Using cherish to trace a 3D outline of a building

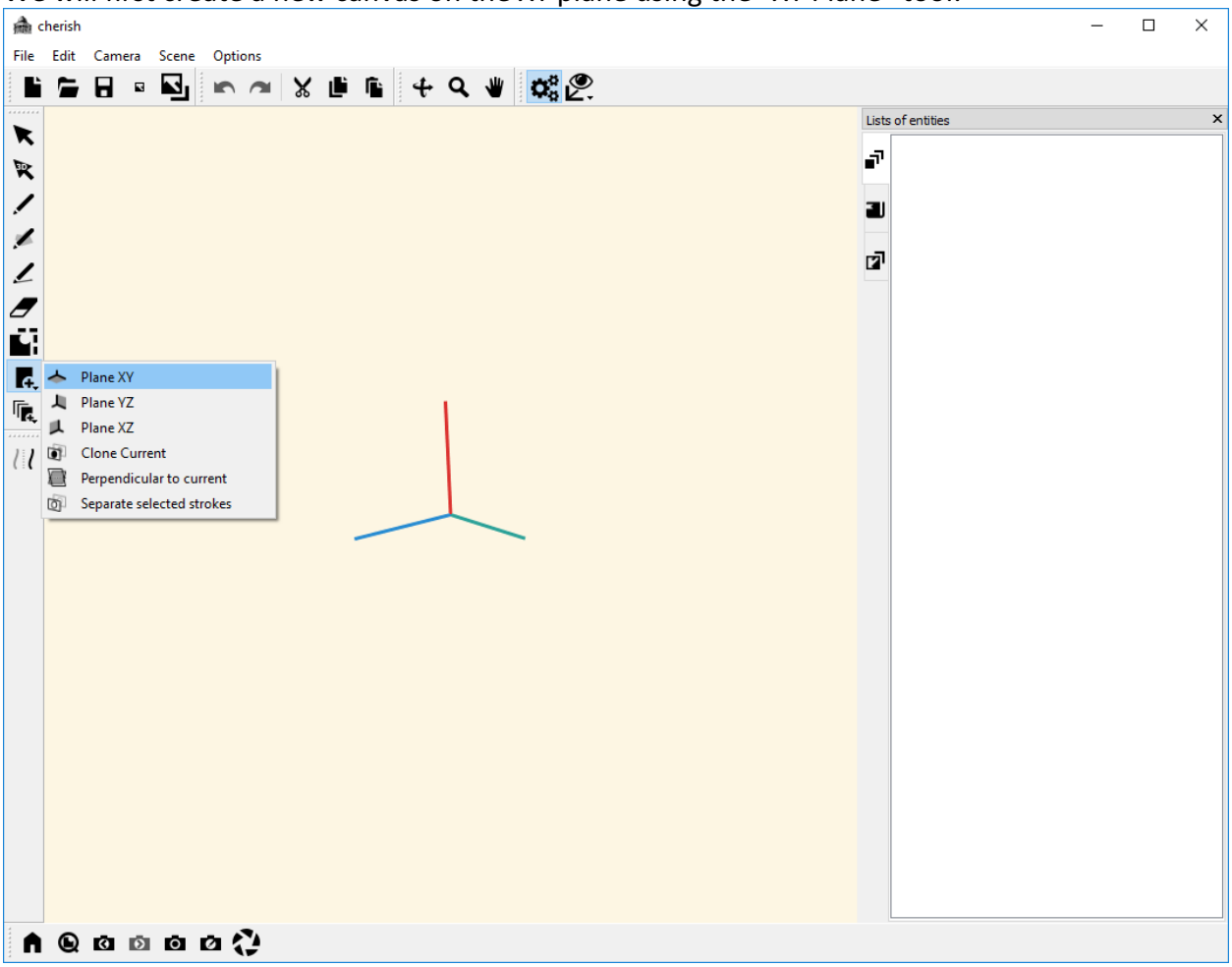
Introduction:

In this guide, we will walk through the basics for how to use the cherish system to trace a 3D outline of a scene using a floor plan and reference images. We will be walking through a tracing of Strawberry Hill House, using images from Horace Walpole's Strawberry Hill Collection.

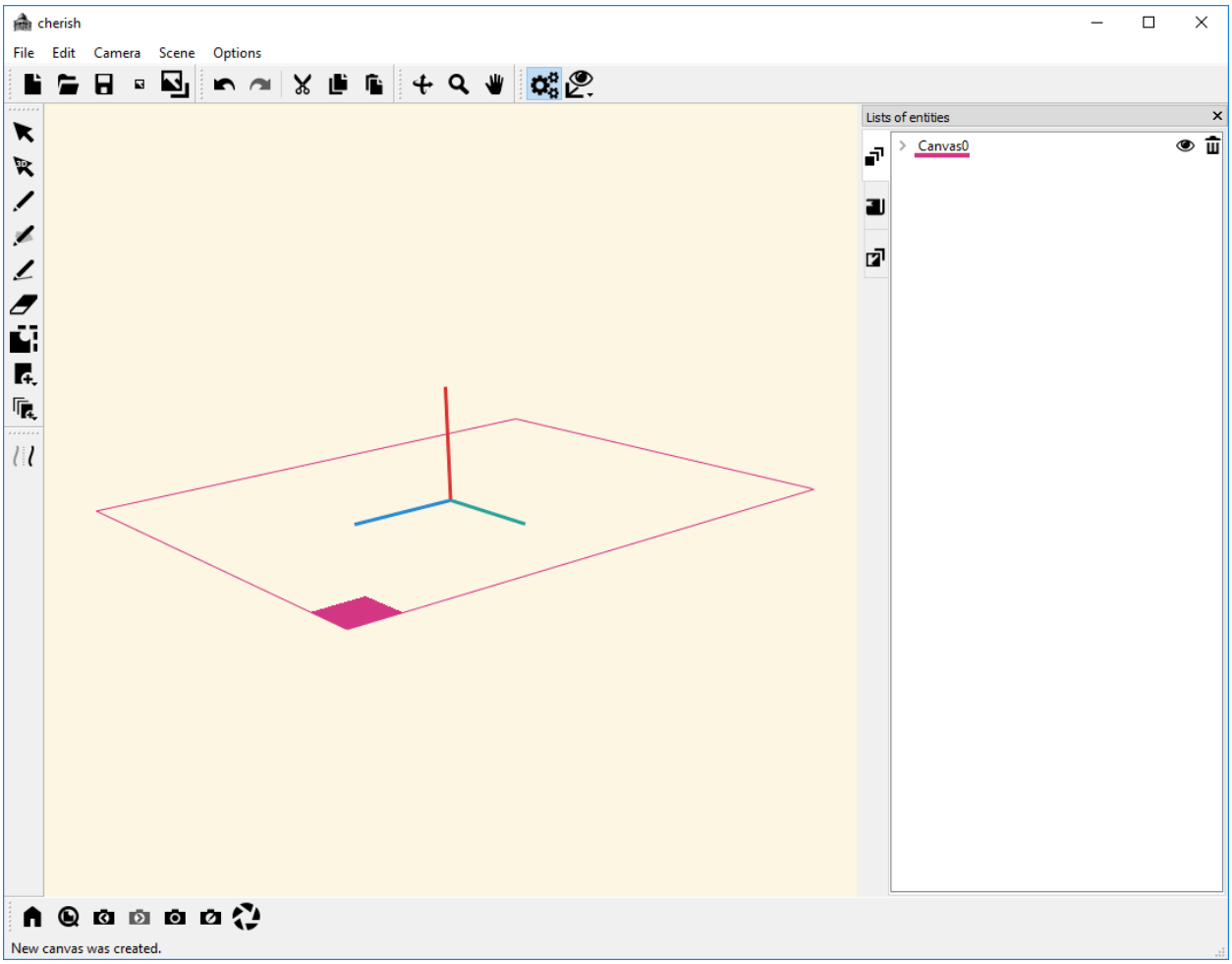
Creating Base Maps Canvas:

First, we will be creating a canvas that will serve as the floor plan of the building. This canvas will allow us to later trace the outline of the building based on the provided floorplan.

We will first create a new canvas on the XY plane using the "XY Plane" tool:

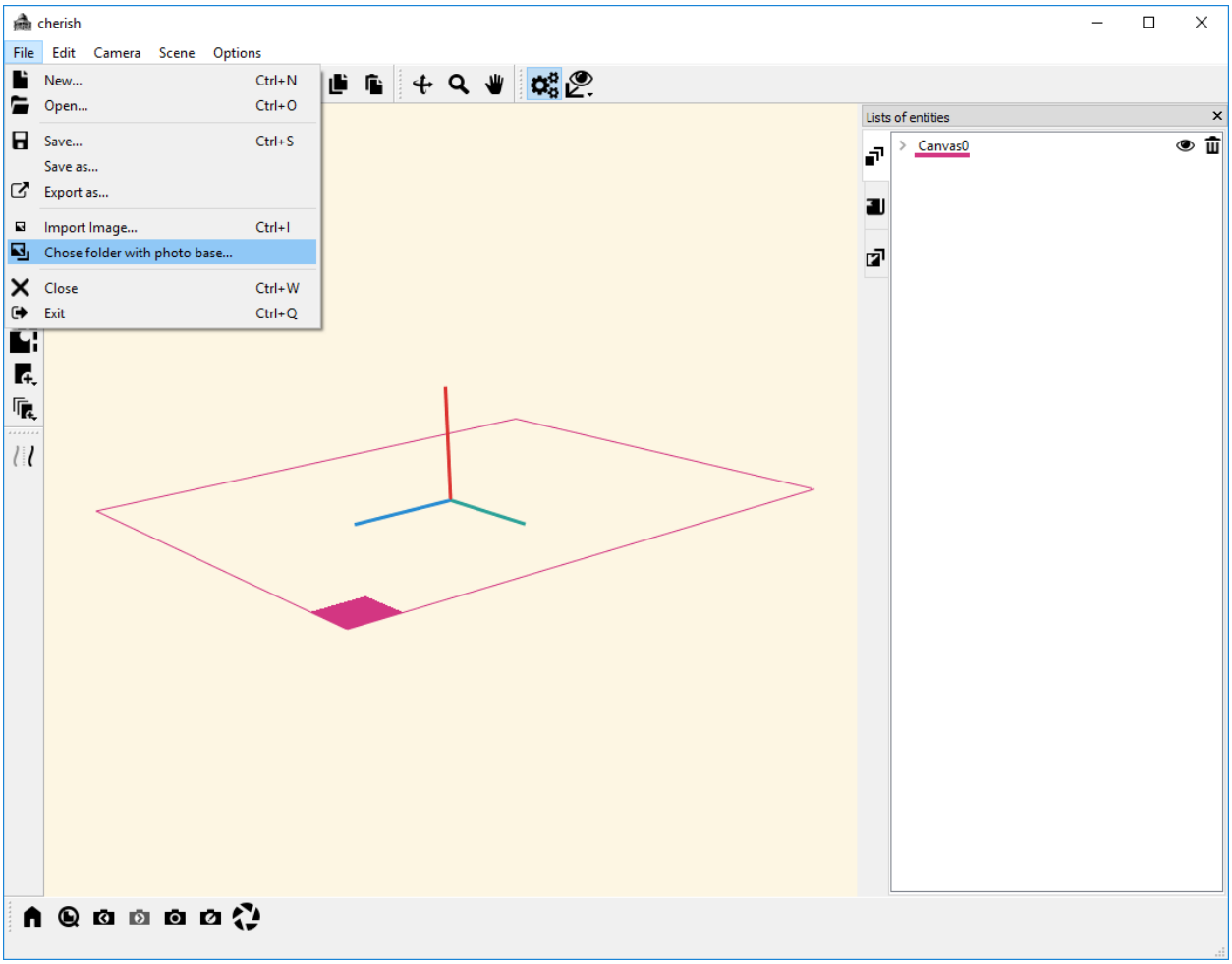


This will create a canvas as shown in the image below:



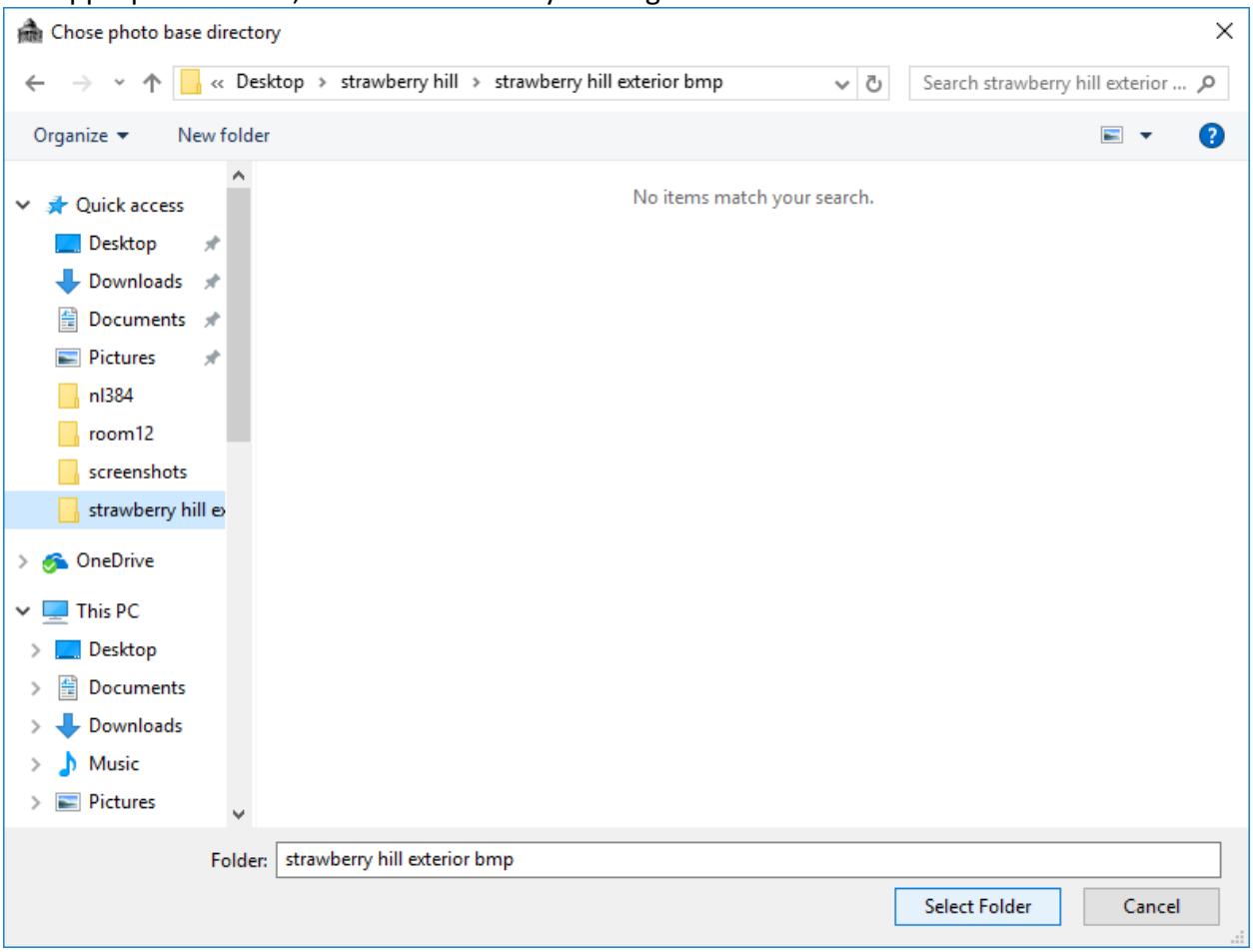
It is good practice to rename our canvases to help keep track of the canvases. We will rename “Canvas0” to “maps”.

After creating the “maps” canvas, we will select the folder in which the references images are stored using the “File” -> “Choose folder with photo base” tool:

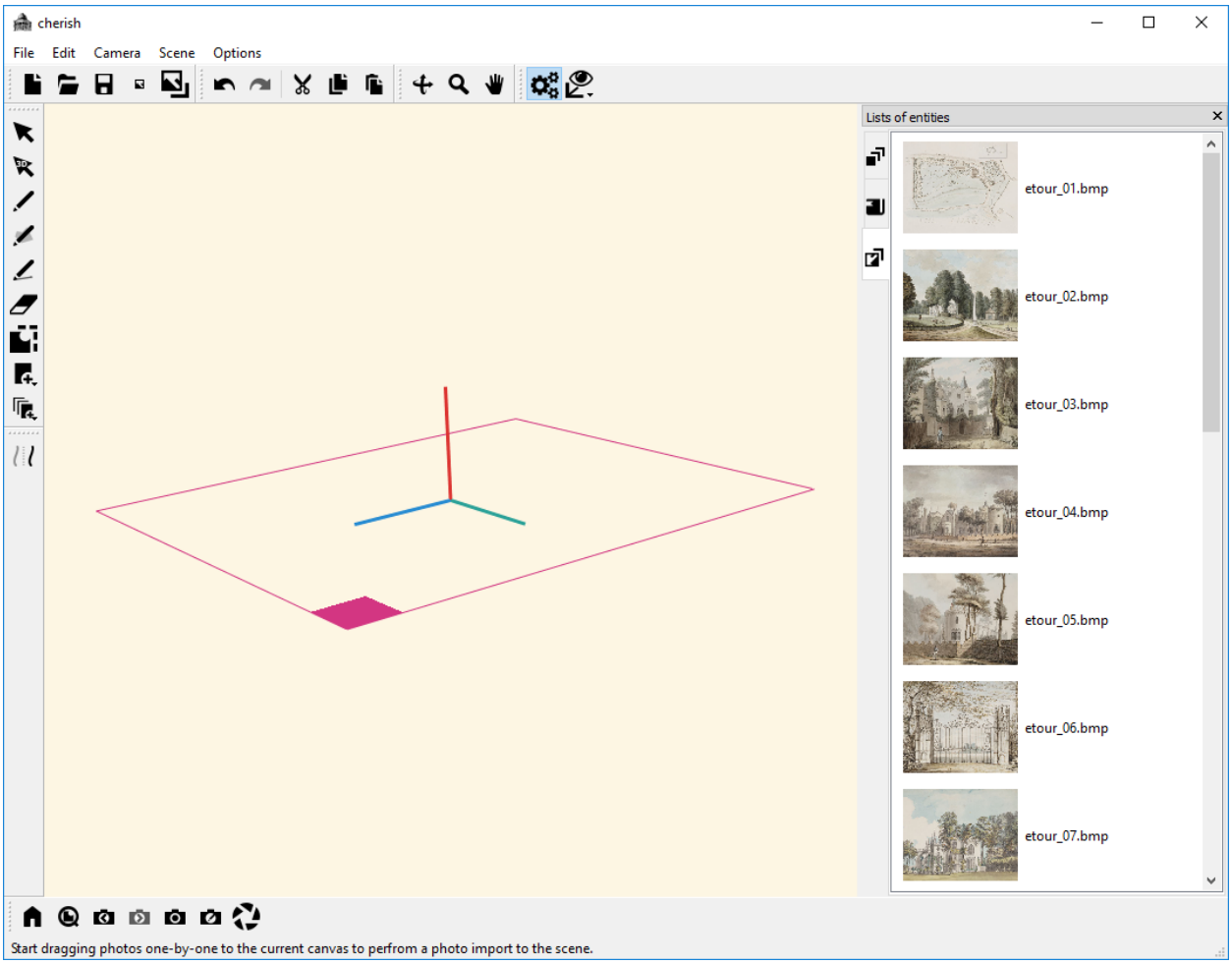


In the window that opens, we will navigate to reach the photo base folder. In our case, the images are located in a folder called “strawberry hill exterior bmp”. Once you have navigated to

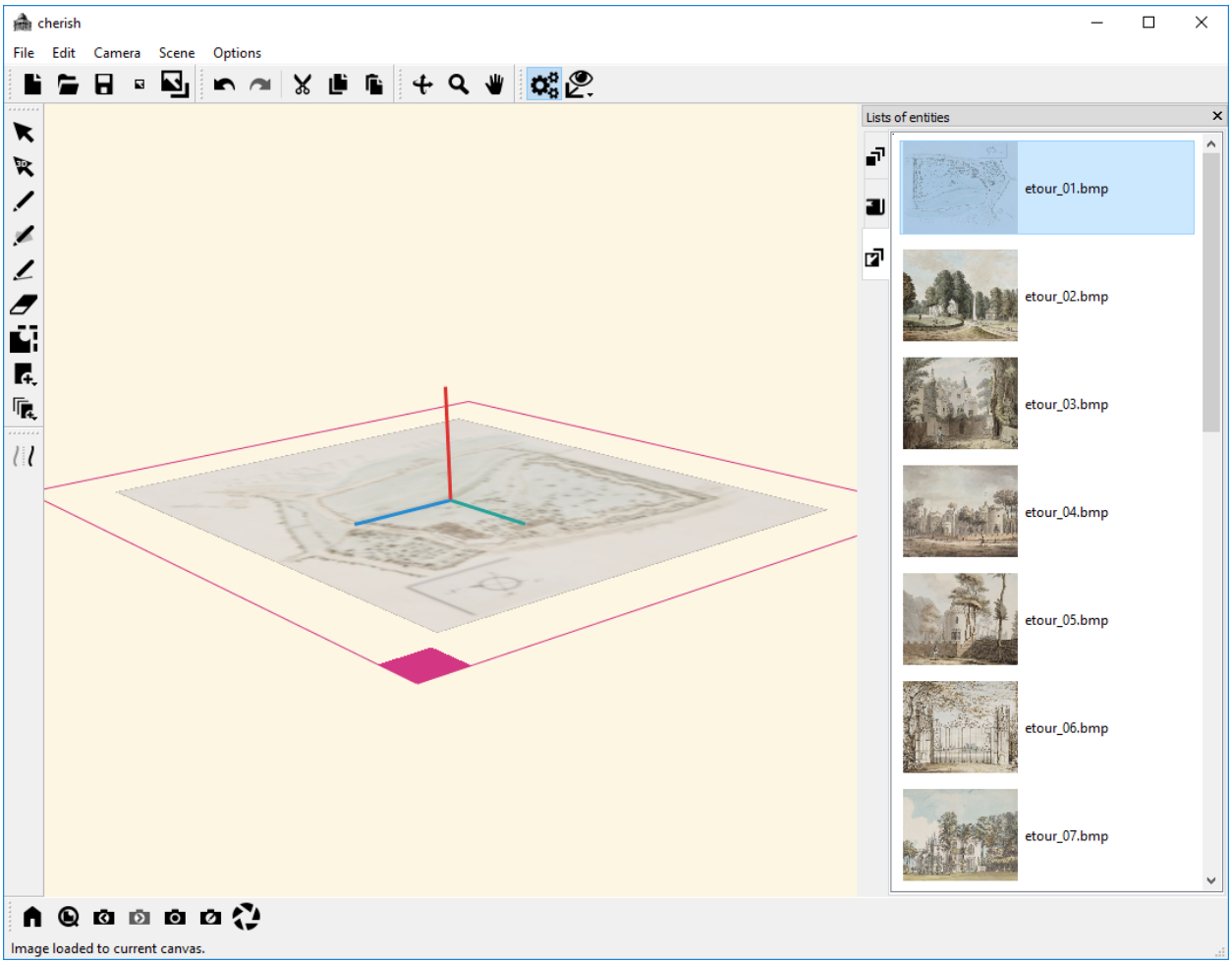
the appropriate folder, select the folder by clicking “Select Folder”:



The right sidebar should now display the images in our photo base folder:

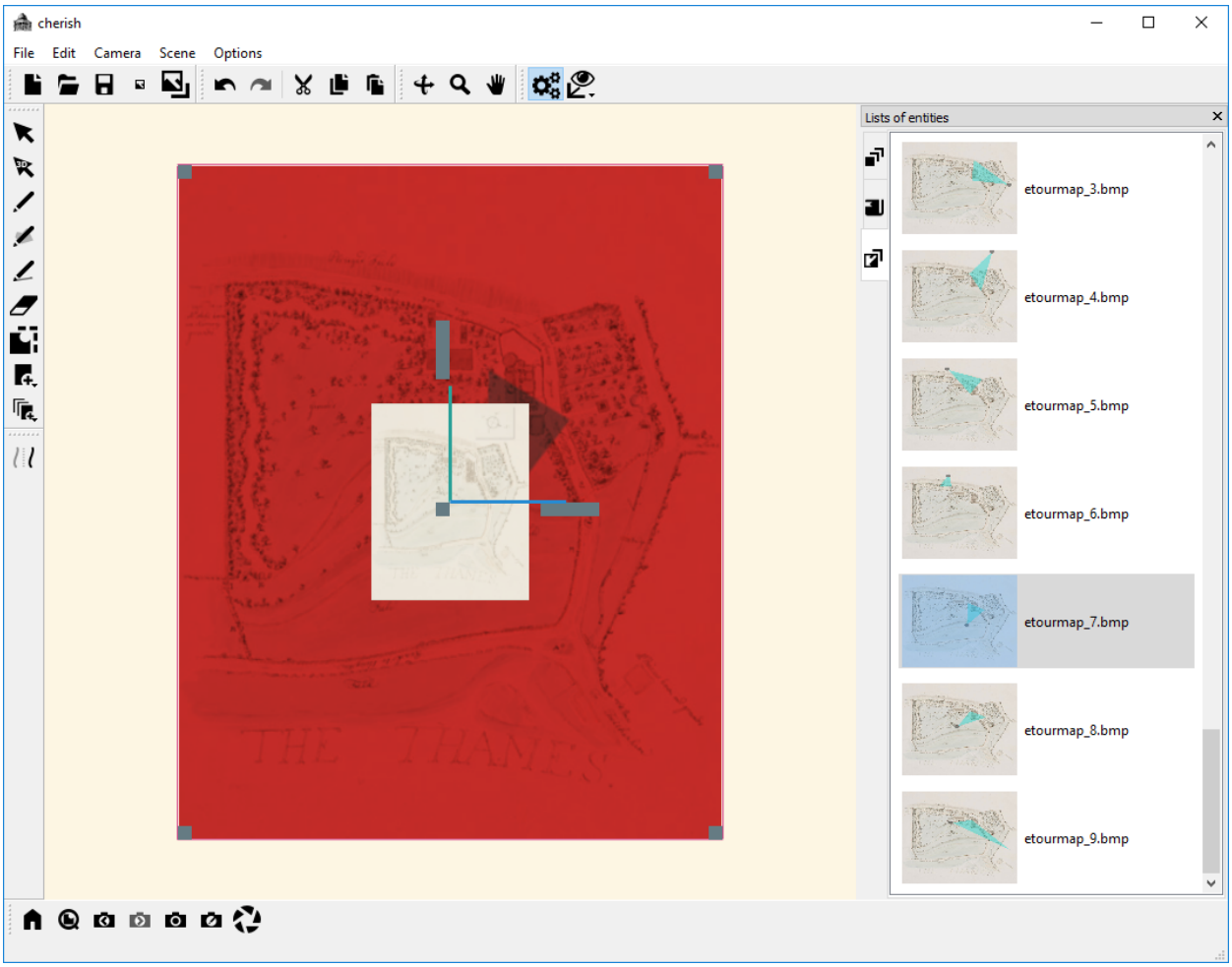


We can insert an image onto the canvas by dragging the image from the “List of entities” onto the Canvas. We will first drag “etour_01.bmp” onto the “maps” canvas:



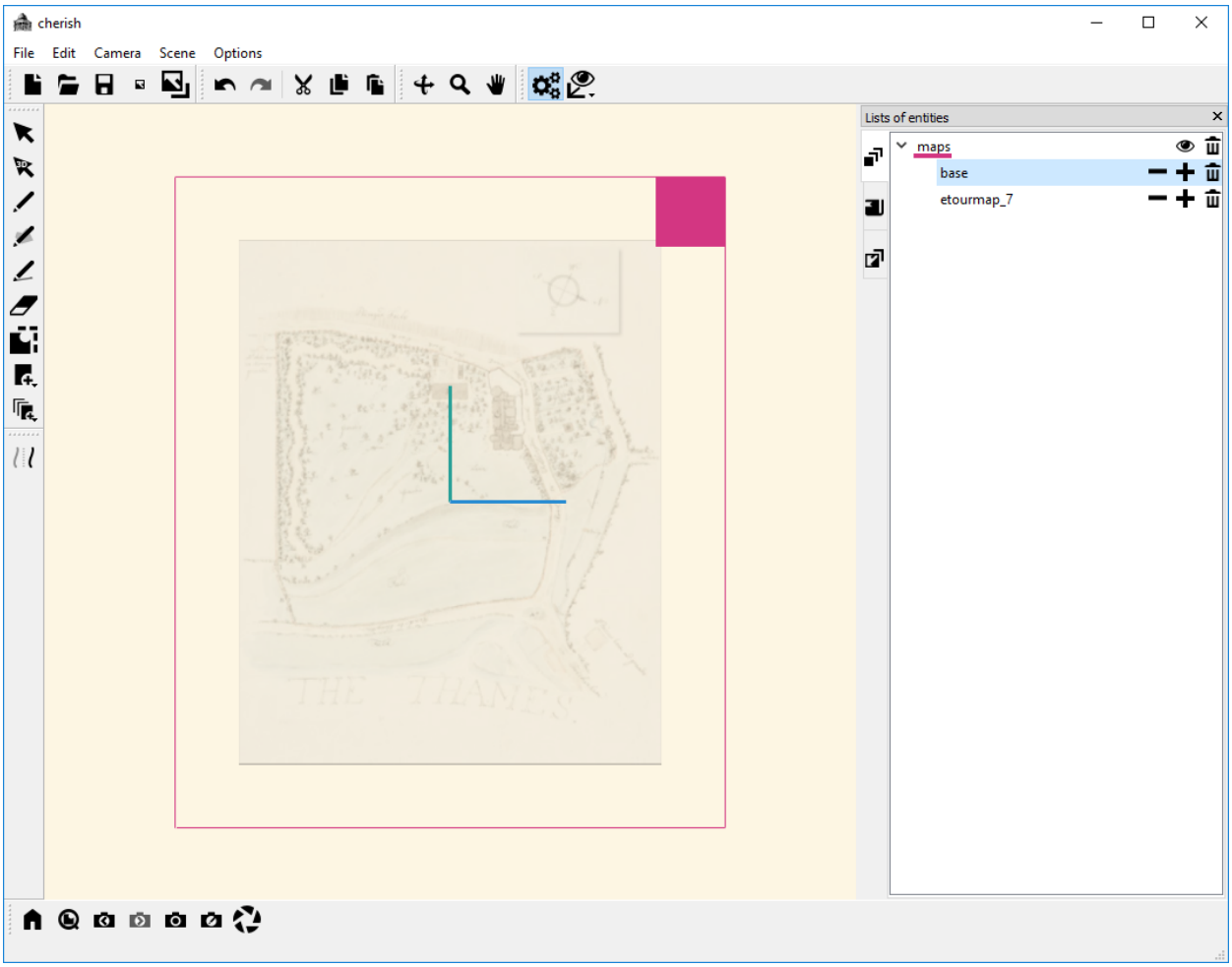
This image, which we will rename as “base”, will provide the basic floor plan for the building that we will be outlining. Nonetheless, there are additional images that depict maps overlaid with the perspective of the different paintings in the collection; we will want to include some of these images on our “maps” canvas to aid in our tracing. For now, insert the “etourmap_7.bmp” file onto the “maps” canvas.

If you inserted both maps onto the canvas without changing the camera settings, the images will automatically be in the same location and the same size, with the “base” image on top of the “etourmap_7” image. However, if you have changed the camera settings since inserting the first image, you may need to change the scaling or location of the “etourmap_7” image. You can do this by selecting the new image with the “Select 2D entity” tool and using the markers to scale and move the image:

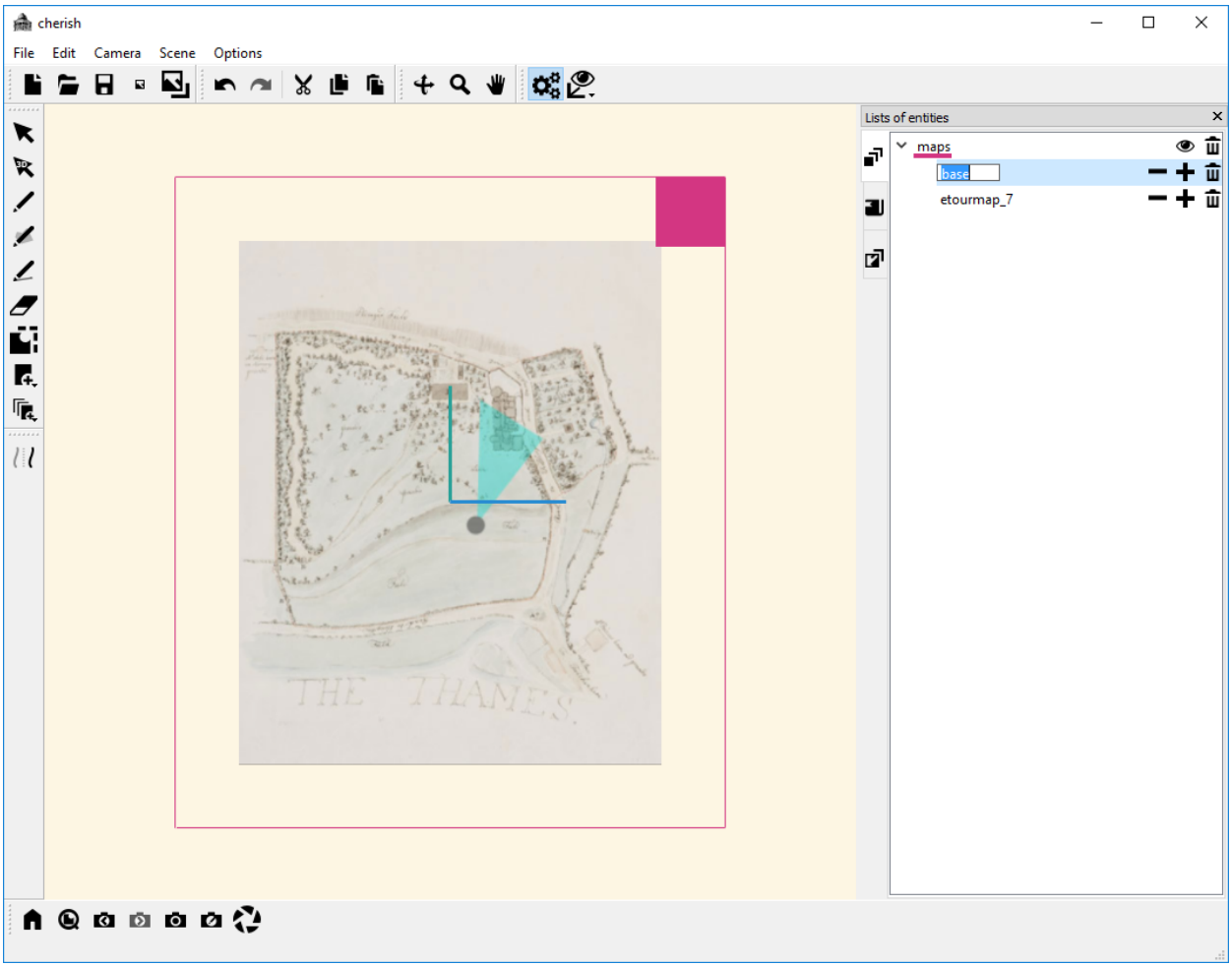


You should scale the second image such that it matches the size of the original “base” image, and the images should be arranged such that the images are overlapping.

Now, by returning to the list of canvases in the right toolbar, we can show the images in “maps” canvas by pressing the dropdown arrow to the left of the canvas name. The “+” and “-” options allow us to adjust the transparency of the images. For instance, decreasing the transparency of the “base” image will give us a lighter image as shown below:



Because our images are directly overlapping, setting the transparency of the “base” image to maximum transparency will result in the appearance of the “etourmap_7” image:

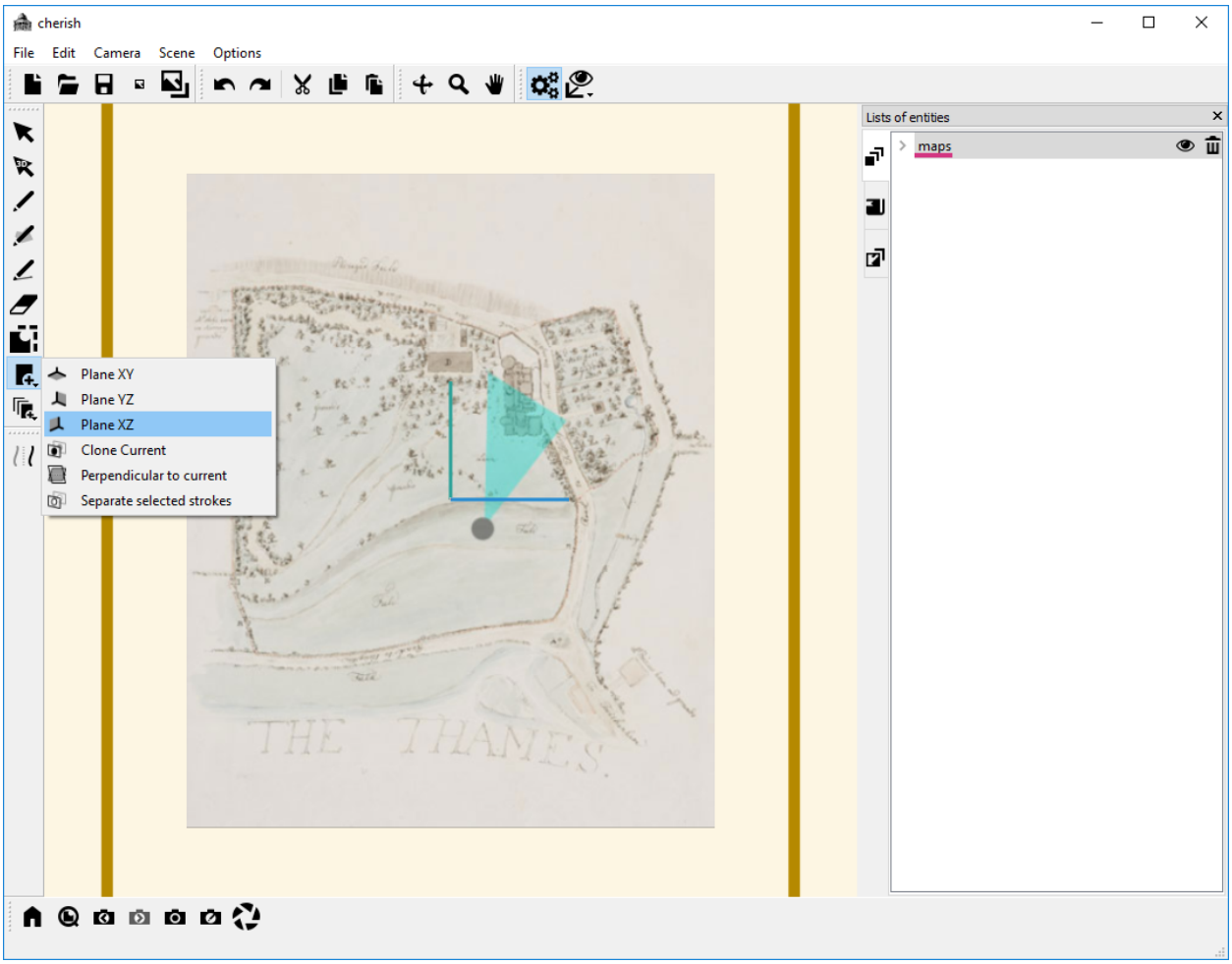


You have now successfully created a “maps” canvas with two images, “base” and “etourmap_7”. You will now use this canvas to aid in the drawing of the front wall of the building.

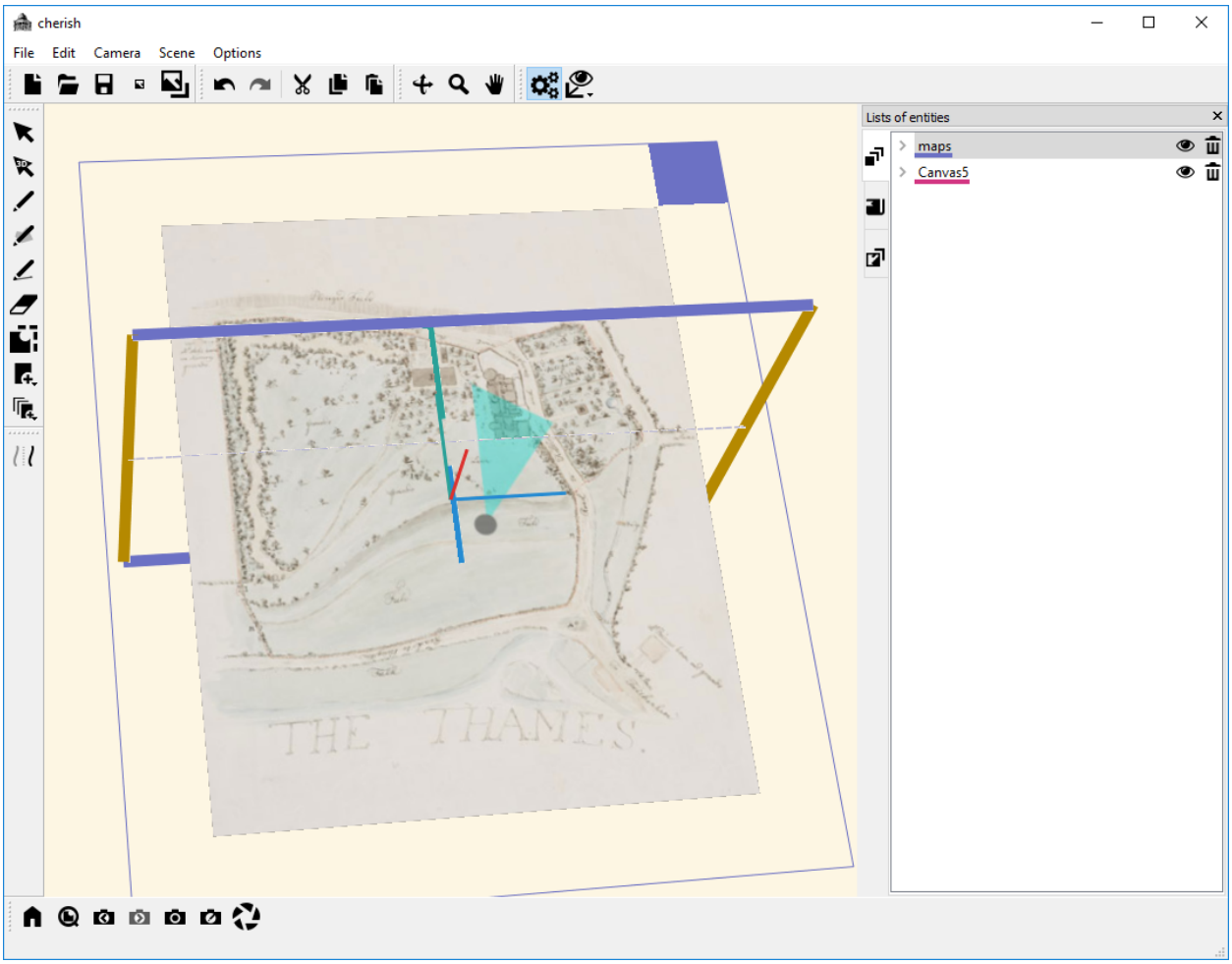
Tracing the Front Wall:

Now, we will trace the outline of the front of the building. We will do this by creating a canvas aligned with the front wall of the building as shown in the floorplan, and then using an image from our photo base folder to trace the outline of the wall.

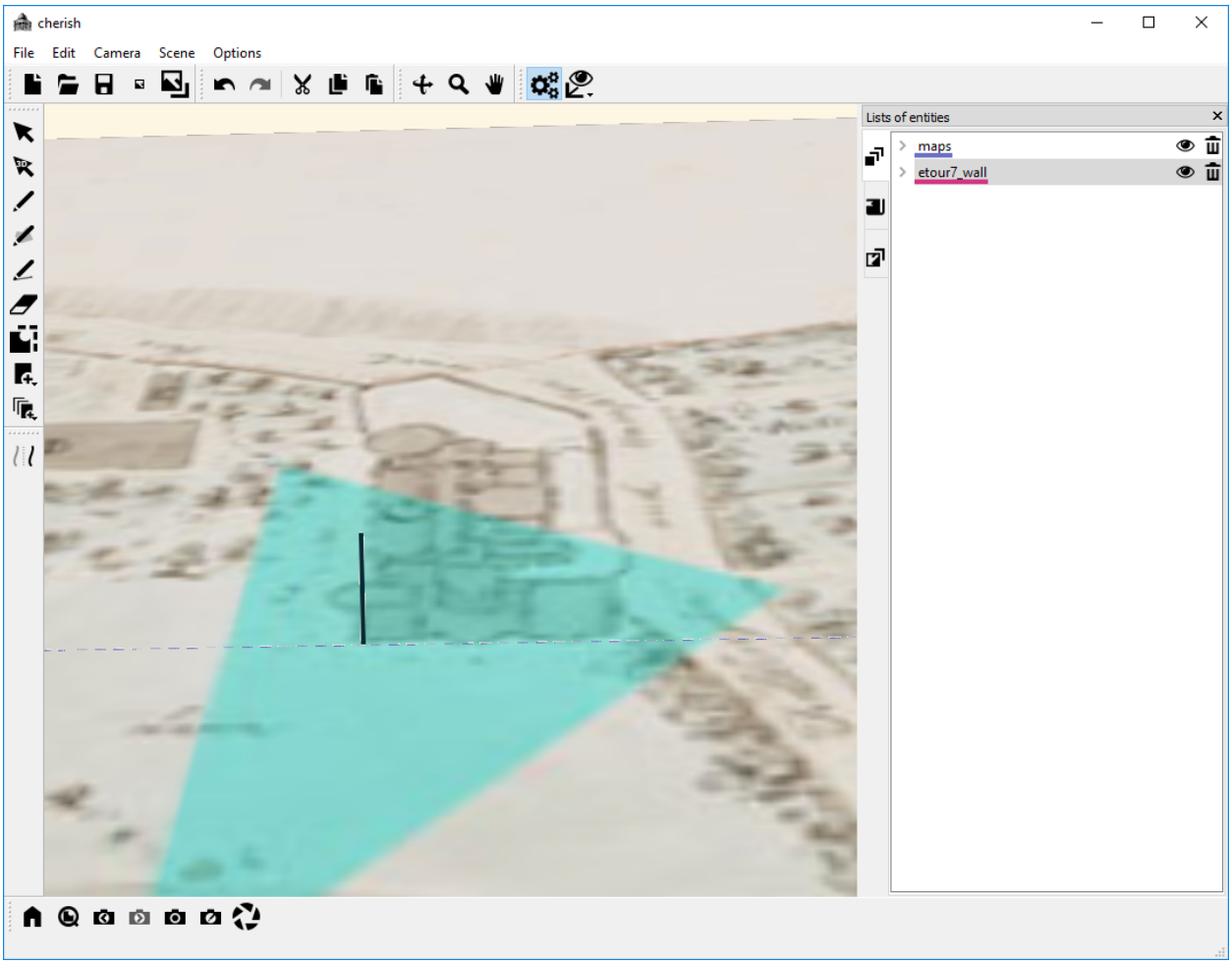
First, we will create a new XZ plane using the “XZ Plane” tool:



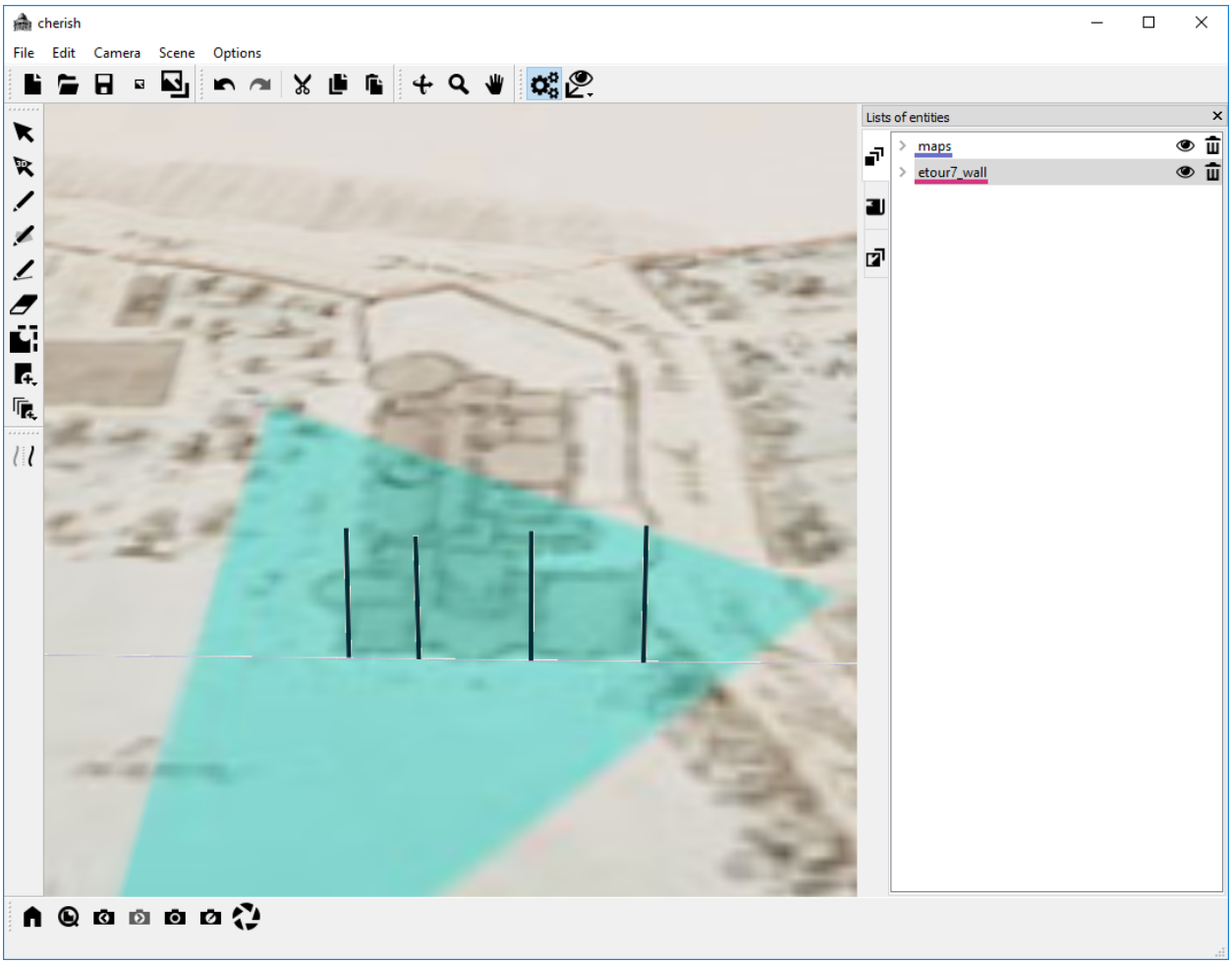
Next, we will use the “Edit canvas location” tool to move the new canvas that we have just created. Then, we can use the blue bars to move the canvas. You should drag the canvas until it lines up with the front of the building on the floorplan:



Now, we can zoom in, and start drawing line segments using the “Draw line segment” tool. We will draw a vertical line segment at the left edge of the front of the building:

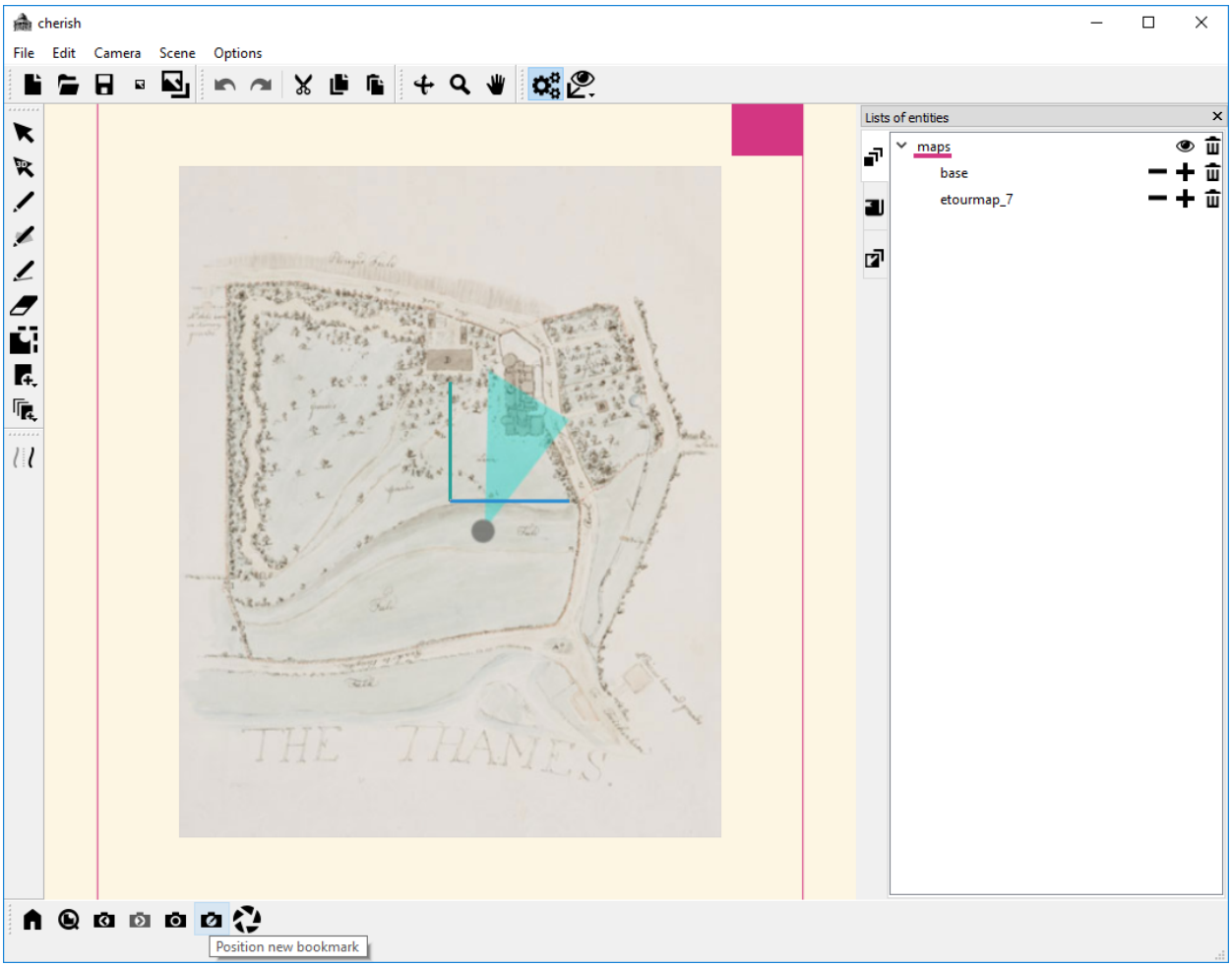


Next, we will continue drawing segments, at the other notable points along the front wall:

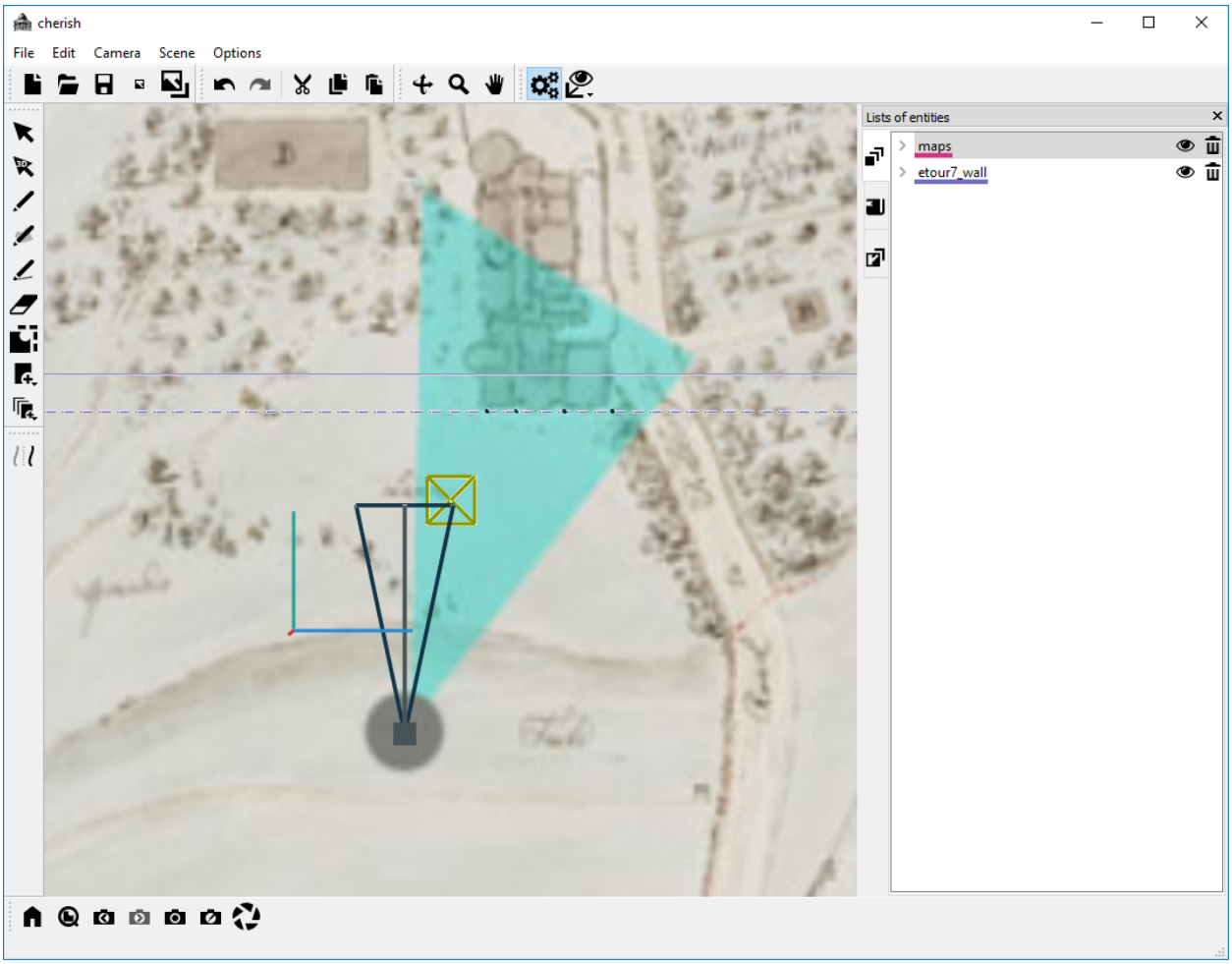


Note that these line segments will just serve as a preliminary sketch. We will just be using them for reference when we are aligning our image along the front of the building; thus, it does not matter how tall the lines are, or how straight they are.

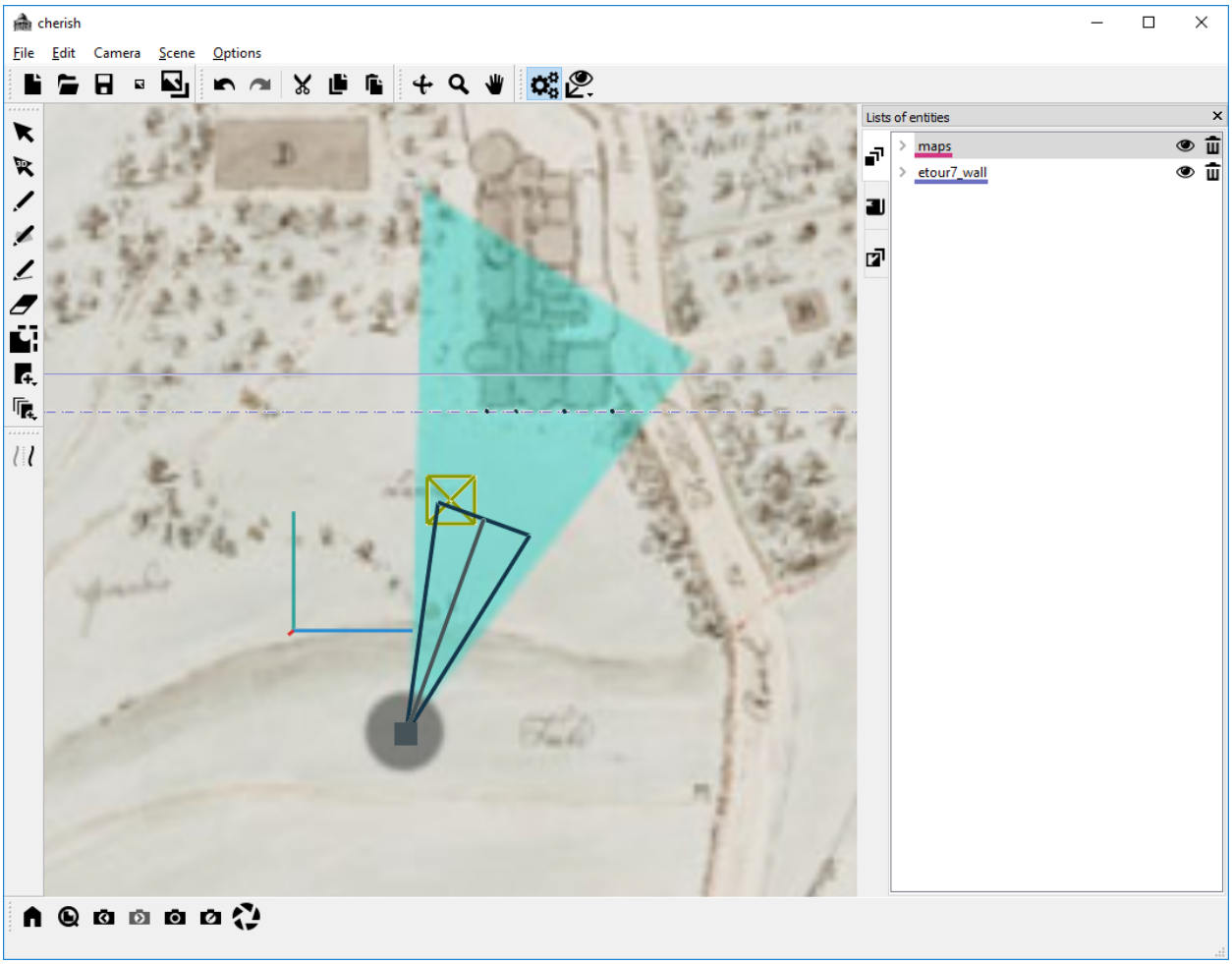
Next, we will position a new bookmark using our “etourmap_7” image and the “Position new bookmark” tool:



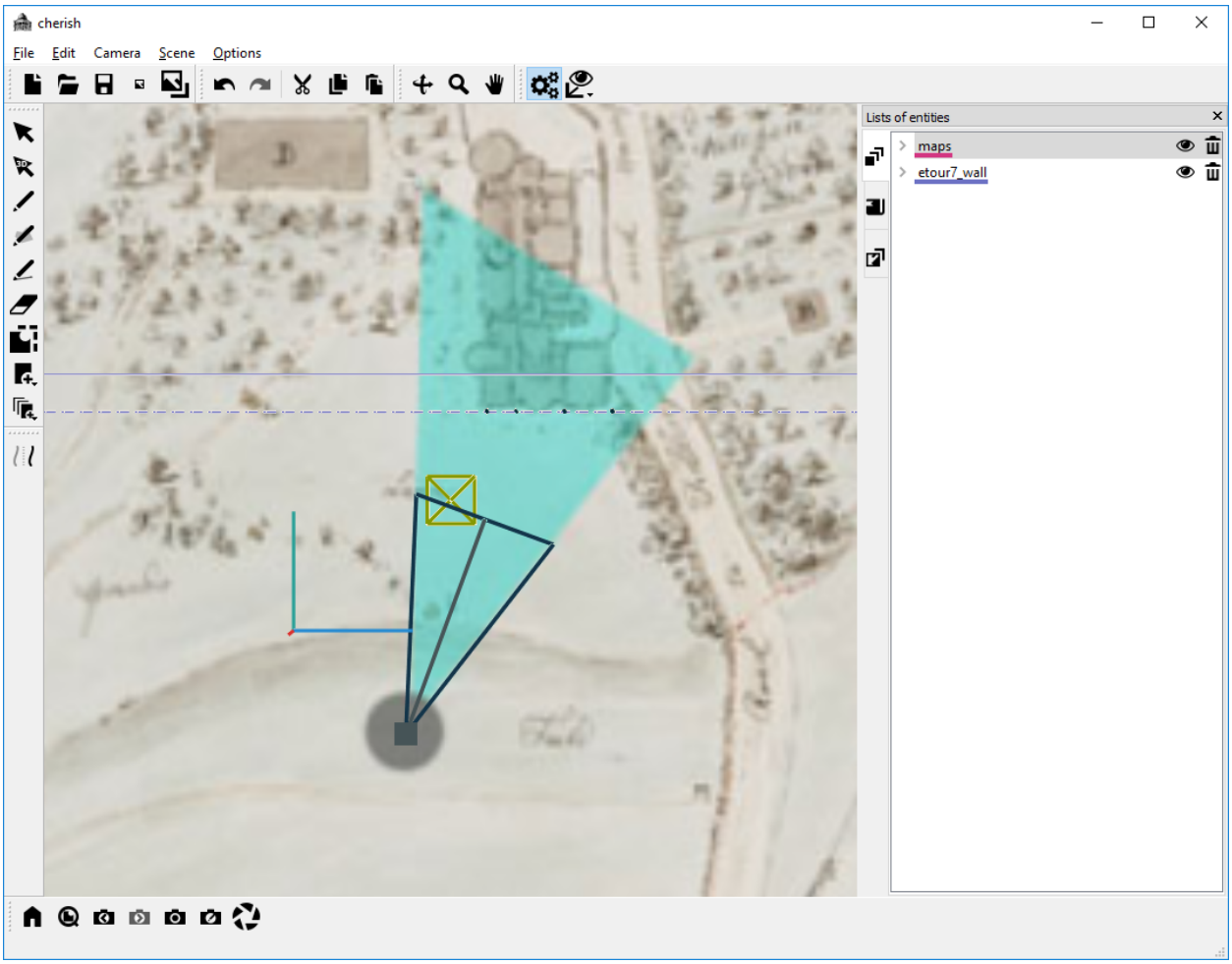
After clicking “Position new bookmark”, first click in the middle of the circle. This will establish the viewer position for the new camera view:



Next, click in the middle of the view triangle to establish the view direction:

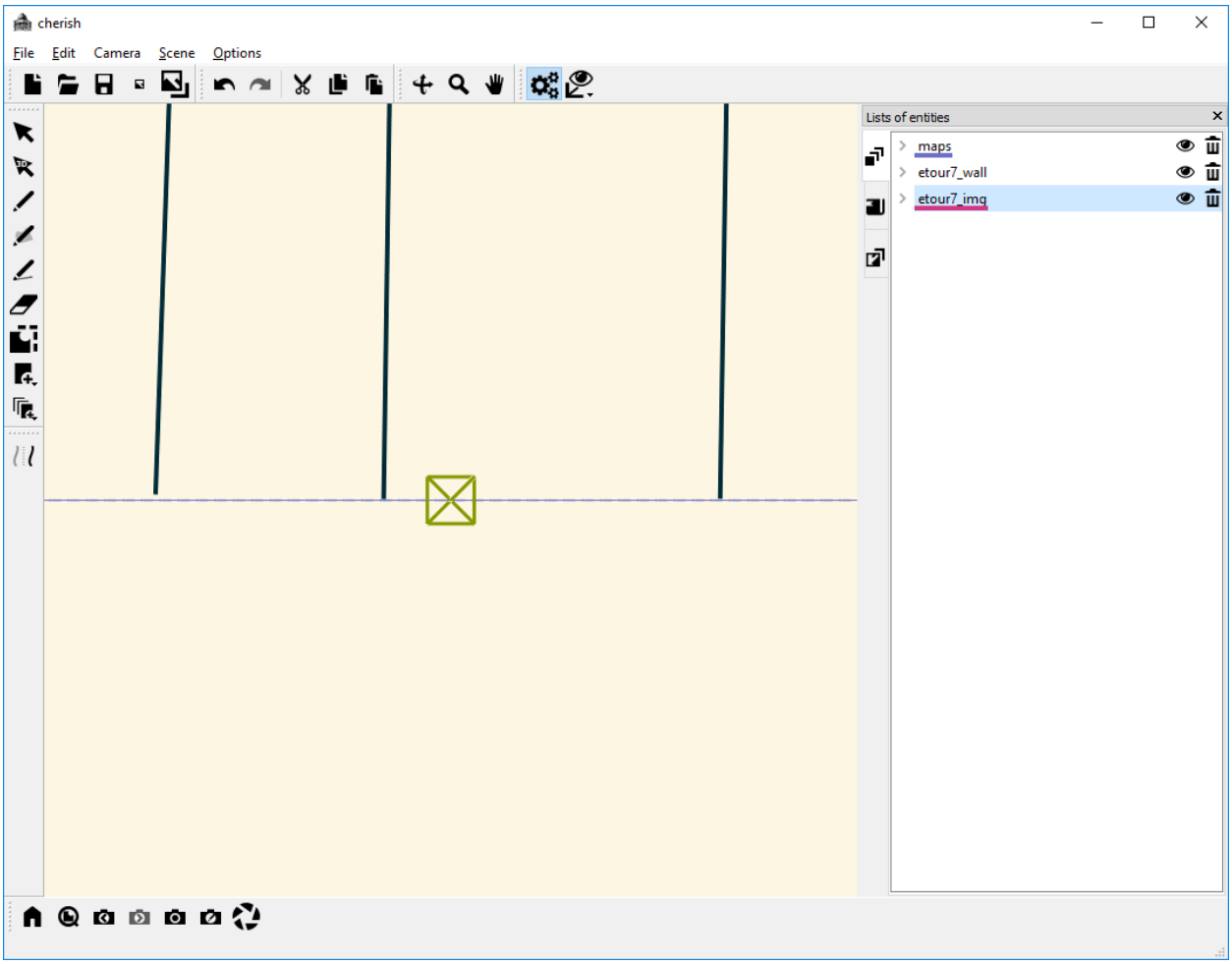


Finally, adjust the field of view by clicking when the black triangle aligns with the blue triangle:



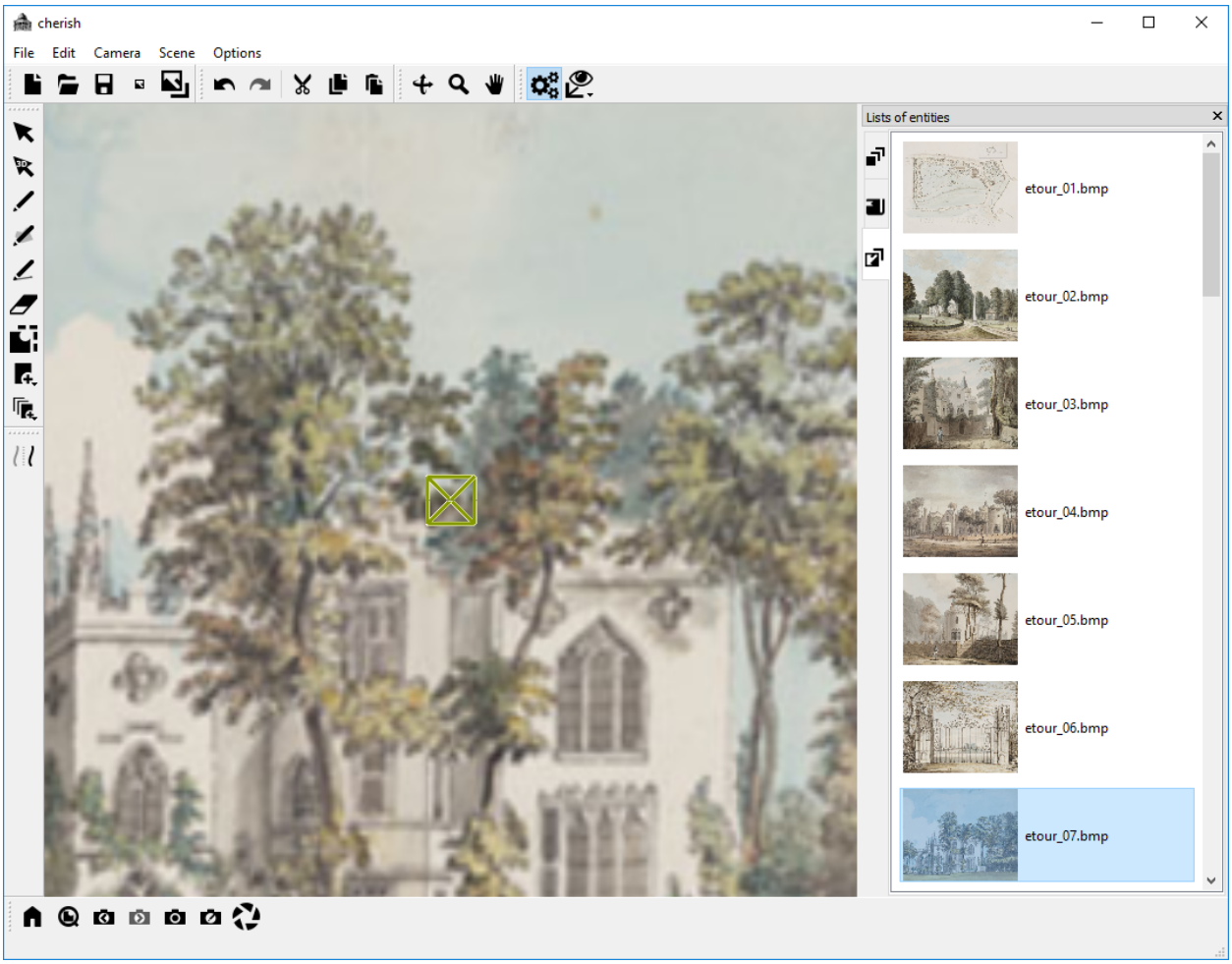
When prompted to create a new canvas associated with this view, click “Yes”.

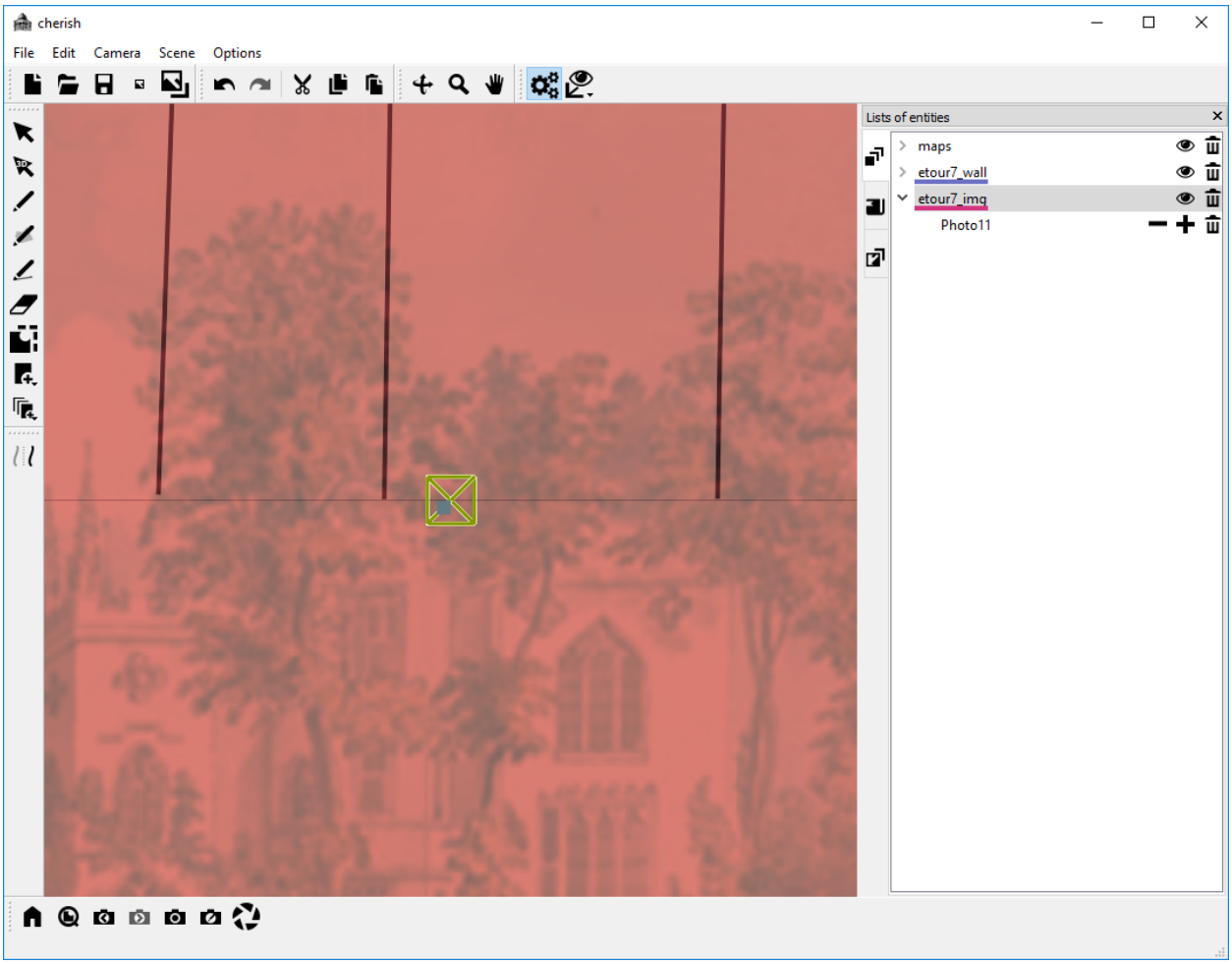
Our new view will look something like this:



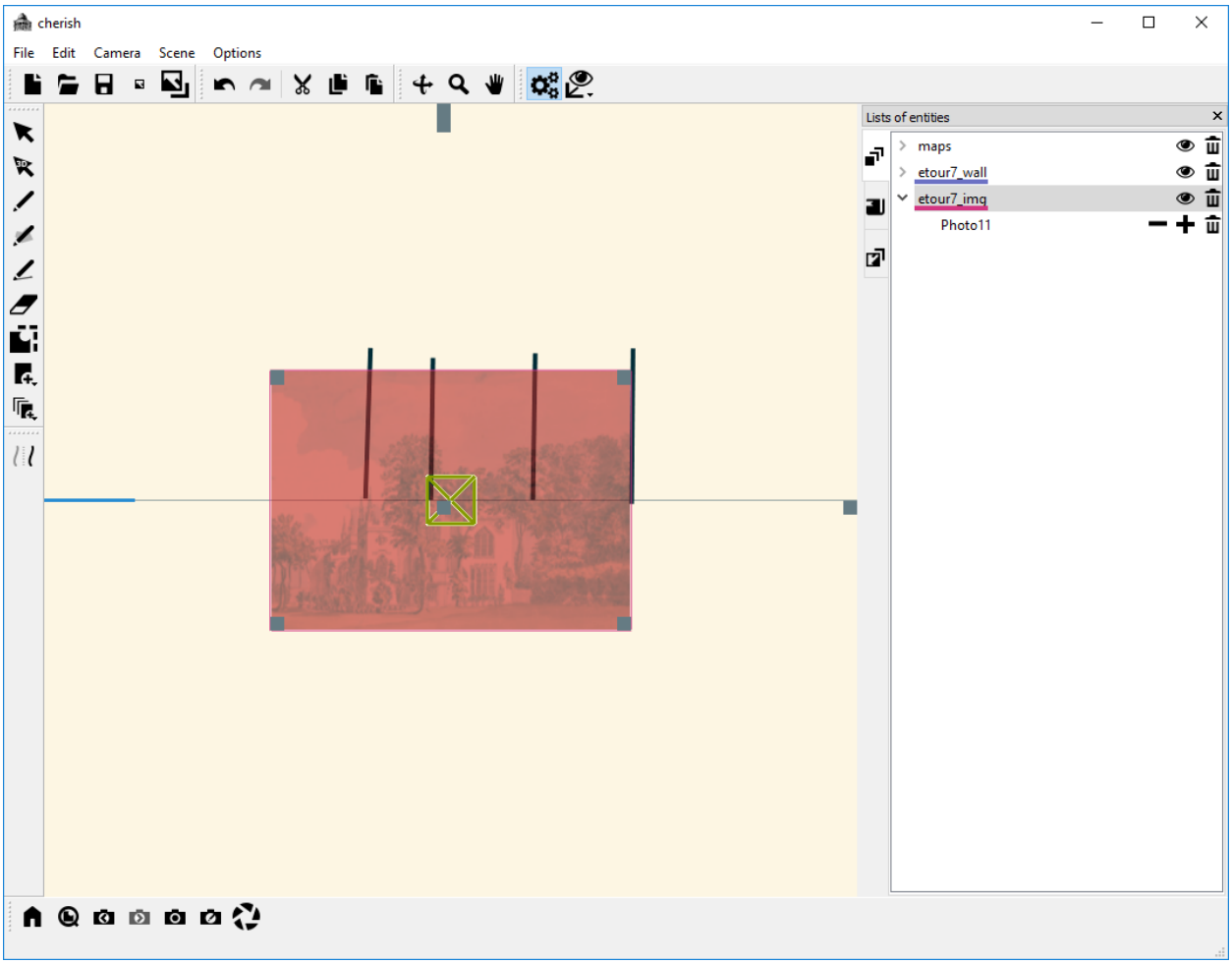
Unfortunately, this is not a great camera view for drawing the front of the building (as we cannot see all the vertical lines we have previously drawn). However, we will adjust our view after we add our new image.

Accordingly, we will drag the “etour_7.bmp” image onto the new canvas created when we created the new bookmark:

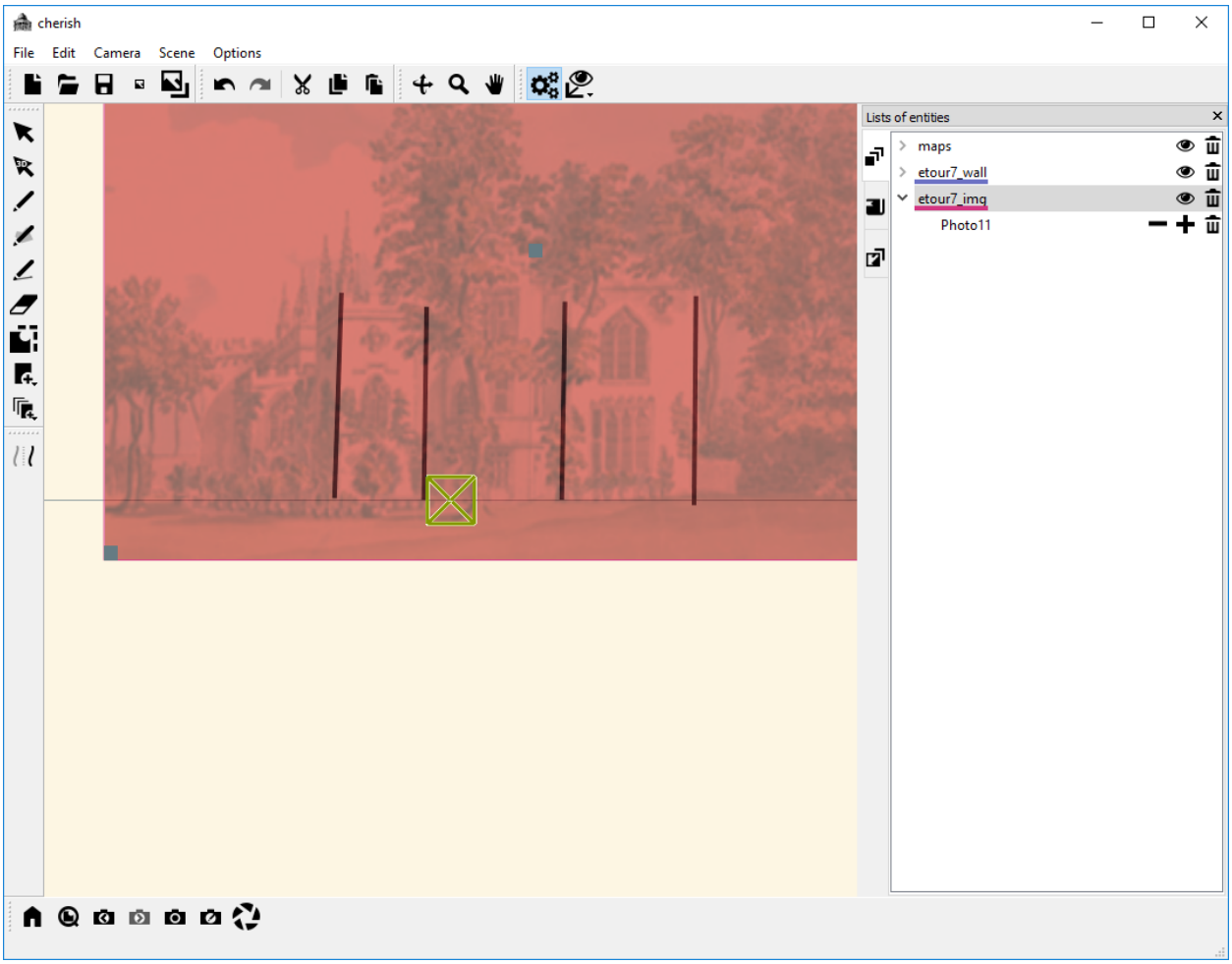

cherish
File
Edit
Camera
Scene
Options
Lists of entities
etour_01.bmp
etour_02.bmp
etour_03.bmp
etour_04.bmp
etour_05.bmp
etour_06.bmp
etour_07.bmp



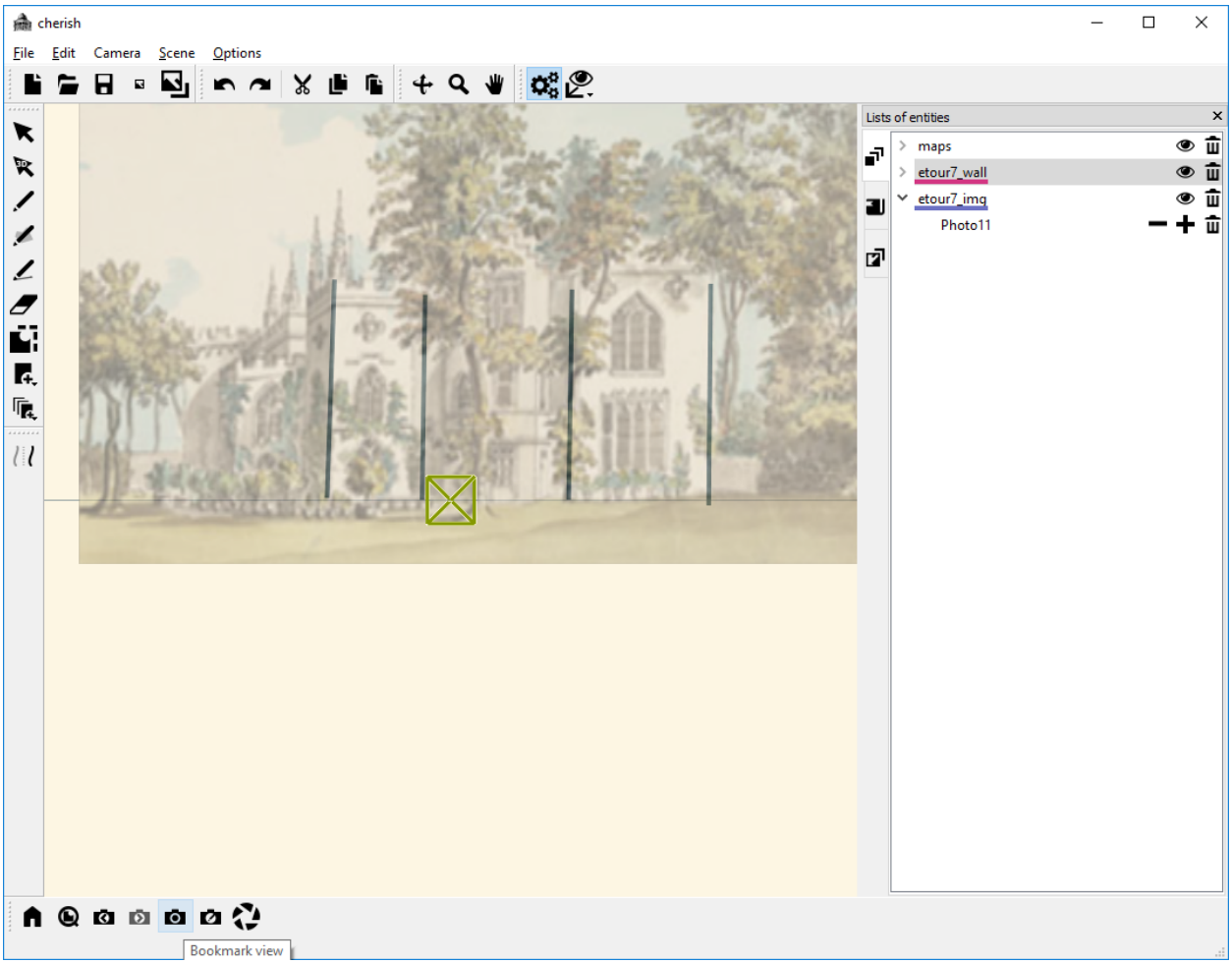
We can adjust the transparency of the new image to allow us to see the line segments that we drew earlier. Now, we will try to find a better camera view for drawing the front of the building. We will do this in two steps. First we will zoom out, such that the four vertical lines occupies a space in the center of the screen:



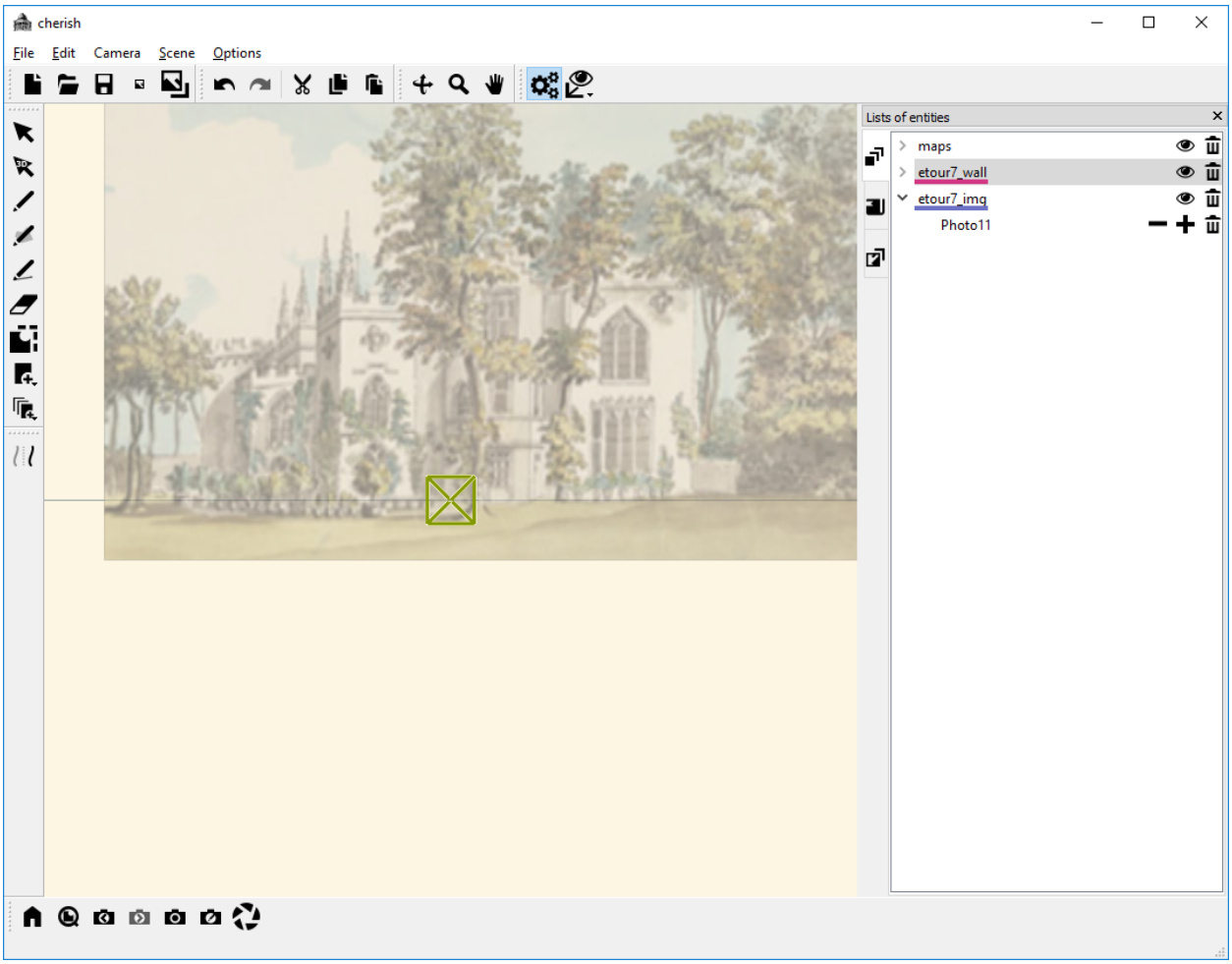
Next, we will adjust the size of the image itself and move the image so that the walls of the building align with the lines we drew previously. This will probably take a bit of time, but the final results should appear as follows:



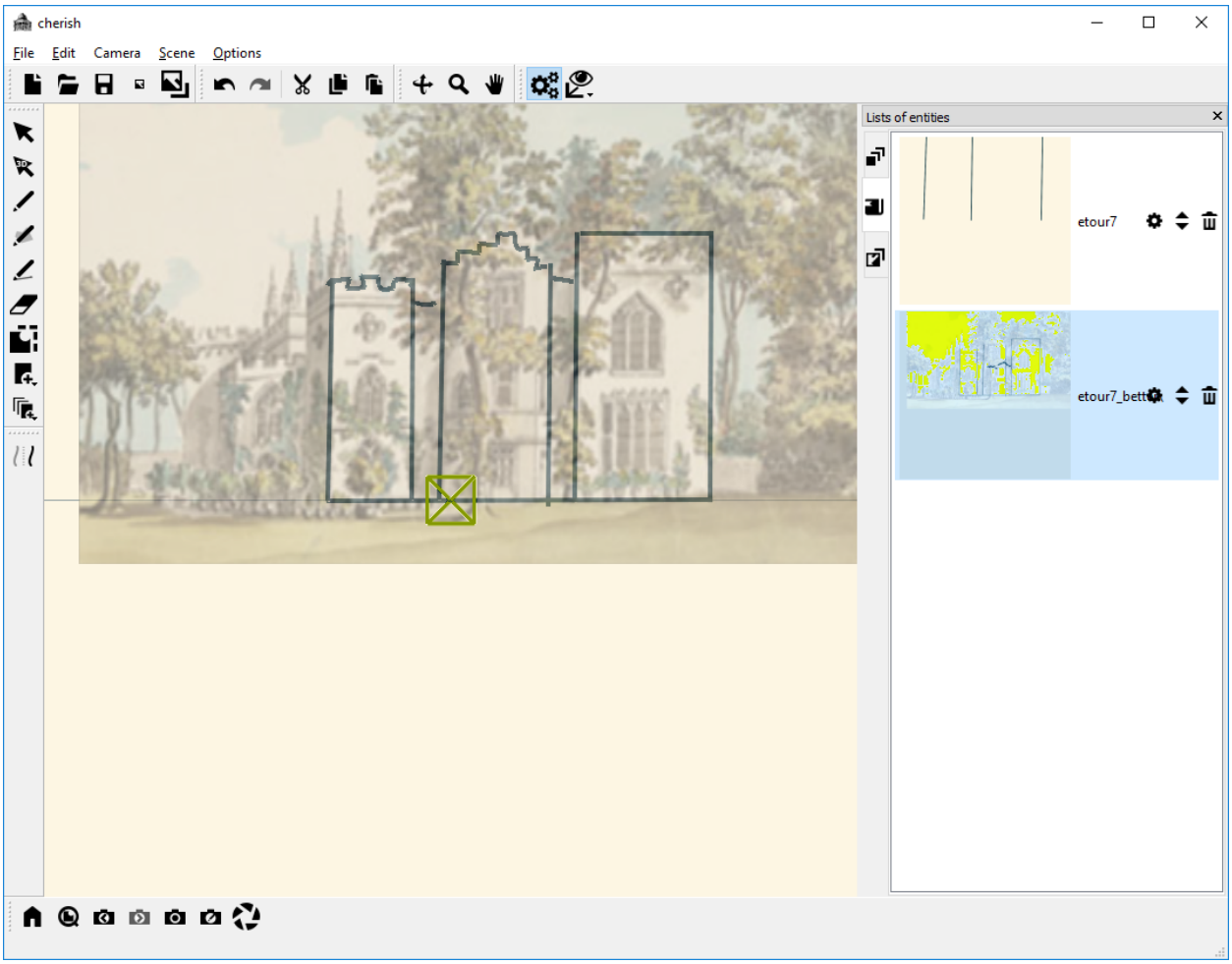
We will create a new bookmark with this camera view using the “New bookmark” tool:



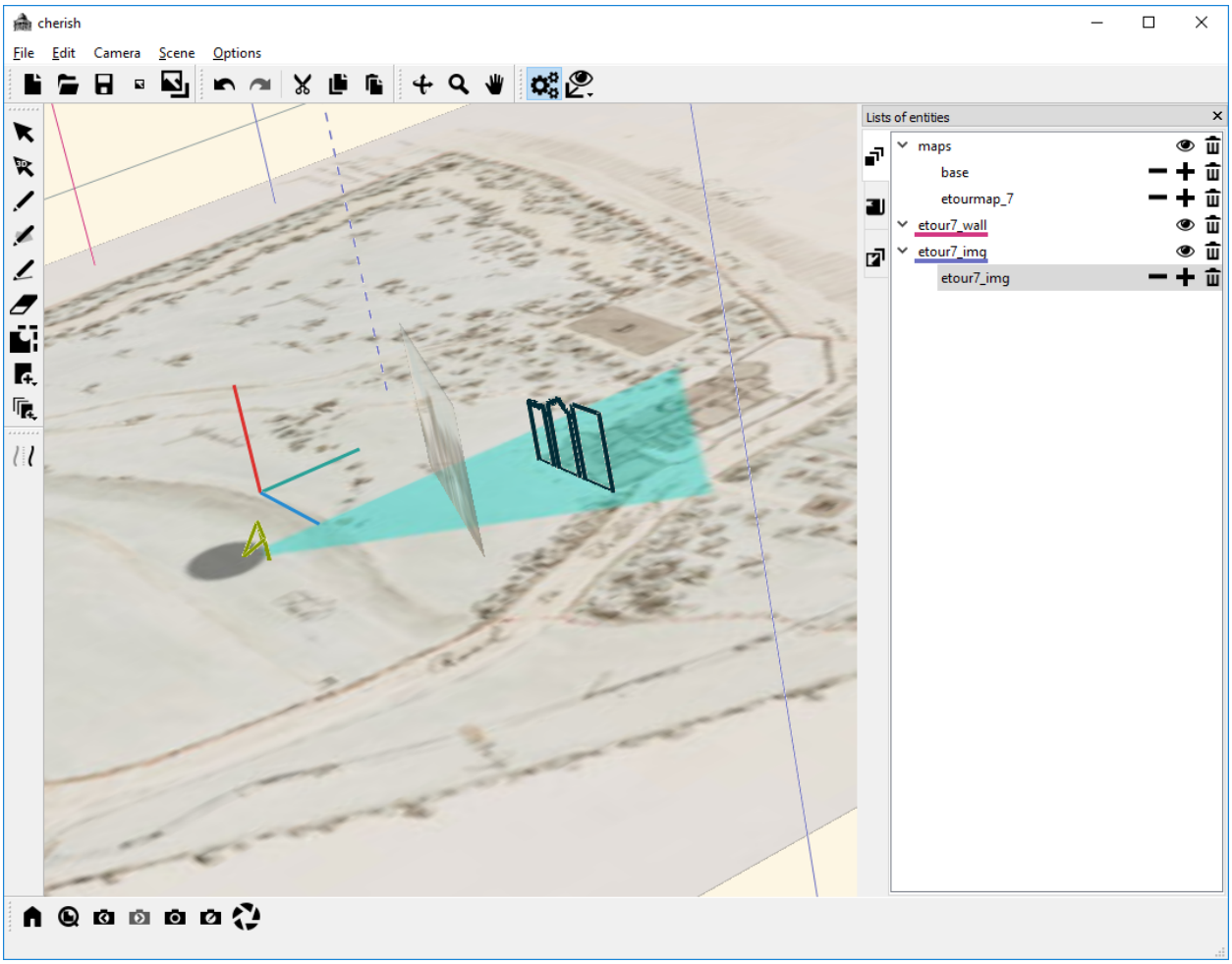
At this point, we can use the “Deleter” tool to delete the line segments we drew previously (make sure the correct canvas is selected):



Once we have a blank slate, we can now trace the outline of the front of the building using the “Draw line segment” and “Draw” tools. The finished tracing should look something like this:



From a different view:

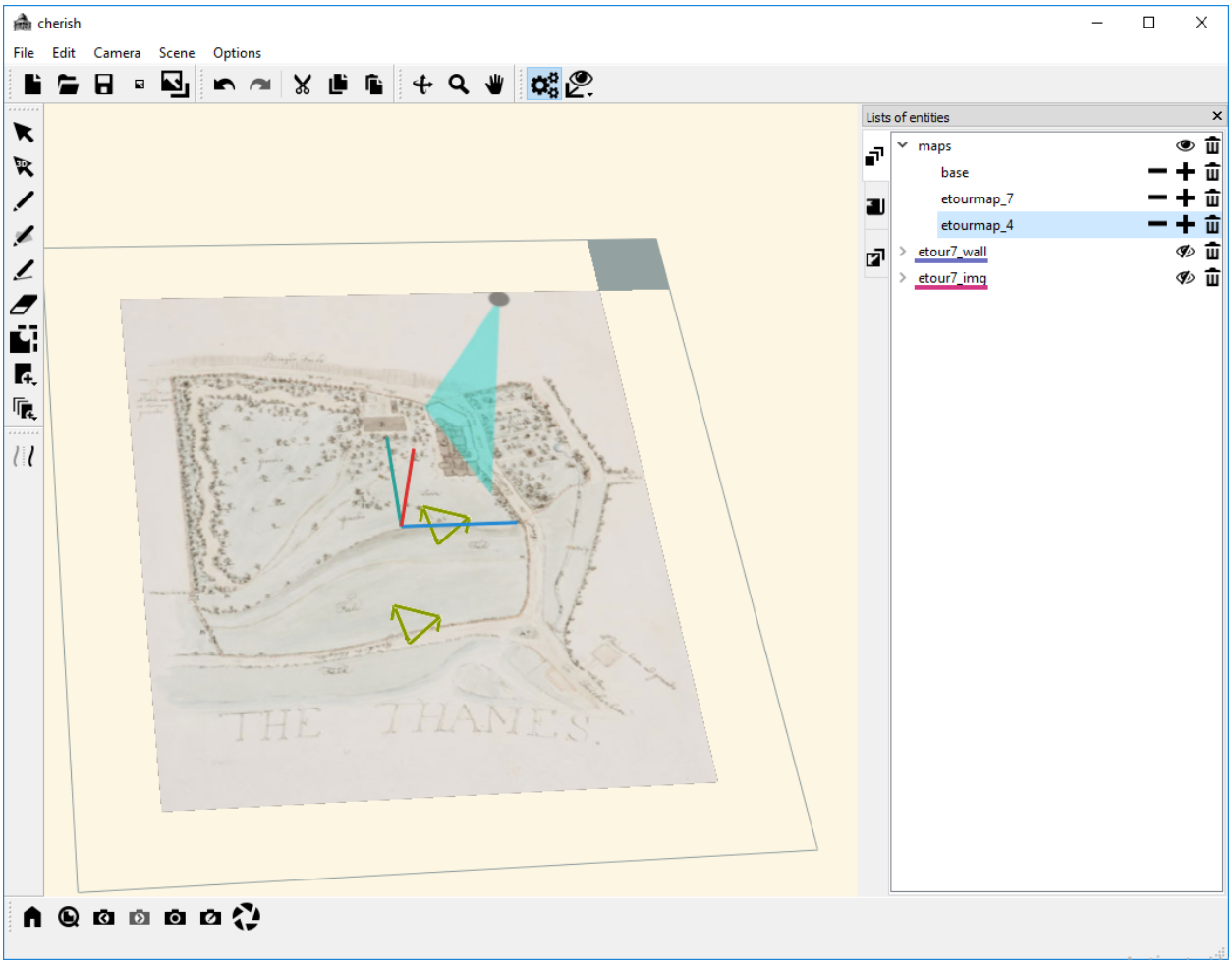


Congratulations! We've successfully traced the front wall.

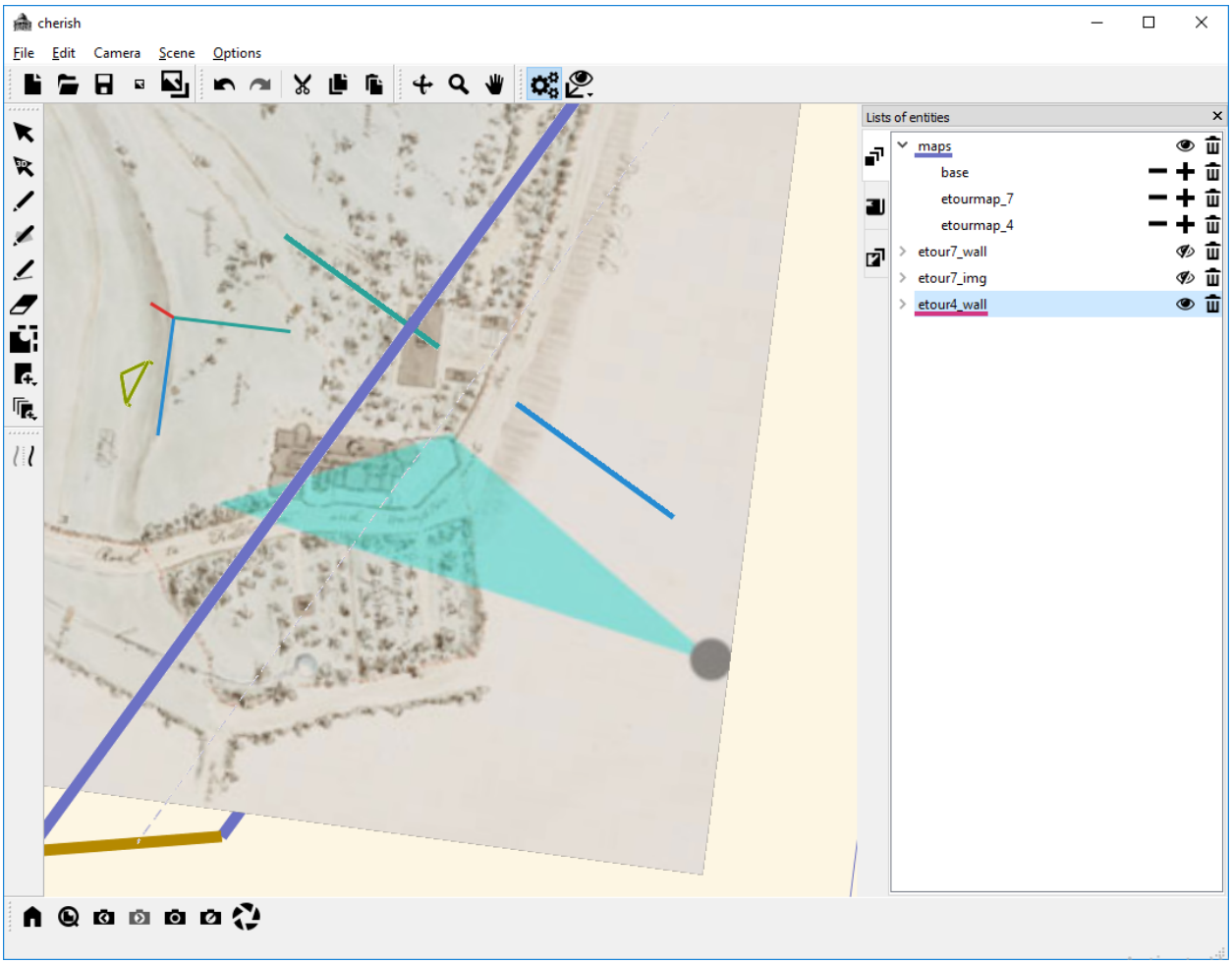
Tracing the Other Walls:

Now, we will use the same method that we used to trace the front wall to trace the remaining walls of the building.

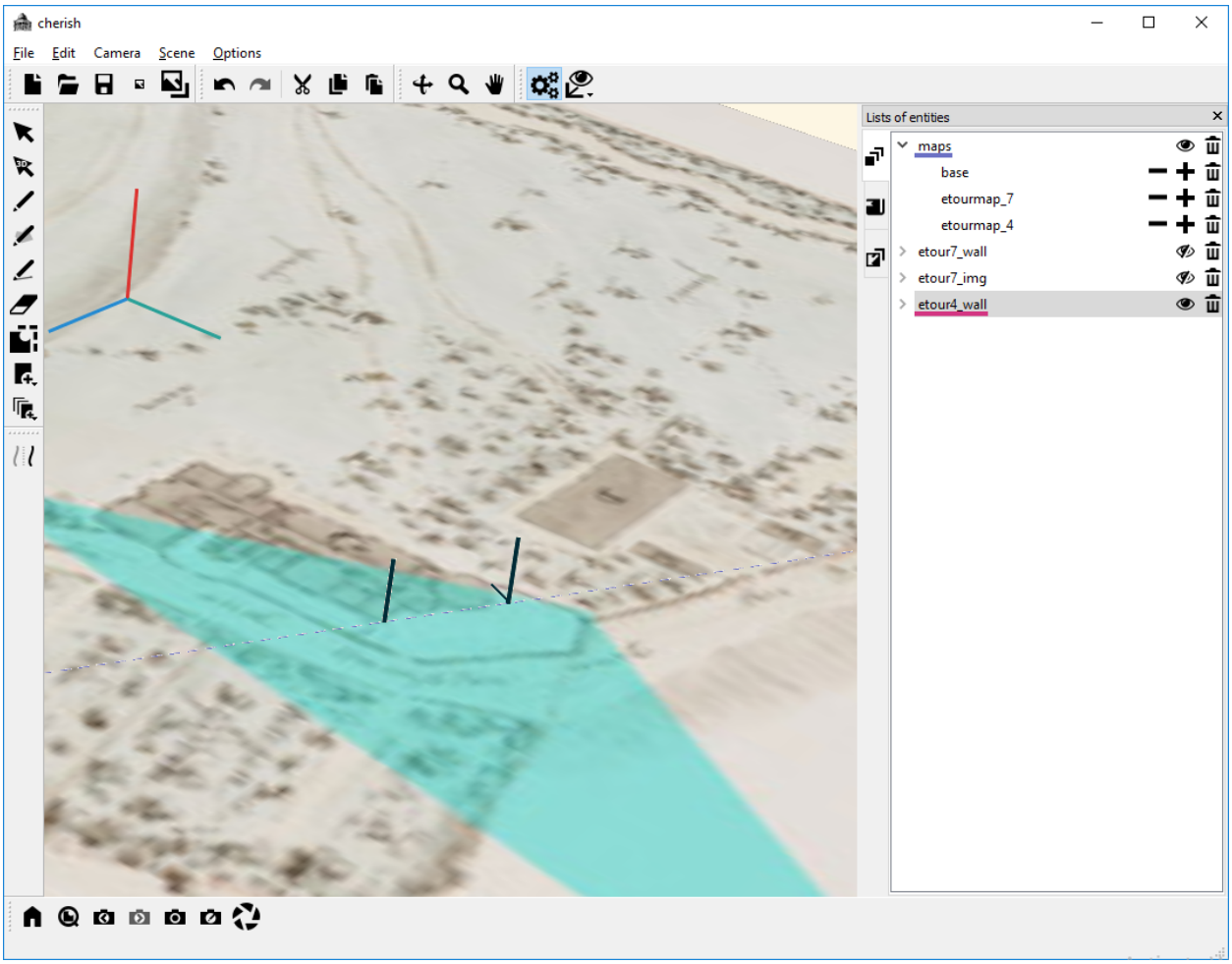
Consider the back wall of the building. First, we will add an additional map "etourmap_4" to our "maps" canvas:



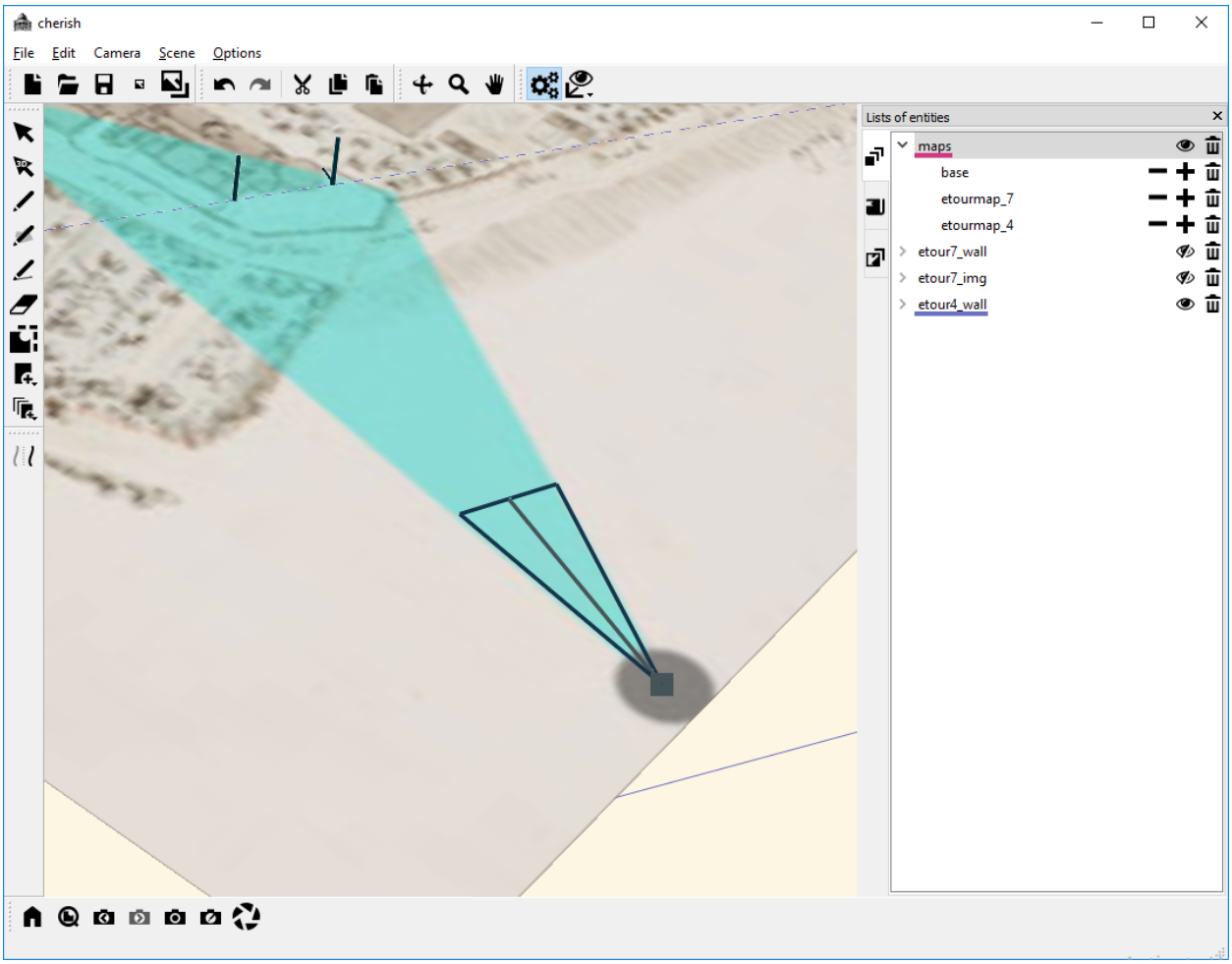
Then add a new XZ plane, and adjust the plane such that it lines up with the back of the building as shown in the floorplan. This is somewhat tricky, as the back of the building is not one flat plane, but rather includes a series of outcroppings as well as a cylinder. For now, we can approximate the outline of the building with a single plane as shown below:



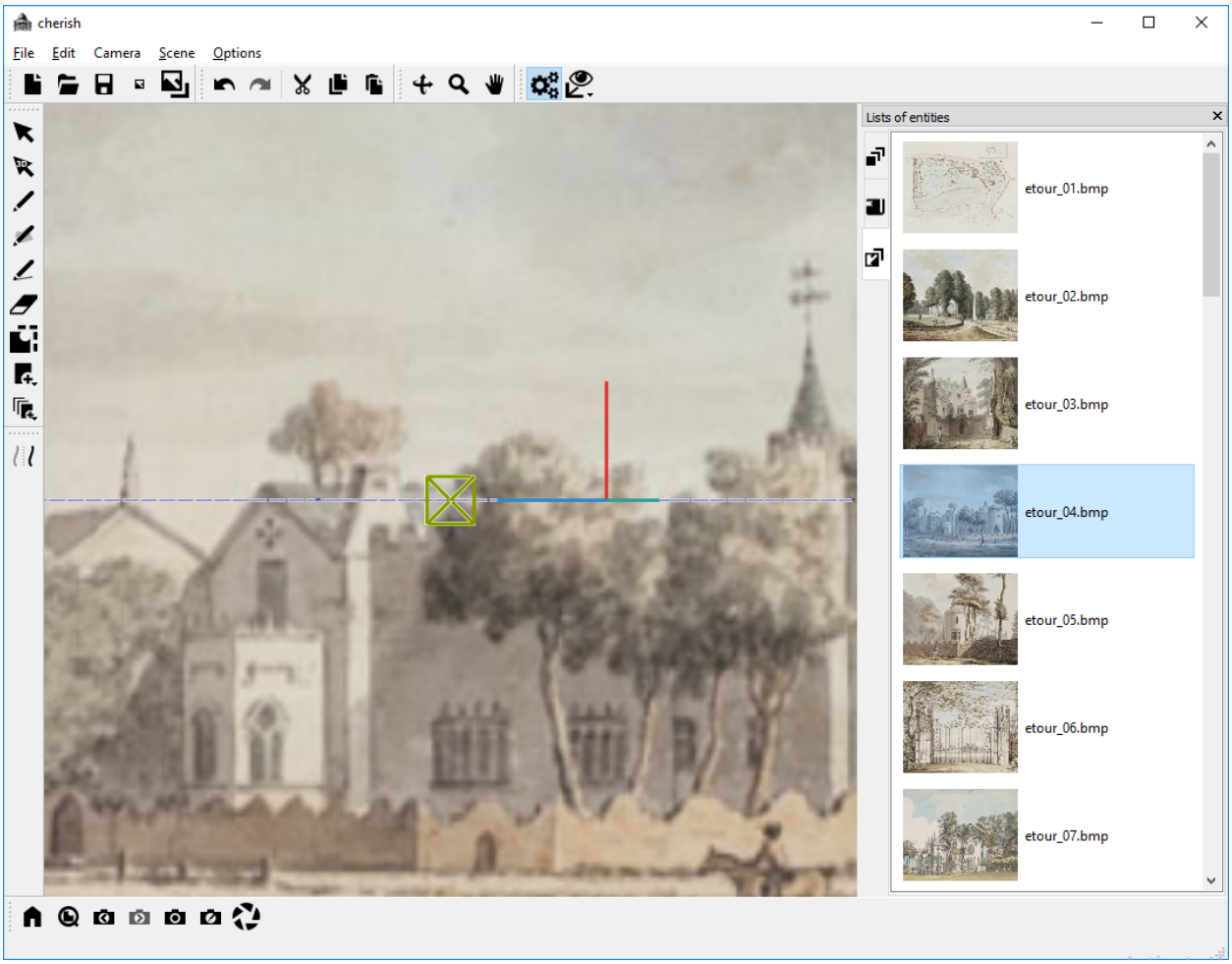
Now, we will once again add some vertical lines as markers. In this case, we chose to draw one line at the farthest left point along the back wall and one line marking the farthest edge of the cylinder as it would appear from this view. Note that we drew a horizontal line on the “maps” canvas to aid in determining the location for placing the vertical line:



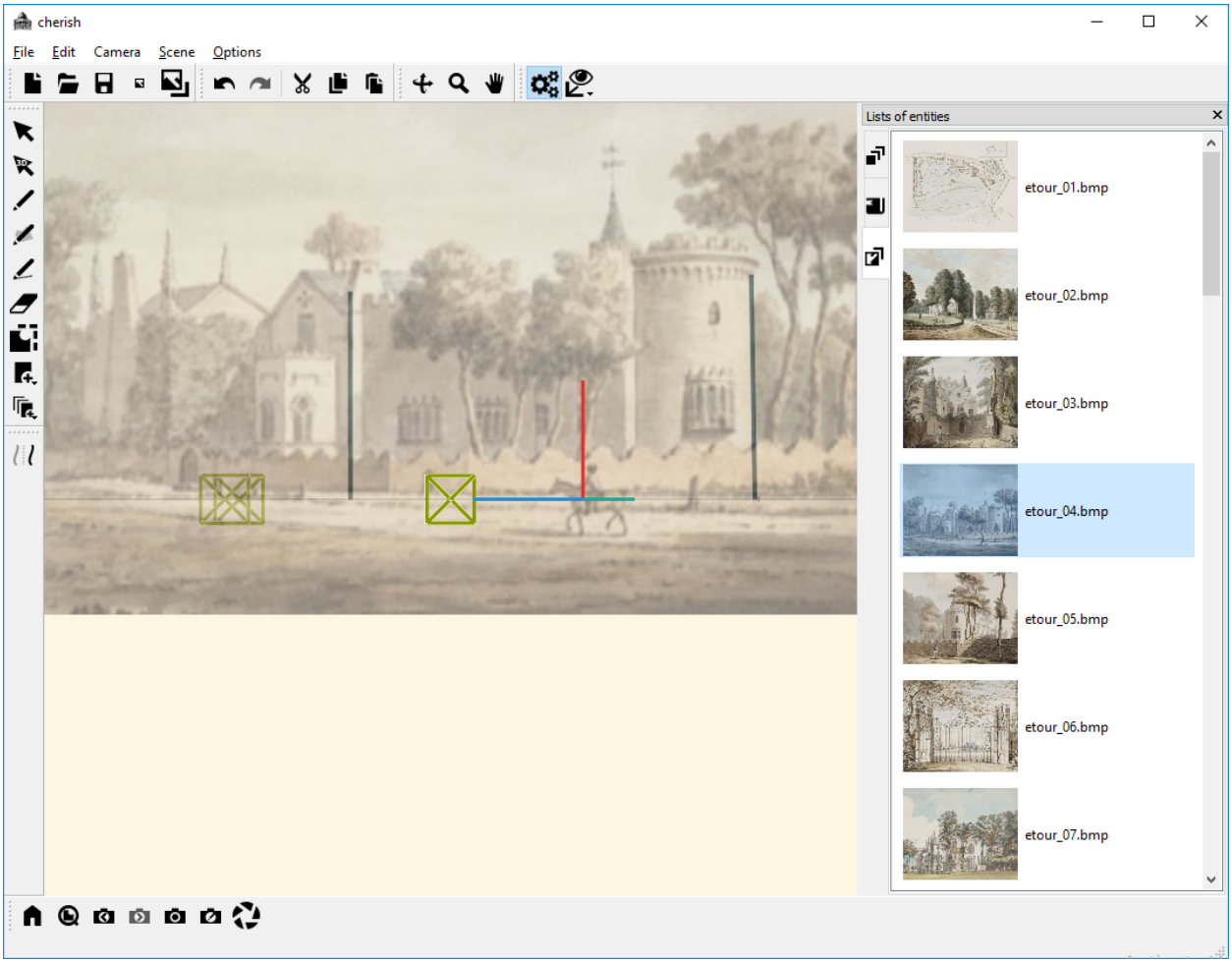
At this point, we can once again set a new view:



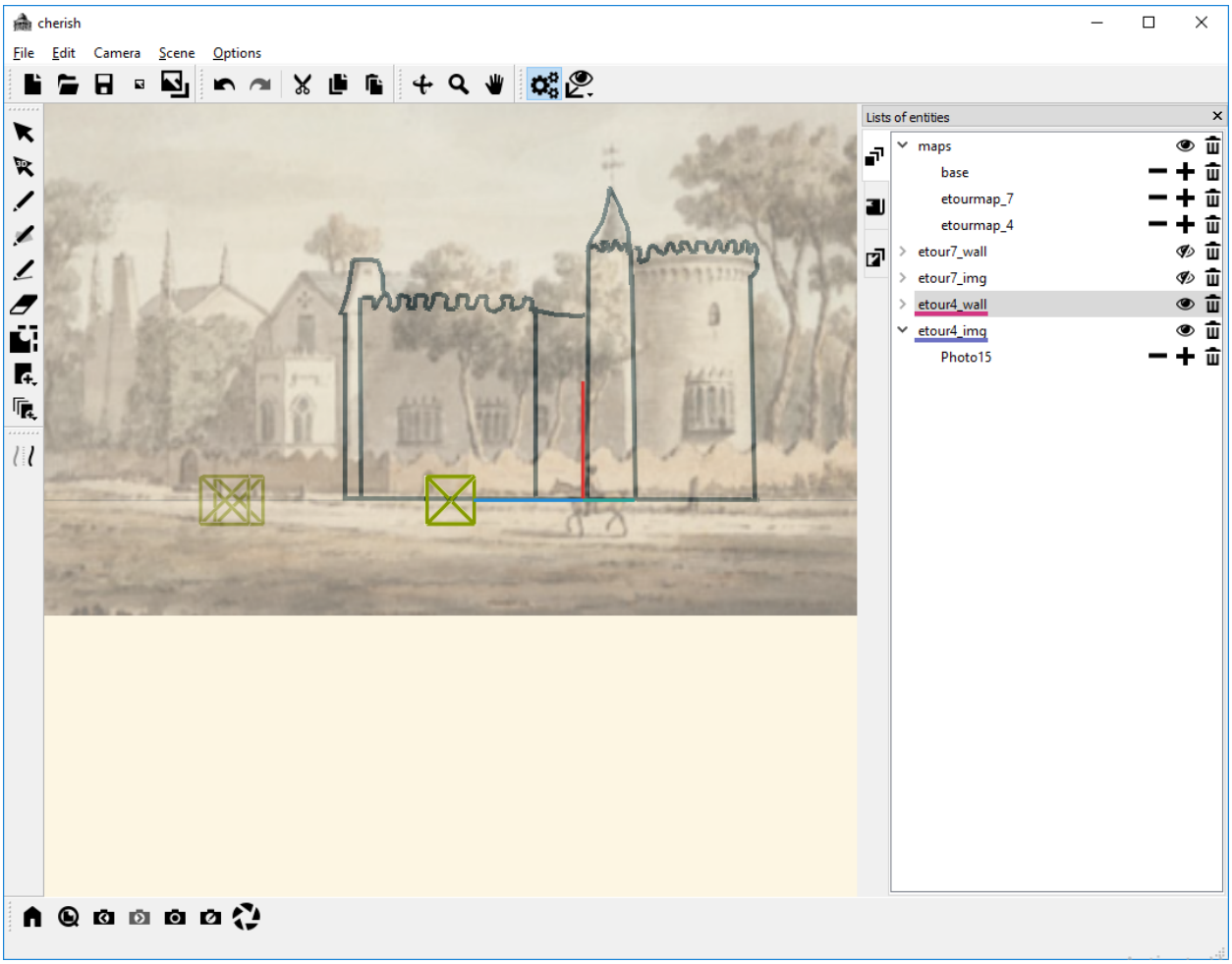
We then insert the “etour_4” image into the new canvas created with our new view:



And then we can once again edit the size and location of the image, as well as the zoom of the camera view, such that the image is set within the vertical lines we drew earlier:

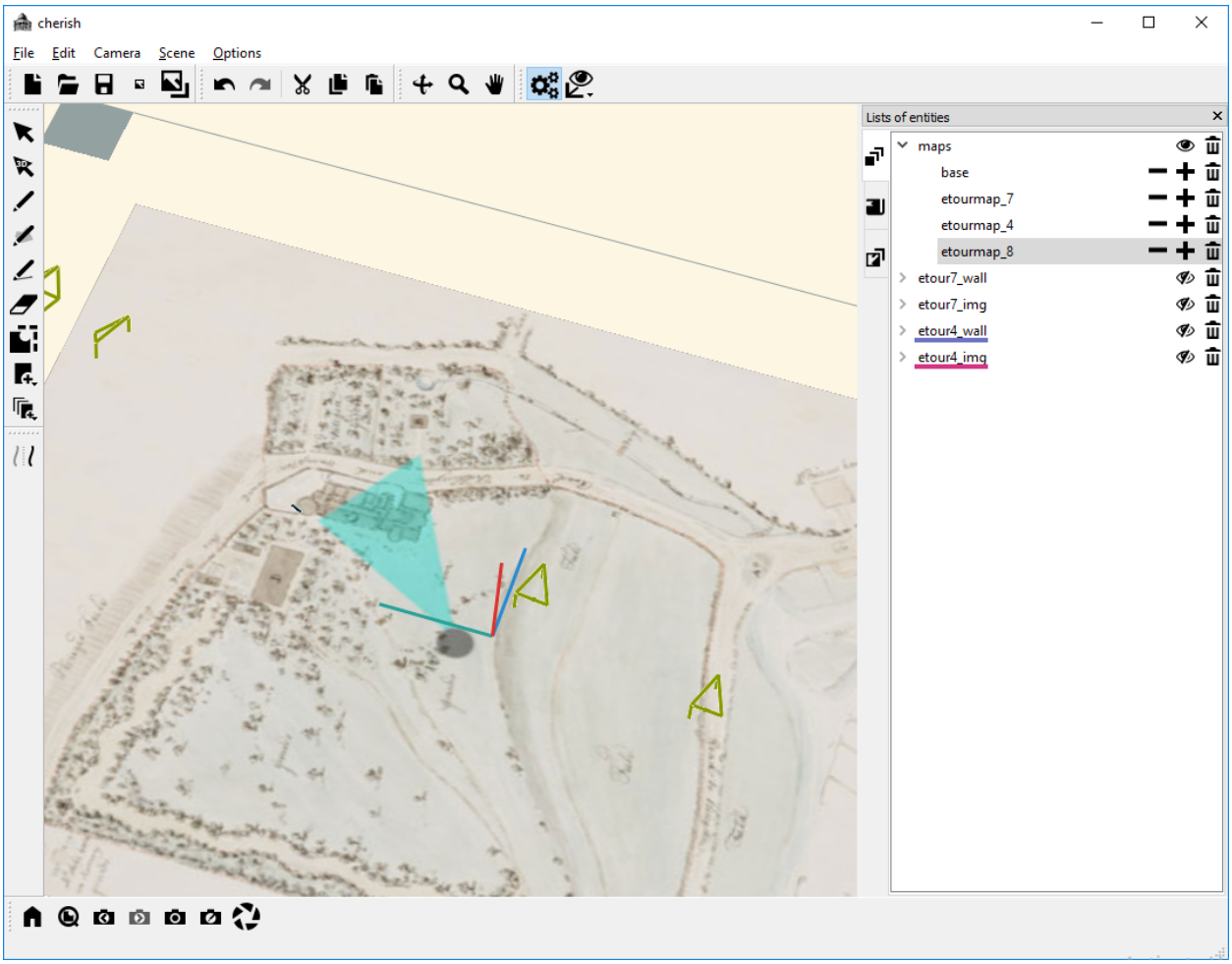


Once we bookmark this view, we will erase our earlier lines, and trace an outline of the wall:

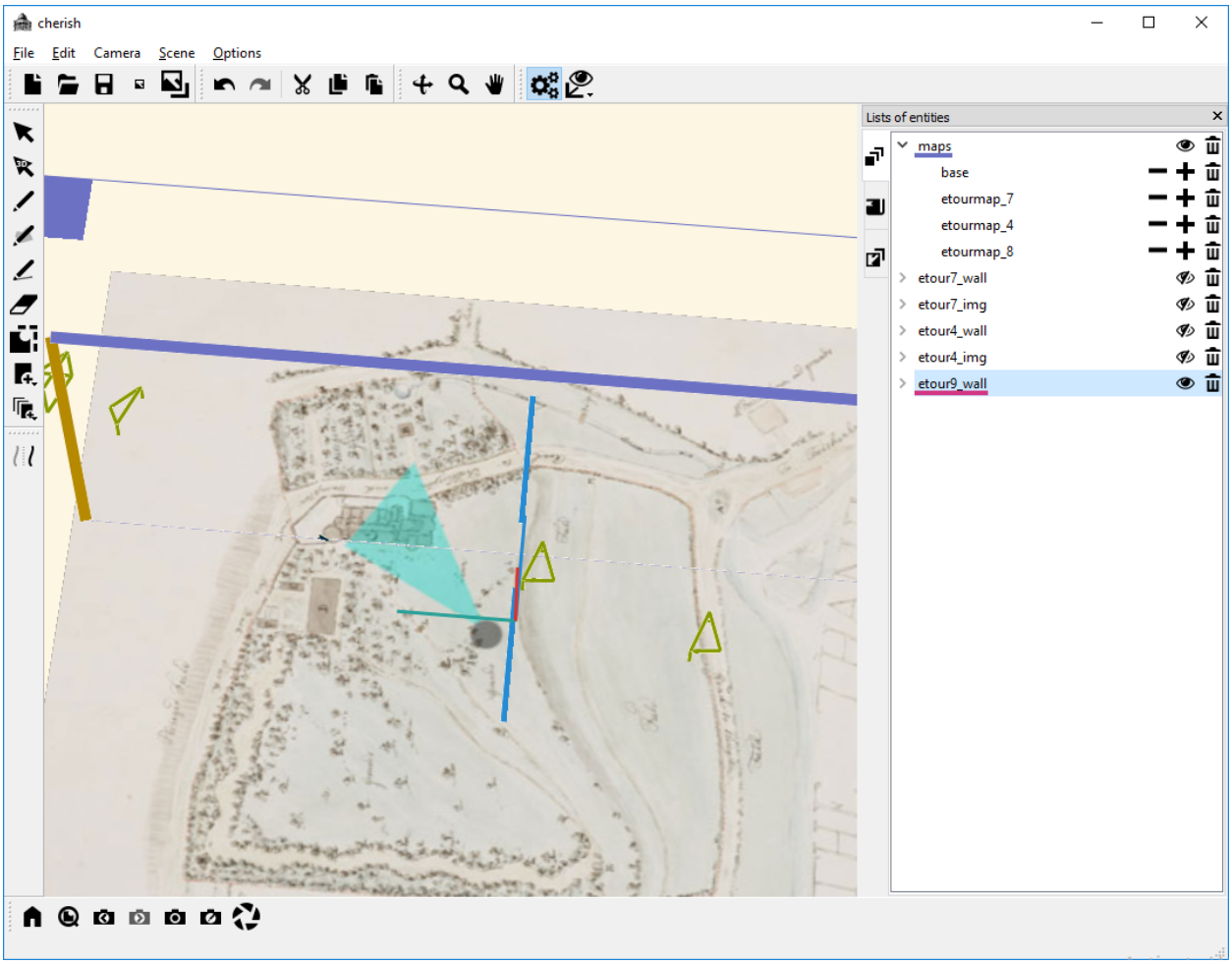


At this point, we have traced a relatively good approximation of the wall. However, it is important to note that we did not capture the true 3D structure of the cylinder using this approach.

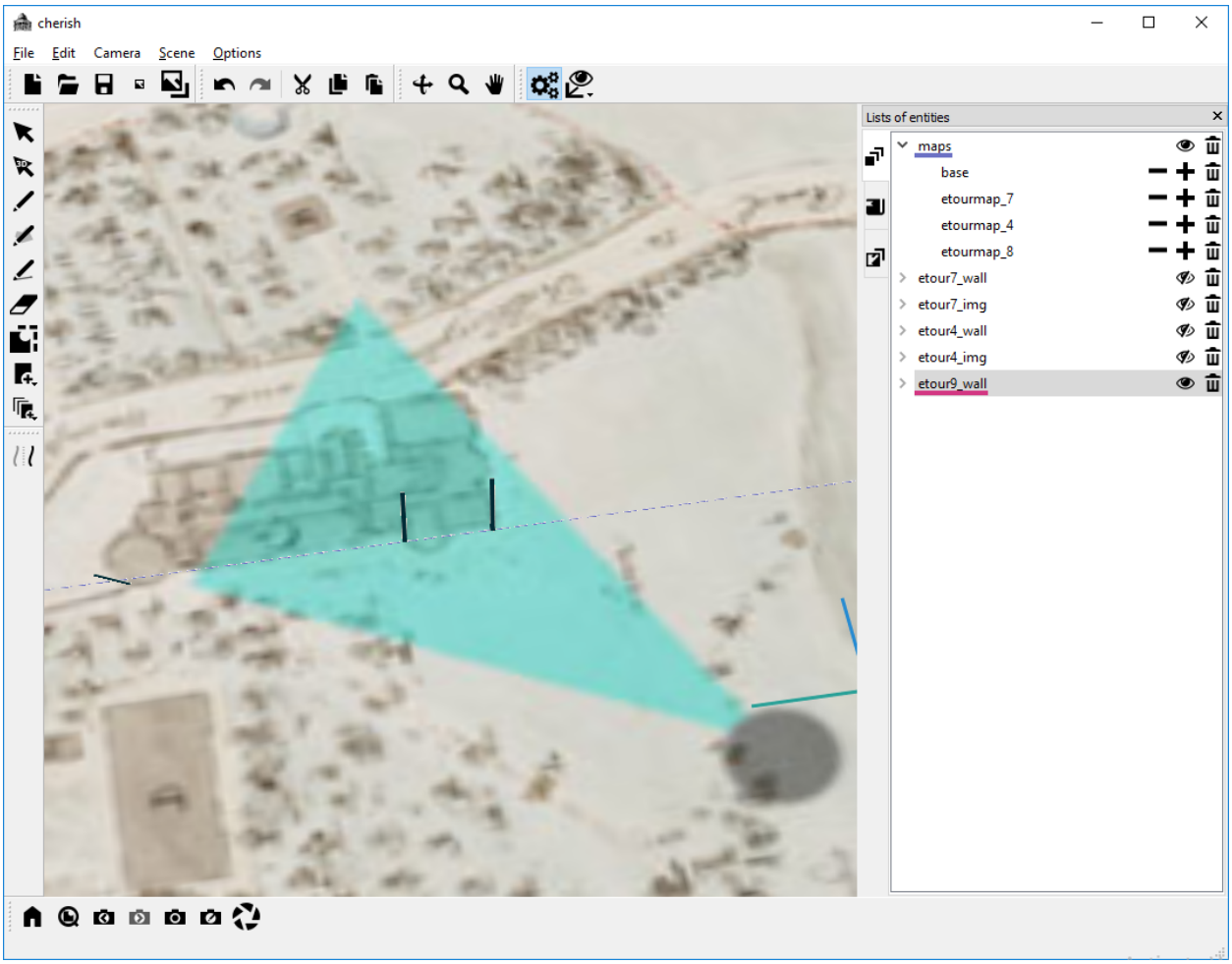
Once again, we can use our technique to trace the left wall of the building. In this example, we will first insert the “etourmap_9” image into the “maps” canvas:



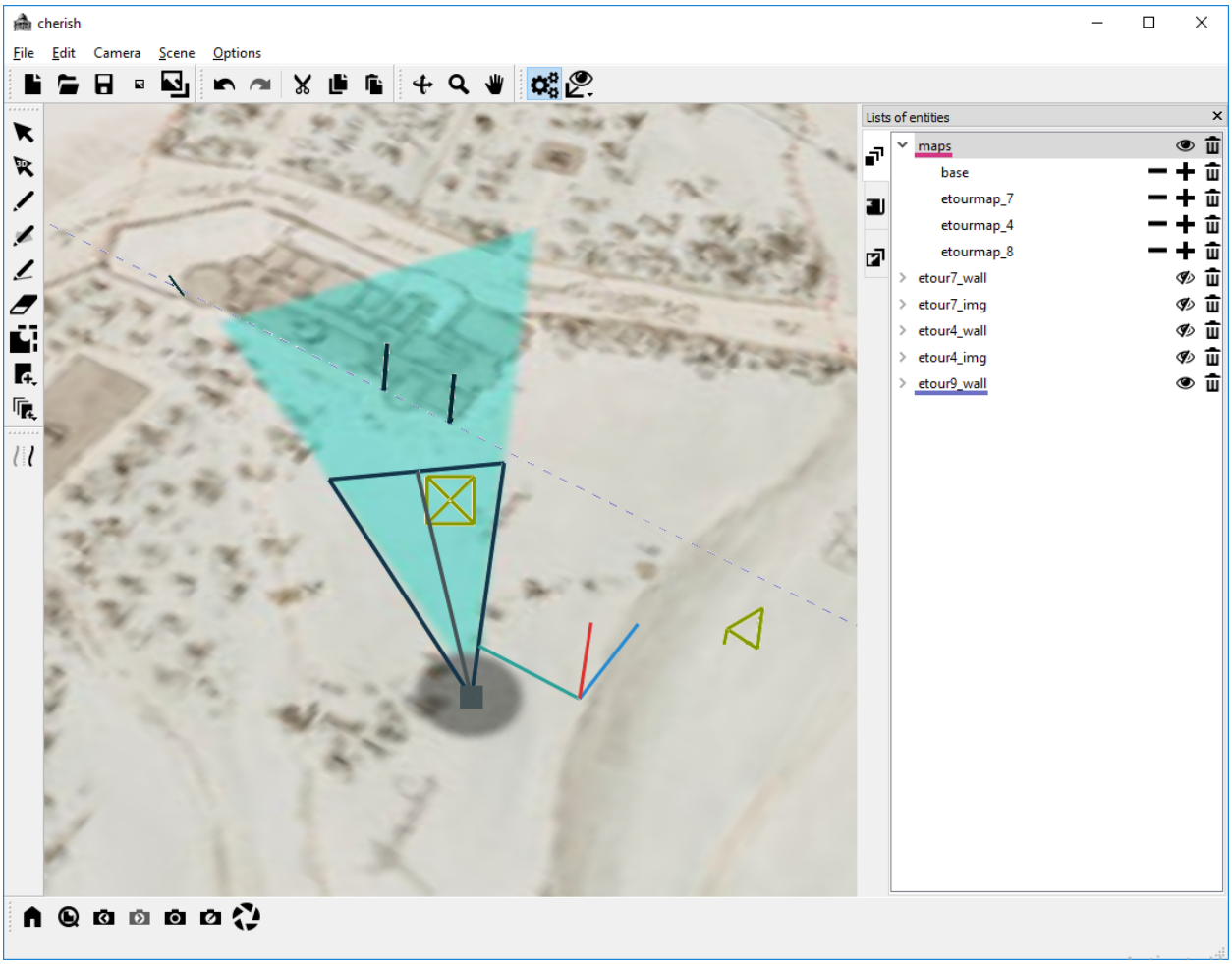
We then add a new YZ canvas, and adjust the canvas to align with the floorplan:



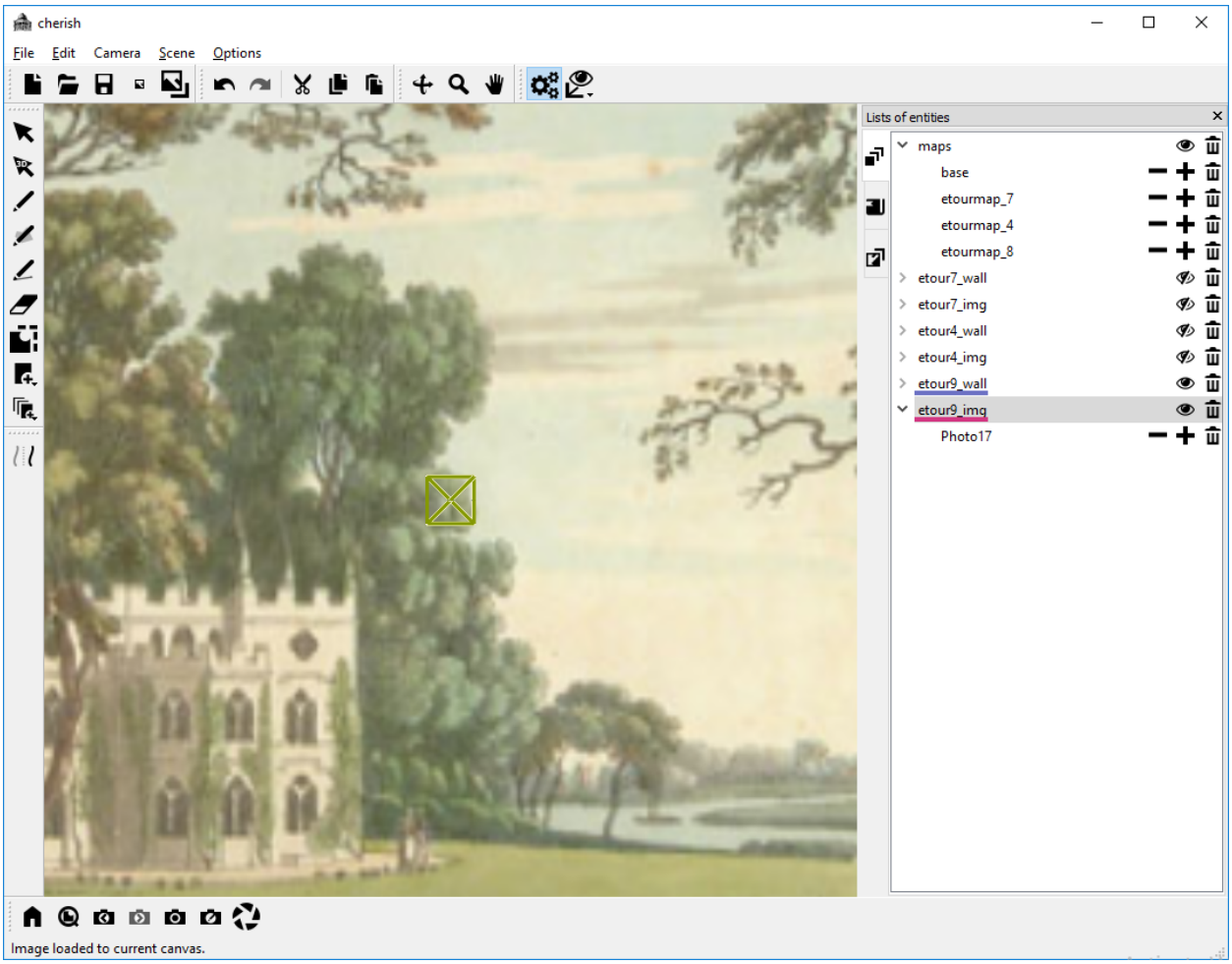
We can then draw some vertical lines. In this case, drawing one line at the right edge of the wall and one line at the left edge of the outcropping will provide good reference lines:



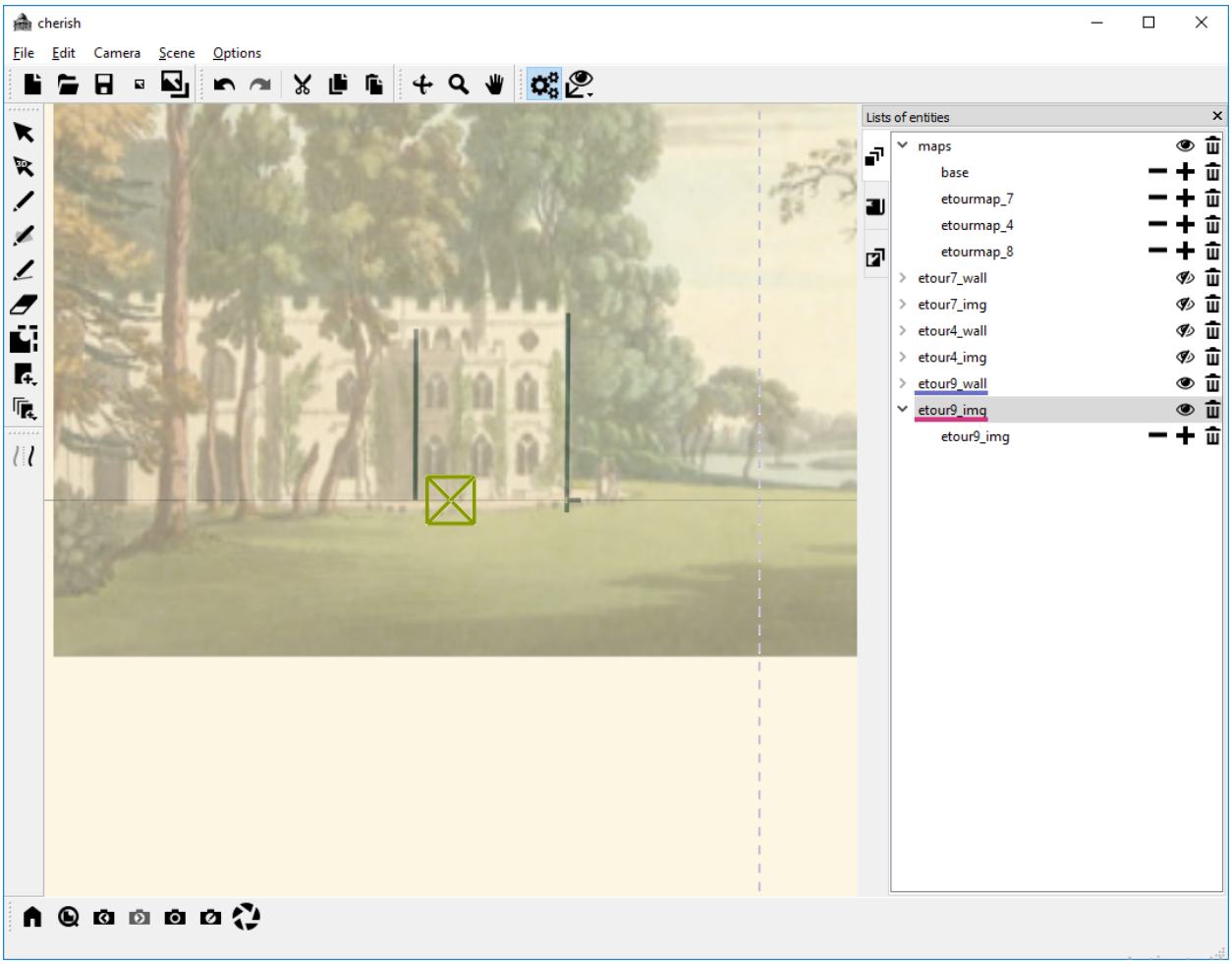
We can then add a new view:



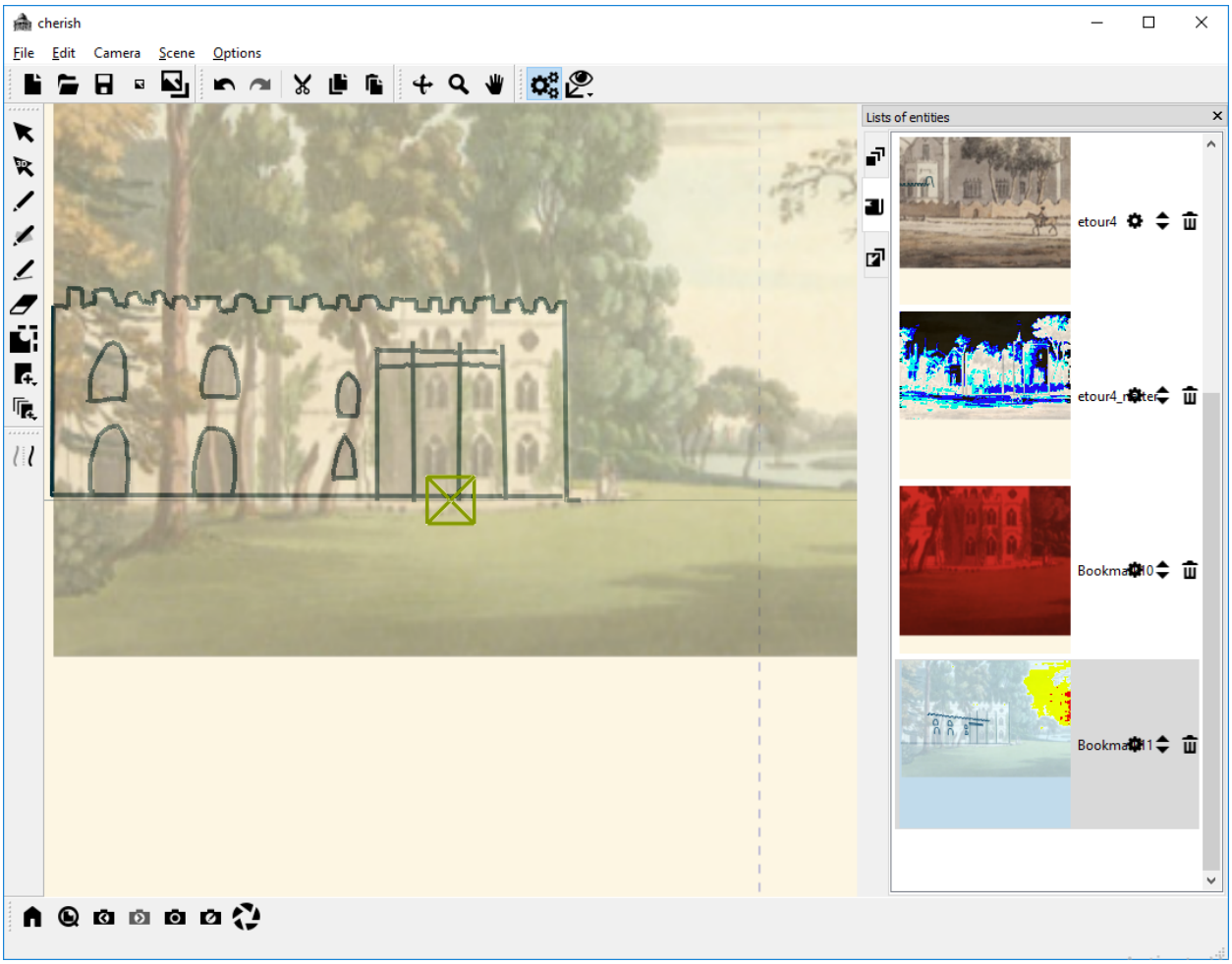
We can insert the “etour_9” image into the new canvas associated with the new camera view:



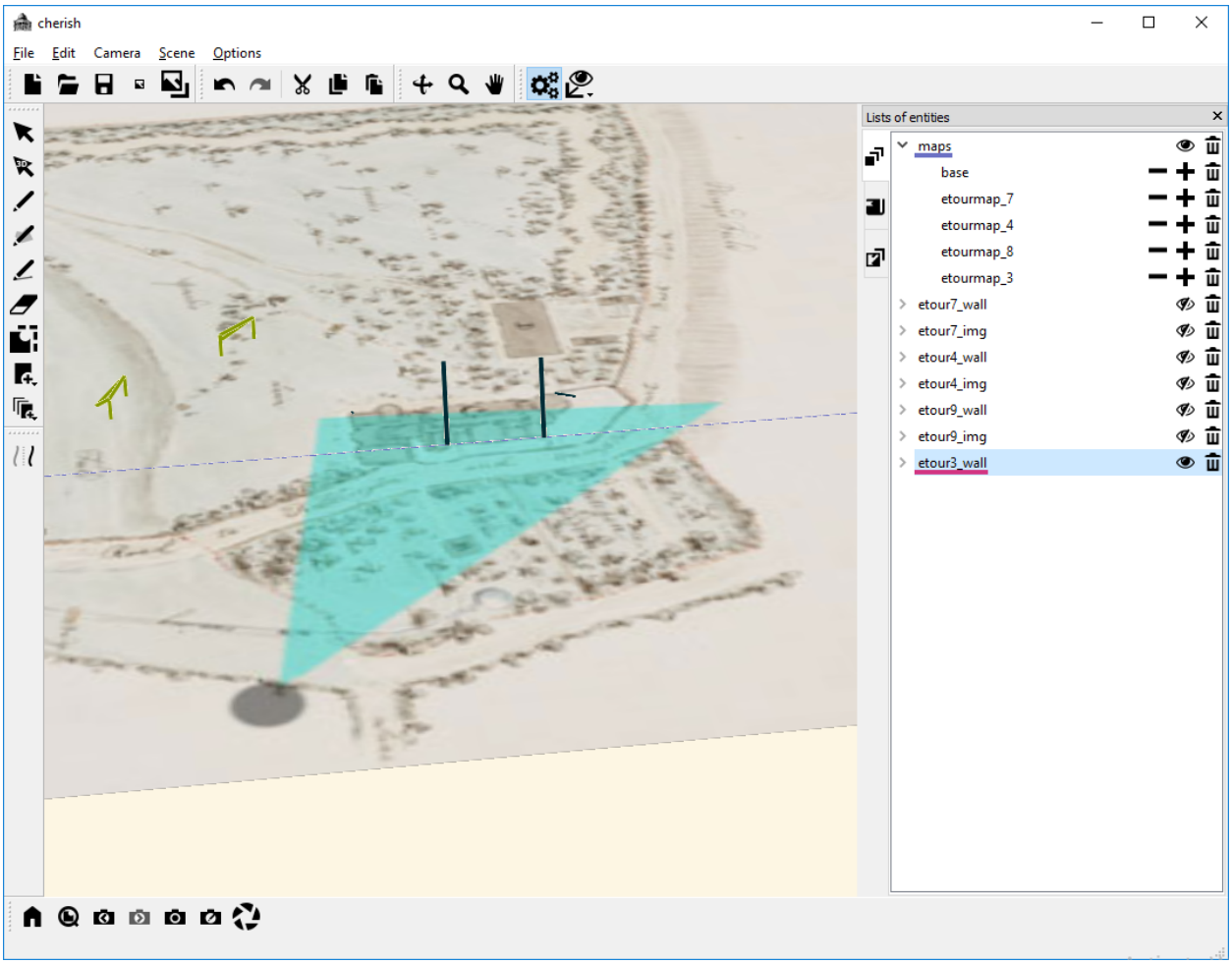
We can adjust the image to align with our lines and zoom out the camera view:



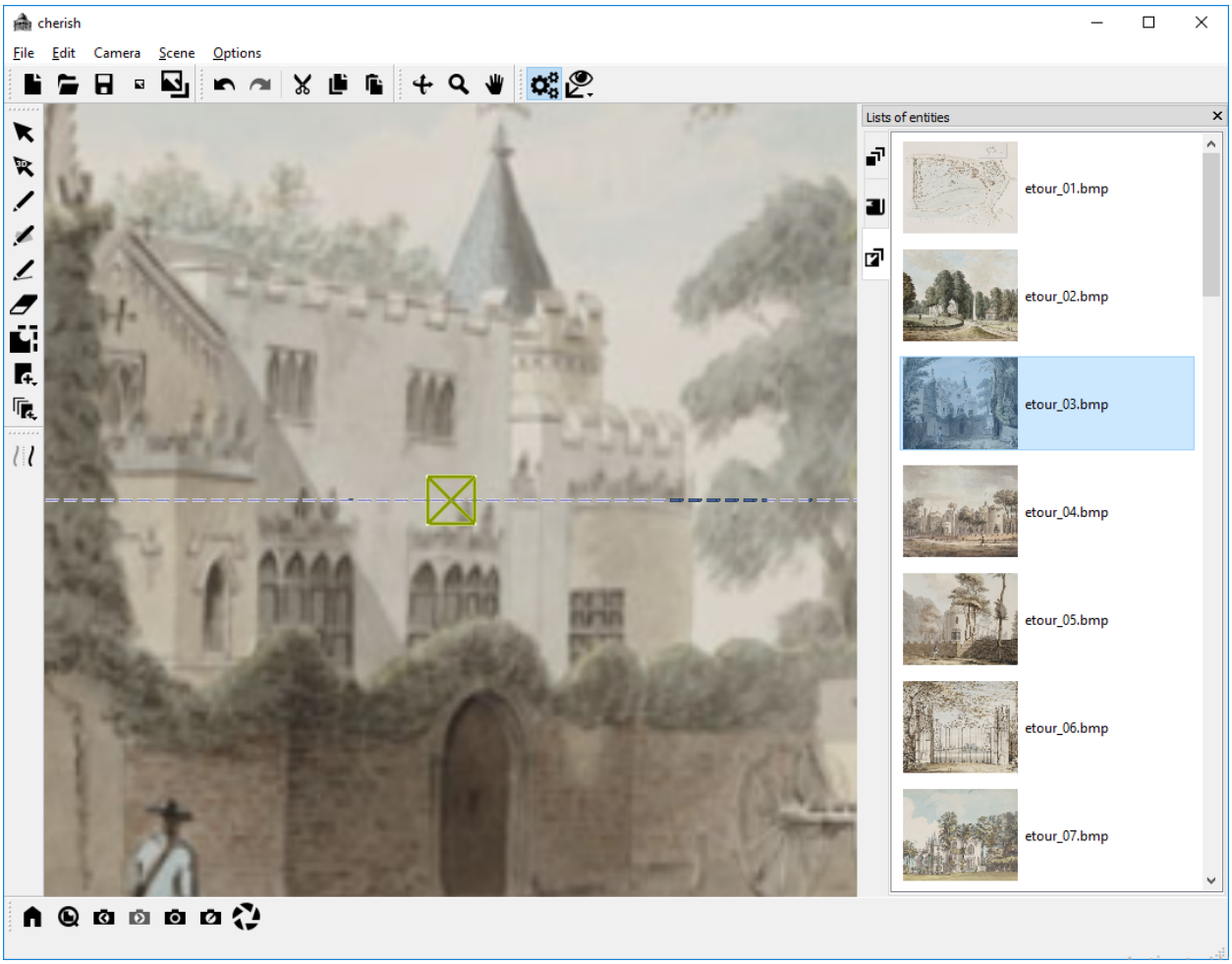
We can then trace out the wall. Note that because the image is slightly slanted, our tracing will be slightly slanted as well. We can try to self-correct for that ourselves (note that the lower line that we drew does not match up with the image, but is straighter rather than slanted):



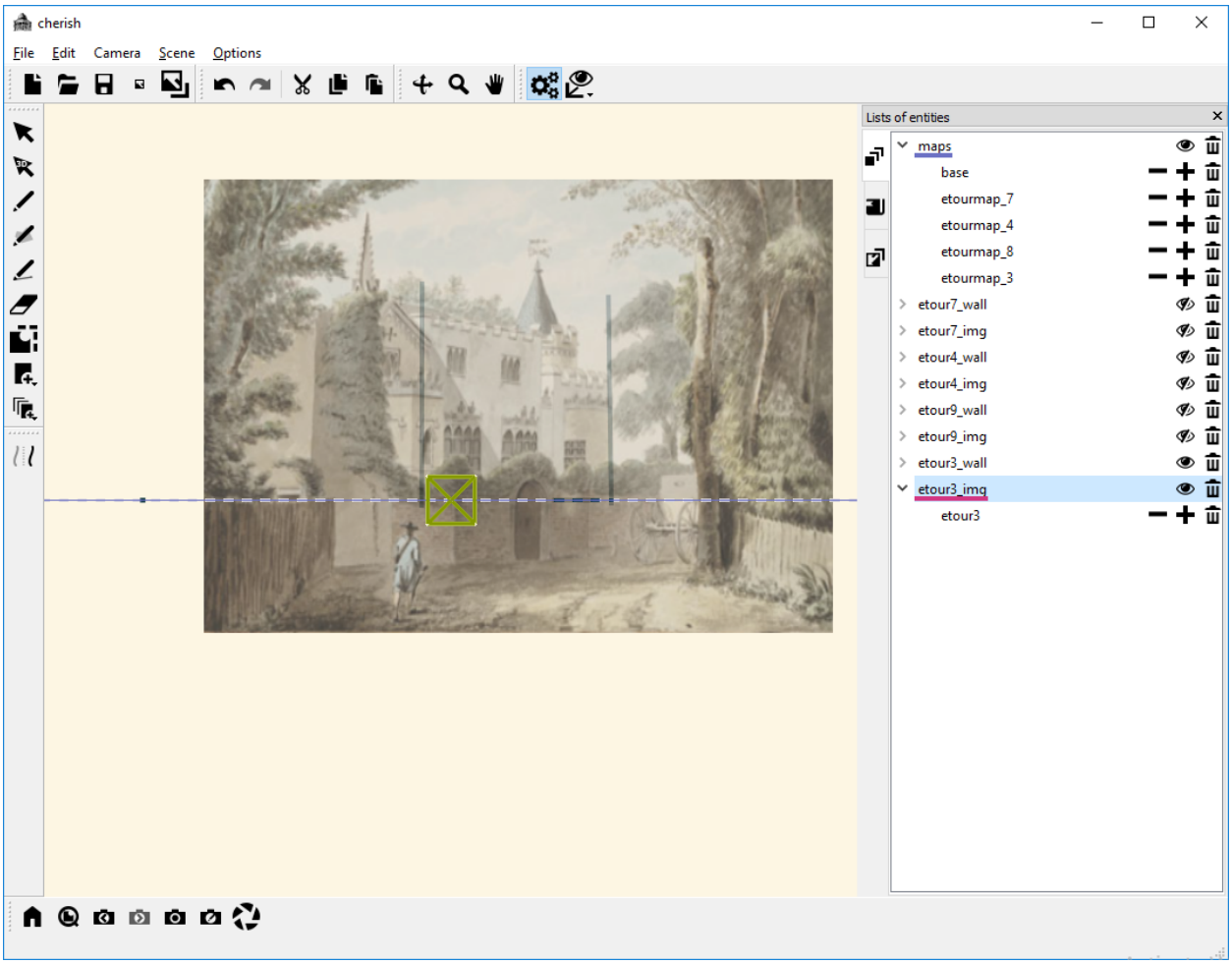
Finally, we will draw the right wall of the building. We can insert the “etourmap_3” image into the “maps” canvas. Then we can add a new XZ canvas, adjust its location, and draw some vertical lines:



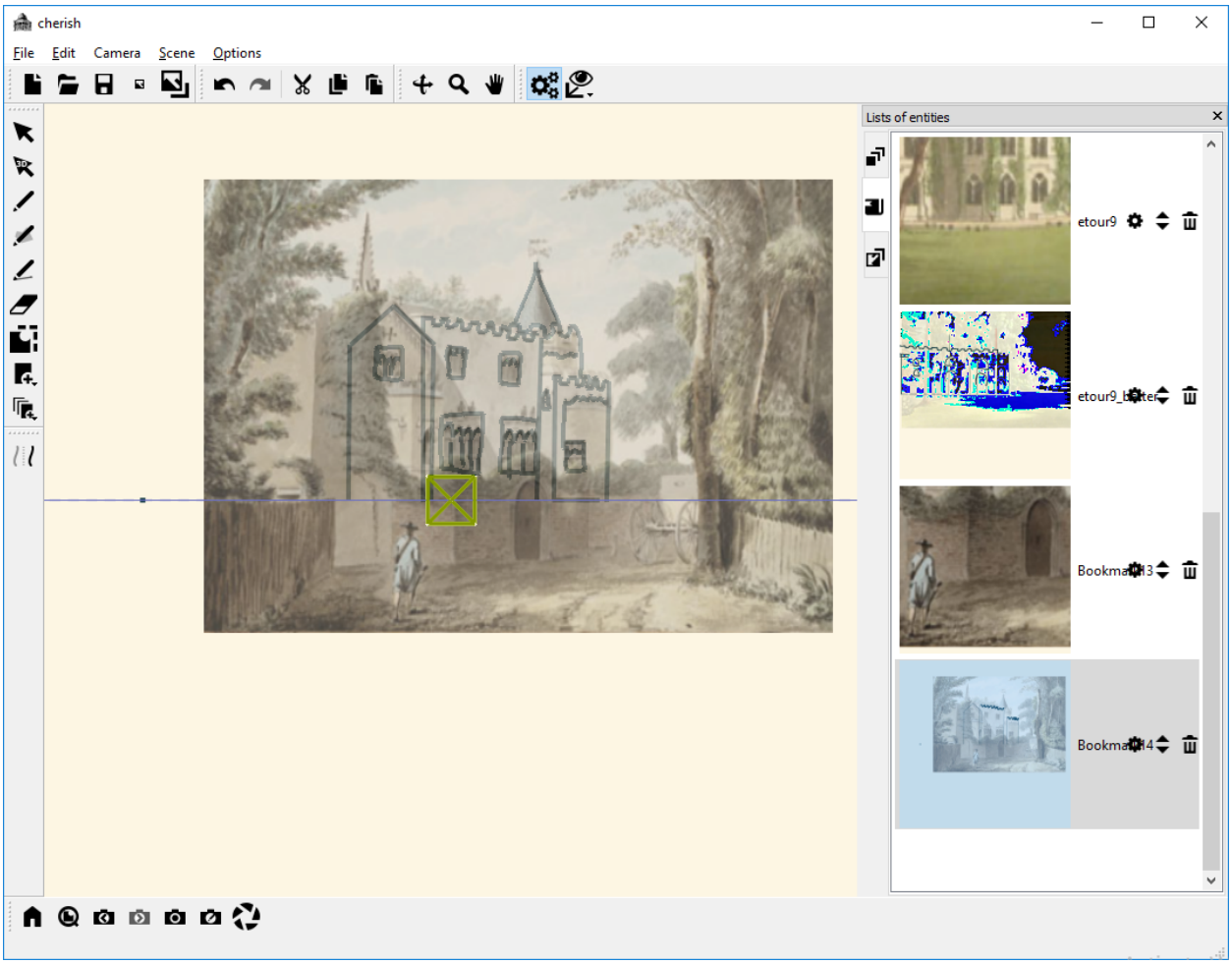
We can then create a new view, and add the “etour_3” image to the view:



Then, we adjust the size of the image and the zoom of the camera view to align with the image:

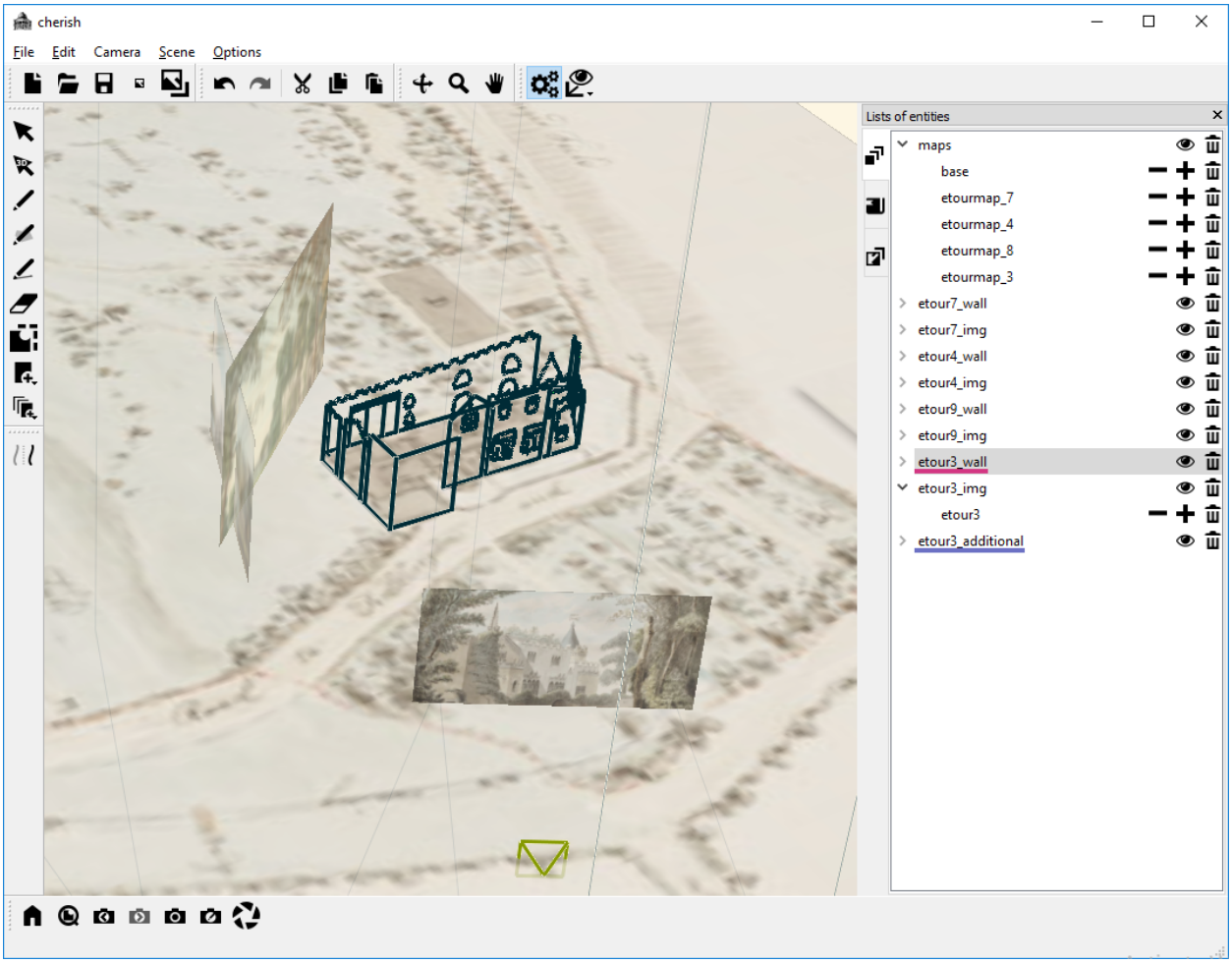


Next, we draw the wall of the building:

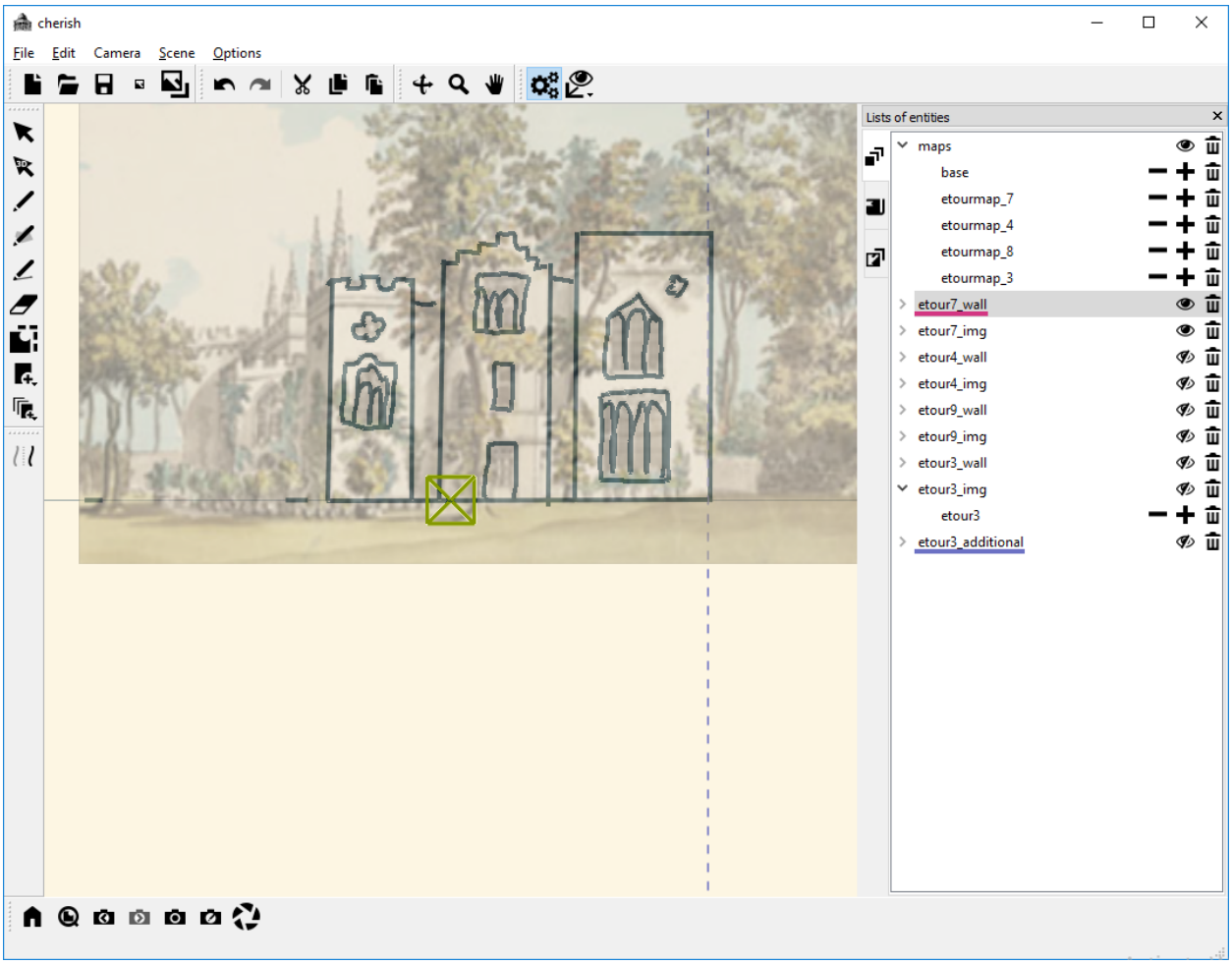


Note, you may also want to add an additional canvas to draw the remaining wall of the rectangular tower in the front-right corner of the building. This part of the building is quite

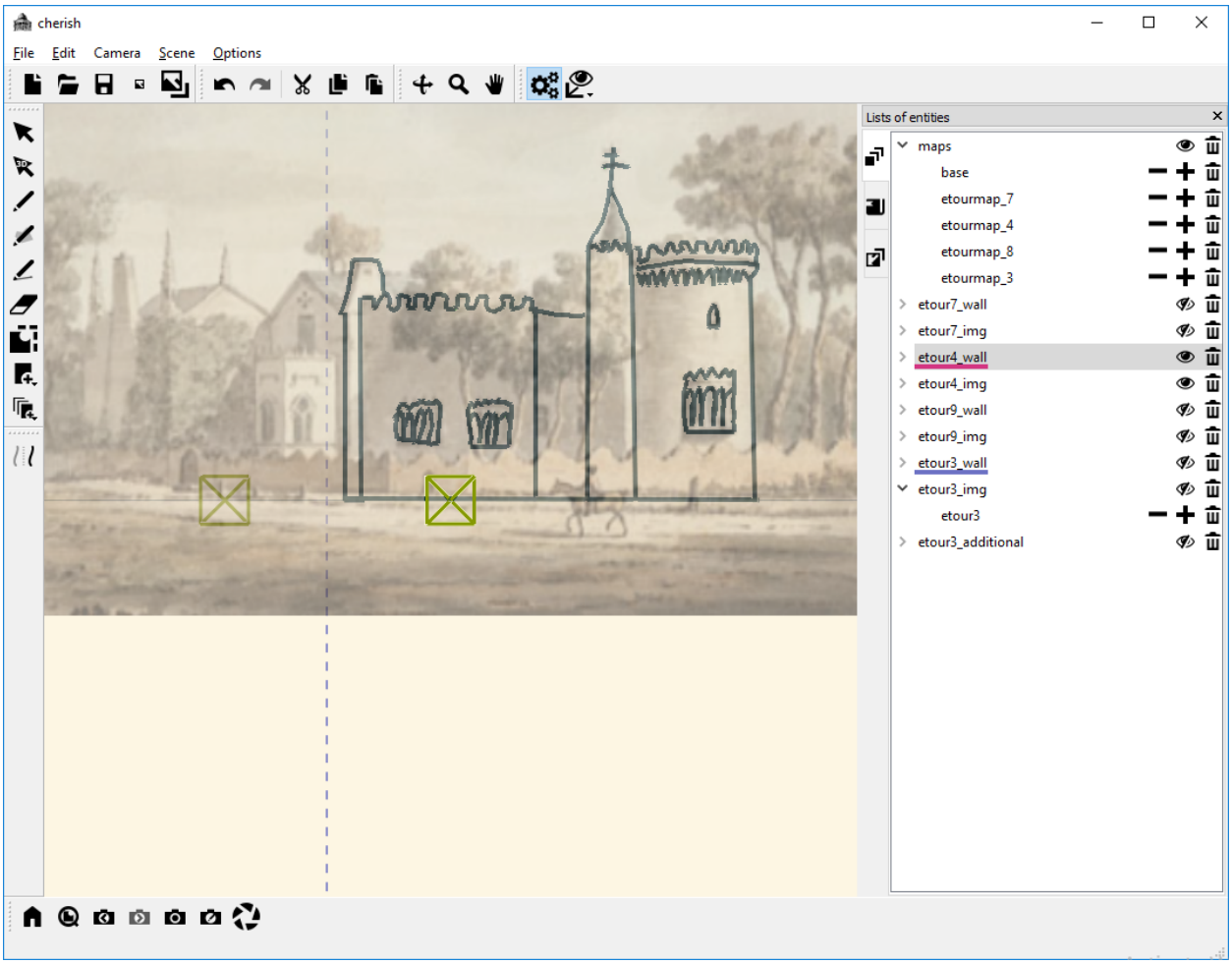
featureless:



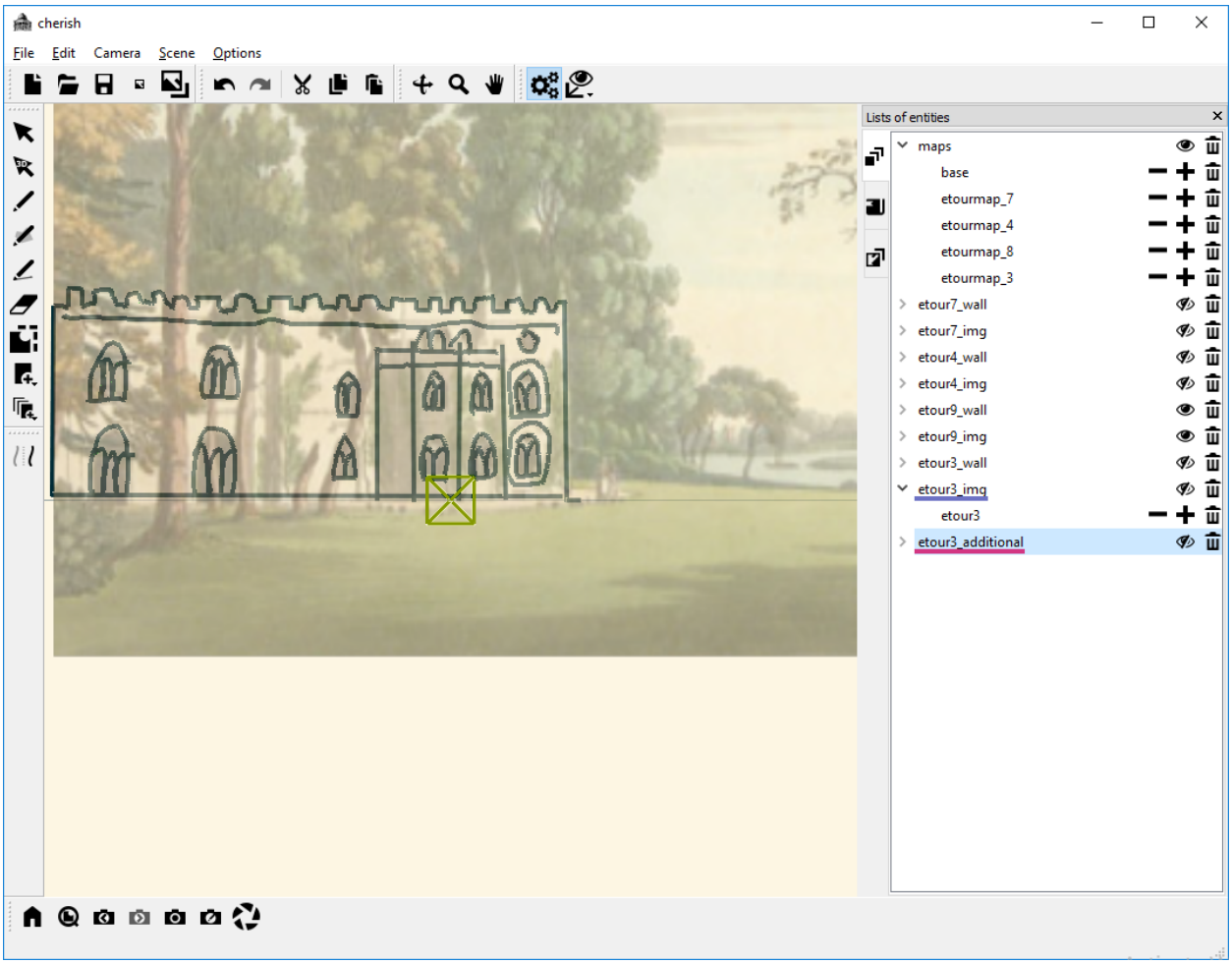
At this point, we have drawn the outline of the building. We can choose to add some more detail to the various walls of the building. Starting with the front wall:



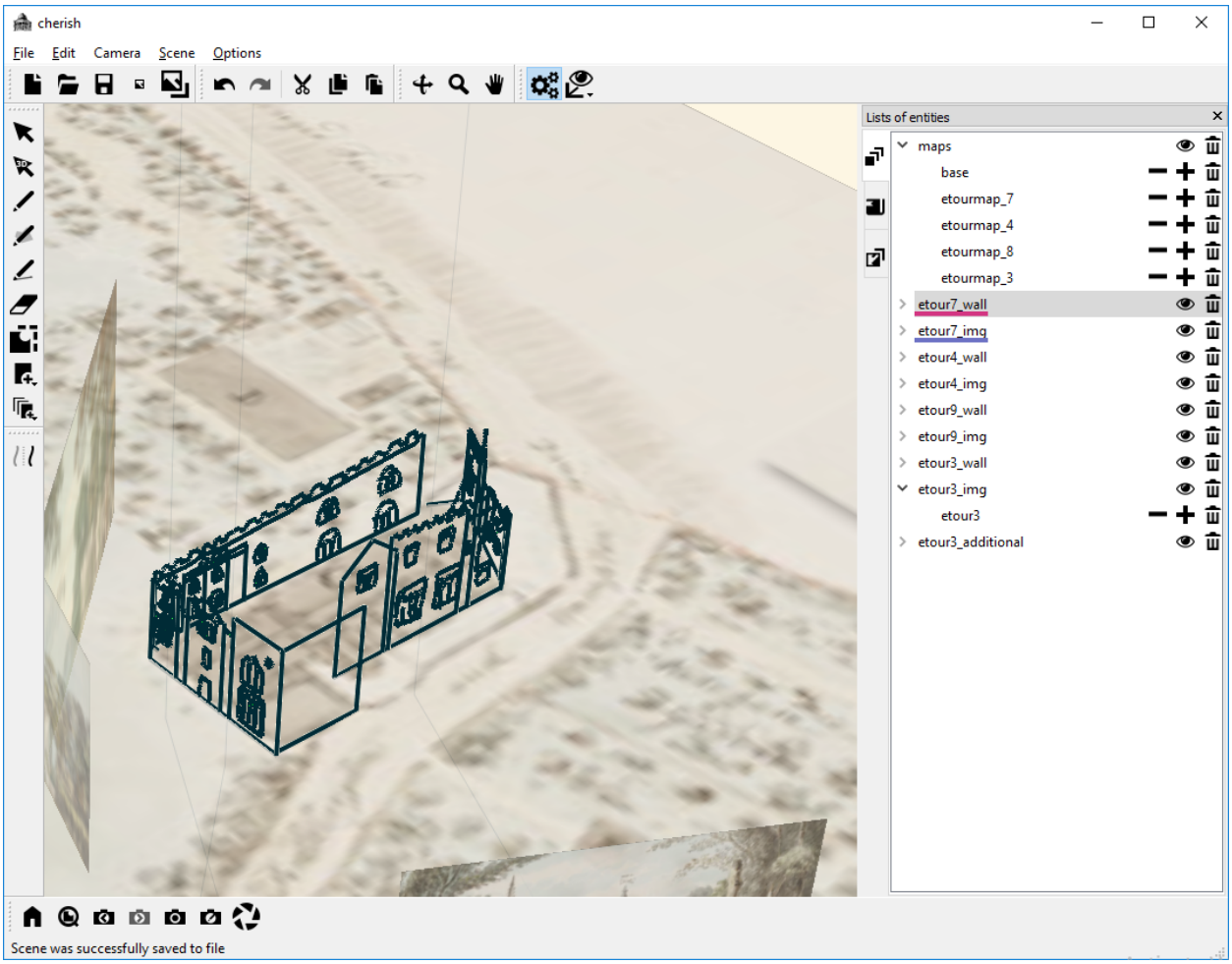
Then the back wall:



And finally the left wall:



As you can see, our finish product will appear as something similar to the image below:



Congratulations, we've successfully traced an outline of the building! At this point, you can feel free to add some additional detail to the tracing. For instance, you could also trace the short wall that surrounds much of the building, or you could add more canvases to some of the areas that we approximated as flat to add some depth.