Week7 Assignment

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

Solar radiation density

Solar radiation intensity refers to the solar radiation energy received on a unit surface area perpendicular to the solar radiation at the upper boundary of the Earth's atmosphere when the average solar distance is reached. The standard value of the solar constant is $1367W/m^2$.

Solar radiation spectrum

Solar radiation spectrum is a spectrum that describes the radiation capacity of light of various wavelengths of solar radiation. The sun is an electromagnetic radiation source with a temperature of about 5800K.

Solar radiation characteristics

1.The annual equator to receive the most radiation, the least polar. This uneven distribution of heat is bound to lead to differences in temperature at various latitudes on the surface of the earth, resulting in tropical, temperate and cold climate on the surface of the earth.

2. Astronomical radiation summer big winter small, it leads to high summer temperature and low winter temperature. The weakening effect of atmosphere on solar radiation includes its absorption, scattering and reflection.

Diffuse radiation

Diffuse radiation refers to the amount of solar radiation emitted in all directions except the direction of the sun, also known as sky radiation, scattering radiation. It is caused by the scattering of solar radiation from aerosols and clouds in the atmosphere and the reflection of solar radiation from oceans, land and buildings on the earth's surface.

Direct radiation

Direct solar radiation is the radiation that the sun projects directly onto the ground in the form of parallel rays.

Atmospheric absorption

Atmospheric absorption refers to the absorption of various components in the atmosphere when the electromagnetic wave radiation spreads among them.

Atmospheric absorption is selective absorption, solar radiation through the long atmospheric path, suffered a series of absorption to the surface, the absorbed energy into thermal energy, ionization energy or other forms of energy, to determine the physical and chemical state of the atmosphere plays an important role.

Solar energy: availability

Solar radiation intensity refers to the intensity of solar radiation reaching the ground. The absorption, reflection and scattering of solar radiation by the atmosphere greatly weaken the solar radiation reaching the ground. However, there are still many factors affecting the intensity of solar radiation, so that the amount of solar radiation reaching different regions is different.

There are four main factors influencing the intensity of solar radiation.

1.Latitude location

If the latitude is low, the altitude of the sun at noon is large. The solar radiation passes through the atmosphere in a short distance, and is weakened less by the atmosphere. Otherwise, less. This is the main reason why solar radiation decreases from low latitudes to high latitudes.

2.The weather conditions

In fine weather, because the clouds are few and thin, the atmosphere is weak in weakening solar radiation, and the solar radiation reaching the ground is strong. Rainy weather, due to the thick and more clouds, the atmosphere of the solar radiation weakened, reached the ground of the solar radiation is weak.

3.Elevation of high and low

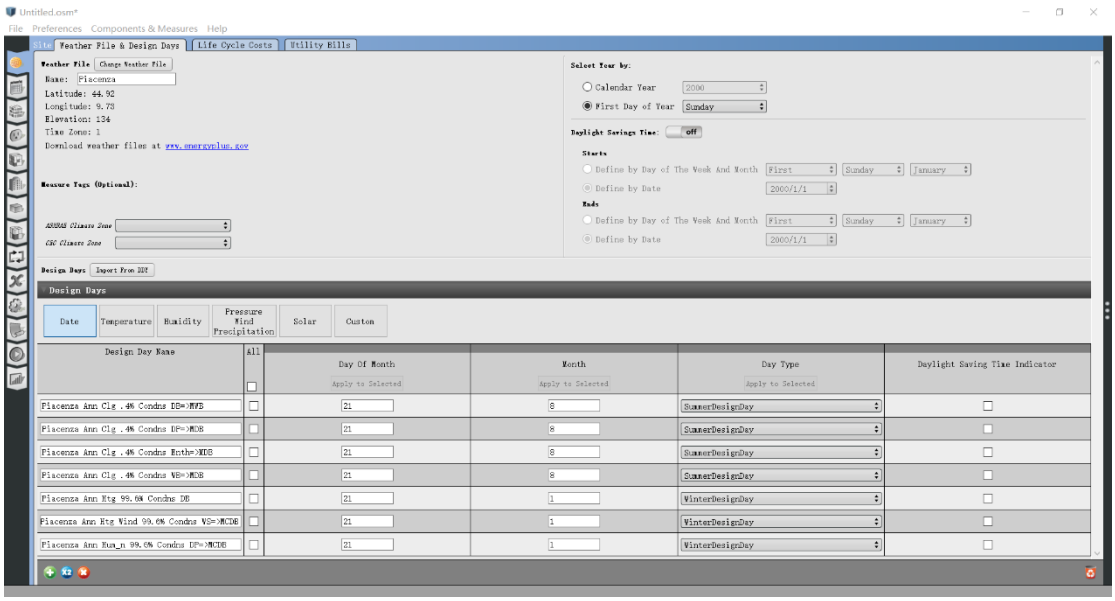
High altitude, thin air, the atmosphere of the solar radiation weakened, reached the surface of the solar radiation is strong; Otherwise, it is weak.

4.Rizhao length

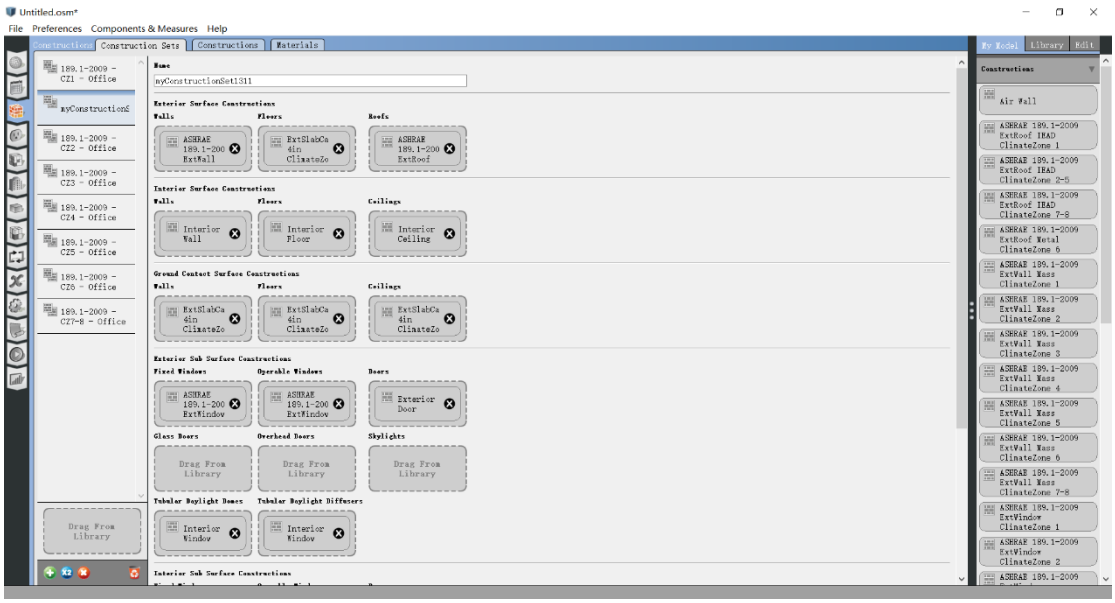
Long sunshine time and strong solar radiation; The sunshine time is short and the solar radiation is weak.

2.You create a pdf file with screenshots of all of the steps we went through in the second lesson on Open Studio and explain briefly the reason behind the use of each step (in your own words!)

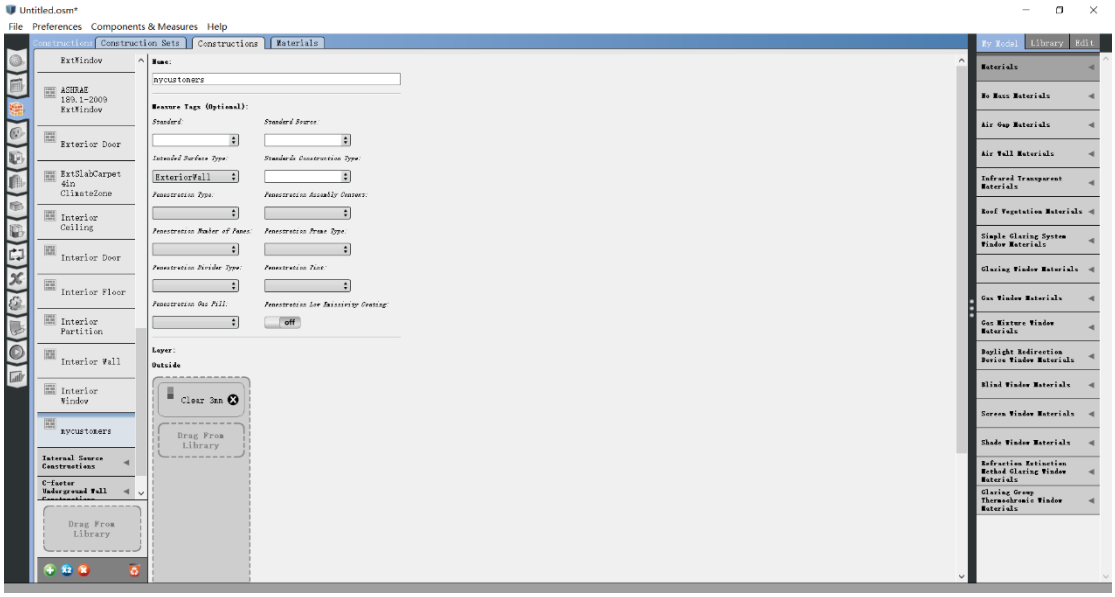
(1) Open file to add the weather data of Piacenza and run.

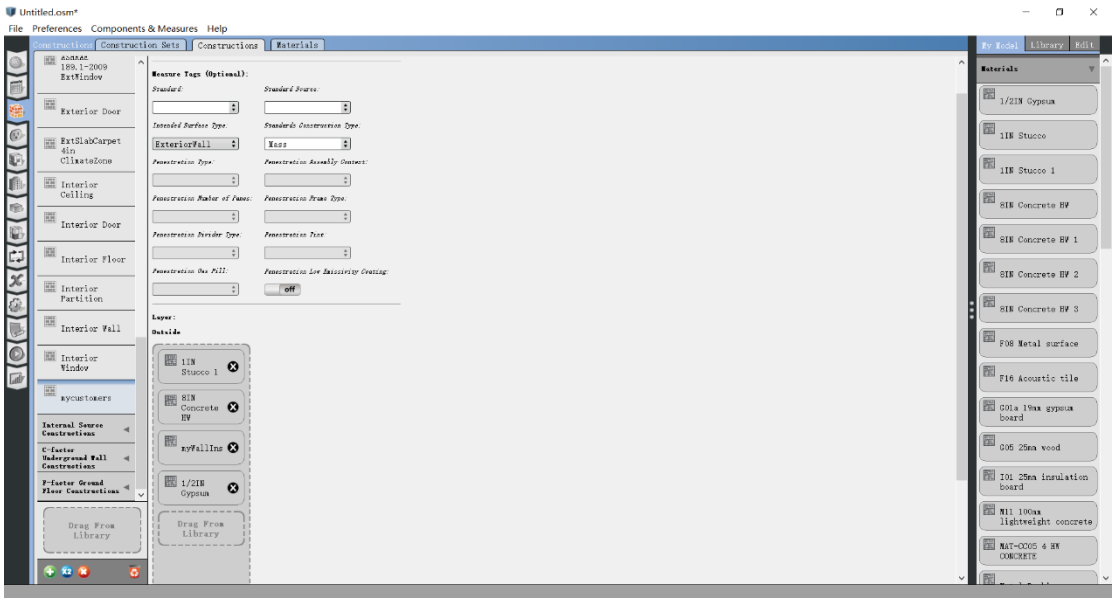


(2) Click the ‘Construction’ and go to ‘Construction Set’ tab. Copy the layer of left list. Create a new one and name it.

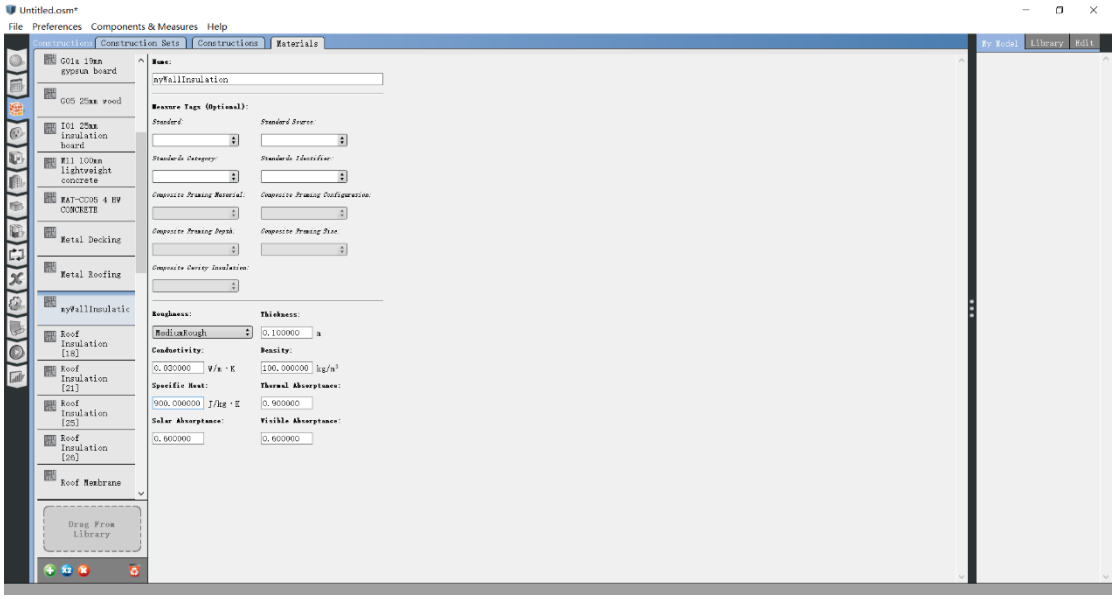


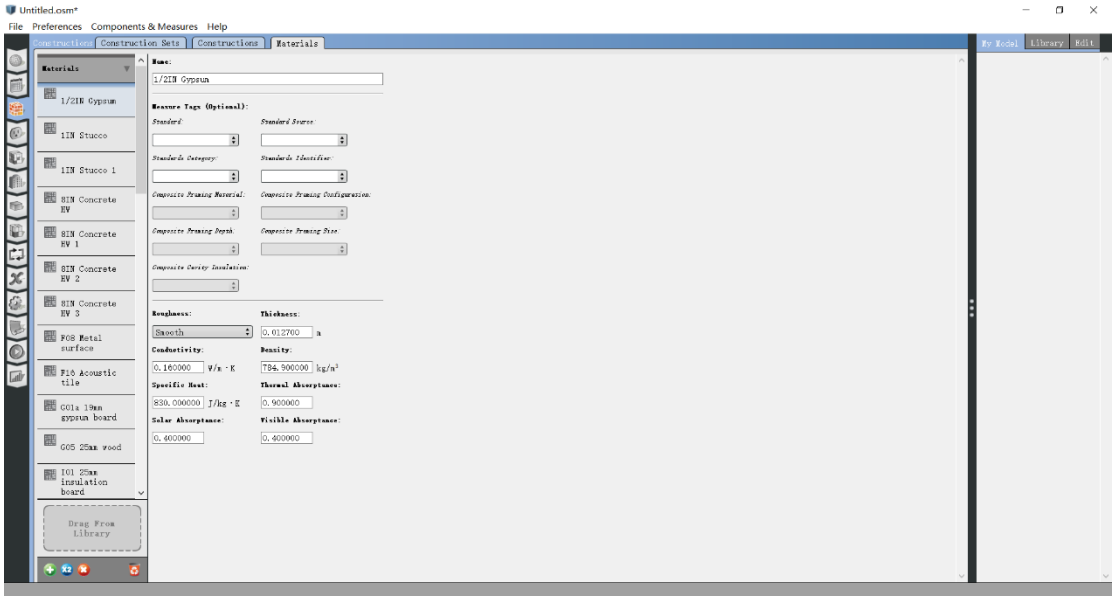
(3) Go to ‘Construction’ tab. Create a custom one, use duplicate button and remove existing layers. Drag and drop other labels from the material library.





(4) Go to ‘Materials’ tab, define a new one and use duplicate again. Change the thickness or properties.





(5) Use customized materials to modify customized constructions, and use customized constructions to modify customized construction set.