

Week 7

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

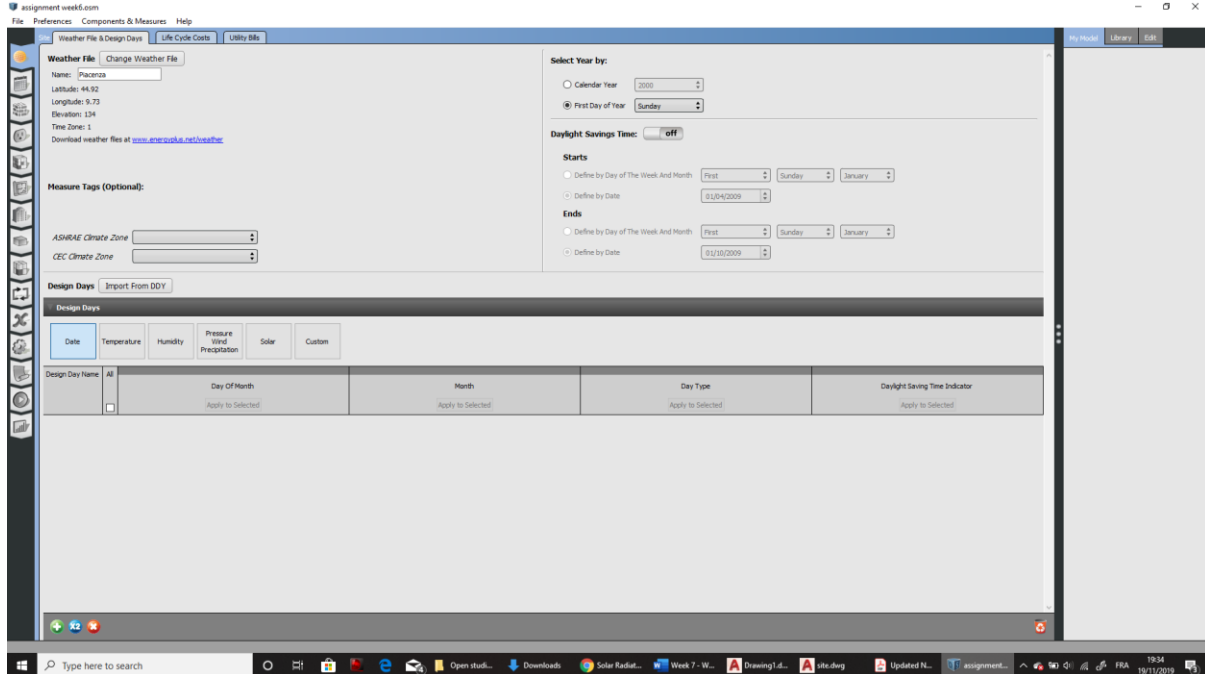
Radiation is a term that describes some form of energy emission or transmission in the form of a wave or particle. A common form of radiation is electromagnetic radiation in the form of photons such as radio waves, microwaves, and visible light. Solar radiation that reaches the earth is largely electromagnetic radiation, or photons that are emitted by the sun through nuclear reactions and chemical processes that are taking place inside of the sun and on its surface. Radiant energy can interact with earth in three extreme modes.

- Reflectivity: a number incoming solar radiation is reflected back to space. Clouds; Twenty-four percent of incoming solar radiation is reflected by clouds, 4% by the Earth's surface.
- Scattering; a percentage of incoming solar radiation is scattered back to space. Particles in the atmosphere can scatter incoming solar radiation. The wavelengths scattered depends on the size of the scattering particle. Haze and smog particles are relatively large and they scatter all wavelengths. The presence of particles of smog and haze (small water droplets) gives the sky a milky appearance. Contrast the color of the sky on a hot humid summer day with its appearance on a cold clear winter day. Small particles, such as air molecules (molecules of nitrogen or oxygen), scatter a larger proportion of short wavelength light (blue and violet) rather than longer wavelengths (red). This preferential scattering of blue light is what gives the sky its blue color. This effect is also responsible for red Sunsets. At Sunset, if you look directly at the Sun, the Sun's rays have traveled through a much greater thickness of the Earth's atmosphere than they do when the Sun is directly overhead at noon. Consequently, because of the preferential scattering of blue light by the atmosphere, only red and yellow light reach your eyes, hence red Sunsets.

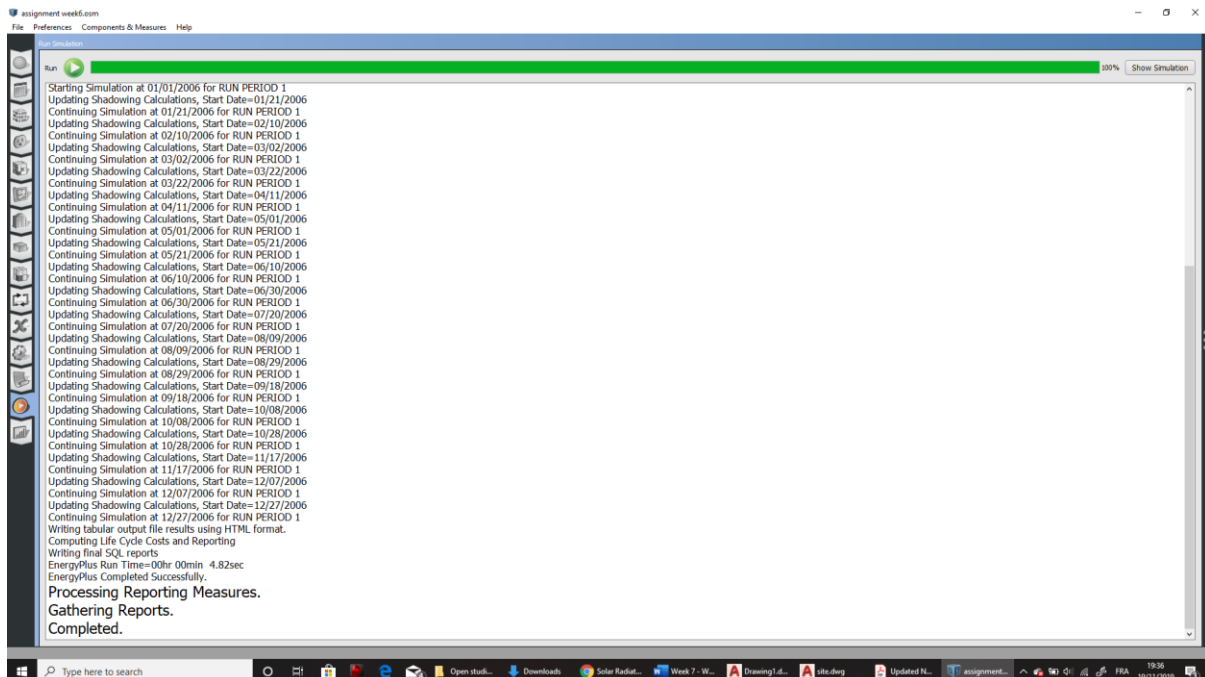
Absorption: a percentage of incoming solar radiation is absorbed at various levels in the atmosphere. Each mode of energy absorption occurs at a specific narrow band of the solar spectrum. Gases, therefore, are not like black bodies that absorb equally and completely at all wavelengths. Rather, they absorb only at specific, often narrow ranges of wavelengths. Diatomic molecules such as nitrogen and oxygen (most of our atmosphere) can absorb energy by increasing the vibration of the bond between the two atoms. If the energy absorbed is great enough it may break the bond resulting in two freewheeling oxygen or nitrogen atoms traveling at high speeds.

Task 2 Y 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 (in your own words!)**

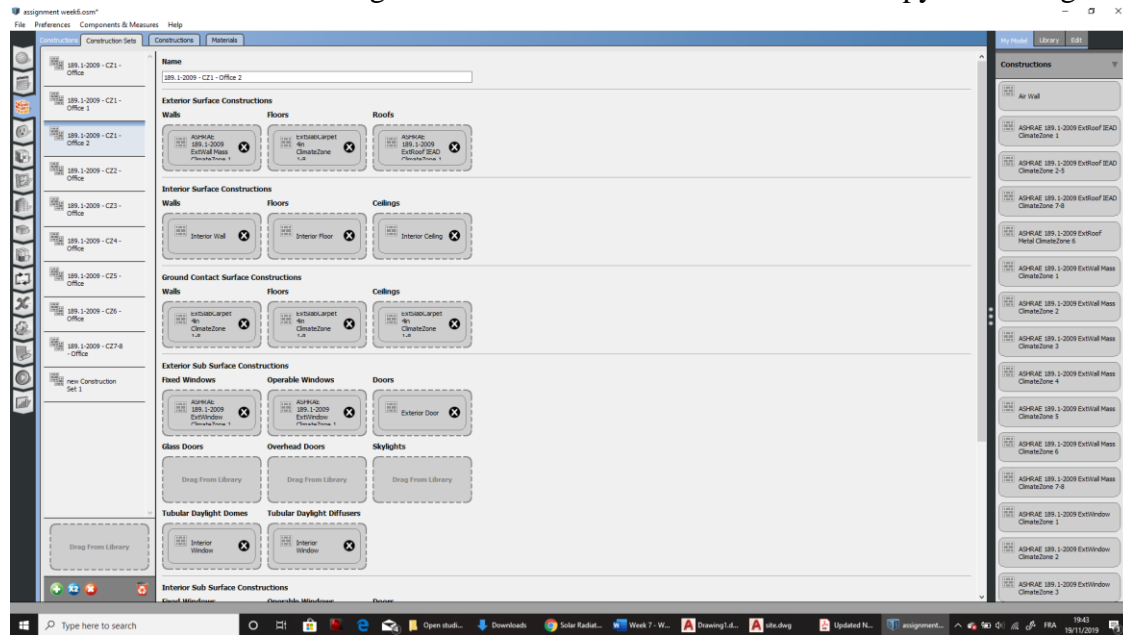
Firstly, launch the previous project on openstudio and insert the giving data if we need more weather data we can download them from energyplus.net



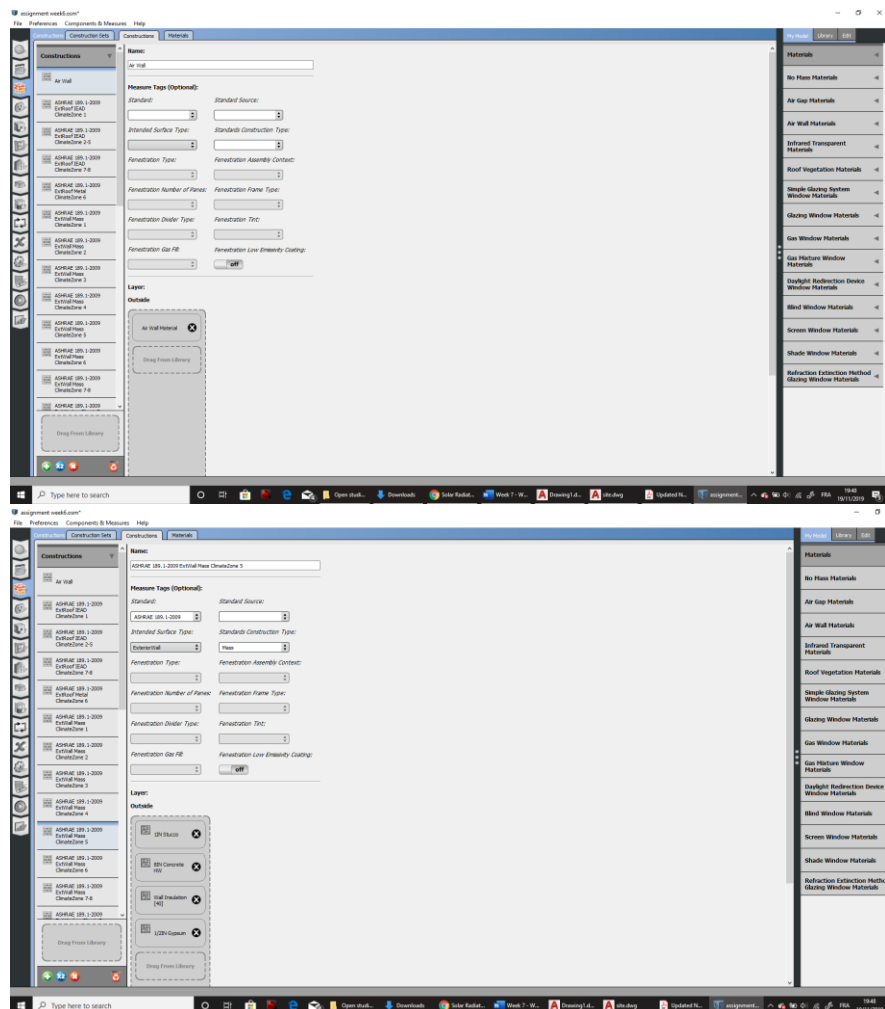
Then run the model:

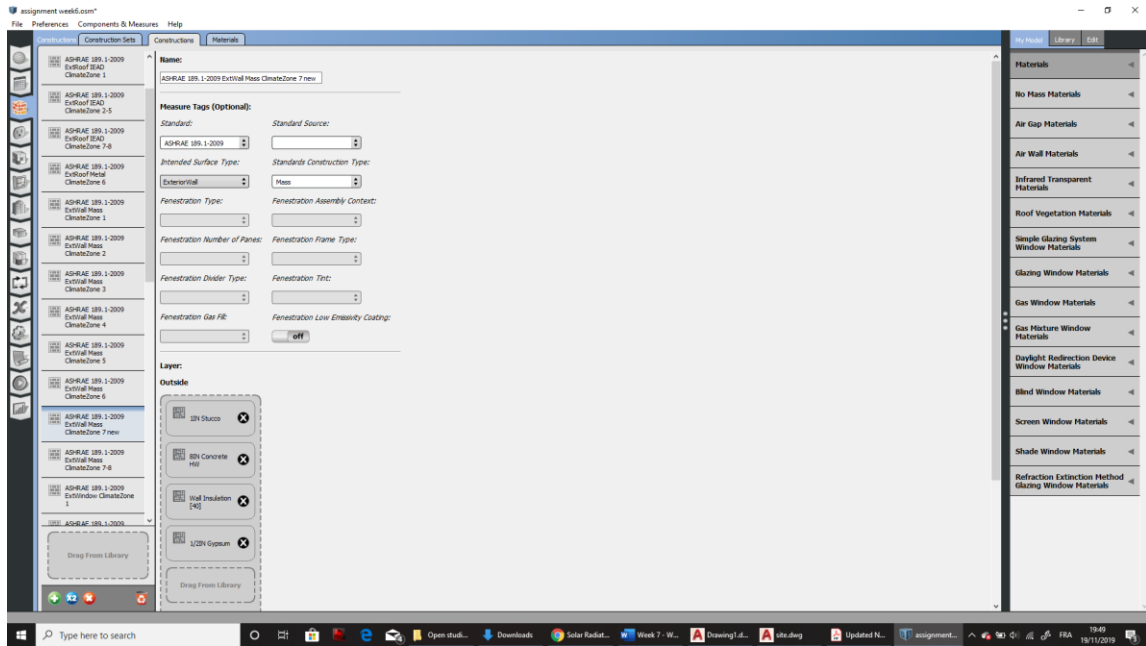


The next is to modify the construction part of the project, by alternating the contain data of the wall and floor and ceiling materials. In order to do that create a copy of the original.

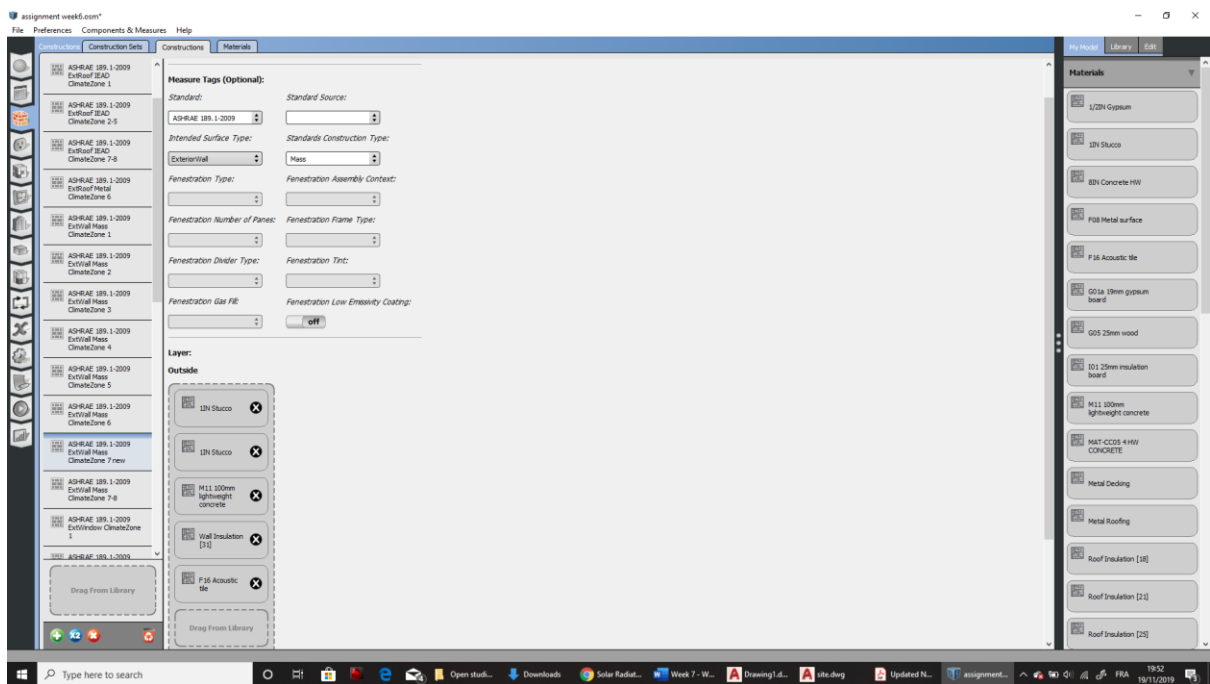


Then check existing constructions' properties:

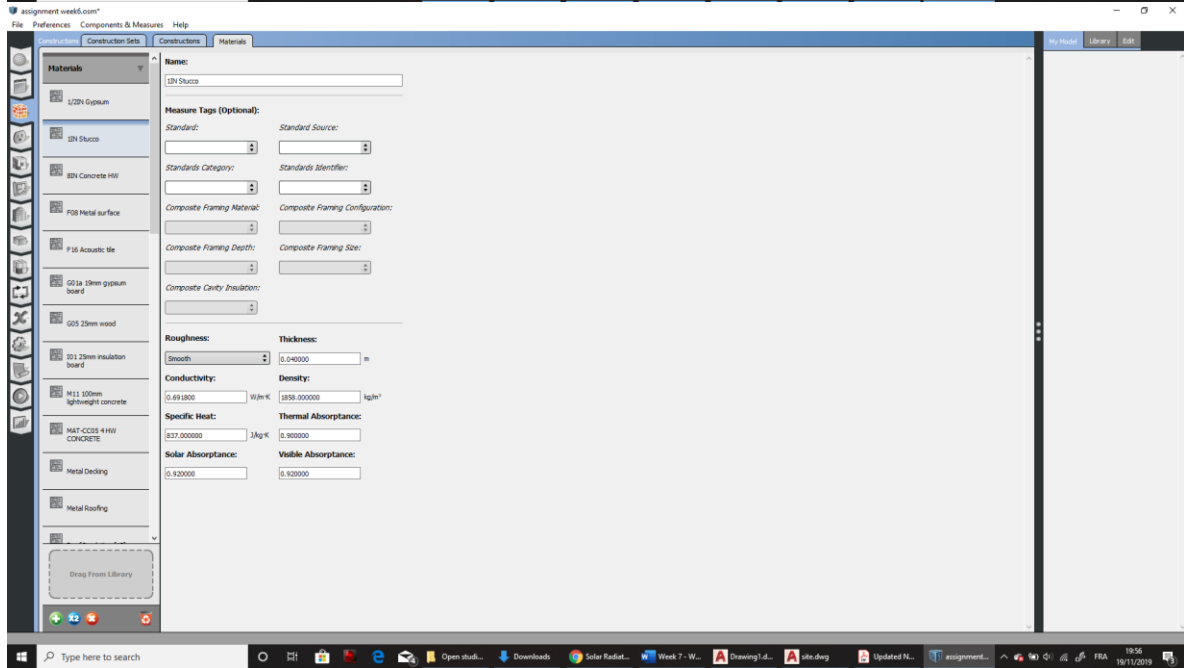
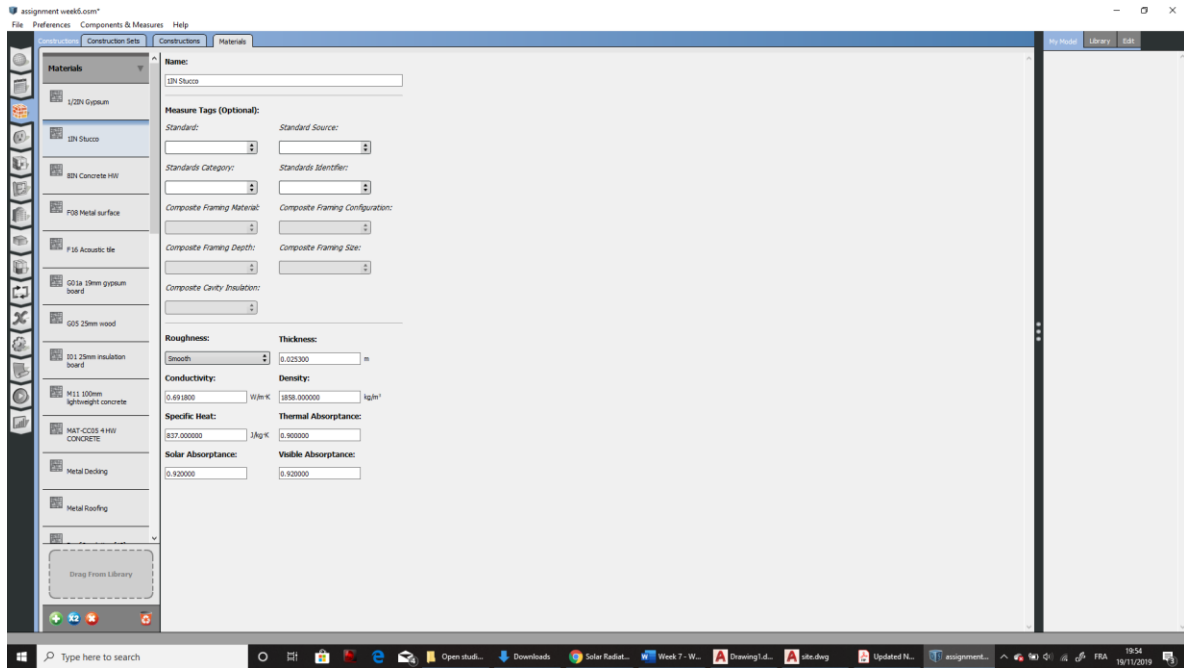


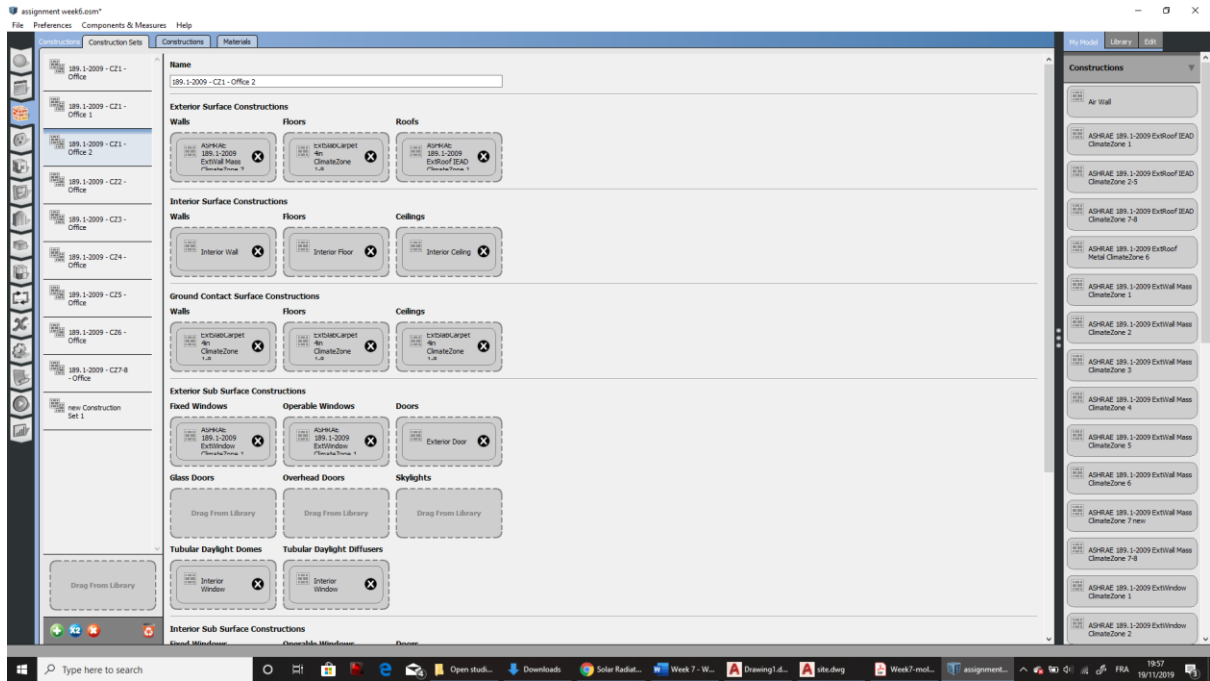


After that in construction tab, the wall specifications can be found and the items from building also changing the layers of both. The order is important because it set the layers from first one to the last one by order of putting them in table.

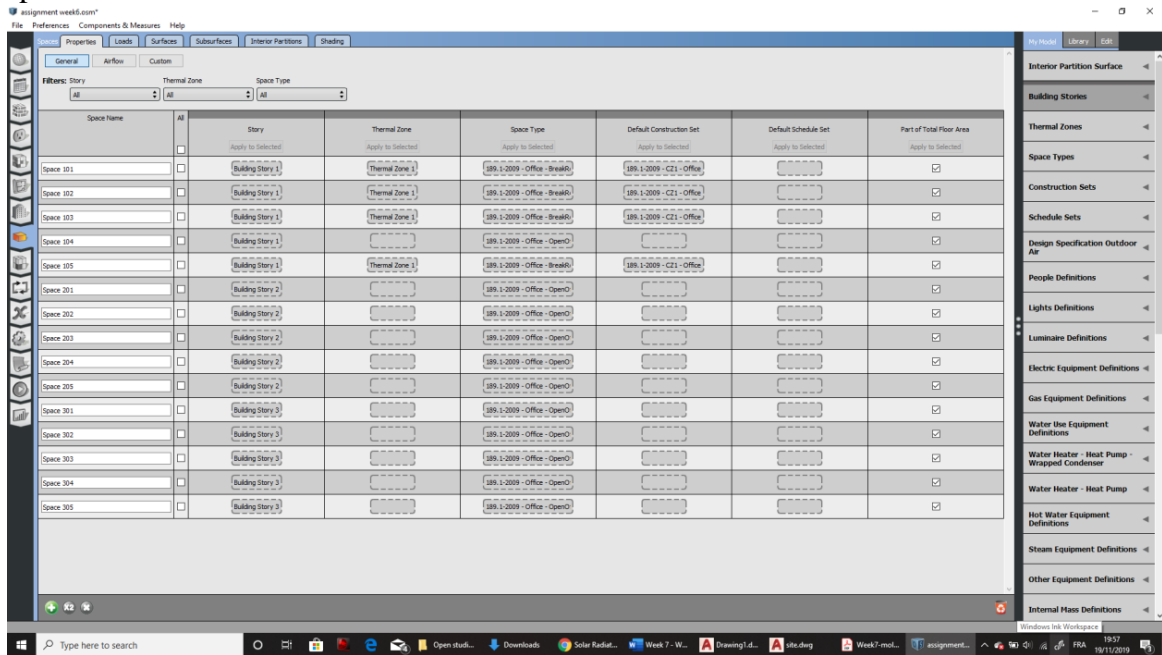


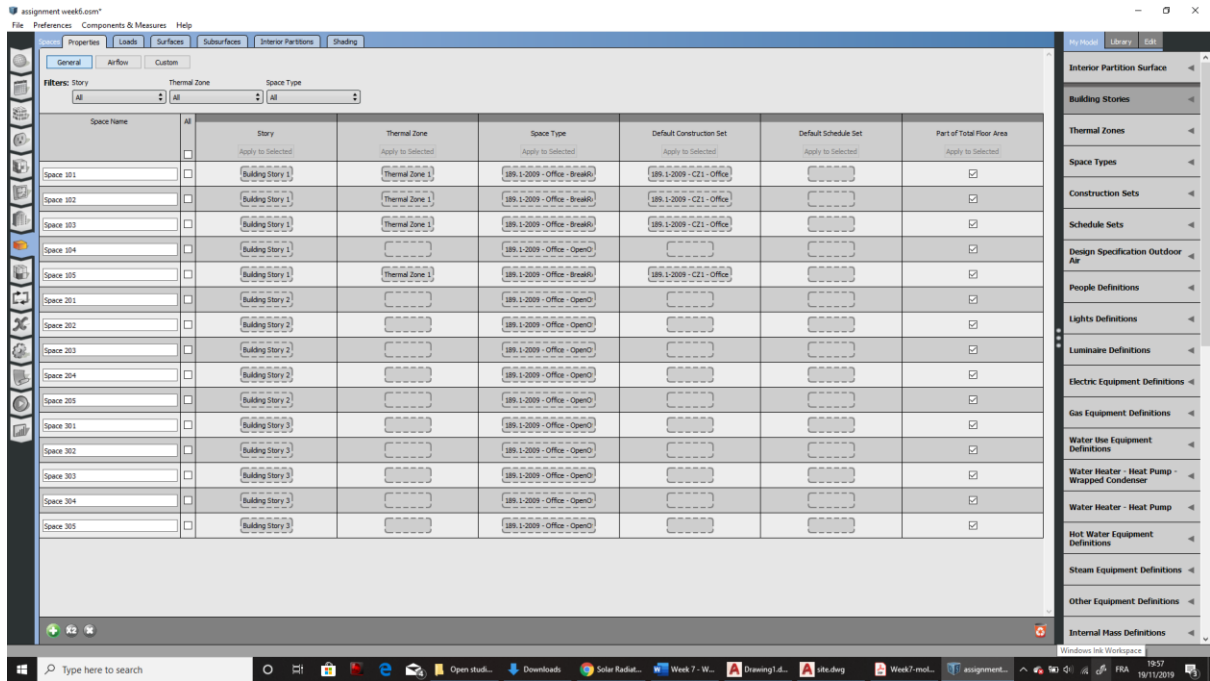
In last part get come back to construction set tab and put the construction layer we made in right space of the building





In space tab the setting for the type of construction can be made and applying them to all spaces.





After that, is schedule which is similar to construction and we can modify each parameter of it.

