

Task 1

$$Q_{\text{with shield}} = Q_{\text{without shield}} * 0.01$$

$$\frac{\sigma(T_1^4 - T_2^4)}{\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right) + n\left(\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1\right)} = \frac{\sigma(T_1^4 - T_2^4)}{\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right)}$$

$$\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right) + n\left(\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1\right) = 100\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right)$$

$$\left(\frac{1}{0.2} + \frac{1}{0.7} - 1\right) + n\left(\frac{1}{0.1} + \frac{1}{0.1} - 1\right) = 100\left(\frac{1}{0.2} + \frac{1}{0.7} - 1\right)$$

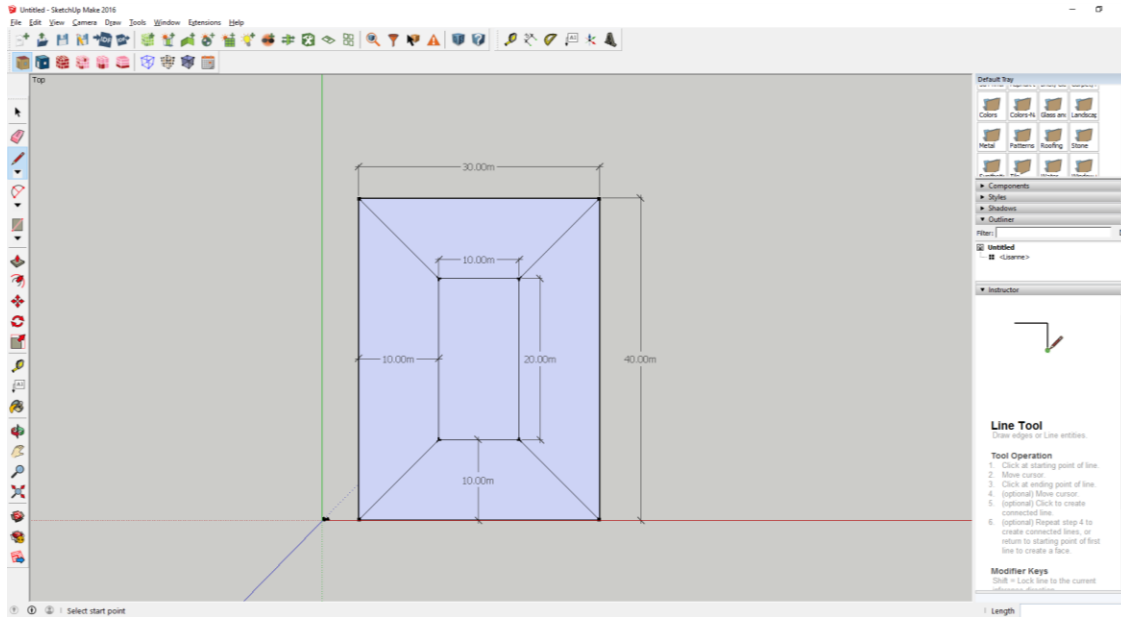
$$5.43 + 19n = 543$$

$$N = 28.29$$

We can have 28 shields

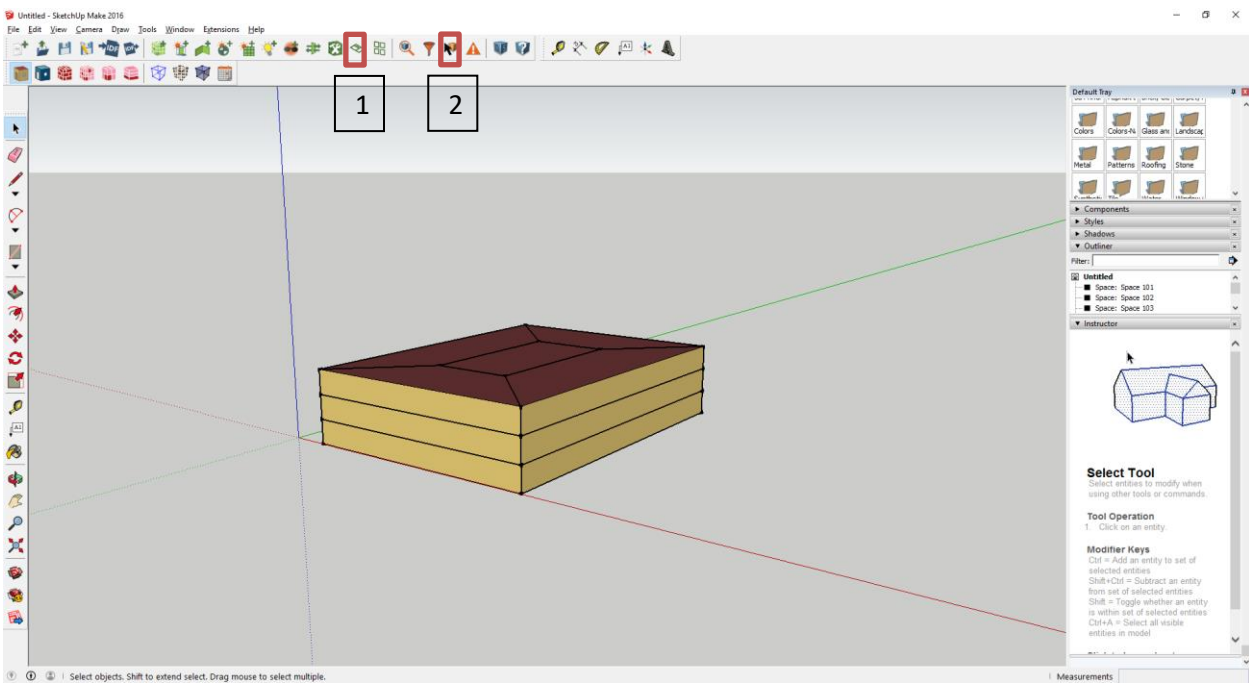
Task 2

We draw the diagram by creating a 40m *30 m rectangle, then create another rectangle inside it with the offset of 10 m and connect the edges with 4 lines.



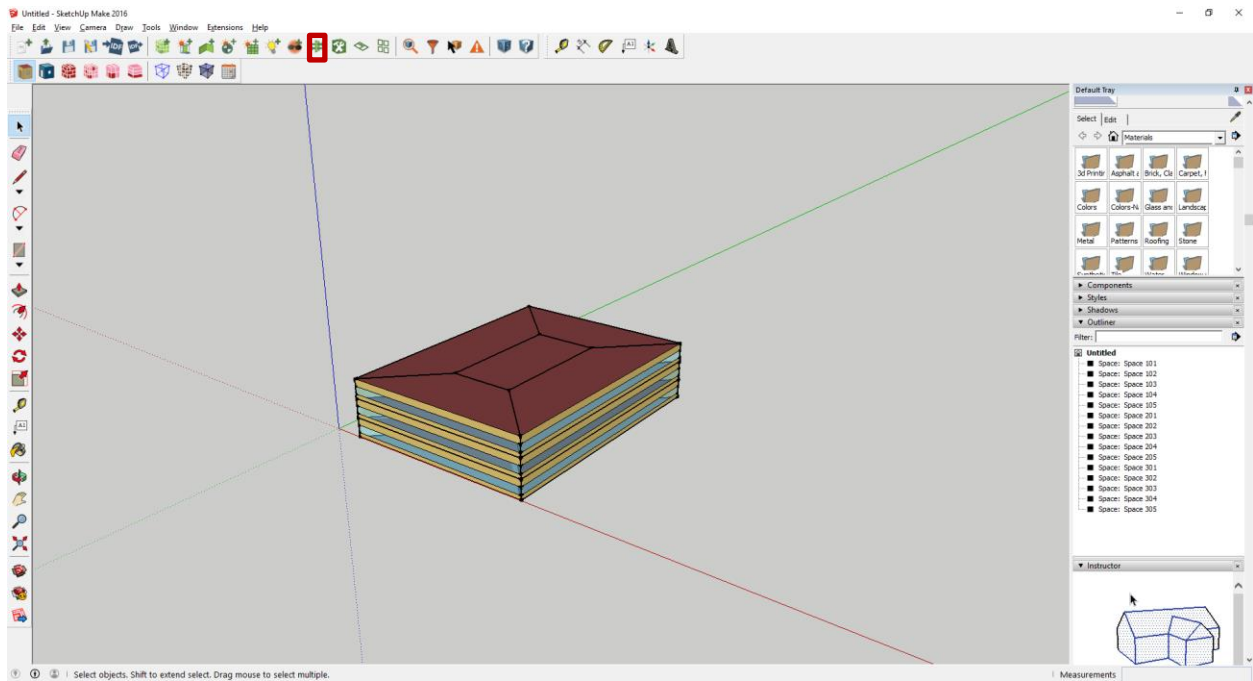
We should choose: create spaces from diagram (1)

With this icon we can set the levels

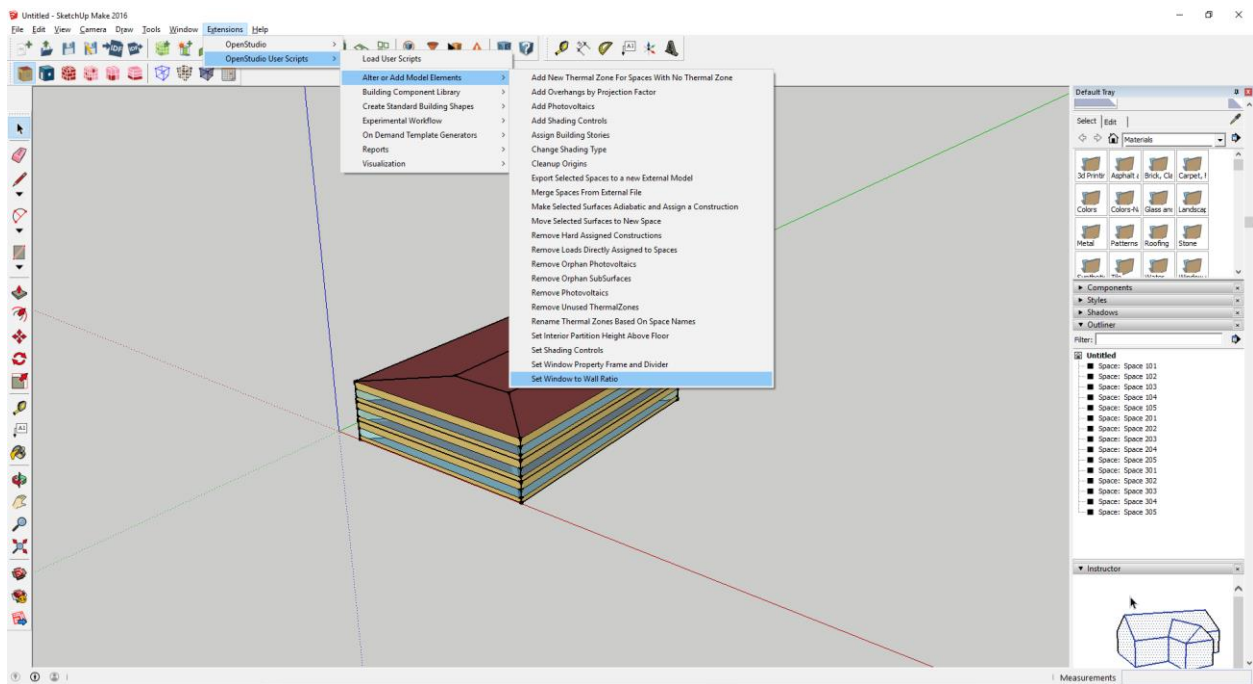


We can use info tool to see the properties of each surface (2)

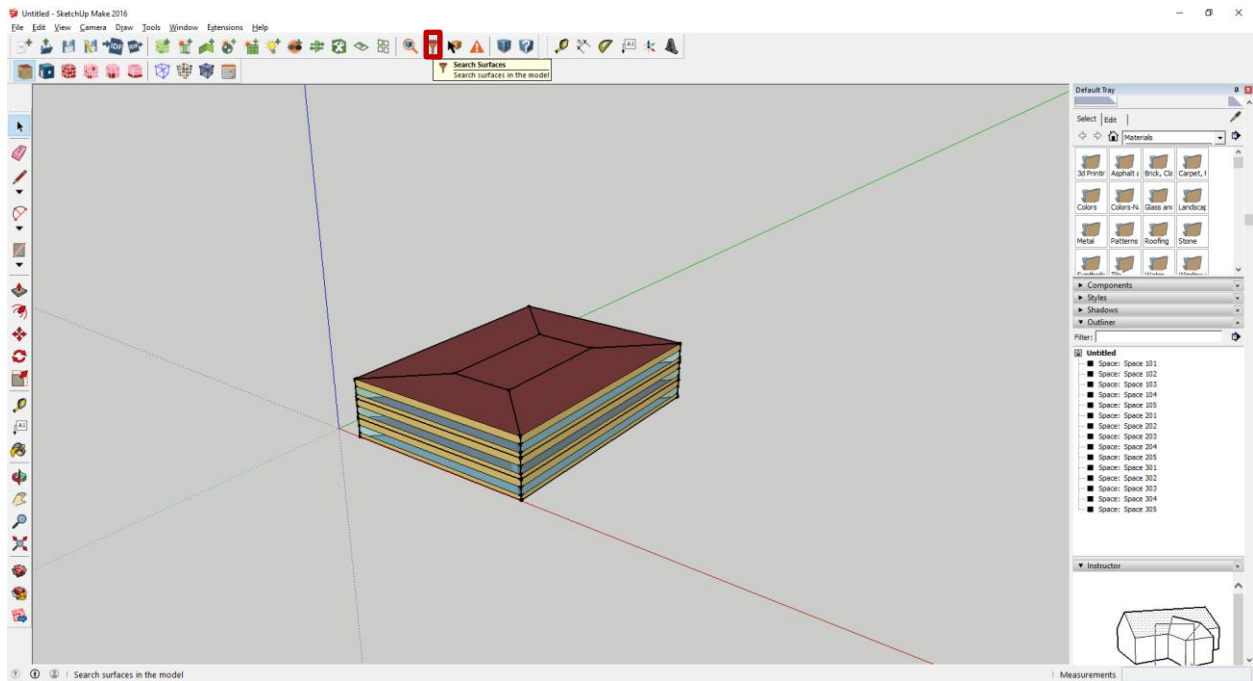
We use this icon set every things in all floors



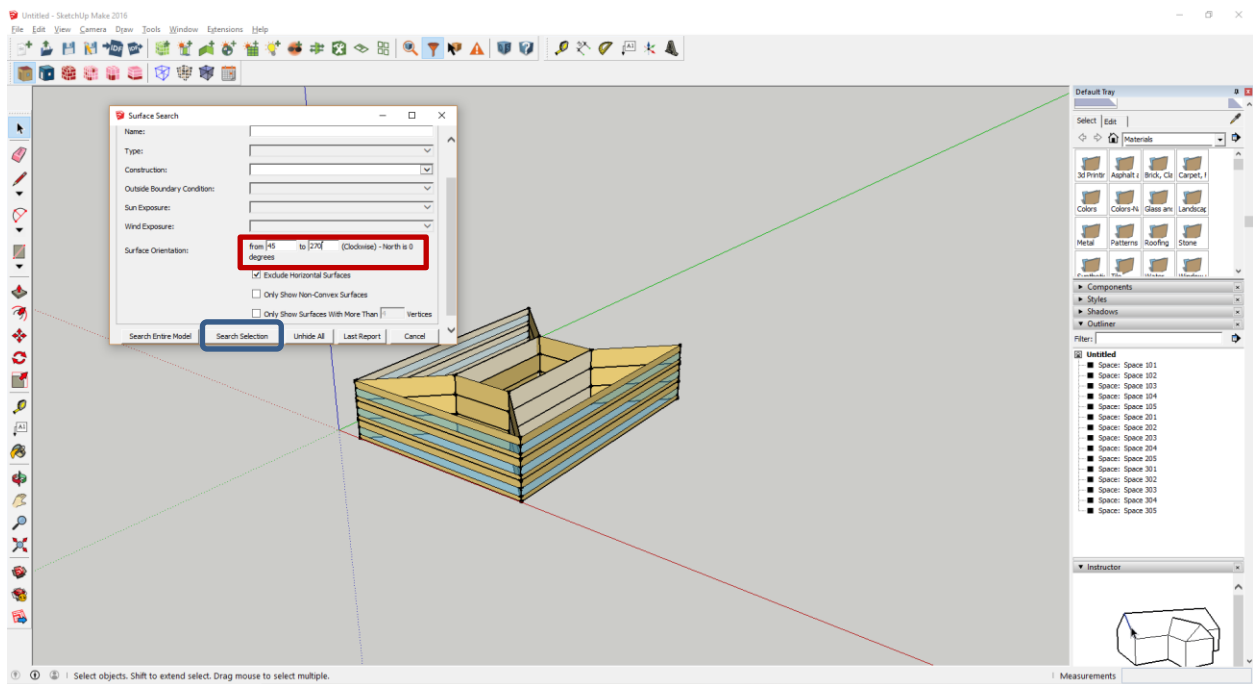
And we use these options if we want windows in our buildings

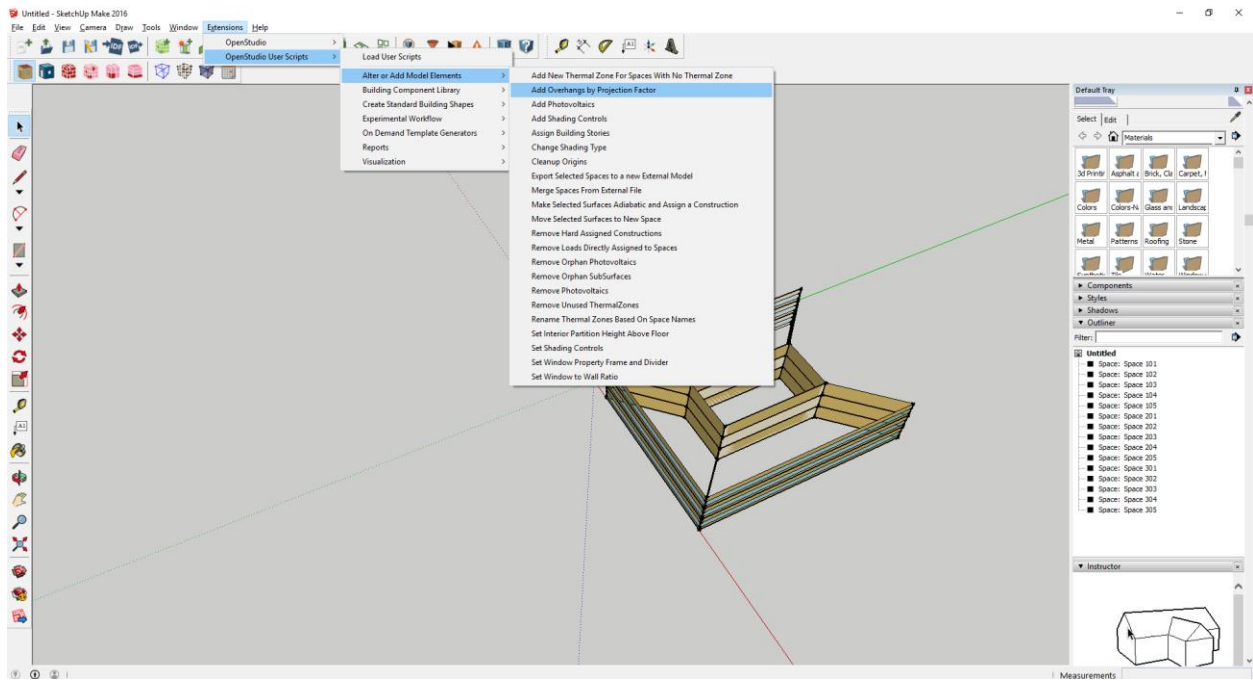


We can have external shadings by follow these ways:

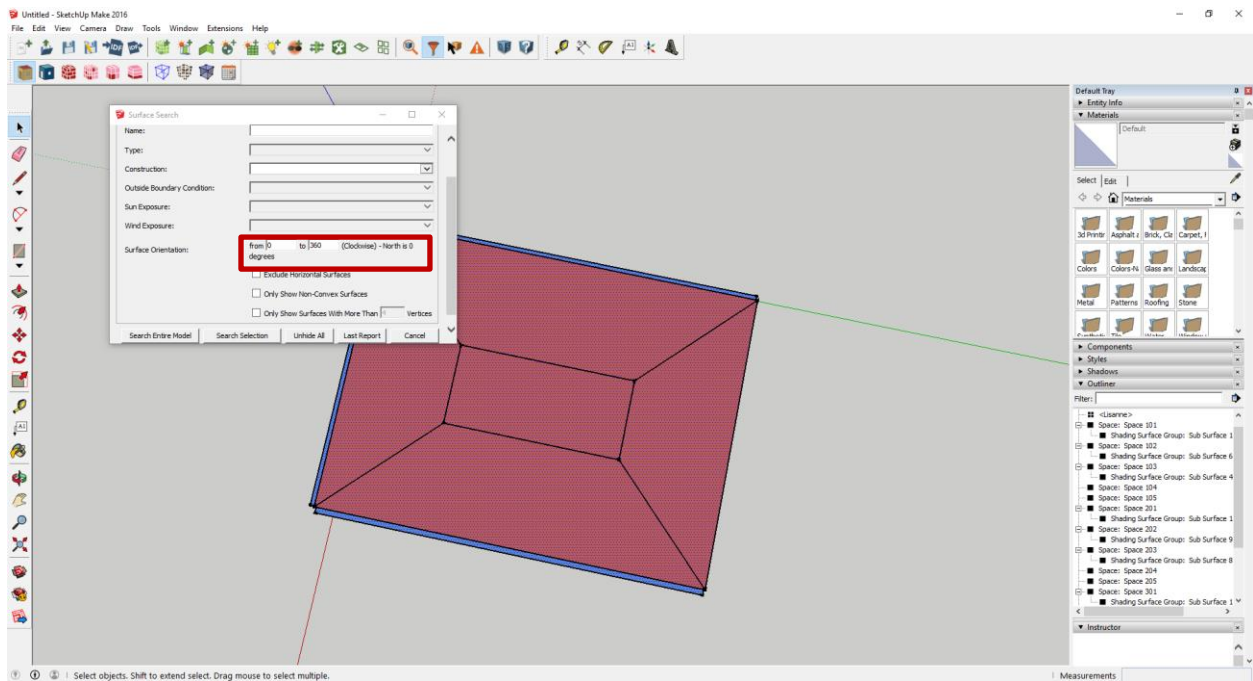


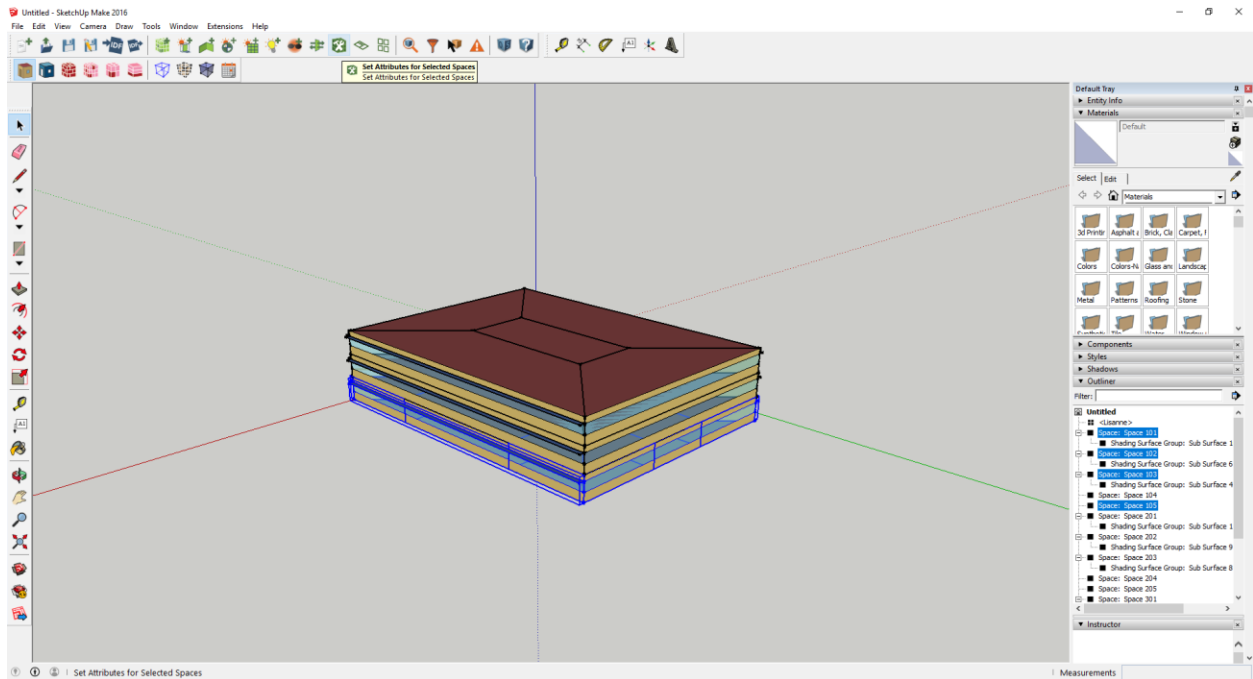
We choose all of the surfaces except the north by this way:



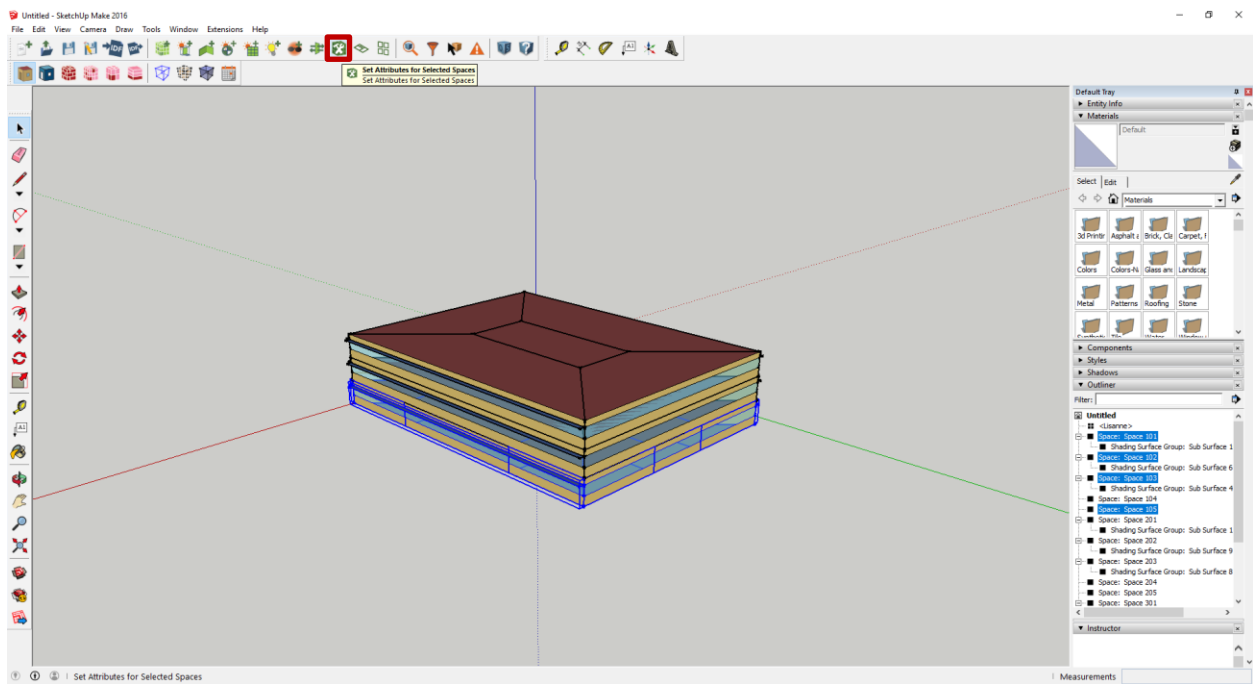


After that we should choose 0-360 surfaces to go back to the previous selection

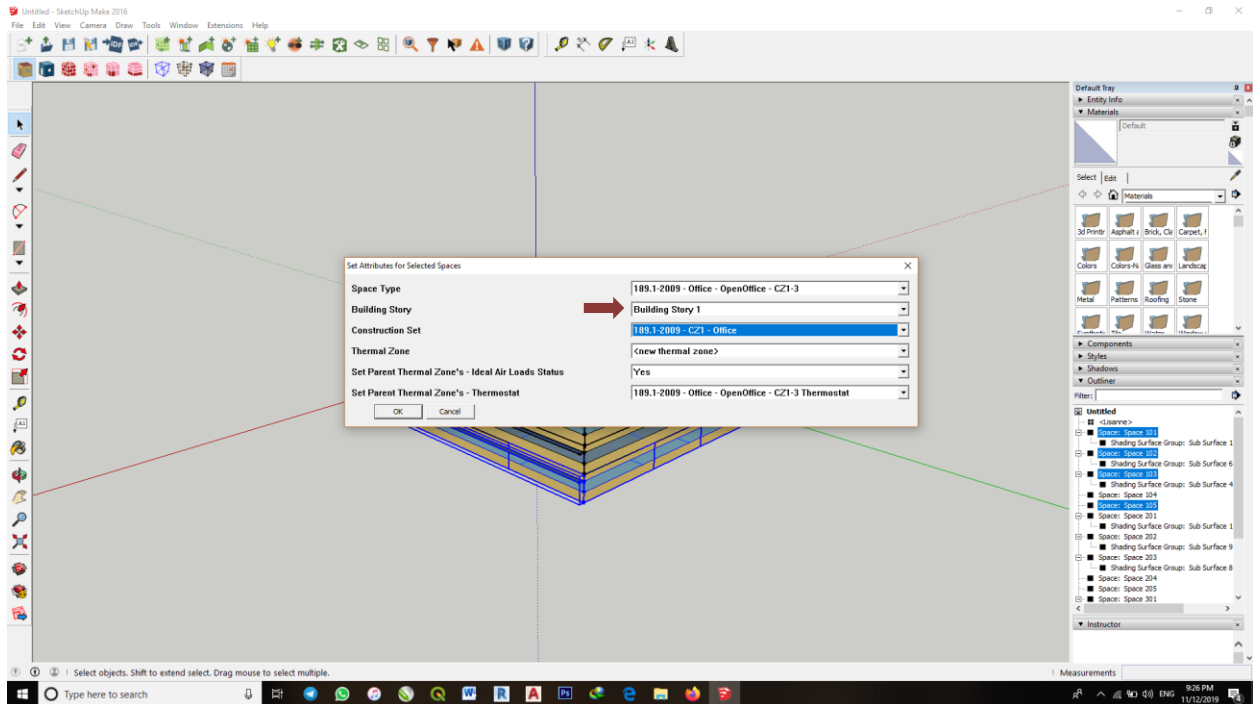




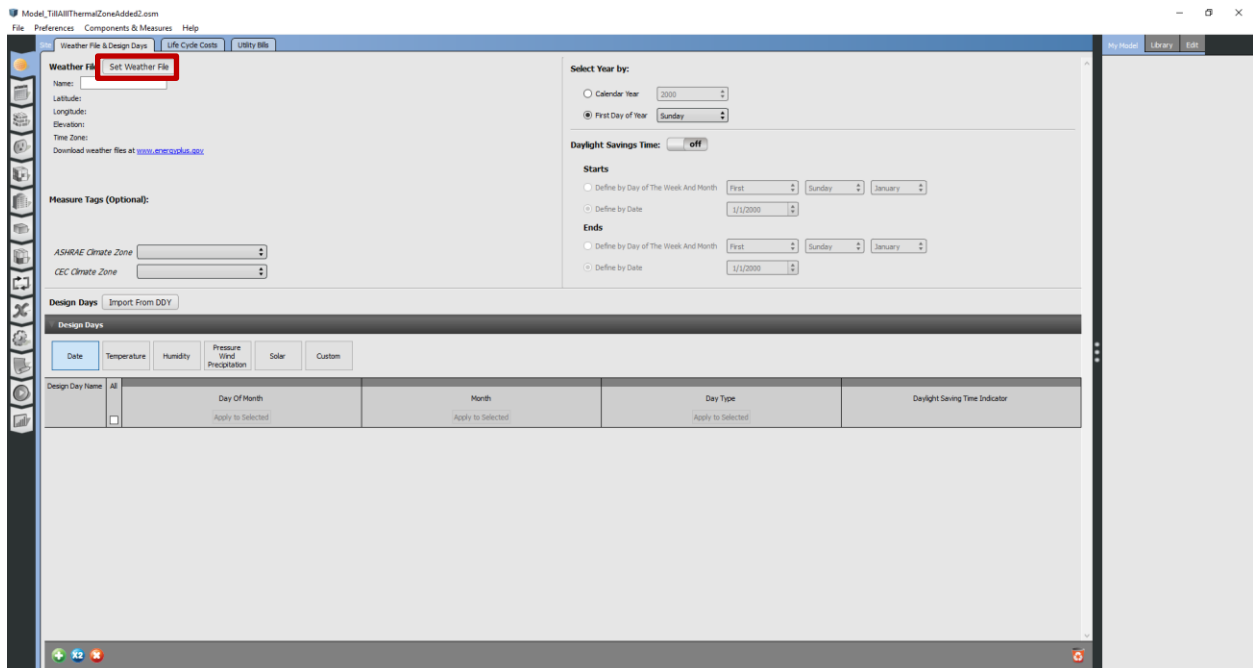
We choose the spaces of each thermal zone and we add specifications by this icon

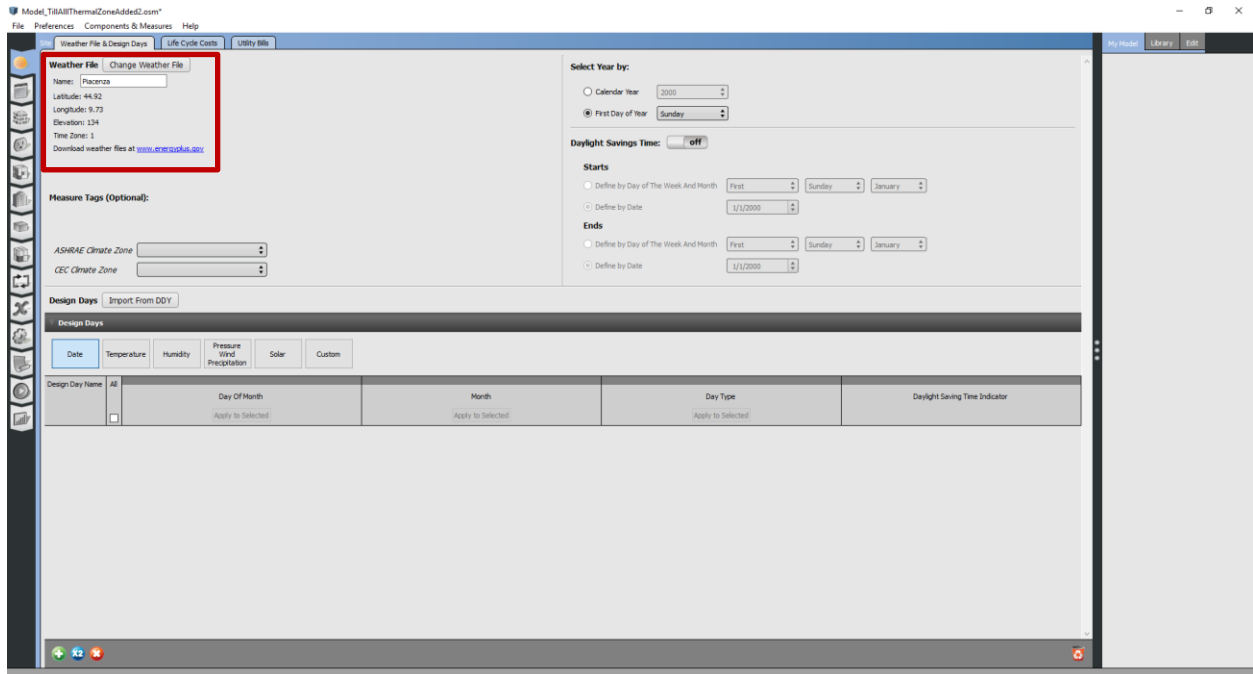


Set for level one and we should do that for other floors too

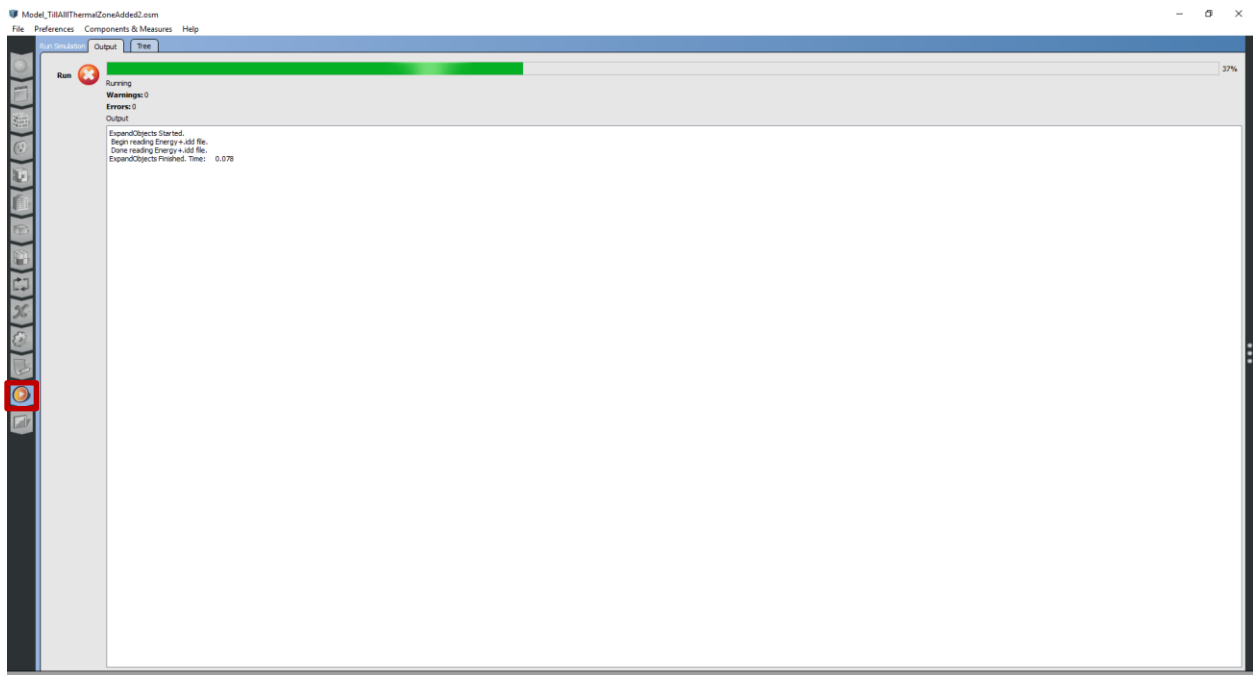


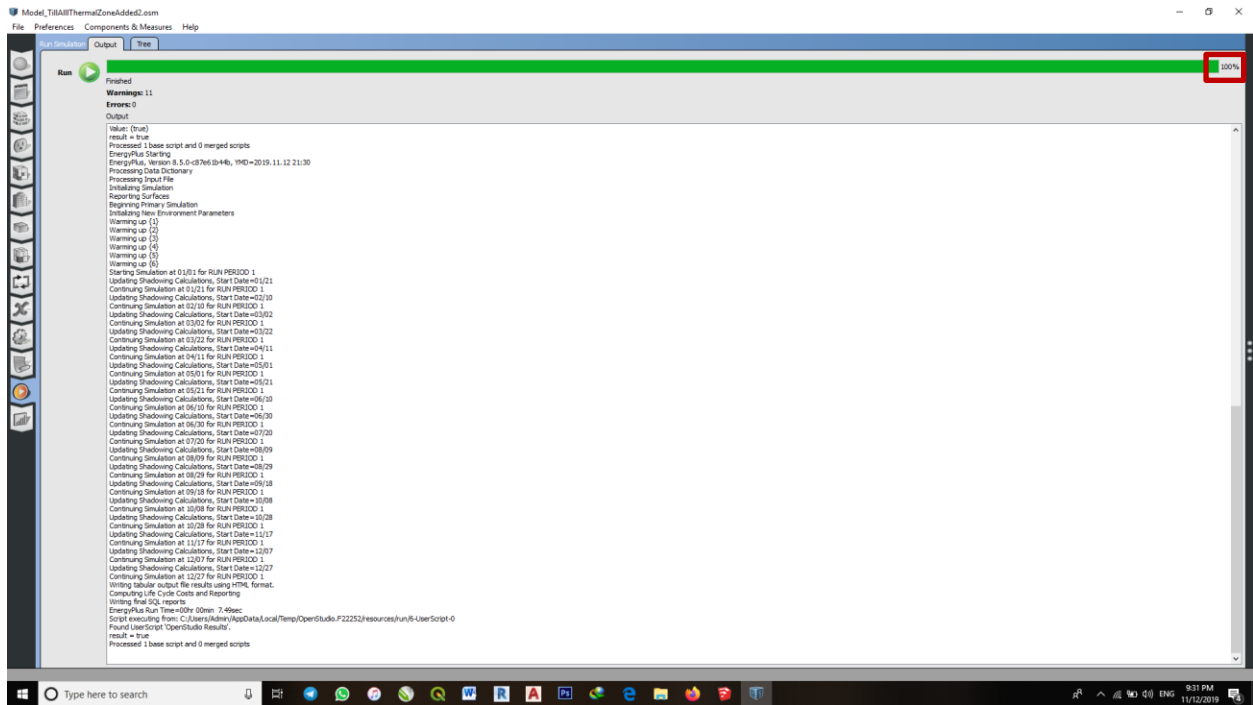
Then we open Open studio to add the weather Data





Next we simply run the model





Finally we can review our results in the last tab

