

## TASK 1. Summary of the main concepts about solar radiation

**Solar radiation:** It is the radiation emitted by the sun. Due to the dispersion of molecular and particle scattering and the absorption phenomena, the solar radiation that reaches the Earth's surface is attenuated in the total irradiance and spectral distribution.

**Direct and diffuse radiation:** They are two types of solar radiation that reach the Earth's surface. The sunlight that passes through the Earth's atmosphere without being disturbed or modified by particles and reaches the surface is called direct radiation. While, the sunlight that is affected by particles in the atmosphere like dust, eater, pollutants, clouds is know as diffuse radiation.

**Solar Radiation absorption:** The solar radiation absorption is made possible by atmospheric components, the ozone, water, and carbon dioxide. These atmospheric components absorb the incident radiation in specific wavelength bands. The stratospheric ozone absorbs all the ultraviolet component of the solar radiation wavelength less than 0.29.

**Solar Radiation density:** The extraterrestrial solar irradiance, the maximum yearly average solar radiation density, has a value of 1367 W/m<sup>2</sup>

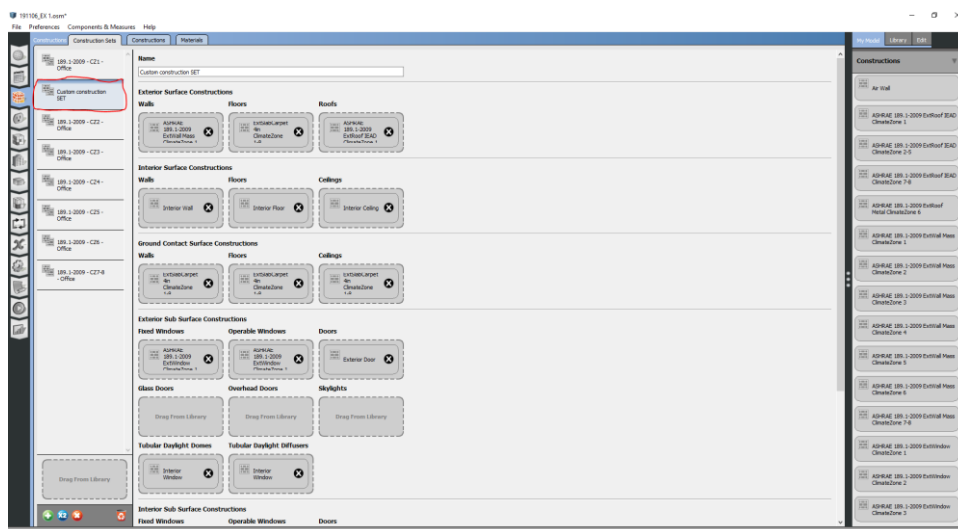
## TASK 2. Sketchup – Open studio

### STEP 1.

Modifying construction set.

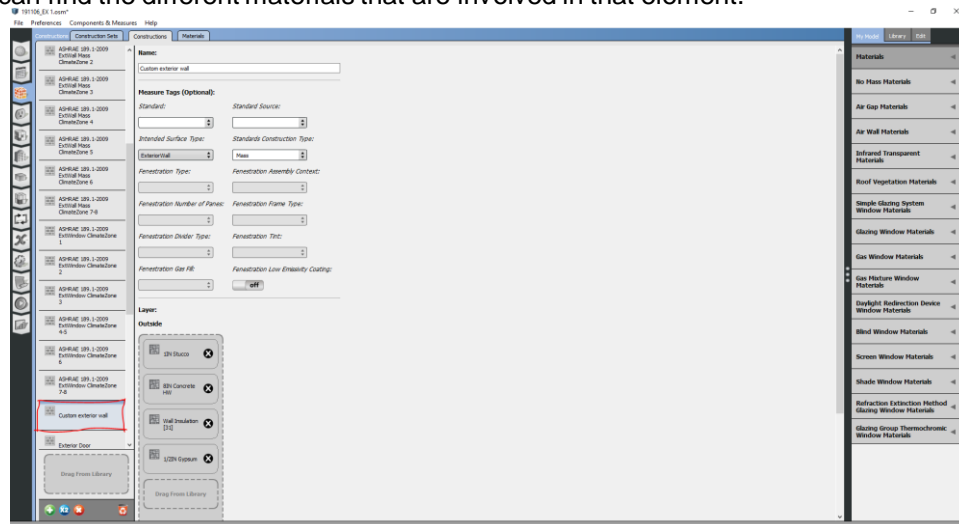
In OpenStudio, in the tab construction, duplicate an existing construction set to modify and create your own construction set.

The construction set is conformed by several construction elements that are shown in the right part of the screen. These elements are classified by type of surface and location.



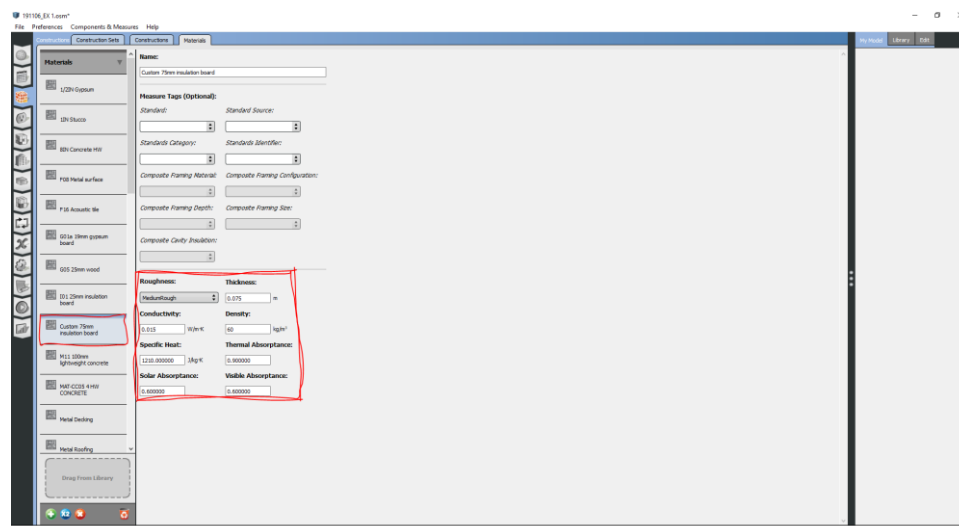
## STEP 2.

To modify one of the construction materials in your custom construction set, you must click on your construction set and change to construction in the superior tabs. There, you repeat the same procedure with a material you want to modify. Duplicate the material and change the name to create your own construction element. In the middle section of the screen, you can find the different materials that are involved in that element.



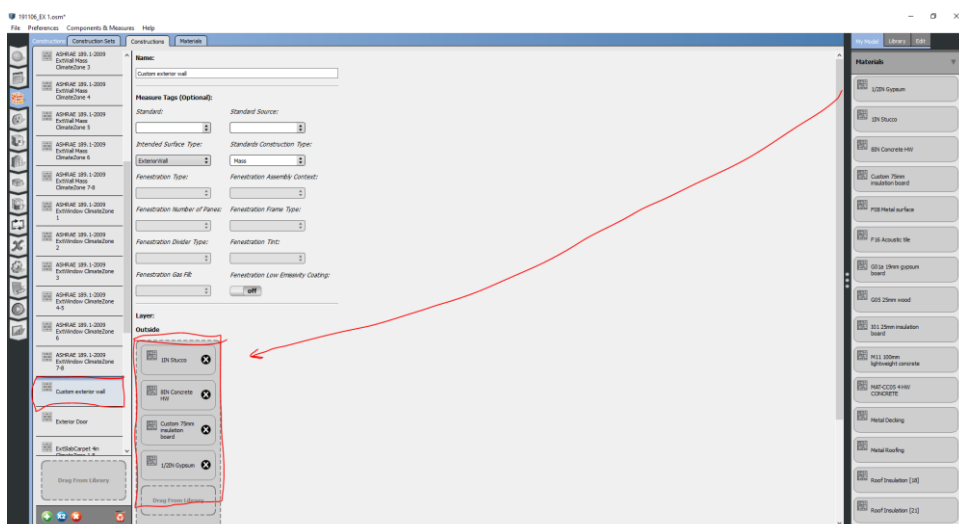
## STEP 3.

To modify one material in your construction element. You must click on your custom construction element and change to the material tab. In that tab, you can select according to the material you want to modify. Creating your custom material, you can modify the characteristics of your material as you want.



## STEP 4.

After creating the custom material, go back to your custom construction element and drag materials there to create your own configuration. You must erase the materials listed and add your new preferences. It is important to take in consideration the titles OUTSIDE and INSIDE. They represent the order of your materials depending with those surfaces. Pick the materials from the right window on the screen.



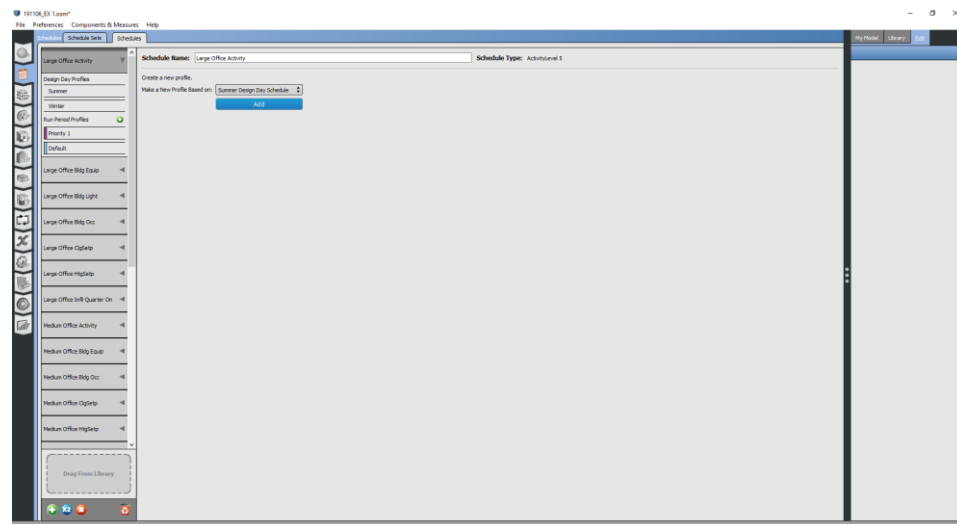
## STEP 5.

Drag and drop the custom construction element into the custom construction set.



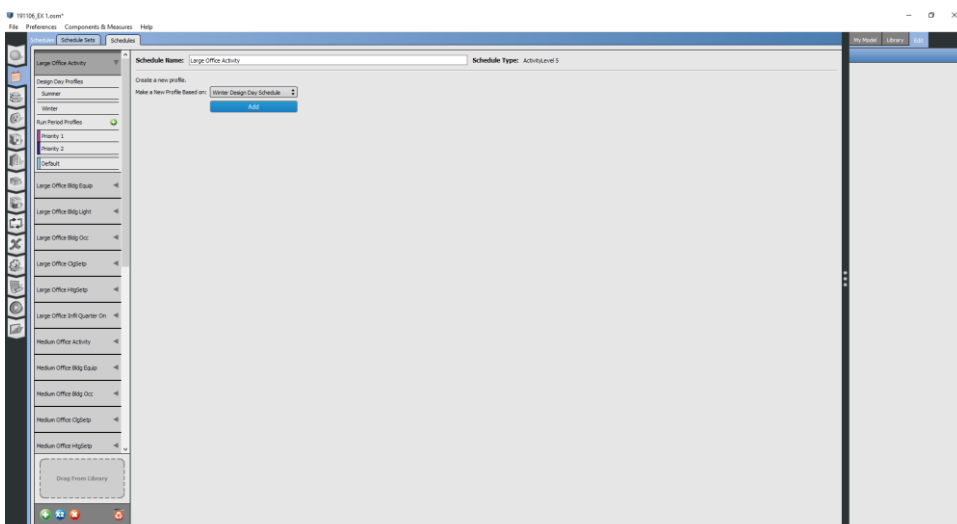
## STEP 6.

Create custom schedule for summer. In the tab run period profiles, click in the button add and set the configuration for a summer design day schedule.



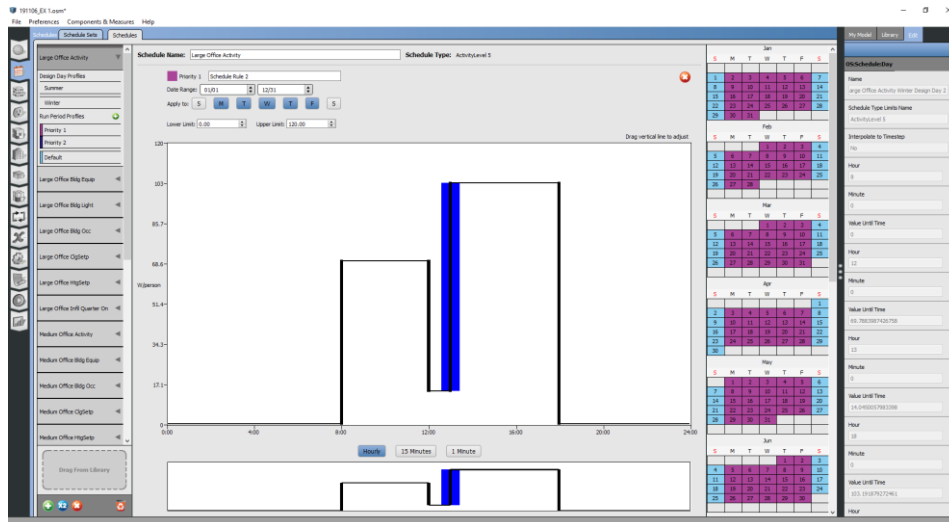
## STEP 7.

Create custom schedule for winter. In the tab run period profiles, click in the button add and set the configuration for a winter design day schedule



## STEP 8.

Create custom schedule for priority 1.



## STEP 9.

Create custom schedule for priority 2

