WEEK 7_ZHU CUILING

Task 1

Provide a summary of the main concepts that went through about solar radiation (formulas are not needed)

Solar radiation is the fact that the sun transmits energy in the form of electromagnetic waves, which refers to the electromagnetic waves and particle flows emitted by the sun into space.

Since the wavelength of solar radiation is much smaller than the wavelength of the ground and atmospheric radiation (about 3 to 120 microns), it is often called **solar radiation** as **short-wave radiation**, and the **ground and atmospheric radiation** is called **long-wave radiation**.

Solar radiation passes through the atmosphere, **part of which reaches the ground**, called **direct solar radiation**; the other part is the absorption, scattering and reflection of molecules in the atmosphere, dust in the atmosphere, and water vapor. Part of the scattered solar radiation **returns to space** and another **part reaches the ground**. This part of the ground is called **scattered solar radiation**. The **sum** of scattered solar radiation and direct solar radiation reaching the ground is called **total radiation**.

The physical quantity indicating the strength of solar radiation is called the solar radiation intensity. $J/cm^2 \cdot min$ is the unit, which is the solar radiation energy that is projected perpendicularly to the unit area per unit time. The intensity of solar radiation at the upper boundary of the atmosphere depends on the altitude angle of the sun, the distance between the sun and the earth, and the time of sunshine. The greater the solar elevation angle, the greater the solar radiation intensity. Because of the same beam of light, the direct irradiation area is the smallest, and the solar radiation per unit area is increased. Conversely, when the oblique beam is irradiated, the irradiation area is large, and the solar radiation per unit area is small.

Solar radiation intensity refers to the intensity of solar radiation reaching the ground. The main factors affecting the strength of solar radiation are:

1. Latitude position

2. weather

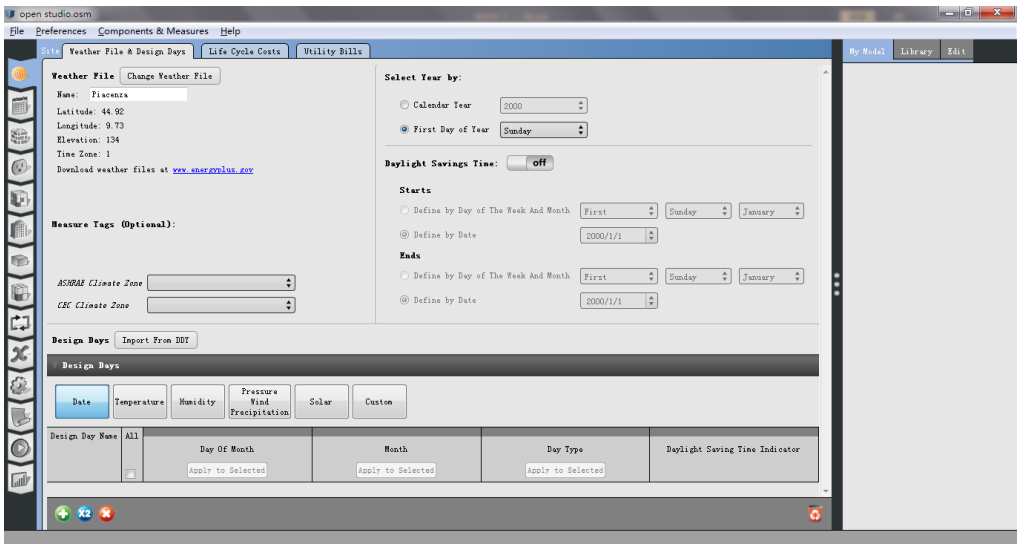
3. Altitude

4. Length of sunshine

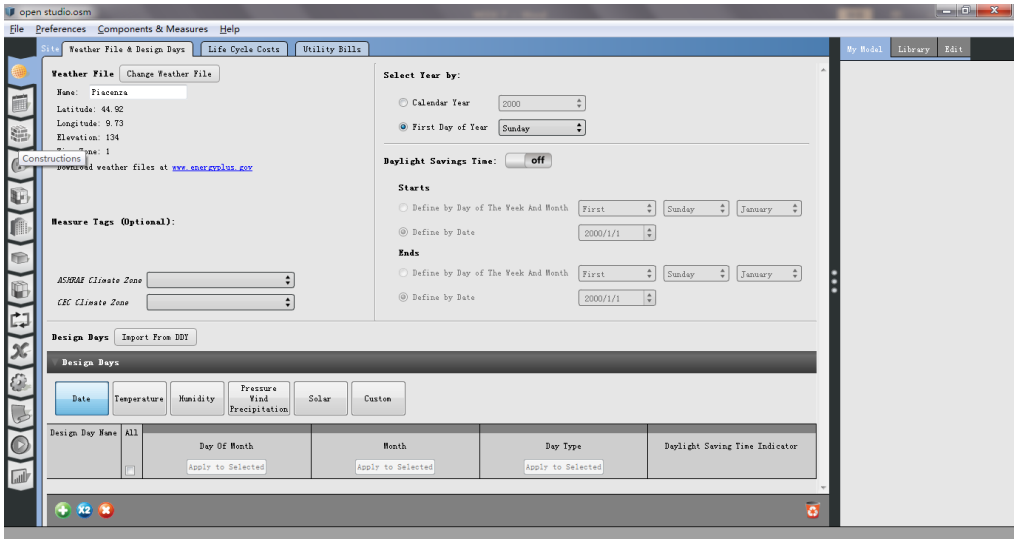
Task 2

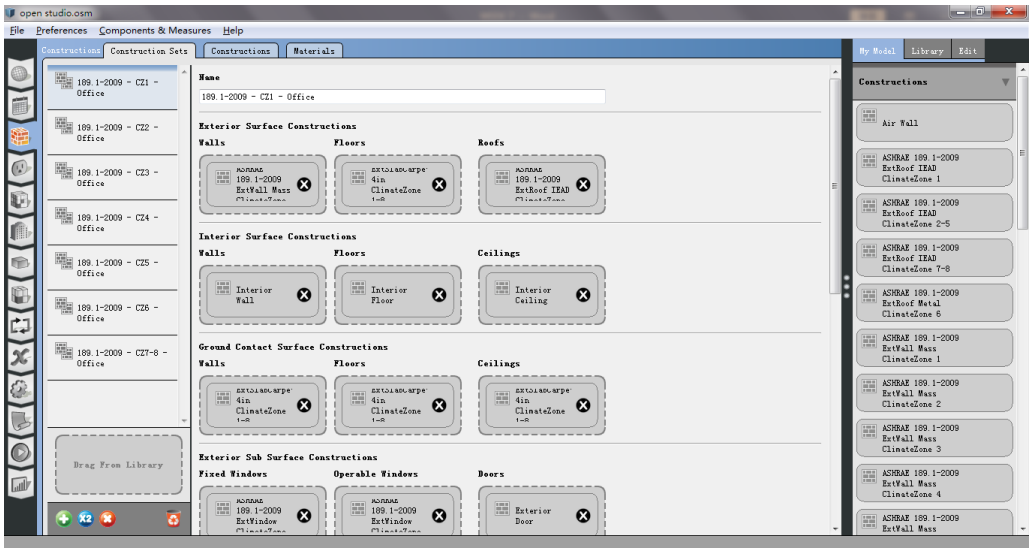
Create a pdf file with screenshots of all of the steps we went through in the second lesson on openStudio and explain briefly the reason behind the use of each step.

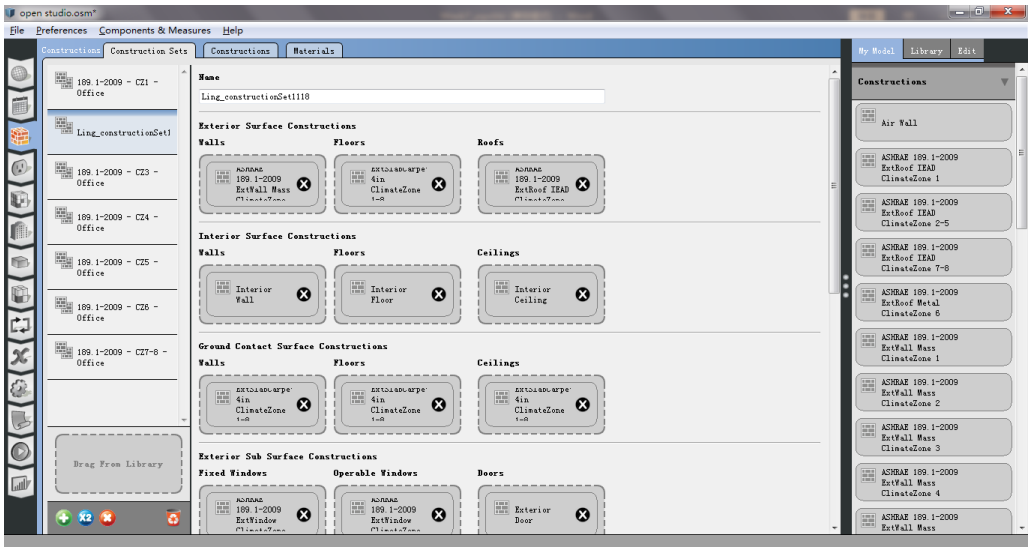
1. Click the “Weather File” to add the weather data of Piacenza in OpenOffice.



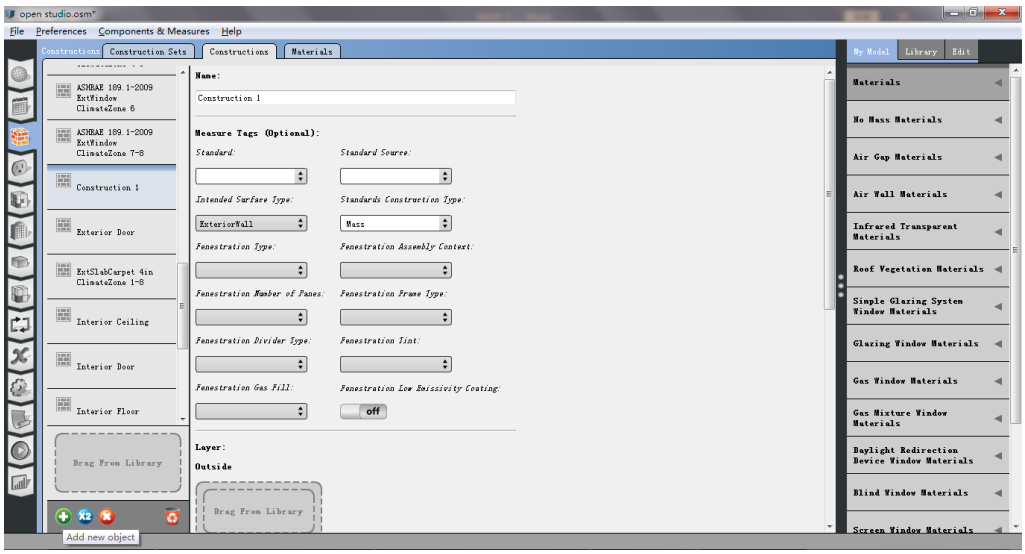
2. Click the “construction”, start customize the building, renaming it.

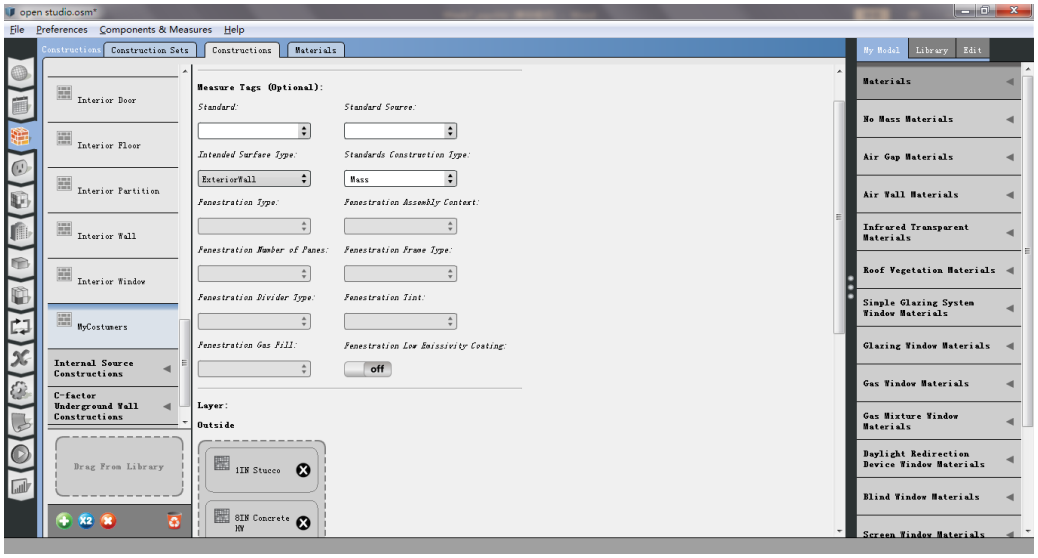




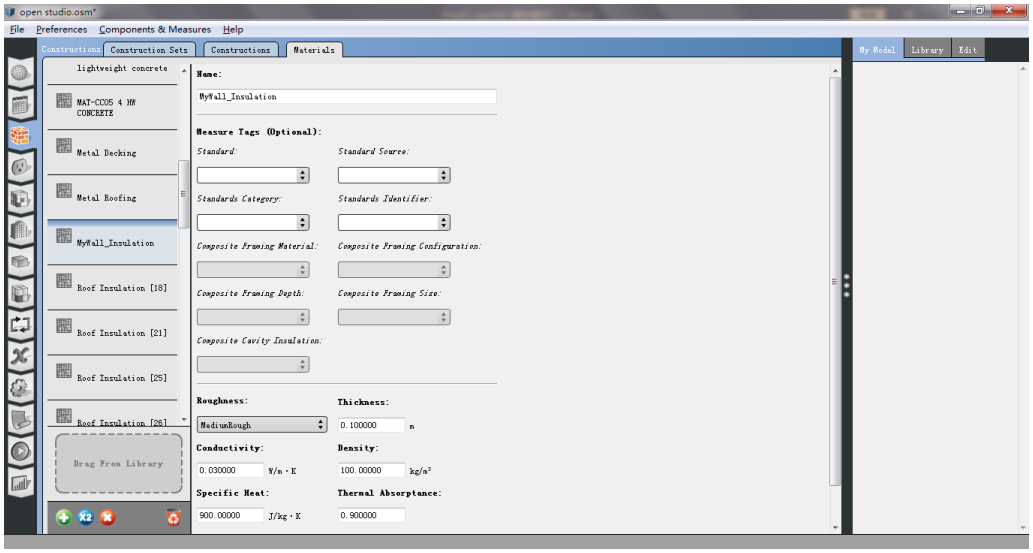


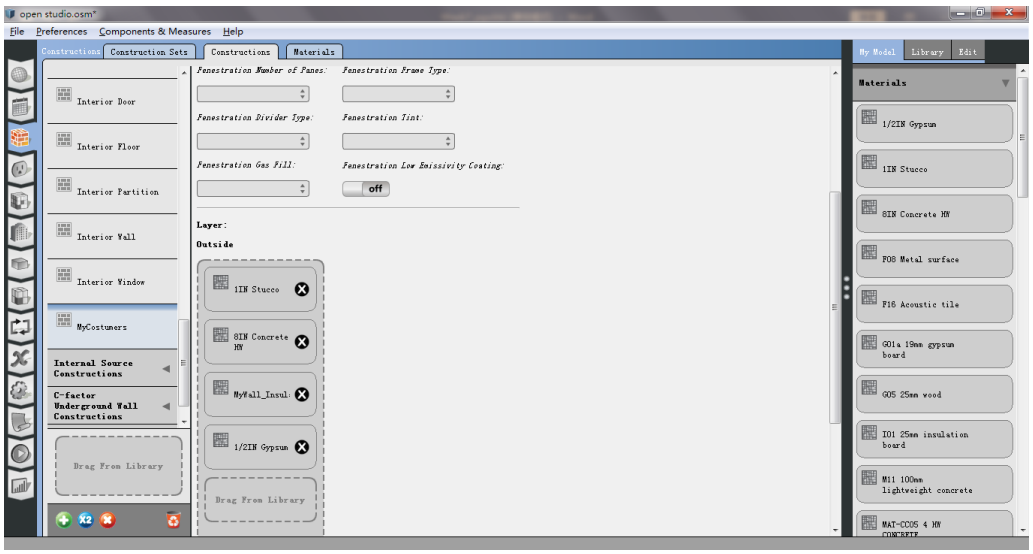
3. Click “construction” to add a new project and start customizing the wall package in the “construction sets” window.



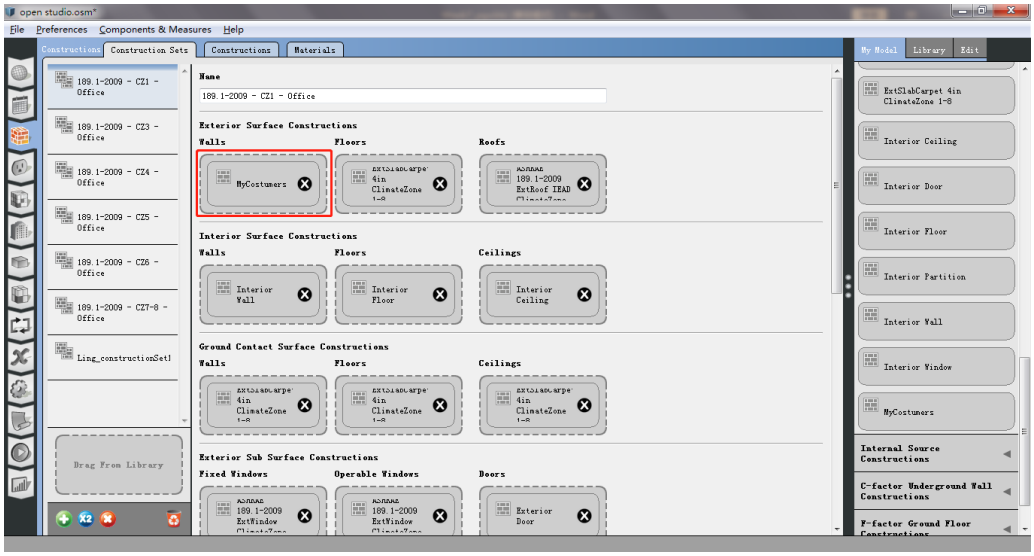


4. Click “Material” to add a new material and decide the type of wall insulation and insert it later in the package.

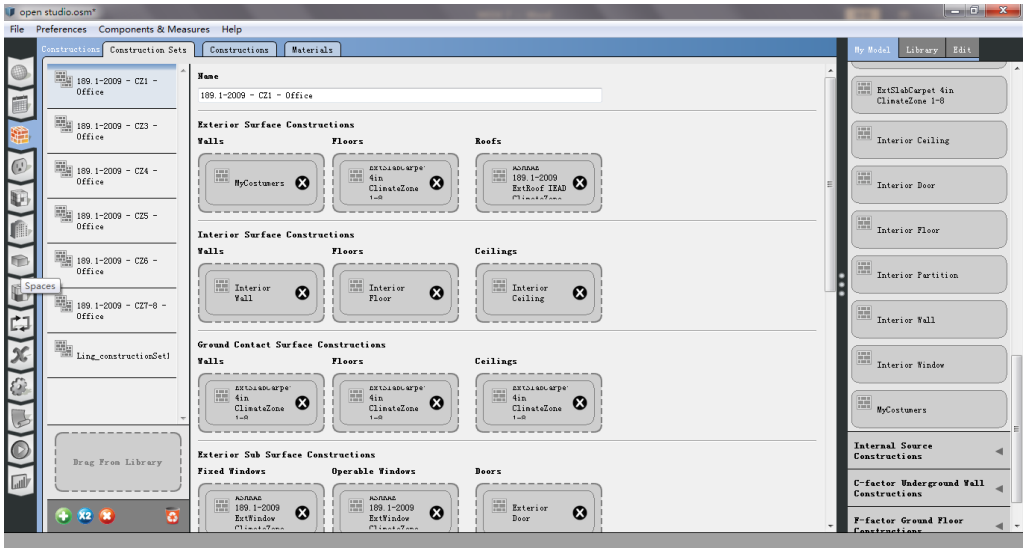


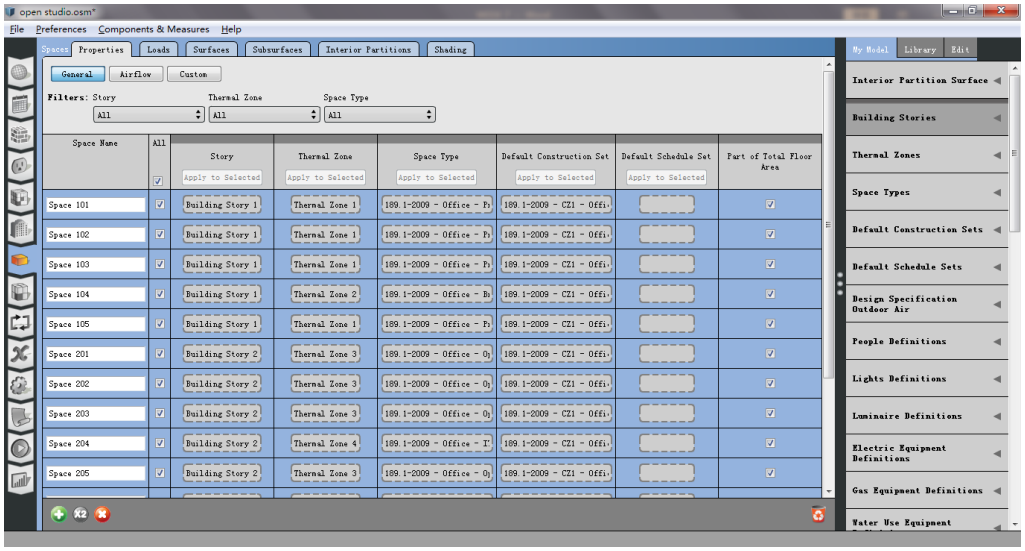


5. Insert the wall in the building data.

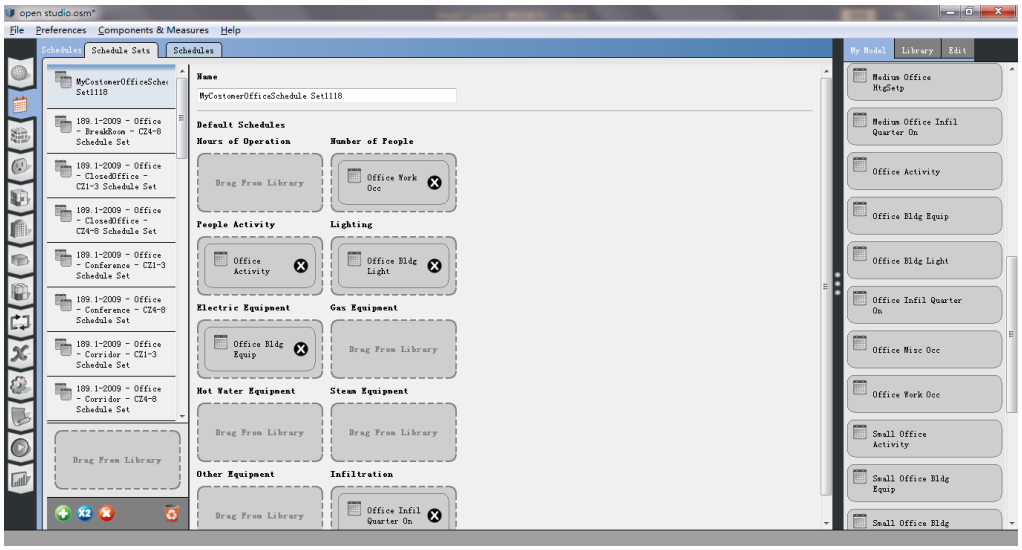


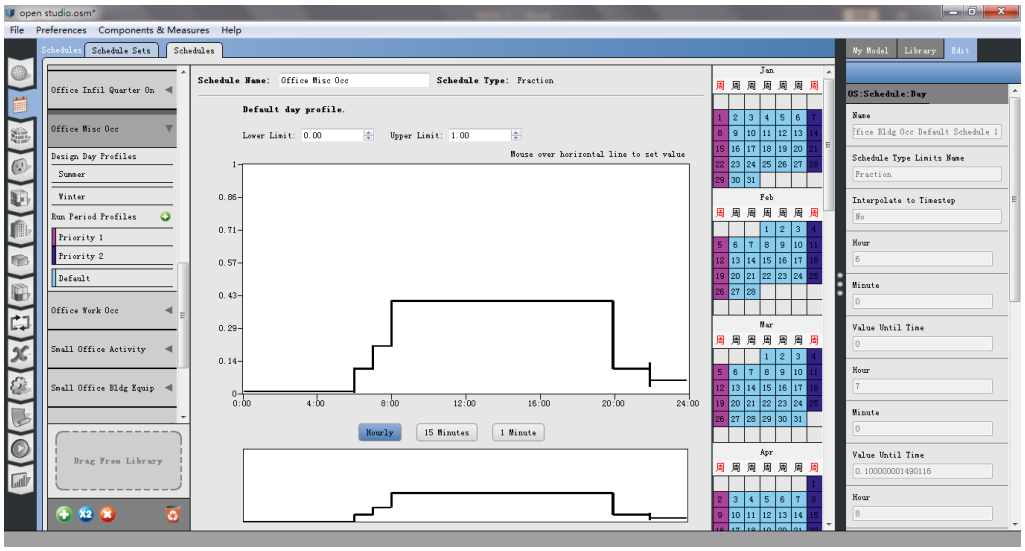
6. Click “space” window and insert the project layer with our modifications applying it to the whole building.



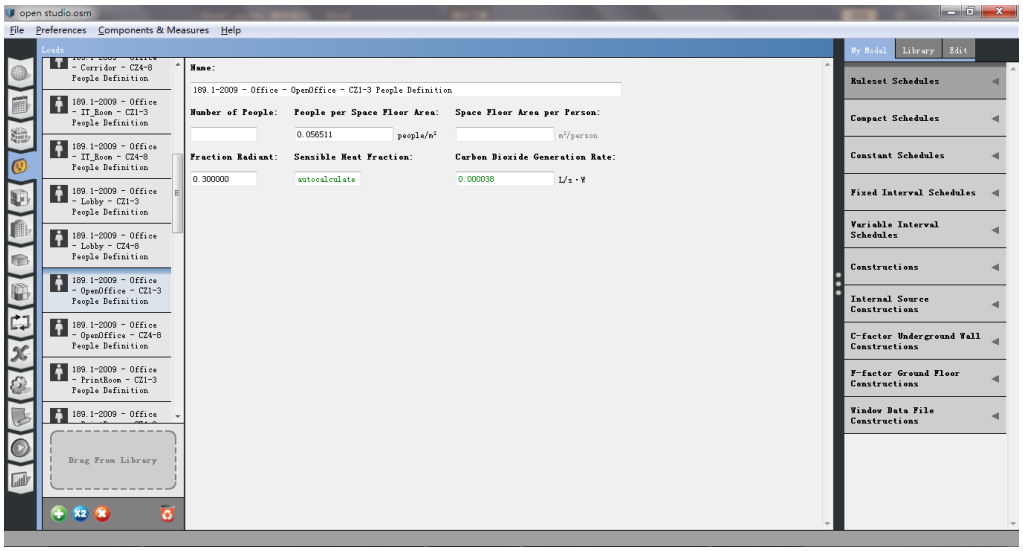


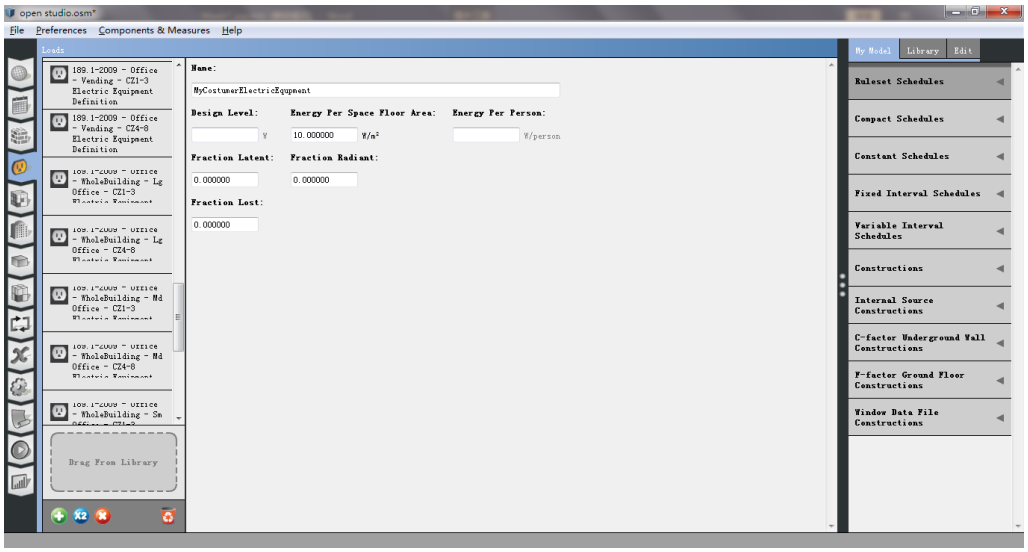
7. Return to “schedule sets” to enter all the information relating to activities, equipments, etc and their schedules.





8. Click the “loads” command to change other specifications, like people, light, electricity, etc.




open studio.osm*
File
Preferences
Components & Measures
Help
Loads
189.1-2009 - Office - Vending - CZ1-3 Electric Equipment Definition
189.1-2009 - Office - Vending - CZ4-8 Electric Equipment Definition
Drag From Library
Name:
MyCostumerElectricEquipment
Design Level:
Energy Per Space Floor Area:
10.000000
W/m²
Energy Per Person:
W/person
Fraction Latent:
0.000000
Fraction Radiant:
0.000000
Fraction Lost:
0.000000
My Model
Library
Edit
Ruleset Schedules
Compact Schedules
Constant 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