

WEEK 7_WORK

Task 1

MEAN RADIANT TEMPERATURE

The Mean Radiant temperature of a given surface is the temperature of the equivalent black enclosure with which it would exchange the same radiative flux exchanged with all the other surfaces.

OPERATIVE TEMPERATURE

It is the virtual ambient temperature with which the sum of the radiative thermal and convective linearized flow is exchanged which exchanges with the air and all the other surfaces.

SOLAR RADIATION DENSITY

The solar constant GSC is a flux density measuring mean solar electromagnetic radiation (solar irradiance) per unit area. The solar "constant" is not a physical constant, is an average of a varying value. Its value is 1367 W/m².

SOLAR RADIATION CHARACTERISTICS

Solar radiation is attenuated both in the spectral distribution and in the total radiation. This is due to the dispersion and absorption phenomena.

ATMOSPHERIC ABSORPTION

The absorption of solar radiation is due to the atmospheric components, in particular ozone, water and carbon dioxide, which absorb the incident radiation in absorption bands, consequently modifying its energy spectrum. The stratospheric ozone absorbs almost all the ultraviolet component of solar radiation.

SOLAR ENERGY

The solar radiation depends on:

1. The sun position in the sky (altitude and azimuth angles), which changes daily and seasonally
2. The weather condition
3. The site altitude over the sea level
4. Sunshine hours

Task 2

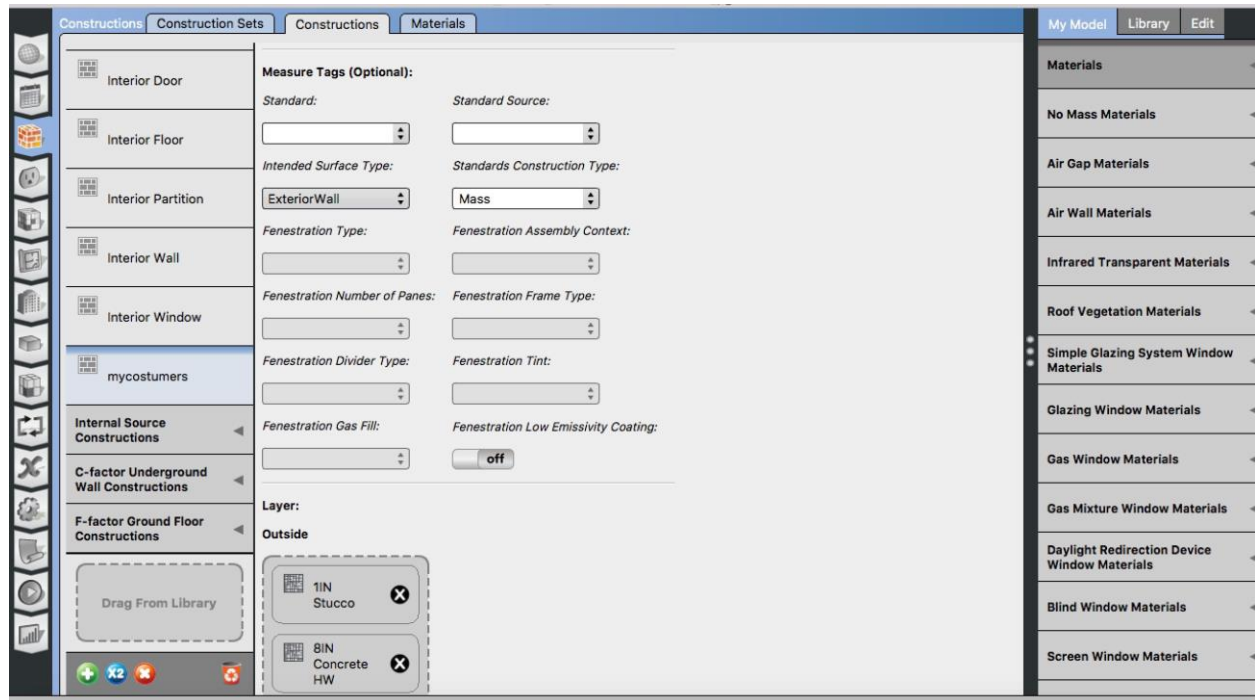
1. First we open Open studio to add the weather Data

The screenshot shows the 'Weather File & Design Days' dialog box in OpenStudio. The 'Weather File' tab is active, showing fields for Name (Piacenza), Latitude (44.92), Longitude (9.73), Elevation (134), and Time Zone (1). There is a link to download weather files at www.energyplus.net/weather. The 'Measure Tags (Optional)' section has dropdowns for ASHRAE Climate Zone and CEC Climate Zone. The 'Design Days' section has an 'Import From DDY' button. The 'Select Year by:' section has radio buttons for 'Calendar Year' (set to 2000) and 'First Day of Year' (set to Sunday). The 'Daylight Savings Time' is set to 'off'. The 'Starts' and 'Ends' sections have radio buttons for 'Define by Day of The Week And Month' and 'Define by Date' (set to 01/04/09 and 01/10/09 respectively). The 'Design Days' table has columns for Date, Temperature, Humidity, Pressure Wind Precipitation, Solar, and Custom. The table has a header row and a body row with buttons for 'Apply to Selected'.

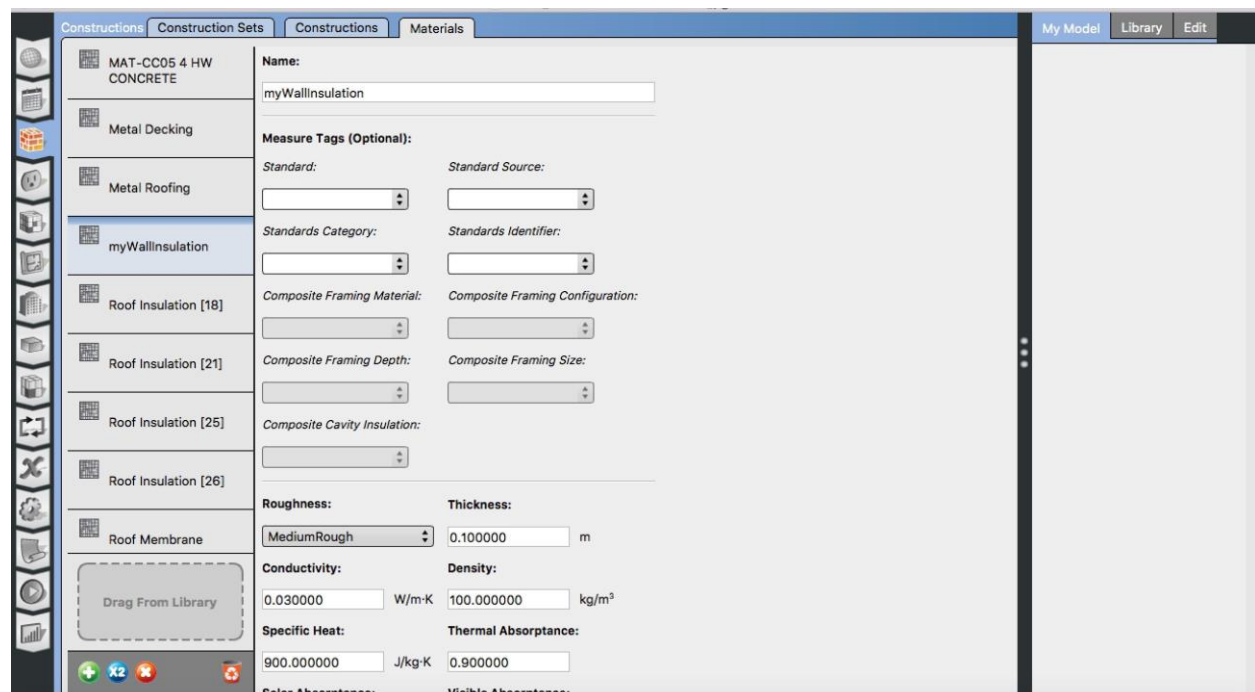
2. Go to the “construction” command to start customize the building, renaming it

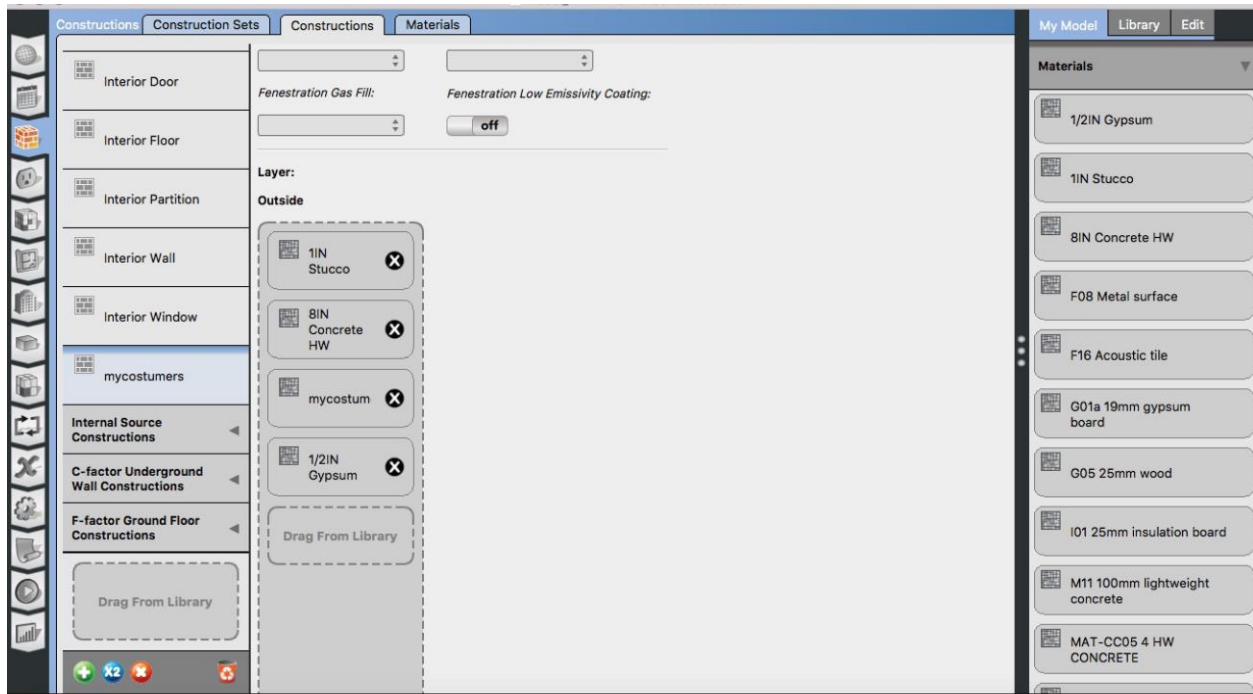
The screenshot shows the 'Construction Sets' dialog box in OpenStudio. The 'Constructions' tab is active, showing a list of construction sets on the left. The main area displays the 'myconstructionSet1311' set, which is currently empty. The 'Exterior Surface Constructions' section has buttons for 'Walls', 'Floors', and 'Roofs'. The 'Interior Surface Constructions' section has buttons for 'Walls', 'Floors', and 'Ceilings'. The 'Ground Contact Surface Constructions' section has buttons for 'Walls', 'Floors', and 'Ceilings'. The 'Exterior Sub Surface Constructions' section has buttons for 'Fixed Windows', 'Operable Windows', and 'Doors'. The right sidebar shows a list of available construction sets, including 'Air Wall', 'ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 1', 'ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 2-5', 'ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 7-8', 'ASHRAE 189.1-2009 ExtRoof Metal ClimateZone 6', 'ASHRAE 189.1-2009 ExtWall Mass ClimateZone 1', 'ASHRAE 189.1-2009 ExtWall Mass ClimateZone 2', 'ASHRAE 189.1-2009 ExtWall Mass ClimateZone 3', 'ASHRAE 189.1-2009 ExtWall Mass ClimateZone 4', 'ASHRAE 189.1-2009 ExtWall Mass ClimateZone 5', and 'ASHRAE 189.1-2009 ExtWall Mass ClimateZone 6'.

3.Start customizing the wall package in the “construction sets” window.

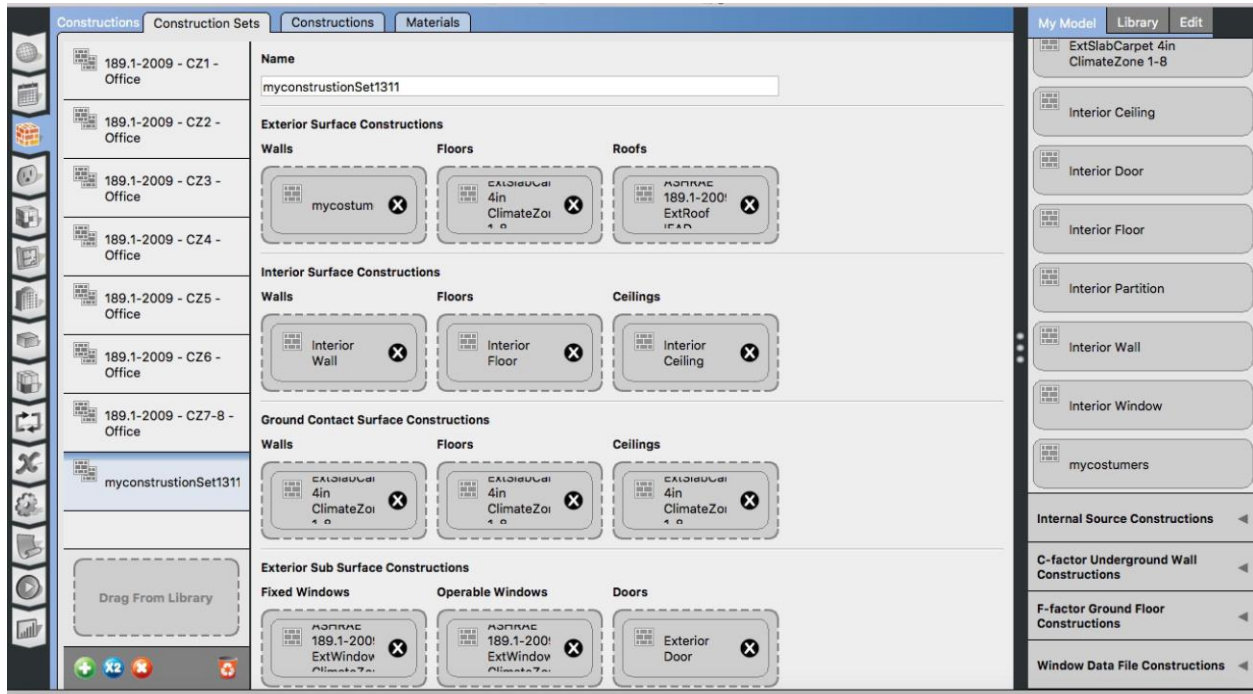


4.Decide the type of wall insulation and insert it later in the package

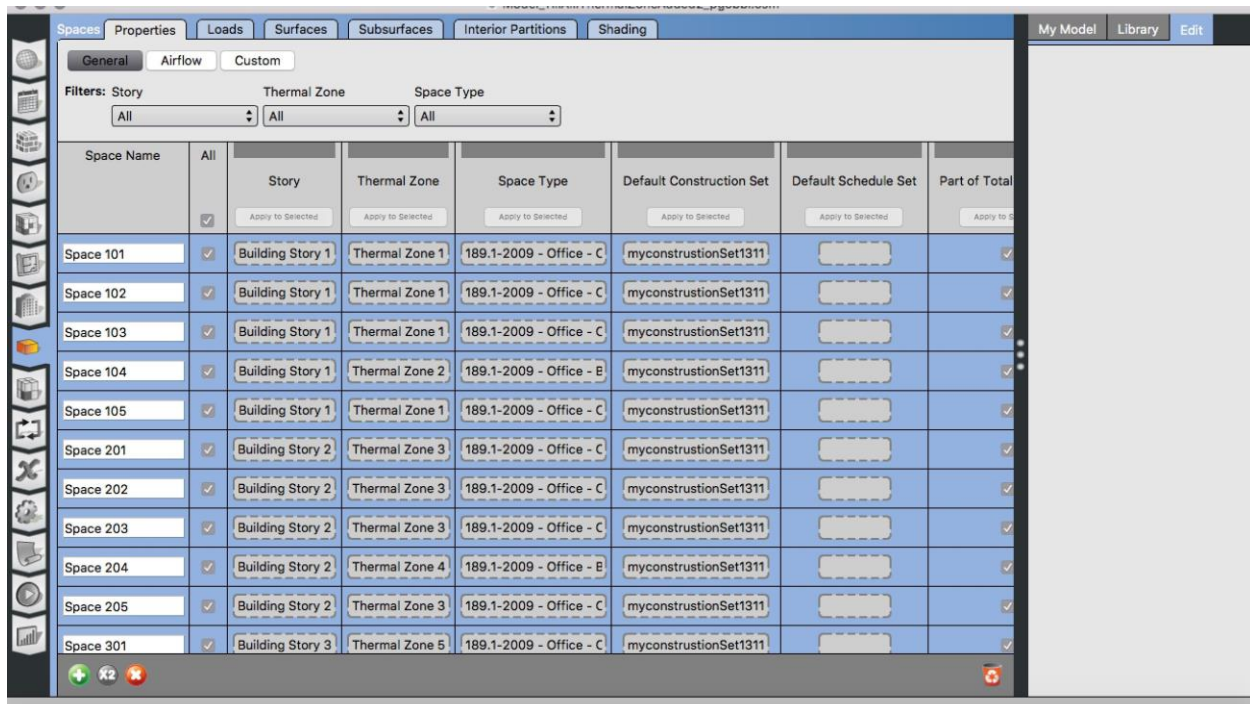




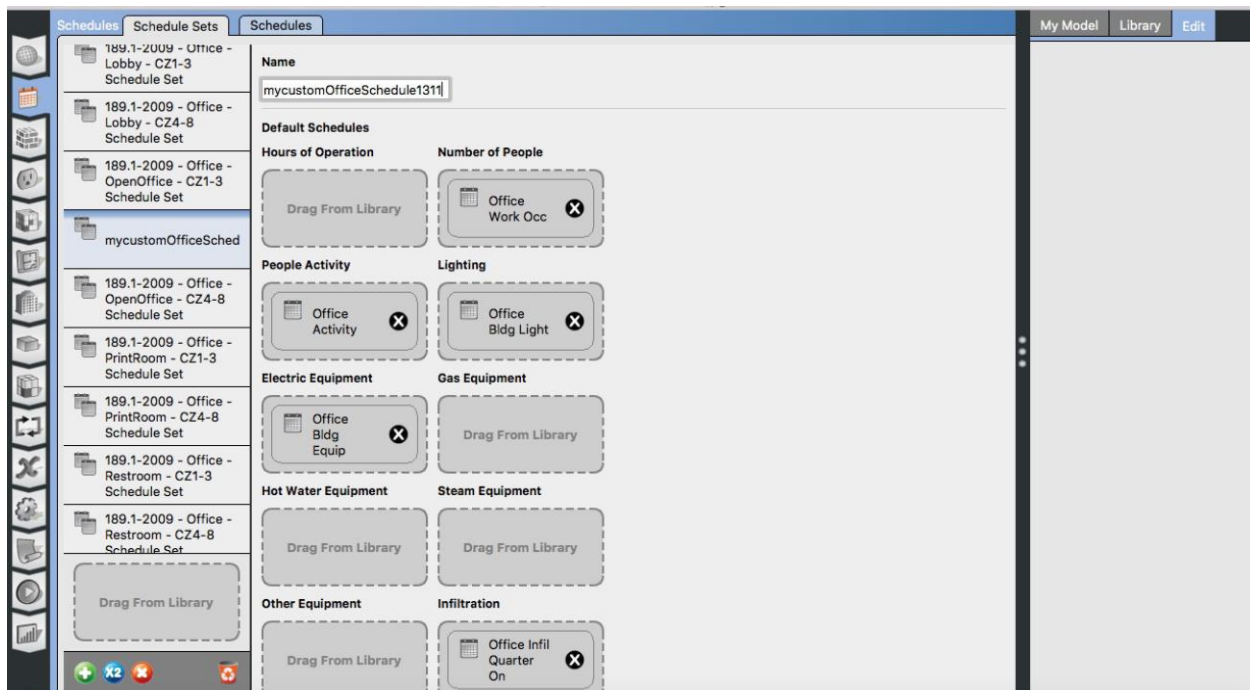
5.Insert the wall in the building data

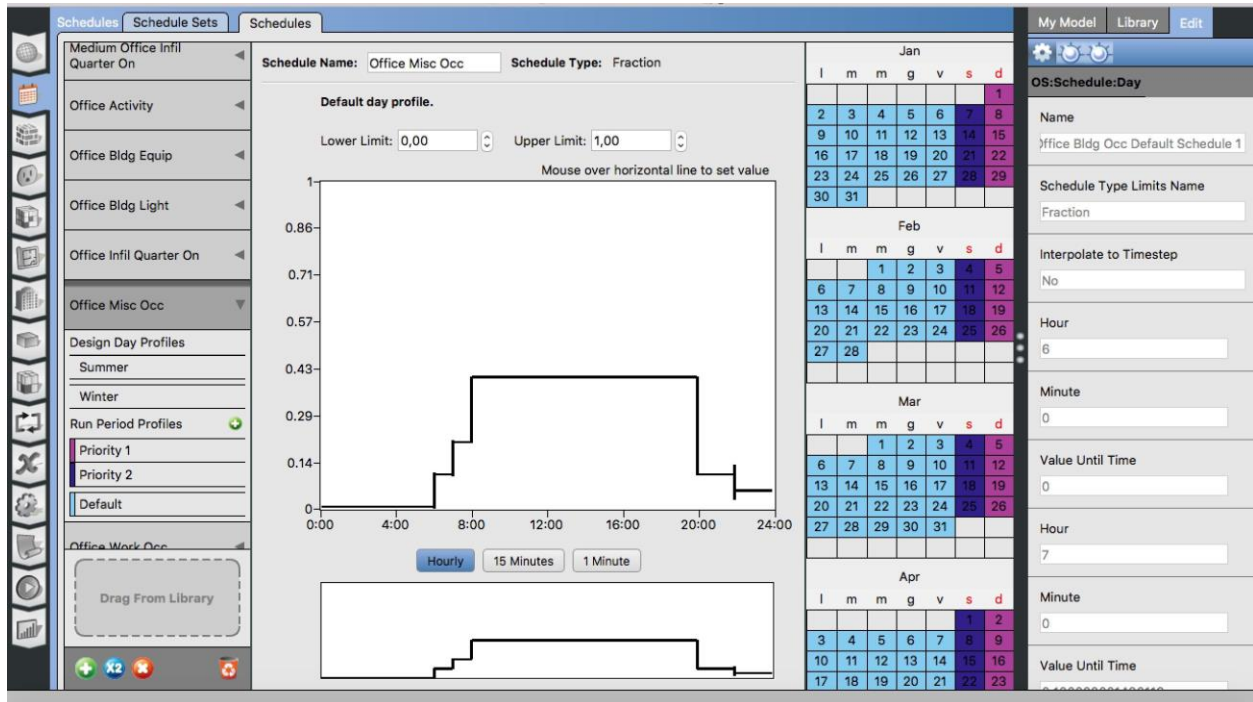


6.Go to the “space” window and insert the project layer with our modifications applying it to the whole building.



7.Return to “schedule sets” to enter all the information relating to activities, equipment, est. and their schedules





8. Go to the “loads” command to change other specifications, like people, light, electricity, etc.

The screenshot shows the 'Loads' window in a software interface. The window is divided into several sections. On the left, there is a sidebar with icons for different building components. The main area is titled 'Loads' and contains a list of 'People Definition' entries. The entries are: '189.1-2009 - Office - IT_Room - CZ1-3 People Definition', '189.1-2009 - Office - IT_Room - CZ4-8 People Definition', '189.1-2009 - Office - Lobby - CZ1-3 People Definition', '189.1-2009 - Office - Lobby - CZ4-8 People Definition', '189.1-2009 - Office - OpenOffice - CZ1-3 People Definition', '189.1-2009 - Office - OpenOffice - CZ4-8 People Definition', '189.1-2009 - Office - PrintRoom - CZ1-3 People Definition', and '189.1-2009 - Office - PrintRoom - CZ4-8 People Definition'. The main area contains input fields for 'Name', 'Number of People', 'People per Space Floor Area', 'Space Floor Area per Person', 'Fraction Radiant', 'Sensible Heat Fraction', and 'Carbon Dioxide Generation Rate'. The right side of the window shows a sidebar with icons for different building components.

Model_1 (Main) | Normalization | Add | Edit | Delete | Save | Print | Help

Loads

109.12008 - Office - WholeBuilding - Md Office - CZ1-3 Electric Equipment Radiation

109.12008 - Office - WholeBuilding - Md Office - CZ4-8 Electric Equipment

109.12008 - Office - WholeBuilding - Sm Office - CZ1-3 Electric Equipment Radiation

109.12008 - Office - WholeBuilding - Sm Office - CZ4-8 Electric Equipment

1mycostumElectricEqu

Gas Equipment Definitions

Steam Equipment Definitions

Other Equipment Definitions

Drag From Library

+

x2

✖

🔍

Name:

1mycostumElectricEquipment

Design Level:

Watts Per Space Floor Area:

Watts Per Person:

Fraction Latent:

Fraction Radiant:

Fraction Lost:

W

10.000000

W/m²

W/person

0.000000

0.000000

0.000000

My Model

Library

Edit

Ruleset Schedules

Compact Schedules

Constant Schedules

Year Schedules

Fixed Interval Schedules

Variable Interval Schedules

Constructions

Internal Source Constructions

C-factor Underground Wall Constructions

F-factor Ground Floor Constructions

Window Data File Constructions