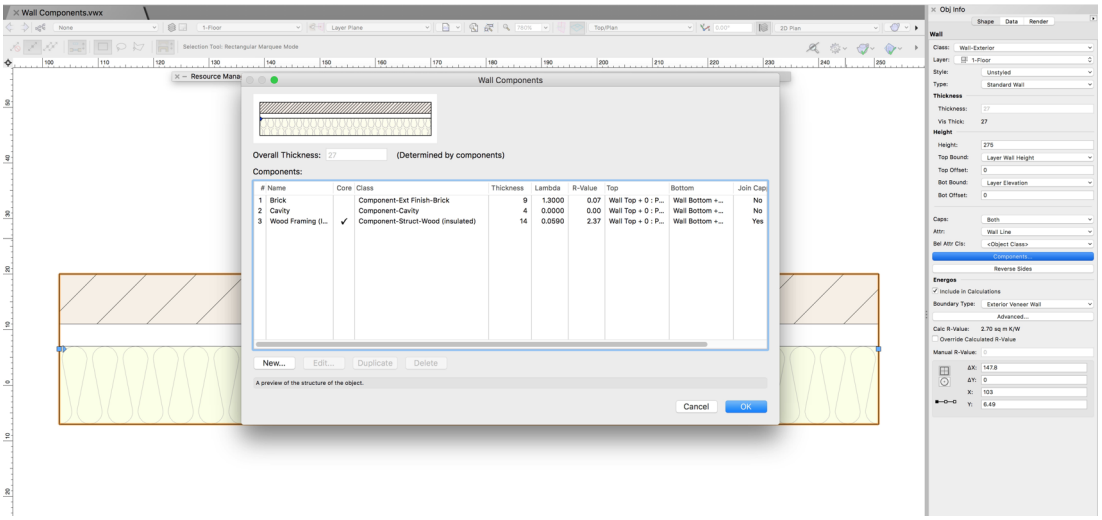
After clicking OK, a Wall Replacement dialog will appear. Keep the defaults and click OK. As you can see, both of the Walls using this Wall Style update to reflect the deleted component.



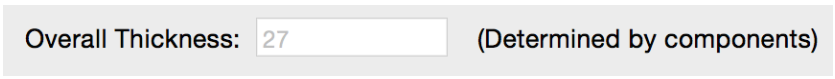
These are the major difference between editing Walls with and without components as well as Styled and Unstyled Walls. Now, let's go more indepth into the Wall Components dialog and editing individual components. We will use an Unstyled Wall with Components for this example.



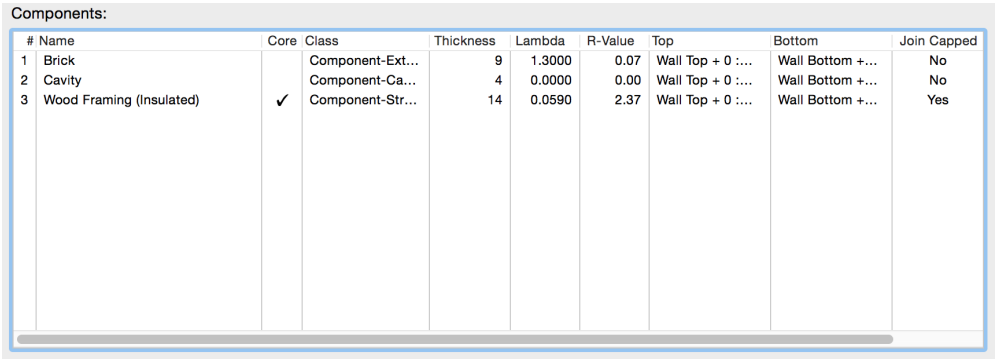
Since this is an Unstyled Wall, you can simply click on the Components… button in the Object Info Palette, to bring up the Wall Components dialog.



Let's start at the the top. As we mentioned earlier, the Overall Thickness is controlled by the total thickness of all the components.

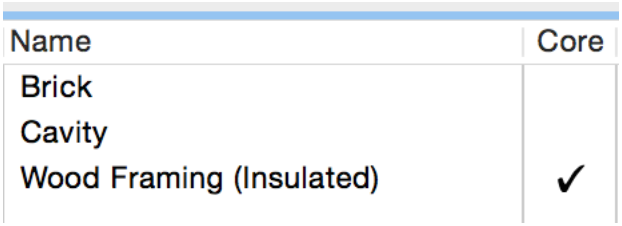


Next, we have the Component list. This is made up of several columns, that display various settings of each component.

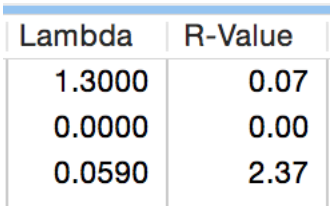


Starting from the left, we have the Number column. Here you can reorder the components. The first component is the left or exterior component, in this case Brick. The last component listed, Wood Framing is the right or interior component. These can be reordered by click and dragging a component up or down in this column.

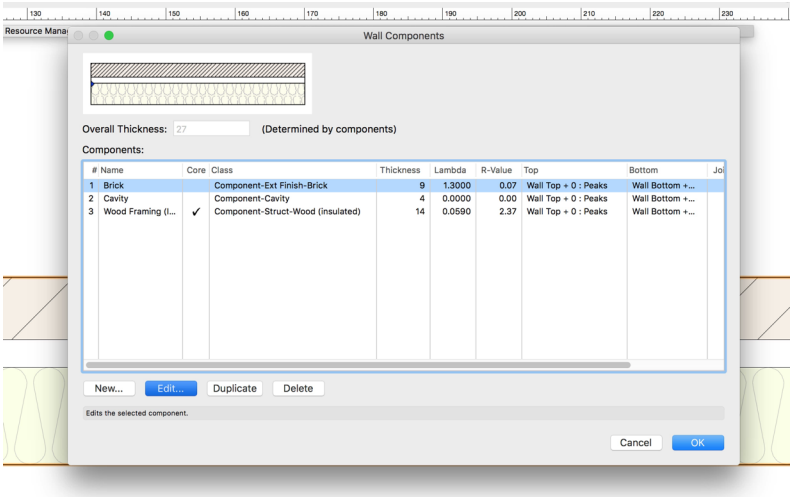
Next, is the Name column. This simple displays the given name of each component. Then, we have the Core column. This is where the core component is set. The chosen component is represented by a check mark. The Core component is used for alignment and offsets. Typically, this will be a framing component of some kind.



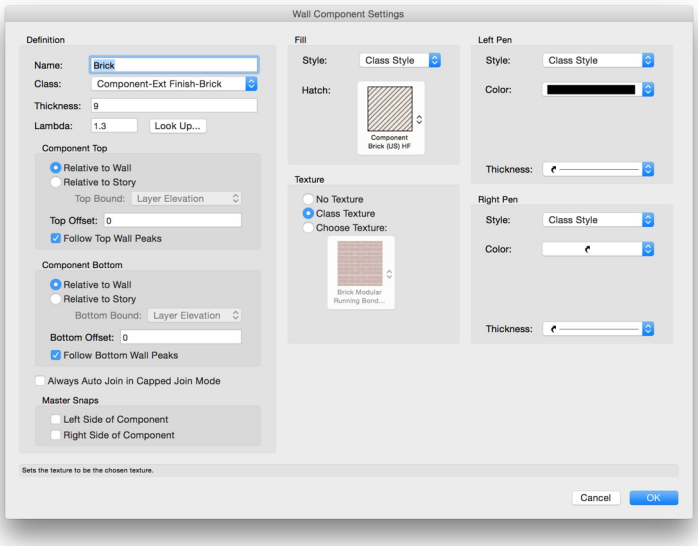
Then, we have the Lambda and R-Value columns. These values are used for Energos calculations.



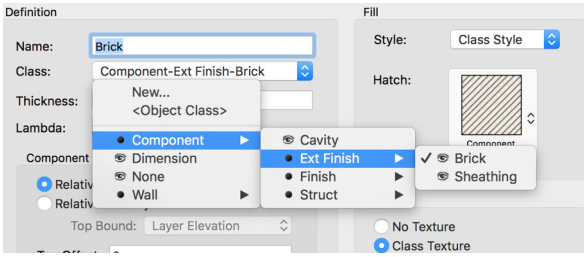
The rest of the columns will be more easily seen once we edit an individual component. Let's select the Brick component and click Edit.

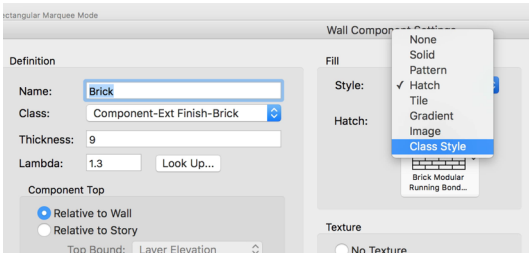


Here all settings for this component can be edited. From its name, class, and thickness, to Fill and Texture attributes.

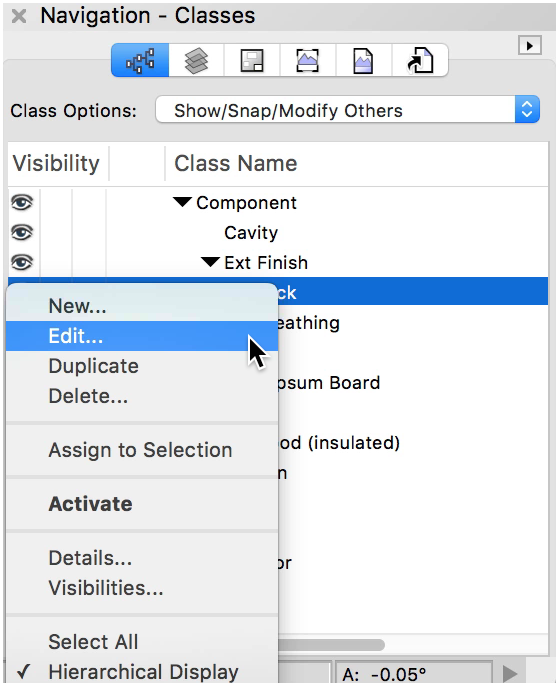


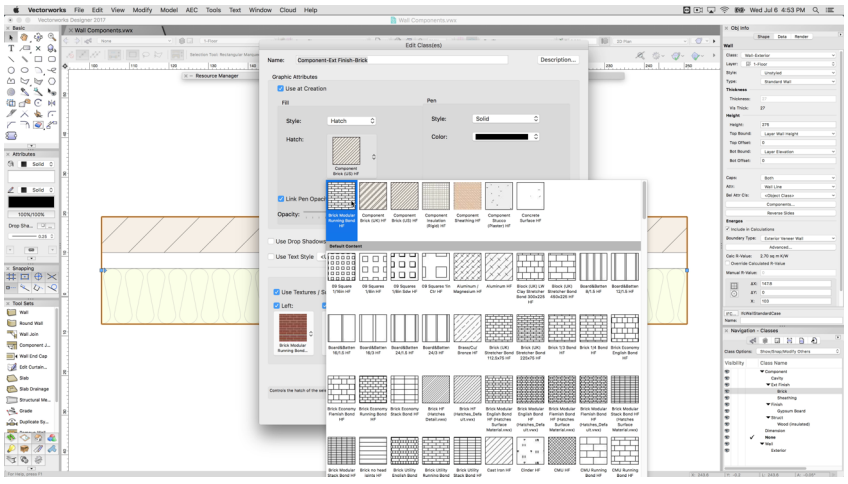
Classing individual components is very important. This allows you control the visibility of individual components, as well as the attributes if they are set to Class Style. This is extremely useful, if you would like to see just the Wall object and not components or need to override a component's attributes at some point.



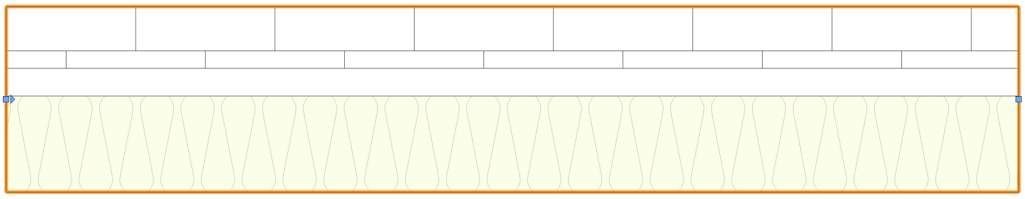


For example, this component is using the Component-Ext-Finish-Brick Class. If we wanted to change the Fill of this component, we can simply edit this Class's attributes and change the Fill.

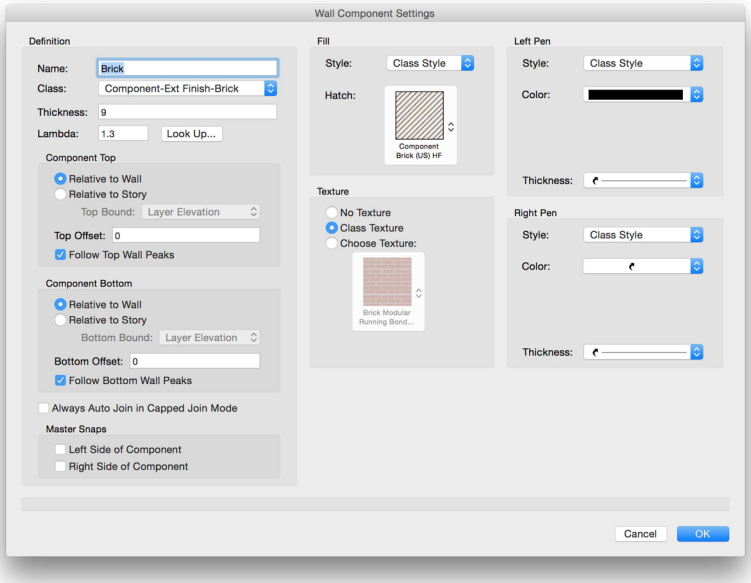




This component will now show the new Fill attribute. As a general rule, it is best to control attributes of objects, including Wall components through Class Attribute settings.

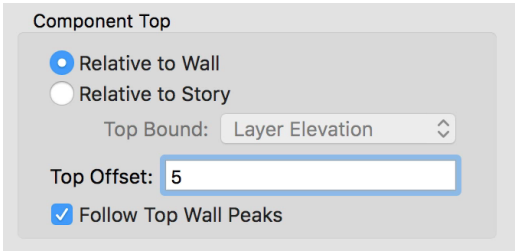


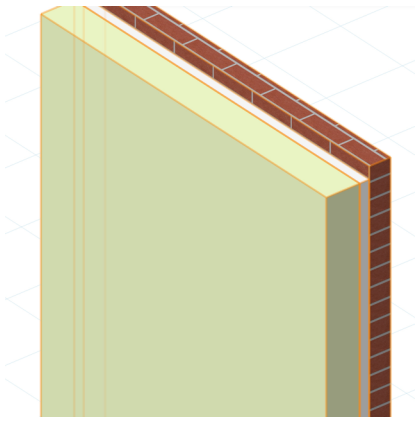
Now, let's look at component offsets. When editing a component there are settings for the Component Top and Component Bottom. This allows you to adjust the top and bottom position of each individual component. This great if you have an exterior cladding, that needs to extend above or below the base height of the Wall object.



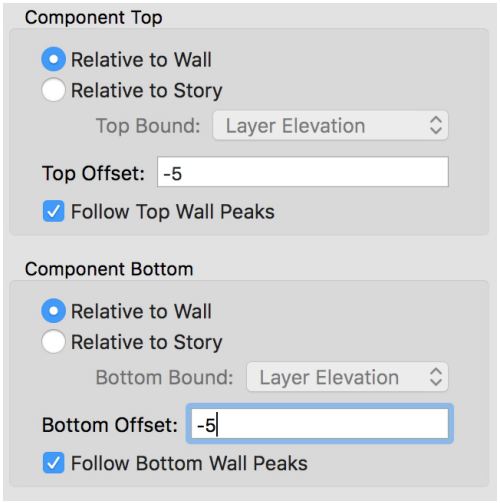
There are two options for the reference height of the offset, Relative to Wall and Relative to Story. When set to Relative to Wall, the offset is applied to the set height of the Wall. When Relative to Story is selected, the component can bound and then further offset if desired to a specified Story Level. We are going to focus on Relative to Wall in this section.

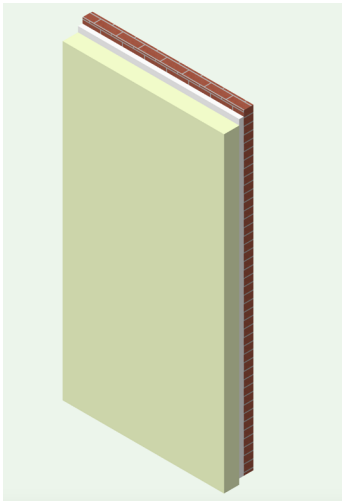
With Relative to Wall enabled for the Component Top, if a Top Offset of 5mm is entered, this component will extend an additional 5mm above the top of the Wall object.



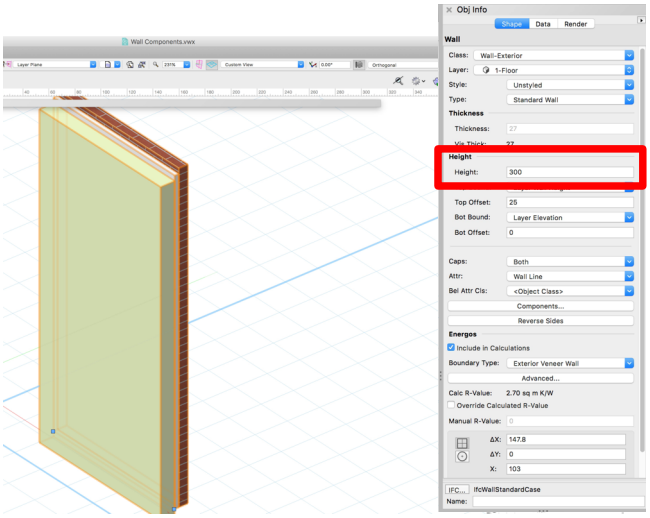


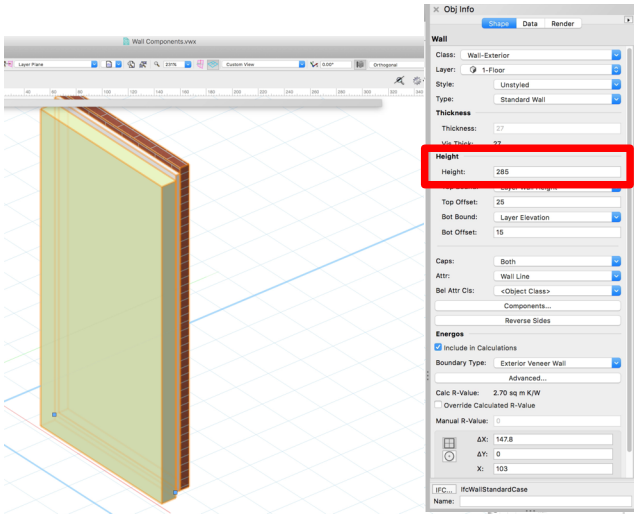
The offset can also be negative. If the Wood Framing component is given a Top and Bottom Offset of -5mm, we can see at the top of the Wall object, the component is 5mm below the top of the Wall and at the bottom of the Wall object, it extends 5mm below the bottom of the Wall.



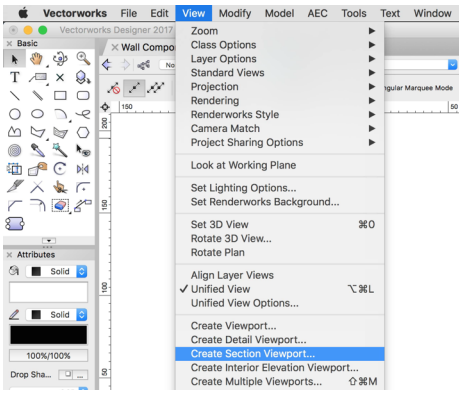


As these offset are relative to the Wall itself, the component offsets will maintain, if the changes are made to the Wall object directly. For example, if we give this Wall a Bottom Offset of 15mm, the component offsets do not change.

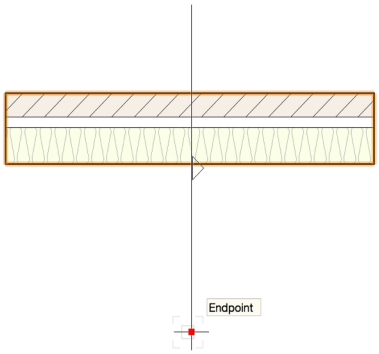




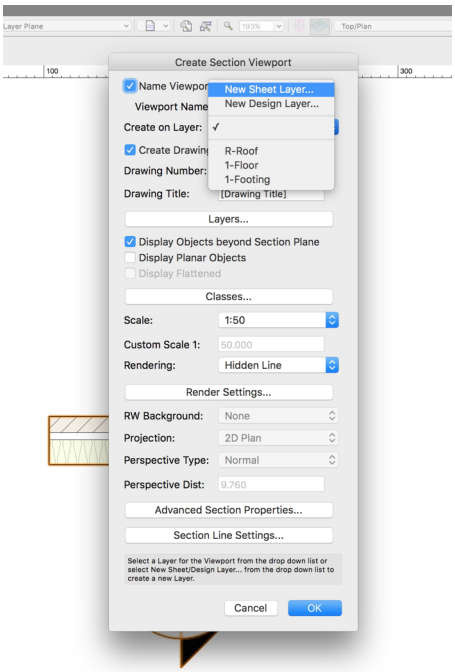
Finally, to fully understand the benefit of using Wall components, we need to take a look at a Section of this Wall. To create a Section Viewport, go to the View menu and choose Create Section Viewport.



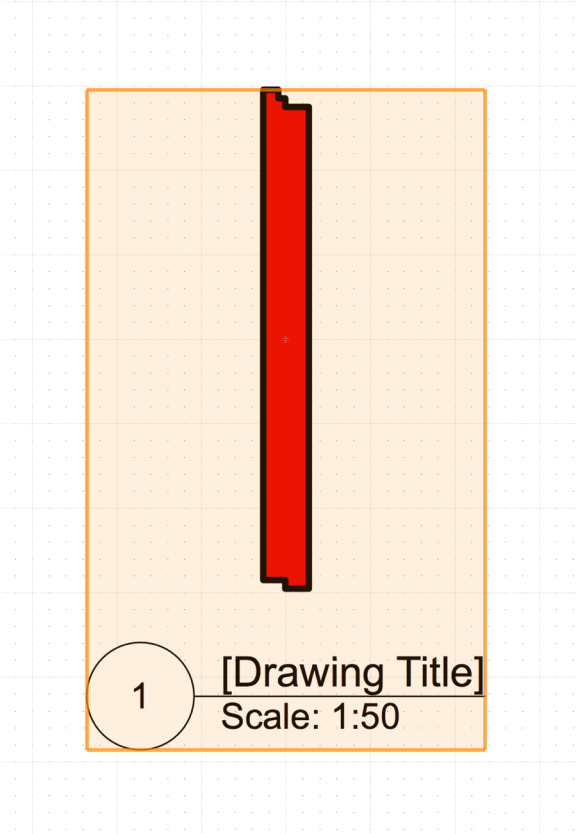
Click once above the Wall in a Top/Plan view, move your cursor below the Wall to draw the Section Line and double click to create the section.

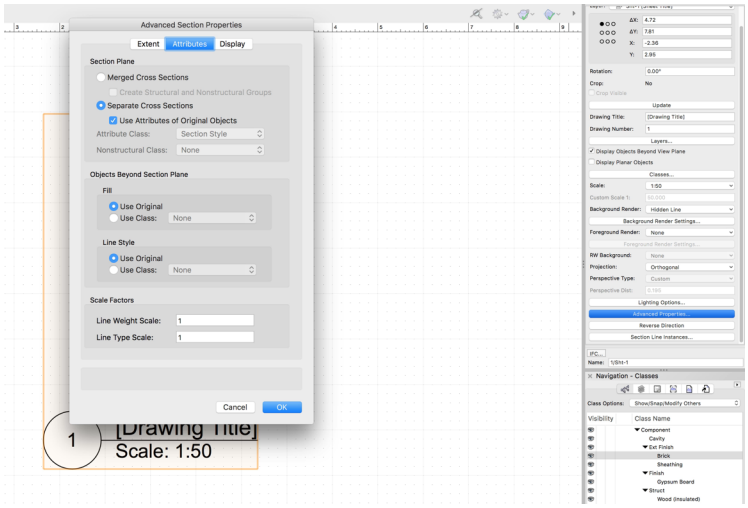


In the Create Section Viewport dialog, choose New Sheet Layer under Create on Layer and then click OK to both dialogs to accept the defaults.

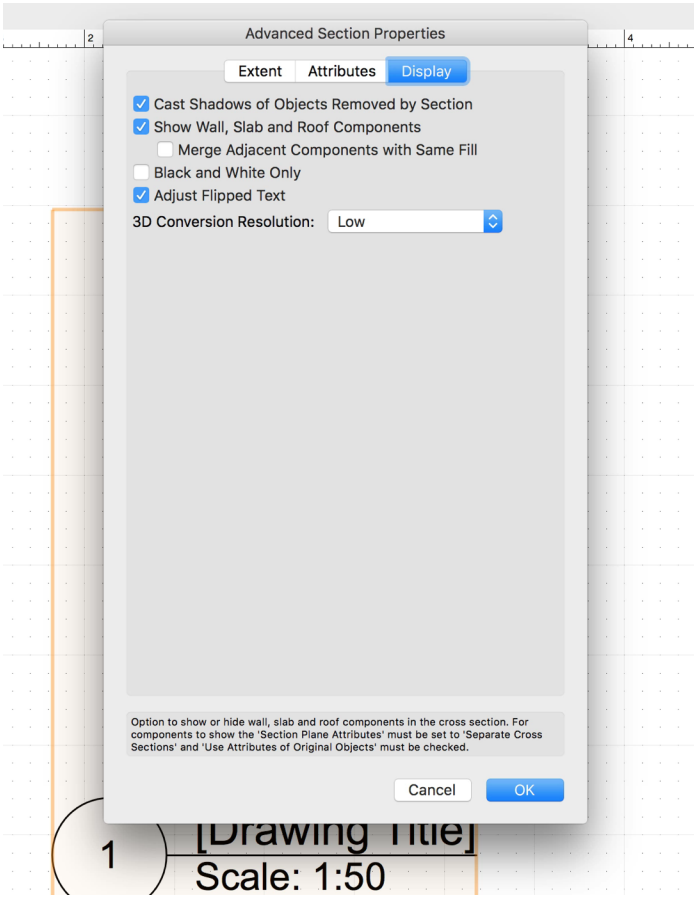


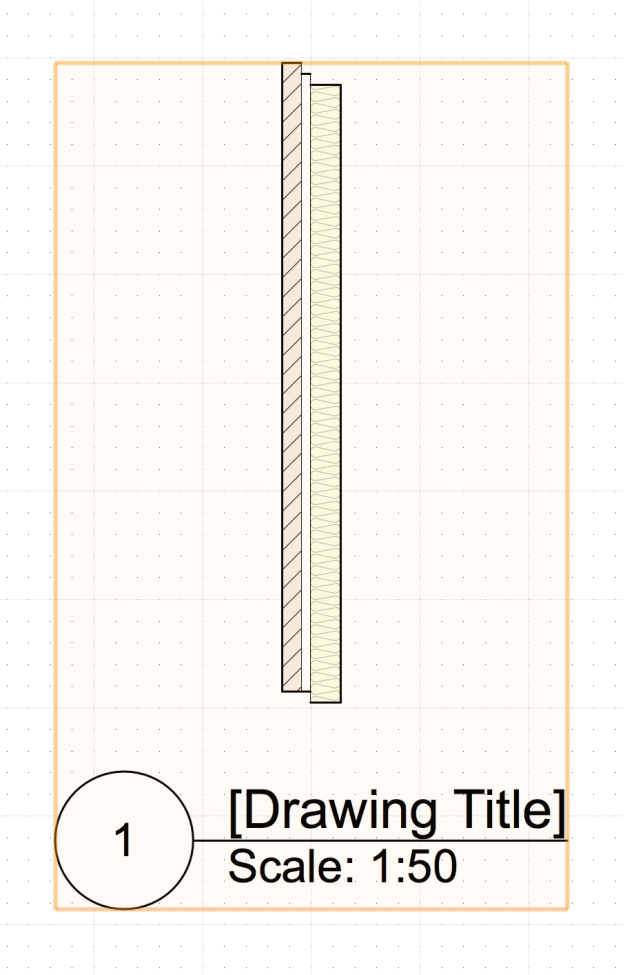
By default the Section fill is just a solid red color. However, if we go to the Object Info Palette and click on the Advanced Properties button, we can adjust the Section's attributes.





Under the Attribute pane in the Advanced Section Properties dialog, enable the Separate Cross Sections option and check the Use Attributes of Original Objects. This will show the fill attributes of the Wall for Section fill instead of the solid red color. Then, under Display enable the Show Wall, Slab and Roof Components option. This will enable the visibility of the individual components.





The Section Viewport, now shows the fill attributes assigned to each of the individual components. So with properly configured Wall components, you can save considerable time when creating Wall details.