Assignment Week 7.

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Solar radiation

Characteristics.

Solar radiation is the electromagnetic energy emitted by the sun. This radiation is express on its maximum level with the constant G_{SC} = 1367W/m^2. On the case of the earth surface that power density is equal to 1000 W/m^2.

The wavelength of the solar radiation is measure between 0,3 and 2,50 micrometer.

Dispersion and absorption.

When the solar radiation reaches the earth atmosphere it gets modify (attenuated) by the phenomenon of dispersion and the absorption.

The *dispersion* phenomenon involves the *black reflection*, which is the part of the incident radiation on the atmosphere forward the sidereal space; as well as the appearance, which is the *radiation deflected* in all directions. This last one is also called *diffuse solar radiation* or diffuse irradiance (G_d (W/m^2).

The *absorption* phenomenon is due to components like ozone, water and carbon dioxide. Those are elements that modify the energetic spectrum. It is the zone the one that absorbs the ultraviolet components of the solar radiation. As a result, the absorbed solar energy is converted into thermal energy.

In the case of the radiation that is not intercepted by molecules it is called *direct solar radiation* and they maintain a unique direction (G_b (W/m^2).

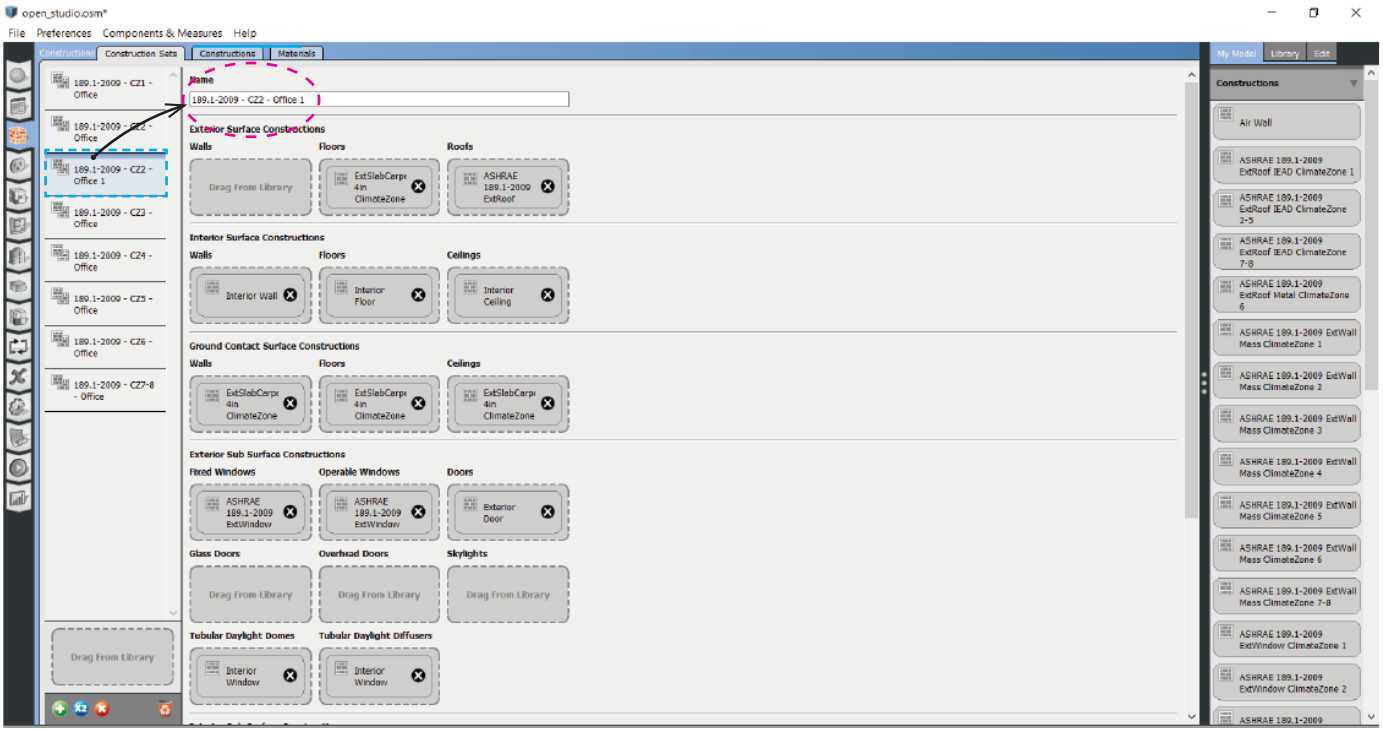
To use the solar Radiation on Earth, we must consider different aspects: sun position, weather conditions, site altitude and sunshine area or day light.

Air mass.

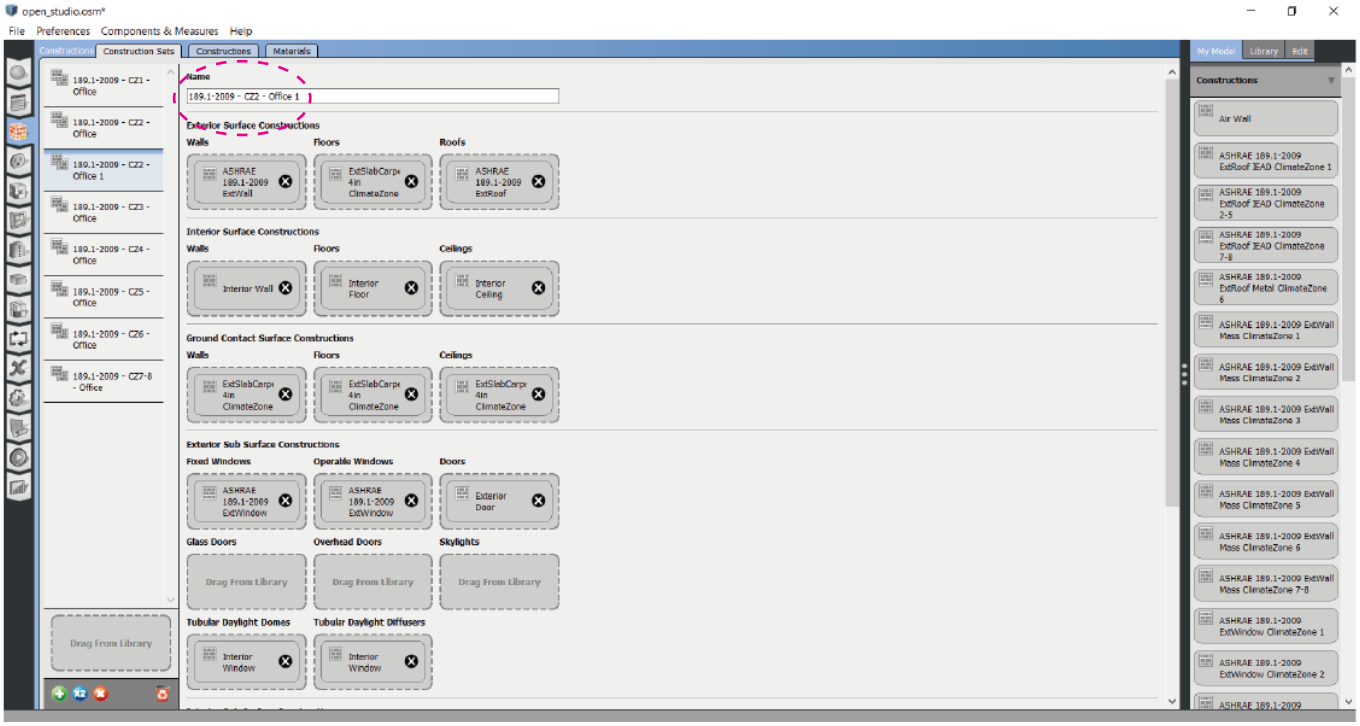
When the solar radiation is perpendicular to the horizon, it is called Zenith and crosses the minimum thickness if the atmosphere. On the other hand, when it forms an angle we obtain the larger thickness of the atmosphere.

1. Modification of the construction.

In order to modify what we have built we need to copy the elements from the “construction set tab”.

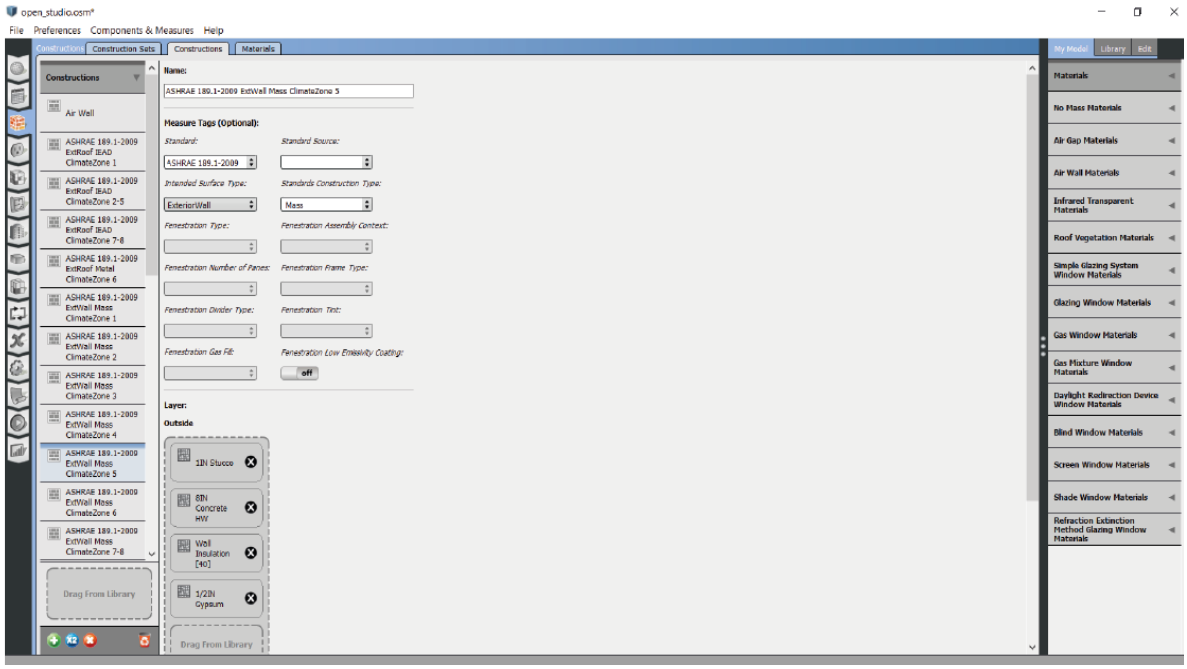


As part of the modifications, for example, we can be added external walls to our model by dragging and dropping the elements.



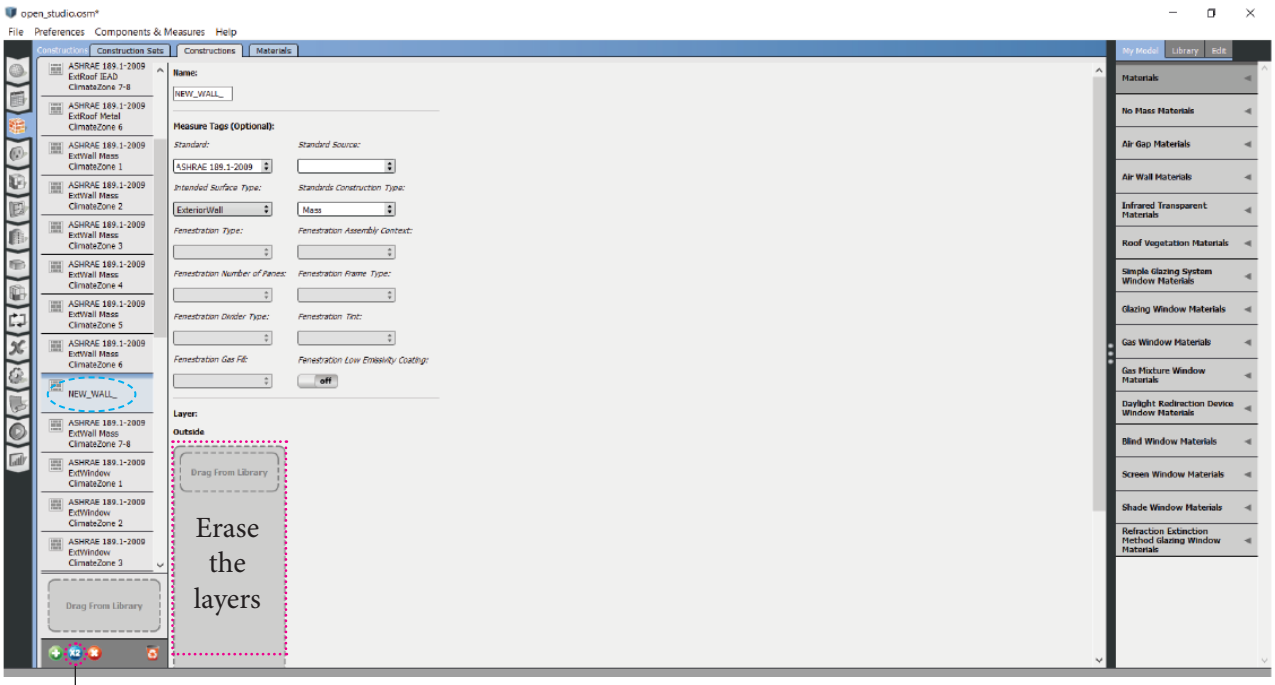
3. Review of the existing properties.

Go to the construction tab in order to review the existing properties.



4. Creation of a customize layer.

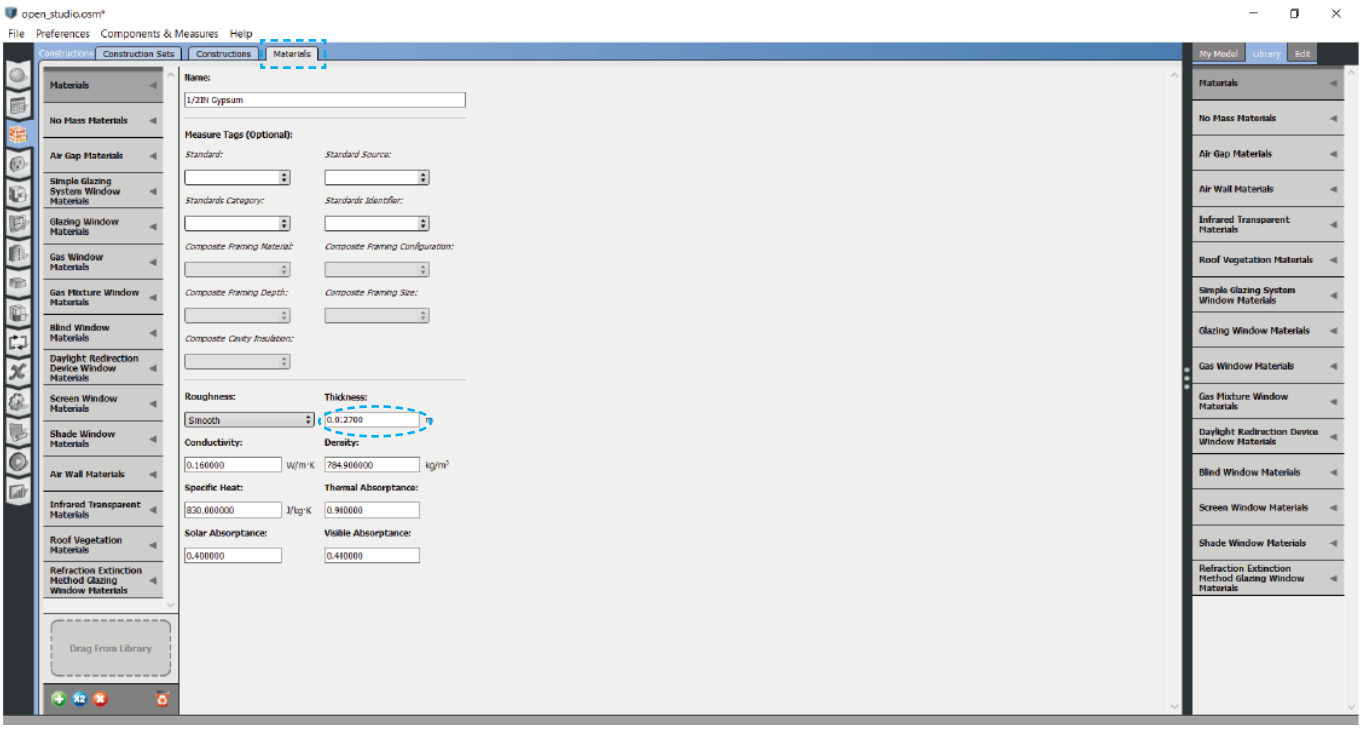
In order to create a customize layer we need to use the duplicate tool and then erase the existing layers.



Duplicate tool

5. Review of the materials properties and change of properties.

In order to review the properties of the materials, go to the “material tab” and select the desired material. There by duplicating the material we can also modify them, like for example chaging the thickness



We can used this materials to customize the “construction sets”.

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