WEEK 6

Tuesday, November 12, 2019 11:03 PM

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 Considering the same example you solved in the previous assignment (radiative heat transfer between two parallel plates), how many shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields?

-8

 σ =5.67x10

£1=E2=E3.1=E3.2=**0.1**

T1=800K

T2=500K

If we assume that all values are equal

How many shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields?

4

 $Q/A = \sigma(T_1-T_2)/1/\epsilon_1+1/\epsilon_2-1=1035.81 \text{ W/m}2$

1035.81x1%=10.35

 $\sigma(T_1-T_2)/(1/\epsilon_1+1/\epsilon_2-1)(N+1)=1/N+1$ 1/(N+1)Q=1/100Q

99 Surfaces to lower the radiation to 1% If not;

-6

σ=5.67x10

€1=0.2

ε₂=0.7

T1=800K

T2=500K

 $Q/A = \sigma(T_1-T_2)/1/\epsilon_1+1/\epsilon_2-1=3625.4 \text{ W/m}2$

3625.4x1%=36.25

Q/A= $\sigma(T_1-T_2)/(1/\epsilon_1+1/\epsilon_2-1)+(1/\epsilon_3.1+1/\epsilon_3.2-1)+(1/\epsilon_{n.1}+1/\epsilon_{n.2}-1)=36.25$

19680.57/5.42 + 19n = 36.25

19680.57=36.25(5.42+19n)

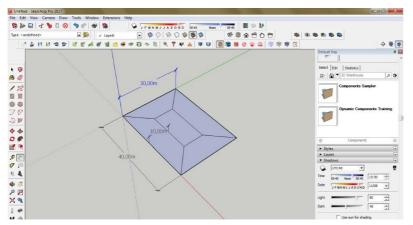
542.91-5.42=19n

537.49=19n

28.1=n

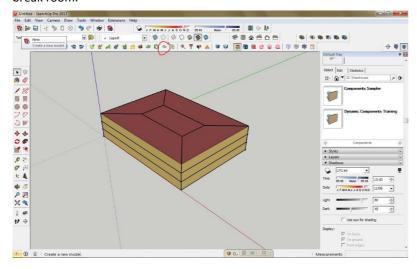
28 Shields with ε = 0.1 in order to lower the radiative heat transfer to %1

 You should create a pdf file with screenshots of all of the steps we went through (clearly from your own file) and explain briefly the reason behind the use of each step

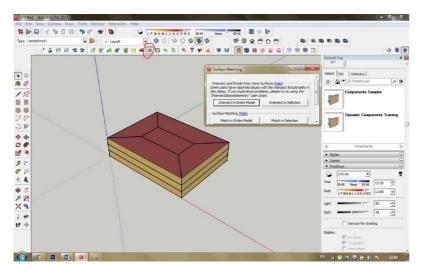




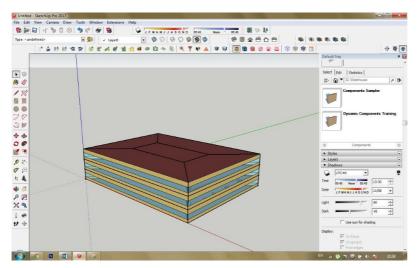
First, in sketch up I created the floor plan of a simple office building. Open offices and the break room.



Then I clicked the create spaces from diagram, floor height 10' and 3 floors. I can see the information with the info tool.

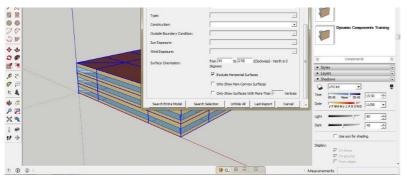


In order to define interior and outer walls, I used surface matching tool.



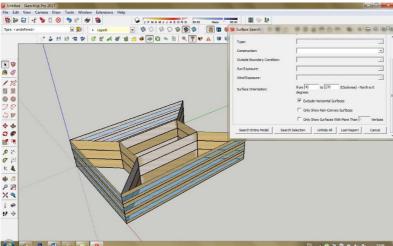
Then using the extensions tab I added the window ratios to the spaces of 70%



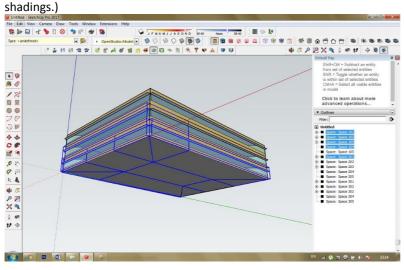


To create shadings for necessary facades, I use the surface selection, selecting all the facades but the north.

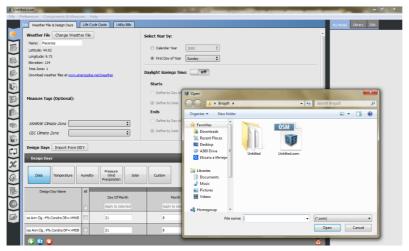
With 45-270



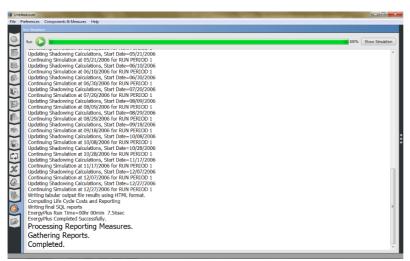
The facades are selected, I used the extensions window to add overhangs (external



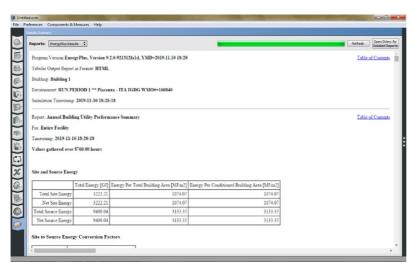
When the shadings are done, I use the side bar to select the spaces and define thermal zones.I am done with sketch up. Saved my progress.



I open OpenStudio and open my file which I created in Skethup and add weather and design days in the file by importing.



I run the model.



I have my results in the last tab.