10689304 Amirhossein Roustaei week 6 13/11/2019

۱۰:۴۳ ب.ظ سه شنبه، ۱۲ نوامبر ۲۰۱۹

1. Based on the last assignment we consider that the epsilon is 0.1 for both plates. So because the epsilon for the shield is also 0.1, so the following relations are true:

$$\dot{Q}_{12,\,N\text{ shields}} = \frac{A\sigma(T_1^4 - T_2^4)}{(N+1)\left(\frac{1}{\varepsilon} + \frac{1}{\varepsilon} - 1\right)} = \frac{1}{N+1}\dot{Q}_{12,\text{ no shield}}$$

$$Q_{12,N\ shields} = 0.01\ Q_{12,no\ shields}$$

$$0.01\ Q_{12,no\ shields} = \frac{1}{N+1}\ Q_{12,no\ shields}$$

$$0.01 = \frac{1}{N+1} \rightarrow \frac{1}{100} = \frac{1}{N+1} \rightarrow N = 99$$

There is another answer based on the example for the previous assignment if we consider that the epsilon for the parallel plates are 0.2 and .07 :

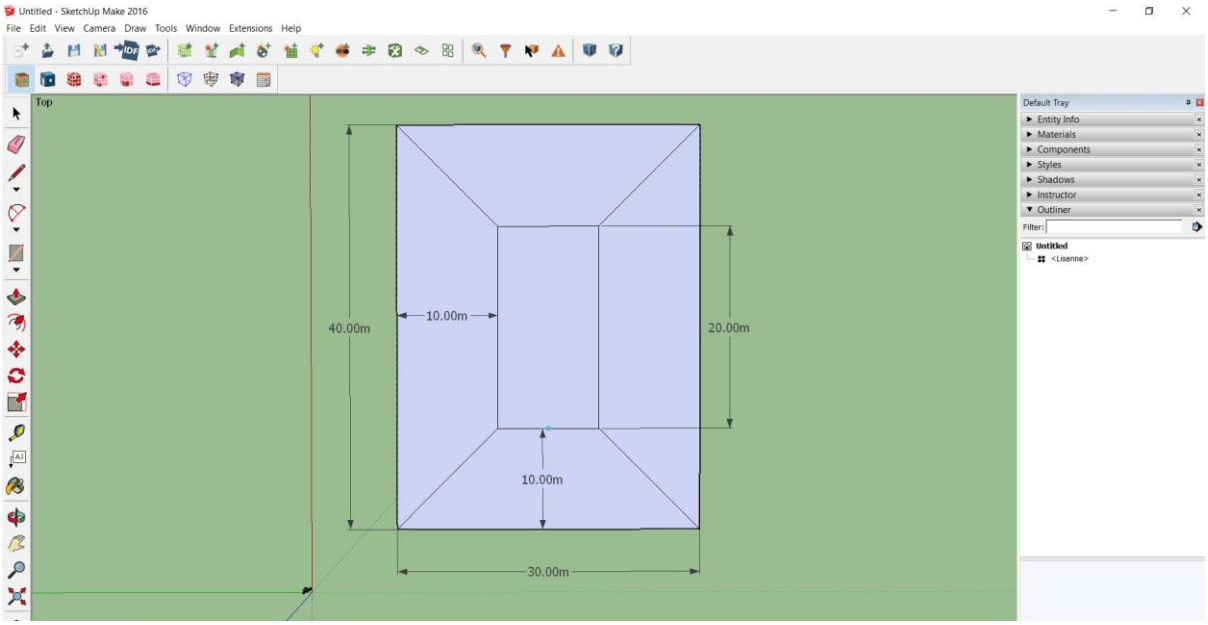
$$\frac{\dot{Q}}{A} = 5.67 \times 10^{-8}\frac{800^4 - 500^4}{\frac{1}{0.2} + \frac{1}{0.7} - 1} =$$ 3625.4 w/m2

3625.4 * 0.01 = 36.25

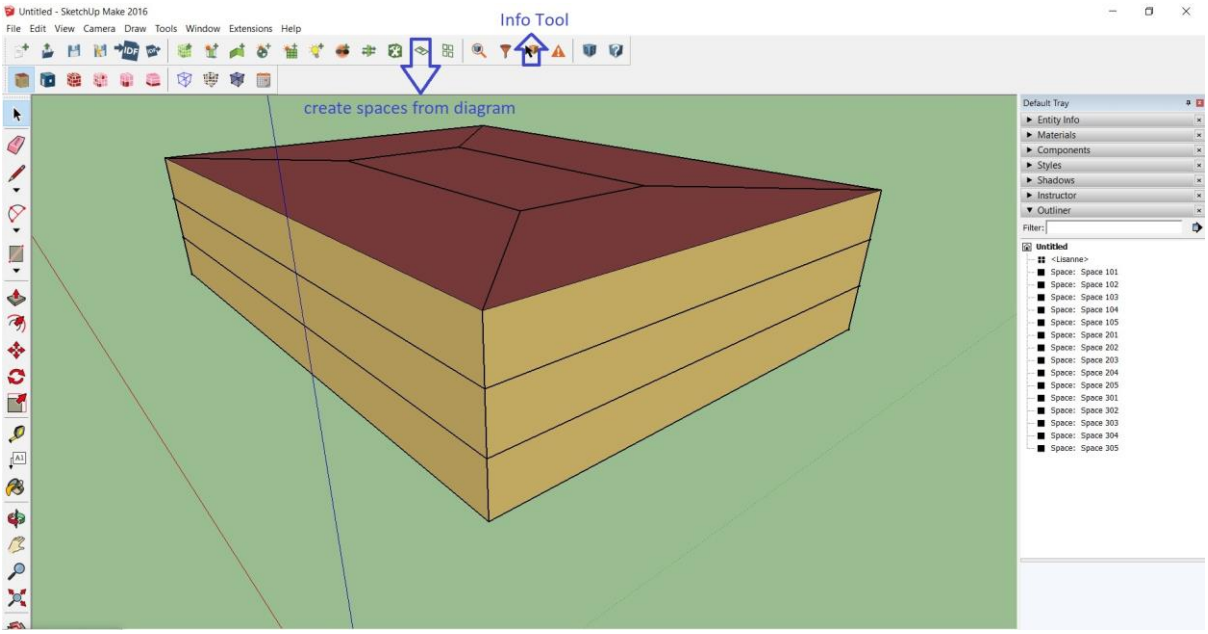
$$5.67 \times 10^{-8}\frac{800^4 - 500^4}{\left(\frac{1}{0.2} + \frac{1}{0.7} - 1\right) + \ n.\left(\frac{1}{0.1} + \frac{1}{0.1} - 1\right)} = 36.25$$

N = 28 .1

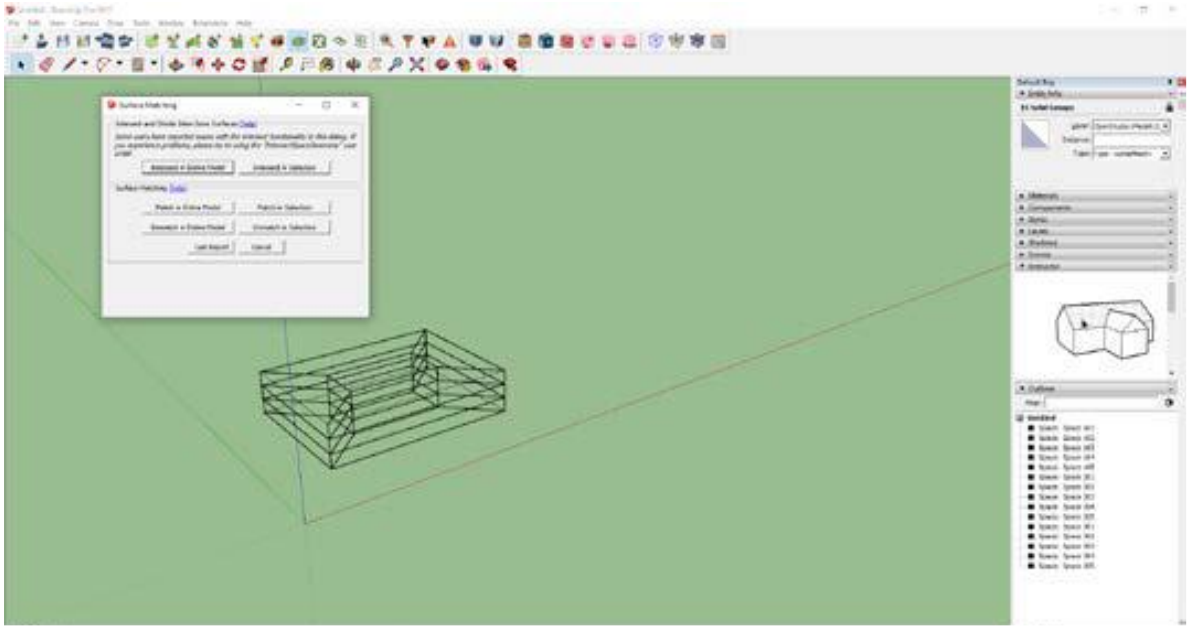
2.



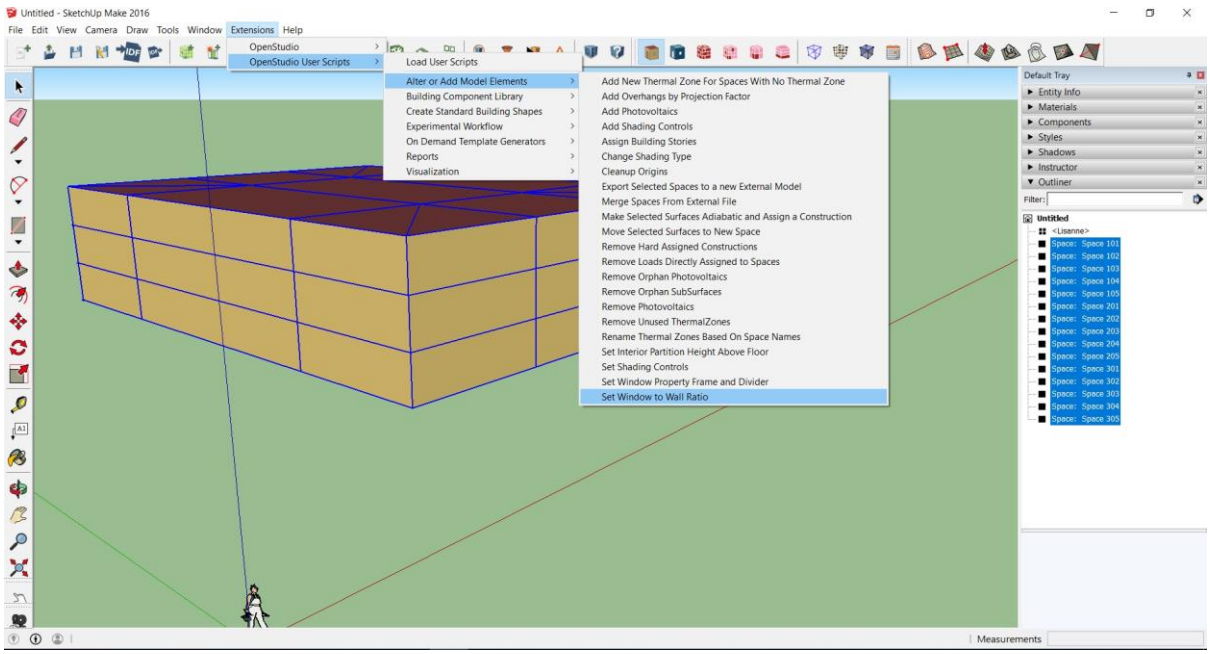
1. In the first step we draw the plan of the building using sketch up tools.



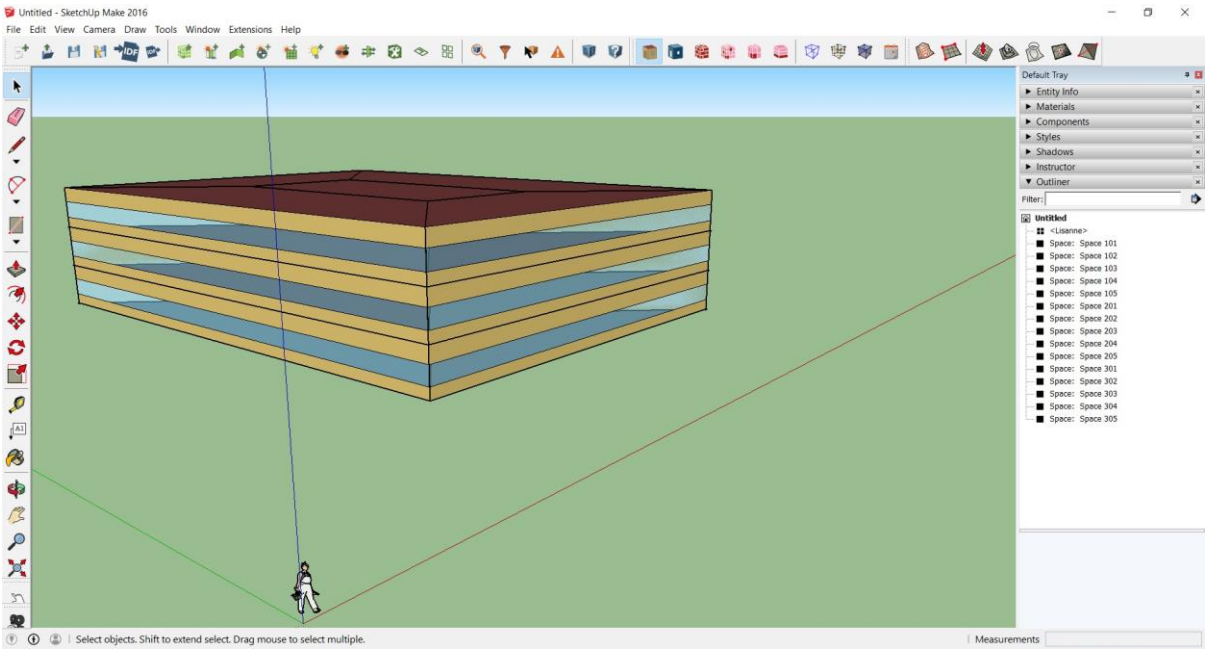
2. From the second step we use the OpenStudio tools. So we create spaces based on the diagram. By the info tool we can check the properties of each surfaces. Openstudio can recognize the features and different sections of building. For example roof, walls, floors,….



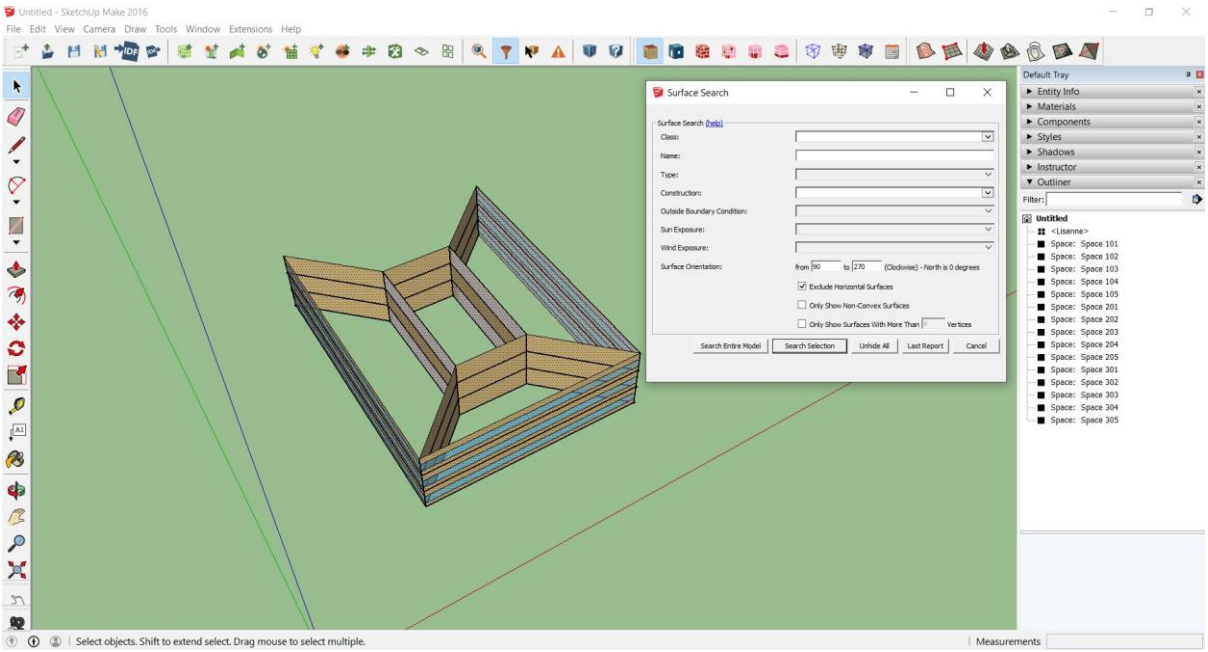
3. In the next step, by surface matching tool we can define outer and inner walls.



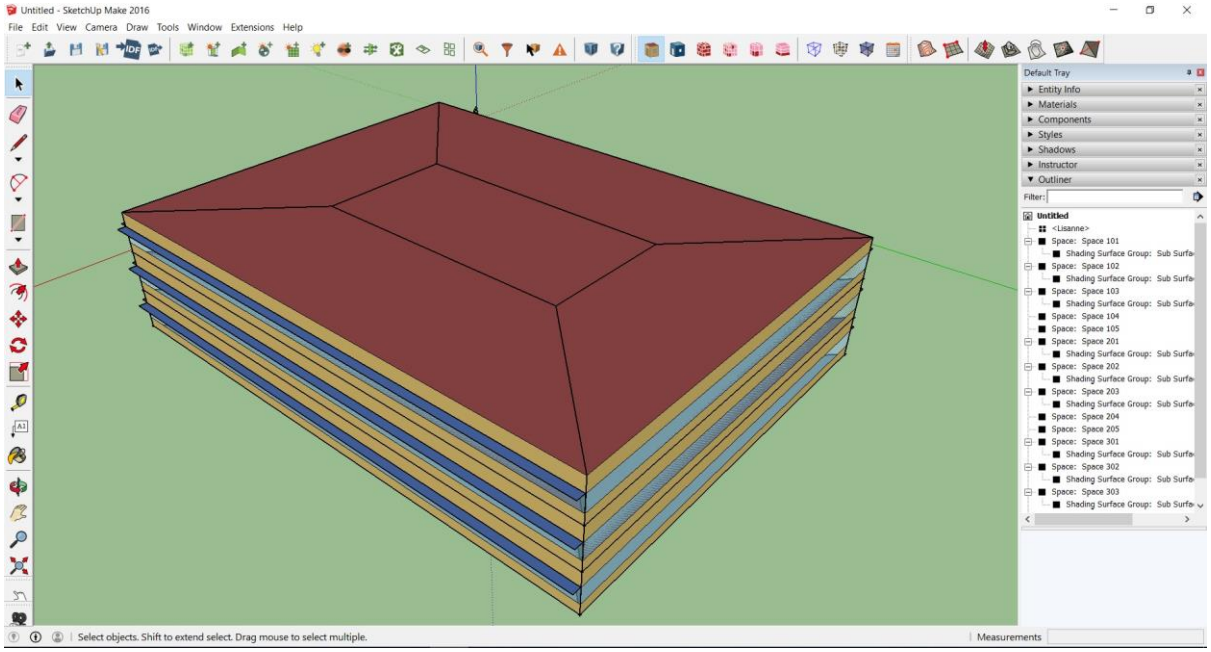
4. After that we should define the window ratio to the spaces of 70%



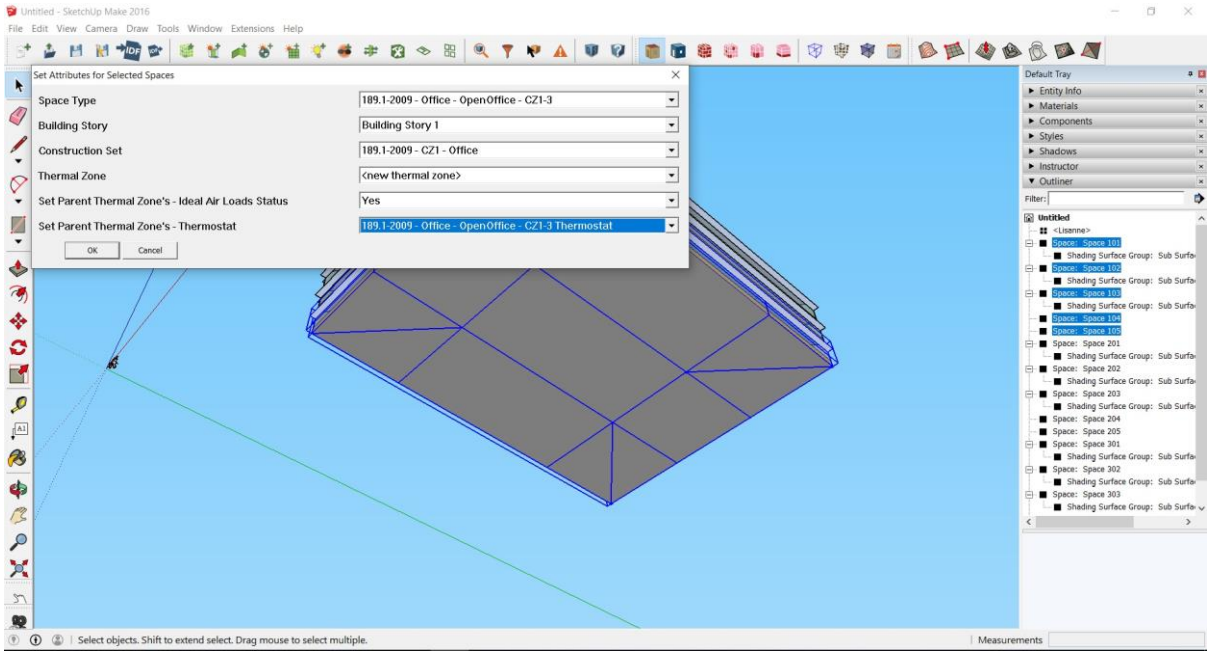
5. After determining the ratio, windows are created.



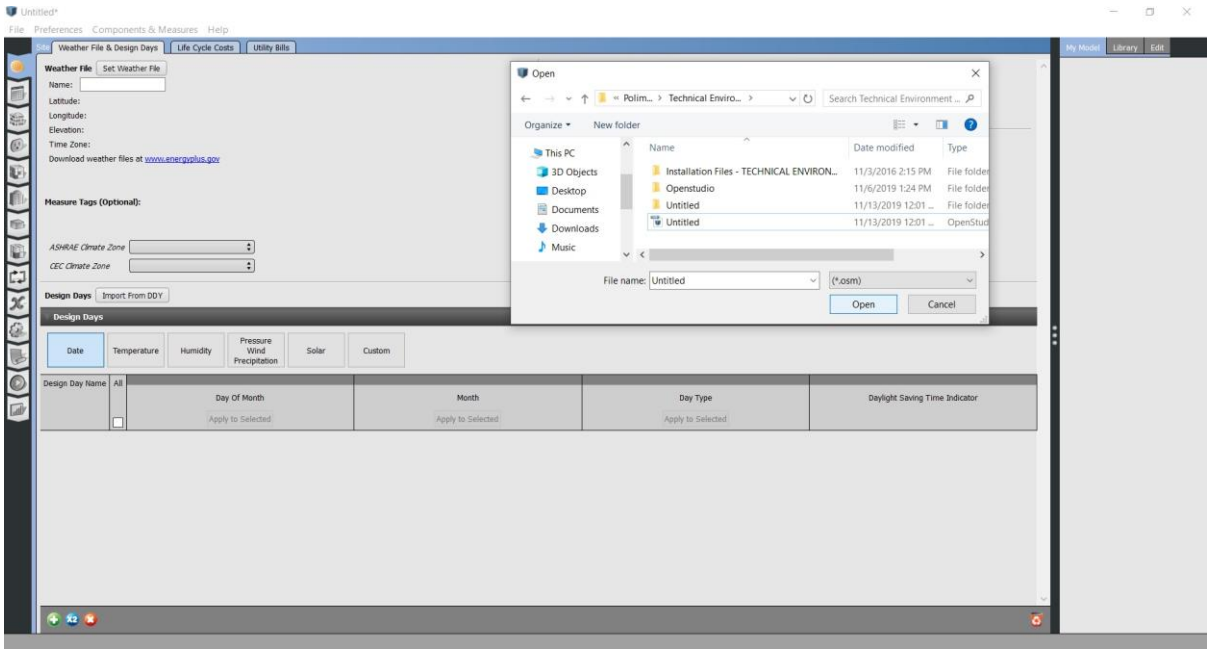
6. Because of adding shades for specific surfaces, we should use search surface tool to choose the surfaces for which we want to create the shades. We choose all but north with 90-270.



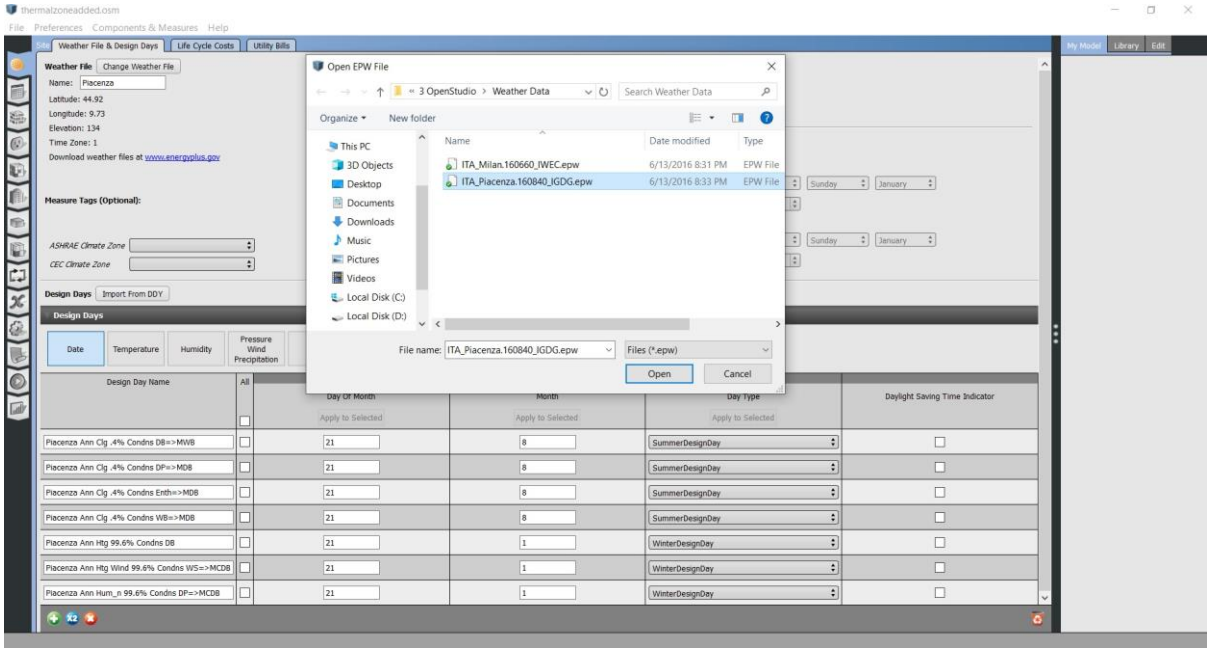
7. The shades are added for all sides except north side.



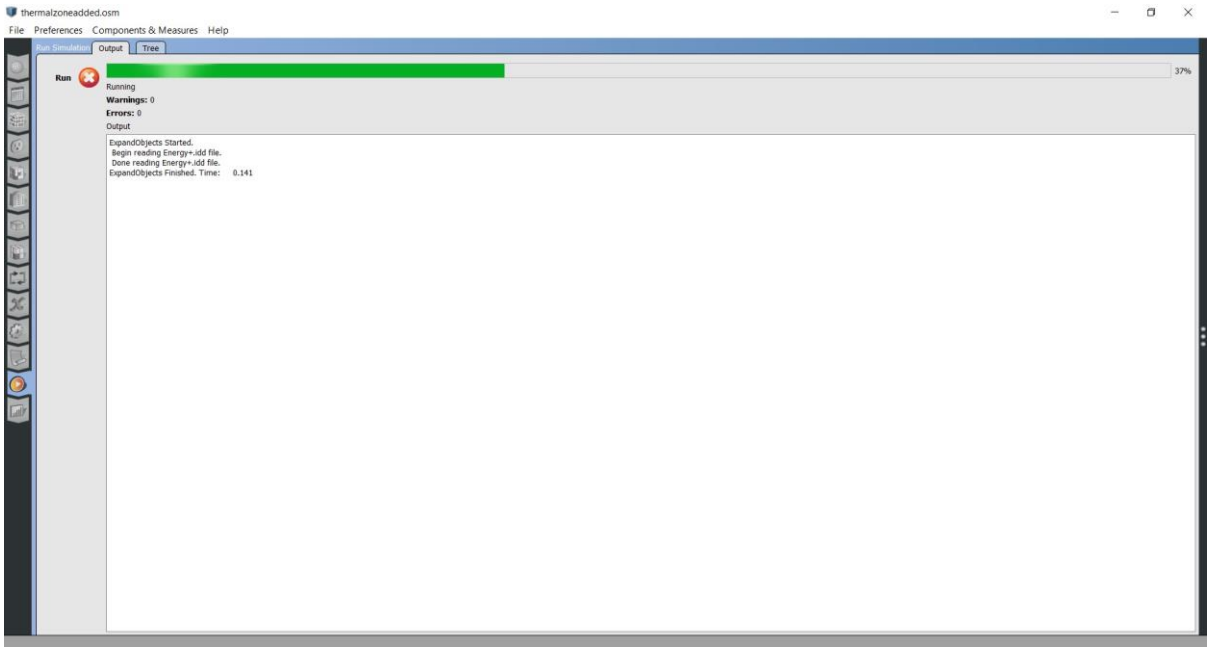
8. At this step, In the side bar, we can define thermal zones for different spaces.



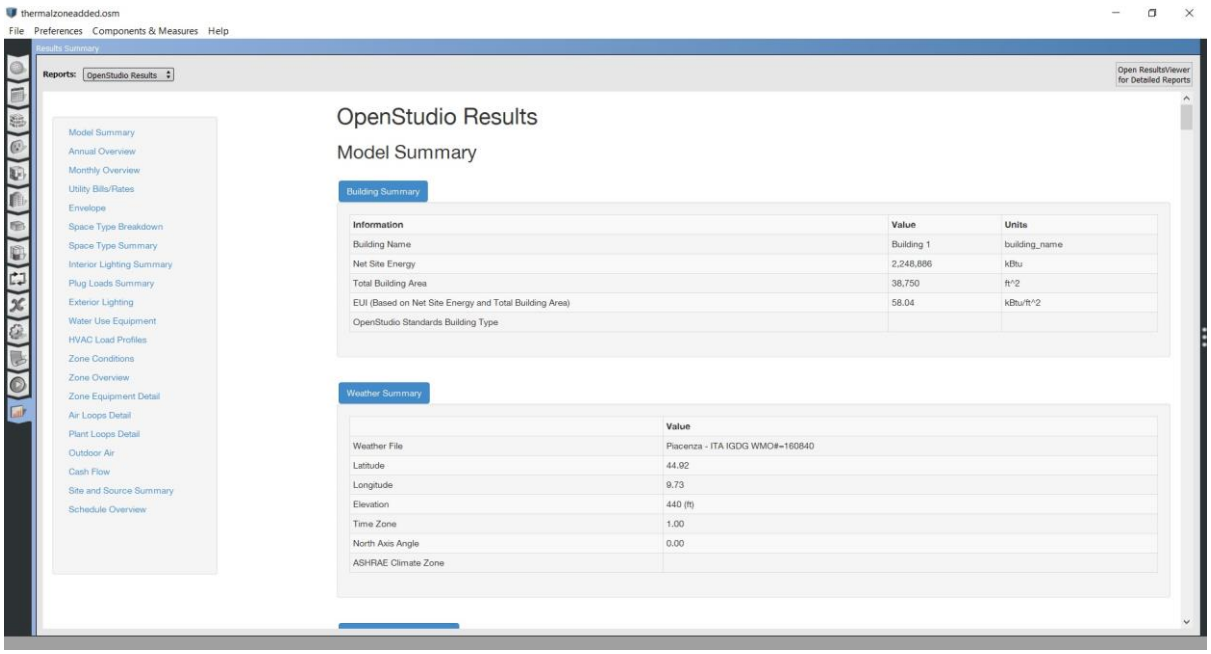
10. we should open the file which we created in the Sketch up in OpenStudio



11. after that we should import the weather of days for the city (in this case Piacenza)



12. after that we should run the processing.



13. The summary of the results are shown.