

## Task 1 Provide a summary of the main concepts that went through about solar radiation

### **Solar radiation**

The solar radiation is electromagnetic energy emitted from the sun, with wavelength varying between 0.3 to 2.5  $\mu\text{m}$ . Solar radiation propagates in all direction and some hits the earth surface. The max annual average solar radiation power density (Expressed by the letter GSG) is the radiation from the Sun by unit of receiving surface placed out of the atmosphere and perpendicular to the Sun-Earth ray. The value of this out of the Earth's atmosphere is  $1367 \text{ W/m}^2$ , the value on the Earth's surface is instead  $1000 \text{ W/m}^2$ , which is lower. Hence we can say that the Earth's atmosphere acts as a barrier as a part of the solar radiation is absorbed by it. The radiation from Sun are modified both in spectral distribution and in total irradiance, this is due to a dispersion and absorption phenomena.

The dispersion is classified by 2 types: one is direct radiation and the other is the diffuse radiation. The first are the radiation that is not intercepted by molecules instead maintains the incidence direction as the unique direction. The 2nd one is a black reflection of the incident radiation on the atmosphere and the radiation deflected in all directions. The sum of the direct and diffuse direction is the global solar radiations.

The atmosphere absorbs some quantity of the incident radiation in specific wavelength band and this is because of the atmospheric components like carbon, ozone and water. For example, Ozone absorbs most of the UV component, which is very dangerous for human beings.

The Solar radiation which falls on the Earth's surface depends on several factors like the position of the Sun in the sky, which changes due to Earth's rotation and the revolution around the sun, the weather condition, the day length and the site altitude over the sea level.

## Task 2 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

**Customise walls in the  
buildings**

Constructions Construction Sets Constructions Materials

- 189.1-2009 - CZ1 - Office
- 189.1-2009 - CZ1 - Office 1
- 189.1-2009 - CZ2 - Office
- 189.1-2009 - CZ3 - Office
- 189.1-2009 - CZ4 - Office
- 189.1-2009 - CZ5 - Office
- 189.1-2009 - CZ6 - Office
- 189.1-2009 - CZ7-8 - Office

**Name**  
mycostumconstructionset

**Exterior Surface Constructors**

**Walls** **Floors** **Roofs**

- ASHRAE 189.1-2009 ExtWall Mass ClimateZone 1
- ExtSlabCarpet 4in ClimateZone 1-8
- ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 1

**Interior Surface Constructors**

**Walls** **Floors** **Ceilings**

- Interior Wall
- Interior Floor
- Interior Ceiling

**Ground Contact Surface Constructors**

**Walls** **Floors** **Ceilings**

- ExtSlabCarpet 4in ClimateZone 1-8
- ExtSlabCarpet 4in ClimateZone 1-8
- ExtSlabCarpet 4in ClimateZone 1-8

**Exterior Sub Surface Constructors**

**Fixed Windows** **Operable Windows** **Doors**

- ASHRAE 189.1-2009 ExtWindow ClimateZone 1
- ASHRAE 189.1-2009 ExtWindow ClimateZone 1
- Exterior Door

**Glass Doors** **Overhead Doors** **Skylights**

- Drag From Library
- Drag From Library
- Drag From Library

**Tubular Daylight Domes** **Tubular Daylight Diffusers**

- Interior Window
- Interior Window

**Interior Sub Surface Constructors**

**Fixed Windows** **Operable Windows** **Doors**

**Constructions**

- 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 ExtWall Mass 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
- ASHRAE 189.1-2009 ExtWall Mass ClimateZone 6
- ASHRAE 189.1-2009 ExtWall Mass ClimateZone 7-8
- ASHRAE 189.1-2009 ExtWindow ClimateZone 1
- ASHRAE 189.1-2009 ExtWindow ClimateZone 2
- ASHRAE 189.1-2009 ExtWindow ClimateZone 3

Constructions Construction Sets Constructions Materials

**Constructions**

**Name:** ASHRAE 189.1-2009 ExtWall Mass ClimateZone 1

**Measure Tags (Optional):**

**Standard:** ASHRAE 189.1-2009 **Standard Source:**

**Intended Surface Type:** ExteriorWall **Standards Construction Type:** Mass

**Fenestration Type:** Fenestration Assembly Context:

**Fenestration Number of Panes:** Fenestration Frame Type:

**Fenestration Divider Type:** Fenestration Tint:

**Fenestration Gas Fill:** Fenestration Low Emissivity Coating: off

**Layer:**

**Outside**

- 1IN Stucco
- 8IN Concrete HW
- Wall Insulation [31]
- 1/2IN Gypsum

Drag From Library

My Model Library Edit

**Materials**

- No Mass Materials
- Air Gap Materials
- Air Wall Materials
- Infrared Transparent Materials
- Roof Vegetation Materials
- Simple Glazing System Window Materials
- Glazing Window Materials
- Gas Window Materials
- Gas Mixture Window Materials
- Daylight Redirection Device Window Materials
- Blind Window Materials
- Screen Window Materials
- Shade Window Materials
- Refraction Extinction Method Glazing Window Materials

Constructions Construction Sets Constructions Materials

**Constructions**

**Name:** mycustomconstruction

**Measure Tags (Optional):**

**Standard:** ASHRAE 189.1-2009 **Standard Source:**

**Intended Surface Type:** ExteriorWall **Standards Construction Type:** Mass

**Fenestration Type:** **Fenestration Assembly Context:**

**Fenestration Number of Panes:** **Fenestration Frame Type:**

**Fenestration Divider Type:** **Fenestration Tint:**

**Fenestration Gas Fill:** **Fenestration Low Emissivity Coating:** off

**Layer:**

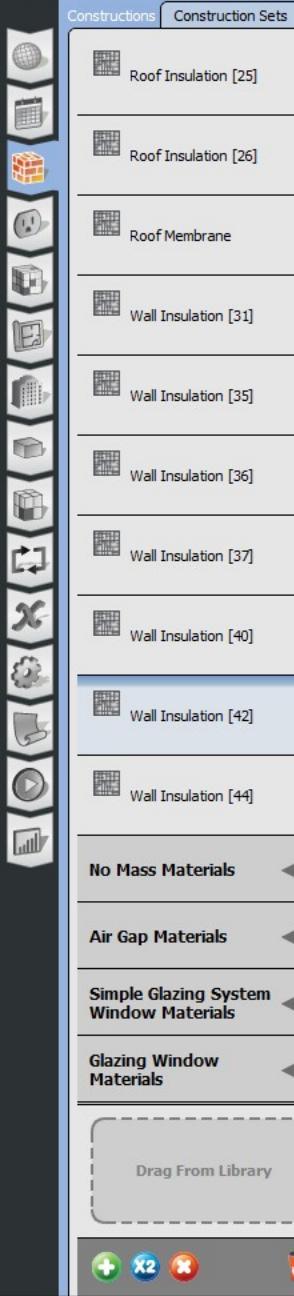
**Outside**

- 1IN Stucco
- 8IN Concrete HW
- 1/2IN Gypsum
- Wall Insulation [37]

Drag From Library

**My Model Library Edit**

- Metal Decking
- Metal Roofing
- Roof Insulation [18]
- Roof Insulation [21]
- Roof Insulation [25]
- Roof Insulation [26]
- Roof Membrane
- Wall Insulation [31]
- Wall Insulation [35]
- Wall Insulation [36]
- Wall Insulation [37]
- Wall Insulation [40]
- Wall Insulation [42]
- Wall Insulation [44]
- No Mass Materials
- Air Gap Materials



**Name:**  
Wall Insulation [42]

**Measure Tags (Optional):**

Standard: Standard Source:

Standards Category: Standards Identifier:

Composite Framing Material: Composite Framing Configuration:

Composite Framing Depth: Composite Framing Size:

Composite Cavity Insulation:

**Roughness:** **Thickness:**

MediumRough 0.091400 m

**Conductivity:** **Density:**

0.043200 W/m·K 91.000000 kg/m<sup>3</sup>

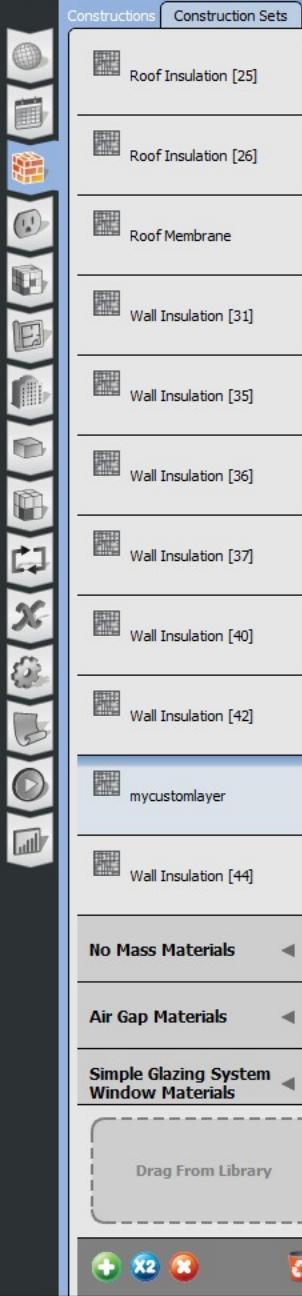
**Specific Heat:** **Thermal Absorptance:**

837.000000 J/kg·K 0.900000

**Solar Absorptance:** **Visible Absorptance:**

0.500000 0.500000

Drag From Library



**Constructions Construction Sets Constructions Materials** My Model Library Edit

**Name:**  
mycustomlayer

**Measure Tags (Optional):**

*Standard:* *Standard Source:*

*Standards Category:* *Standards Identifier:*

*Composite Framing Material:* *Composite Framing Configuration:*

*Composite Framing Depth:* *Composite Framing Size:*

*Composite Cavity Insulation:*

**Roughness:** *Thickness:*  0.1 m

**Conductivity:** *Density:*  0.03 W/m·K 100 kg/m<sup>3</sup>

**Specific Heat:** *Thermal Absorptance:*  900 J/kg·K 0.900000

**Solar Absorptance:** *Visible Absorptance:*  0.500000 0.500000

Constructions Construction Sets Constructions Materials

ExtWindow ClimateZone 6

ASHRAE 189.1-2009 ExtWindow ClimateZone 7-8

Exterior Door

ExtSlabCarpet 4in ClimateZone 1-8

Interior Ceiling

Interior Door

Interior Floor

Interior Partition

Interior Wall

Interior Window

mycustomconstruction

Air Boundary Constructions

Internal Source Constructions

C-factor Underground Wall Constructions

Drag From Library

Fenestration Number of Panes: Fenestration Frame Type:

Fenestration Divider Type: Fenestration Tint:

Fenestration Gas Fill: Fenestration Low Emissivity Coating: off

Layer:

Outside

1IN Stucco X

8IN Concrete HW X

Drag From Library

Inside

My Model Library Edit

Materials

No Mass Materials

Air Gap Materials

Air Wall Materials

Infrared Transparent Materials

Roof Vegetation Materials

Simple Glazing System Window Materials

Glazing Window Materials

Gas Window Materials

Gas Mixture Window Materials

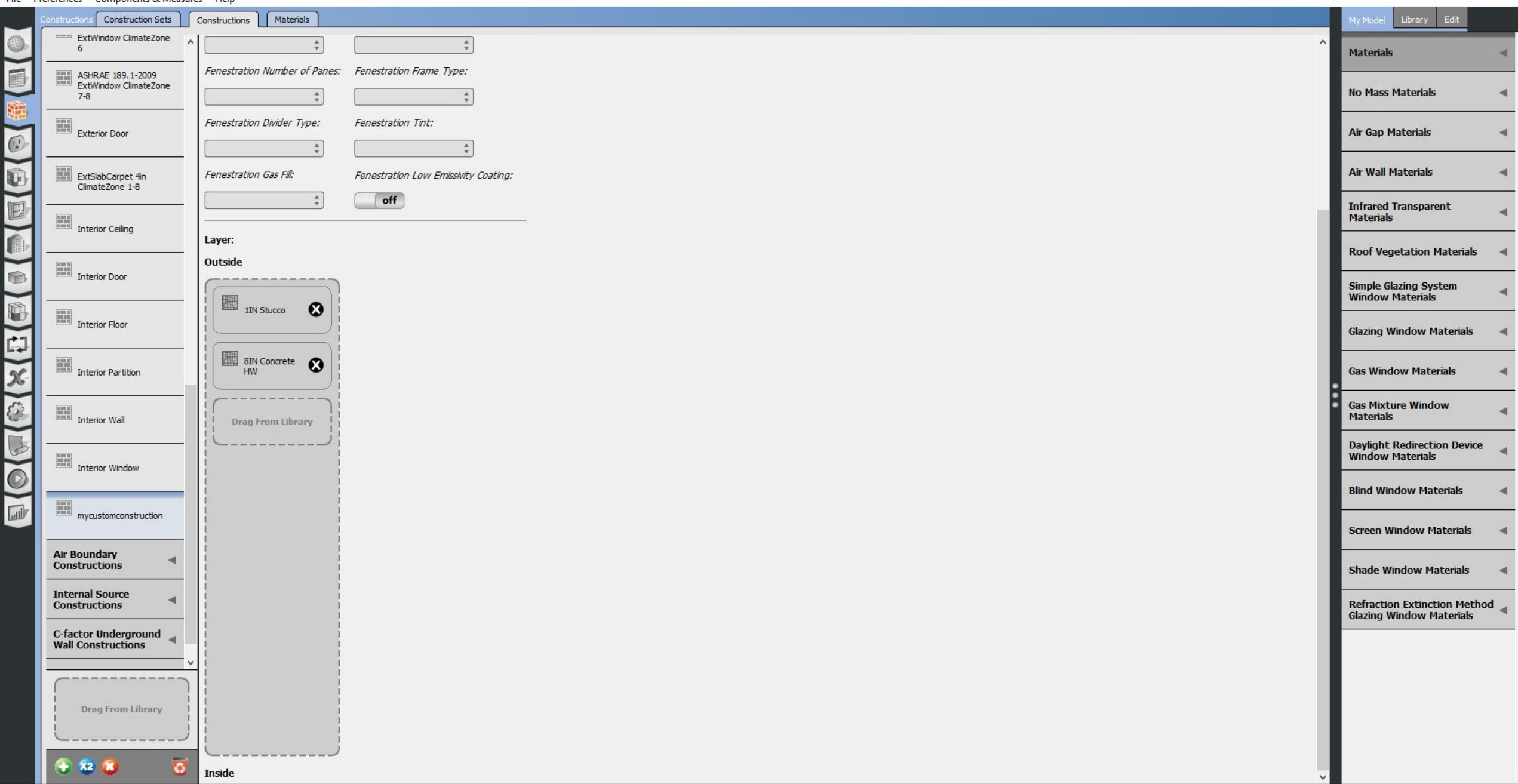
Daylight Redirection Device Window Materials

Blind Window Materials

Screen Window Materials

Shade Window Materials

Refraction Extinction Method Glazing Window Materials



Constructions Construction Sets Constructions Materials

ExtWindow ClimateZone 6

ASHRAE 189.1-2009 ExtWindow ClimateZone 7-8

Exterior Door

ExtSlabCarpet 4in ClimateZone 1-8

Interior Ceiling

Interior Door

Interior Floor

Interior Partition

Interior Wall

Interior Window

mycustomconstruction

Air Boundary Constructors

Internal Source Constructors

C-factor Underground Wall Constructors

Drag From Library

ExtWindow ClimateZone 6

Fenestration Number of Panes: Fenestration Frame Type:

Fenestration Divider Type: Fenestration Tint:

Fenestration Gas Fill: Fenestration Low Emissivity Coating: off

Layer:

Outside

1IN Stucco

8IN Concrete HW

1/2IN Gypsum

mycustomlayer

Drag From Library

Inside

My Model Library Edit

Materials

1/2IN Gypsum

1IN Stucco

8IN Concrete HW

F08 Metal surface

F16 Acoustic tile

G01a 19mm gypsum board

G05 25mm wood

I01 25mm insulation board

M11 100mm lightweight concrete

MAT-CC05 4 HW CONCRETE

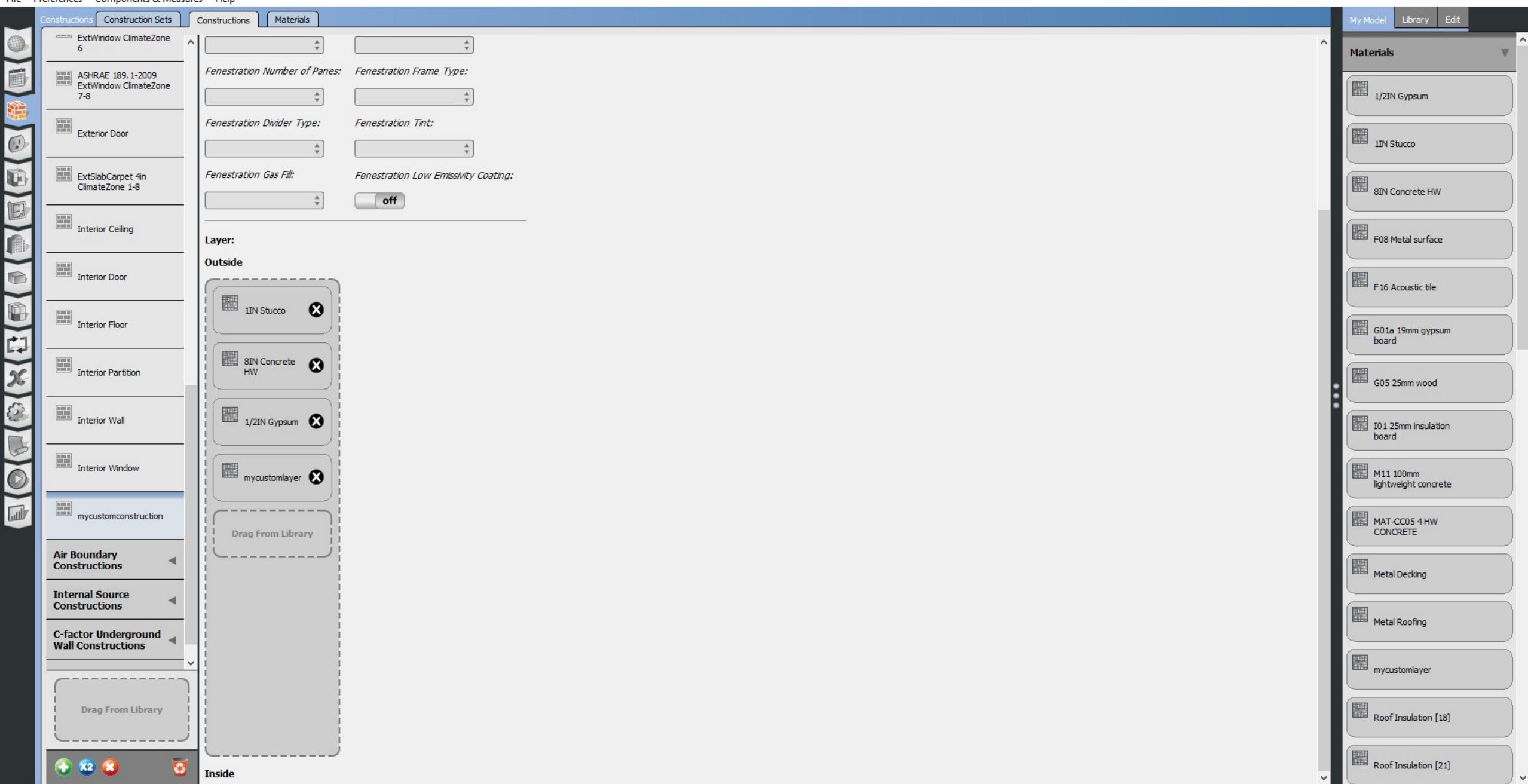
Metal Decking

Metal Roofing

mycustomlayer

Roof Insulation [18]

Roof Insulation [21]



Constructions Construction Sets Constructions Materials

- 189.1-2009 - CZ1 - Office
- 189.1-2009 - CZ2 - Office
- 189.1-2009 - CZ3 - Office
- 189.1-2009 - CZ4 - Office
- 189.1-2009 - CZ5 - Office
- 189.1-2009 - CZ6 - Office
- 189.1-2009 - CZ7-8 - Office
- mycostumconstructionset

**Name**  
mycostumconstructionset

**Exterior Surface Constructors**

**Walls** **Floors** **Roofs**

Drag From Library    ExtSlabCarpet 4in ClimateZone 1-8    ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 1

**Interior Surface Constructors**

**Walls** **Floors** **Ceilings**

Interior Wall    Interior Floor    Interior Ceiling

**Ground Contact Surface Constructors**

**Walls** **Floors** **Ceilings**

ExtSlabCarpet 4in ClimateZone 1-8    ExtSlabCarpet 4in ClimateZone 1-8    ExtSlabCarpet 4in ClimateZone 1-8

**Exterior Sub Surface Constructors**

**Fixed Windows** **Operable Windows** **Doors**

ASHRAE 189.1-2009 ExtWindow ClimateZone 1    ASHRAE 189.1-2009 ExtWindow ClimateZone 1    Exterior Door

**Glass Doors** **Overhead Doors** **Skylights**

Drag From Library    Drag From Library    Drag From Library

**Tubular Daylight Domes** **Tubular Daylight Diffusers**

Drag From Library    Drag From Library

**Interior Sub Surface Constructors**

Fixed Windows    Operable Windows    Doors

My Model Library Edit

ClimateZone 4-5

ASHRAE 189.1-2009 ExtWindow ClimateZone 6

ASHRAE 189.1-2009 ExtWindow ClimateZone 7-8

Exterior Door

ExtSlabCarpet 4in ClimateZone 1-8

Interior Ceiling

Interior Door

Interior Floor

Interior Partition

Interior Wall

Interior Window

mycostumconstruction

Air Boundary Constructors

Internal Source Constructors

C-factor Underground Wall Constructors

F-factor Ground Floor Constructors

Window Data File Constructors

Constructions Construction Sets Constructions Materials

- 189.1-2009 - CZ1 - Office
- 189.1-2009 - CZ2 - Office
- 189.1-2009 - CZ3 - Office
- 189.1-2009 - CZ4 - Office
- 189.1-2009 - CZ5 - Office
- 189.1-2009 - CZ6 - Office
- 189.1-2009 - CZ7-8 - Office
- mycostumconstructionset

**Name**  
mycostumconstructionset

**Exterior Surface Constructors**

**Walls** **Floors** **Roofs**

- mycustomconst
- ExtSlabCarpet 4in ClimateZone 1-8
- ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 1

**Interior Surface Constructors**

**Walls** **Floors** **Ceilings**

- Interior Wall
- Interior Floor
- Interior Ceiling

**Ground Contact Surface Constructors**

**Walls** **Floors** **Ceilings**

- ExtSlabCarpet 4in ClimateZone 1-8
- ExtSlabCarpet 4in ClimateZone 1-8
- ExtSlabCarpet 4in ClimateZone 1-8

**Exterior Sub Surface Constructors**

**Fixed Windows** **Operable Windows** **Doors**

- ASHRAE 189.1-2009 ExtWindow ClimateZone 1
- ASHRAE 189.1-2009 ExtWindow ClimateZone 1
- Exterior Door

**Glass Doors** **Overhead Doors** **Skylights**

- Drag From Library
- Drag From Library
- Drag From Library

**Tubular Daylight Domes** **Tubular Daylight Diffusers**

- Interior Window
- Interior Window

**Interior Sub Surface Constructors**

**Fixed Windows** **Operable Windows** **Doors**

**My Model** **Library** **Edit**

- ClimateZone 4-5
- ASHRAE 189.1-2009 ExtWindow ClimateZone 6
- ASHRAE 189.1-2009 ExtWindow ClimateZone 7-8
- Exterior Door
- ExtSlabCarpet 4in ClimateZone 1-8
- Interior Ceiling
- Interior Door
- Interior Floor
- Interior Partition
- Interior Wall
- Interior Window
- mycostumconstruction

**Air Boundary Constructors**

**Internal Source Constructors**

**C-factor Underground Wall Constructors**

**F-factor Ground Floor Constructors**

**Window Data File Constructors**

Filters: Story Thermal Zone Space Type

All All All

Space Name	All	Story	Thermal Zone	Space Type	Default Construction Set	Default Schedule Set	Part of Total Floor Area
Space 101	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 102	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 103	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 104	<input type="checkbox"/>	Building Story 1	Thermal Zone 2	189.1-2009 - Office - BreakR	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 105	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 201	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 202	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 203	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 204	<input type="checkbox"/>	Building Story 2	Thermal Zone 4	189.1-2009 - Office - Closed	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 205	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 301	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 302	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 303	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 304	<input type="checkbox"/>	Building Story 3	Thermal Zone 6	189.1-2009 - Office - Closed	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 305	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>

Filters: Story Thermal Zone Space Type

All All All

Space Name	All	Story	Thermal Zone	Space Type	Default Construction Set	Default Schedule Set	Part of Total Floor Area
<input type="checkbox"/> <input type="button" value="Apply to Selected"/>							
Space 101	<input checked="" type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenOffice	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 102	<input checked="" type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 103	<input checked="" type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 104	<input checked="" type="checkbox"/>	Building Story 1	Thermal Zone 2	189.1-2009 - Office - BreakRoom	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 105	<input checked="" type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 201	<input checked="" type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 202	<input checked="" type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 203	<input checked="" type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 204	<input checked="" type="checkbox"/>	Building Story 2	Thermal Zone 4	189.1-2009 - Office - ClosedOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 205	<input checked="" type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 301	<input checked="" type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - ClosedOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 302	<input checked="" type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - ClosedOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 303	<input checked="" type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - ClosedOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 304	<input checked="" type="checkbox"/>	Building Story 3	Thermal Zone 6	189.1-2009 - Office - ClosedOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>
Space 305	<input checked="" type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - ClosedOffice	189.1-2009 - CZ1 - Office		<input checked="" type="checkbox"/>

We apply the new construction set to all walls



189.1-2009 - CZ1 - Office

189.1-2009 - CZ2 - Office

189.1-2009 - CZ3 - Office

189.1-2009 - CZ4 - Office

189.1-2009 - CZ5 - Office

189.1-2009 - CZ6 - Office

189.1-2009 - CZ7-8 - Office

mycostumconstructionset

Run Simulation



66%

Show Simulation

Initializing workflow.

Processing OpenStudio Measures.

Translating the OpenStudio Model to EnergyPlus.

Processing EnergyPlus Measures.

Starting Simulation.

EnergyPlus Starting

EnergyPlus, Version 9.2.0-921312fa1d, YMD=2019.11.13 12:32



**Define schedule for  
activity of the people**

File Preferences Components & Measures Help

Schedules Schedule Sets Schedules

Name  
mycustomset

Default Schedules

Hours of Operation      Number of People

Drag From Library      Office Work Occ X

People Activity      Lighting

Office Activity X      Office Bldg Light X

Electric Equipment      Gas Equipment

Office Bldg Equip X      Drag From Library

Hot Water Equipment      Steam Equipment

Drag From Library      Drag From Library

Other Equipment      Infiltration

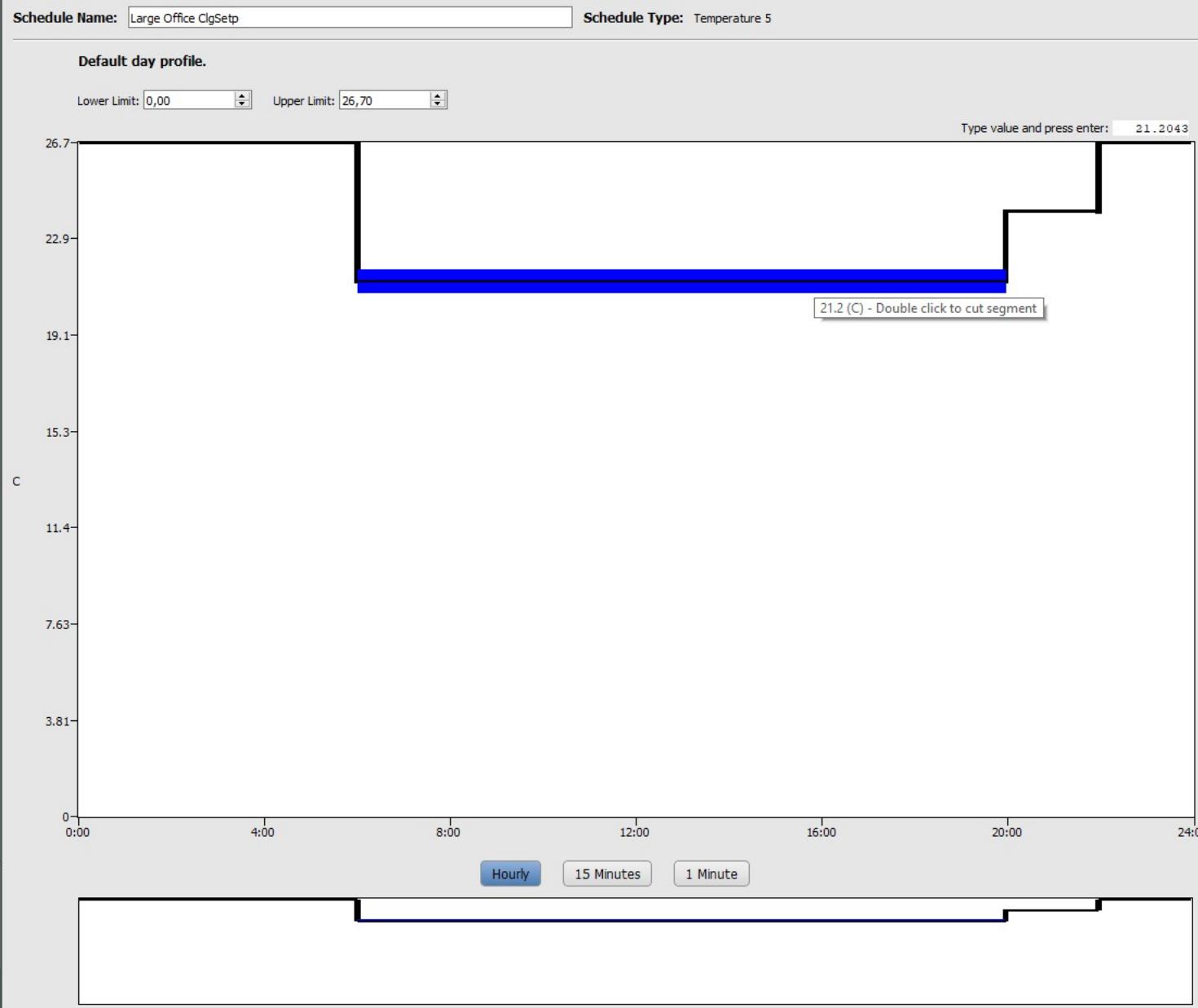
Drag From Library      Office Infil Quarter On X

Drag From Library

+ X2 X X



Schedules Schedule Sets Schedules



Jan						
I	m	m	j	v	s	d
					1	
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
Feb						
I	m	m	j	v	s	d
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					
Mar						
I	m	m	j	v	s	d
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
Apr						
I	m	m	j	v	s	d
		1	2			
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
May						
I	m	m	j	v	s	d
		1	2			
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

My Model Library Edit

OS:Schedule:Day

Name: Large Office ClgSetp Default Schedule

Schedule Type Limits Name: Temperature 5

Interpolate to Timestep: No

Hour: 6

Minute: 0

Value Until Time: 26.7000007629395

Hour: 20

Minute: 0

Value Until Time: 21.204318884277

Hour: 22

Minute: 0

Value Until Time: 24

Hour: 24

Minute: 0

Value Until Time: 26.7000007629395



Schedules Schedule Sets Schedules

mycustomoffice

Design Day Profiles

- Summer
- Winter

Run Period Profiles +

- Priority 1
- Priority 2
- Default

Large Office ClgSetp 1

Large Office Activity

Large Office Bldg Equip

Large Office Bldg Light

Large Office Bldg Occ

Large Office ClgSetp

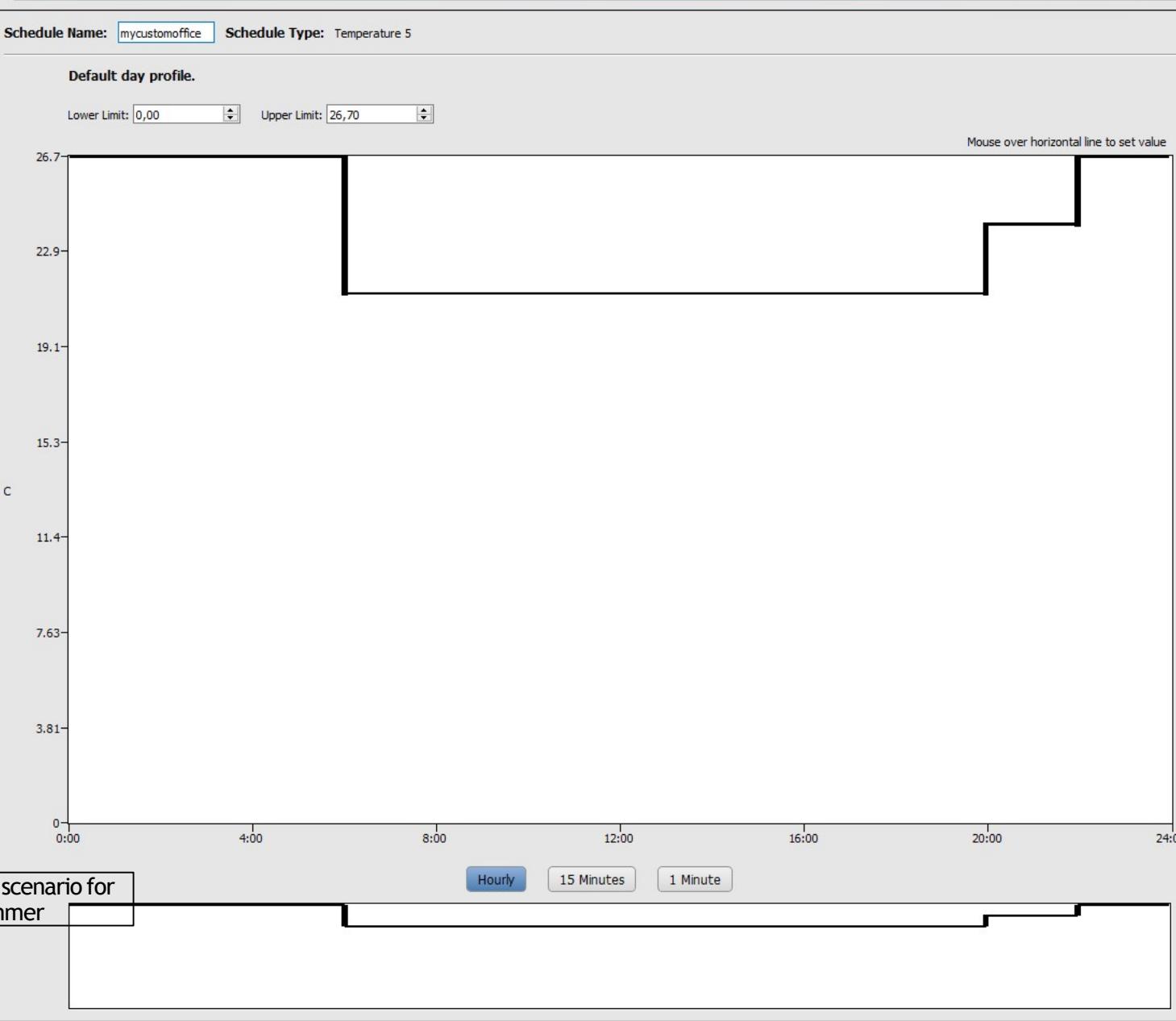
Large Office HtgSetp

Large Office Infil Quarter On

Medium Office Activity

Medium Office Bldg Equip

Medium Office Bldg Occ



Jan						
I	m	m	j	v	s	d
					1	
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
Feb						
I	m	m	j	v	s	d
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					
Mar						
I	m	m	j	v	s	d
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
Apr						
I	m	m	j	v	s	d
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
May						
I	m	m	j	v	s	d
					1	2
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

My Model Library Edit

OS:Schedule:Day

Name: Large Office ClgSetp Default Schedule 2

Schedule Type Limits Name: Temperature 5

Interpolate to Timestep: No

Hour: 6

Minute: 0

Value Until Time: 26.7000007629395

Hour: 20

Minute: 0

Value Until Time: 21.204318884277

Hour: 22

Minute: 0

Value Until Time: 24

Hour: 24

Minute: 0

Value Until Time: 26.7000007629395



Schedules Schedule Sets Schedules

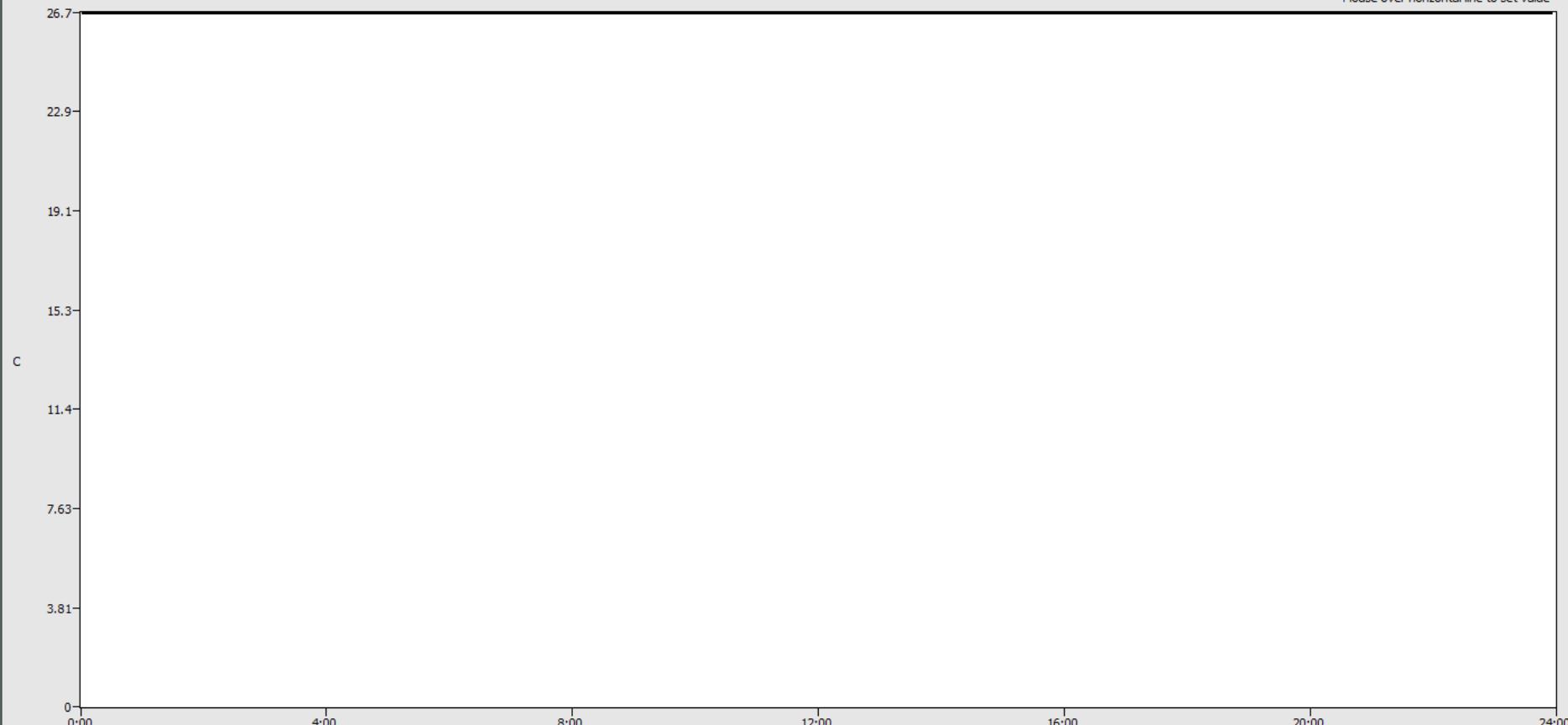
Schedule Name: mycustomoffice

Schedule Type: Temperature 5

Winter design day profile.

Lower Limit: 0,00      Upper Limit: 26,70

Mouse over horizontal line to set value



Hourly 15 Minutes 1 Minute

We consider the worst case scenario for the winter

Drag From Here



My Model Library Edit



OS:Schedule:Day

Name: Large Office ClgSetp Winter Design Day 2

Schedule Type Limits Name: Temperature 5

Interpolate to Timestep: No

Hour: 24

Minute: 0

Value Until Time: 26.69999999999999



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12:53 13/11/2019 FRA

Define a schedule for  
light

Medium Office Bldg Occ

Medium Office ClgSetp

Medium Office HtgSetp

Medium Office Infil Quarter On

mycustomoffice

Office Activity

Office Bldg Equip

Office Bldg Light

Design Day Profiles

- Summer
- Winter

Run Period Profiles

- Priority 1
- Priority 2
- Default

Office Infil Quarter On

Office Misc Occ

Office Work Occ

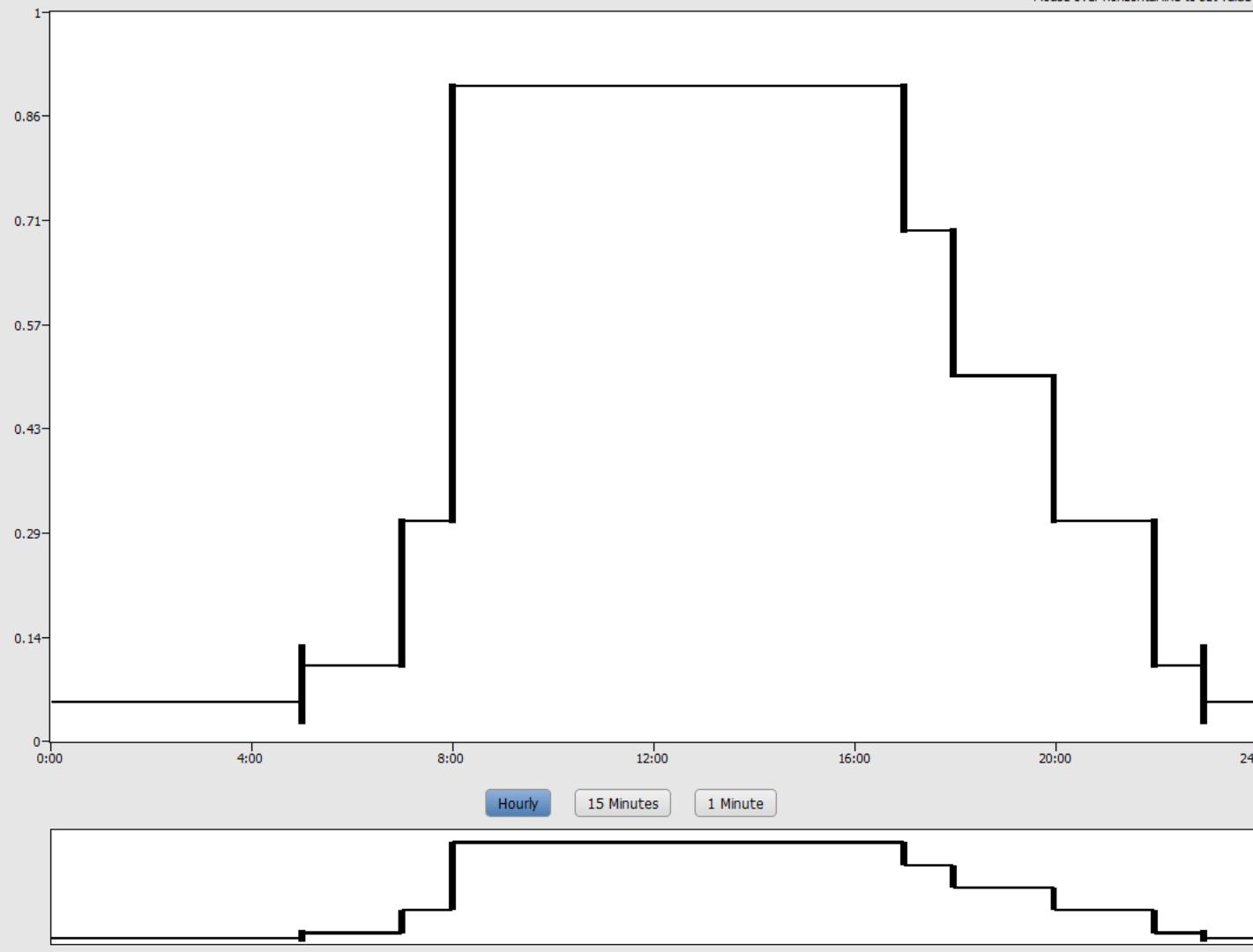
Drag From Library

Schedule Name: Office Bldg Light

Schedule Type: Fraction

Default day profile.

Lower Limit: 0,00  Upper Limit: 1,00 

Jan						
I	m	m	j	v	s	d
					1	
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
Feb						
I	m	m	j	v	s	d
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					
Mar						
I	m	m	j	v	s	d
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
Apr						
I	m	m	j	v	s	d
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
May						
I	m	m	j	v	s	d
				1	2	3
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

OS:Schedule:Day

Name: Office Bldg Light Default Schedule

Schedule Type Limits Name: Fraction

Interpolate to Timestep: No

Hour: 5

Minute: 0

Value Until Time: 0.05

Hour: 7

Minute: 0

Value Until Time: 0.1

Hour: 8

Minute: 0

Value Until Time: 0.3

Hour: 17

Minute: 0

Value Until Time: 0.9

Hour: 24

Define schedule for  
equipements



Schedules Schedule Sets Schedules

- 189.1-2009 - Office - BreakRoom - CZ1-3 Schedule Set
- 189.1-2009 - Office - BreakRoom - CZ4-8 Schedule Set
- 189.1-2009 - Office - ClosedOffice - CZ1-3 Schedule Set
- 189.1-2009 - Office - ClosedOffice - CZ1-3 Schedule Set 1
- 189.1-2009 - Office - ClosedOffice - CZ4-8 Schedule Set
- 189.1-2009 - Office - Conference - CZ1-3 Schedule Set
- 189.1-2009 - Office - Conference - CZ4-8 Schedule Set
- 189.1-2009 - Office - Corridor - CZ1-3 Schedule Set
- 189.1-2009 - Office - Corridor - CZ4-8 Schedule Set
- 189.1-2009 - Office - Elec/MechRoom - CZ1-3 Schedule Set
- 189.1-2009 - Office - Elec/MechRoom - CZ4-8 Schedule Set
- 189.1-2009 - Office - IT\_Room - CZ1-3 Schedule Set
- 189.1-2009 - Office - IT\_Room - CZ4-8 Schedule Set
- 190.1-2000 - Office

We put all the schedules we defined

Drag From Library

+ X2 X -

## Name

189.1-2009 - Office - BreakRoom - CZ1-3 Schedule Set

## Default Schedules

## Hours of Operation



## Number of People



## People Activity

## Lighting



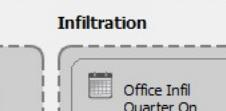
## Electric Equipment

## Gas Equipment



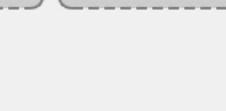
## Hot Water Equipment

## Steam Equipment



## Other Equipment

## Infiltration



My Model Library Edit

Large Office Infil Quarter On

Medium Office Activity

Medium Office Bldg Equip

Medium Office Bldg Occ

Medium Office ClgSetp

Medium Office HtgSetp

Medium Office Infil Quarter On

mycustomoffice

Office Activity

Office Bldg Equip

Office Bldg Light

Office Infil Quarter On

Office Misc Occ

Office Work Occ

Small Office Activity

Small Office Bldg Equip

Filters: Story Thermal Zone Space Type

All All All

Space Name	All	Story	Thermal Zone	Space Type	Default Construction Set	Default Schedule Set	Part of Total Floor Area
Space 101	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 102	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 103	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 104	<input type="checkbox"/>	Building Story 1	Thermal Zone 2	189.1-2009 - Office - BreakR	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 105	<input type="checkbox"/>	Building Story 1	Thermal Zone 1	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 201	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 202	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 203	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 204	<input type="checkbox"/>	Building Story 2	Thermal Zone 4	189.1-2009 - Office - Closed	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 205	<input type="checkbox"/>	Building Story 2	Thermal Zone 3	189.1-2009 - Office - OpenO	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 301	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 302	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 303	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 304	<input type="checkbox"/>	Building Story 3	Thermal Zone 6	189.1-2009 - Office - Closed	mycostumconstructionset		<input checked="" type="checkbox"/>
Space 305	<input type="checkbox"/>	Building Story 3	Thermal Zone 5	189.1-2009 - Office - Closed	mycostumconstructionset		<input checked="" type="checkbox"/>

**Define the loads**



Loads

- People Definitions
- Lights Definitions
- Luminaire Definitions
- Electric Equipment Definitions
- Gas Equipment Definitions
- Steam Equipment Definitions
- Other Equipment Definitions
- Internal Mass Definitions
- Water Use Equipment Definitions

Name:

mycustomload

Number of People: People per Space Floor Area: Space Floor Area per Person:

 0.1 people/m<sup>2</sup>  m<sup>2</sup>/person

Fraction Radiant: Sensible Heat Fraction: Carbon Dioxide Generation Rate:

 0.300000   0.000038 L/s·W

Drag From Library



My Model Library Edit

Ruleset Schedules

Compact Schedules

Constant Schedules

Year Schedules

Fixed Interval Schedules

Variable Interval Schedules

Constructions

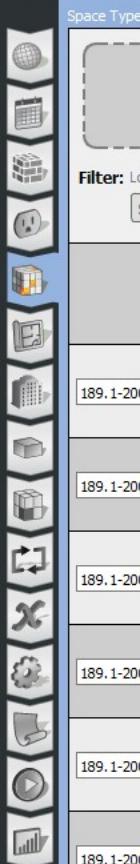
Air Boundary Constructions

Internal Source Constructions

C-factor Underground Wall Constructions

F-factor Ground Floor Constructions

Window Data File Constructions



## Space Types



Filter: Load Type

Show all loads

Space Type Name	All	Rendering Color	Default Construction Set	Default Schedule Set	Design Specification Outdoor Air	Space Infiltration Design Flow Rates	Space Infiltration Effective Leakage Areas
189.1-2009 - Office - BreakRoom - CZ1-3	<input type="checkbox"/>	<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - BreakRoom - CZ4-8	<input type="checkbox"/>	<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - ClosedOffice - CZ1-3	<input type="checkbox"/>	<span style="background-color: cyan; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - ClosedOffice - CZ4-8	<input type="checkbox"/>	<span style="background-color: cyan; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - Conference - CZ1-3	<input type="checkbox"/>	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - Conference - CZ4-8	<input type="checkbox"/>	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - Corridor - CZ1-3	<input type="checkbox"/>	<span style="background-color: darkred; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - Corridor - CZ4-8	<input type="checkbox"/>	<span style="background-color: darkred; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - Elec/MechRoom - CZ1-3	<input type="checkbox"/>	<span style="background-color: darkblue; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>
189.1-2009 - Office - Elec/MechRoom - CZ4-8	<input type="checkbox"/>	<span style="background-color: darkblue; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>	<span style="border: 1px dashed gray; display: inline-block; width: 10px; height: 10px;"></span>



My Model Library Edit

Construction Sets

Schedule Sets

Design Specification Outdoor Air

People Definitions

Lights Definitions

Luminaire Definitions

Electric Equipment Definitions

Gas Equipment Definitions

Water Use Equipment Definitions

Hot Water Equipment Definitions

Steam Equipment Definitions

Other Equipment Definitions

Internal Mass Definitions

Ruleset Schedules

Compact Schedules

Constant Schedules

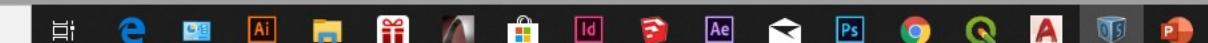
Year Schedules

Fixed Interval Schedules

Variable Interval Schedules



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