Task 1:

Then when the $\varepsilon 1 = \varepsilon 2 = 0.1$

$$Q \text{ With no shield} = \frac{A\sigma(T_1^4 - T_2^4)}{\frac{1}{\epsilon}+\frac{1}{\epsilon}-1}$$

$$Q \text{ With no shield} = \frac{Ax5.67x10^8(800x10^4 - 500x10^4)}{\frac{1}{0.1}+\frac{1}{0.1}-1}$$

$$Q \text{ With no shield} = 1035.82W$$

$$Q \text{ N shield} = \frac{1}{(N)+1} \text{ x } Q \text{ With no shield}$$

$$1\% \text{ (Q With no shield)} = \frac{1}{(N)+1} \text{ x } Q \text{ With no shield}$$

$$1\% \text{ (1035.82)} = \frac{1}{(N)+1} \text{ x } 1035.82$$

$$\frac{10.3582}{1035.82} = \frac{1}{(N)+1}$$

$$0.01 = \frac{1}{(N)+1}$$

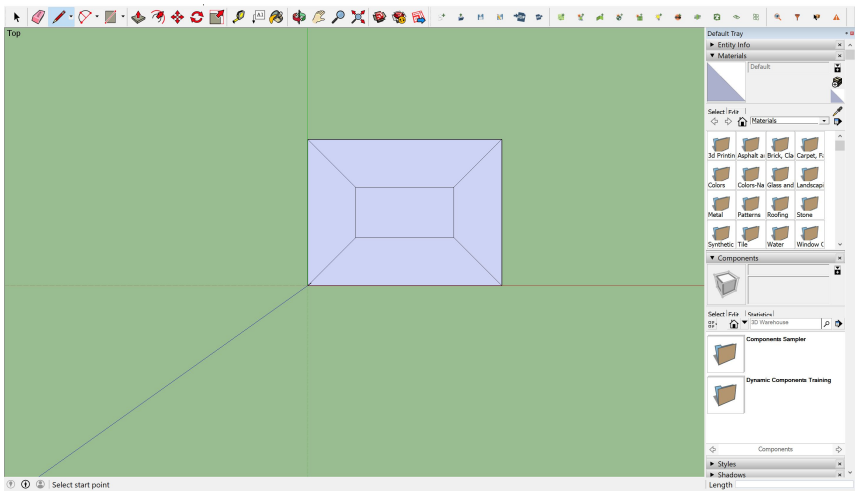
$$N = \frac{1}{0.01} - 1$$

$$N = 1.01$$

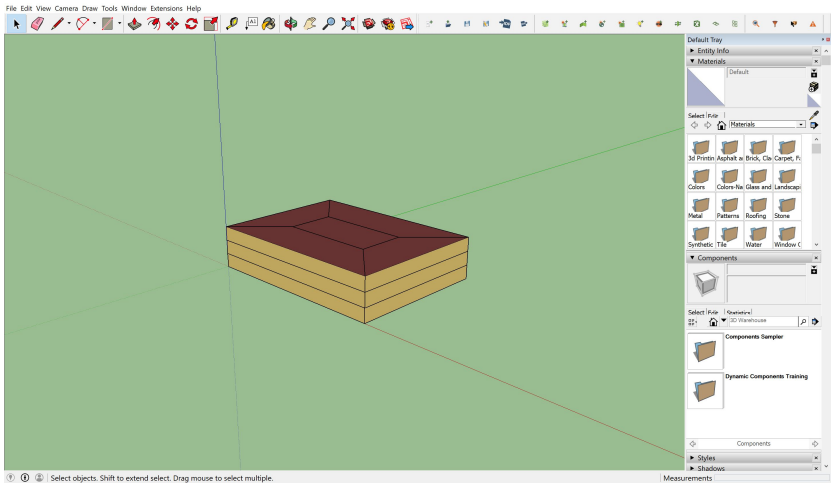
$$N = 99$$

Task 2:

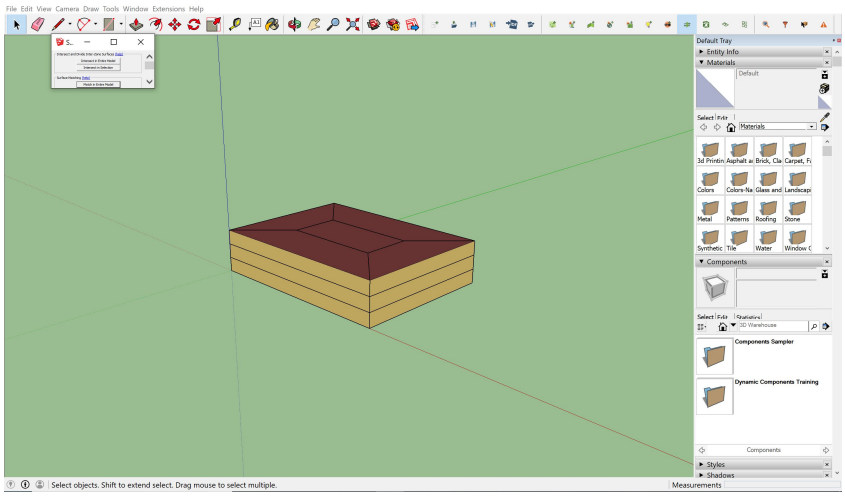
1. Draw a rectangle 30m x 40m with an offset of 10m



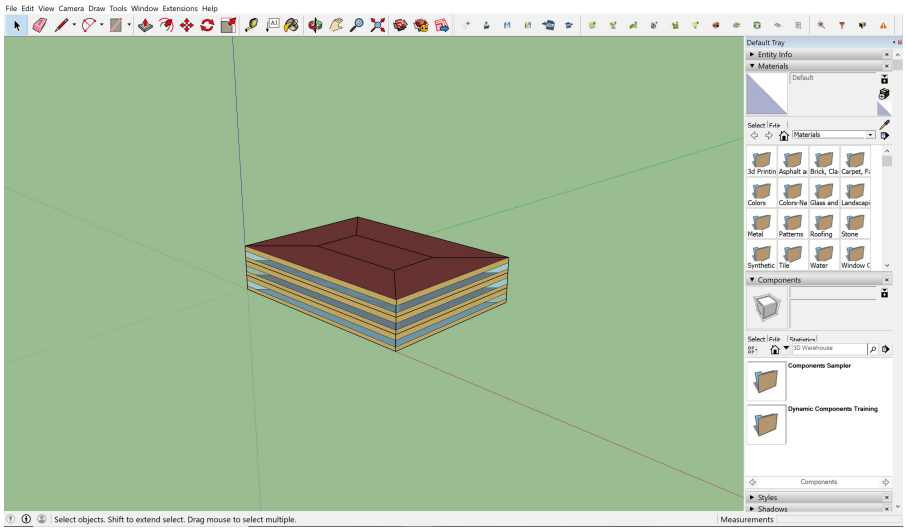
2. Create spaces from diagram and then set the number of floors and height of each floor.



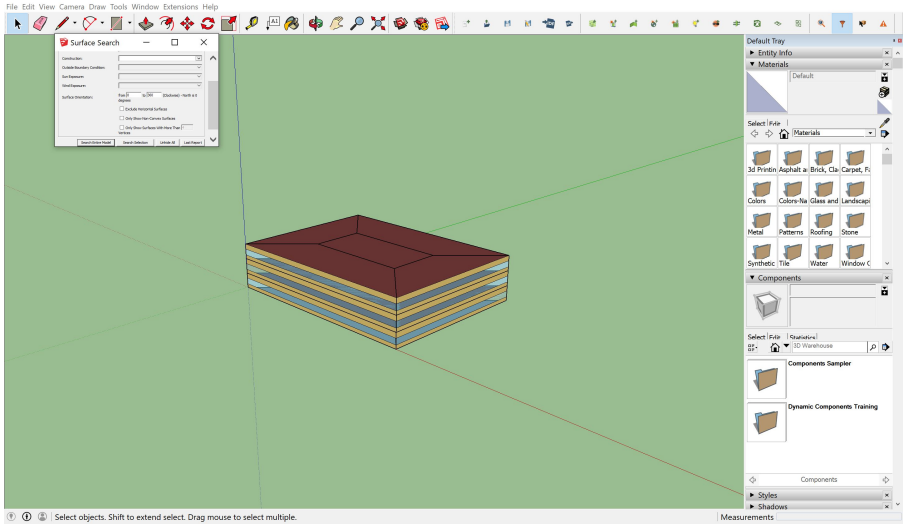
3. Use Surface matching tool and match in entire model.



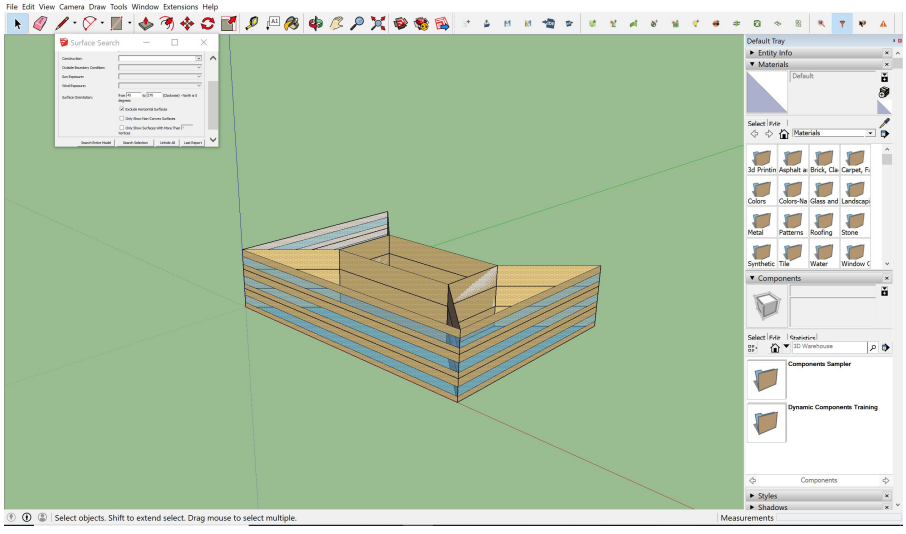
4. Create windows using openStudio and set window to wall ratio



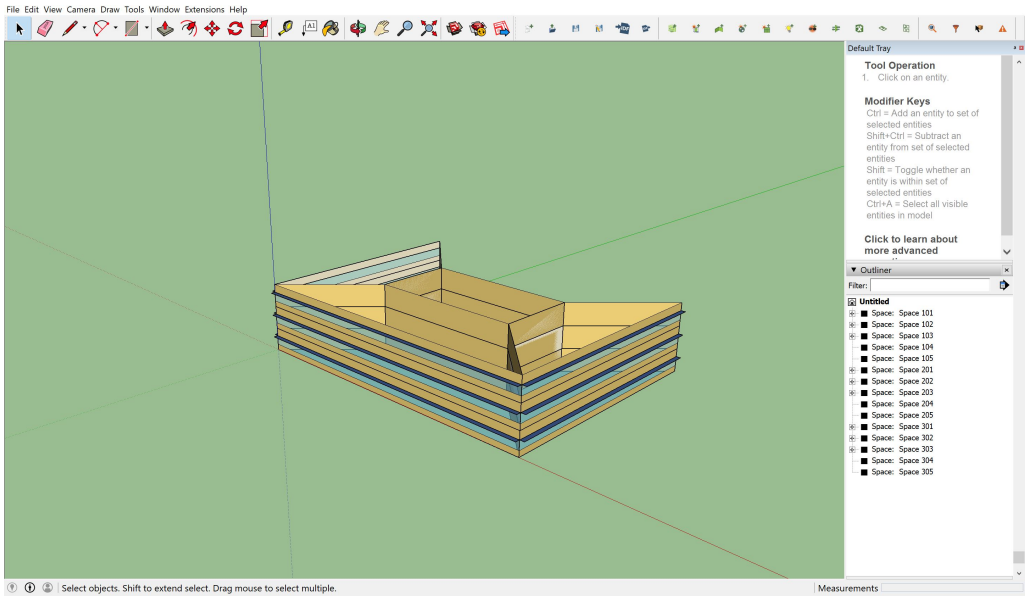
5. Apply Surface search tool and set orientation from 45 to 270



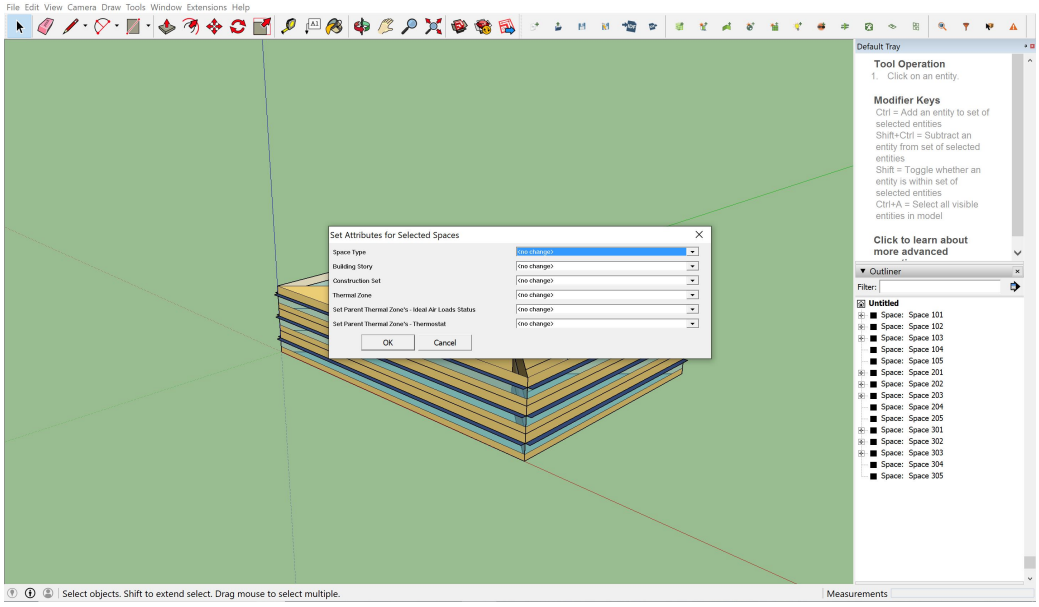
6. Put overhangs using OpenStudio and then add overhangs by projection



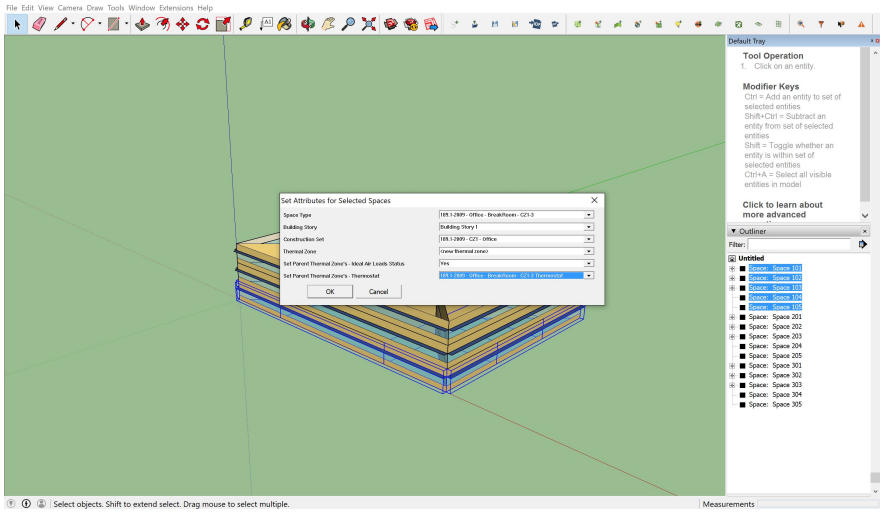
7. Set the window to outliner



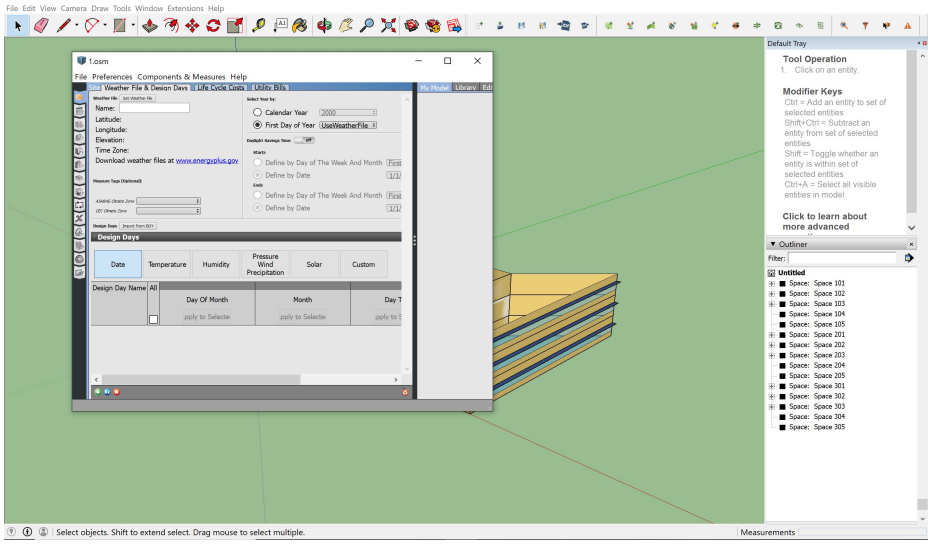
8. Set attributes for selected space



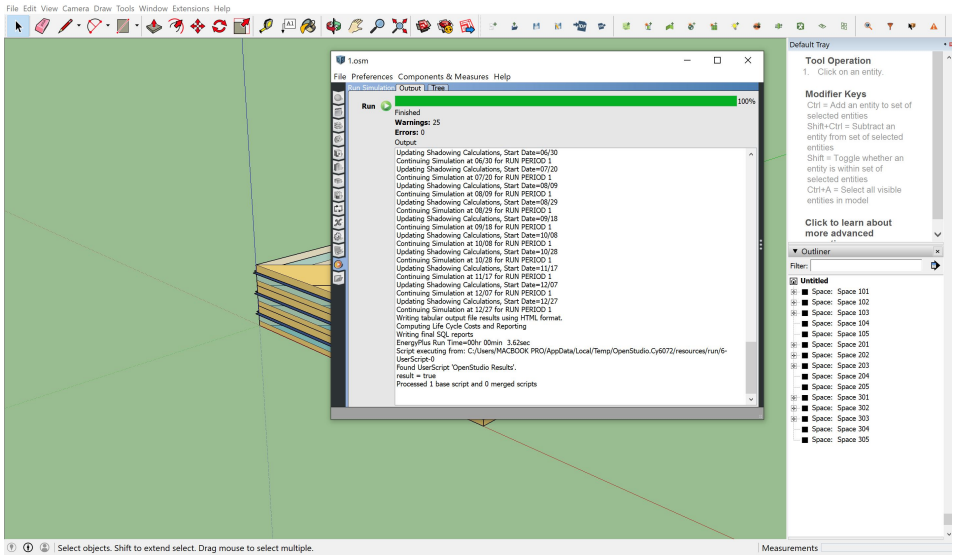
9. First Floor



10. Open OpenStudio file and import Piacenza weather data file



11. Run simulation



12. Convert to Energyplus results