

Build a flying buttress of Chartres Cathedral

Overview:

- Step 1. Create a new Design Layer
- Step 2. Measure reference image
- Step 3. Build the buttress
- Step 4. Build the arches

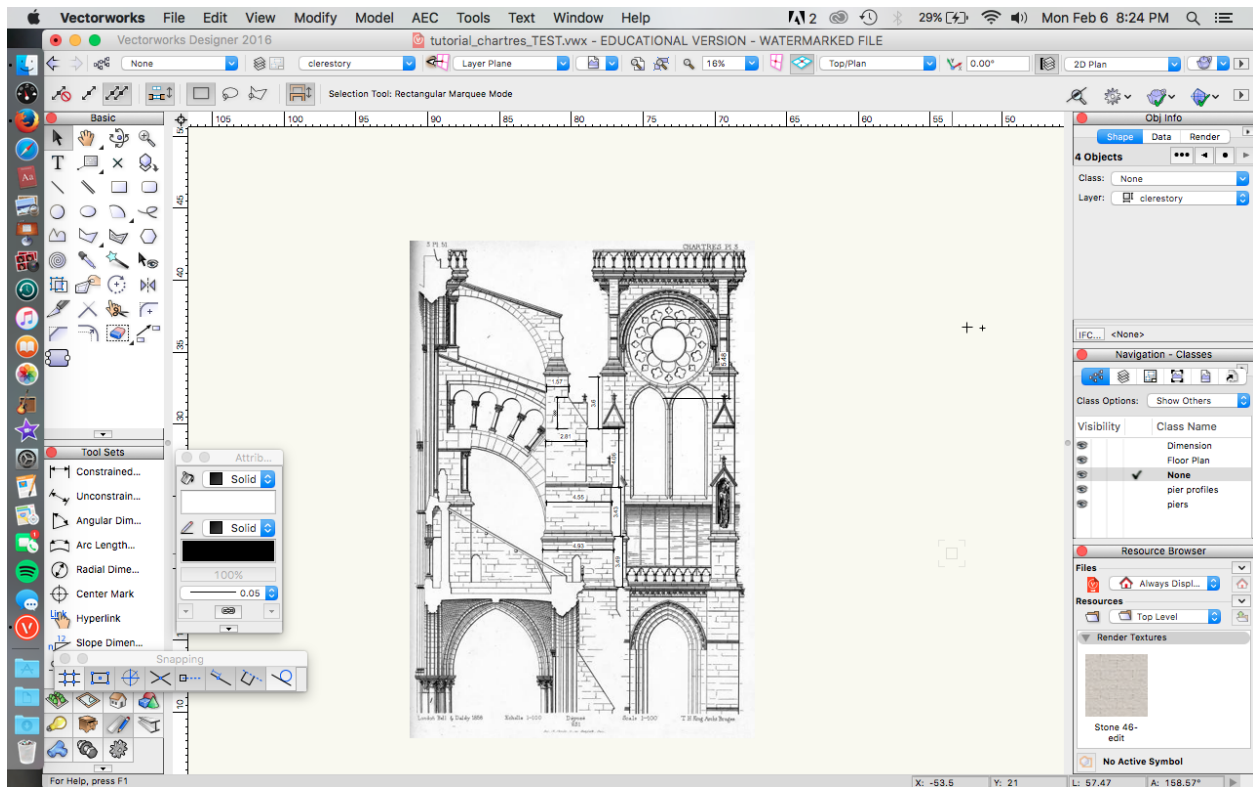
Dimensions for the buttress provided in image

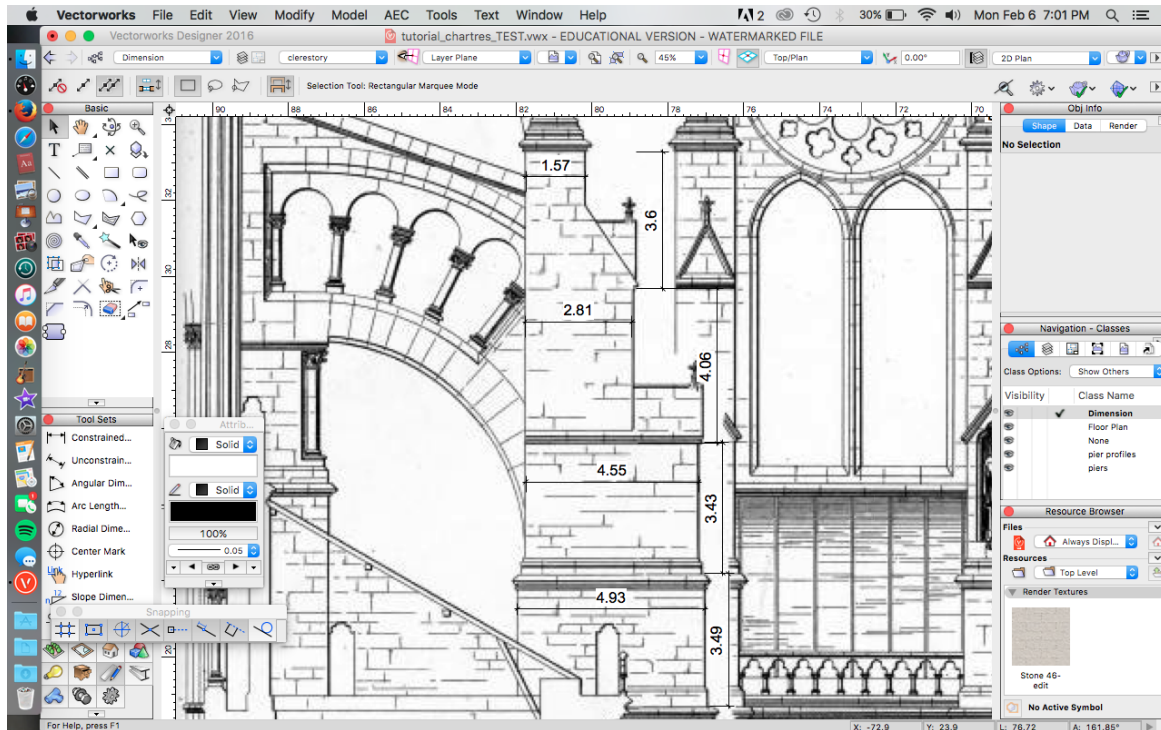
Step 1. Create a New Layer

1. Create a new design layer and name it “flying buttress.”

Step 2. Measure Reference Image

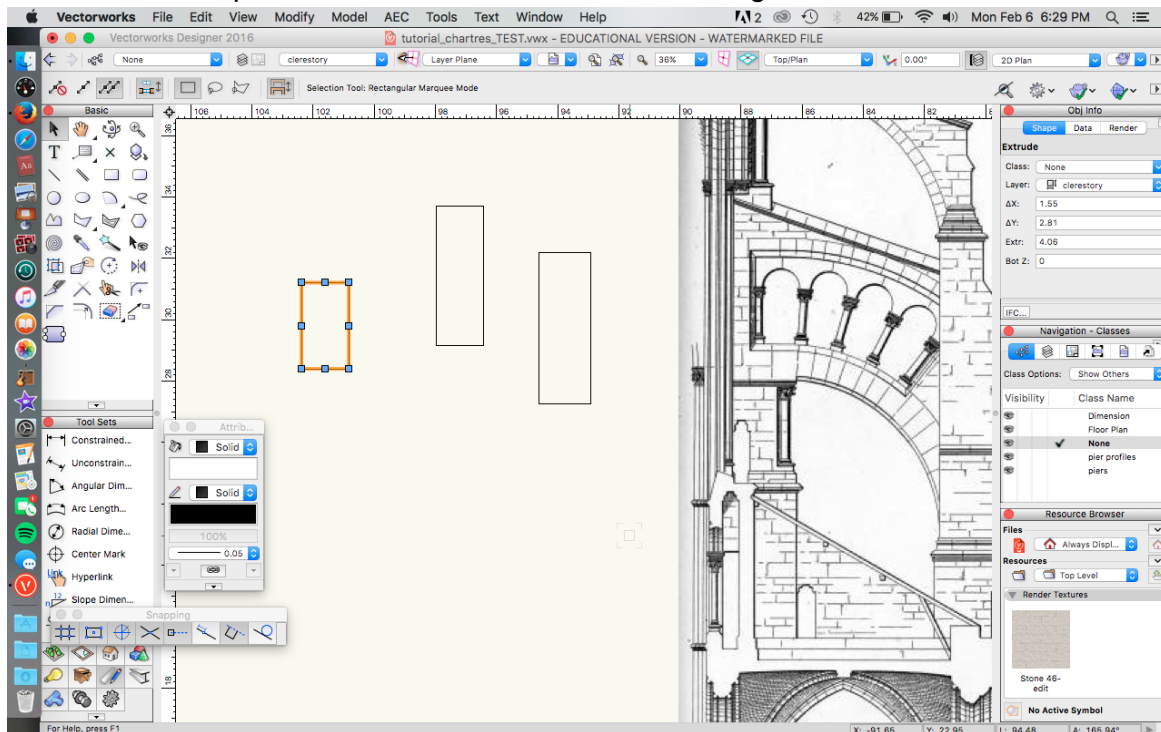
1. Use the same image that you used for the clerestory tutorial (file name: elevation_buttress.jpg). The image should be scaled so that the widest part of the buttress measure 4.93 m.



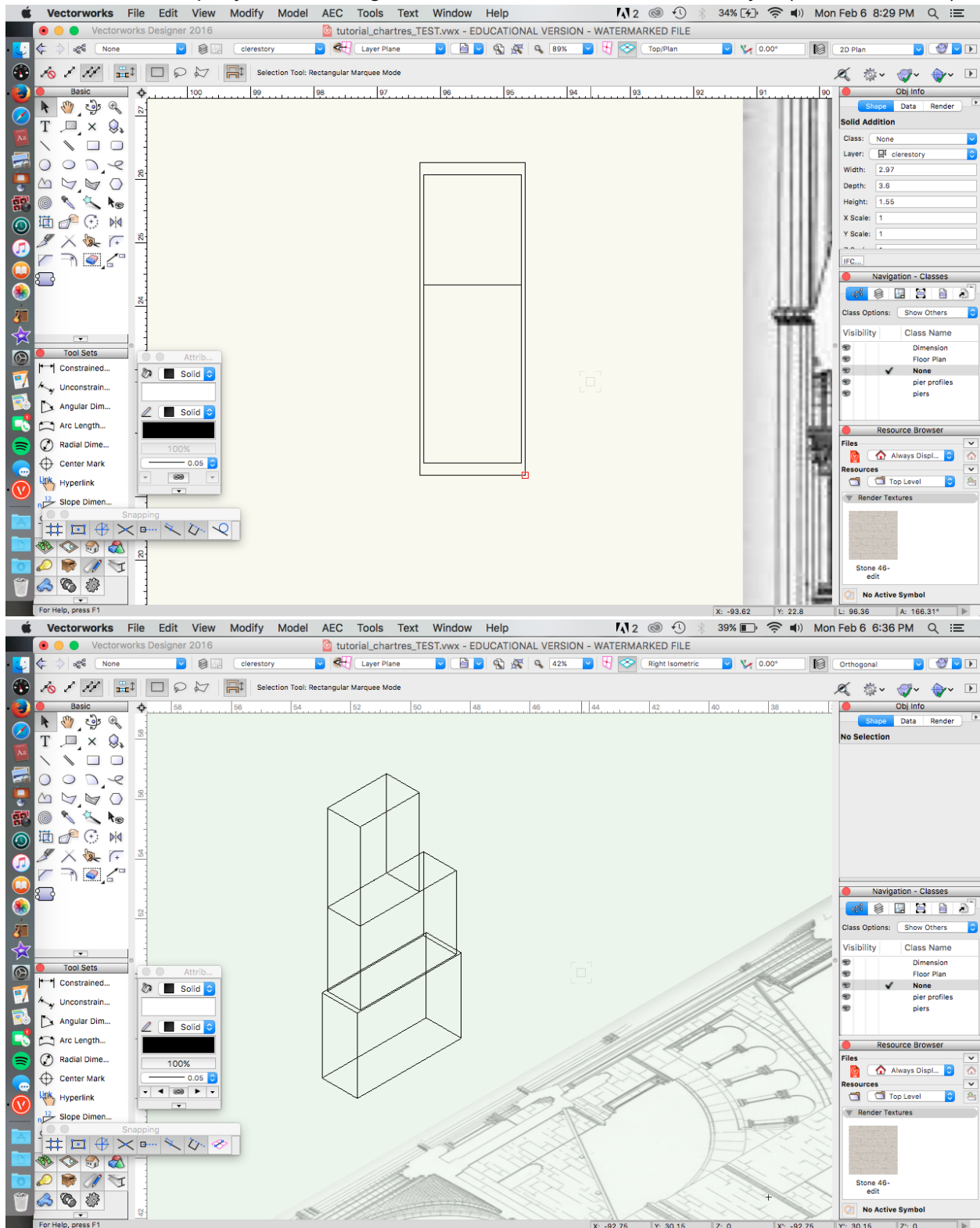


Step 3. Build the buttress

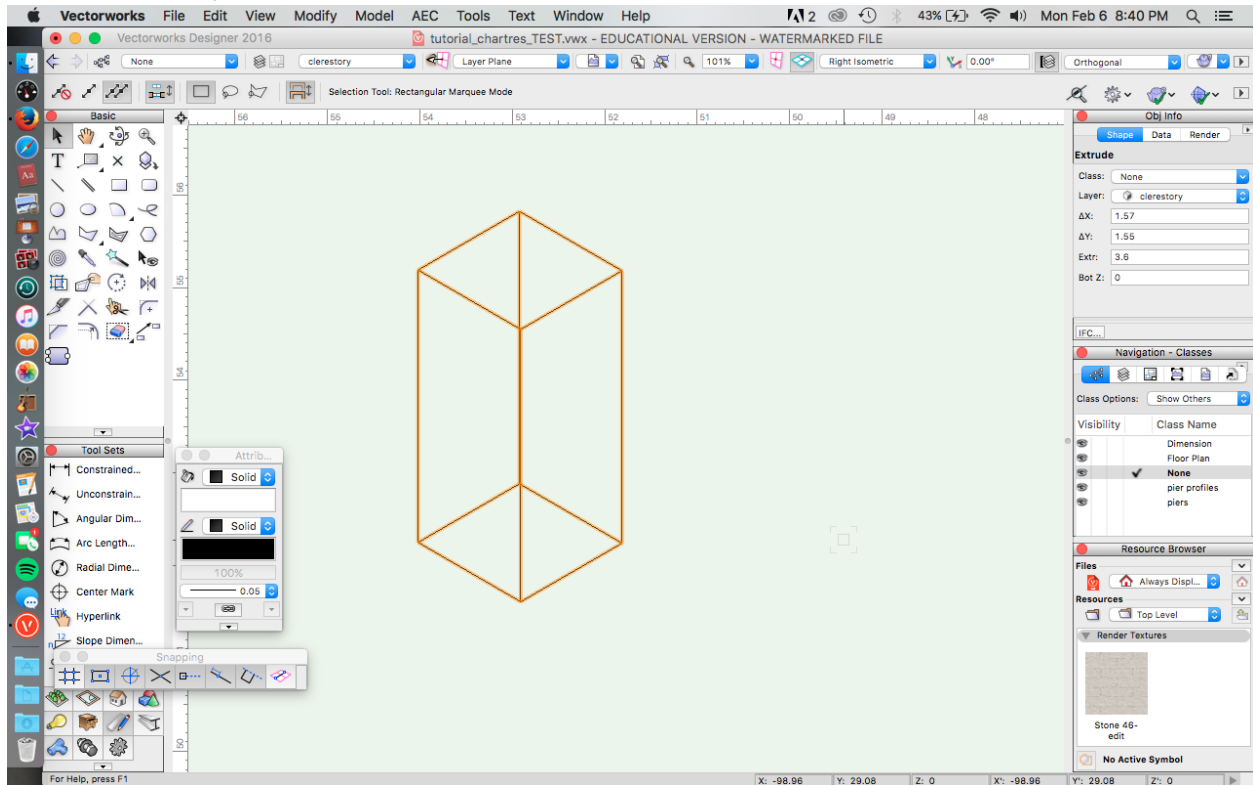
1. The buttress consists of 4 levels.
2. The first three levels are rectangular. The dimensions for these levels are:
 - Bottom level: 4.93m x 1.67m. Extrude to a height of 3.49m
 - Middle level: 4.55m x 1.55m. Extrude to a height of 3.43m
 - Top level: 2.81m x 1.55m. Extrude to a height of 4.06m



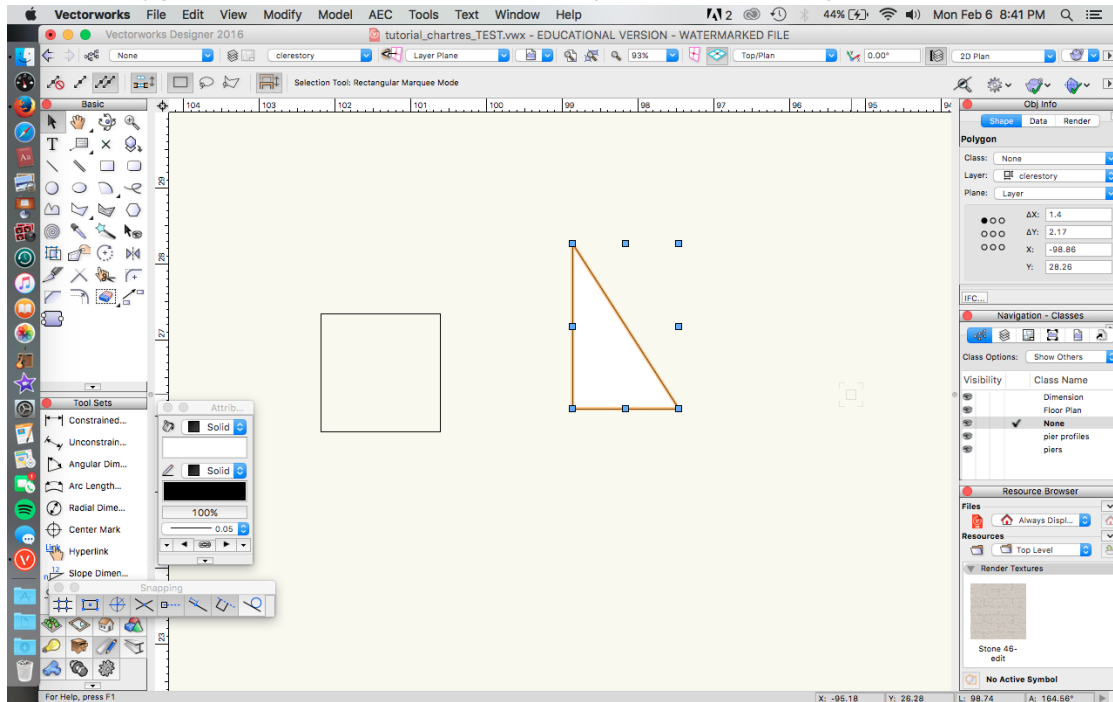
3. Align the three sections (see screenshot below). Check in various views to make sure that the sections align properly. The middle layer should be centered to the bottom layer, while the top layer should align with the short side of the middle layer (see screenshot).

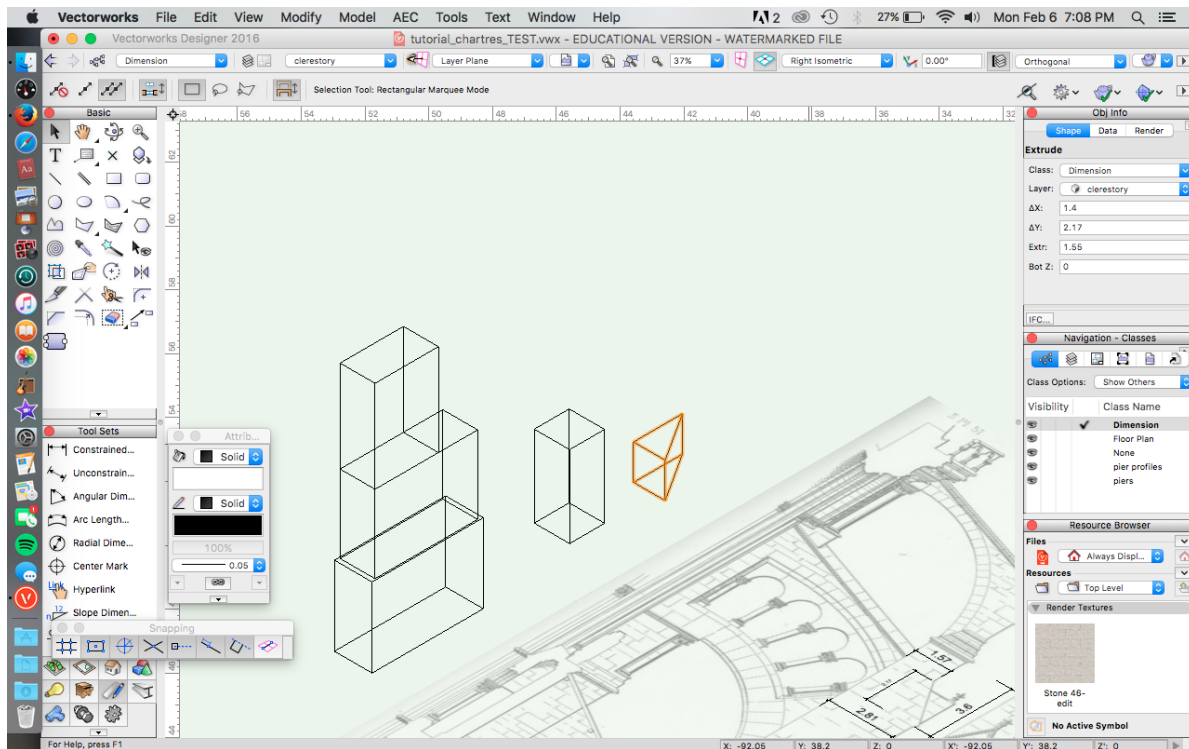


4. The top piece (fourth section) is not rectangular. Build it in two parts: a rectangle and a triangle. The rectangle should measure 1.57m x 1.55m. Extrude it to 3.6m (**Model > Extrude**).



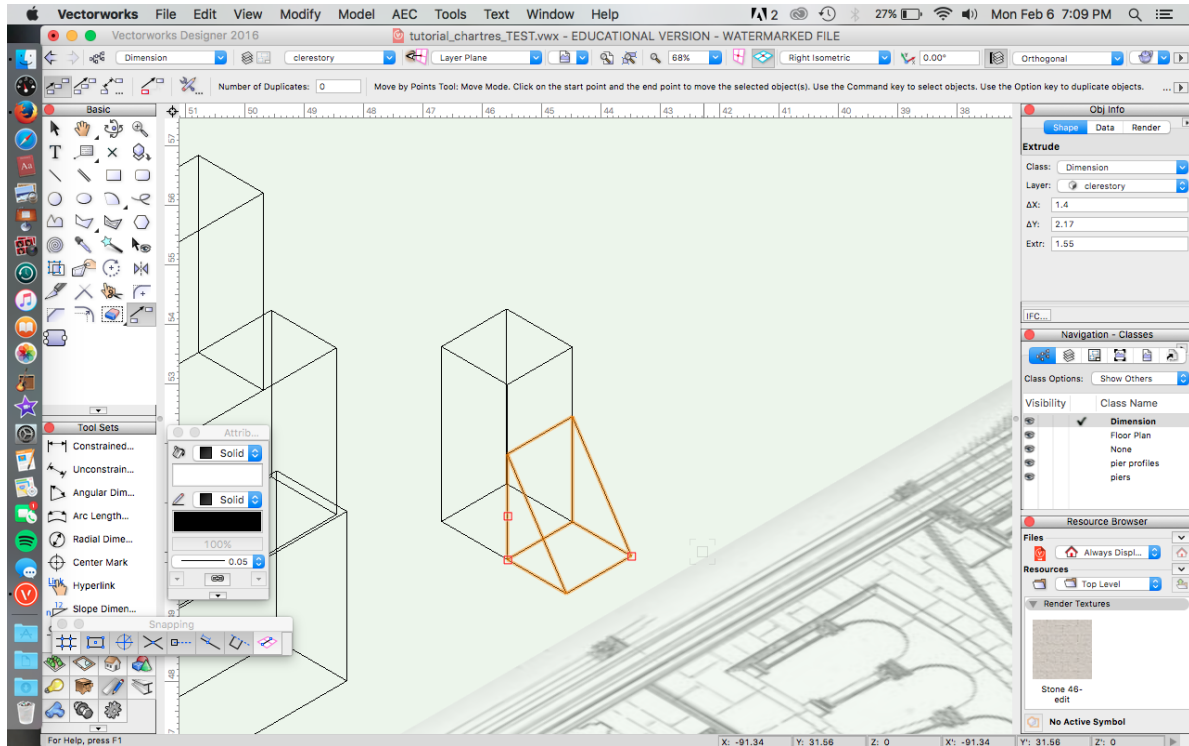
5. Draw a right a triangle that measure 2.17 m (height) and 1.4m (width). Be sure the polygon is 'closed'. Extrude to 1.55m (**Model > Extrude**).



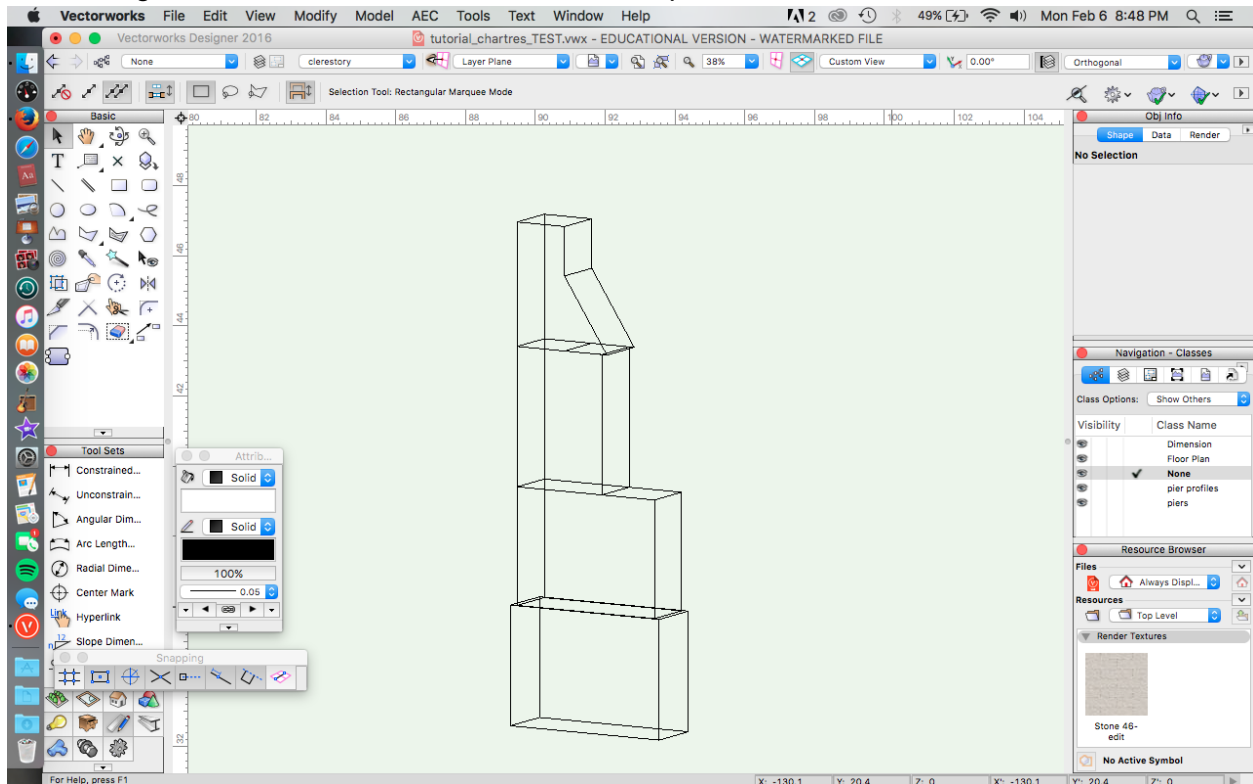


6. Rotate the triangle so that it is standing up and align it to the base of the rectangle (see screenshot).

7. Select the triangle and the rectangle and go to **Model > Add Solids**.

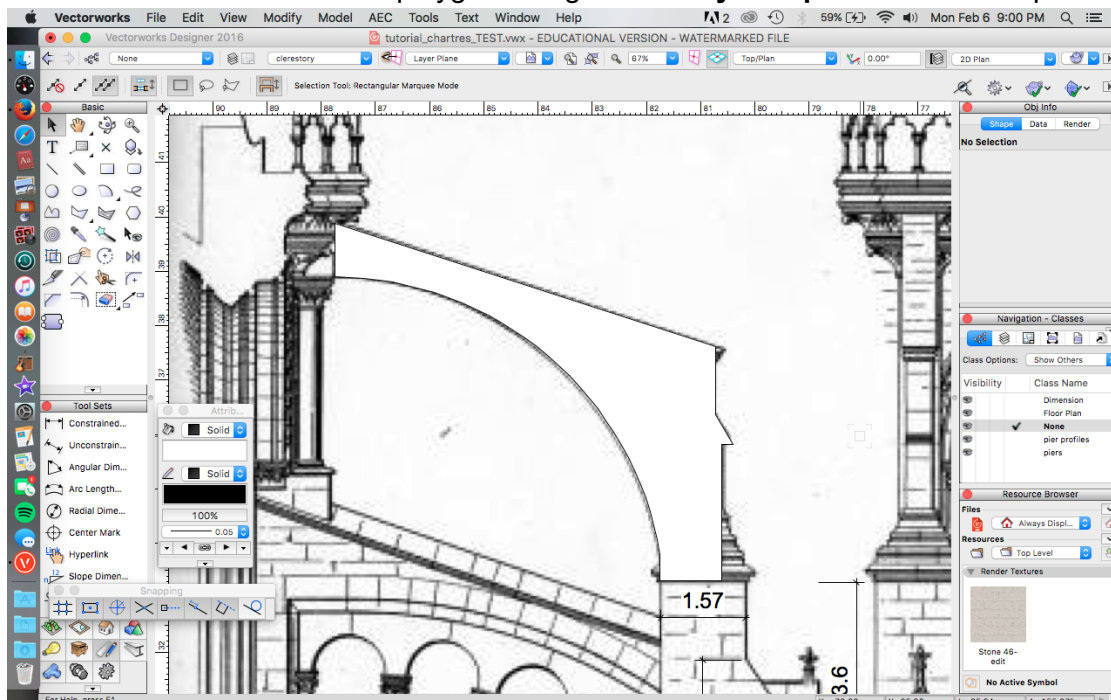


8. Align the fourth section of the buttress on top of the other buttress sections.

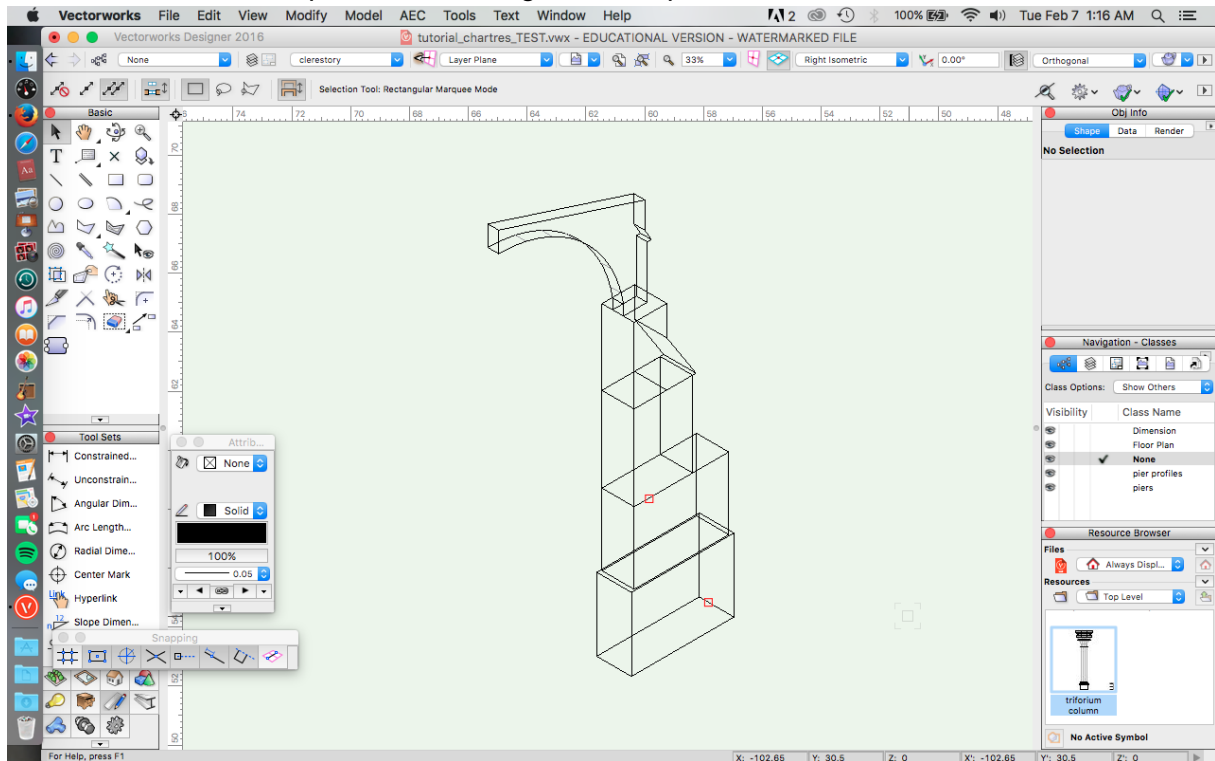


Step 4. Build the Arches

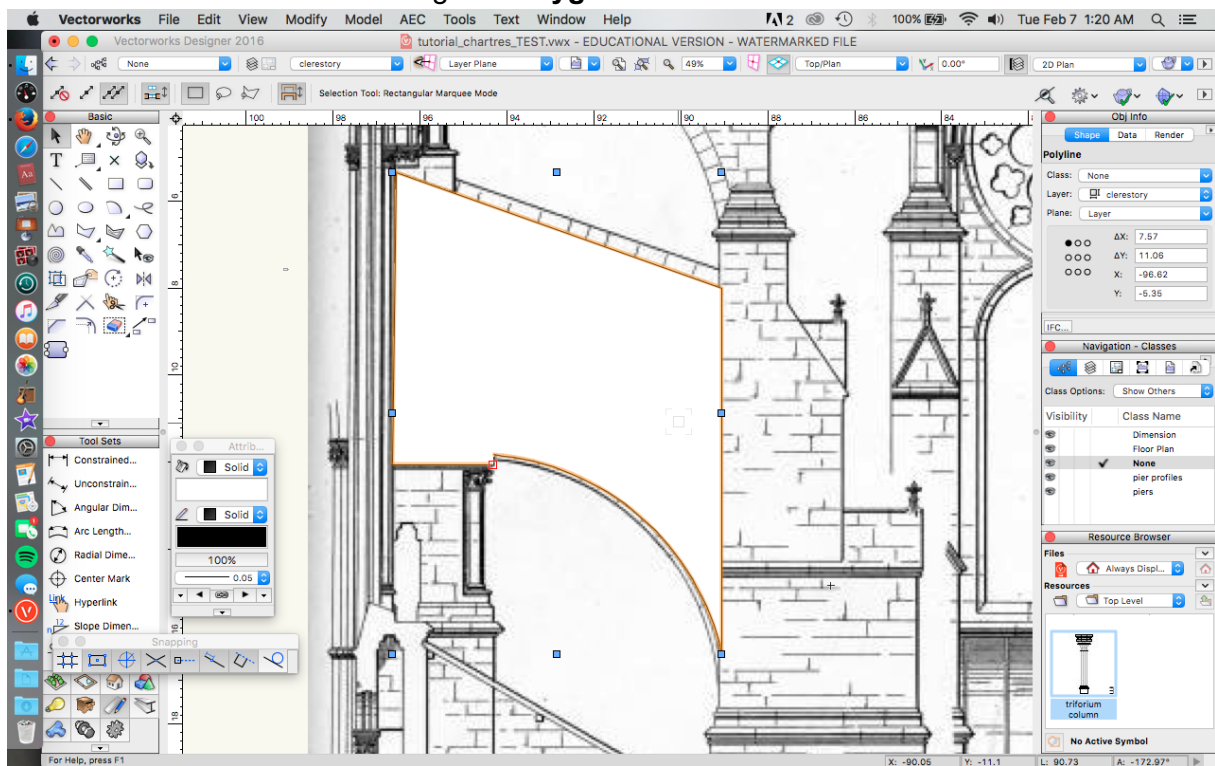
1. Begin the upper arch, which is a simpler form. Use the **Arc** tool in **Three Points** mode to trace the arc in the reference drawing. Use the **Polygon** tool, trace the rest of the shape. Select the arc and the polygon and go to **Modify > Clip Surface** to complete the shape.



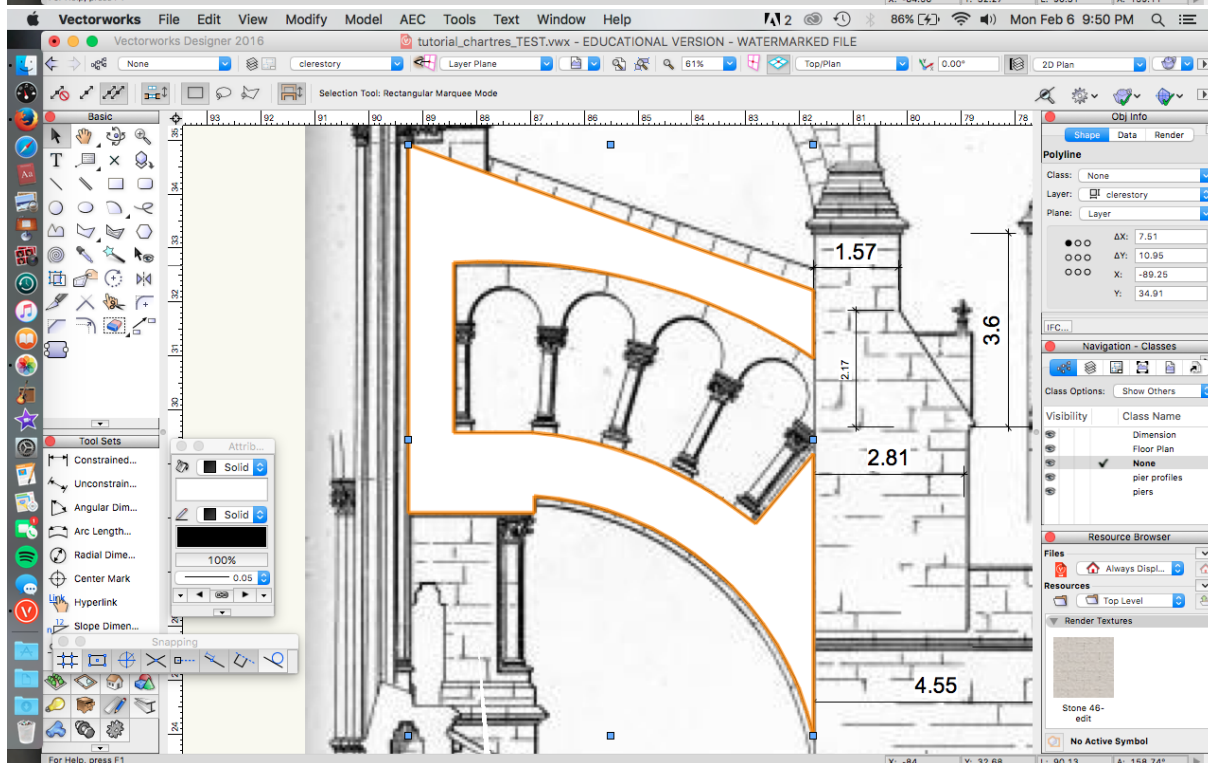
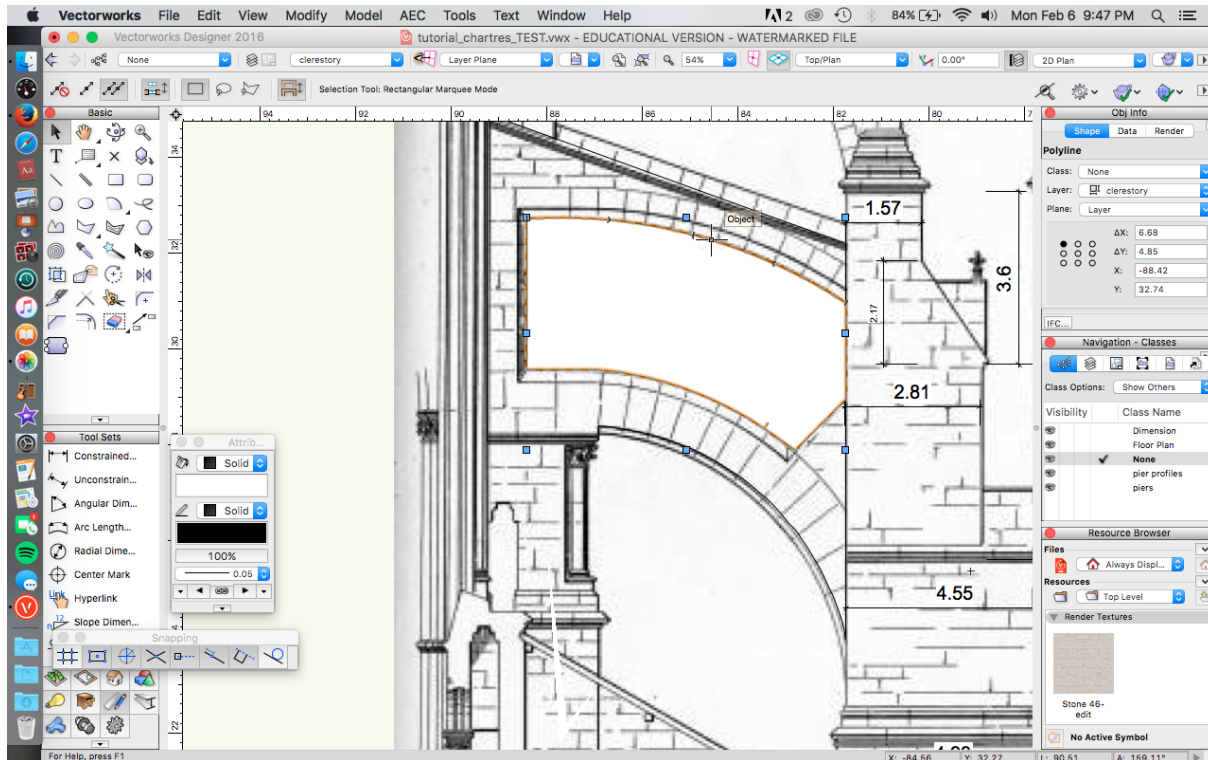
2. Extrude the shape to 0.52 m. Align at the top of the stacked buttress form.



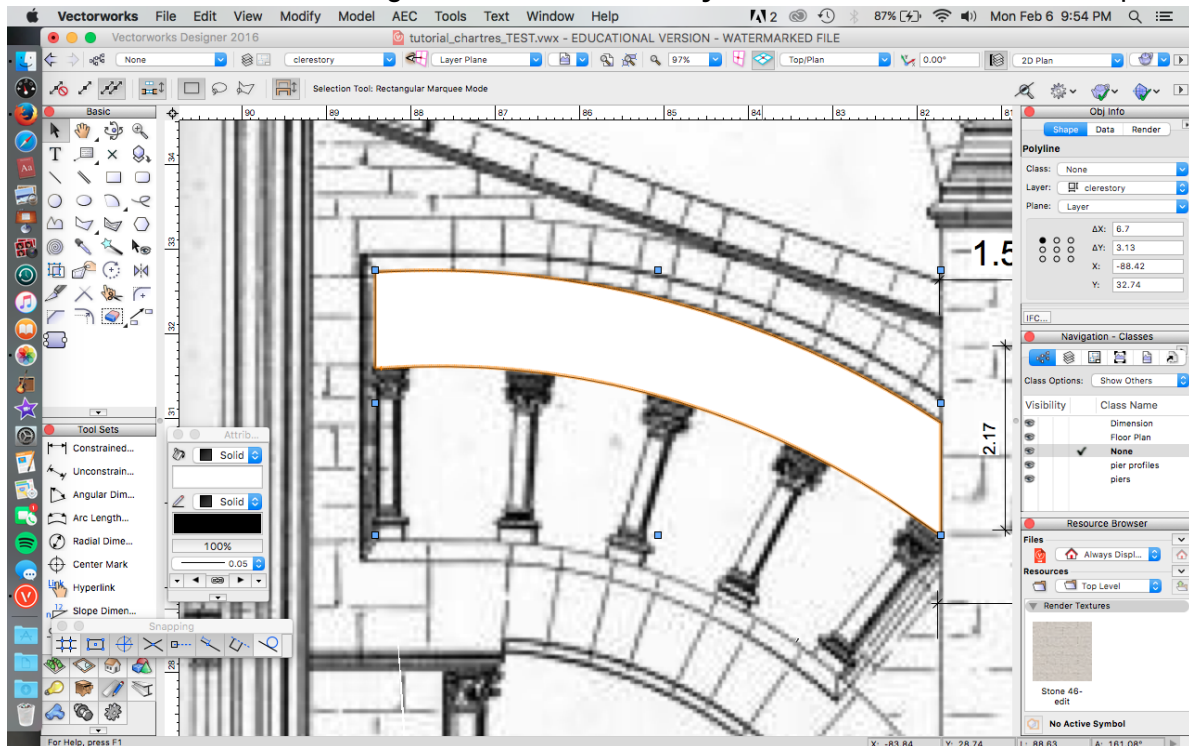
3. Trace the lower arch using the **Polygon** and **Arc** tools.



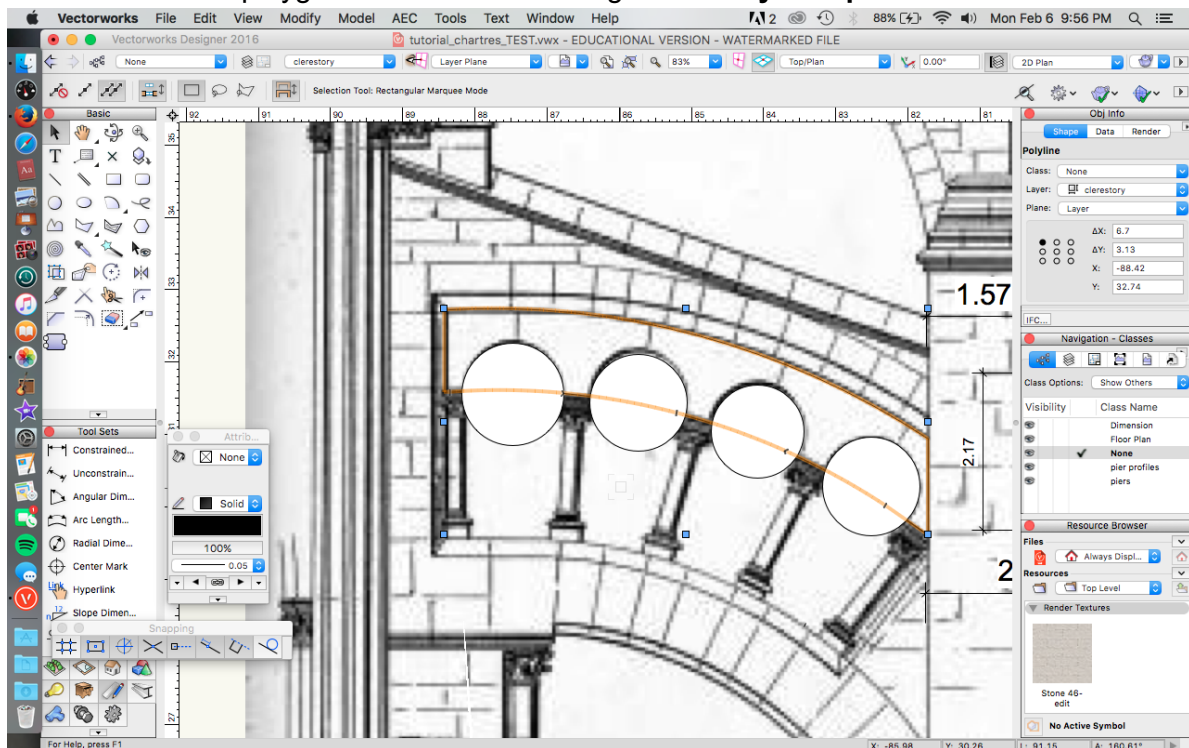
4. Set the fill attribute for this shape to “none” so that you can see the reference drawing underneath. Trace the arcade cut-out. Select both polygons and go to **Modify > Clip Surface** to create the arch.

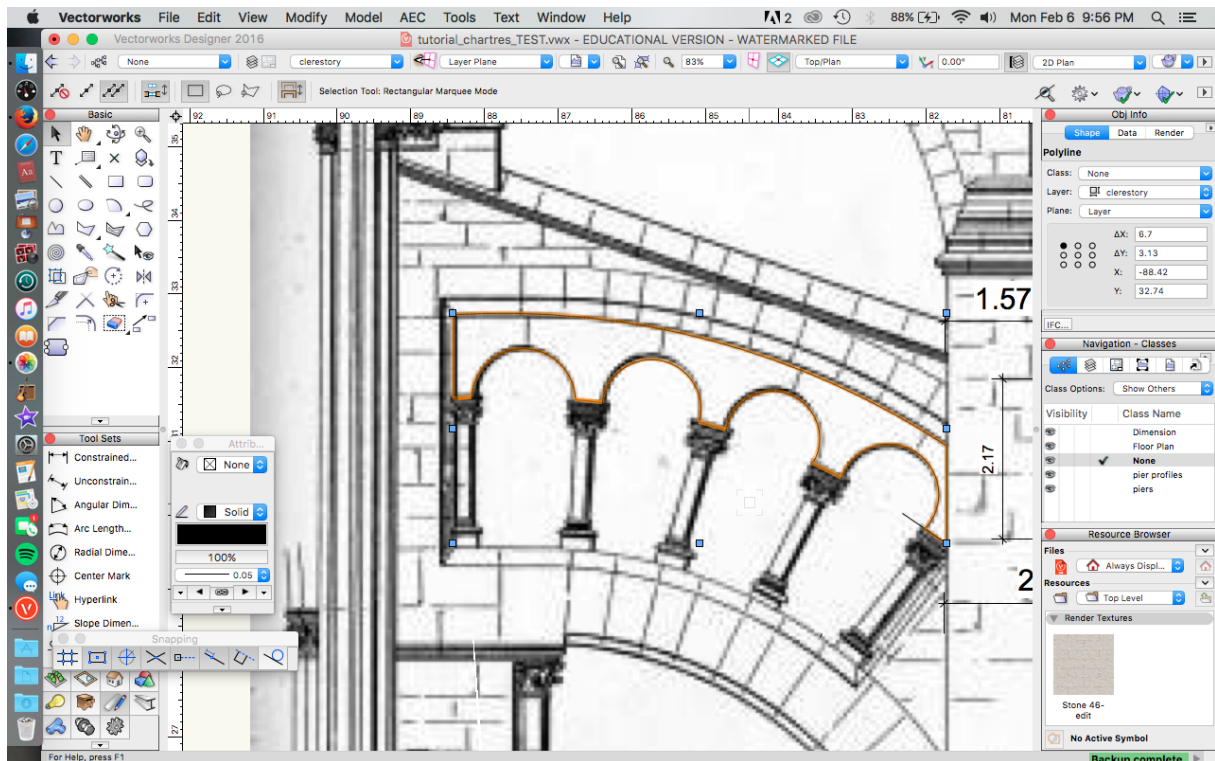


5. Extrude the arch to 1 m. Set the shape to the side of the reference drawing.
6. Trace the arcade using the **Arc** tool or the **Polyline** tool from the **Basic Tools** palette.

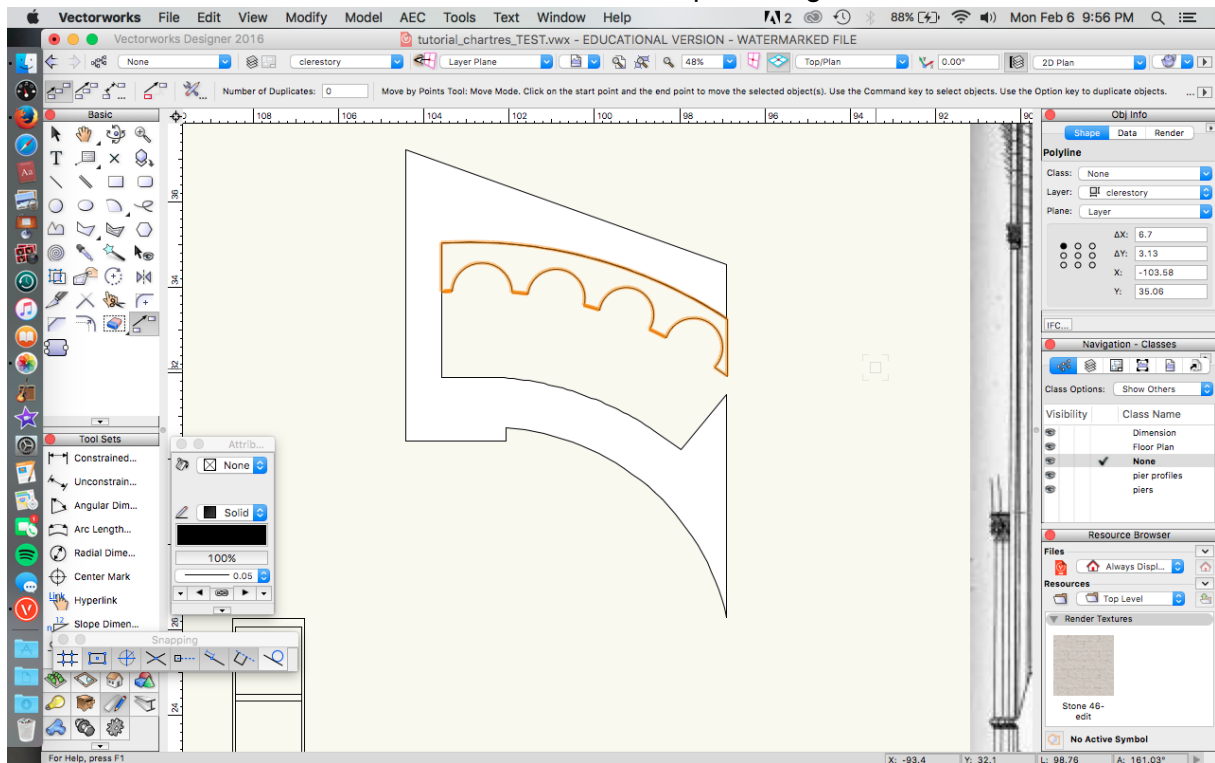


7. Use the **Circle** tool to create the arcade. Align the circle with the reference drawing. Select the polygon and the circles and go to **Modify > Clip Surface**.

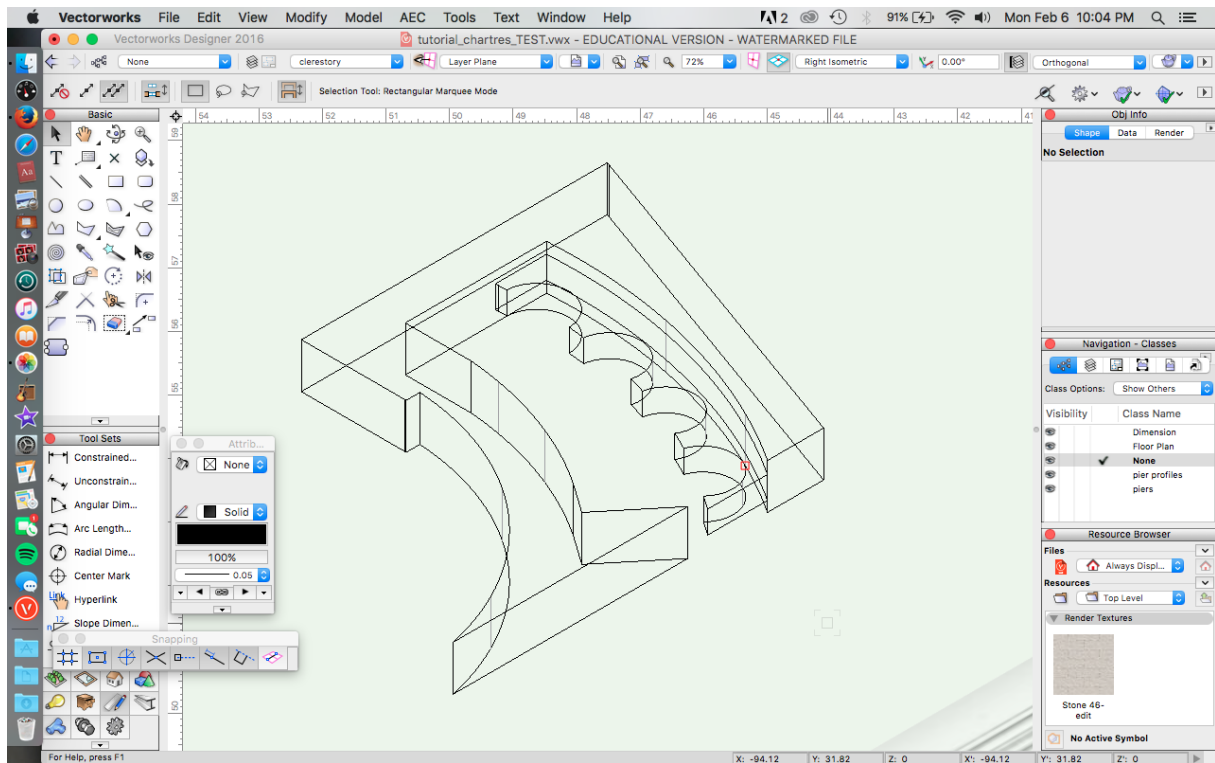




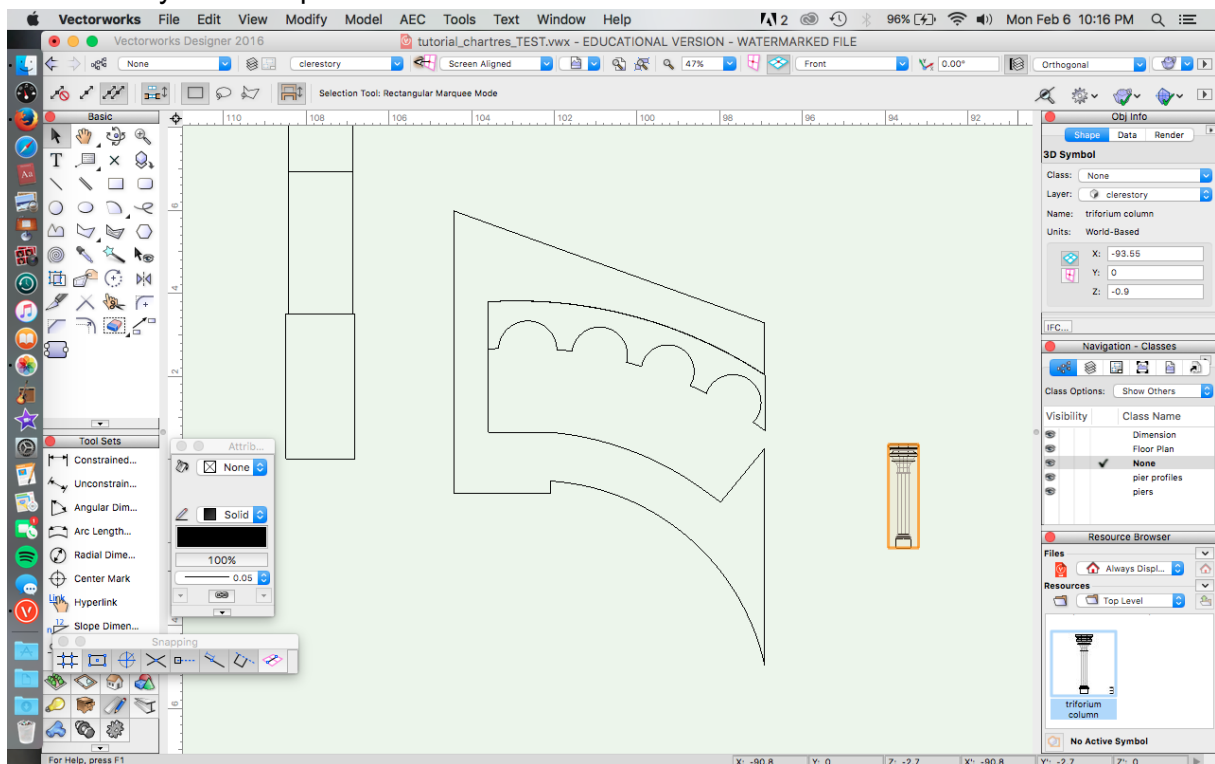
8. Extrude the arcade to a depth of 0.5 m (**Model > Extrude**). Align the arcade with the arch form that you placed to the side of the reference drawing. Then rotate the arch so that it is visible in **Front** view. Select both shapes and go to **Model > Solids**.



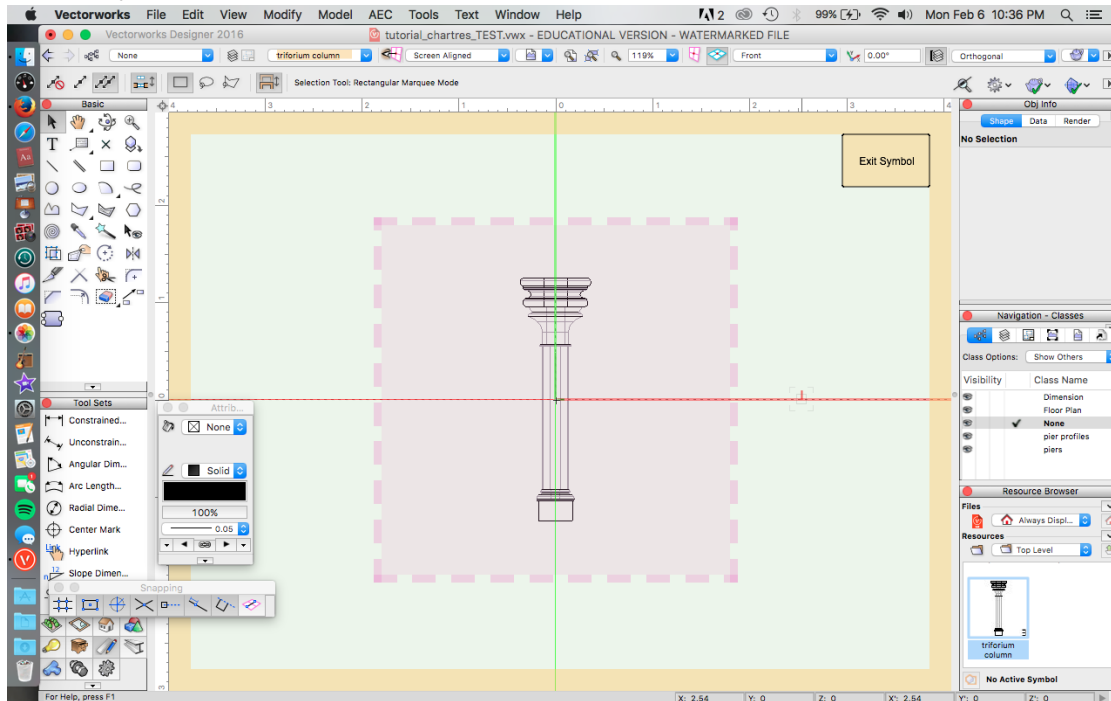
Tutorial: Digital Gothic—AH C117B (Winter 2019)



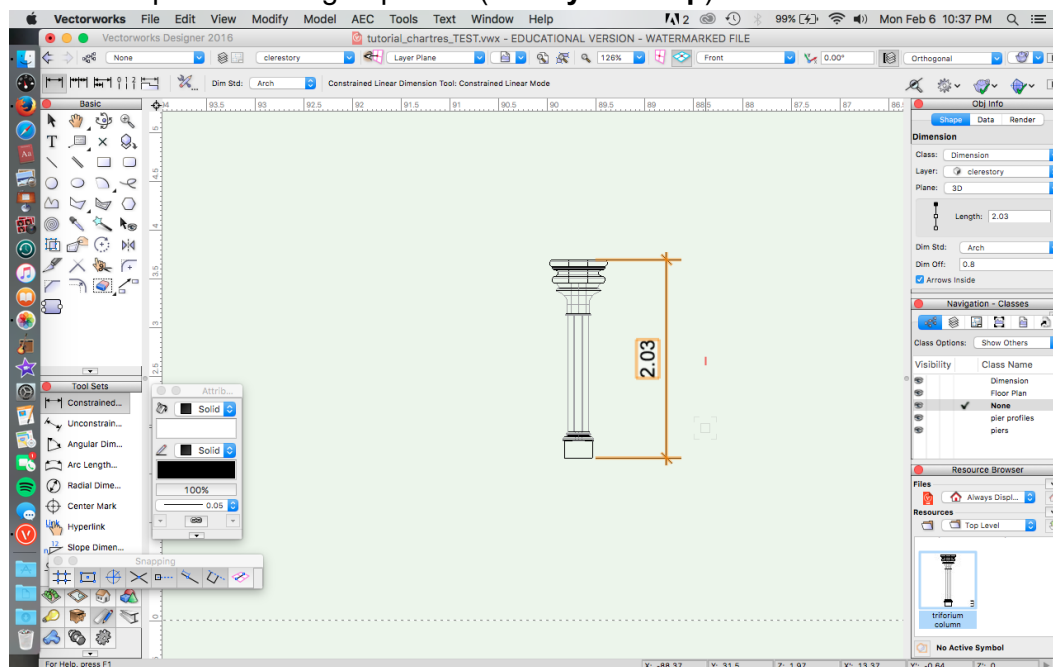
9. Go to the Resource Browser and select the triforium column symbol. Select and drag it into your workspace.



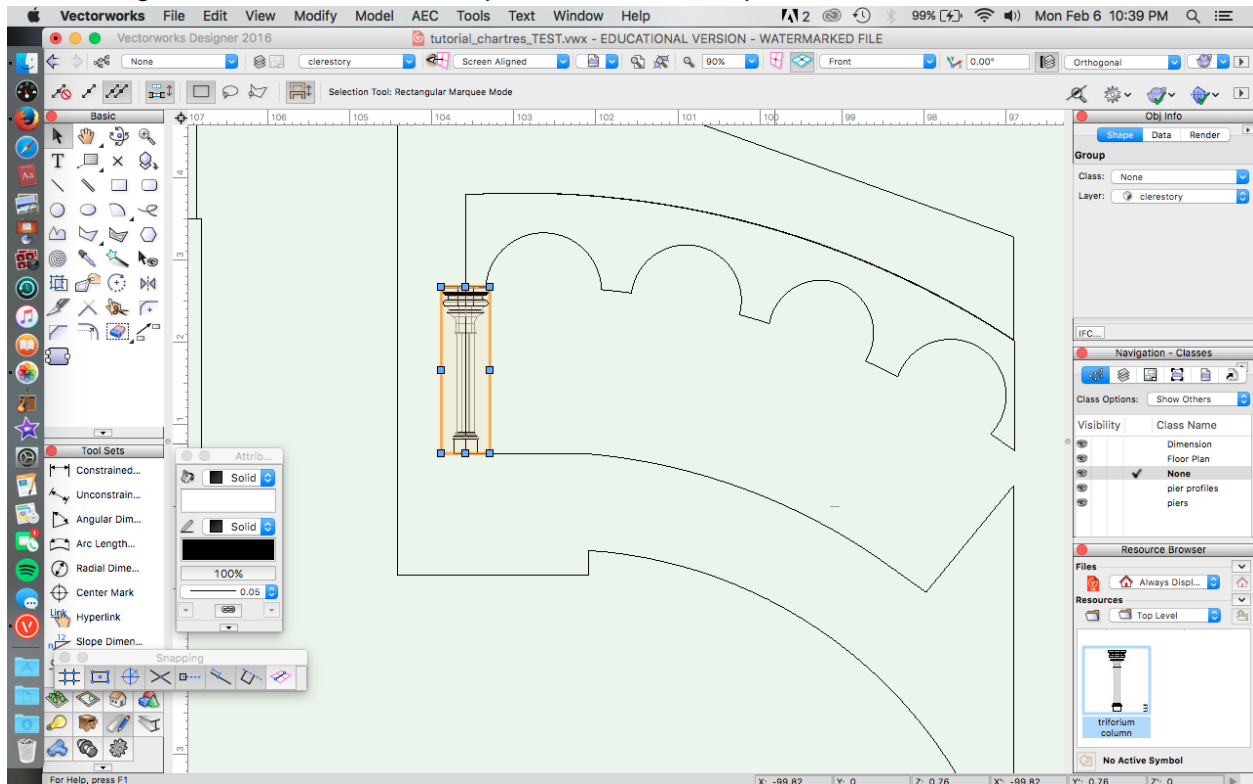
10. Note that the column is too big to fit into the arcade. If you alter the symbol, you will change every iteration of it in your model. To avoid this, double click on the symbol to edit the 3D component. Select and copy all column components (**Edit > Copy**). Exit the symbol by clicking on the “Exit Symbol” box in the upper right-hand corner of the workspace. Go to **Edit > Paste** to paste the column components. Delete the column symbol from the workspace.



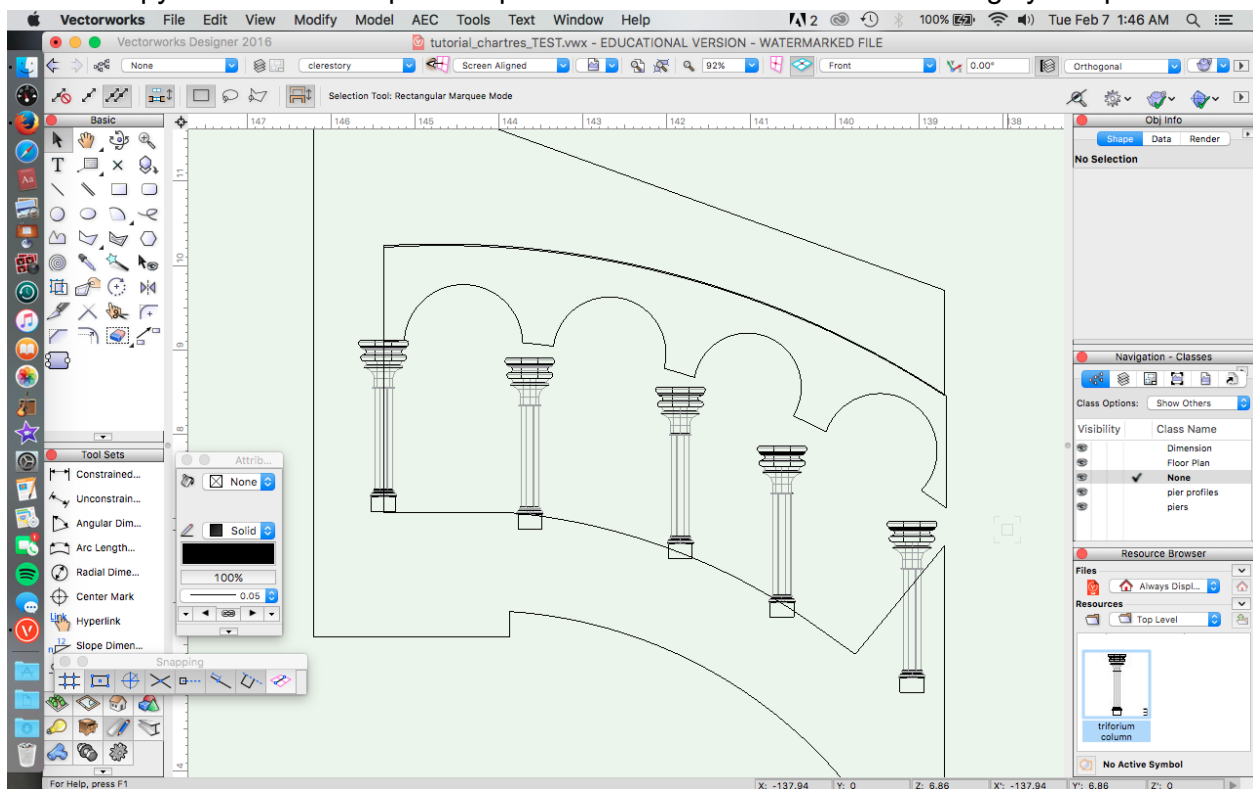
11. Select all column components and scale objects to a height of 2.03m. Select the components and group them (**Modify > Group**).



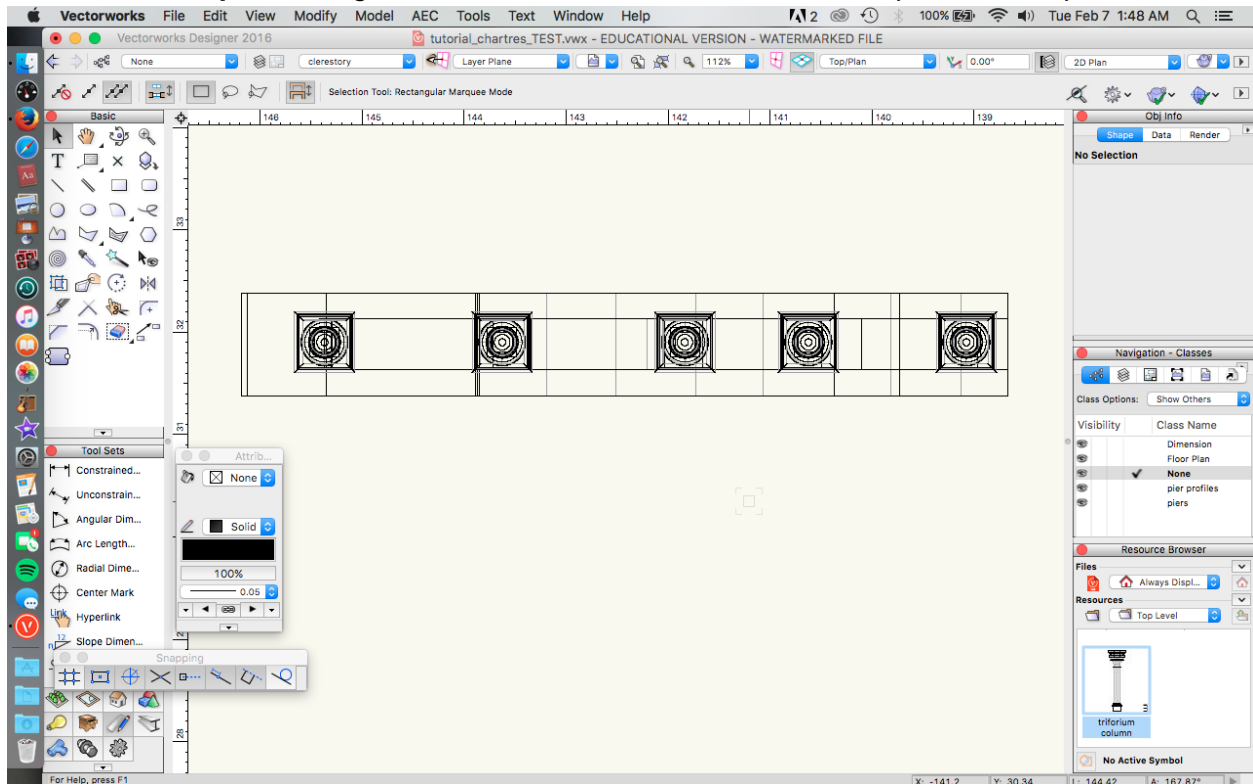
12. Align the column with the midpoint of the far-left spandrel.



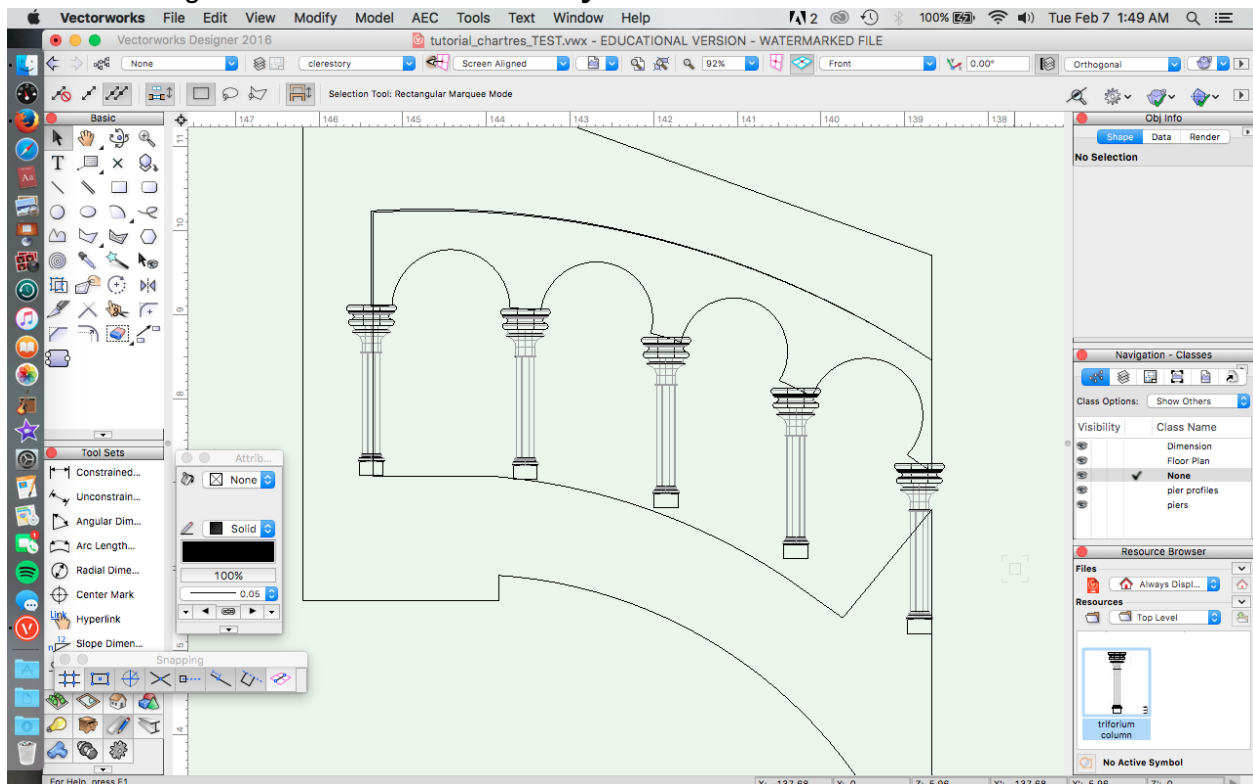
13. Copy the column and paste in place 4 times. Place each column roughly into position.



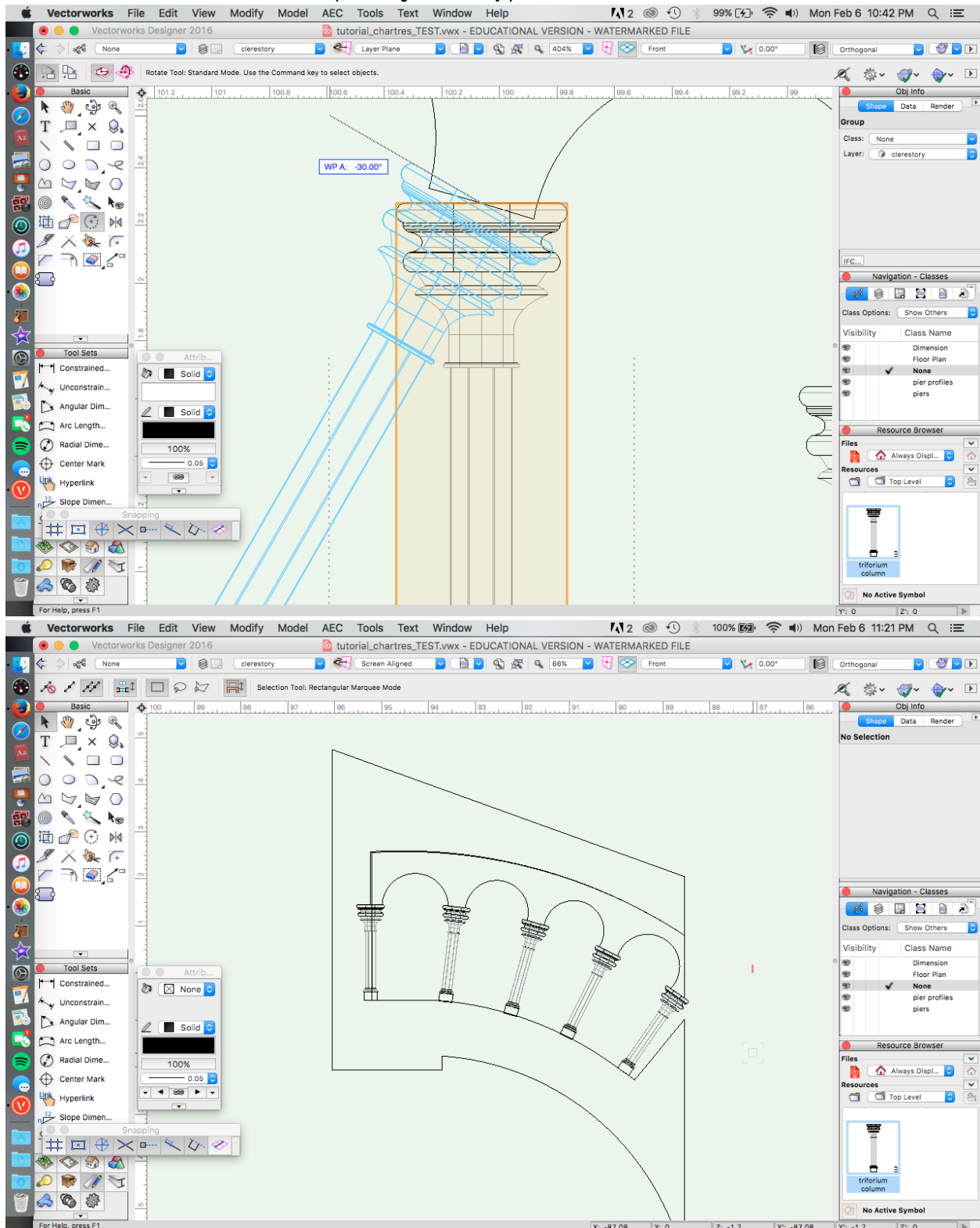
14. Go to **Top** view. Align the center of each column with the midpoint of the spandrels.



15. Return to **Front** view. Align the columns with the center of each spandrel. You may need to nudge rather than use the **Move by Points** tool.



16. Use the **Rotate** tool to position each column within the curve of the arcade. Group the columns and the arcade (**Modify > Group**).



17. Align the arcade with the rest of the butress. Select all components and group
(Modify > Group).

