

## WeeklySubmission7

1.

Solar Radiation:

It is the Radiation emitted by the sun, and it's electromagnetic energy, before the solar radiation reach the Earth's surface, it's changed by dispersion and absorption phenomena, from the scattering molecule in the air.

The Solar Radiation that can be transformed into other type of energy, depending on the position of the sun( daily and seasonal change ), weather condition in different area, altitude over sea level, sunshine hour.

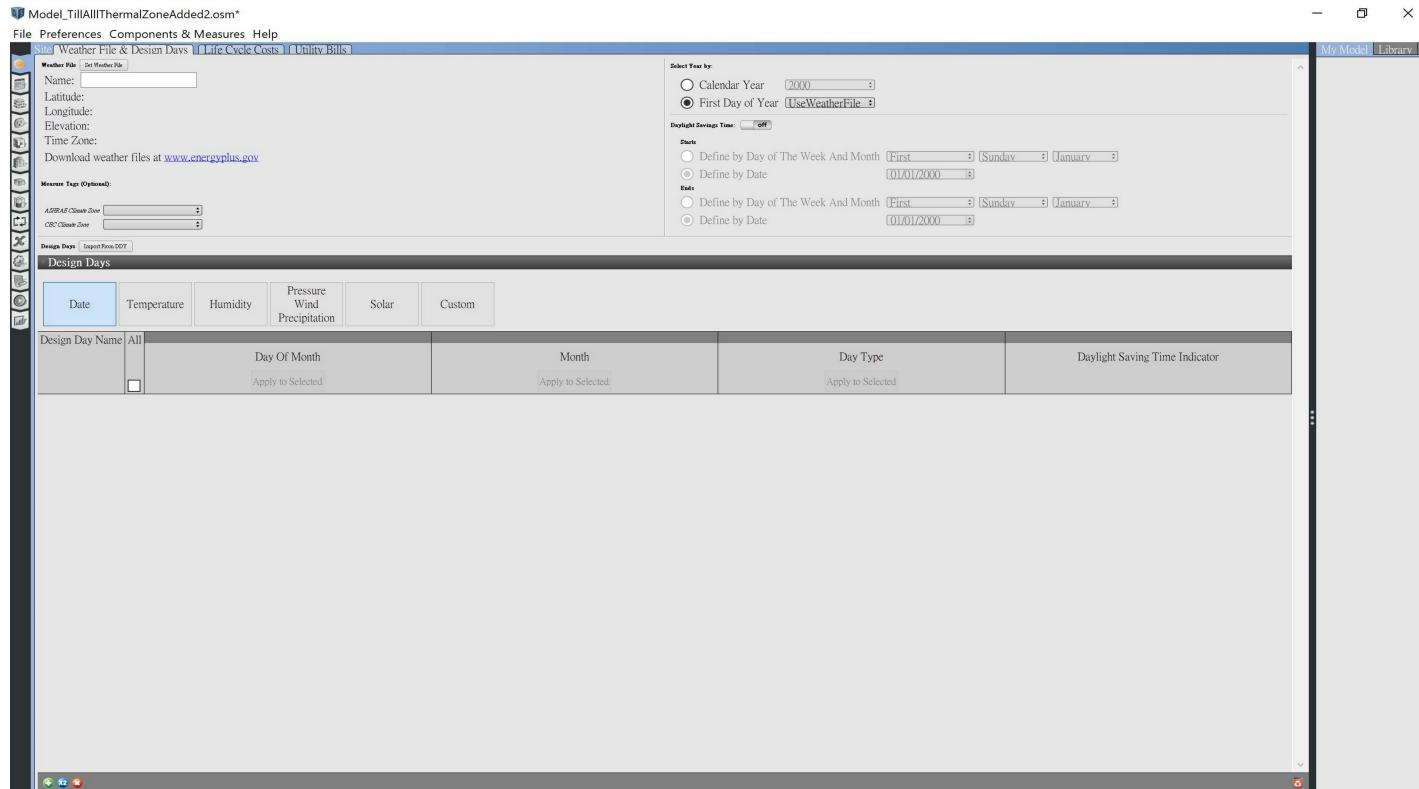
2.

To customize the thermal condition of the building, we can use the data on Energy Plus to search for the data of the location we need.

After we found and downloaded.

Launch the OpenStudio.

Import the Set Weather file, in .epw format, and then adding the design day, clicking "Import From DDY".



After that just run the model by clicking the second tab counting from down, on the left hand side.

Model\_TillAllThermalZoneAdded2.osm

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Run Simulation Output Tree

Run Finished  
Warnings: 10  
Errors: 0  
Output

Warming up { 6 }  
Starting Simulation at 01/01 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=01/21  
Continuing Simulation at 01/21 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=02/10  
Continuing Simulation at 02/10 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=03/02  
Continuing Simulation at 03/02 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=03/22  
Continuing Simulation at 03/22 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=04/11  
Continuing Simulation at 04/11 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=05/01  
Continuing Simulation at 05/01 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=05/21  
Continuing Simulation at 05/21 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=06/10  
Continuing Simulation at 06/10 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=06/30  
Continuing Simulation at 06/30 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=07/20  
Continuing Simulation at 07/20 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=08/09  
Continuing Simulation at 08/09 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=08/29  
Continuing Simulation at 08/29 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=09/18  
Continuing Simulation at 09/18 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=10/08  
Continuing Simulation at 10/08 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=10/28  
Continuing Simulation at 10/28 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=11/17  
Continuing Simulation at 11/17 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=12/07  
Continuing Simulation at 12/07 for RUN PERIOD 1  
Updating Shadowing Calculations, Start Date=12/27  
Continuing Simulation at 12/27 for RUN PERIOD 1  
Writing tabular output file results using HTML format.  
Computing Life Cycle Costs and Reporting  
Writing final SQL reports  
EnergyPlus Run Time=00hr 00min 8.60sec  
Script executing from: C:/Users/Iris/AppData/Local/Temp/OpenStudio.TxF168/resources/run/6-UserScript-0  
Found UserScript 'OpenStudio Results'.  
result = true  
Processed 1 base script and 0 merged scripts

Seeing the running result from the last tab. The weather condition has been customized.

The screenshot shows the OpenStudio Results interface with the following sections:

- Model Summary** (selected):
  - Building Name: Building 1
  - Net Site Energy: 2,242,535 kBtu
  - Total Building Area: 38,700 ft<sup>2</sup>
  - EUI (Based on Net Site Energy and Total Building Area): 57.87 kBtu/ft<sup>2</sup>
- Weather Summary**:
 

| Value                                       |
|---|
| Weather File: Placenza - ITA/IGD WMO=160840 |
| Latitude: 44.92                             |
| Longitude: 9.73                             |
| Elevation: 440 (ft)                         |
| Time Zone: 1.00                             |
| North Axis Angle: 0.00                      |
| ASHRAE Climate Zone:                        |
- Sizing Period Design Days**:
 

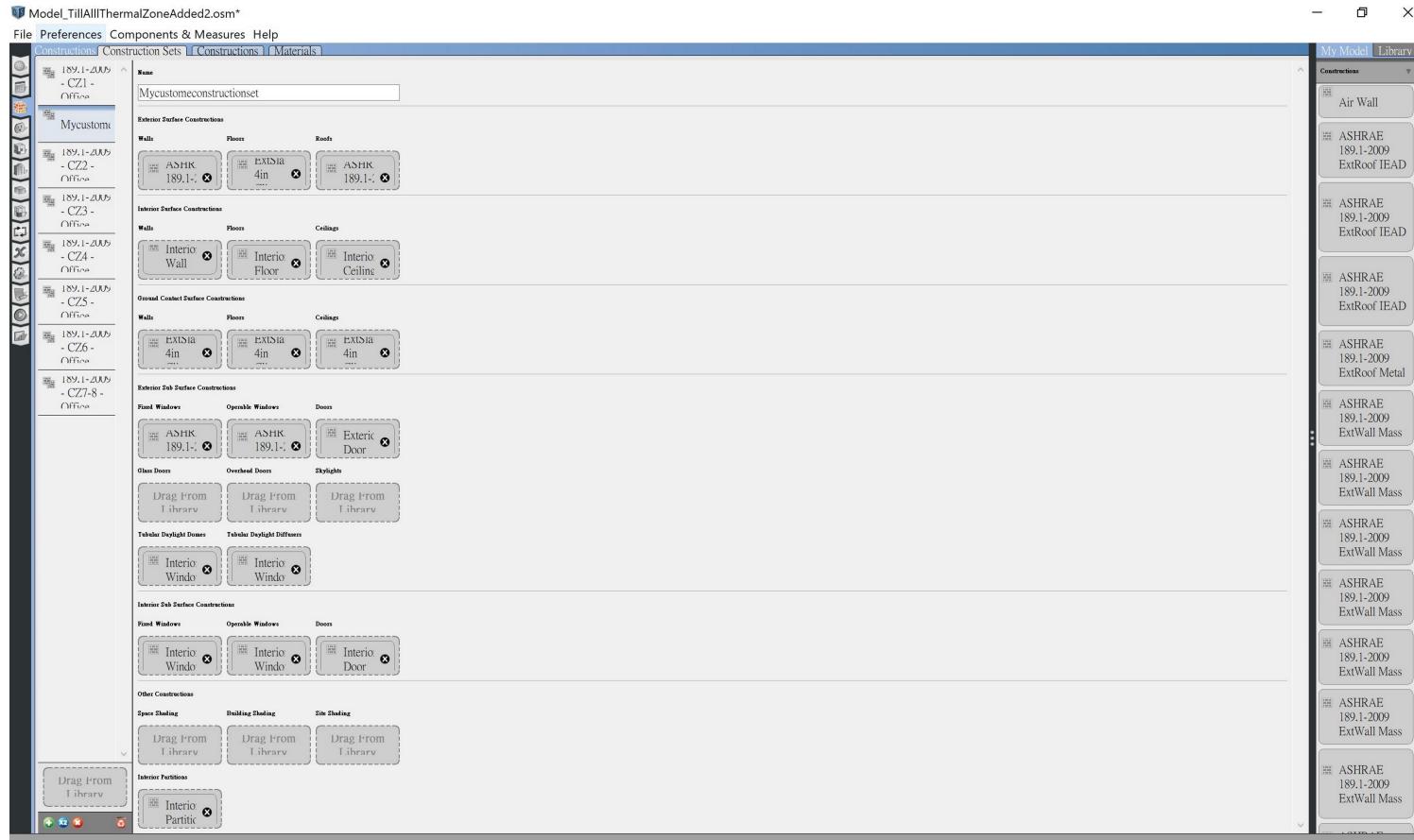
|  | Maximum Dry Bulb (F) | Daily Temperature Range (R) | Humidity Value | Humidity Type     | Wind Speed (mph) | Wind Direction |
|--|----------------------|-----------------------------|----------------|-------------------|------------------|----------------|
| PIACENZA ANN CLG_4% CONDNS DB=>MB          | 91.58                | 21.42                       | 72.88          | Wetbulb [F]       | 5.14             | 90.0           |
| PIACENZA ANN CLG_4% CONDNS DP=>MB          | 81.32                | 21.42                       | 73.4           | Deeppoint [F]     | 5.14             | 90.0           |
| PIACENZA ANN CLG_4% CONDNS ENTH=>MB        | 86.54                | 21.42                       | 32.2           | Enthalpy [Btu/lb] | 5.14             | 90.0           |
| PIACENZA ANN CLG_4% CONDNS WB=>MB          | 86.18                | 21.42                       | 76.28          | Wetbulb [F]       | 5.14             | 90.0           |
| PIACENZA ANN HTG_99.6% CONDNS DB           | 21.02                | 0.0                         | 21.02          | Wetbulb [F]       | 4.47             | 250.0          |
| PIACENZA ANN HTG_WND_99.6% CONDNS WS=>MCDB | 42.44                | 0.0                         | 42.44          | Wetbulb [F]       | 19.91            | 250.0          |
| PIACENZA ANN HUM_N_99.6% CONDNS DP=>MCDB   | 38.3                 | 0.0                         | 11.66          | Deeppoint [F]     | 4.47             | 250.0          |
- Unmet Hours Summary**:
 

| Time Setpoint Not Met   | Time (hr) |
|-------------------------|-----------|
| During Heating          | 0.0       |
| During Cooling          | 0.0       |
| During Occupied Heating | 0.0       |
| During Occupied Cooling | 0.0       |

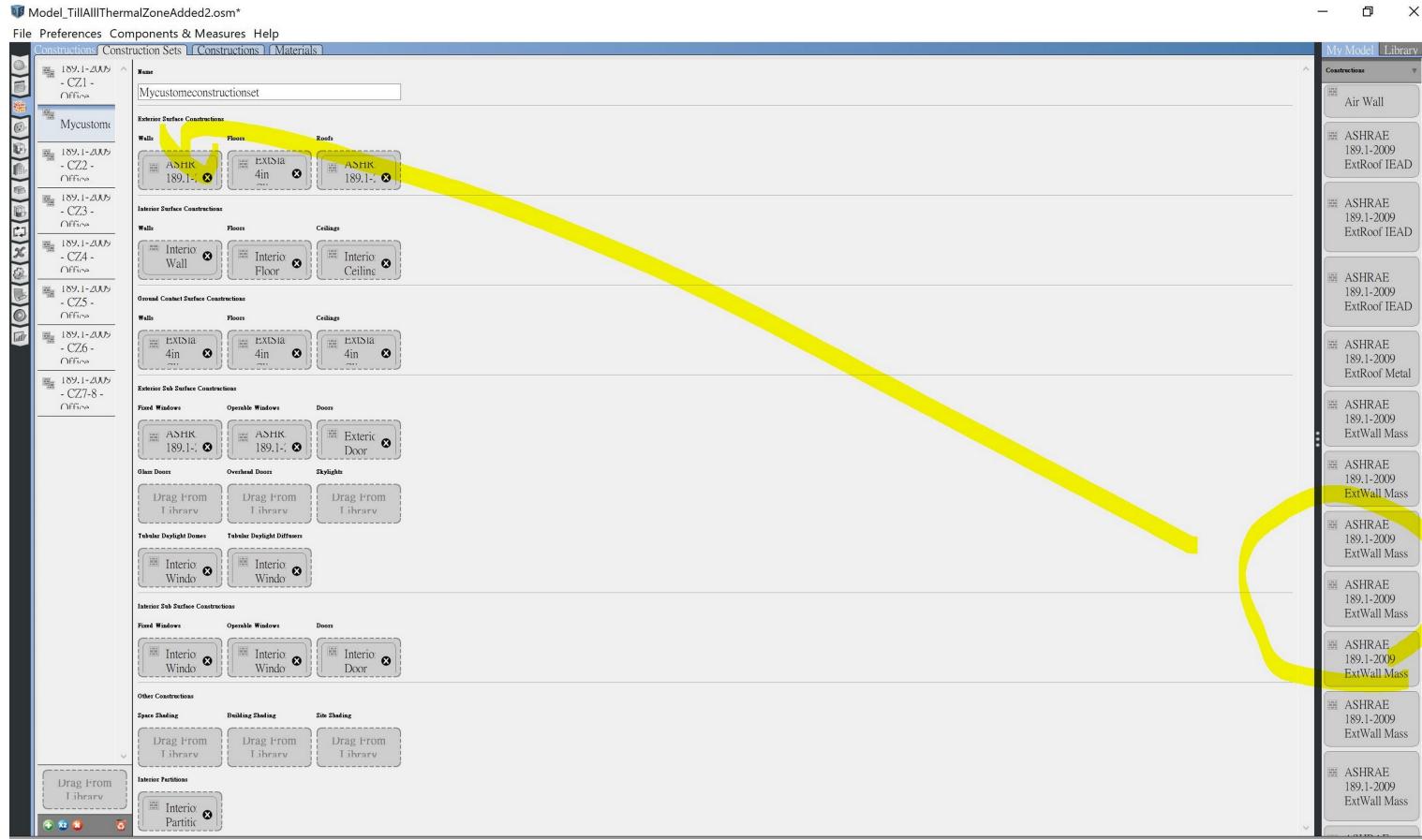
Using Openstudio to modify, to change the constructing element. To customize the construction set.

Changing the Wall as an example.

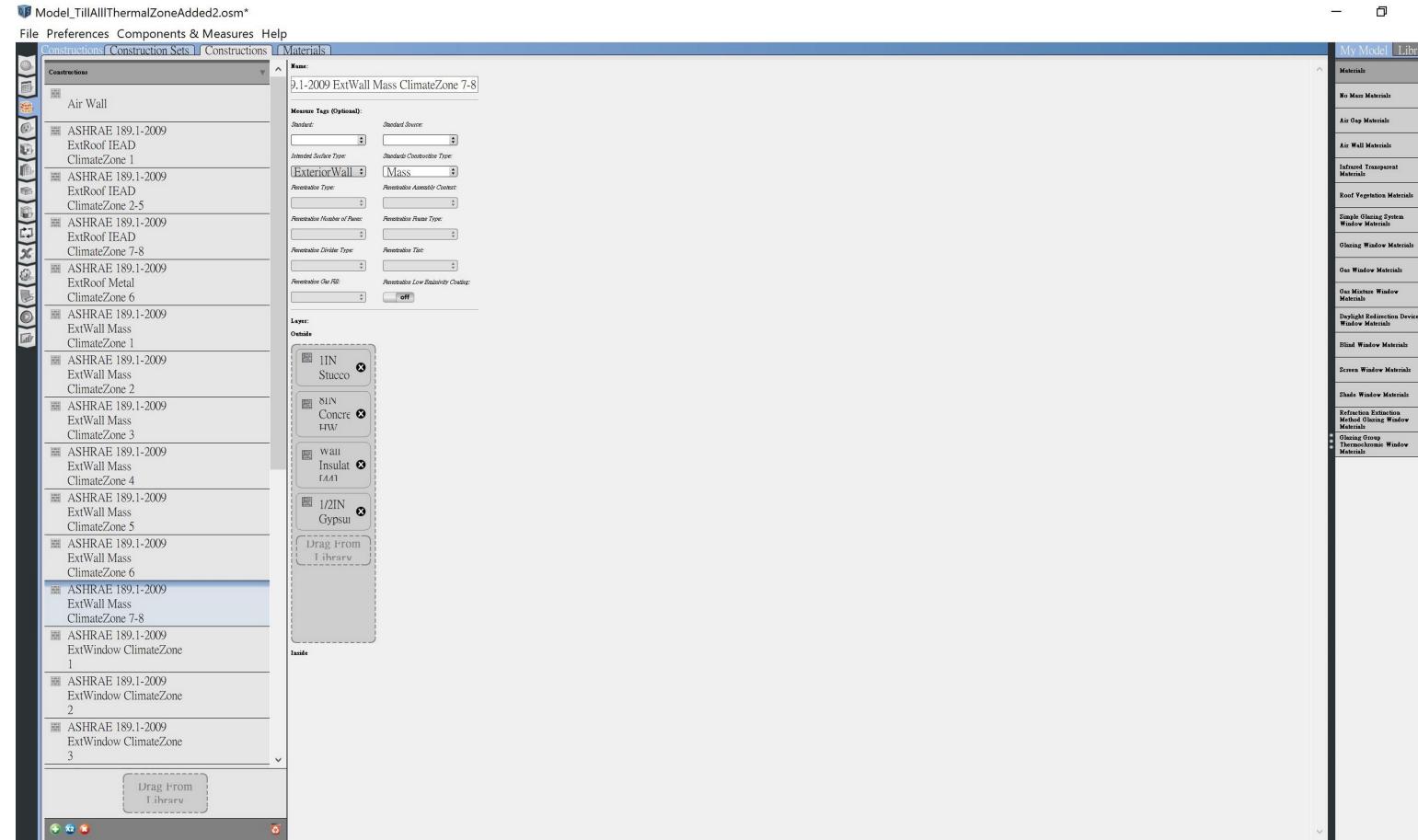
Go the third tab on the left, and go down to the blue tab with x2, to duplicate the set, and change the name as to be recognized better.



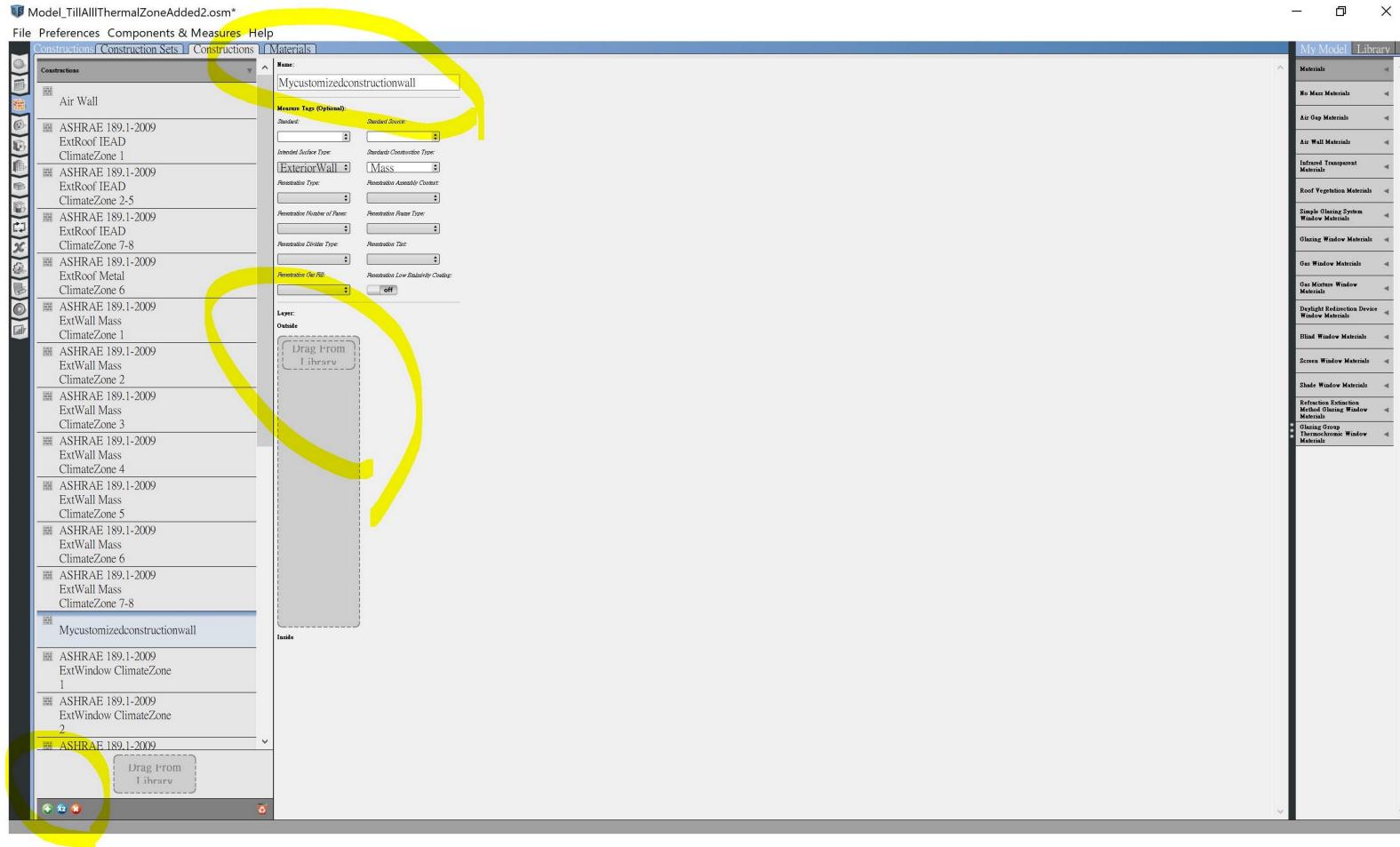
We can drag and drop from the bar of right hand side, in "My Model", but these are existing ones.



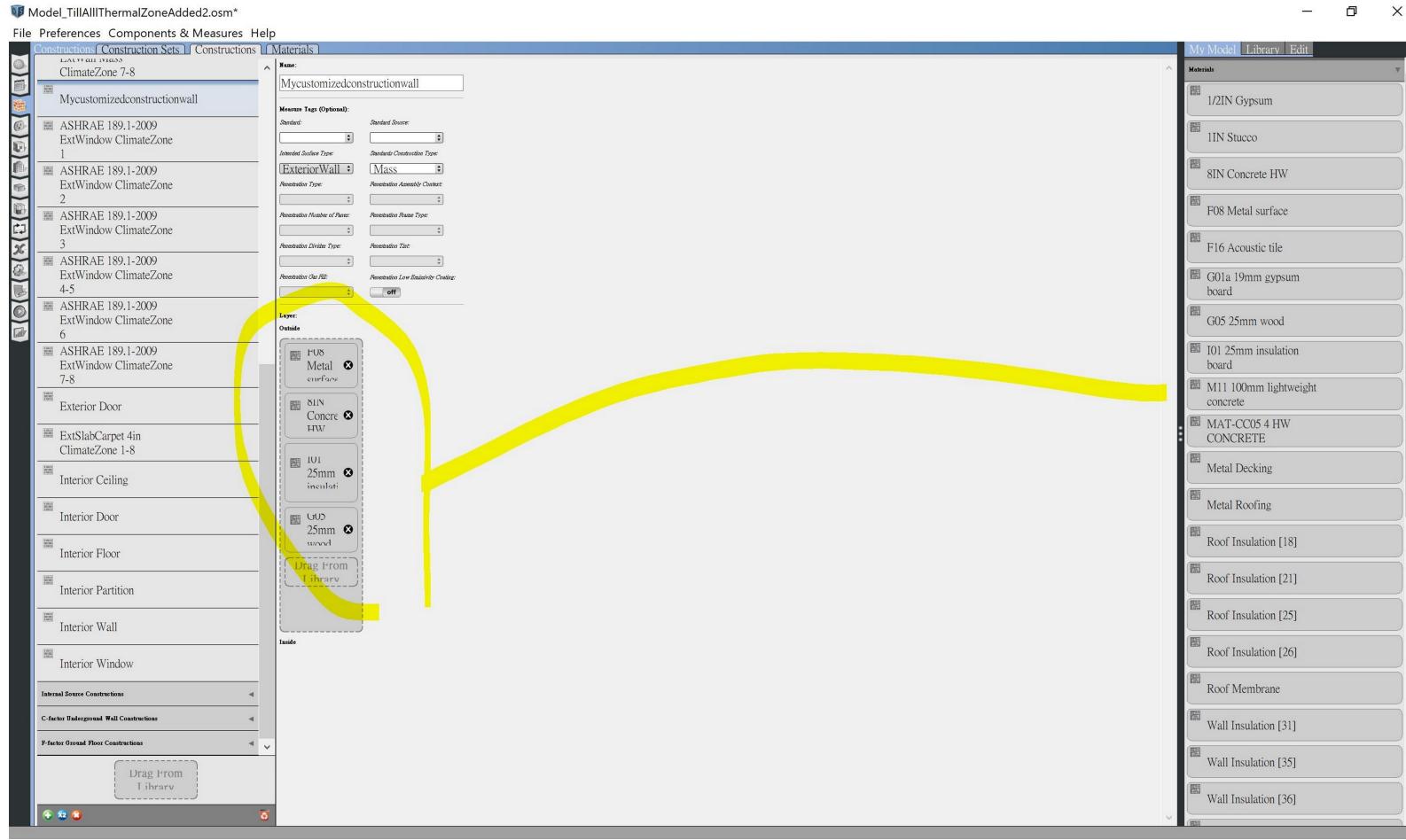
If we want to define a new construction, or to check for the existing construction properties. We go to "Constructions" tab on the upper part of the window.



To customize, using the same x2 tab, and change the name.  
After that remove existing layers, to put new ones.

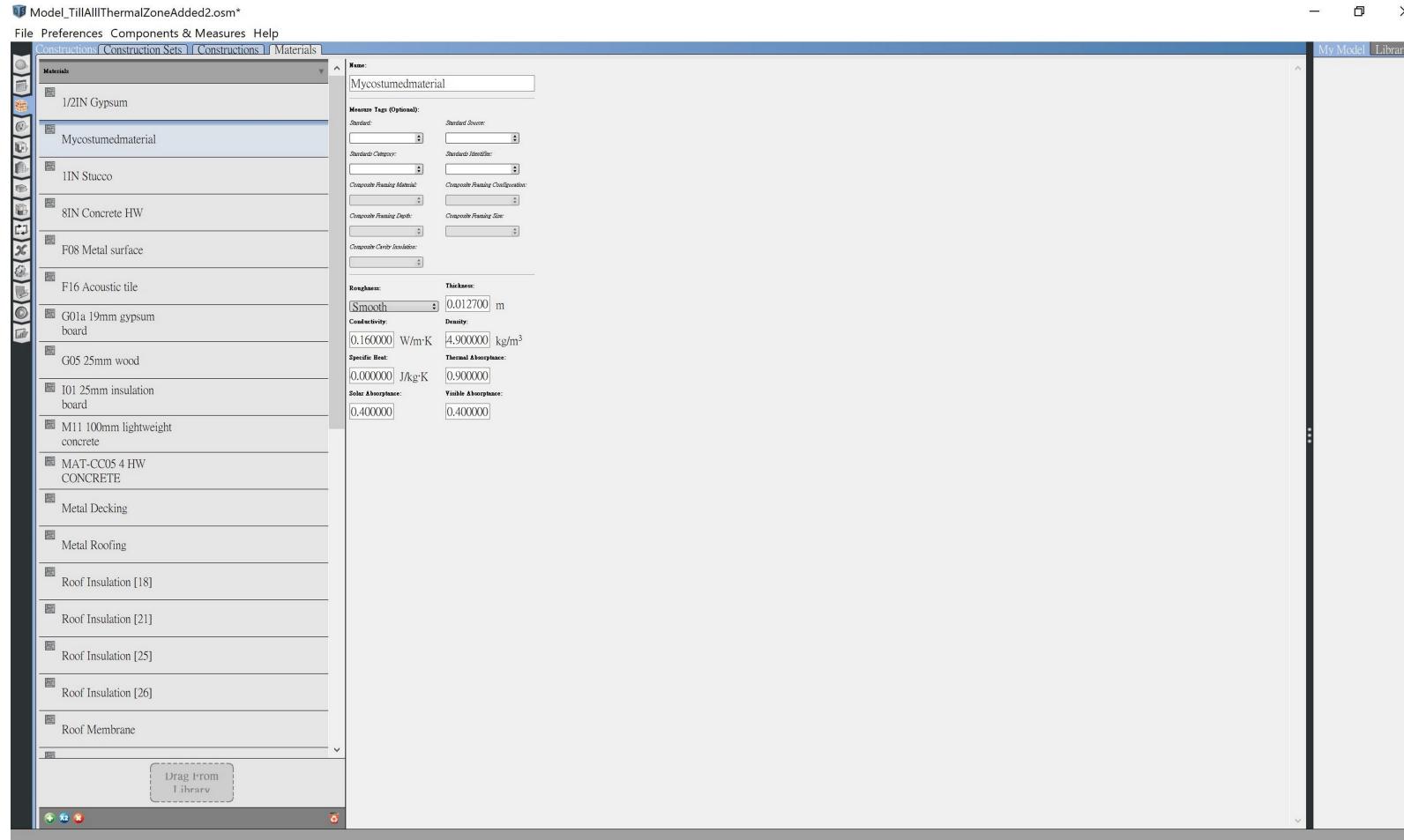


Putting the new material for the wall, from "My Model", we should put the material with the order from External to Internal. For now we are only using the existing material.

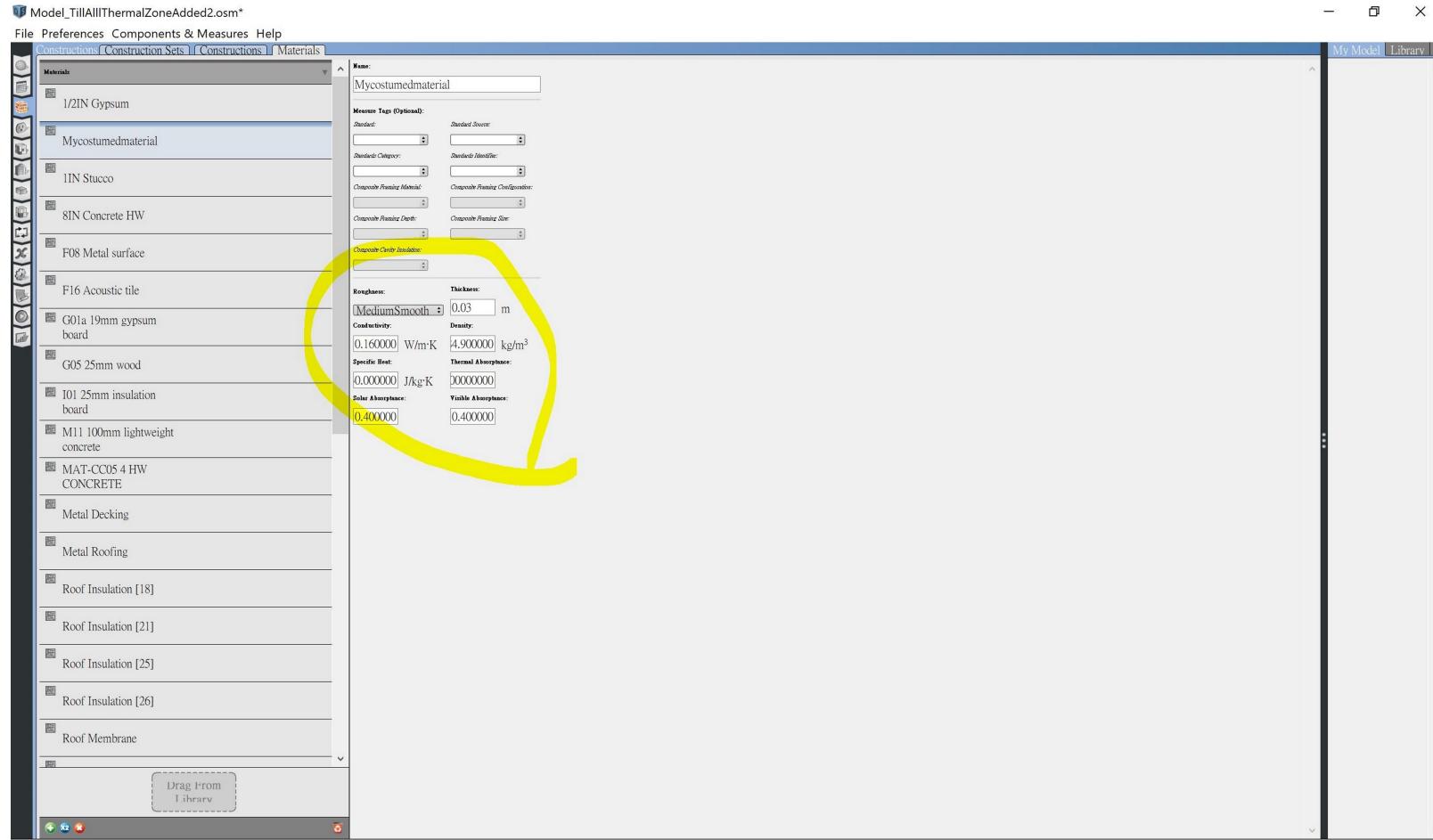


For to check the properties of the materials, we go to the "Material" tab, we can also define a new material from here.

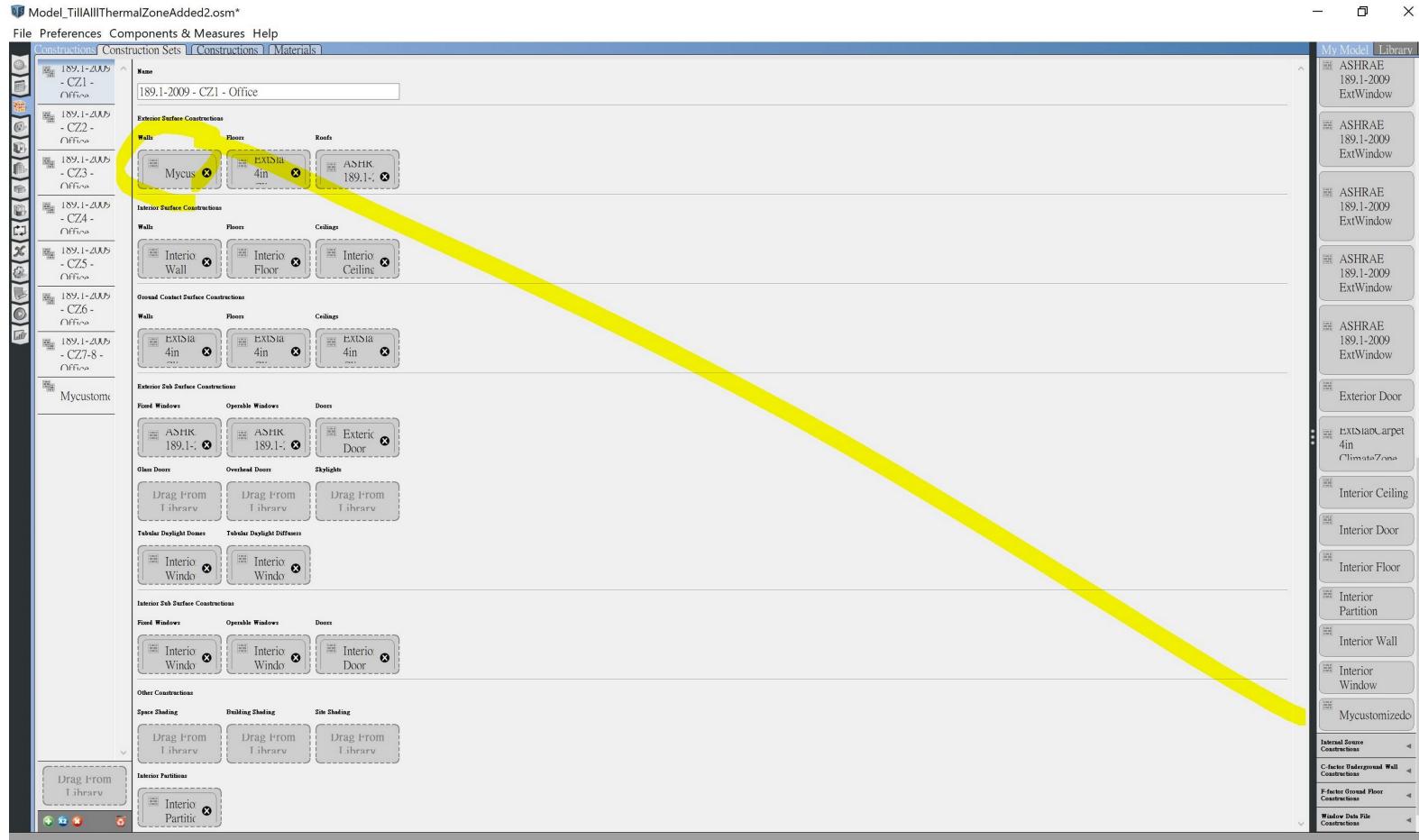
To define a new material, we use again the tab x2 to duplicate, and changing the name.



We can change the properties, like thickness here.



Afterwards, we can use the new material we've defined, into new customized construction, and to modify the construction set. Just drags and drops.



For to control the working schedule as a group, we can go to the second tab on the left, to modify the schedules.

Model\_TillAllThermalZoneAdded2.osm\*

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