Sofia Lopez Mendoza

Task 1: What is Solar Radiation?

Is electromagnetic energy emitted by the sun. Solar radiation goes through the atmosphere to reach the surface and is modified.

Solar radiation absorption is due to atmospheric components as ozone, water and carbon dioxide, which absorb the incident radiation in specific wavelengths bands (also absorption bands) consequently modifying its energetic spectrum.

Stratospheric ozone absorbs almost all the ultraviolet component of the solar radiation for wavelength less than 0.29 um

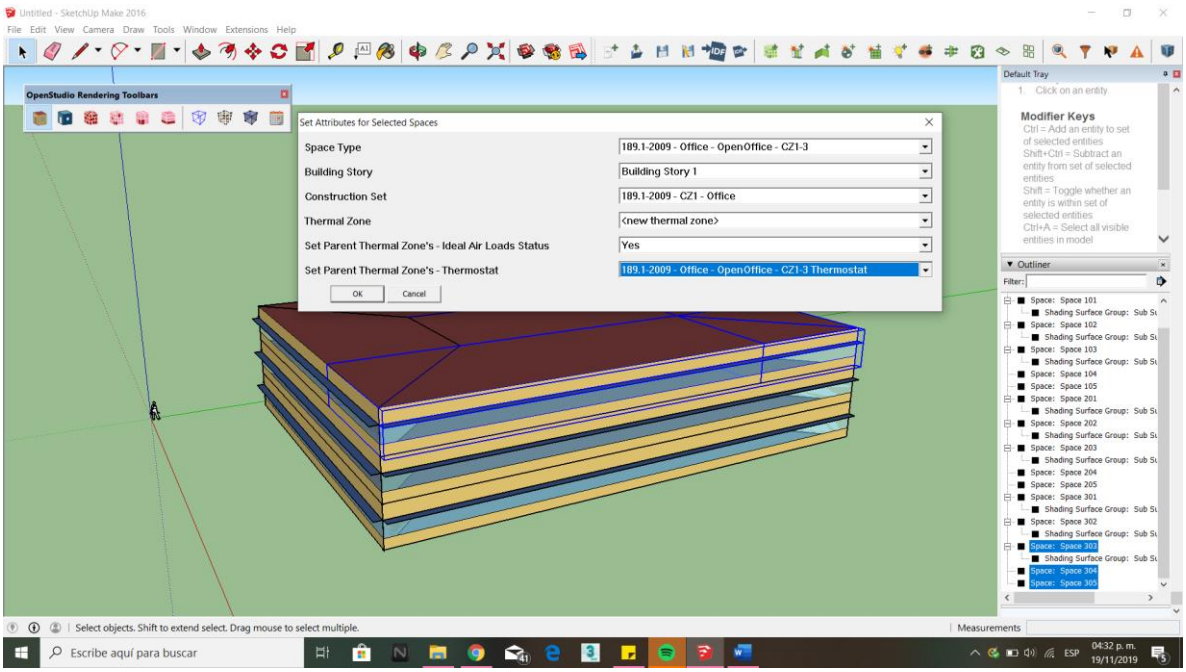
The availability of solar radiation which we can find on the Earth´s surface for conversion in other energy forms, depends on:

- The sun position in the sky and this changes every day and every season
- The weather conditions
- The site altitude over the see level
- And sunshine hours

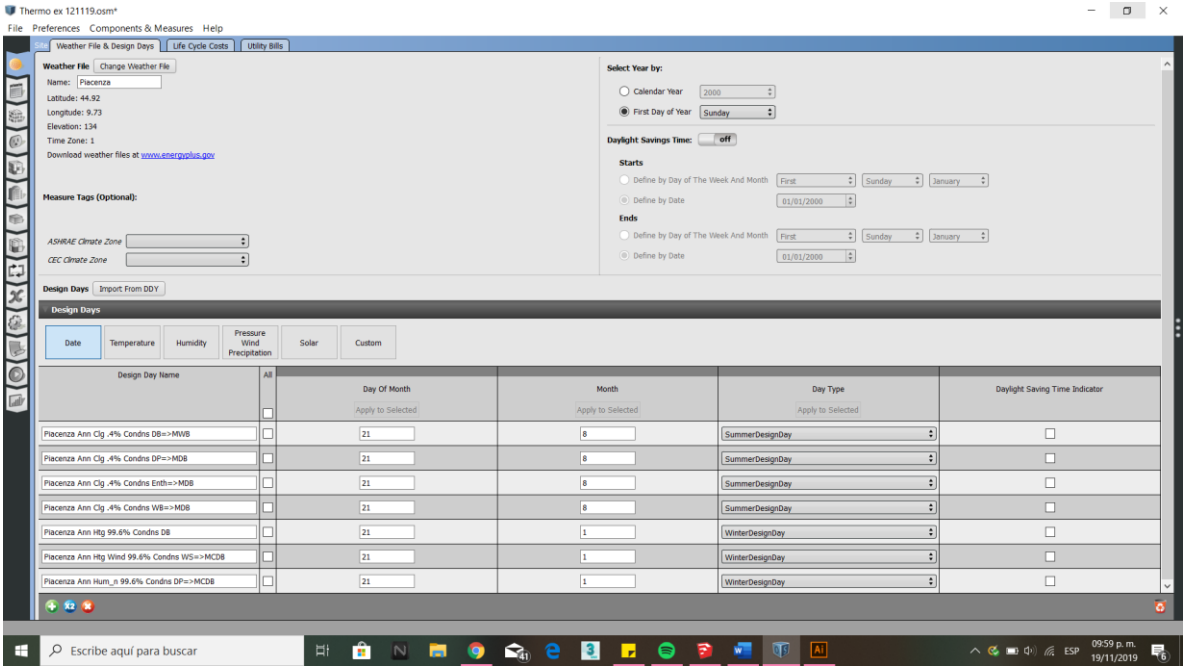
Task 2: Steps of Open Studio Sessions

AFTER step 5

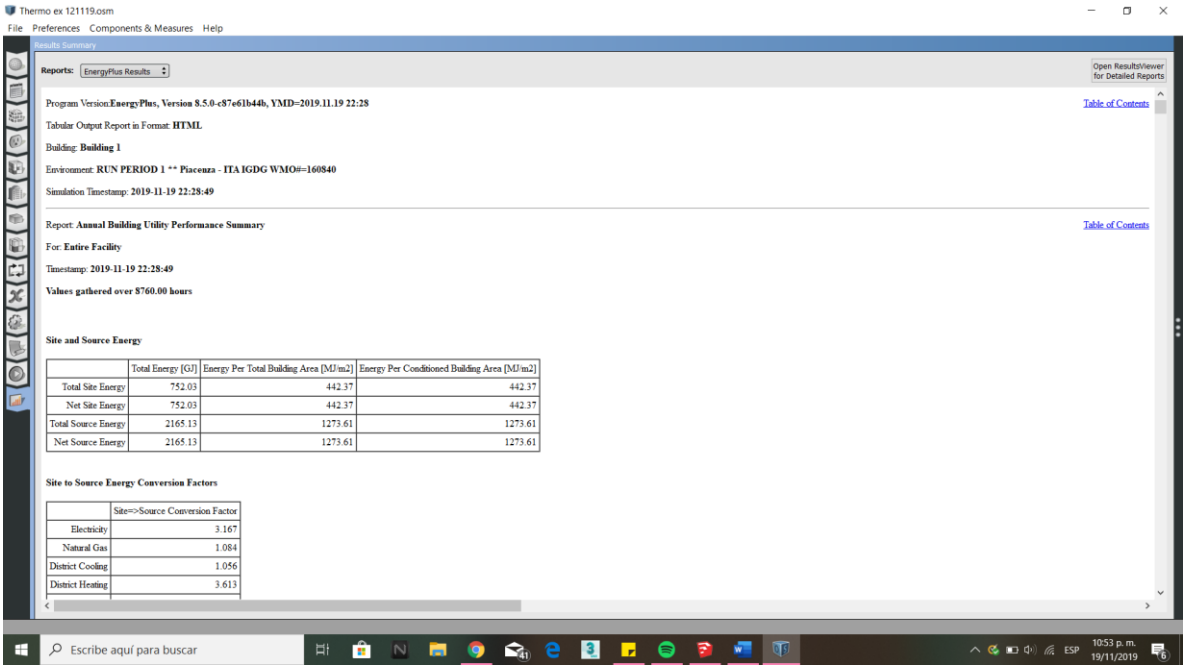
6. I used the tool set attributes for selected spaces to set up the thermal characteristics of some spaces.

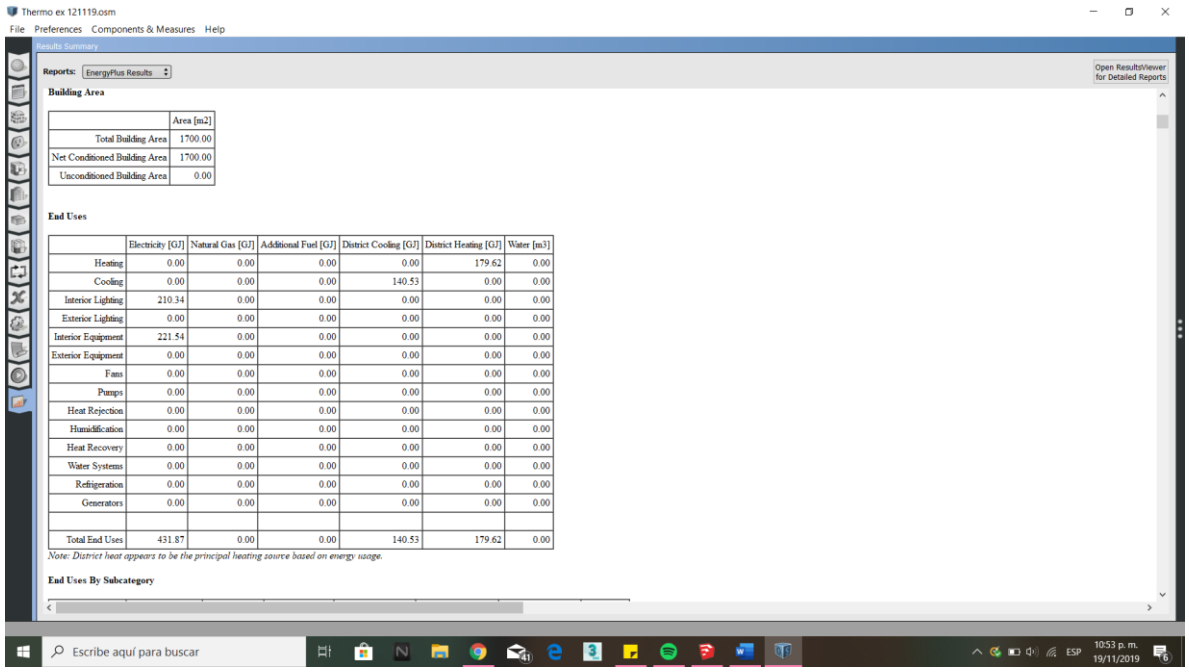


7. I opened Open studio to add the weather data of Piacenza and do the simulation



8. I ran the simulation and these were the energy results




Thermo ex 121119.osm
File Preferences Components & Measures Help
Results Summary
Reports: EnergyPlus Results
Open ResultsViewer for Detailed Reports
Building Area
Area [m2]
Total Building Area 1700.00
Net Conditioned Building Area 1700.00
Unconditioned Building Area 0.00
End Uses
Electricity [GJ] Natural Gas [GJ] Additional Fuel [GJ] District Cooling [GJ] District Heating [GJ] Water [m3]
Heating 0.00 0.00 0.00 0.00 179.62 0.00
Cooling 0.00 0.00 0.00 140.53 0.00 0.00
Interior Lighting 210.34 0.00 0.00 0.00 0.00 0.00
Exterior Lighting 0.00 0.00 0.00 0.00 0.00 0.00
Interior Equipment 221.54 0.00 0.00 0.00 0.00 0.00
Exterior Equipment 0.00 0.00 0.00 0.00 0.00 0.00
Fans 0.00 0.00 0.00 0.00 0.00 0.00
Pumps 0.00 0.00 0.00 0.00 0.00 0.00
Heat Rejection 0.00 0.00 0.00 0.00 0.00 0.00
Humidification 0.00 0.00 0.00 0.00 0.00 0.00
Heat Recovery 0.00 0.00 0.00 0.00 0.00 0.00
Water Systems 0.00 0.00 0.00 0.00 0.00 0.00
Refrigeration 0.00 0.00 0.00 0.00 0.00 0.00
Generators 0.00 0.00 0.00 0.00 0.00 0.00
Total End Uses 431.87 0.00 0.00 140.53 179.62 0.00
Note: District heat appears to be the principal heating source based on energy usage.
End Uses By Subcategory
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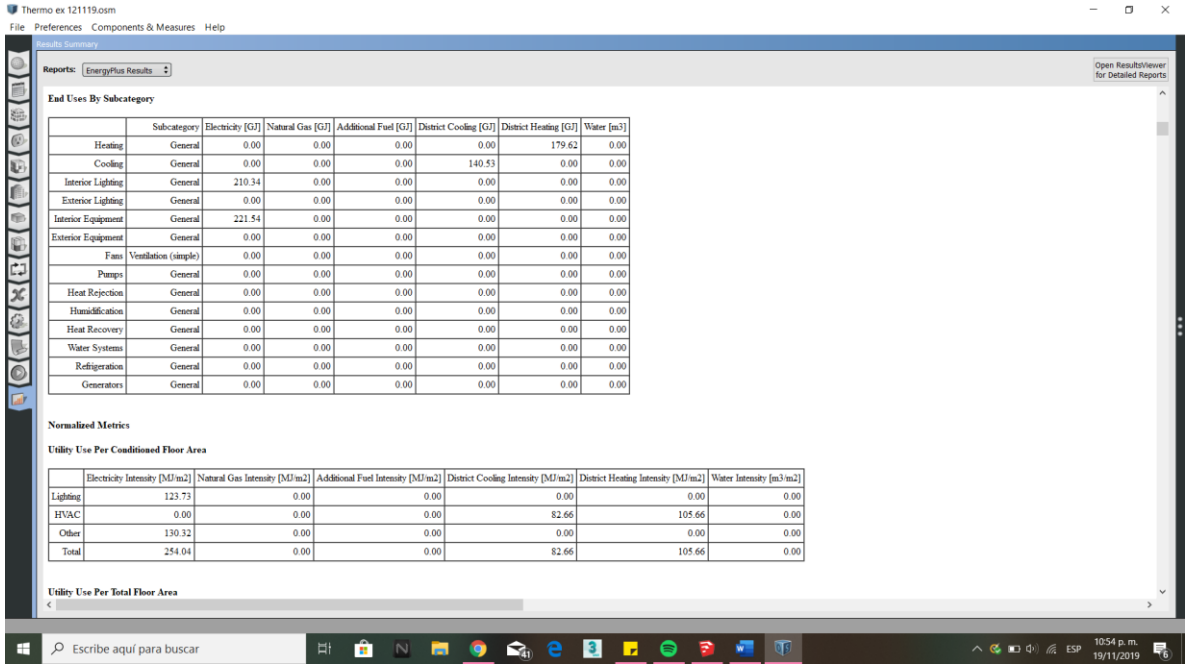
ESP
10:53 p. m.
19/11/2019


Thermo ex 121119.osm
File Preferences Components & Measures Help
Results Summary
Reports: EnergyPlus Results
Open ResultsViewer for Detailed Reports
End Uses By Subcategory
Subcategory Electricity [GJ] Natural Gas [GJ] Additional Fuel [GJ] District Cooling [GJ] District Heating [GJ] Water [m3]
Heating General 0.00 0.00 0.00 0.00 179.62 0.00
Cooling General 0.00 0.00 0.00 140.53 0.00 0.00
Interior Lighting General 210.34 0.00 0.00 0.00 0.00 0.00
Exterior Lighting General 0.00 0.00 0.00 0.00 0.00 0.00
Interior Equipment General 221.54 0.00 0.00 0.00 0.00 0.00
Exterior Equipment General 0.00 0.00 0.00 0.00 0.00 0.00
Fans Ventilation (simple) 0.00 0.00 0.00 0.00 0.00 0.00
Pumps General 0.00 0.00 0.00 0.00 0.00 0.00
Heat Rejection General 0.00 0.00 0.00 0.00 0.00 0.00
Humidification General 0.00 0.00 0.00 0.00 0.00 0.00
Heat Recovery General 0.00 0.00 0.00 0.00 0.00 0.00
Water Systems General 0.00 0.00 0.00 0.00 0.00 0.00
Refrigeration General 0.00 0.00 0.00 0.00 0.00 0.00
Generators General 0.00 0.00 0.00 0.00 0.00 0.00
Normalized Metrics
Utility Use Per Conditioned Floor Area
Electricity Intensity [MJ/m2] Natural Gas Intensity [MJ/m2] Additional Fuel Intensity [MJ/m2] District Cooling Intensity [MJ/m2] District Heating Intensity [MJ/m2] Water Intensity [m3/m2]
Lighting 123.73 0.00 0.00 0.00 0.00 0.00
HVAC 0.00 0.00 0.00 82.66 105.66 0.00
Other 130.32 0.00 0.00 0.00 0.00 0.00
Total 254.04 0.00 0.00 82.66 105.66 0.00
Utility Use Per Total Floor Area
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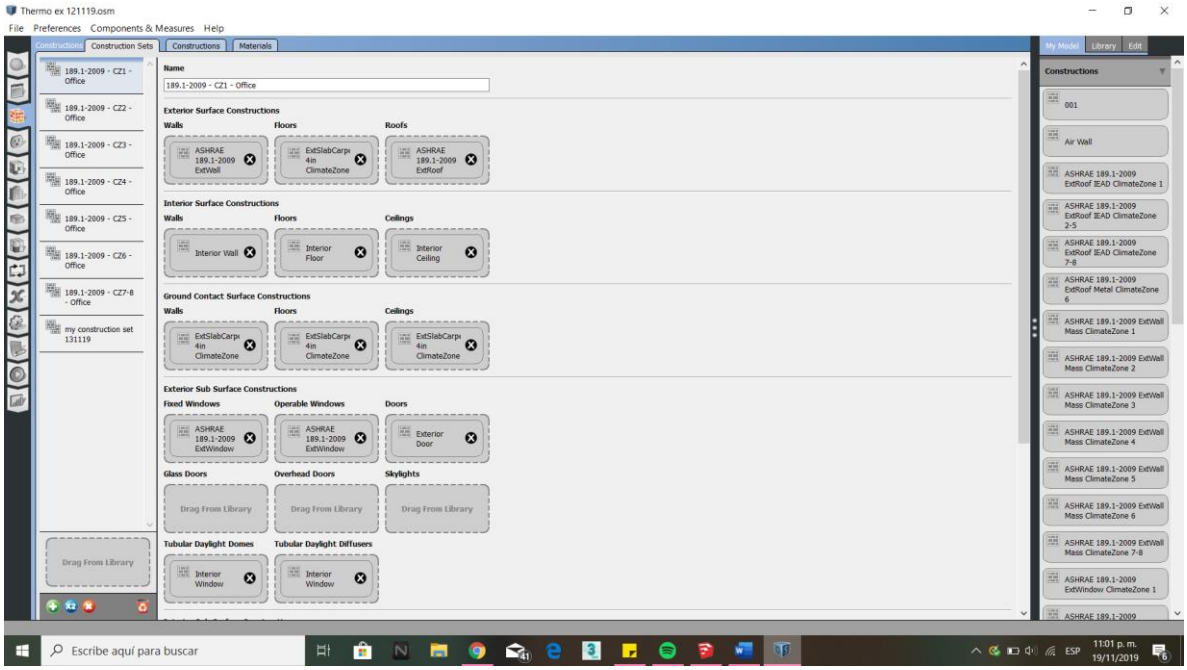
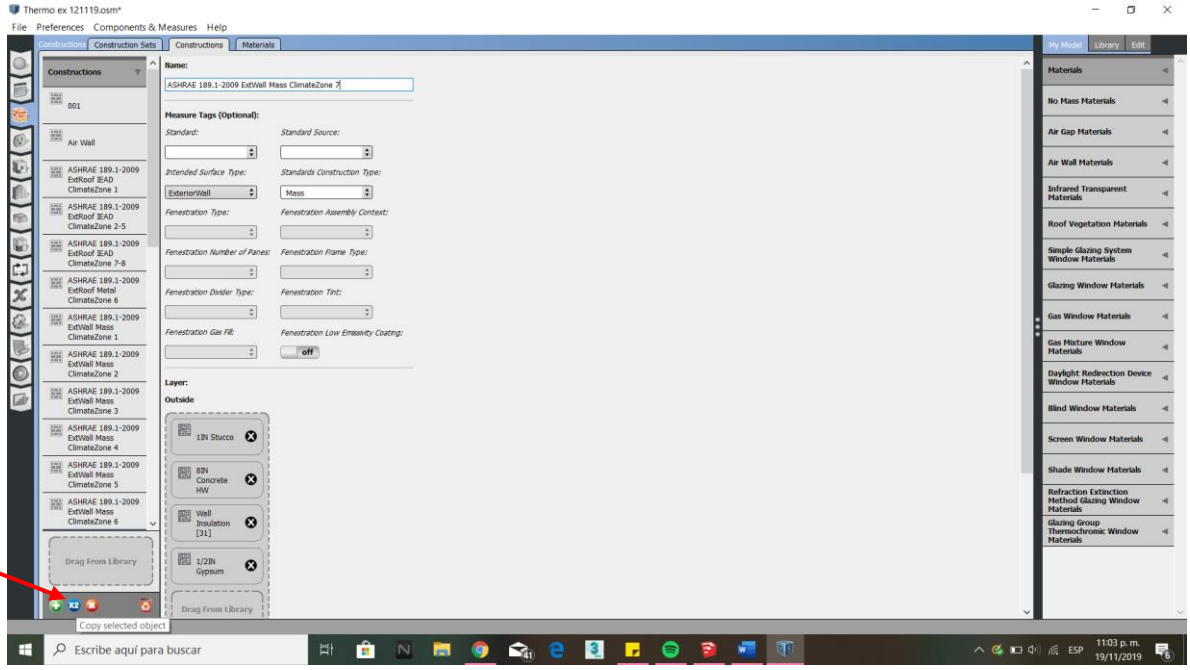
19/11/2019

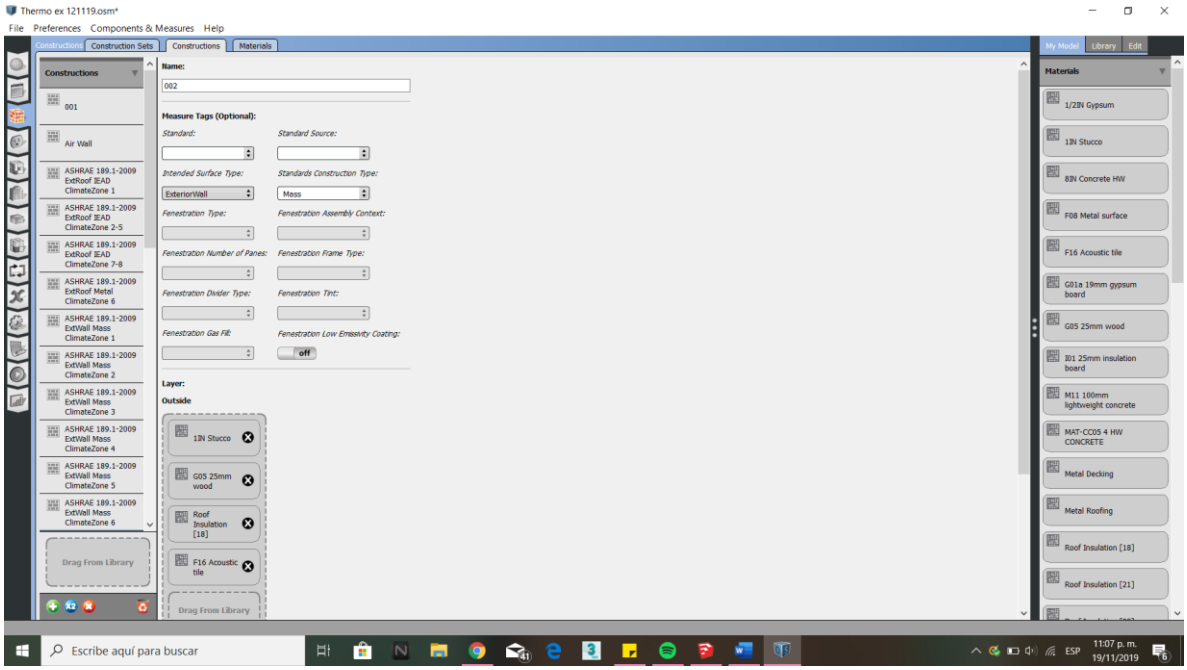
9. In construction set, we can modify the materials and add new ones with specific characteristics



10. To duplicate a material.



11. Here I already created a new material with certain characteristics.



12. And in construction set we can find the material I created and add it to the wall set up.