

Task 1

Solar Radiation

Solar radiation is electromagnetic energy emitted by the sun from a nuclear fusion. Spectrum of solar radiation is close to that of a black body with a temperature of about 5800 K. The solar radiation that enter the Earth is attenuated both in spectral distribution and in total irradiance due to dispersion and absorption phenomena.

Diffuse and direct beam solar radiation

There are direct beam solar radiation and diffuse solar radiation.

-> Direct beam solar radiation enters the surface of the Earth direct and undisturbed. It throws sharp shadows and can be focused.

-> Diffuse solar radiation, is absorbed, scattered, or reflected by dust, water vapor, clouds, pollutants, etc. It doesn't throw sharp shadows and cannot be focused. The sum of the diffuse and direct beam solar radiation is called global solar radiation.

Absorption of solar radiation

Solar radiation absorption is due to some atmospheric components, especially ozone, water and carbon dioxide.

-> Stratospheric ozone absorbs all the ultraviolet component of the solar radiation for wavelength less than $0.29\text{ }\mu\text{m}$,

-> Water vapor has important absorption bands in the infrared field, centered at 1.0 , 1.4 , and $1.8\text{ }\mu\text{m}$.

-> Water and carbon dioxide absorb a lot that over $2.5\text{ }\mu\text{m}$ of the atmosphere becomes practically opaque to solar radiation.

Air Mass

The sun to the zenith crosses the minimum thickness of the atmosphere while the sun with an elevated zenith angle crosses a large thickness of the atmosphere.

Solar radiation density

The maximum yearly average solar radiation density is the solar constant, which is the beam normal spectral irradiance, its value is 1367 W/m^2

Solar energy: availability

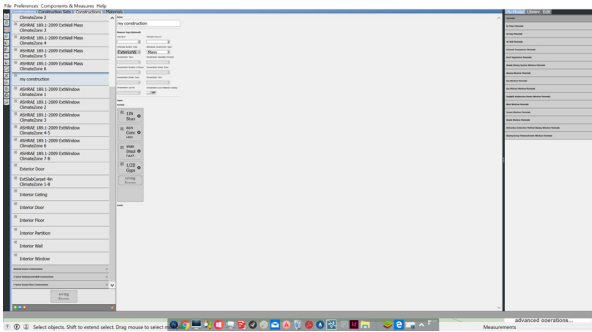
The solar radiation, available on the Earth's surface for conversion in other energy forms, depends on the:

- > Sun position.
- > Weather condition.
- > Site altitude over the sea level.
- > Daylight hours.

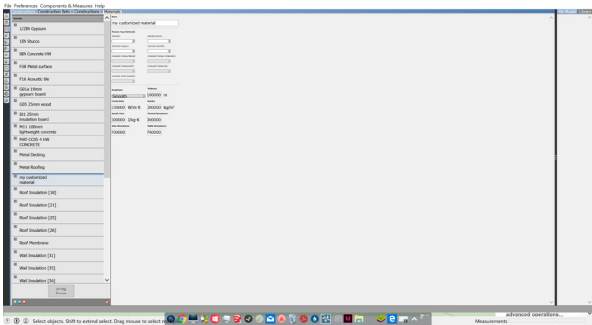
Task 2

I had a problem with the open studio application that it minimizes all the buttons and features so the texts appear cut and the numbers are hidden or incomplete so they don't look in the screenshot like what I inserted.

Use the “construction” tab to customize the construction layer of the wall and rename it.



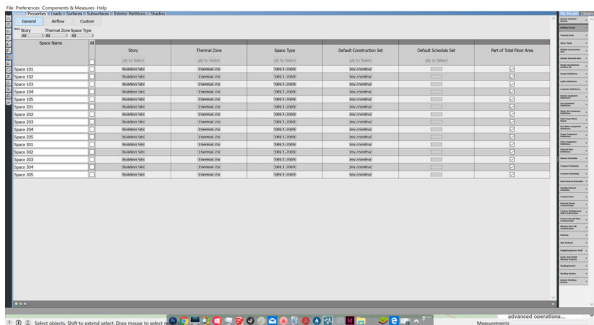
Use the “material” tab to customize the material layer of the wall with the required type of material and insulation.



The screenshot displays the Revit software interface. On the left, the 'Materials' panel is active, showing a list of materials categorized by construction type. The 'Properties' panel on the right shows the 'Material' tab with fields for 'Name' and 'Color'. The central 'Model' view shows a 3D rendering of a building facade with a grid of windows and doors. The bottom status bar indicates 'Select objects. Shift to extend select. Click mouse to select.' and 'advanced operations...'.

[illegible]

Go to “space” tab and add the customized construction layer to the whole building.



Go to the “schedule” tab.

