7th *WEEK'S* SUBMISSION

1. PROVIDE A SUMMARY OF THE MAIN CONCEPTS THAT WENT THROUGH ABOUT SOLAR RADIATION (FORMULAS ARE NOT NEEDED)

Solar radiation is electromagnetic energy emitted by sun.

We have two kind of solar radiation:

- Direct
- Diffuse

We can have different ways on how this radiation is received by a body:

- Dispertion: when a molecule receive radiation and reject this.
- Absorbition: when a molecule receive radiation and became hot and give back the heat.

The radiation is effect of changing the air mass.

In other words the radiation receives by the soil depends on how much air the solar radiation has to cross. When the sun is perpendicular to the plan of the horizon, it crosses the minimum thickness of the atmosphere.

The solar radiation depends on:

- the sun position in the sky (altitude and azimuth angles), which changes daily and seasonally

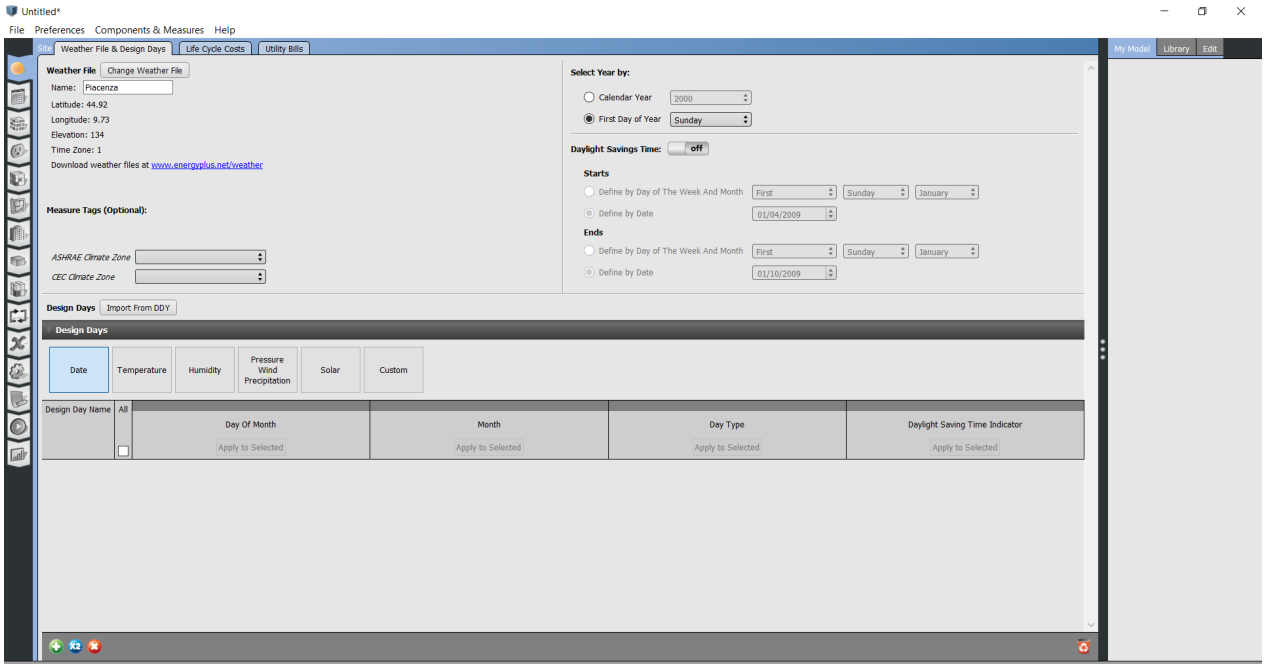
- the weather conditions

- the site altitude over the sea level

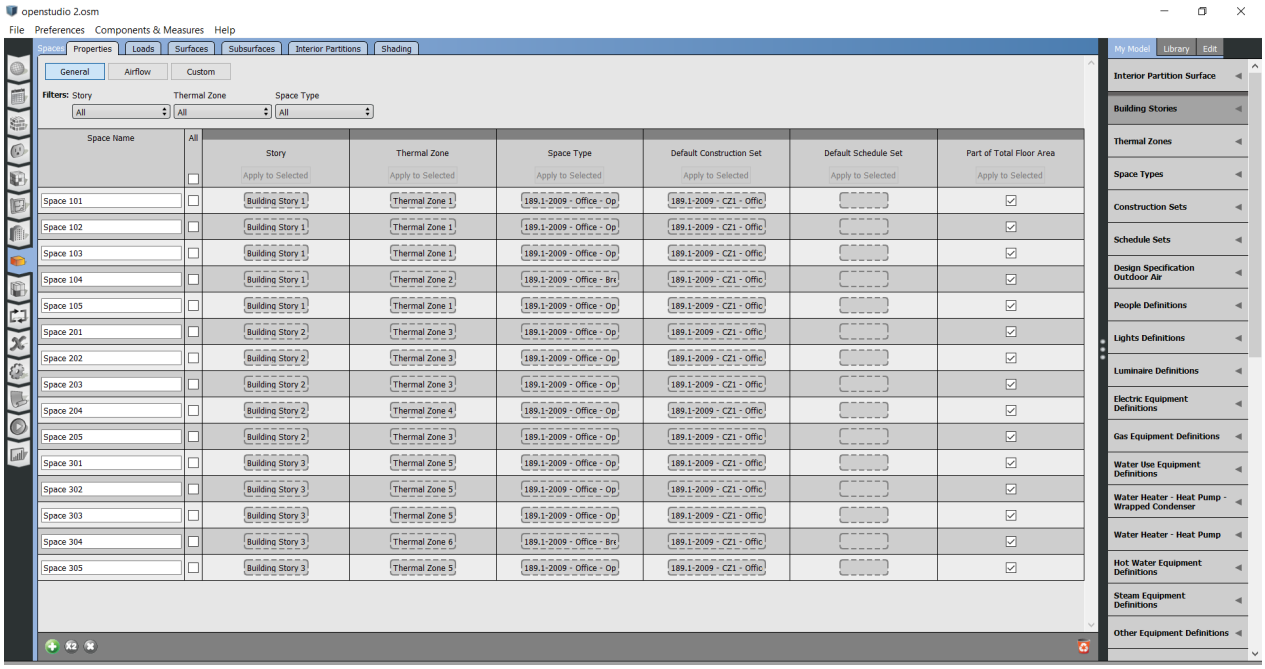
- sunshine hours

2. CREATE A PDF FILE WITH SCREENSHOTS OF ALL OF THE STEPS WE WENT THROUGH IN THE SECOND LESSON ON OPENSTUDIO AND EXPLAIN BRIEFLY THE REASON BEHIND THE USE OF EACH STEP

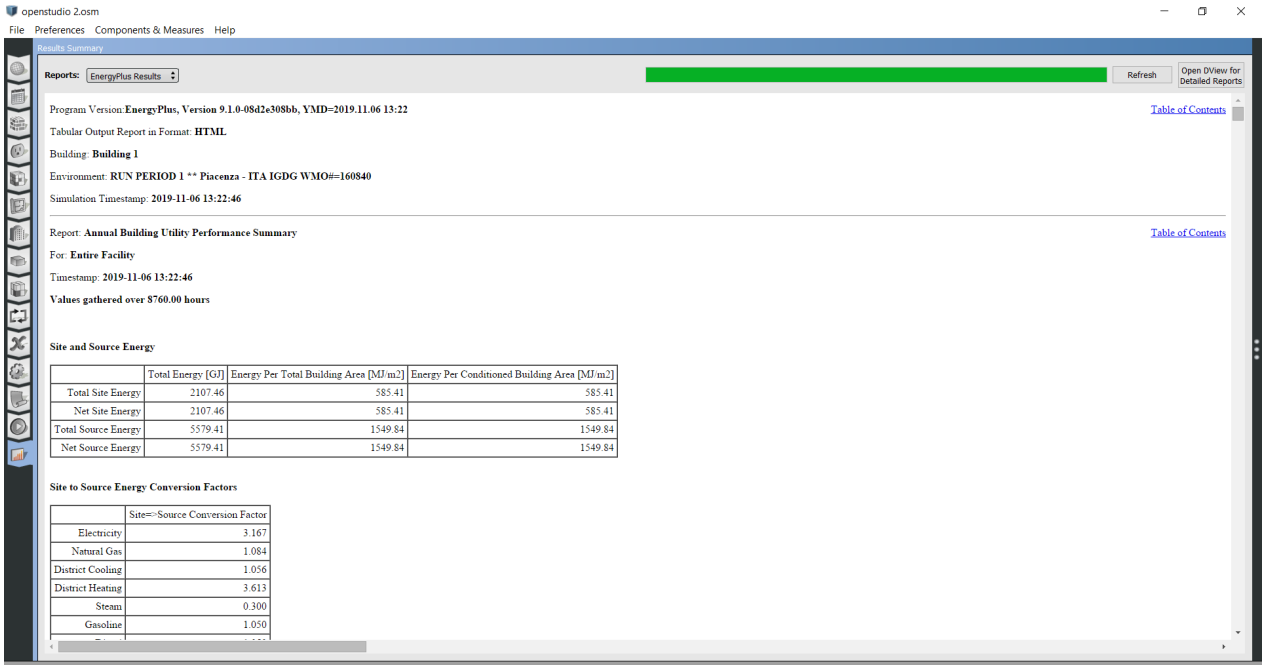
Let's open the openstudio file we created last time. Let's reset the "design days" related to the Piacenza area. Within the site "energy plus weather file" we can find climatic information about any location.



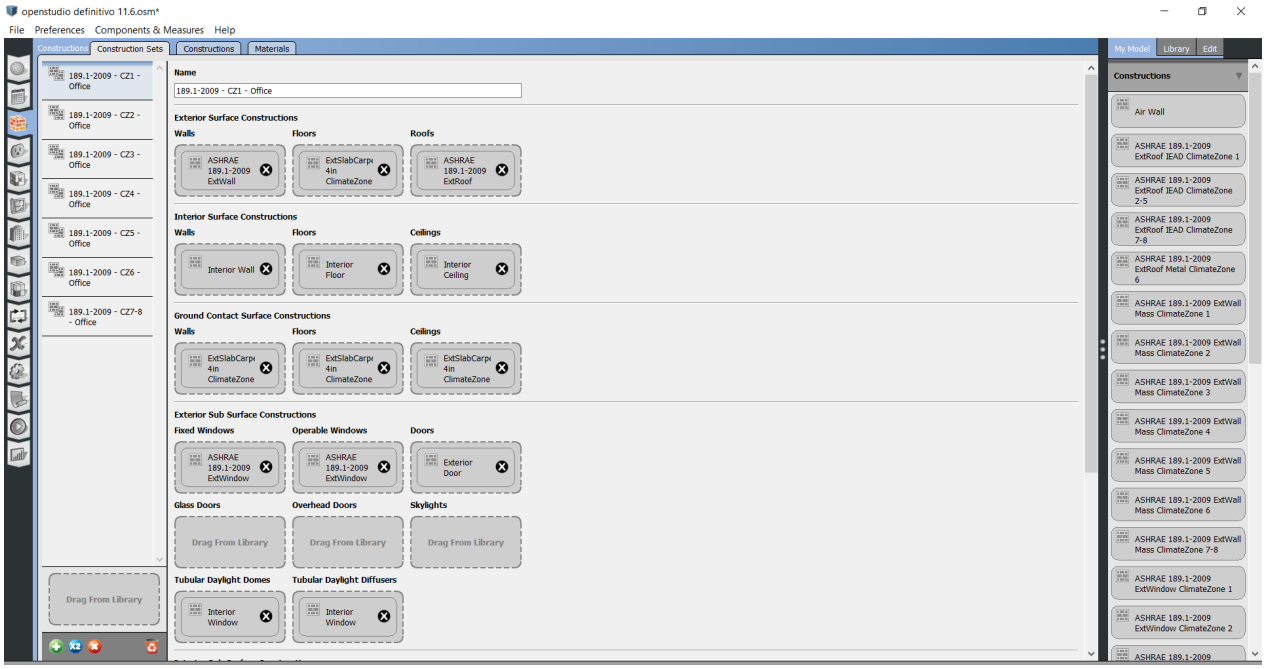
Within this screen we can go to set different "construction set" and "schedule set" in each place of the building. We will then go into more detail on how to manage the settings of these two elements.



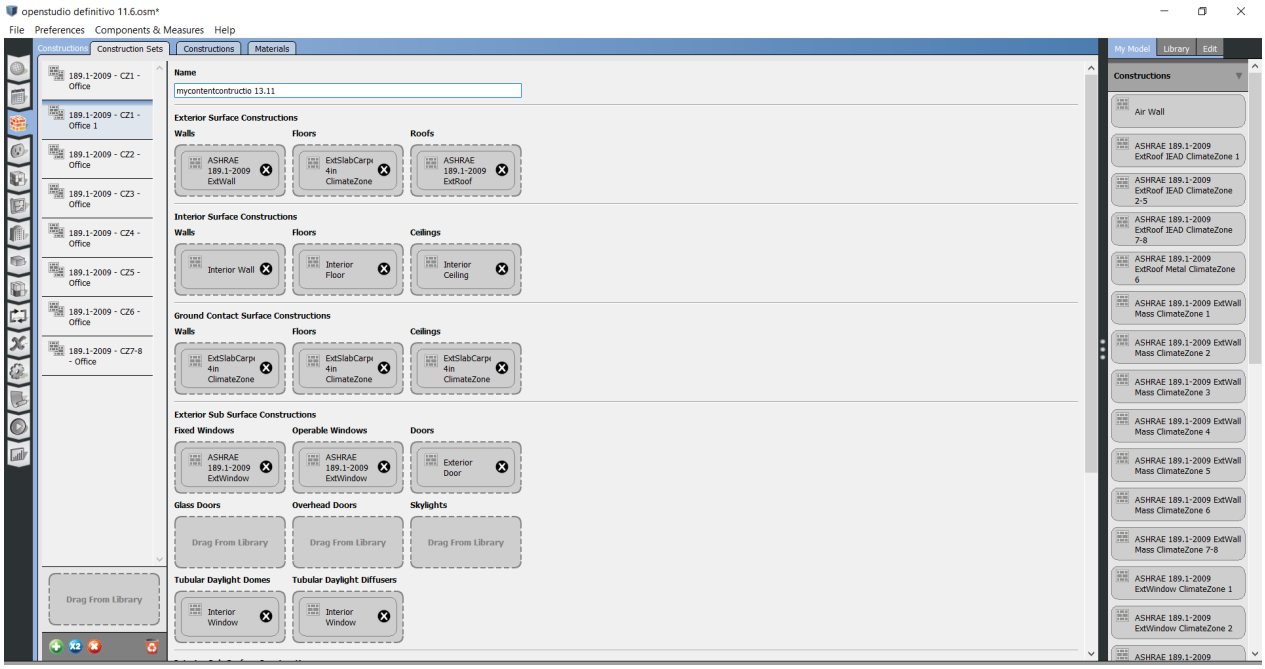
These are the data relative to the simulation of the last time with parameters of default.



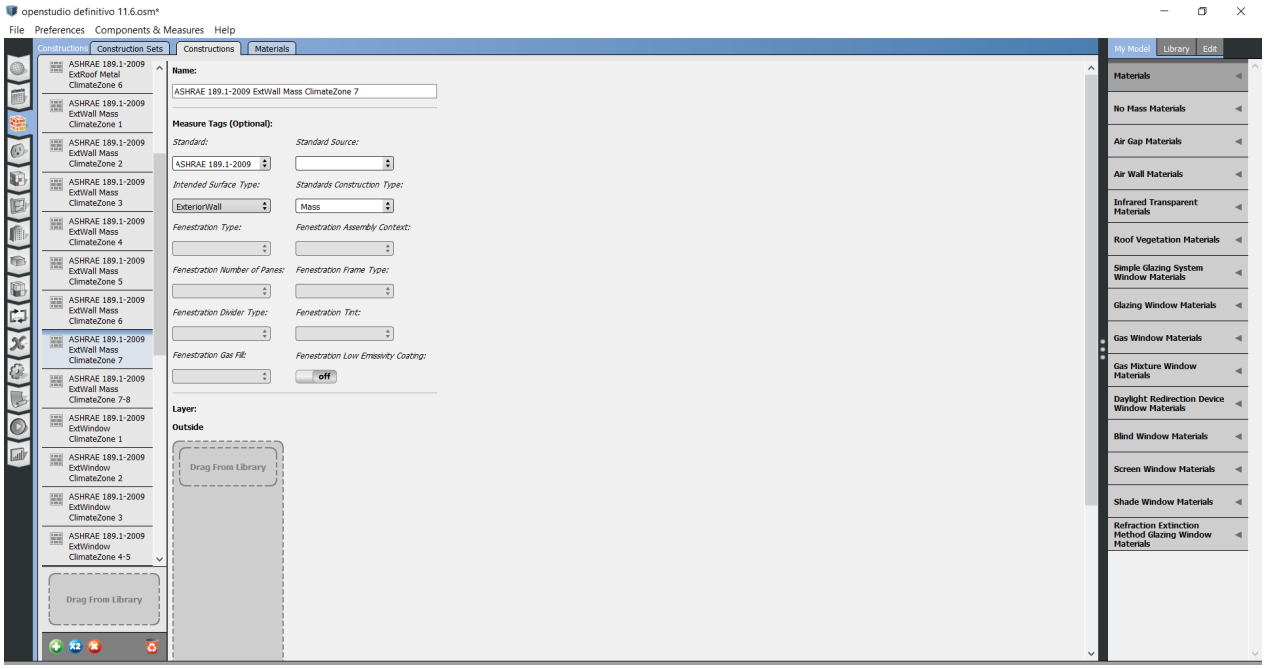
In the section “constuction set” we can create the combination of roofs, interior walls, floors, exterior walls best suited to our needs and those of the building.



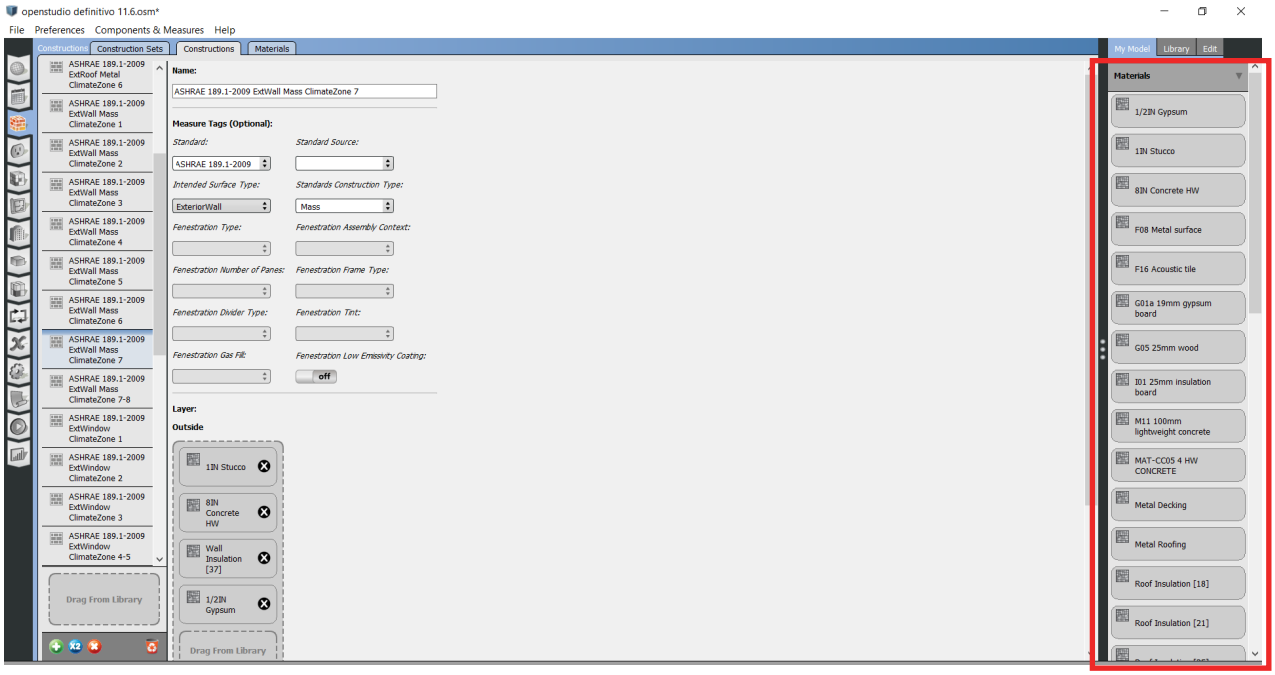
Let’s rename one of these settings as “mycontentconstuction 13.11” so that we can recognize it with respect to the others.



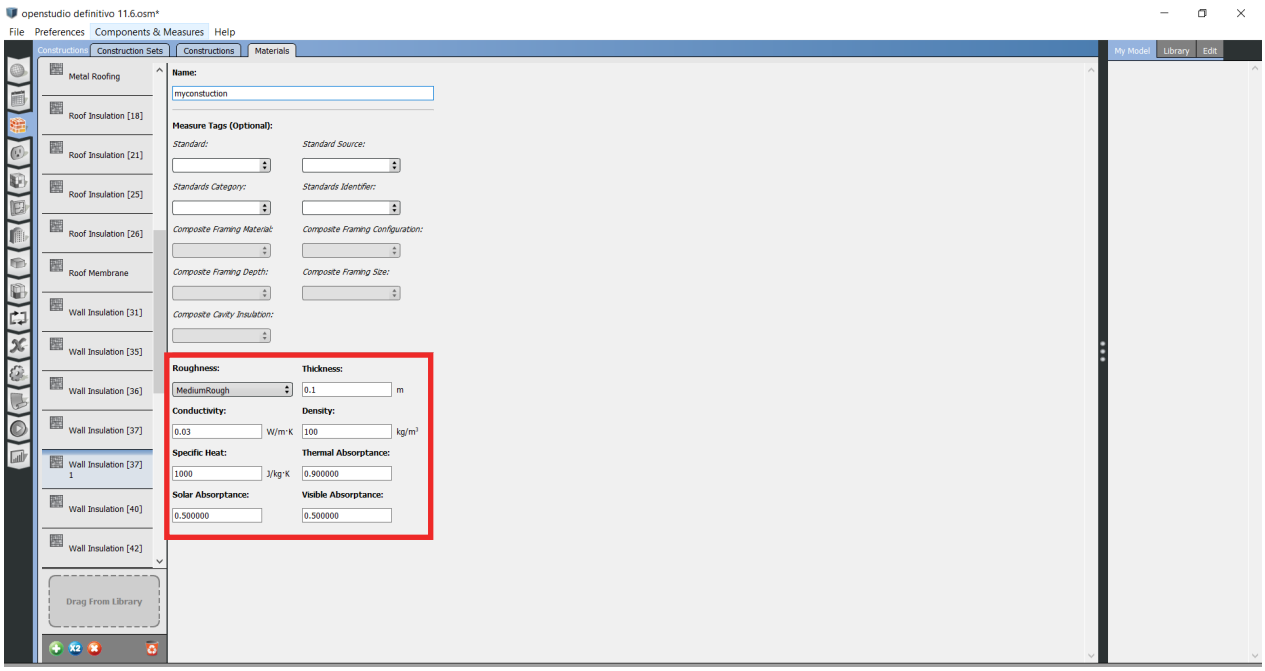
Now in the construction section we can deal with a specific wall.



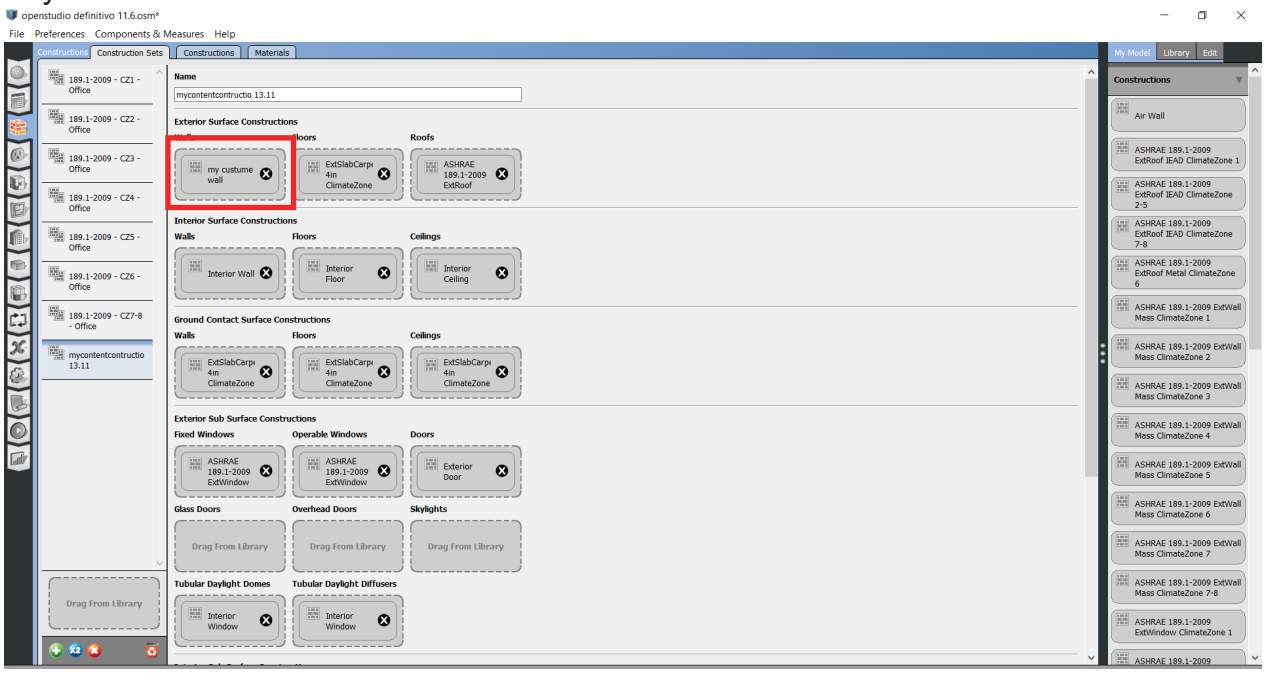
We can see that some materials have already been defined in the “layer” section. We remove them, insert the materials we prefer (from the section on the right “materials”) and rename the wall as “myconstruction wall”.



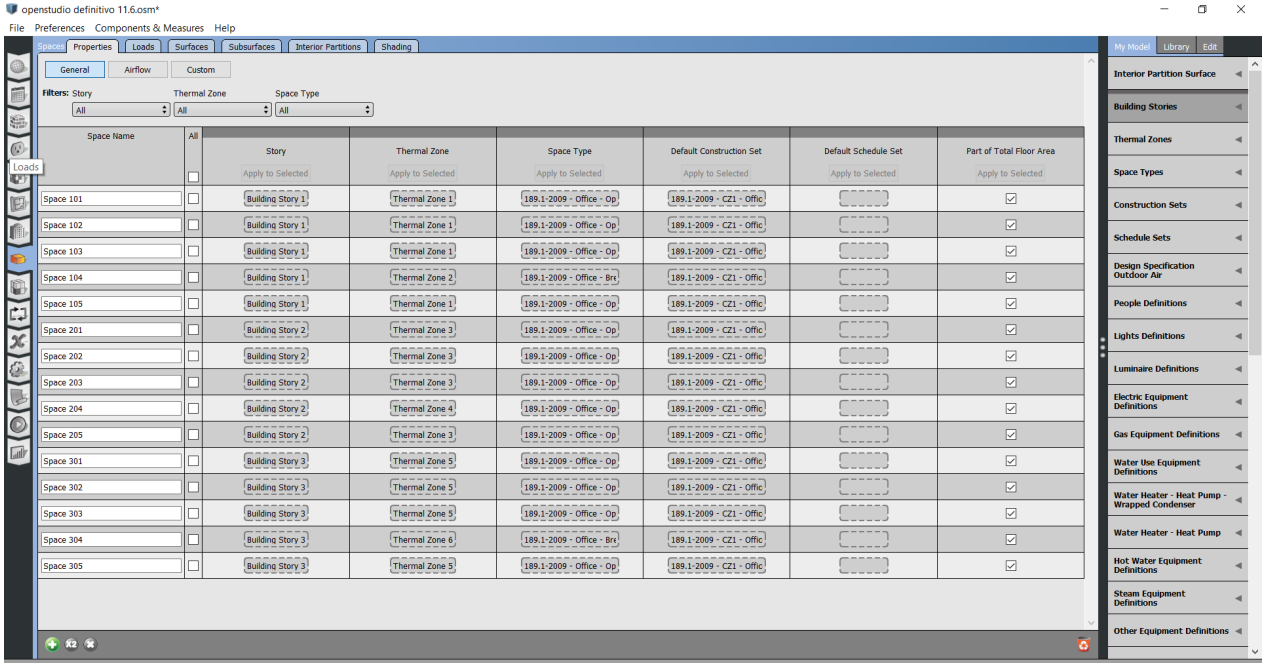
Now let’s go down more specifically, going to change the values of: condudditivity, thickness, density, etc..
Also this time we rename the material as “myconstuction”.



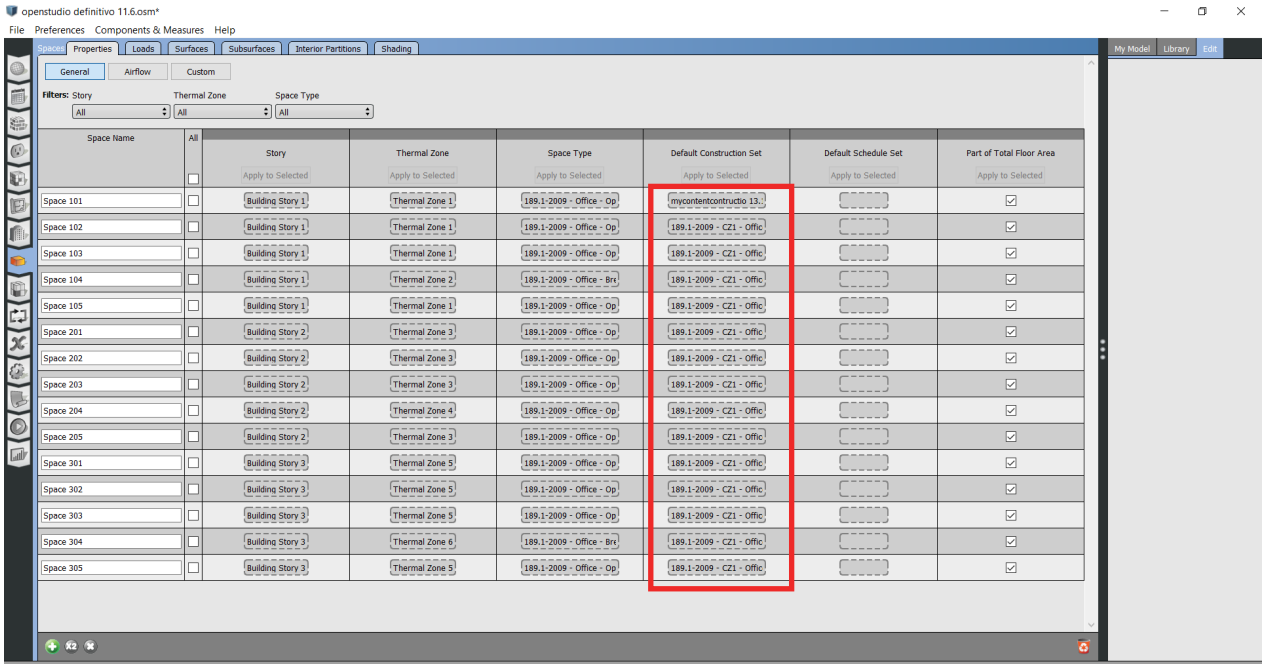
Now let’s retrace the path done so far in the opposite direction, that is, inserting the material created “myconstuction” within the layers of “myconstructionwall” and finally inserting the latter in the card that manages all the structural components of the building “mycontentconstruction 13.11”.



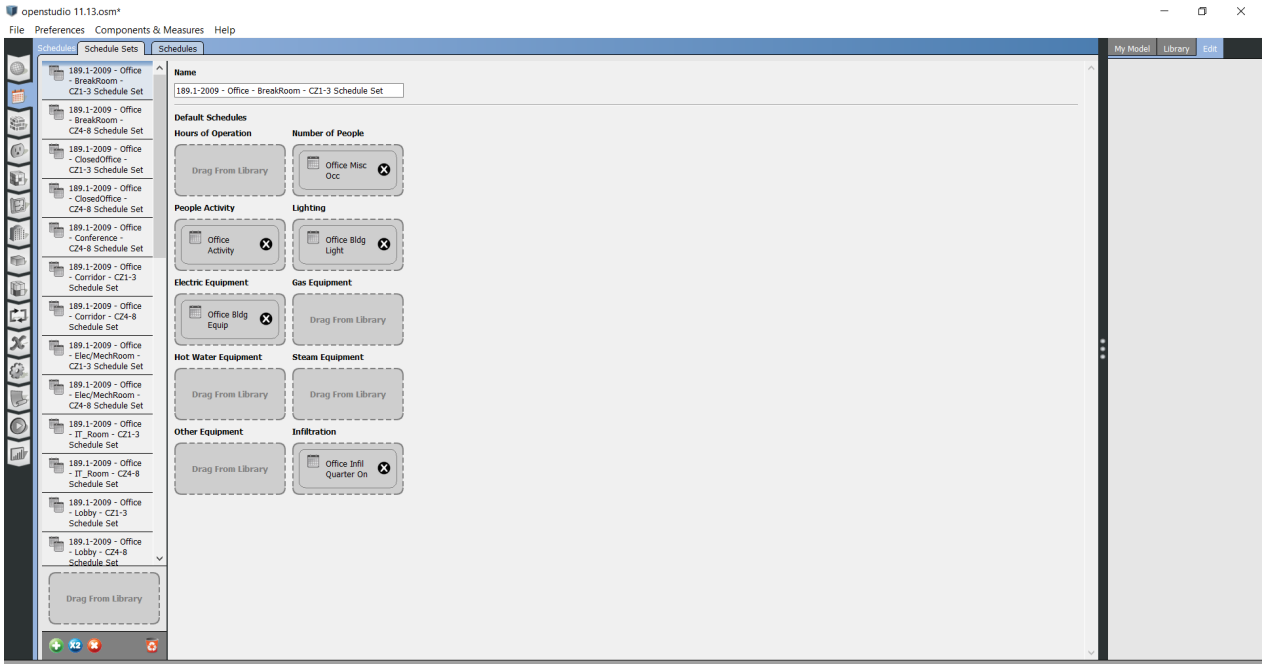
Let’s go back to the screen where you can change the “construction sets”.



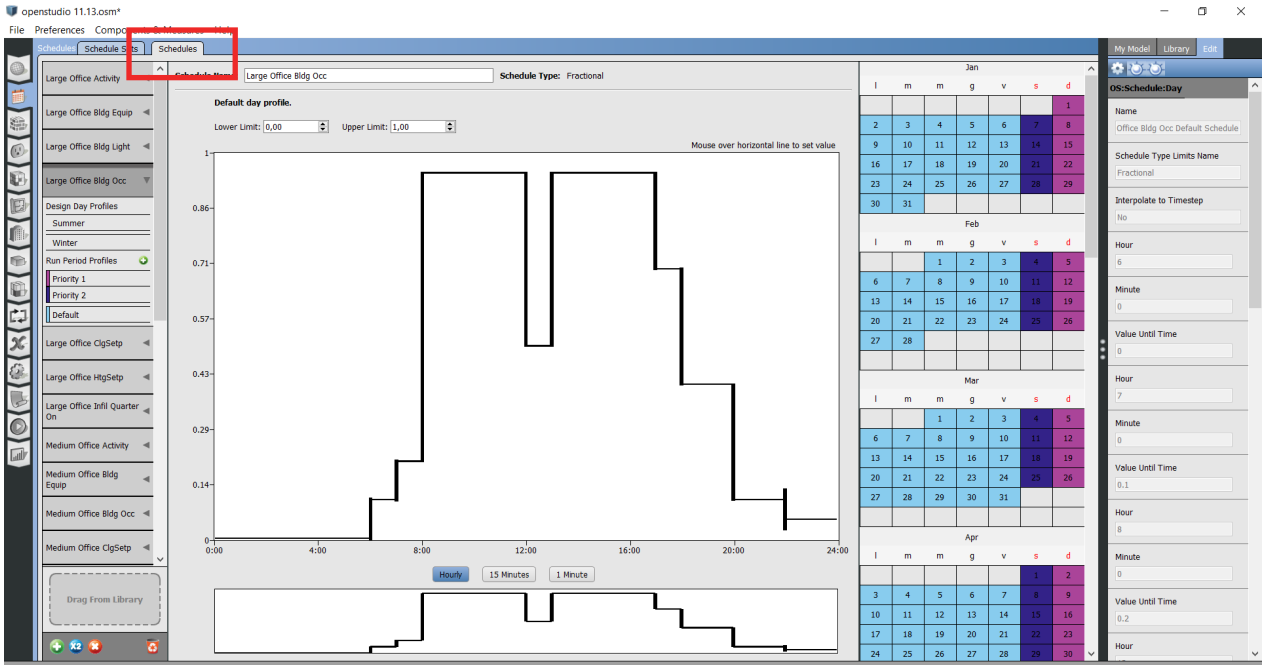
Now let’s replace the default construction set with the one we created previously and copy it for any room in the building.



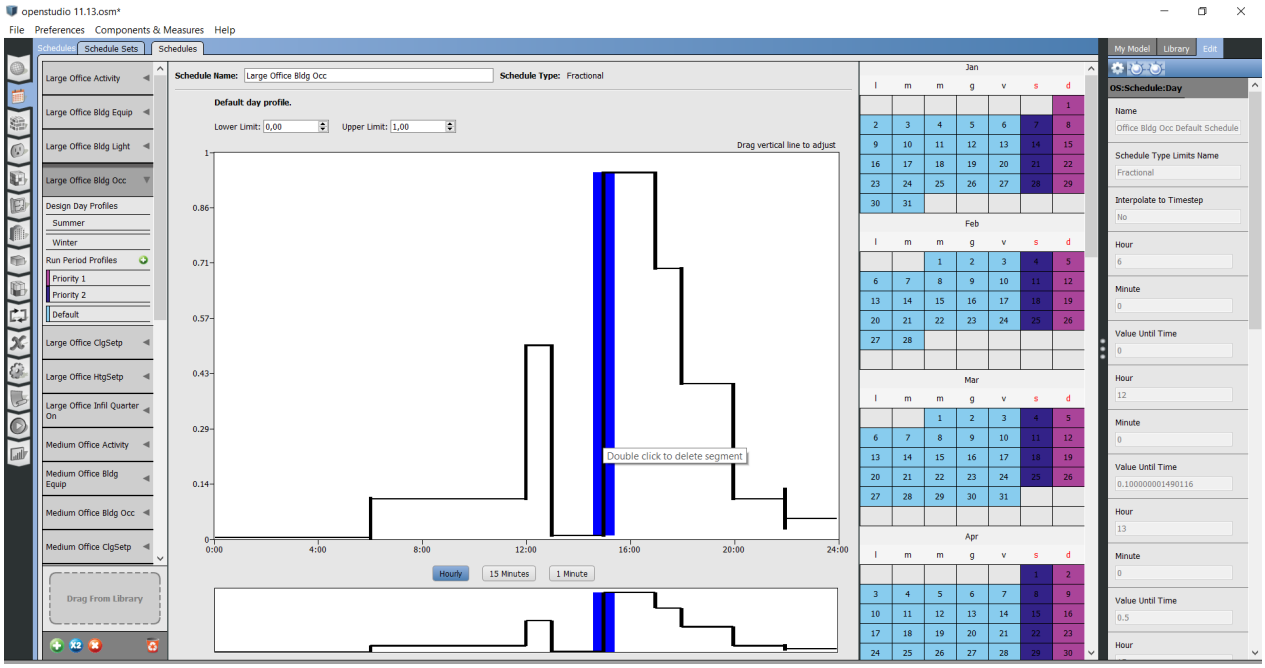
Now we can move on to the schedule definition in the “schedule set” section.
We deal with those related to the “number of people” related to the Breakroom.



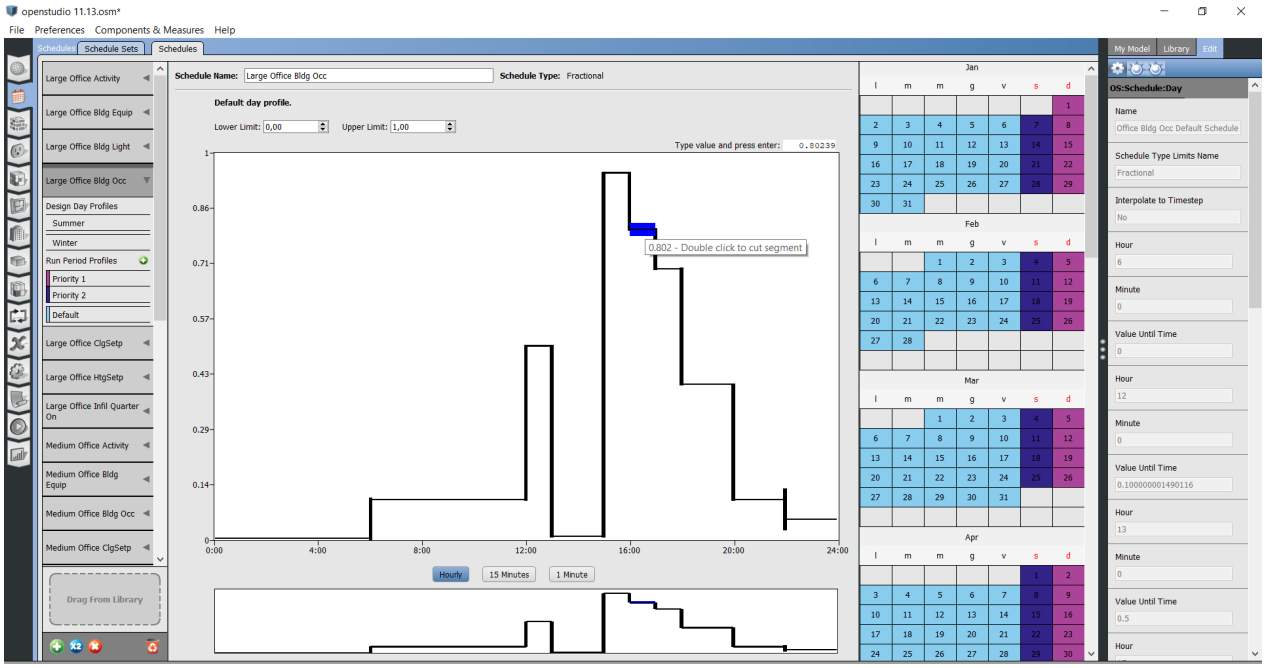
In the “schedules” window we can modify the time and quantity values of people.



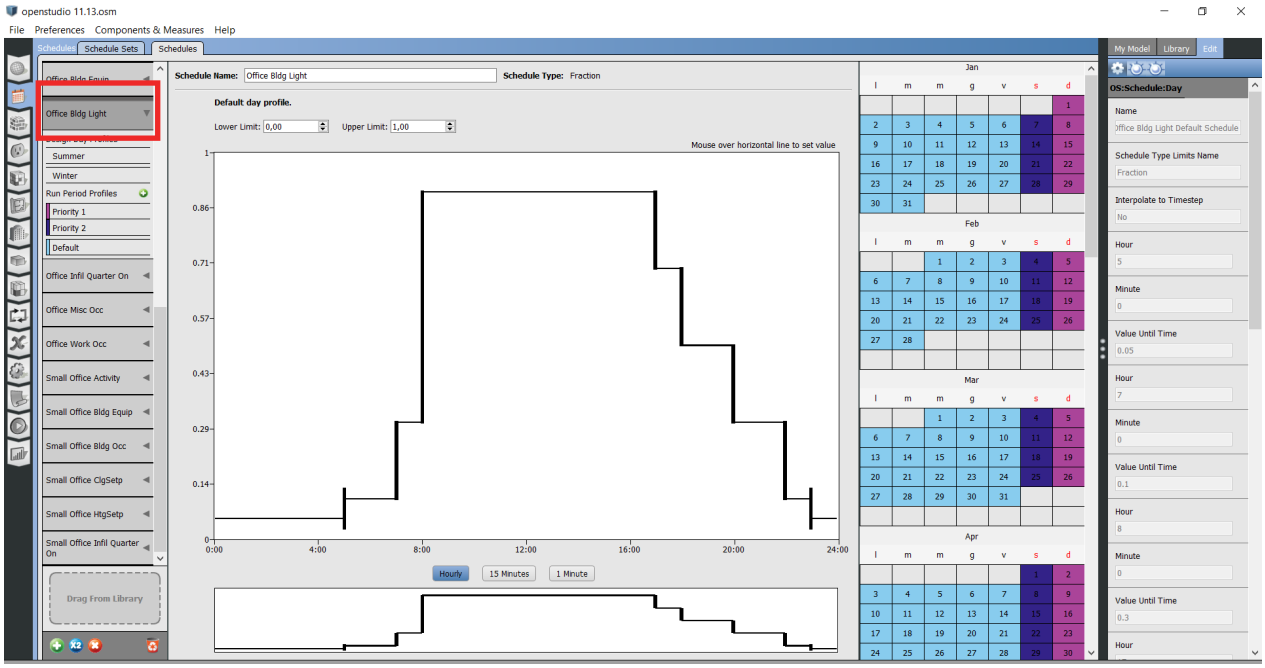
With a double click we can eliminate the vertical segment.



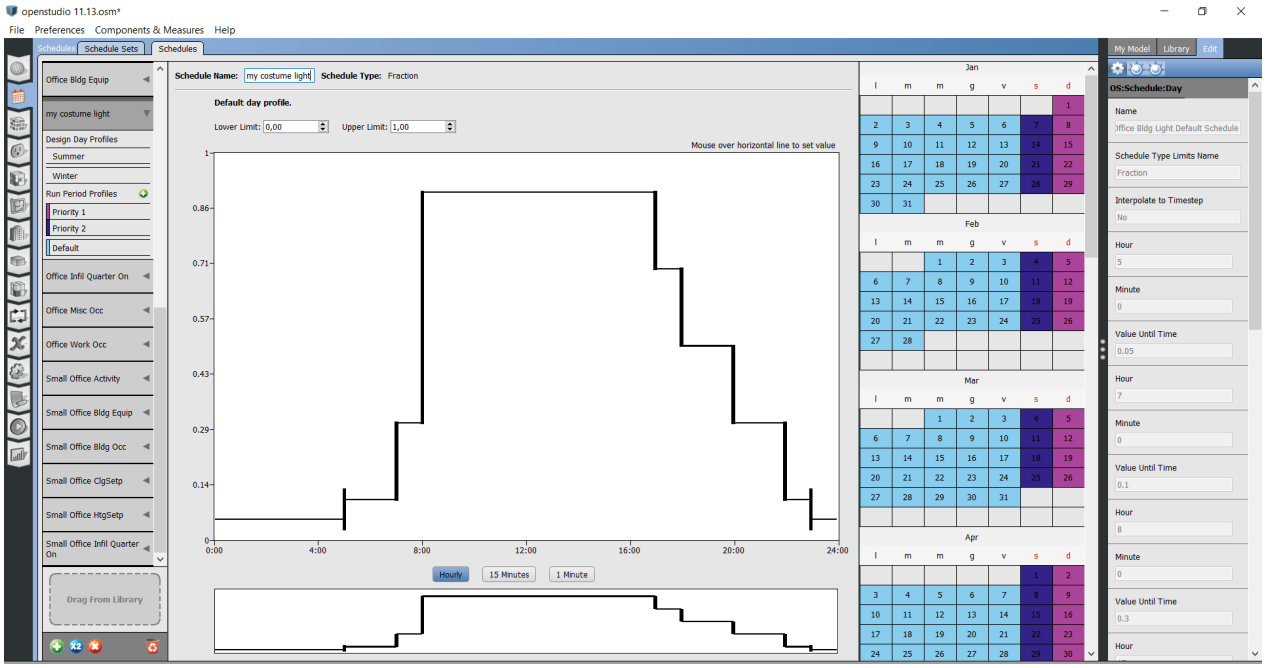
With a double click we can divide the horizontal segment



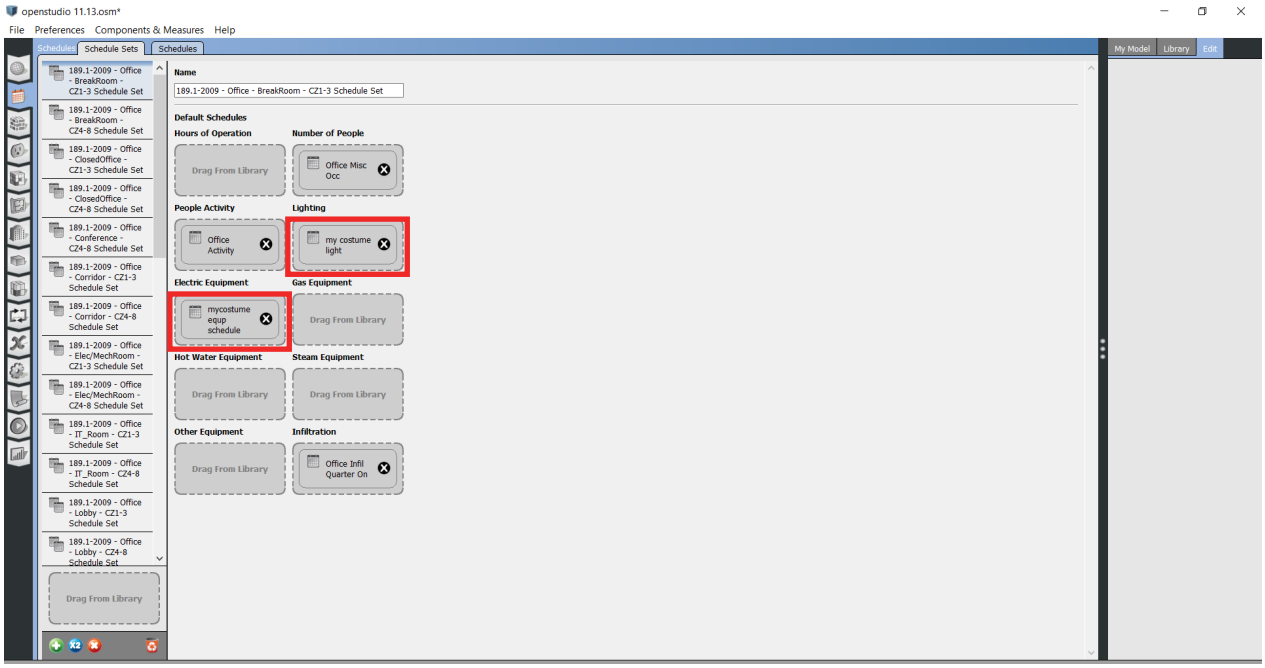
We can also repeat the same operations for the building's lights.



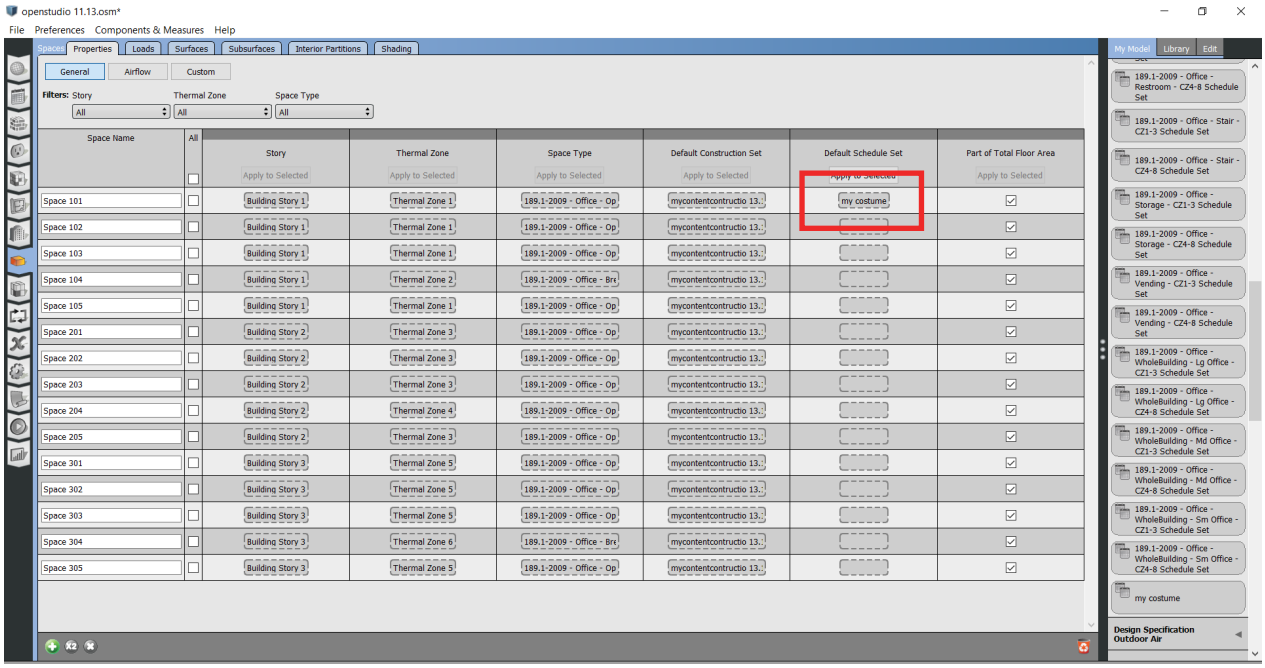
Let’s renamed Schdule as “my costume light”.



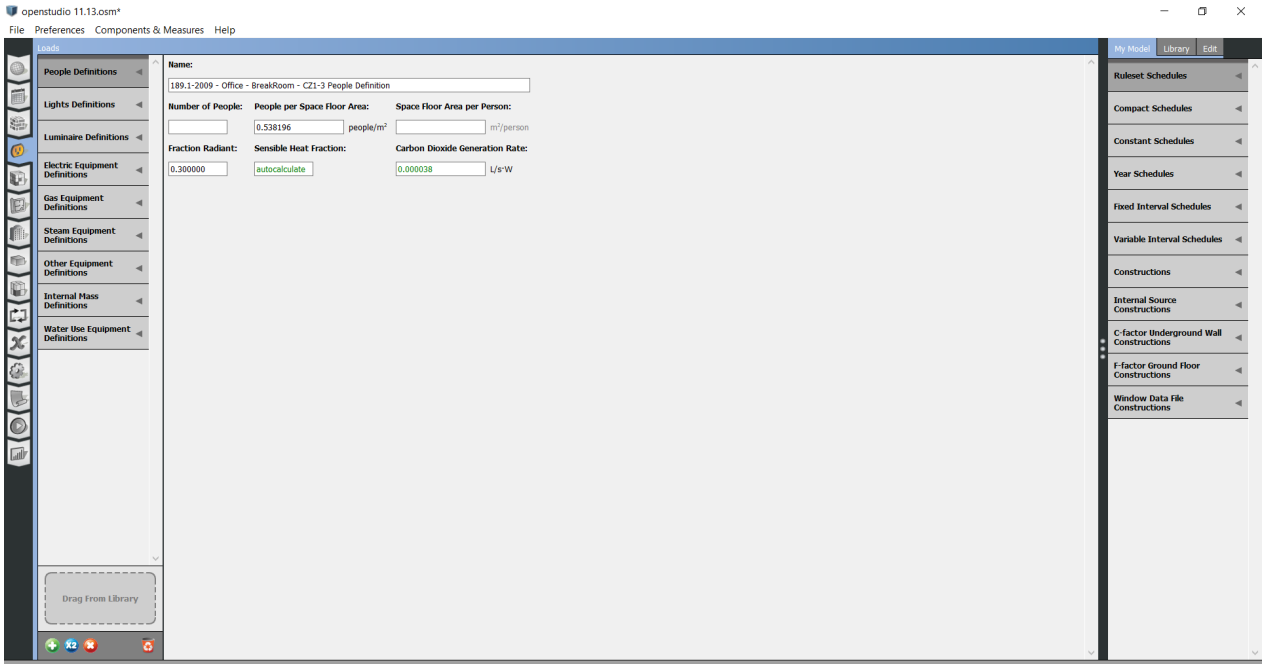
Also this time we repeat the path backwards and add in the section that manages all the schedules our “my costume light” and “my costume equip schedule”.



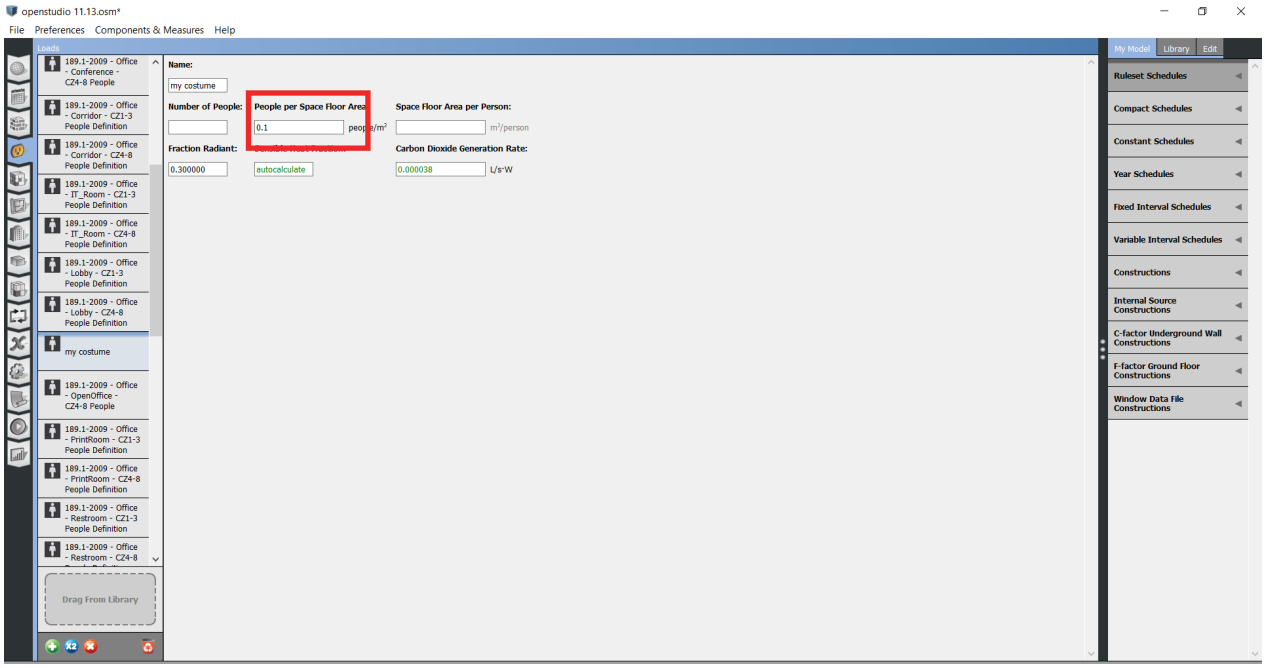
Now we replace the default schedule set with the one we created previously and we copy it for any room in the building.



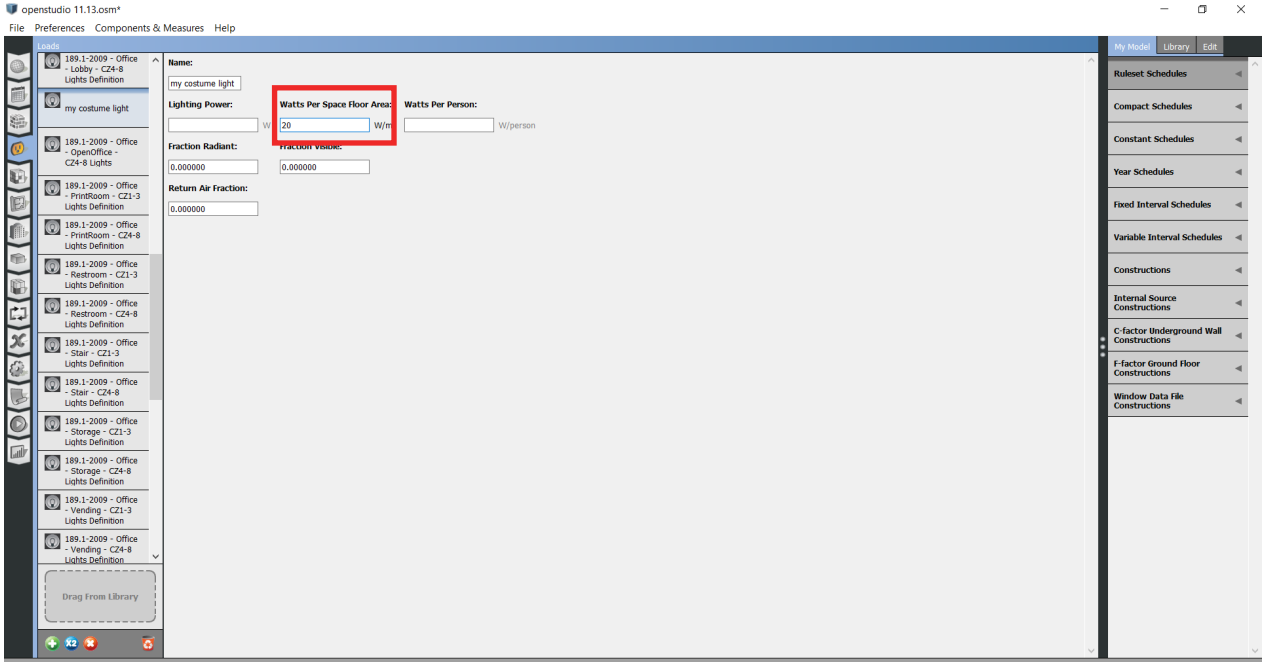
Last but not least, we can set some power and crowding values for both lights and people.



1


openstudio 11.13.osm*
File Preferences Components & Measures Help
Loads
189.1-2009 - Office - Conference - CZ4-8 People
189.1-2009 - Office - Corridor - CZ1-3 People Definition
189.1-2009 - Office - Corridor - CZ4-8 People Definition
189.1-2009 - Office - IT_Room - CZ1-3 People Definition
189.1-2009 - Office - IT_Room - CZ4-8 People Definition
189.1-2009 - Office - Lobby - CZ1-3 People Definition
189.1-2009 - Office - Lobby - CZ4-8 People Definition
my costume
189.1-2009 - Office - OpenOffice - CZ4-8 People
189.1-2009 - Office - PrintRoom - CZ1-3 People Definition
189.1-2009 - Office - PrintRoom - CZ4-8 People Definition
189.1-2009 - Office - Restroom - CZ1-3 People Definition
189.1-2009 - Office - Restroom - CZ4-8
Drag From Library
Name:
my costume
Number of People:
People per Space Floor Area:
0.1
Space Floor Area per Person:
m²/person
Fraction Radiant:
0.300000
autocalculate
Carbon Dioxide Generation Rate:
0.000038
L/s·W
My Model
Library
Edit
Ruleset Schedules
Compact Schedules
Constant Schedules
Year Schedules
Fixed Interval Schedules
Variable Interval Schedules
Constructions
Internal Source Constructions
C-factor Underground Wall Constructions
F-factor Ground Floor Constructions
Window Data File Constructions

2


openstudio 11.13.osm*
File Preferences Components & Measures Help
Loads
189.1-2009 - Office - Lobby - CZ4-8 Lights Definition
my costume light
189.1-2009 - Office - OpenOffice - CZ4-8 Lights
189.1-2009 - Office - PrintRoom - CZ1-3 Lights Definition
189.1-2009 - Office - PrintRoom - CZ4-8 Lights Definition
189.1-2009 - Office - Restroom - CZ1-3 Lights Definition
189.1-2009 - Office - Restroom - CZ4-8 Lights Definition
189.1-2009 - Office - Stair - CZ1-3 Lights Definition
189.1-2009 - Office - Stair - CZ4-8 Lights Definition
189.1-2009 - Office - Storage - CZ1-3 Lights Definition
189.1-2009 - Office - Storage - CZ4-8 Lights Definition
189.1-2009 - Office - Vending - CZ1-3 Lights Definition
189.1-2009 - Office - Vending - CZ4-8 Lights Definition
Drag From Library
Name:
my costume light
Lighting Power:
Watts Per Space Floor Area:
20
W/m
Watts Per Person:
W/person
Fraction Radiant:
0.000000
Fraction Visible:
0.000000
Return Air Fraction:
0.000000
My Model
Library
Edit
Ruleset Schedules
Compact Schedules
Constant Schedules
Year Schedules
Fixed Interval Schedules
Variable Interval Schedules
Constructions
Internal Source Constructions
C-factor Underground Wall Constructions
F-factor Ground Floor Constructions
Window Data File Constructions