ASHRAE System 7 Sample Guide

The **ASHRAE System 7 Sample Guide** is also available within the **Sample Project – ASHRAE System 7** CHM file that is available within Simergy  .

Table of Contents

ASHRAE Baseline System 7 - VAV with Reheat System

The sample file ASHRAE -7 VAV (referred to as System 7) available with the Simergy installation at C:\Users\Public\Simergy\Samples\Sample_Projects is a "simulation ready" sample file. The sample file contains all the components and input values required, and is an example of a model containing a HVAC system type that contains multiple water loops and an air loop. It is a sample file that new Simergy users as well as experienced EnergyPlus users will find beneficial to review and study. The following is a breakdown of different components within the sample file that is presented by going through each tab on the Simergy Interface. The Simergy Map also displays all of the Libraries and Templates Categories that are used within the sample file and they are mapped to the different interface tabs.

Design Alternatives

Only a Baseline Design Alternative is included with the file and the location selected is Minneapolis, MN
Simergy ASHRAE System 7 Map

Site

No site objects are included with this file.
Simergy ASHRAE System 7 Map

Buildings

Create/Edit Building

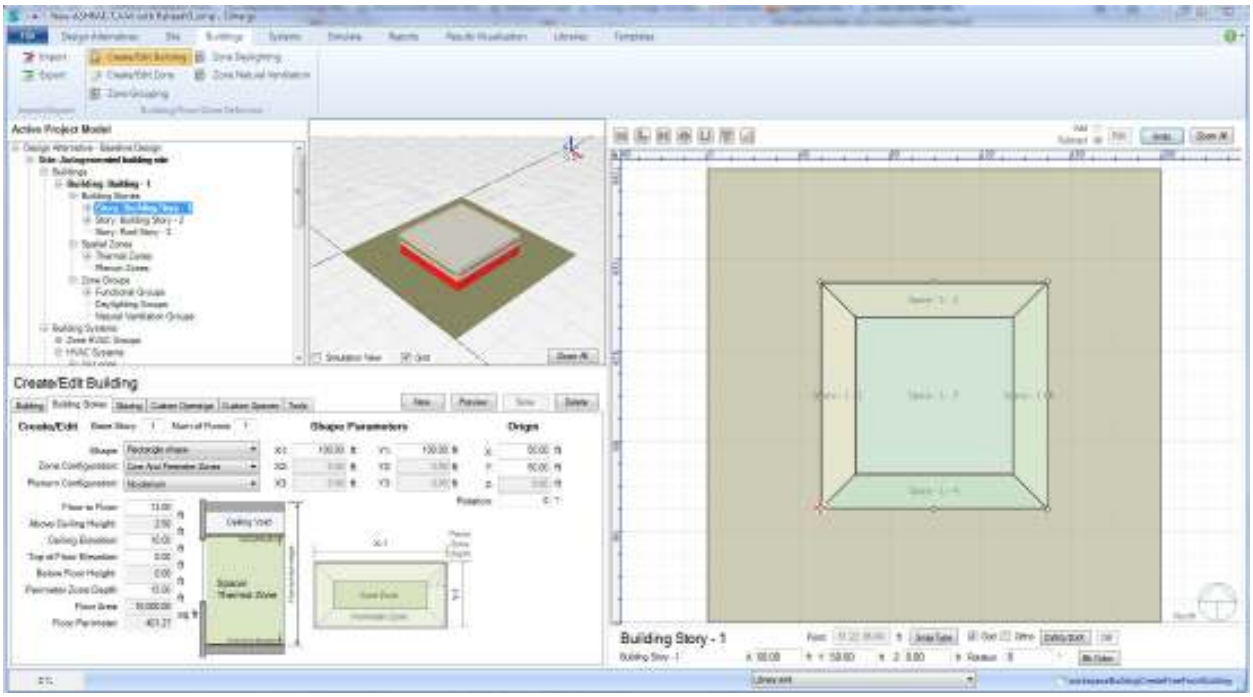
Simergy ASHRAE System 7 Map

Building

The Building Constructions library entry selected from the drop down list is ASHRAE 90.1 nonRes CZ4-6 (Non-Residential Climate Zone 4-6), which contains the different required construction entries (opaque and fenestration) that are outlined in ASHRAE 90.1-2010. The source for the options available in the drop down list is Templates>Constructions

Building Stories

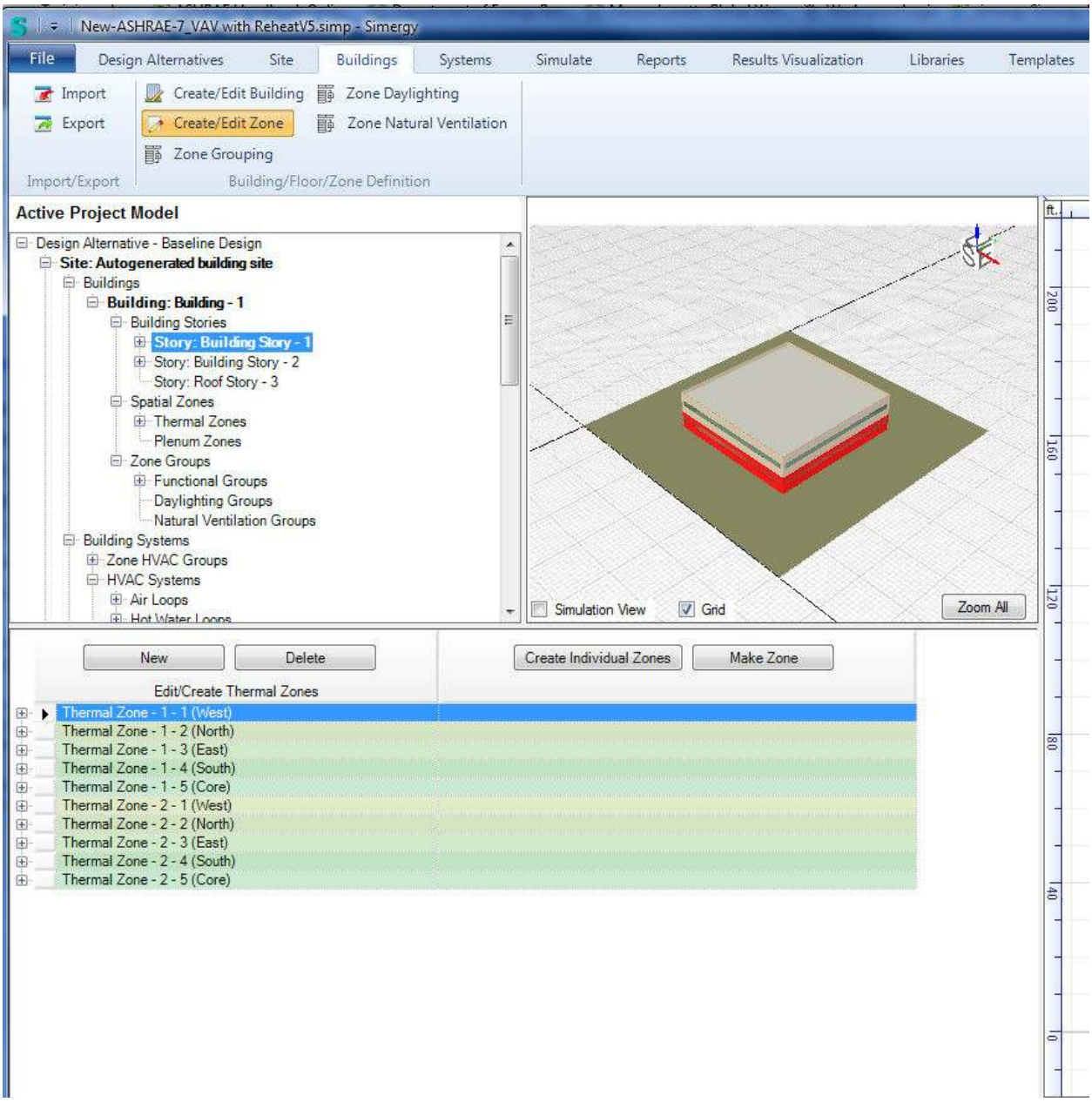
When you first go to this tab it will appear blank, because the geometry has already been created and the program is ready for you to create a new building form. When you highlight one or both of the building stories in the Project Tree, you start to see how the basic geometry was created.



The building geometry is nothing special. A two-story square structure that contains core and perimeter zones. As shown in the image above when one of the floors is highlighted the inputs that were selected to create the geometry are displayed. In addition the window configuration for the model was generated by selecting the default of 30% window to wall ratio and there is only one array (plane) of glazing per floor included (up to three per floor can be included), so in this case there is not anything interesting to see on the other tabs unless changes start to be made to the file.

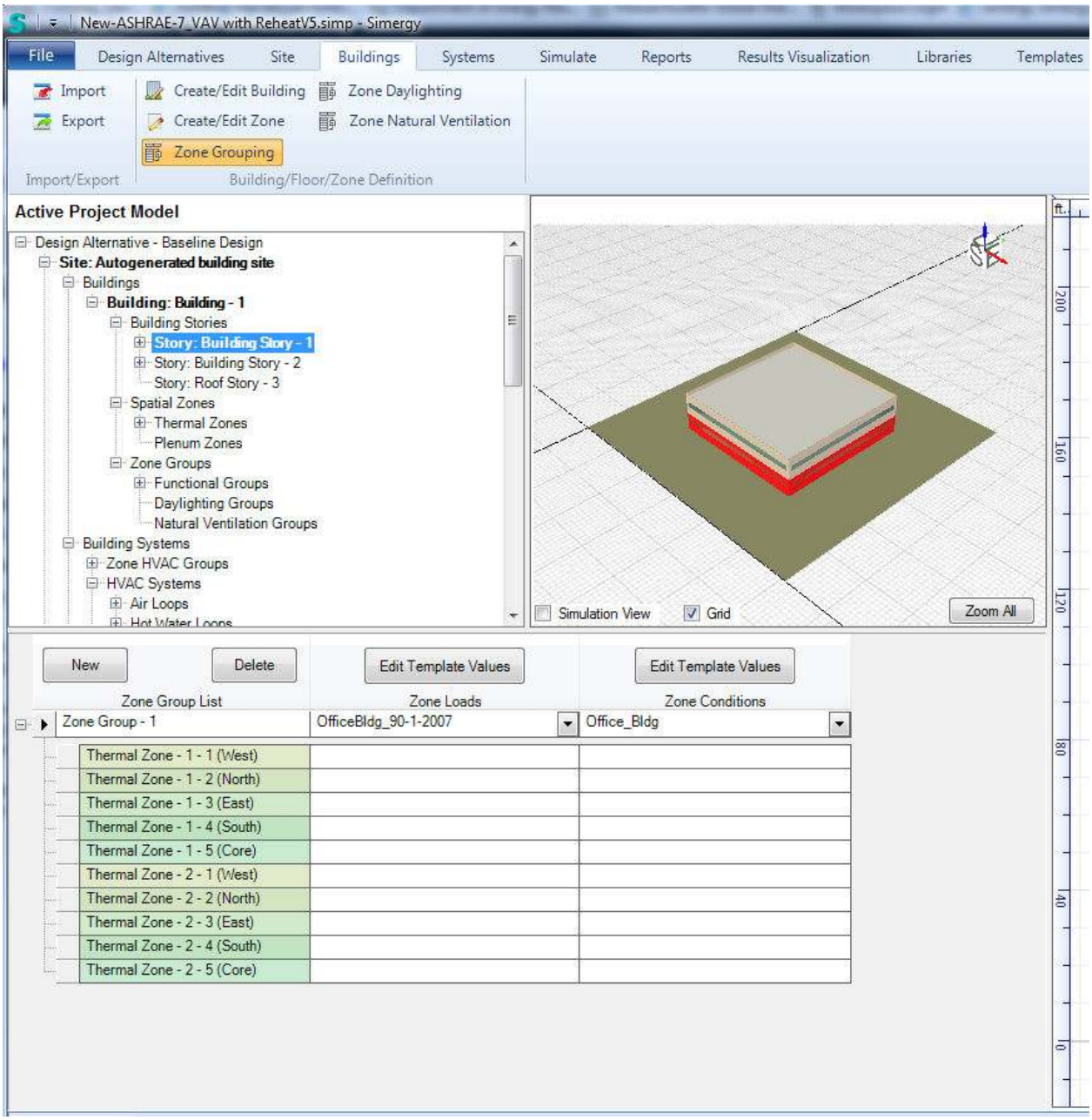
Create/Edit Zone

The two story model with core and perimeter zones means there are ten (10) thermal zones currently incorporated into the model (as shown in the image below). This is workspace where thermal zones can be manipulated, added and assigned. It is typically used to view the current thermal zones in a model and to view the thermal zones that have and have not been assigned on an imported model (whether it is IFC or gbxml).



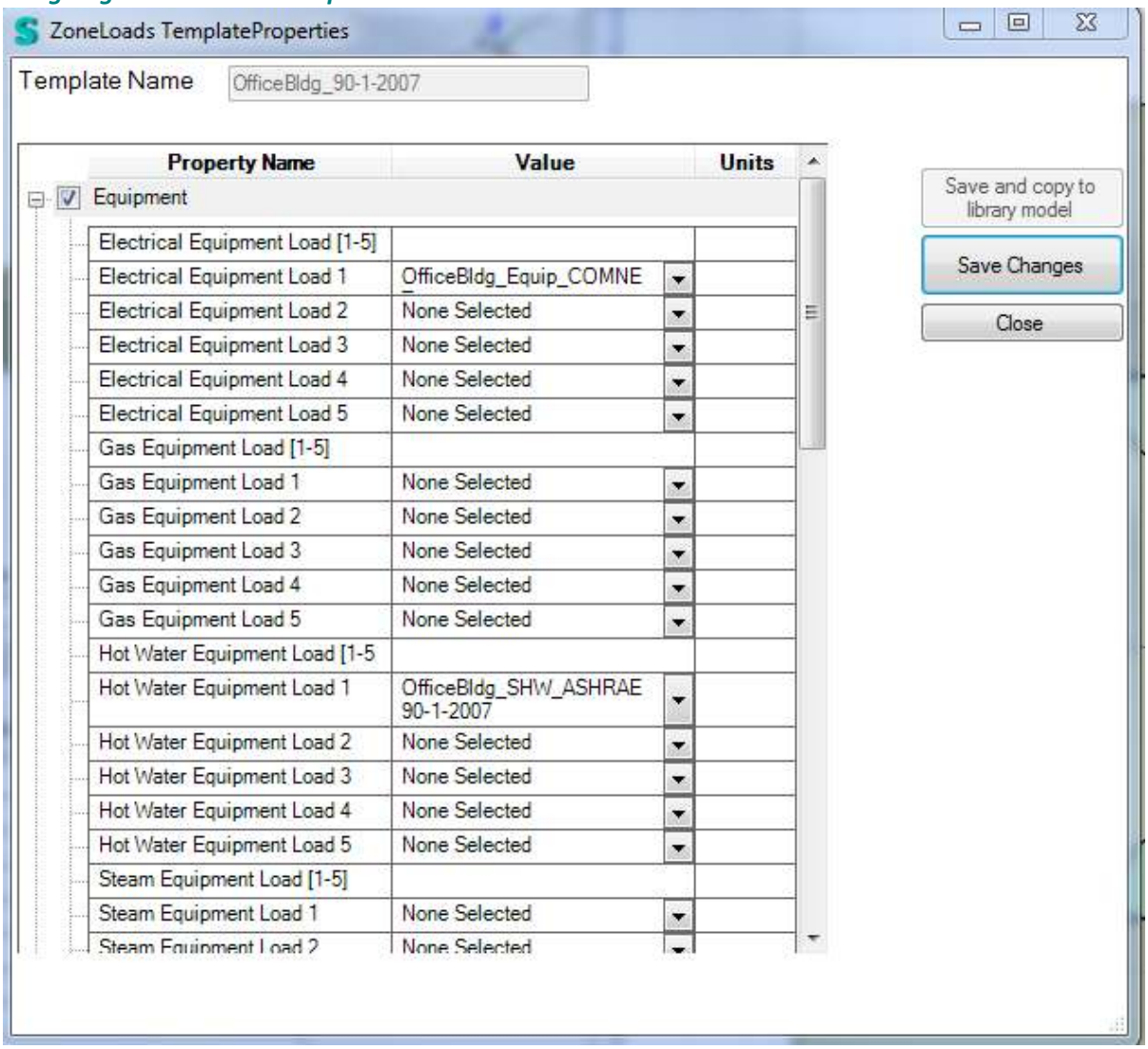
Zone Grouping

The workspace that allows you to build different types of Zone Groups. In this case there is only one Zone Group and all ten zones have been assigned to it, as is shown when the "+" button is selected next to Zone-Group-1.



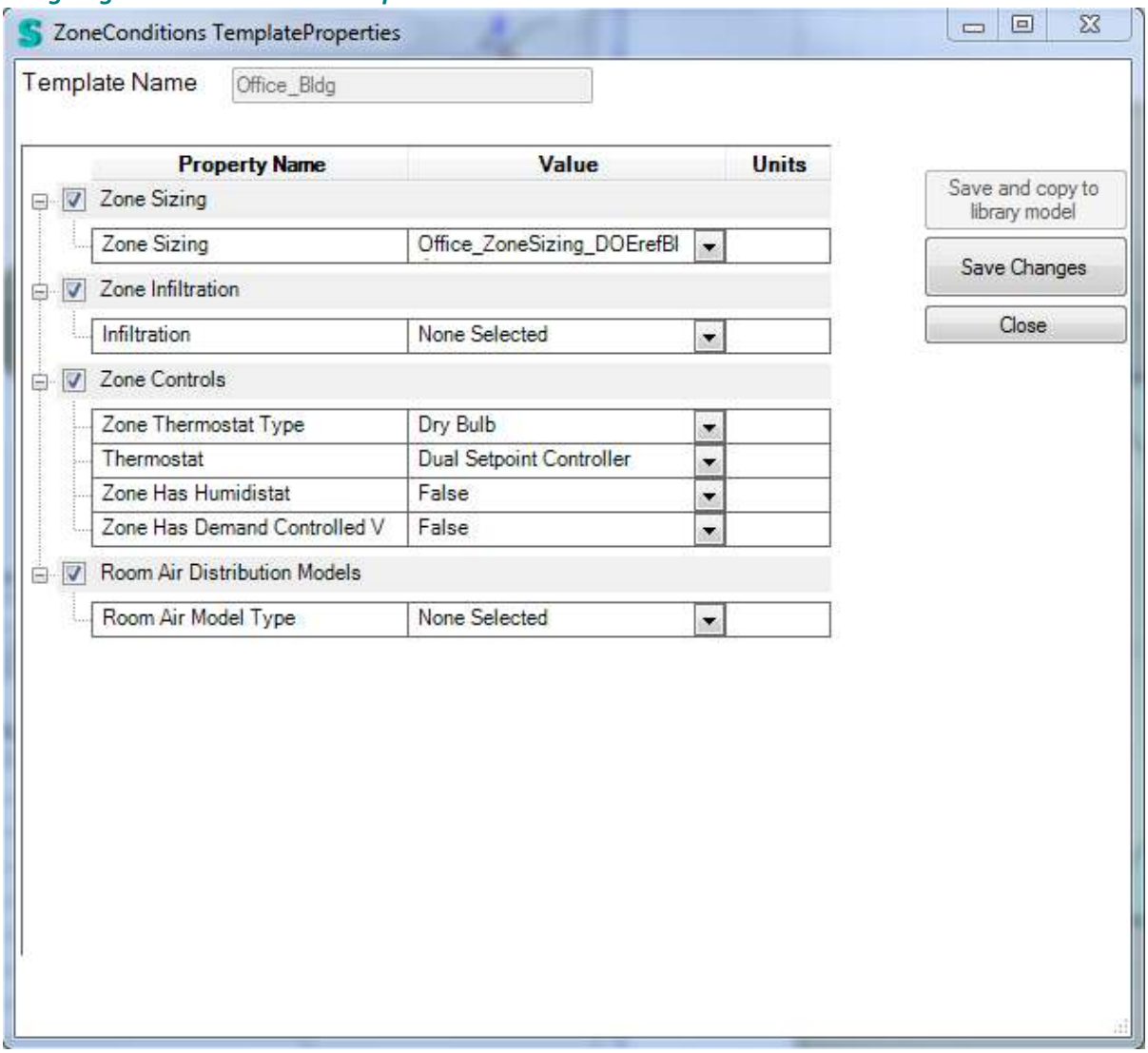
Zone Groups can be a time saver to defining inputs for your model. The key question to answer is what zones will have similar Zone Loads and Zone Conditions entries. If the answer is that they are all similar, then you can get away with one Zone Grouping as shown. Otherwise you can create multiple Zone Groups by selecting New.

Assigning a Zone Loads Template



Clicking Edit Template button displays the library entries that have been selected for each property (row). The properties for Equipment are displayed, but if you could scroll down within the picture you'd see property selections for Lights and People as well. To see a mapping of the property to the value drop down list where the library entries can be viewed and edited, look here.

Assigning a Zone Conditions Template



Clicking Edit Template button displays the library entries that have been selected for each property (row). The properties for Equipment are displayed, but if you could scroll down within the picture you'd see property selections for Lights and People as well. To see a mapping of the property to the value drop down list where the library entries can be viewed and edited, look here.

In this case no Zone Daylighting or Zone Natural Ventilation groups have been set up for the model.

Systems

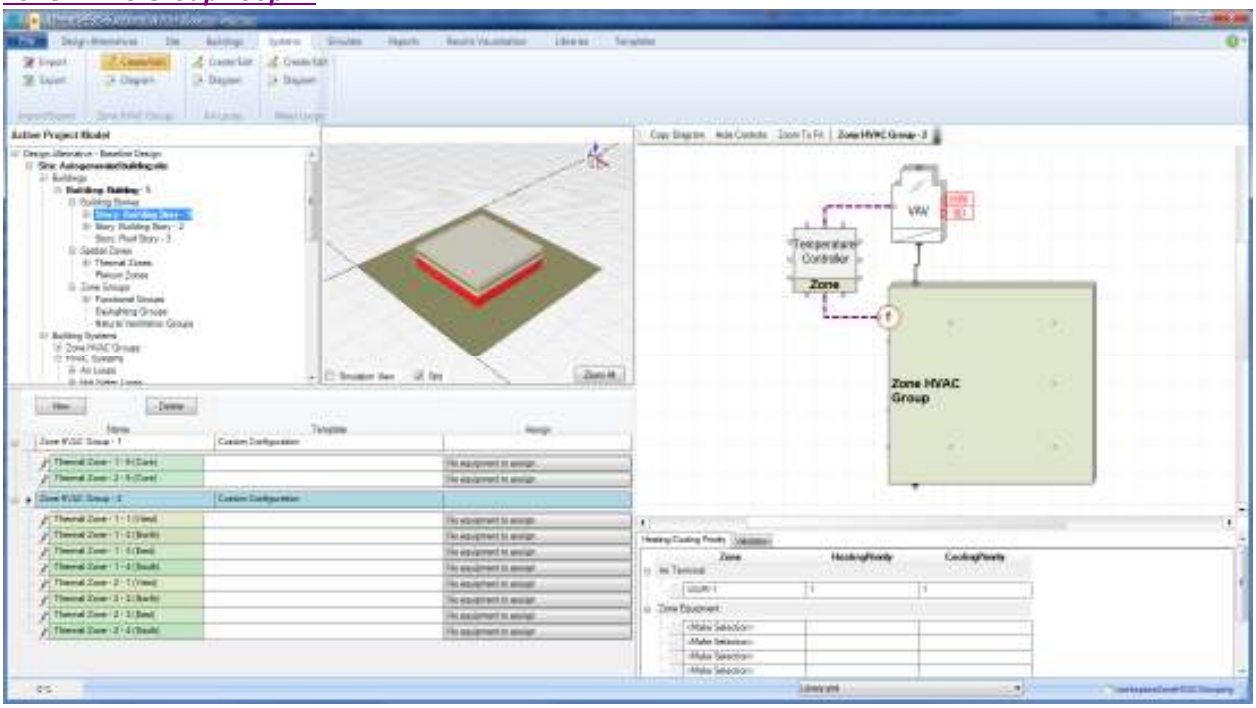
Simergy ASHRAE System 7 Map

Zone HVAC Groups - Create/Edit Workspace

The first destination when the Systems Tab is selected is the Zone HVAC Groups > Create/Edit Workspace. Each Simergy model is required to have at least one Zone HVAC Group, because the demand side for the Air System needs to be defined. The Demand side can either be defined by selecting a Zone HVAC Group template and then dragging that onto the Supply Side or if a Zone HVAC

Group, such as one using an Ideal Loads System (compound object containing multiple components), is set up the Air Loop is not required.

Zone HVAC Group Loop -1



In this case of System 7, two Zone HVAC Groups have been set up. One for the core thermal zones and the other for the perimeter. In this case they just happen to have the same Template assigned to them. However, you'll note that "Custom Configuration" is displayed in the Template column. This indicates that changes have been made to the template after it has been assigned to the model. To view the updated template you will need to change the Source Library to Project Model.siml (lower right of workspace), and then you can go to Template>ZoneHVACGroups to select the template and view the properties.

The Zone HVAC Group Templates included within System 7 are:

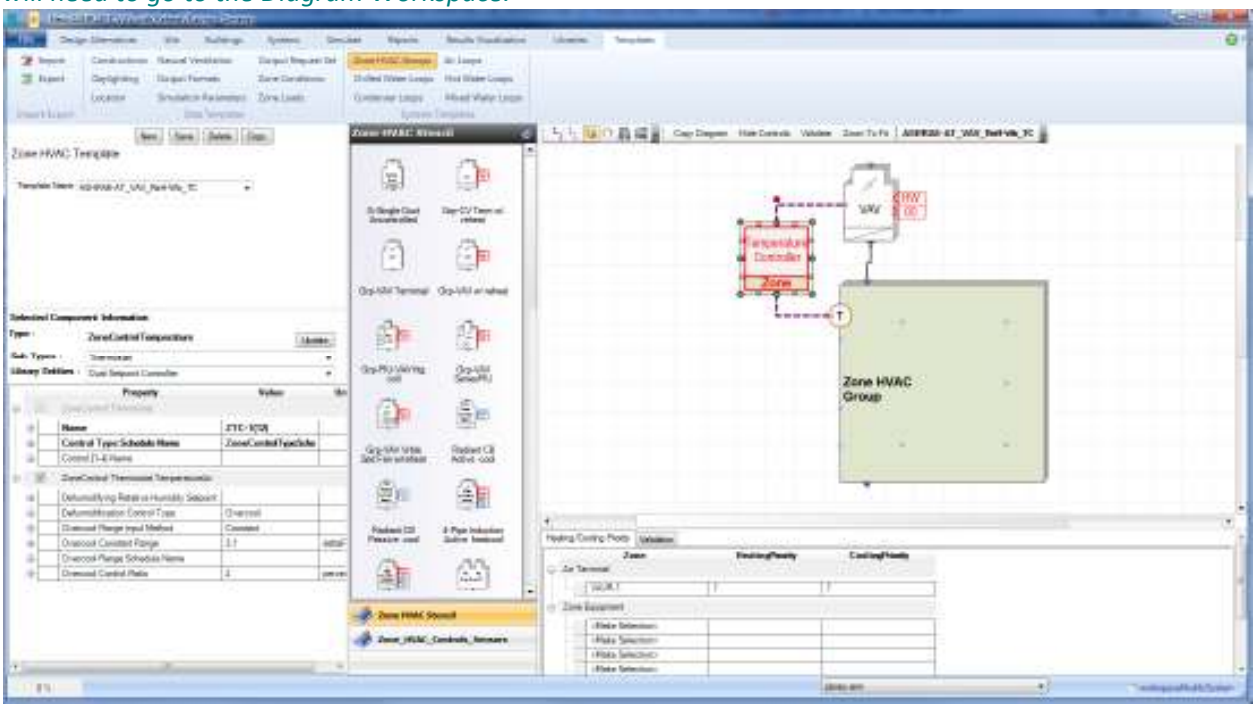
- Zone HVAC Group 1 = Simple Air Terminal Parallel Fan Powered Box, Water Cooling and Heating (ASHRAE-AT_VAV_ReH-Wtr_TC)
- Zone HVAC Group 2 = Simple Air Terminal Parallel Fan Powered Box, Water Cooling and Heating (ASHRAE-AT_VAV_ReH-Wtr_TC)

A common theme in Simergy is that naming conventions for different Template and Library Entries have been set up to provide insight into what is included by just looking at the name.

- *ASHRAE = the input values meet the requirements of ASHRAE 90.1-2010*
- *AT = Air Terminal*
- *VAV = Variable Air Volume*
- *ReH-Wtr = A Reheat coil is included within the VAV box that is sourced by hot water*
- *TC = Temperature Controlled*

Zone HVAC Group - Diagram Workspace

Note: To edit the inputs for the component shapes and/or to add others to the Zone HVAC Group, you will need to go to the Diagram Workspace.



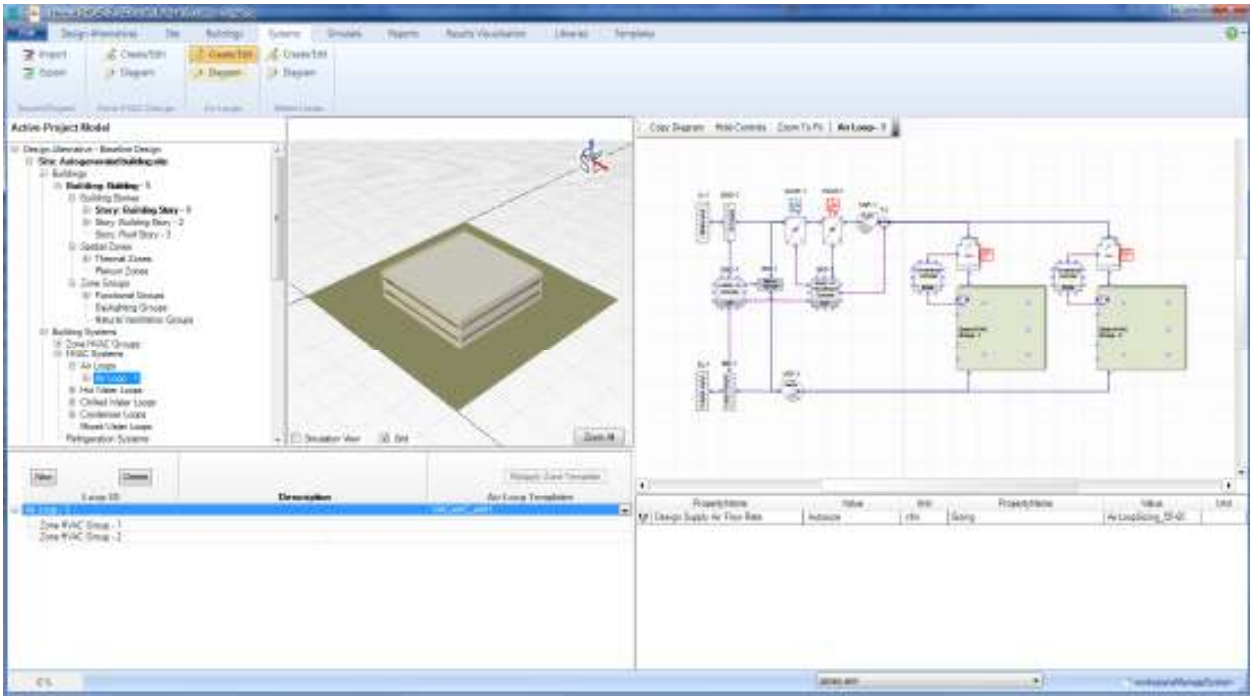
In either workspace the Heating and Cooling Priority can be set by interacting with the table on the bottom right of the workspace. For each model to simulate successfully each component is required to have a library entry associated with it, so that the needed input values are required. All Templates packaged with the Simergy Installation will contain Library Entries. An example is shown in the image above where the "Zone Temperature Controller" has been selected from the 2d view and if you look to the properties table on the lower left you'll see that the Library Entry selected is a Dual Setpoint Controller.

Another common theme to remember is that to run Validation checks, you'll need to be in the Diagram Workspace. See the "Validate" button at the top center of the 2d diagramming section. By selecting the validation check will be completed that will display 'no errors' or 'list the errors' on the table below the 2d diagramming section (note the Validation tab). In addition, the Validation Dashboard that is located on the Design Alternatives and Simulate workspaces will be updated as well.

Air Loops - Create/Edit Workspace

Air Loop -1

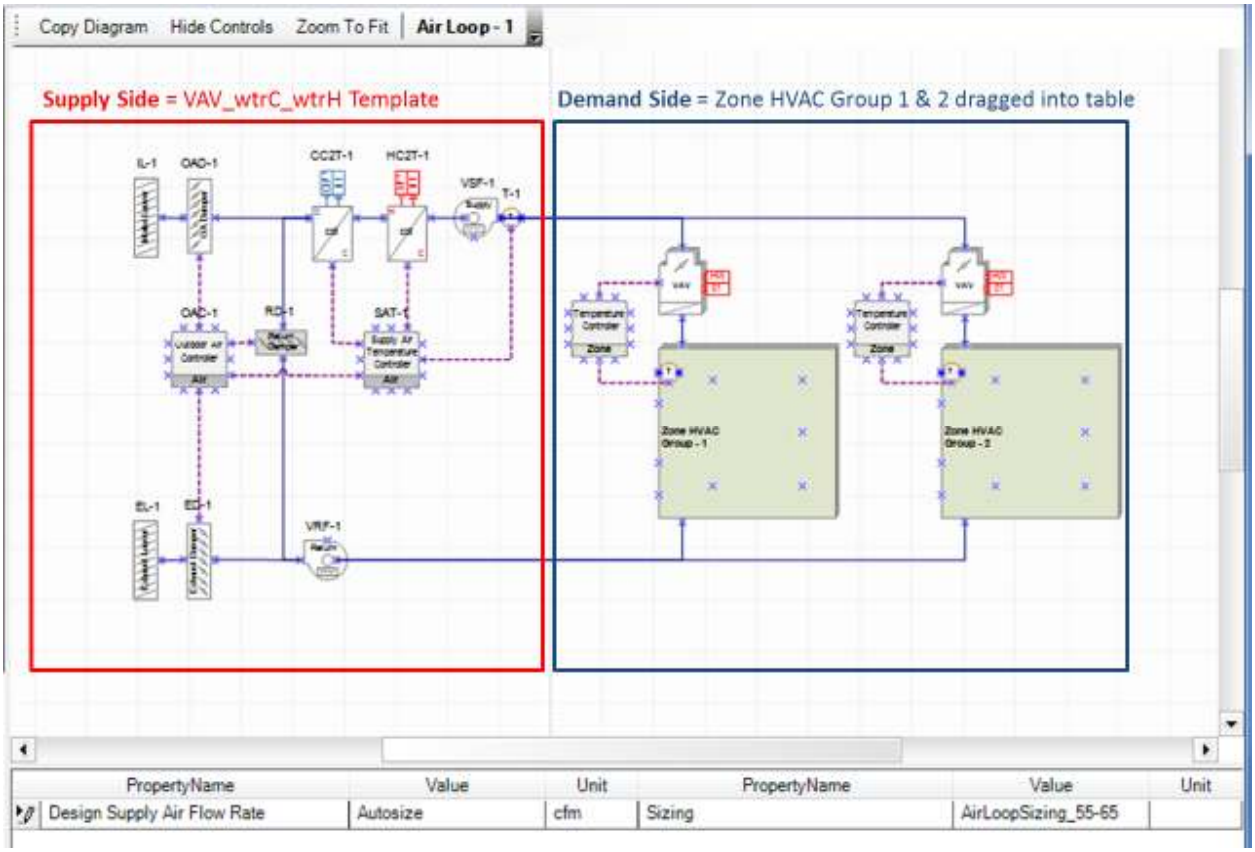
Related Topics: Air Loop Interactive Diagram



For System 7 there is one Air Loop that has been set up, which is listed in the table (lower left). The Air Loop was created by first by selecting the VAV_wtrC_wtrH Template from the Air Loop Template drop down list to set up the Supply Side of the Air Loop. The Demand Side of the Air Loop was established by highlighting ZoneHVAC Group 1 & 2 in the project tree and then dragging and dropping them into the Air Loop Table.

Naming Convention for Air Loop Templates - VAV_wtrC_wtrH

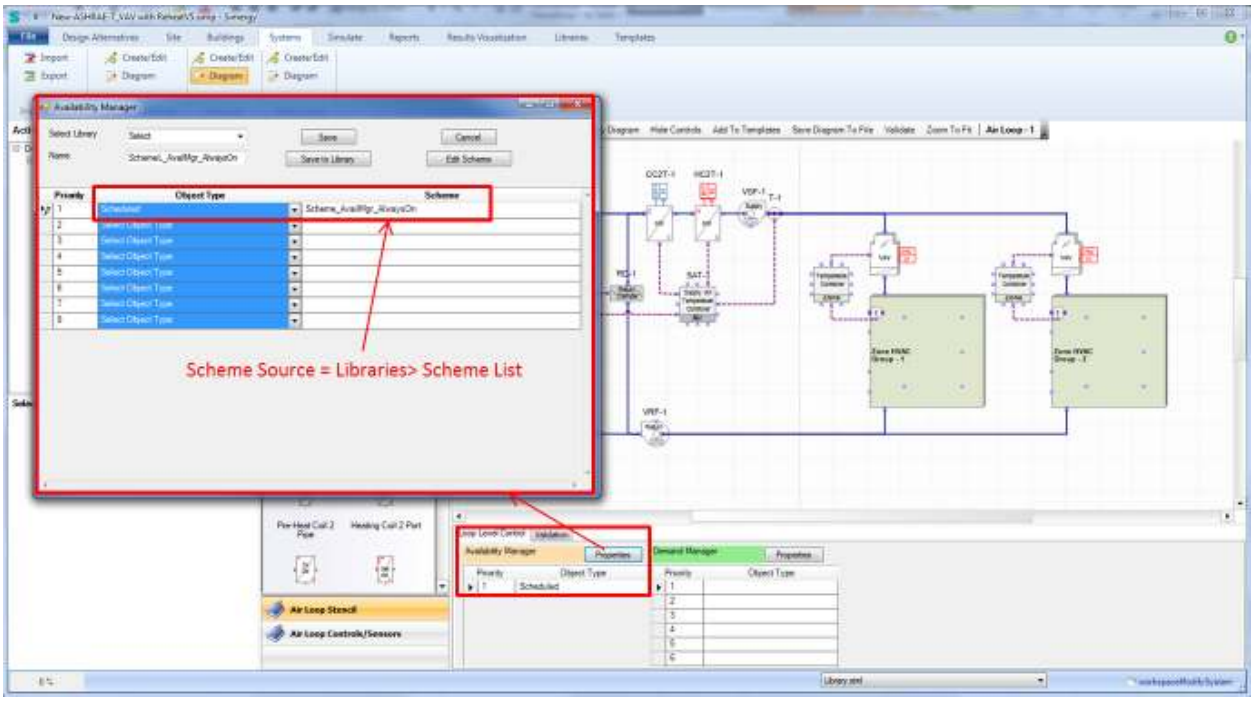
- *VAV = Variable Air Volume Loop*
- *wtrC = Water based Cooling Coil*
- *wtrH = Water based Heating Coil*



The Air Loop Level Properties (table at bottom of image above) display that the Design Supply Air Flow Rate is set to Autosize and the Sizing Property has selected a Library Entry (Air Loop Sizing_55-65) from the Libraries>Controls and Performance Data> Sizing Params category.

Air Loops - Diagram Workspace

Another requirement to run a simulation within EnergyPlus is that an Availability Manager needs to be associated with each Air Loop. In this case the Object Type = Scheduled has been selected and the "Scheme_AvailMgr_AlwaysOn" library entry that was set up in the Libraries>Scheme List area has been selected.



Note: All Air Loop Templates packaged with the Simergy Installation will have Availability Managers assigned to them.

Water Loops - Create/Edit Workspace

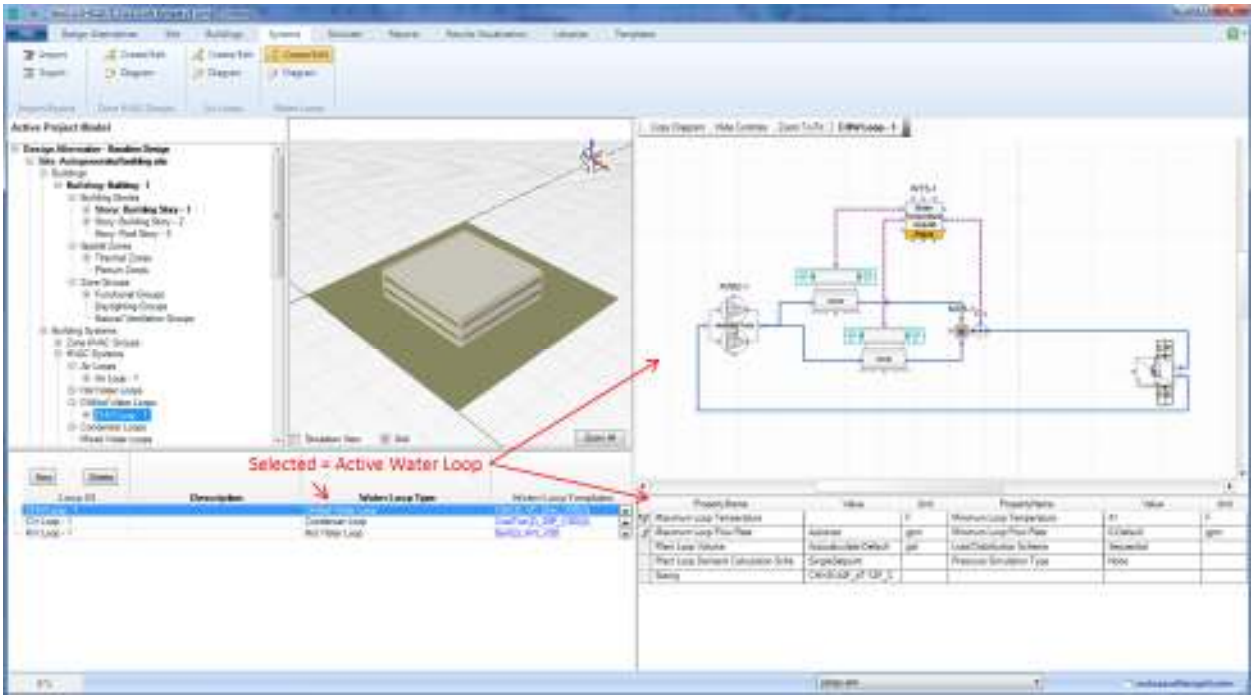
System 7 has three water loops (Chilled Water, Hot Water and Condenser Water) set-up. The Water Loops were set up by selecting "New" to add a new row to the table. Then you select the Water Loop Type from the drop down list, which then populates the Water Loop Templates drop down list with the appropriate options. Next, you guessed it, select the Water Loop Template from the drop down list.

Chilled Water Loop -1

Related Topics: Chilled Water Loop Interactive Diagram

The Chilled Water Loop Selection = Chlr(2)_VC_Elec_VSD(2)

- *Chlr(2) = Two Chillers*
- *VC = Vapor Compression Chillers*
- *Elec = Electric Vapor Compression Chillers*
- *VSD(2) = Variable Speed Drive Headered Pumps*



Loop Level Parameters

The table outlines the Value selection options and the sources for properties where the selection options are determined by a template or library category. The intent is to assist you to locate where more detailed properties can be found.

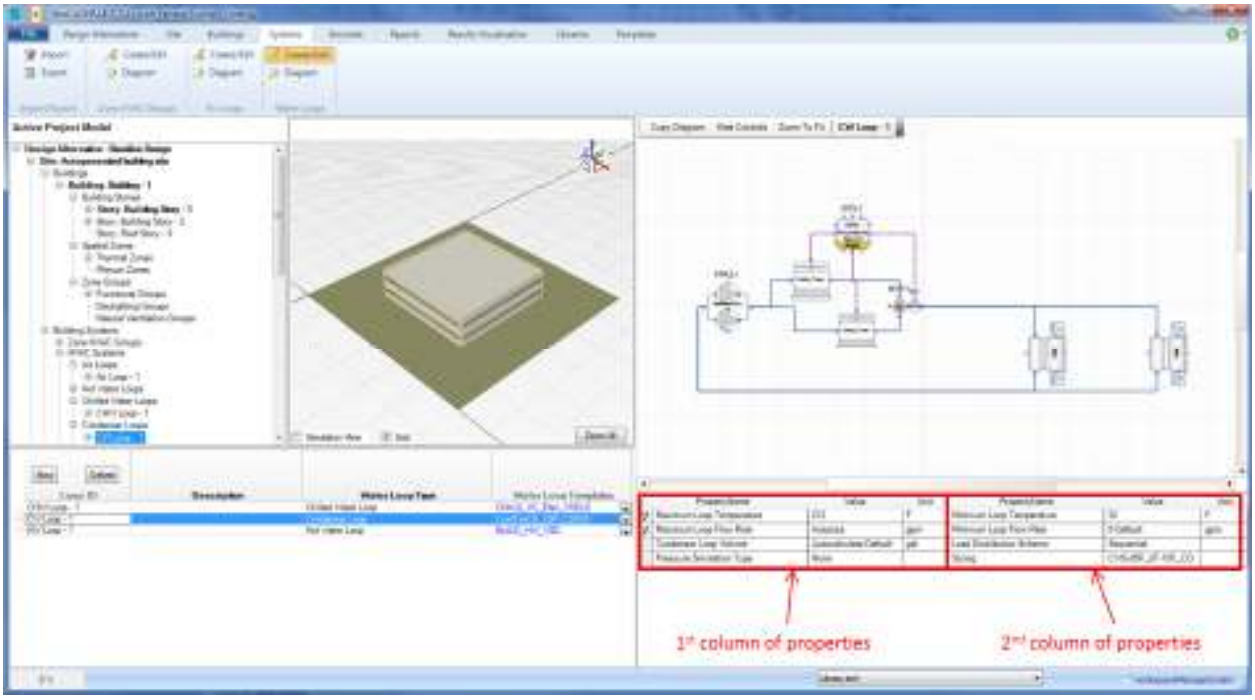
Property Name	Value Source	Units
Maximum Loop Temperature	<input value>	F
Maximum Loop Flow Rate	Autosize or <input value>	gpm
Plant Loop Volume	Autocalculate or <input value>	gal
Plant Loop Demand Calculation Scheme	Single Setpoint or Dual Setpoint Deadband	
Sizing	Libraries>Sizing Params Type = HVAC Design Sub Type = Water Loop Sizing	
Minimum Loop Temperature	<input value>	F
Minimum Loop Flow Rate	Autosize or <input value>	gpm
Load Distribution Scheme	Uniform, Sequential or Optimal	
Pressure Simulation Type	None, LoopFlowCorrection, Pump Power Correction	

Condenser Water Loop -1

Related Topics: Condenser Water Loop Interactive Diagram

The Condenser Water Loop Selection = CoolTwr(2)_2SP_CSD(2)

- *CoolTwr(2) = Two Cooling Towers*
- *2SP = Two Speed*
- *CSD(2) = Constant Speed Drive Headered Pumps*



Loop Level Parameters

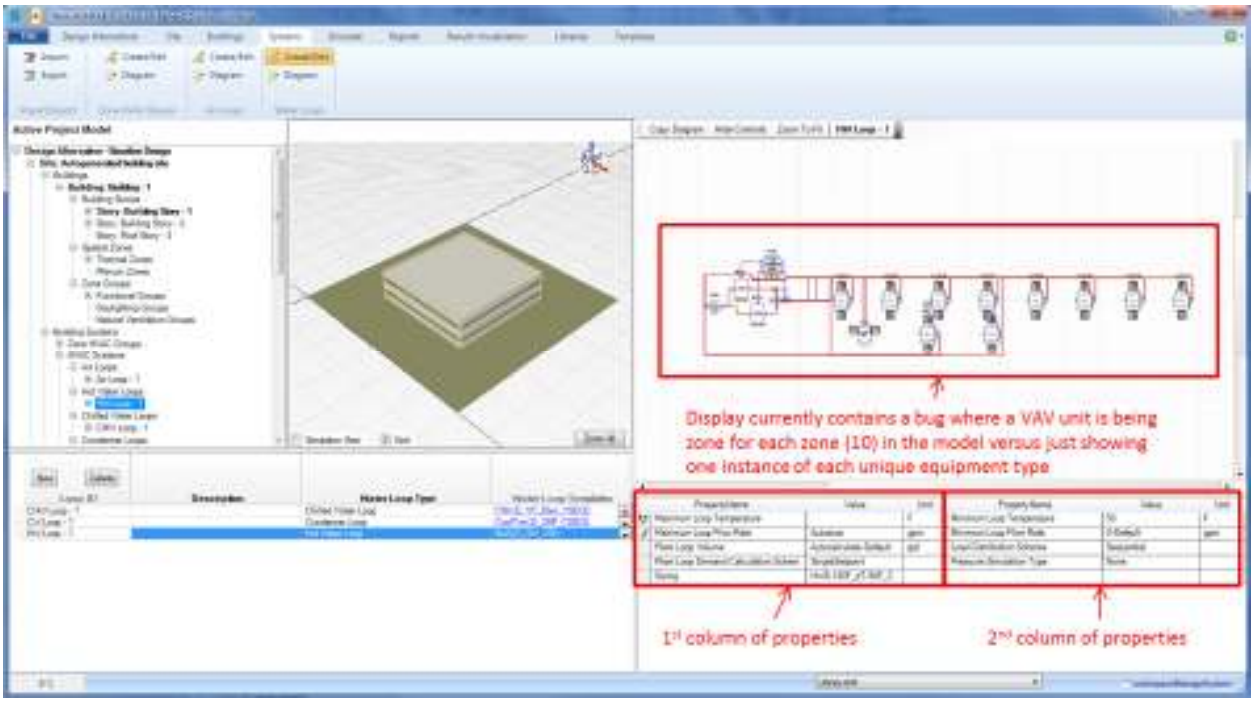
The table outlines the Value selection options and the sources for properties where the selection options are determined by a template or library category. The intent is to assist you to locate where more detailed properties can be found.

Property Name	Value Source	Units
Maximum Loop Temperature	<input value>	F
Maximum Loop Flow Rate	Autosize or <input value>	gpm
Condenser Loop Volume	Autocalculate or <input value>	gal
Pressure Simulation Type	None, LoopFlowCorrection, Pump Power Correction	
Minimum Loop Temperature	<input value>	F
Minimum Loop Flow Rate	Autosize or <input value>	gpm
Load Distribution Scheme	Uniform, Sequential or Optimal	
Sizing	Libraries>Sizing Params Type = HVAC Design Sub Type = Water Loop Sizing	

Hot Water Loop -1

The Hot Water Loop Selection = Boil(2)_HW_VSD

- *Boil(2) = Two Boilers*
- *HW = Hot Water*
- *VSD = Variable Speed Drive Pumps*



Loop Level Parameters

The table outlines the Value selection options and the sources for properties where the selection options are determined by a template or library category. The intent is to assist you to locate where more detailed properties can be found.

Property Name	Value Source	Units
Maximum Loop Temperature	<input value>	F
Maximum Loop Flow Rate	Autosize or <input value>	gpm
Plant Loop Volume	Autocalculate or <input value>	gal
Plant Loop Demand Calculation Scheme	Single Setpoint or Dual Setpoint Deadband	
Sizing	Libraries>Sizing Params Type = HVAC Design Sub Type = Water Loop Sizing	
Minimum Loop Temperature	<input value>	F
Minimum Loop Flow Rate	Autosize or <input value>	gpm
Load Distribution Scheme	Uniform, Sequential or Optimal	
Pressure Simulation Type	None, LoopFlowCorrection, Pump Power Correction	

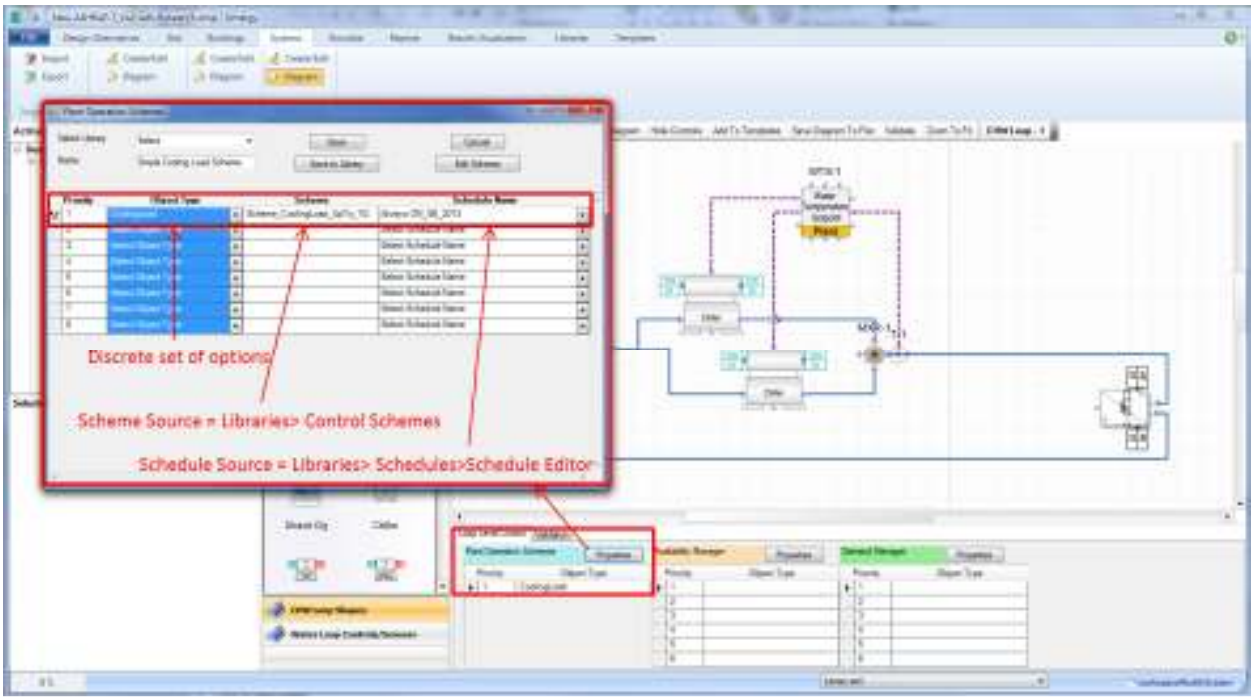
Water Loops - Diagram Workspace

In addition to being able to access the properties for individual components and allowing you to add or delete components or reconfigure the loop diagram, you have access to the Plant Operation Schemes, Availability Managers and/or Demand Managers for each of the loop types.

Chilled Water Loop -1 (Diagram)

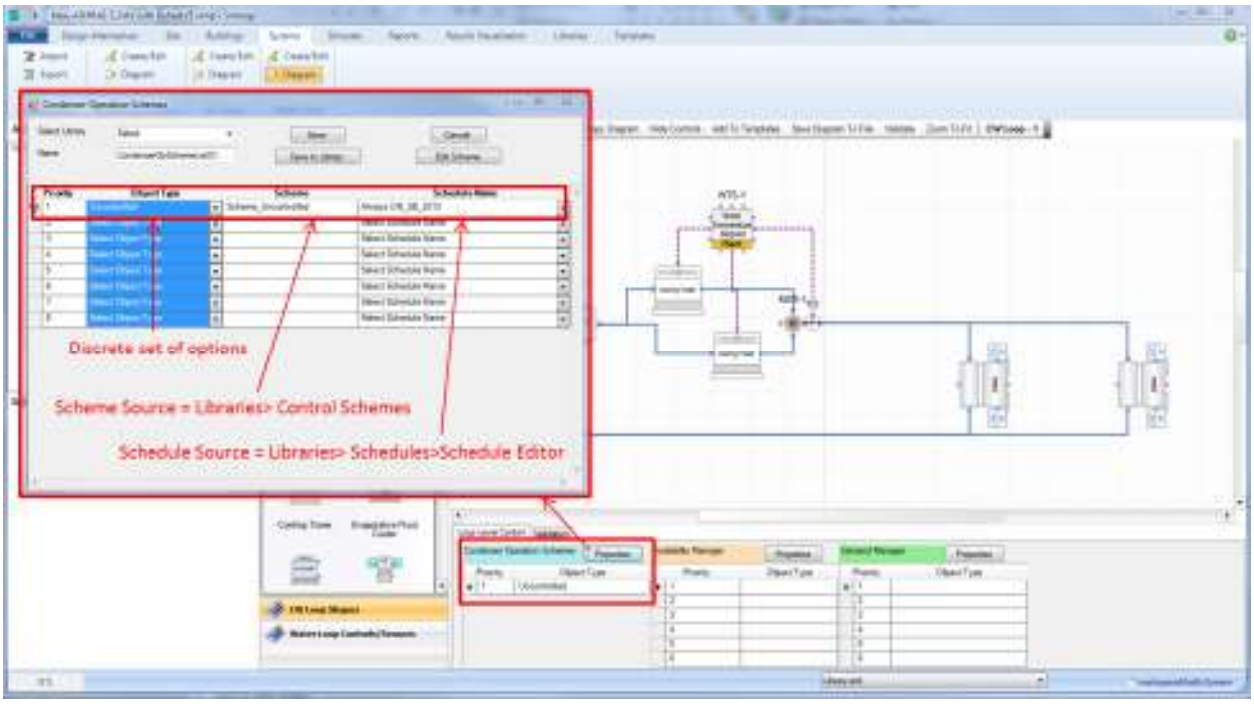
A Plant Operation Scheme for each Chilled Water Loop is required. For this loop the Cooling Load Plant Operation Scheme was set up by selecting "Properties", which displayed the dialog box allowing up to

eight schemes to be associated with the model. Cooling Load was selected from the drop down list and then the Scheme (Scheme_CoolingLoad_UpTo_1G) was selected as well as a schedule (Always ON_SE_2013) for that scheme. The sources for the drop down lists are displayed in the image.



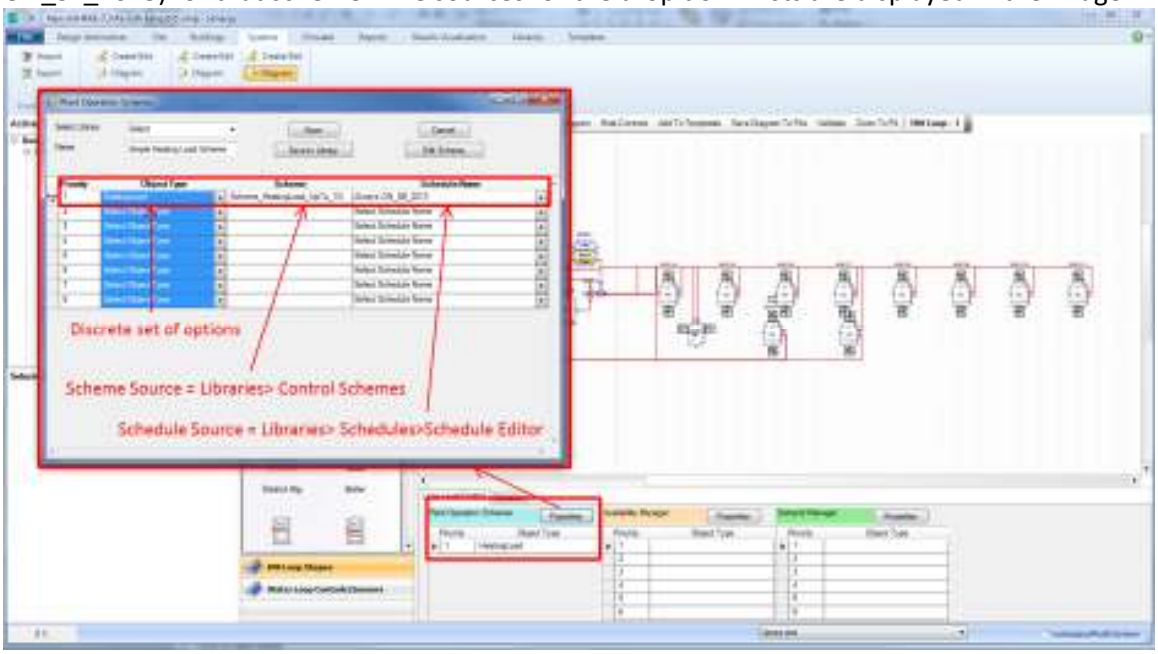
Condenser Water Loop -1 (Diagram)

A Plant Operation Scheme for each Condenser Water Loop is required. For this loop the "Uncontrolled" Plant Operation Scheme was set up by selecting "Properties", which displayed the dialog box allowing up to eight schemes to be associated with the model. Cooling Load was selected from the drop down list and then the Scheme (Scheme_Uncontrolled) was selected as well as a schedule (Always ON_SE_2013) for that scheme. The sources for the drop down lists are displayed in the image.



Hot Water Loop -1 (Diagram)

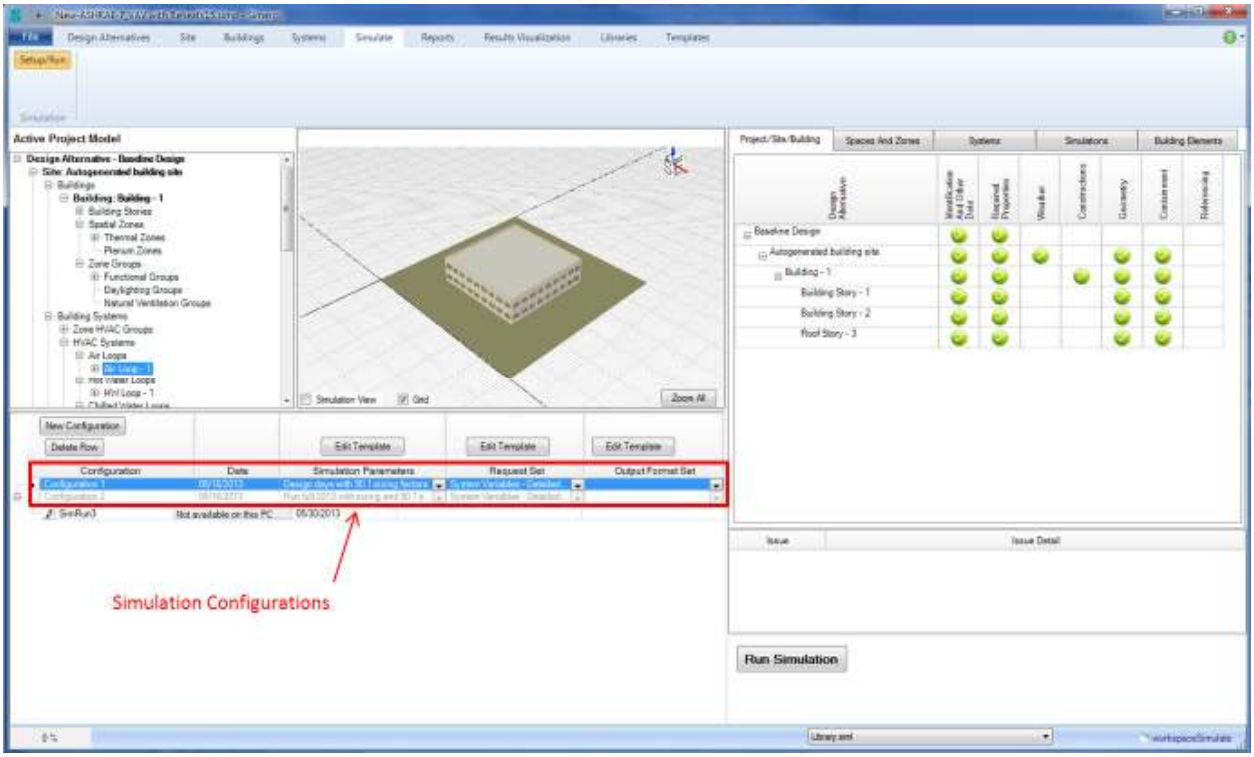
A Plant Operation Scheme for each Hot Water Loop is required. For this loop the Heating Load Plant Operation Scheme was set up by selecting "Properties", which displayed the dialog box allowing up to eight schemes to be associated with the model. Heating Load was selected from the drop down list and then the Scheme (Scheme_HeatingLoad_UpTo_1G) was selected as well as a schedule (Always ON_SE_2013) for that scheme. The sources for the drop down lists are displayed in the image.



Simulate

Simergy ASHRAE System 7 Map

A good habit to get into once you are ready to consider starting to run simulations is to check the different tabs on the "Validation Dashboard" (upper right). It provides an overview of the "integrity of the model", and can assist identifying problem areas that should be addressed before hitting the "Run Simulation" button.



Configurations

Two simulation configurations have been set up for System 7. Simulation configurations can vary based on selections of Simulation Parameters, Request Sets or Output Format Sets

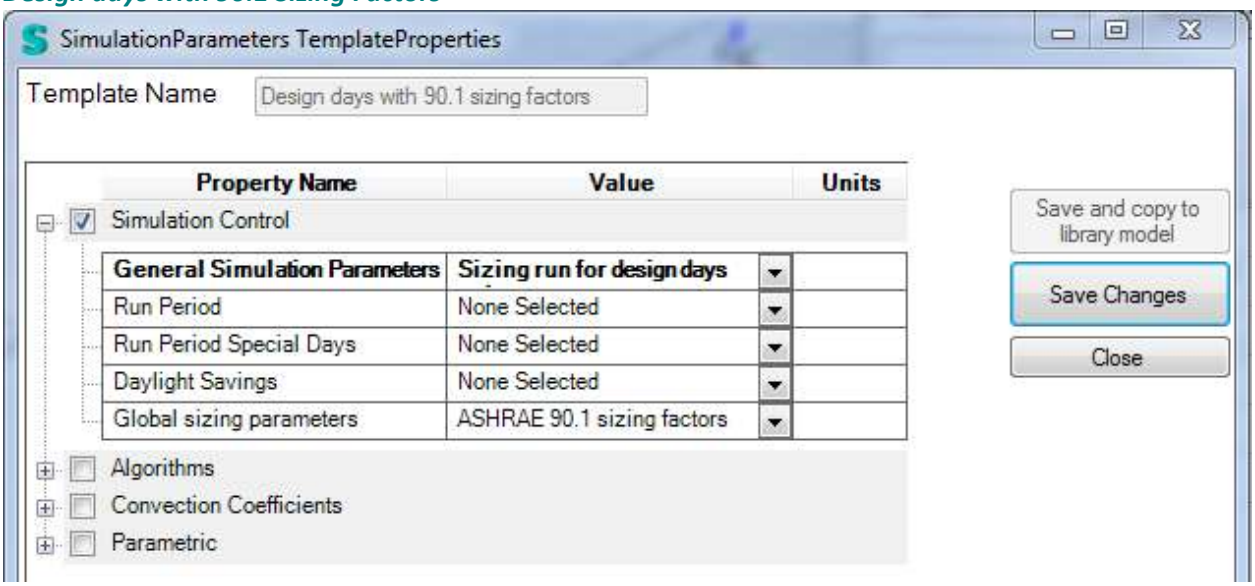
Note: Selecting an Output Format Set is rarely needed, so a majority of the time this field will remain blank.

In this case the difference between the two configurations is the first is to simulate "Design Days with Sizing" and the second is a "Full Year with Sizing" run.

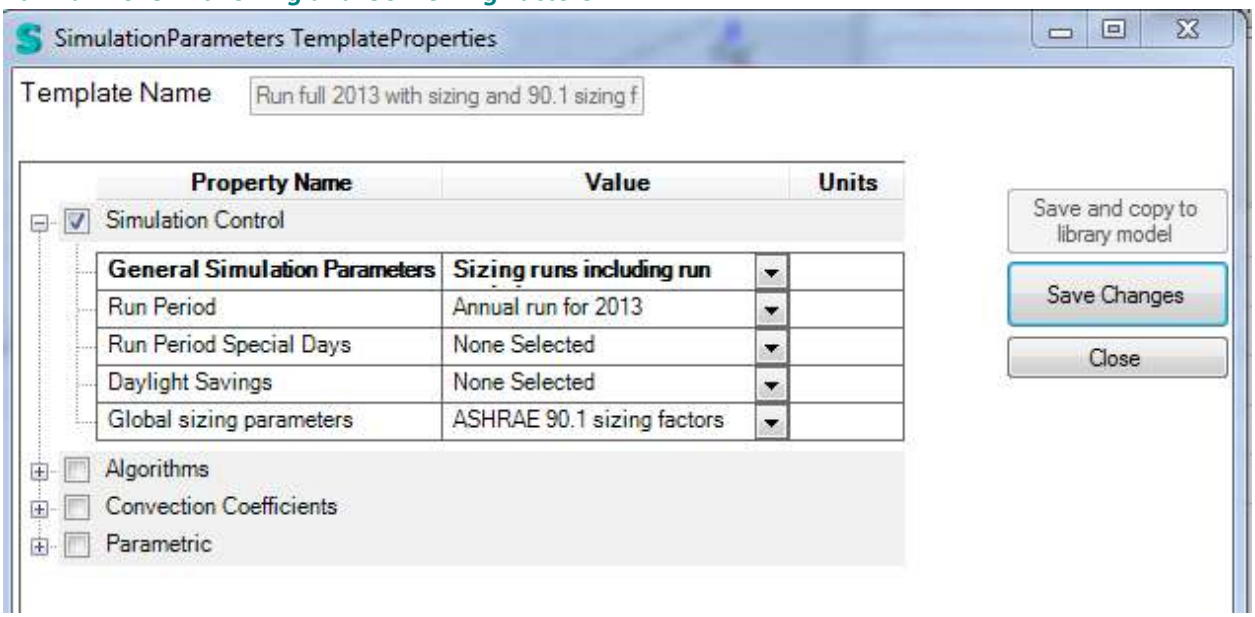
Simulation Parameters

A Simulation Parameters Template is associated with each configuration.

Design days with 90.1 Sizing Factors



Run Full 2013 with sizing and 90.1 Sizing Factors

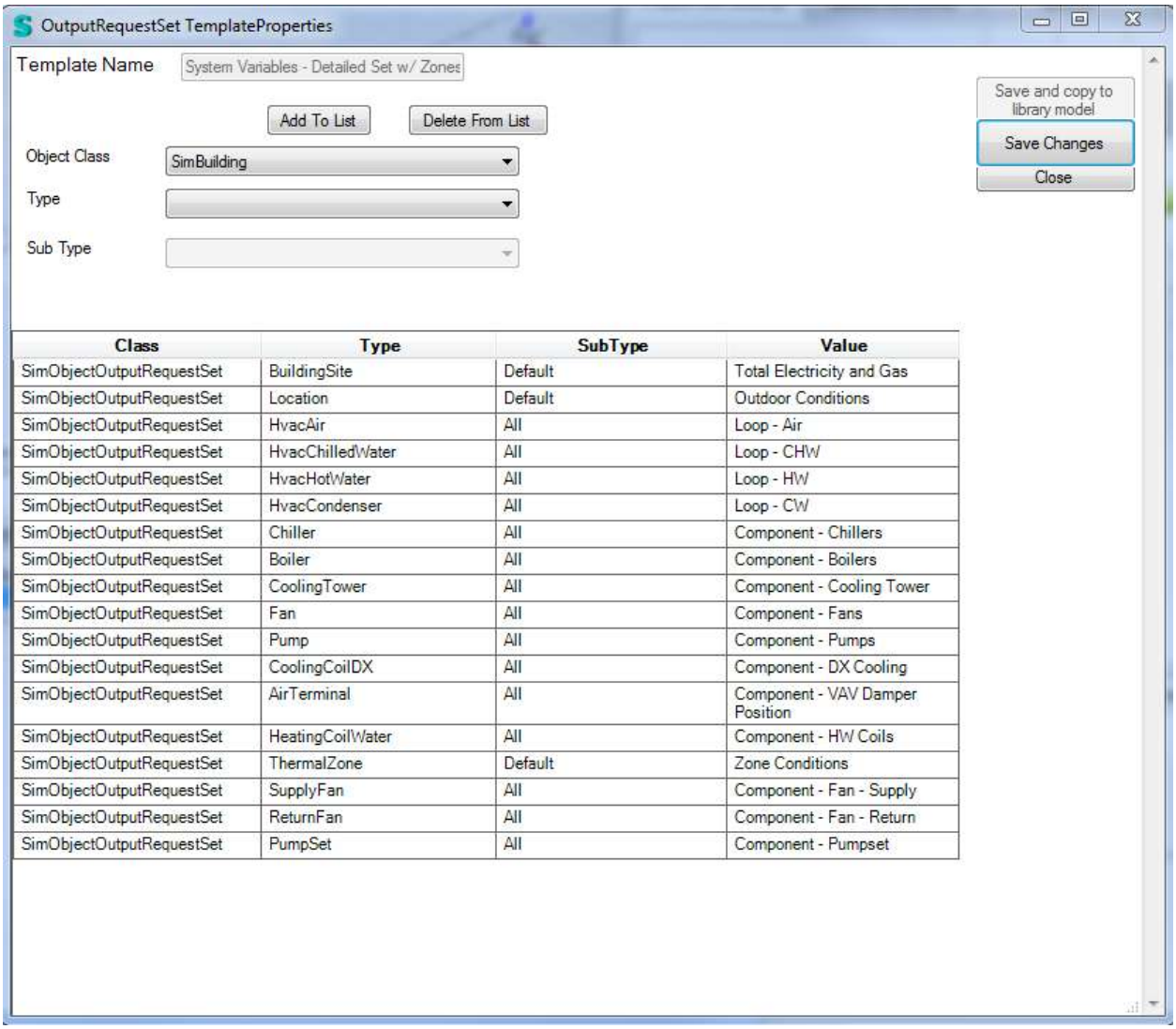


Request Set

Actually the templates selected here are Output Request Set Templates.

System Variables - Detailed Set w/ Zones

From the set packaged with Simergy Version 1, System Variables - Detailed Set w/ Zones is associated with each configuration



Class	Type	SubType	Value
SimObjectOutputRequestSet	BuildingSite	Default	Total Electricity and Gas
SimObjectOutputRequestSet	Location	Default	Outdoor Conditions
SimObjectOutputRequestSet	HvacAir	All	Loop - Air
SimObjectOutputRequestSet	HvacChilledWater	All	Loop - CHW
SimObjectOutputRequestSet	HvacHotWater	All	Loop - HW
SimObjectOutputRequestSet	HvacCondenser	All	Loop - CW
SimObjectOutputRequestSet	Chiller	All	Component - Chillers
SimObjectOutputRequestSet	Boiler	All	Component - Boilers
SimObjectOutputRequestSet	CoolingTower	All	Component - Cooling Tower
SimObjectOutputRequestSet	Fan	All	Component - Fans
SimObjectOutputRequestSet	Pump	All	Component - Pumps
SimObjectOutputRequestSet	CoolingCoilDX	All	Component - DX Cooling
SimObjectOutputRequestSet	AirTerminal	All	Component - VAV Damper Position
SimObjectOutputRequestSet	HeatingCoilWater	All	Component - HW Coils
SimObjectOutputRequestSet	ThermalZone	Default	Zone Conditions
SimObjectOutputRequestSet	SupplyFan	All	Component - Fan - Supply
SimObjectOutputRequestSet	ReturnFan	All	Component - Fan - Return
SimObjectOutputRequestSet	PumpSet	All	Component - Pumpset

Output Format Set

No Output Format Set Templates are included with System 7.

Reports

Simergy ASHRAE System 7 Map

Completed simulation runs are not included with the sample files, but you can run select "Run Simulation" for the two pre-defined configurations to generate them.

Once a simulation has been run "View Results" will appear in the Simulation Configuration table. If you select the button it will take you to the Reports Workspace. As you may recall the Results that are available for a simulation are determined by what Output Variables are included in the Output Request Set selected within the configuration. Typically all of the Request Sets that are included with Simergy contain the Output Variables required for the set of pre-defined Reports. See sections on Reports for additional information

Results Visualization

Simergy ASHRAE System 7 Map

Completed simulation runs are not included with the sample files, but you can run select "Run Simulation" for the two pre-defined configurations to generate them.

In this case once the simulations are complete, rather than selecting the "View Results" button, you should just select "Results Visualization" from the top menu to access the workspace. See sections on Results Visualization for additional information.

Simergy BEM Map for ASHRAE Baseline System 7 Sample File

The following is a map of the sample file Simergy content for "New-ASHRAE-7_VAV with Reheat", which is located at C:\Users\Public\Simergy\Samples\Sample_Projects as part of the Simergy installation. The map displays the templates and libraries that are associated with each of the Simergy interface tabs. The image map contains hyperlinks to the relevant topics and bookmarks for the System 7 file that are included within this chapter of the Simergy
Help.

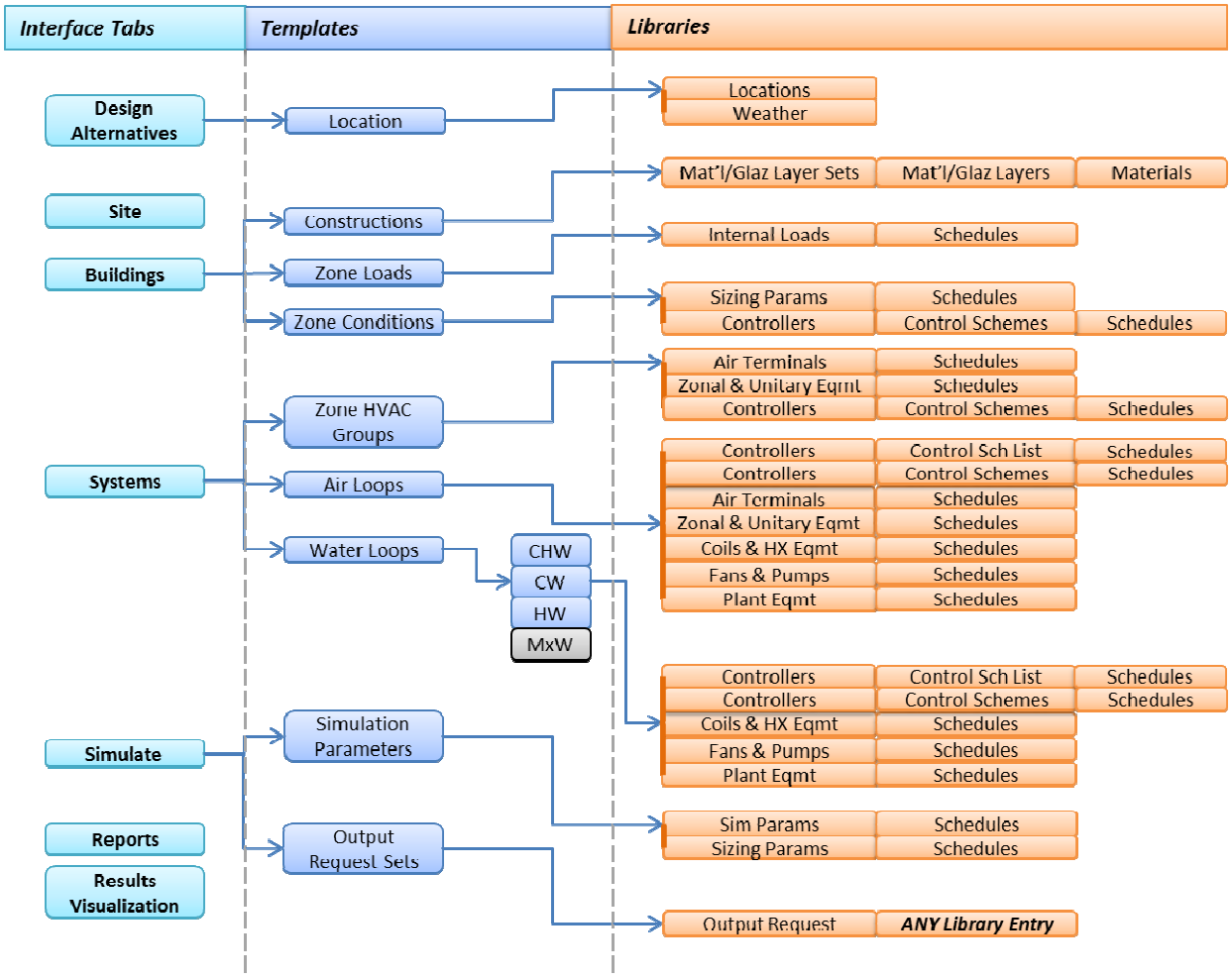


Figure - Interactive Image Map of ASHRAE Baseline System 7 allowing you to investigate the inputs and contents for this sample file as well to enable understanding of the relationships between the different libraries categories and the libraries and templates.

ASHRAE System 7 Templates

The following identifies the different templates that have been included with ASHRAE Baseline System 7 Sample File.

Location

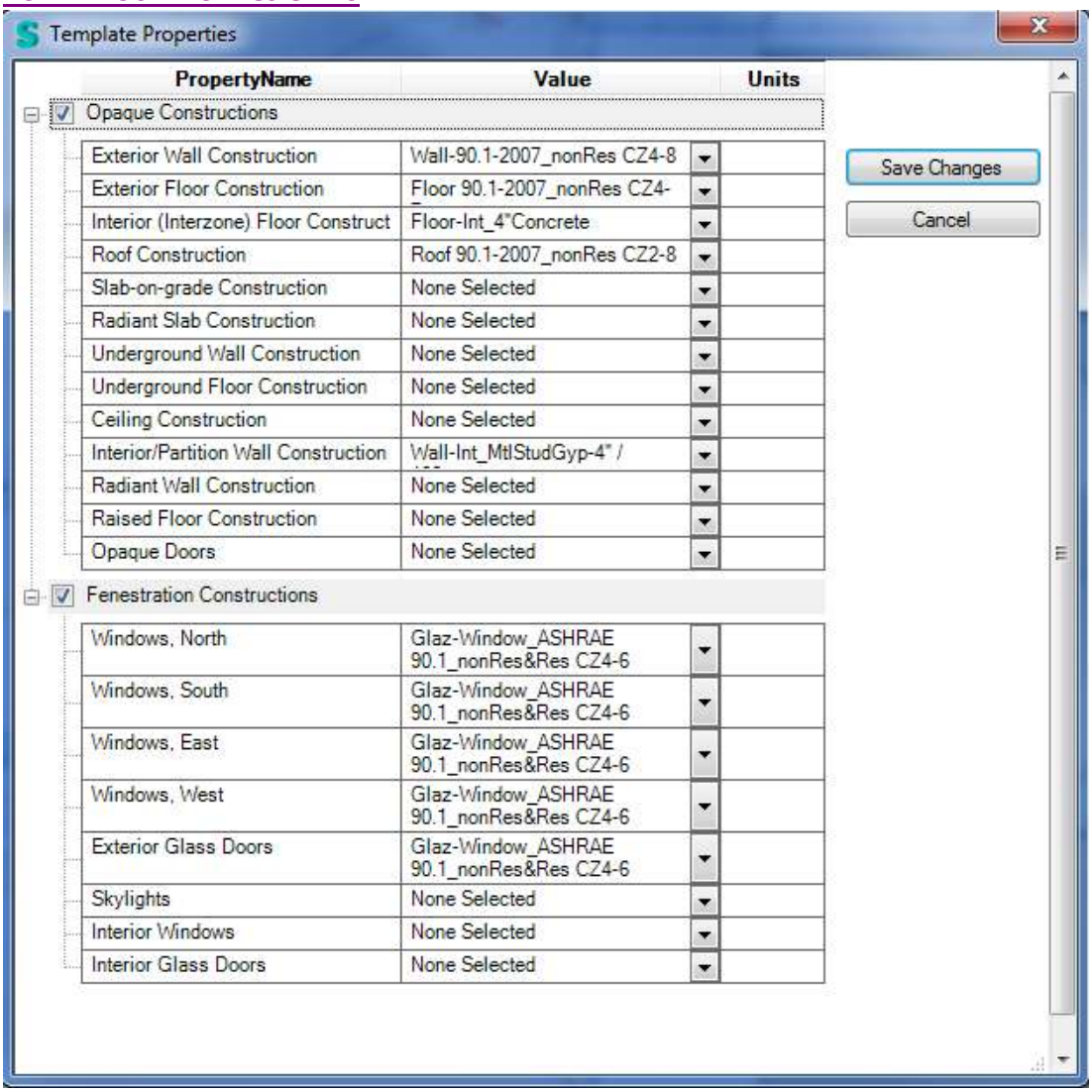
USA_MN_Minneapolis St Paul IntL Arp

Note: To access this Template the Source Library needs to be changed to Project Model.

PropertyName	Value
Site Properties	
Terrain	Suburbs
SolarDistribution	FullExterior
Weather Property Sky Temperature	
Sky Temperature Calculation Type	None Selected
Weather Station	
IDD Weather Station	None Selected
Weather File Name	USA_MN_Minneapolis-St.Paul.Intl.AP_TMY3.epw
Design Days	
Summer Design Day[0-2]	
Summer Design Day 1	Minneapolis St Paul IntL Arp Ann Clg 1% Condns DB=>MWB
Summer Design Day 2	None Selected
Summer Design Day 3	None Selected
Winter Design Day[0-2]	
Winter Design Day 1	Minneapolis St Paul IntL Arp Ann Htg 99% Condns DB
Winter Design Day 2	None Selected
Winter Design Day 3	None Selected
Utilities	
Utility Cost[0-9]	
Utility Cost 1	None Selected
Utility Cost 2	None Selected
Utility Cost 3	None Selected
Utility Cost 4	None Selected
Utility Cost 5	None Selected
Utility Cost 6	None Selected
Utility Cost 7	None Selected
Utility Cost 8	None Selected
Utility Cost 9	None Selected
Utility Cost 10	None Selected

Building Constructions

ASHRAE 90.1 nonRes CZ4-6



Zone Loads

OfficeBldg_90-1-2007

ZoneLoads TemplateProperties

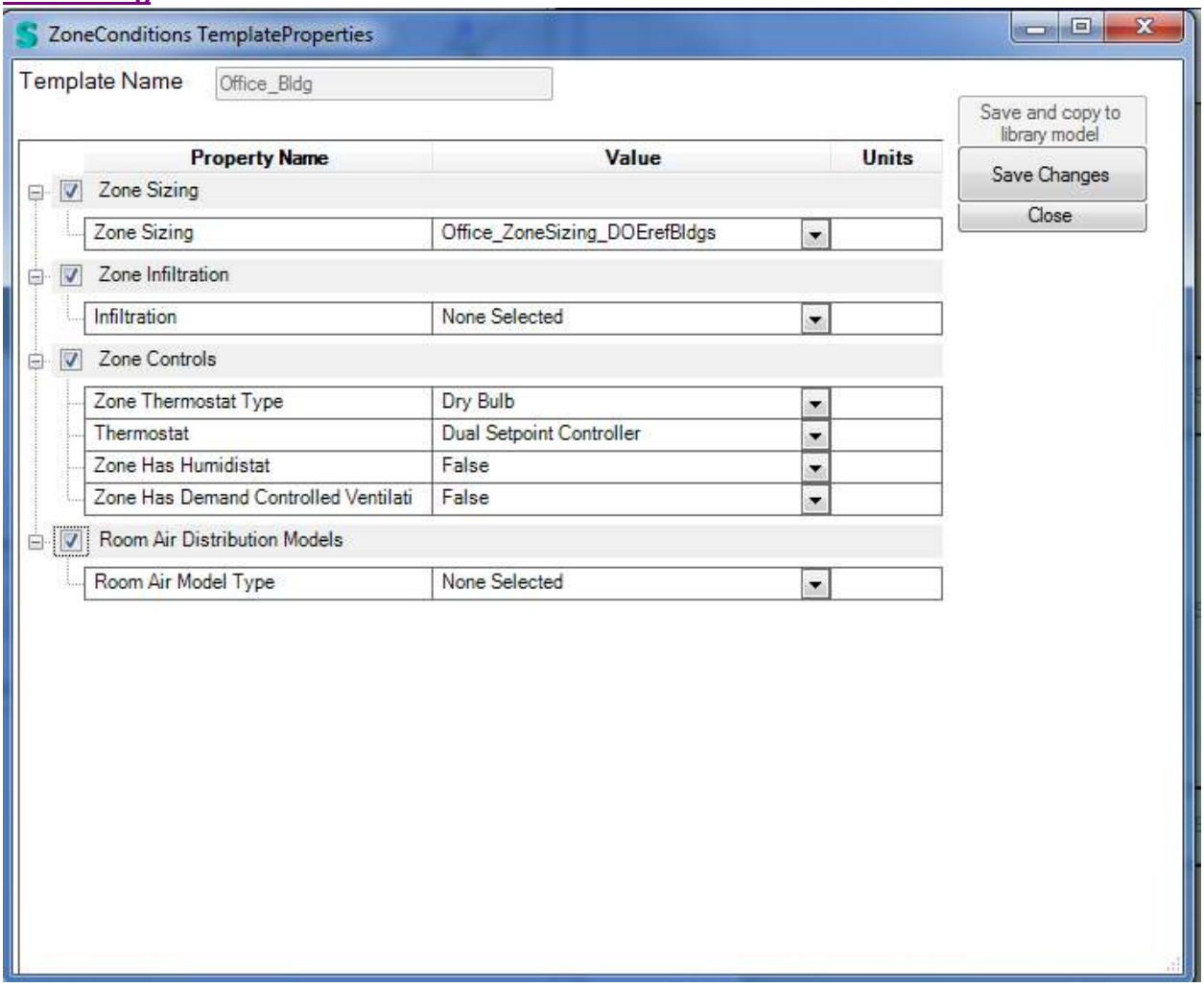
Template Name: OfficeBldg_90-1-2007

Save and copy to library model | Save Changes | Close

Property Name	Value	Units
Equipment		
Electrical Equipment Load [1-5]		
Electrical Equipment Load 1	OfficeBldg_Equip_COMNET	
Electrical Equipment Load 2	None Selected	
Electrical Equipment Load 3	None Selected	
Electrical Equipment Load 4	None Selected	
Electrical Equipment Load 5	None Selected	
Gas Equipment Load [1-5]		
Gas Equipment Load 1	None Selected	
Gas Equipment Load 2	None Selected	
Gas Equipment Load 3	None Selected	
Gas Equipment Load 4	None Selected	
Gas Equipment Load 5	None Selected	
Hot Water Equipment Load [1-5]		
Hot Water Equipment Load 1	OfficeBldg_SHW_ASHRAE 90-1-2007	
Hot Water Equipment Load 2	None Selected	
Hot Water Equipment Load 3	None Selected	
Hot Water Equipment Load 4	None Selected	
Hot Water Equipment Load 5	None Selected	
Steam Equipment Load [1-5]		
Steam Equipment Load 1	None Selected	
Steam Equipment Load 2	None Selected	
Steam Equipment Load 3	None Selected	
Steam Equipment Load 4	None Selected	
Steam Equipment Load 5	None Selected	
Other Equipment Load [1-5]		
Other Equipment Load 1	None Selected	
Other Equipment Load 2	None Selected	
Other Equipment Load 3	None Selected	
Other Equipment Load 4	None Selected	
Other Equipment Load 5	None Selected	
People		
People Load [1-5]		
People Load 1	OfficeBldg_Occup_COMNET	
People Load 2	None Selected	
People Load 3	None Selected	
People Load 4	None Selected	
People Load 5	None Selected	
Lighting		
Lighting Load [1-5]		
Lighting Load 1	OfficeBldg_Ltg_90-1-2007	
Lighting Load 2	None Selected	
Lighting Load 3	None Selected	
Lighting Load 4	None Selected	
Lighting Load 5	None Selected	

Zone Conditions

Office_Bldg



Zone HVAC Groups

ASHRAE-AT_VAV_ReH-Wtr_TC

Air Loops

VAV_wtrC_wtrH

Chilled Water Loops

Chlr(2)_VC_Elec_VSD(2)

Condenser Water Loops

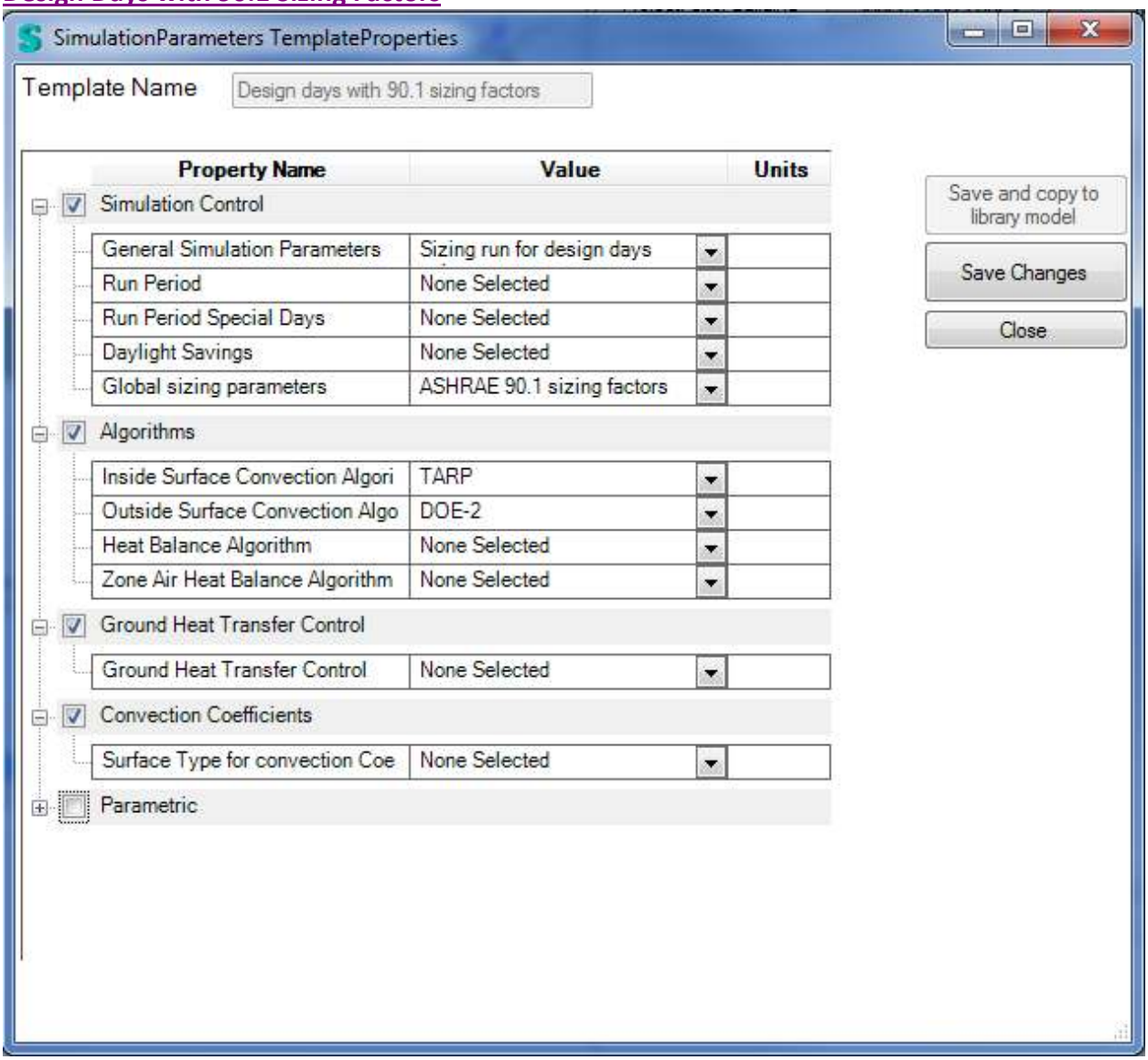
CoolTwr(2)_2SP_CSD(2)

Hot Water Loops

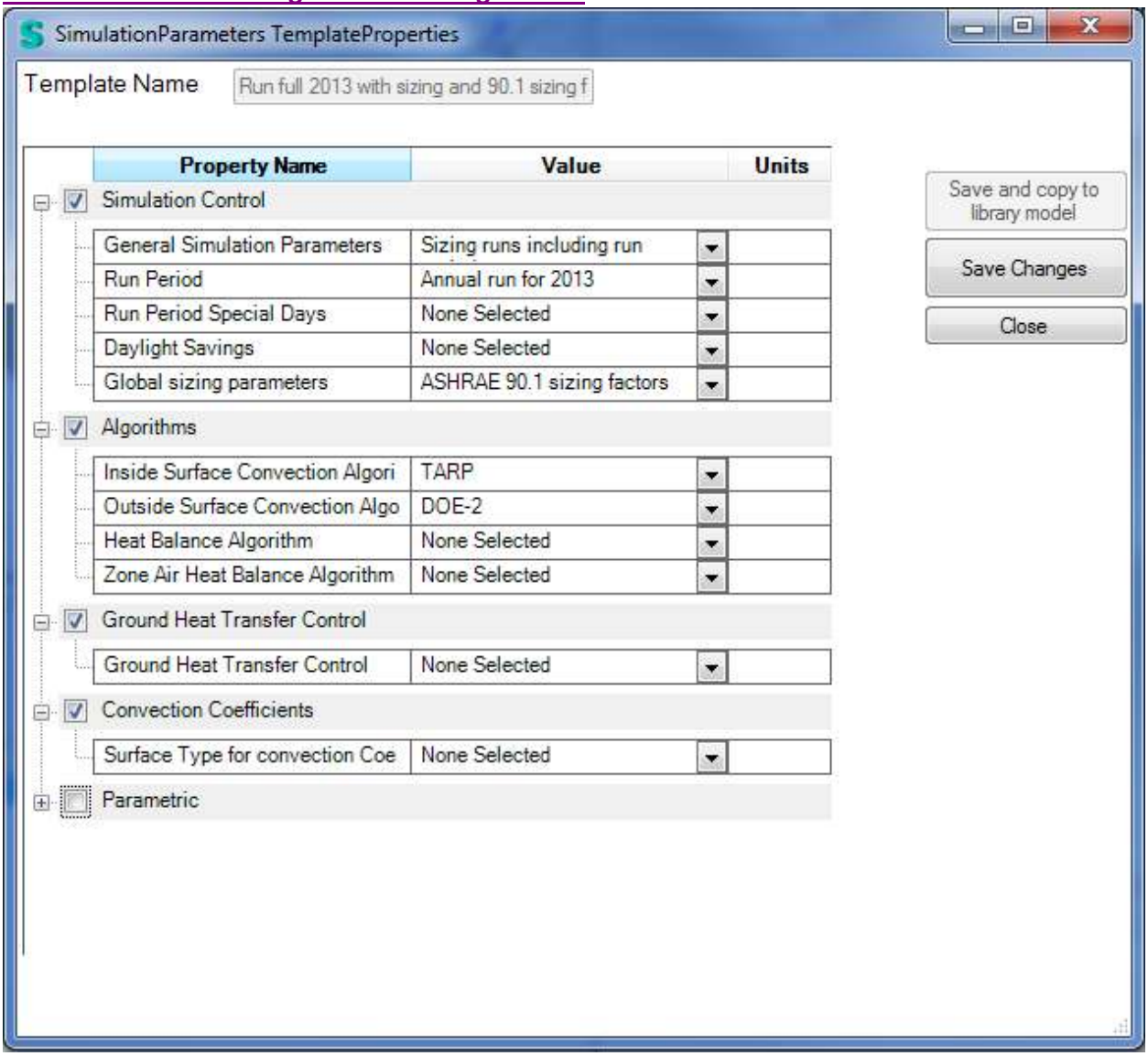
Boil(2)_HW_VSD

Simulation Parameters

Design Days with 90.1 Sizing Factors

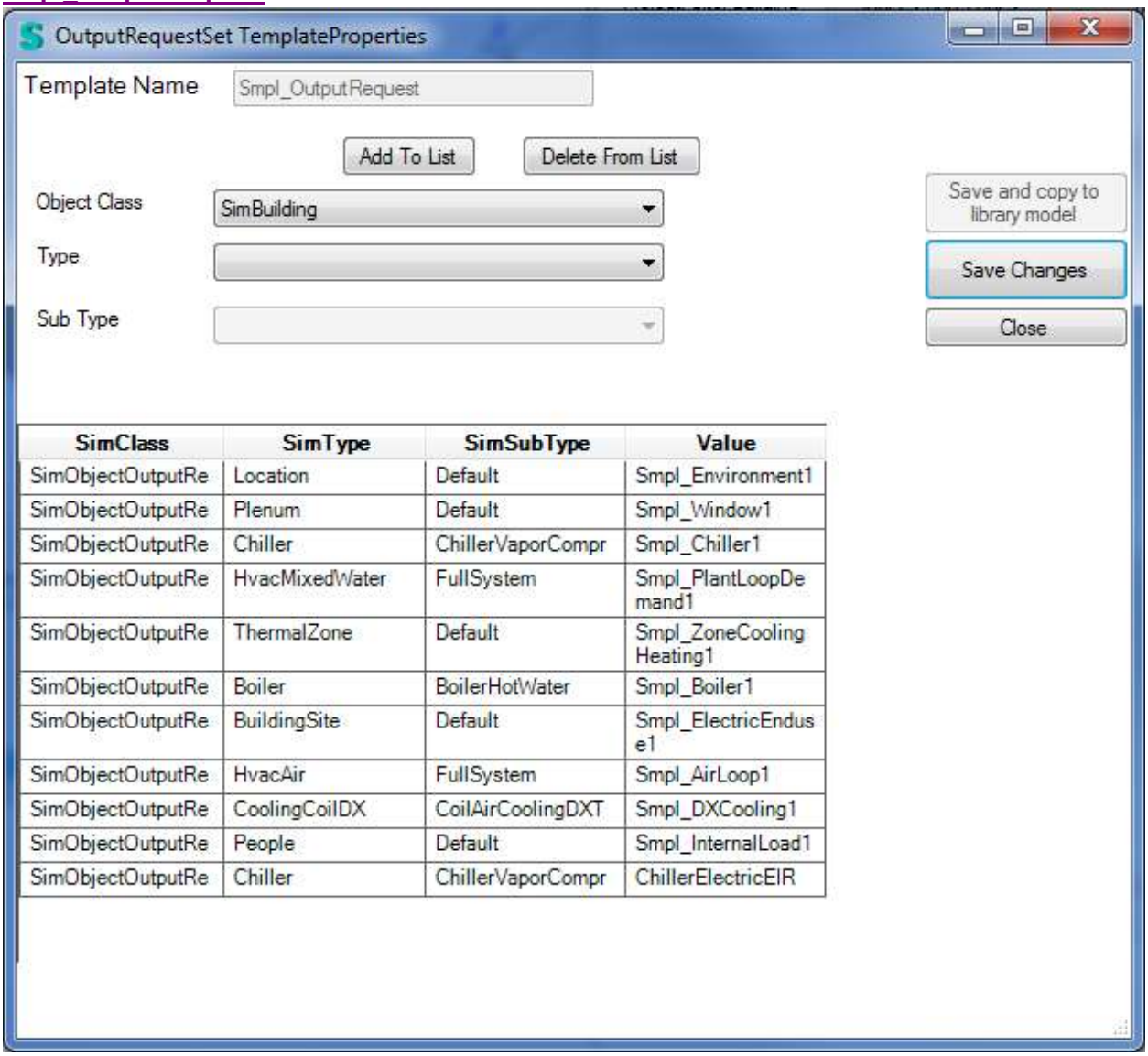


Run Full 2013 with sizing and 90.1 Sizing Factors



Output Request Sets

Smpl_OutputRequest



SimClass	SimType	SimSubType	Value
SimObjectOutputRe	Location	Default	Smpl_Environment1
SimObjectOutputRe	Plenum	Default	Smpl_Window1
SimObjectOutputRe	Chiller	ChillerVaporCompr	Smpl_Chiller1
SimObjectOutputRe	HvacMixedWater	FullSystem	Smpl_PlantLoopDemand1
SimObjectOutputRe	ThermalZone	Default	Smpl_ZoneCoolingHeating1
SimObjectOutputRe	Boiler	BoilerHotWater	Smpl_Boiler1
SimObjectOutputRe	BuildingSite	Default	Smpl_ElectricEnduse1
SimObjectOutputRe	HvacAir	FullSystem	Smpl_AirLoop1
SimObjectOutputRe	CoolingCoilDX	CoilAirCoolingDXT	Smpl_DXCooling1
SimObjectOutputRe	People	Default	Smpl_InternalLoad1
SimObjectOutputRe	Chiller	ChillerVaporCompr	ChillerElectricEIR

ASHRAE System 7 Libraries

The following provides a property level image for each of the library entries that have been included with ASHRAE Baseline System 7 Sample File.

Locations

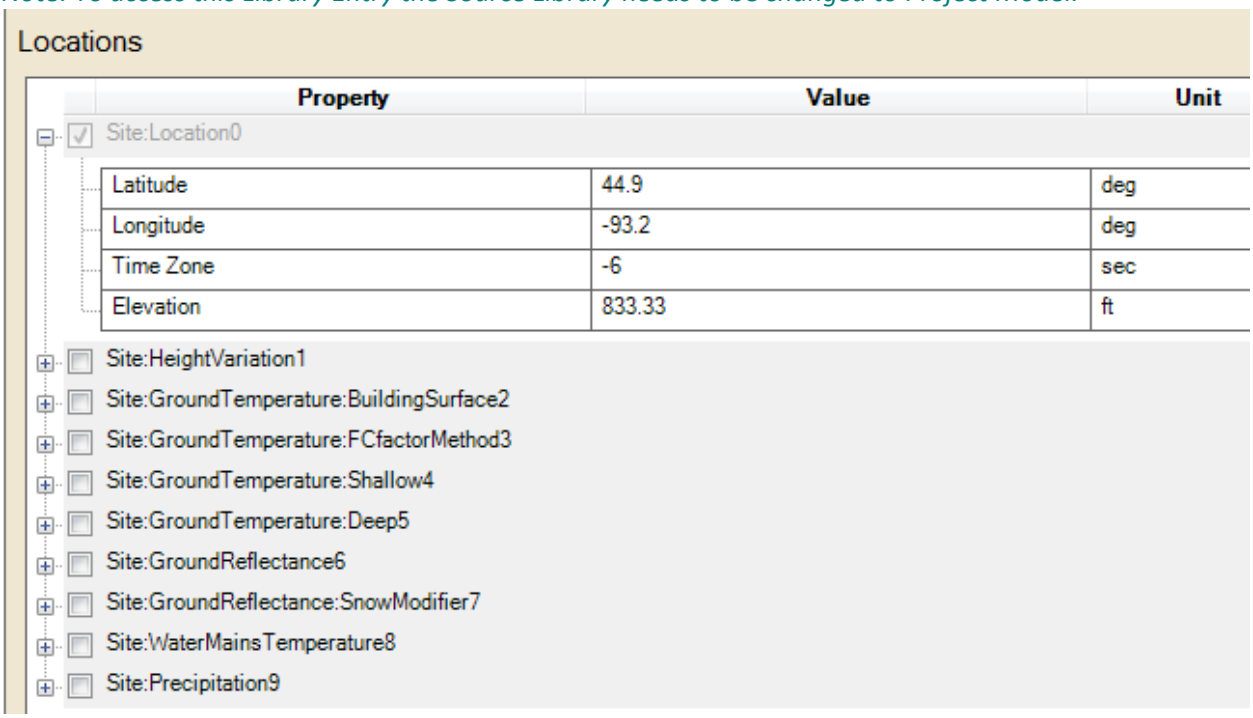
USA_MN_Minneapolis St Paul IntL Arp

Workspace = Libraries>Locations

Type = Location

Sub Type = Default

Note: To access this Library Entry the Source Library needs to be changed to Project Model.



Weather

Minneapolis St Paul IntL Arp Ann Clg 1% Condns DB=>MWB

Workspace = Libraries>Weather

Type = Design Day

Sub Type = Default

Note: To access this Library Entry the Source Library needs to be changed to Project Model.

Weather

SizingPeriod:DesignDay0

Property	Value	Unit
Month	**7**	
Day of Month	**21**	
Day Type	**SummerDesignDay**	
Maximum Dry-Bulb Temperature	**87.8**	**F**
Daily Dry-Bulb Temperature Range	17.8	deltaF
Dry-Bulb Temperature Range Modifier Type	DefaultMultipliers	
Dry-Bulb Temperature Range Modifier Schedule		
Humidity Condition Type	WetBulb	
Wetbulb or DewPoint at Maximum Dry-Bulb	72.3	F
Humidity Condition Day Schedule Name		
Humidity Ratio at Maximum Dry-Bulb		lb-H2O/lb-air
Enthalpy at Maximum Dry-Bulb		Btu/lb
Daily Wet-Bulb Temperature Range		deltaF
Barometric Pressure	29.03	inHg
Wind Speed	**13.42**	**miles/hr**
Wind Direction	**180**	**deg**
Rain Indicator	No	
Snow Indicator	No	
Daylight Saving Time Indicator	No	
Solar Model Indicator	ASHRAEClearSky	
Beam Solar Day Schedule Name		
Diffuse Solar Day Schedule Name		
ASHRAE Clear Sky Optical Depth for Beam Irrad	0	
ASHRAE Clear Sky Optical Depth for Diffuse Irra	0	
Sky Clearness	1	

Minneapolis St Paul IntL Arp Ann Htg 99% Condns DB

Workspace = Libraries>Weather

Type = Design Day

Sub Type = Default

Note: To access this Library Entry the Source Library needs to be changed to Project Model.

Weather

SizingPeriod:DesignDay0

Property	Value	Unit
Month	**1**	
Day of Month	**21**	
Day Type	**WinterDesignDay**	
Maximum Dry-Bulb Temperature	**-7.6**	**F**
Daily Dry-Bulb Temperature Range	0	deltaF
Dry-Bulb Temperature Range Modifier Type	DefaultMultipliers	
Dry-Bulb Temperature Range Modifier Schedule		
Humidity Condition Type	WetBulb	
Wetbulb or DewPoint at Maximum Dry-Bulb	-7.6	F
Humidity Condition Day Schedule Name		
Humidity Ratio at Maximum Dry-Bulb		lb-H2O/lb-air
Enthalpy at Maximum Dry-Bulb		Btu/lb
Daily Wet-Bulb Temperature Range		deltaF
Barometric Pressure	29.03	inHg
Wind Speed	**8.5**	**miles/hr**
Wind Direction	**300**	**deg**
Rain Indicator	No	
Snow Indicator	No	
Daylight Saving Time Indicator	No	
Solar Model Indicator	ASHRAEClearSky	
Beam Solar Day Schedule Name		
Diffuse Solar Day Schedule Name		
ASHRAE Clear Sky Optical Depth for Beam Irradi	0	
ASHRAE Clear Sky Optical Depth for Diffuse Irra	0	
Sky Clearness	0	

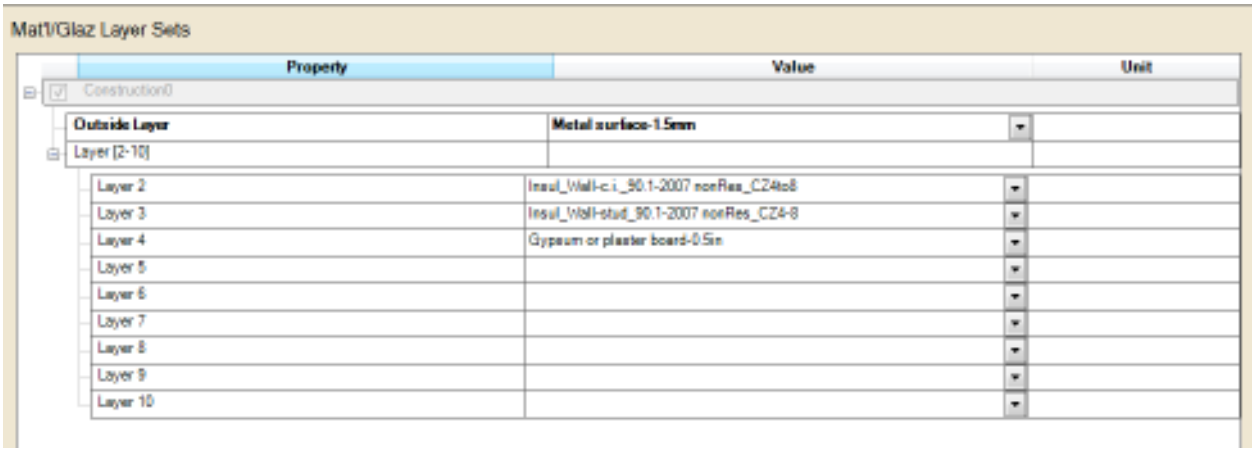
Mat'l/Glaz Layer Sets

Wall-90.1-2007_nonRes CZ4-8

Workspace = Libraries>Mat'l/Glaz Layer Sets

Type = OpaqueLayerSet

Sub Type = Default

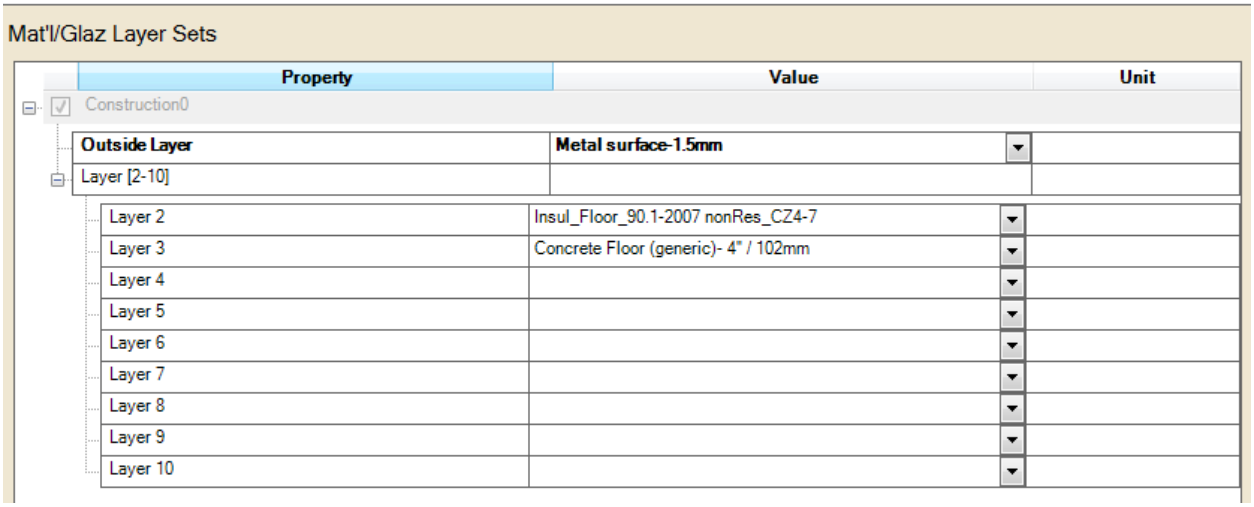


Floor 90.1-2007_nonRes CZ4-7

Workspace = Libraries>Mat'l/Glaz Layer Sets

Type = OpaqueLayerSet

Sub Type = Default

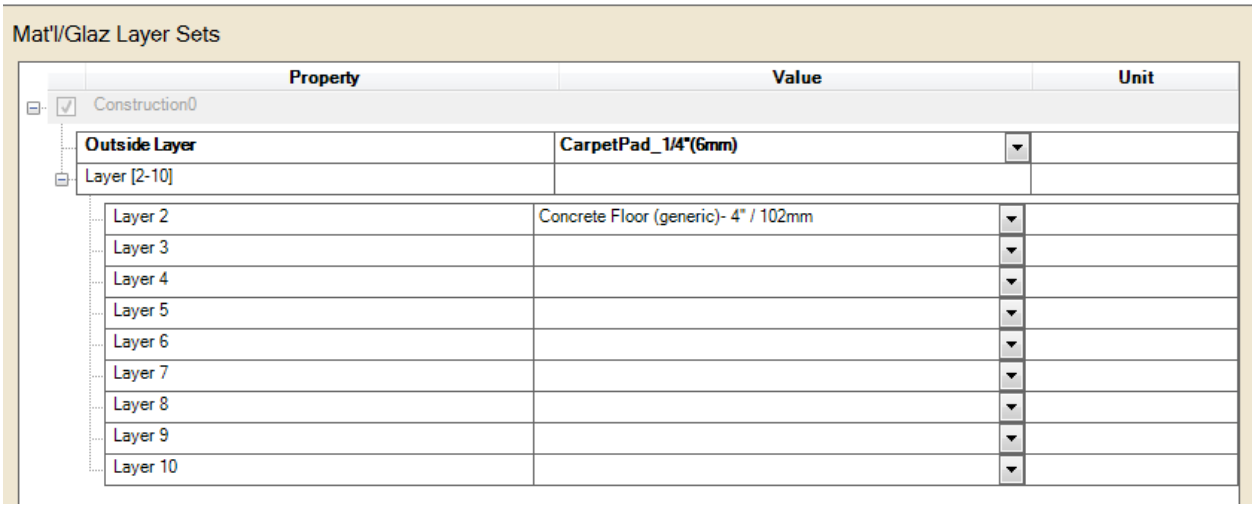


Floor-Int_4"Concrete

Workspace = Libraries>Mat'l/Glaz Layer Sets

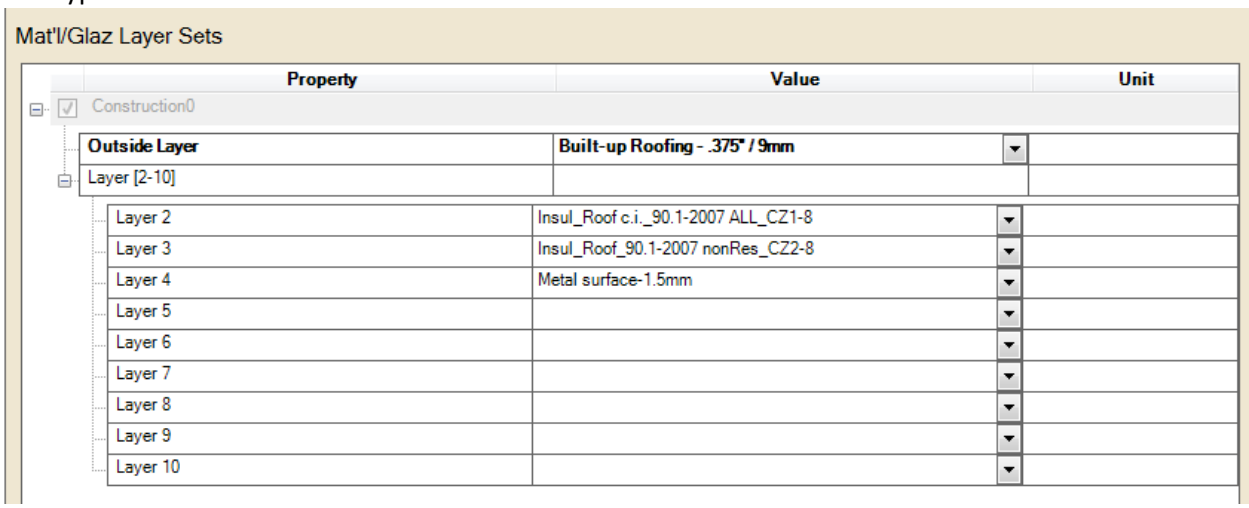
Type = OpaqueLayerSet

Sub Type = Default



Roof 90.1-2007_nonRes CZ2-8

Workspace = Libraries>Mat'l/Glaz Layer Sets
Type = OpaqueLayerSet
Sub Type = Default



Wall-Int_MtlStudGyp-4" / 100mm

Workspace = Libraries>Mat'l/Glaz Layer Sets
Type = OpaqueLayerSet
Sub Type = Default

Mat'l/Glaz Layer Sets

Property	Value	Unit
Construction0		
Outside Layer	**INT-FINISH_GypsumWallBoard_1/2"(12.5 mm)**	
Layer [2-10]		
Layer 2	AIRGAP_WallAirSpace_1"(25mm)	
Layer 3	INT-FINISH_GypsumWallBoard_1/2"(12.5 mm)	
Layer 4		
Layer 5		
Layer 6		
Layer 7		
Layer 8		
Layer 9		
Layer 10		

Glaz-Window_ASHRAE 90.1_nonRes&Res CZ4-6

Workspace = Libraries>Mat'l/Glaz Layer Sets
Type = GlazLayerSet
Sub Type = Default

Mat'l/Glaz Layer Sets

Property	Value	Unit
Construction0		
Outside Layer	**VERT-GLAZ_90.1_US_CZ-4_NonMetalFrame(U-2.27)**	
Layer [2-10]		
Layer 2		
Layer 3		
Layer 4		
Layer 5		
Layer 6		
Layer 7		
Layer 8		
Layer 9		
Layer 10		

Mat'l/Glaz Layers

Metal surface-1.5mm

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)
Type = Opaque Material Layer
Sub Type = Default

Mat'l/Glazing Layers

Property	Value	Unit
MaterialLayer:Opaque0		
Material Name	**F08 Metal surface**	
Layer Thickness	**0.06**	**in**

Insul_Wall-ci_90.1-2007 nonRes_CZ4to8

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

Mat'l/Glazing Layers

Property	Value	Unit
MaterialLayer:Opaque0		
Material Name	INSUL_InsulationBoard	
Layer Thickness	1.57	in

Insul_Wall-stud_90.1-2007 nonRes_CZ4-8

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

Mat'l/Glazing Layers

Property	Value	Unit
MaterialLayer:Opaque0		
Material Name	INSUL_Batt_GlassFiber	
Layer Thickness	1.7	in

Gypsum or plaster board-0.5in

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

Mat'l/Glazing Layers

Property	Value	Unit
MaterialLayer:Opaque0		
Material Name	Gypsum or plaster board	
Layer Thickness	0.5	in

Insul_Floor_90.1-2007 nonRes_CZ4-7

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

Mat'l/Glazing Layers

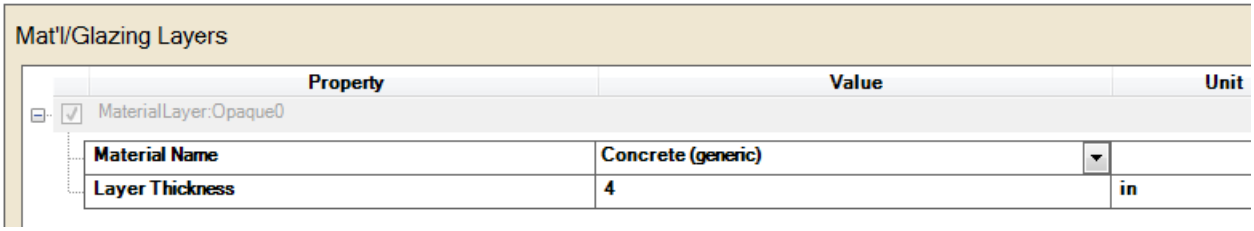
Property	Value	Unit
MaterialLayer:Opaque0		
Material Name	INSUL_RoofInsulation	
Layer Thickness	8.9	in

Concrete Floor (generic)- 4" / 102mm

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

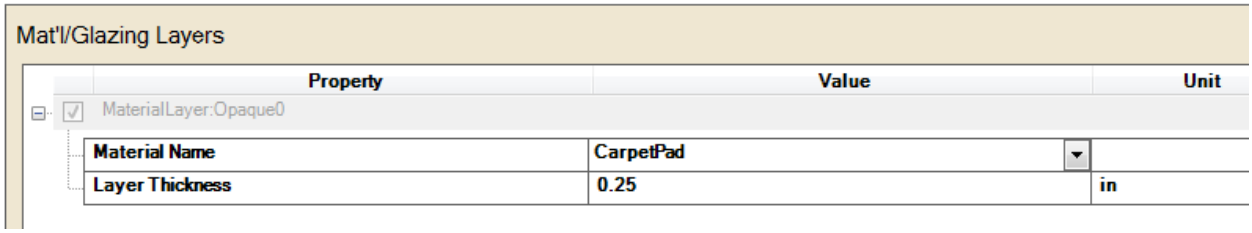


CarpetPad_1/4"(6mm)

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

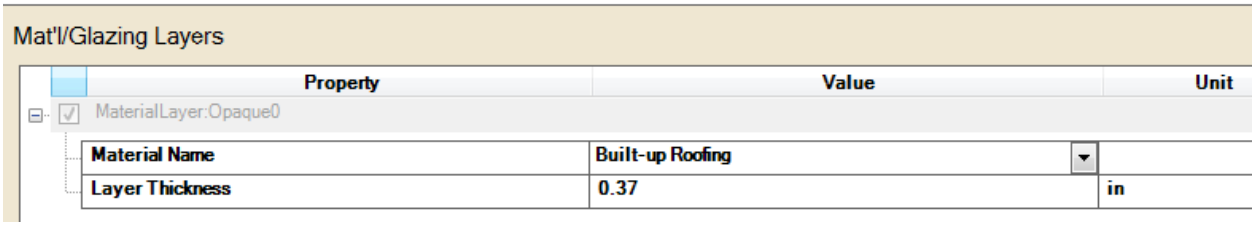


Built-up Roofing - .375" / 9mm

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

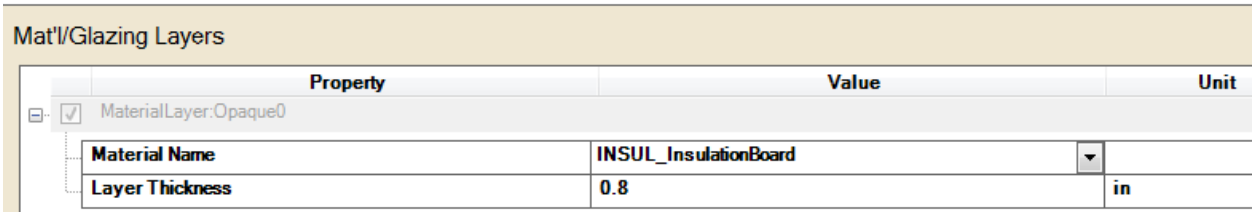


Insul_Roof c.i._90.1-2007 ALL_CZ1-8

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

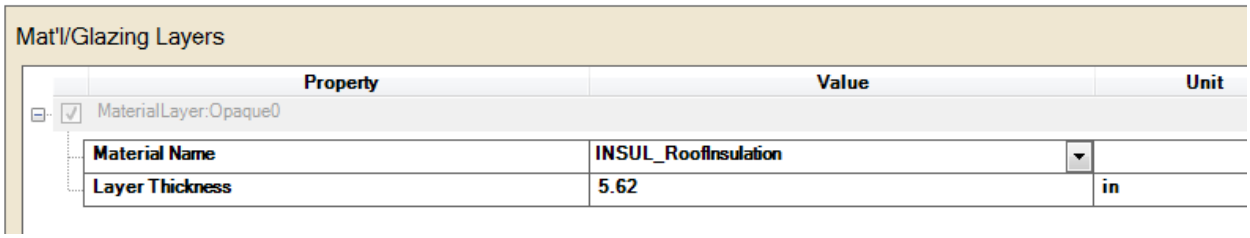


Insul_Roof_90.1-2007 nonRes_CZ2-8

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

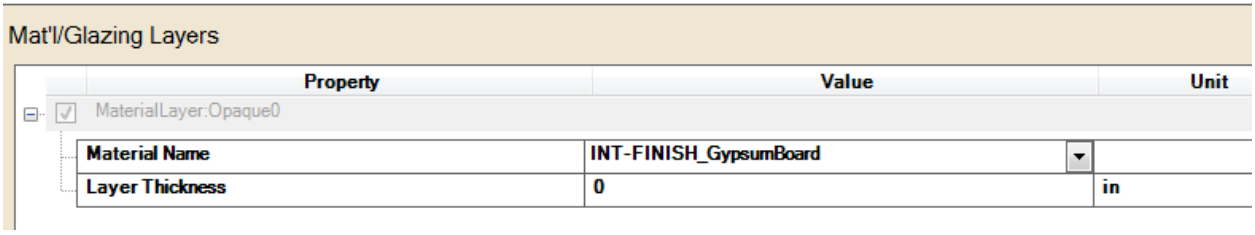


INT-FINISH_GypsumWallBoard_1/2"(12.5 mm)

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

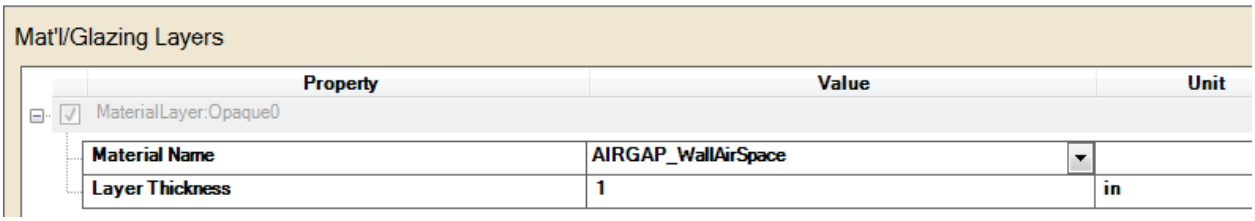


AIRGAP_WallAirSpace_1"(25mm)

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material Layer

Sub Type = Default

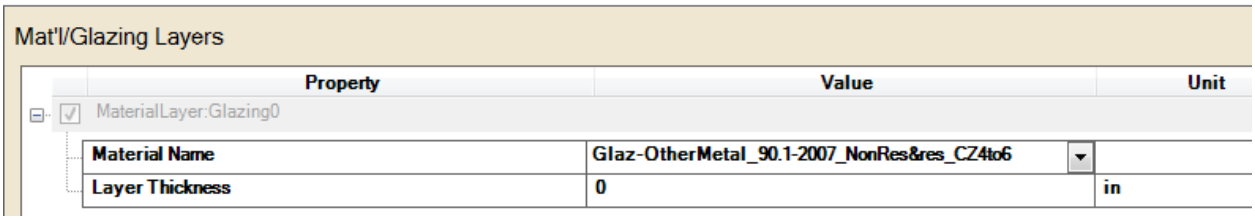


VERT-GLAZ_90.1_US_CZ-4_NonMetalFrame(U-2.27)

Workspace = Libraries>Mat'l/Glazing Layers (back to Mat'l/Glazing Layer Sets)

Type = Glazing Material Layer

Sub Type = Default



Materials

F08 Metal surface

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**Smooth**	
Conductivity	**314.01**	**Btu-in/h-ft2-F**
Density	**488.44**	**lb/ft3**
Specific Heat	**0.12**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

INSUL_InsulationBoard

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumRough**	
Conductivity	**0.21**	**Btu-in/h-ft2-F**
Density	**2.68**	**lb/ft3**
Specific Heat	**0.29**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

INSUL_Batt_GlassFiber

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumRough**	
Conductivity	**0.25**	**Btu-in/h-ft2-F**
Density	**1.2**	**lb/ft3**
Specific Heat	**0.23**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.5	
Visible Absorptance	0.5	

Gypsum or plaster board

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumSmooth**	
Conductivity	**4.02**	**Btu-in/h-ft2-F**
Density	**49.94**	**lb/ft3**
Specific Heat	**0.26**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

INSUL_RoofInsulation

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumRough**	
Conductivity	**0.36**	**Btu-in/h-ft2-F**
Density	**16**	**lb/ft3**
Specific Heat	**0.2**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

Concrete (generic)

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumRough**	
Conductivity	**10.06**	**Btu-in/h-ft2-F**
Density	**129.85**	**lb/ft3**
Specific Heat	**0.22**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

Carpet Pad

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = No Mass

Materials

Property	Value	Unit
Material:NoMass0		
Roughness	**VeryRough**	
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.8	
R-value per Unit Thickness	**1**	**ft2-h-F/Btu-in**

Built-up Roofing

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**VeryRough**	
Conductivity	**1.08**	**Btu-in/h-ft2-F**
Density	**70**	**lb/ft3**
Specific Heat	**0.33**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

INSUL_InsulationBoard

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumRough**	
Conductivity	**0.21**	**Btu-in/h-ft2-F**
Density	**2.68**	**lb/ft3**
Specific Heat	**0.29**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

INSUL_RoofInsulation

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumRough**	
Conductivity	**0.36**	**Btu-in/h-ft2-F**
Density	**16**	**lb/ft3**
Specific Heat	**0.2**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

INT-FINISH_GypsumBoard

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = Default

Materials

Property	Value	Unit
Material0		
Roughness	**MediumSmooth**	
Conductivity	**1.08**	**Btu-in/h-ft2-F**
Density	**49.94**	**lb/ft3**
Specific Heat	**0.2**	**Btu/lb-F**
Thermal Absorptance	0.9	
Solar Absorptance	0.7	
Visible Absorptance	0.7	

AIRGAP_WallAirSpace

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = AirGap

Materials

Property	Value	Unit
Material:AirGap0		
Thermal Resistance	0.85	ft2-F-hr/Btu

Glaz-OtherMetal_90.1-2007_NonRes&res_CZ4to6

Workspace = Libraries>Materials (back to Mat'l/Glazing Layer Sets)

Type = Opaque Material

Sub Type = AirGap

Materials

Property	Value	Unit
WindowMaterial:SimpleGlazingSystem0		
U-Factor	**0.55**	**Btu/h-ft2-F**
Solar Heat Gain Coefficient	**0.4**	
Visible Transmittance		

Internal Loads

OfficeBldg_Equip_COMNET

Workspace = Libraries>Internal Loads

Type = Equipment

Sub Type = Electric

Internal Loads

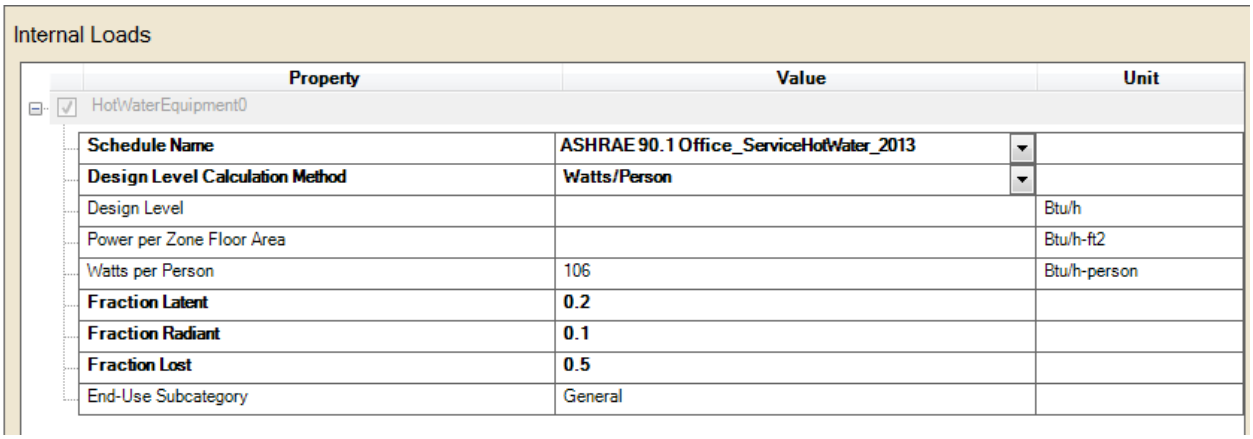
Property	Value	Unit
ElectricEquipment0		
Schedule Name	**ASHRAE 90.1 Office_Ltg&PlugLoads_2013**	
Design Level Calculation Method	**Watts/Area**	
Design Level		W
Watts per Zone Floor Area	0.8	W/ft2
Watts per Person		W/person
Fraction Latent	**0**	
Fraction Radiant	**0.5**	
Fraction Lost	**0**	
End-Use Subcategory	General	

OfficeBldg_SHW_ASHRAE 90-1-2007

Workspace = Libraries>Internal Loads

Type = Equipment

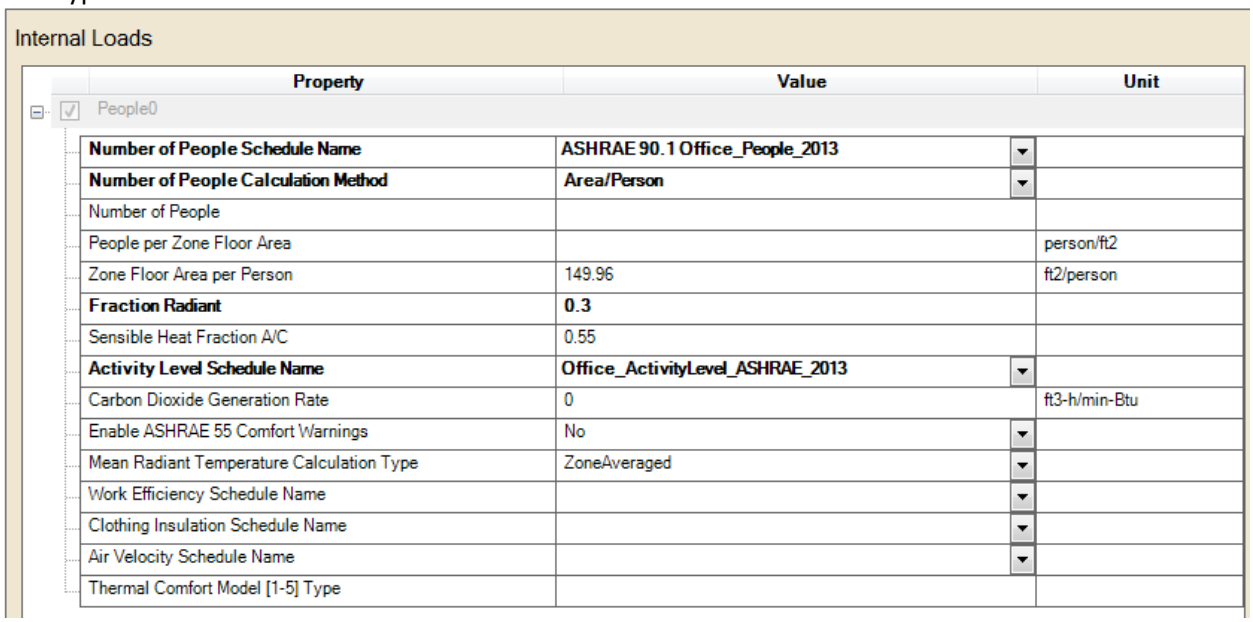
Sub Type = Hot Water


Internal Loads

Property	Value	Unit
HotWaterEquipment0		
Schedule Name	**ASHRAE 90.1 Office_ServiceHotWater_2013**	
Design Level Calculation Method	**Watts/Person**	
Design Level		Btu/h
Power per Zone Floor Area		Btu/h-ft2
Watts per Person	106	Btu/h-person
Fraction Latent	**0.2**	
Fraction Radiant	**0.1**	
Fraction Lost	**0.5**	
End-Use Subcategory	General	

OfficeBldg_Occup_COMNET

Workspace = Libraries>Internal Loads
Type = People
Sub Type = Default


Internal Loads

Property	Value	Unit
People0		
Number of People Schedule Name	**ASHRAE 90.1 Office_People_2013**	
Number of People Calculation Method	**Area/Person**	
Number of People		
People per Zone Floor Area		person/ft2
Zone Floor Area per Person	149.96	ft2/person
Fraction Radiant	**0.3**	
Sensible Heat Fraction A/C	0.55	
Activity Level Schedule Name	**Office_ActivityLevel_ASHRAE_2013**	
Carbon Dioxide Generation Rate	0	ft3-h/min-Btu
Enable ASHRAE 55 Comfort Warnings	No	
Mean Radiant Temperature Calculation Type	ZoneAveraged	
Work Efficiency Schedule Name		
Clothing Insulation Schedule Name		
Air Velocity Schedule Name		
Thermal Comfort Model [1-5] Type		

OfficeBldg_Ltg_90-1-2007

Workspace = Libraries>Internal Loads
Type = Lights
Sub Type = Default

Internal Loads

Property	Value	Unit
Lights0		
Schedule Name	**ASHRAE 90.1 Office_Ltg&PlugLoads_2013**	
Design Level Calculation Method	**Watts/Area**	
Lighting Level		W
Watts per Zone Floor Area	1	W/ft2
Watts per Person		W/person
Return Air Fraction	**0**	
Fraction Radiant	**0.42**	
Fraction Visible	**0.18**	
Fraction Replaceable	**1**	
End-Use Subcategory	General	
Return Air Fraction Calculated from Plenum Temperature	No	
Return Air Fraction Function of Plenum Temperature Coeffici	0	
Return Air Fraction Function of Plenum Temperature Coeffici	0	1/R

Sizing Params

ASHRAE 90.1 sizing factors

Workspace = Libraries>Sim Params

Type = Simulation Control

Sub Type = Default

Sizing Params

Property	Value	Unit
Sizing:Parameters0		
Heating Sizing Factor	1.25	
Cooling Sizing Factor	1.15	
Timesteps in Averaging Window		

Office_ZoneSizing_DOErefBldgs

Workspace = Libraries>Sizing Params

Type = HVAC Design

Sub Type = ZoneSizing

Sizing Params

Property	Value	Unit
Sizing:Zone0		
Zone Cooling Design Supply Air Temperature Input Method		
Zone Cooling Design Supply Air Temperature	55	F
Zone Cooling Design Supply Air Temperature Difference		deltaF
Zone Heating Design Supply Air Temperature Input Method		
Zone Heating Design Supply Air Temperature	100	F
Zone Heating Design Supply Air Temperature Difference		deltaF
Zone Cooling Design Supply Air Humidity Ratio	**0.01**	**lb-H2O/lb-air**
Zone Heating Design Supply Air Humidity Ratio	**0.01**	**lb-H2O/lb-air**
Design Specification Outdoor Air Object Name	Office_OASpec_62-1-2007	
Zone Heating Sizing Factor		
Zone Cooling Sizing Factor		
Cooling Design Air Flow Method	DesignDay	
Cooling Design Air Flow Rate	0	cfm
Cooling Minimum Air Flow per Zone Floor Area	0	cfm/ft2
Cooling Minimum Air Flow	0	cfm
Cooling Minimum Air Flow Fraction	0	
Heating Design Air Flow Method	DesignDay	
Heating Design Air Flow Rate	0	cfm
Heating Maximum Air Flow per Zone Floor Area	0	cfm/ft2
Heating Maximum Air Flow	0	cfm
Heating Maximum Air Flow Fraction	0	
Design Specification Zone Air Distribution Object Name		

CHWS-44F_dT-12F

Workspace = Libraries>Sizing Params

Type = HVAC Design

Sub Type = Water Loop Sizing

EnergyPlus Object = SizingPlant

Sizing Params

Property	Value	Unit
Sizing:Plant0		
Loop Type	**Cooling**	
Design Loop Exit Temperature	**44**	**F**
Loop Design Temperature Difference	**12**	**deltaF**

CWS-85F_dT-10F

Workspace = Libraries>Sizing Params

Type = HVAC Design

Sub Type = Water Loop Sizing

EnergyPlus Object = SizingPlant

Sizing Params

Property	Value	Unit
Sizing:Plant0		
Loop Type	**Condenser**	
Design Loop Exit Temperature	**85**	**F**
Loop Design Temperature Difference	**10**	**deltaF**

HWS-180F_dT-50F

Workspace = Libraries>Sizing Params

Type = HVAC Design

Sub Type = Water Loop Sizing

EnergyPlus Object = SizingPlant

Sizing Params

Property	Value	Unit
Sizing:Plant0		
Loop Type	Heating	
Design Loop Exit Temperature	180	F
Loop Design Temperature Difference	50	deltaF

Controllers

Dual Setpoint Controller

Workspace = Libraries>Controllers

Type = ZoneControlTemperature

Sub Type = Thermostat

Controllers

Property	Value	Unit
ZoneControl:Thermostat0		
Control Type Schedule Name	ZoneControlTypeSched	
Control [1-4] Name		
Control Name1	Thermostat-Dual Setpoint Scheduled	
Control Name2		
Control Name3		
Control Name4		
ZoneControl:Thermostat:OperativeTemperature1		
Radiative Fraction Input Mode		
Fixed Radiative Fraction		
Radiative Fraction Schedule Name		
ZoneControl:Thermostat:TemperatureAndHumidity2		
Dehumidifying Relative Humidity Setpoint Schedule Name		
Dehumidification Control Type		
Overcool Range Input Method		
Overcool Constant Range	3.1	deltaF
Overcool Range Schedule Name		
Overcool Control Ratio	2	percent/F

Sim Params

Sizing Run for Design Day Only

Workspace = Libraries>Sim Params

Type = Simulation Control

Sub Type = Default

Sim Params

Property	Value	Unit
SimulationControl0		
Do Zone Sizing Calculation	Yes	
Do System Sizing Calculation	Yes	
Do Plant Sizing Calculation	Yes	
Run Simulation for Sizing Periods	Yes	
Run Simulation for Weather File Run Periods	No	
Version1		
Version Identifier	**7.2**	
ShadowCalculation2		
Calculation Frequency	**20**	
Maximum Figures in Shadow Overlap Calculations	15000	
Polygon Clipping Algorithm		
Sky Diffuse Modeling Algorithm		
ZoneCapacitanceMultiplier:ResearchSpecial3		
ZoneAirContaminantBalance4		
Timestep5		
Number of Timesteps per Hour	**6**	
ConvergenceLimits6		
Minimum System Timestep		sec
Maximum HVAC Iterations	20	
Minimum Plant Iterations	2	
Maximum Plant Iterations	8	
ProgramControl7		

Sizing Runs Including Period

Workspace = Libraries>Sizing Params

Type = Simulation Control

Sub Type = Default

Sim Params

Property	Value
SimulationControl0	
Do Zone Sizing Calculation	Yes
Do System Sizing Calculation	Yes
Do Plant Sizing Calculation	Yes
Run Simulation for Sizing Periods	Yes
Run Simulation for Weather File Run Periods	Yes
Version1	
Version Identifier	**7.2**
ShadowCalculation2	
ZoneCapacitanceMultiplier:ResearchSpecial3	
ZoneAirContaminantBalance4	
Timestep5	
Number of Timesteps per Hour	**6**
ConvergenceLimits6	
ProgramControl7	

Annual Run for 2013

Workspace = Libraries>Sizing Params

Type = Simulation Control

Sub Type = Run Period

Sim Params

Property	Value
RunPeriod0	
Begin Month	**1**
Begin Day of Month	**1**
End Month	**12**
End Day of Month	**31**
Day of Week for Start Day	Tuesday
Use Weather File Holidays and Special Days	Yes
Use Weather File Daylight Saving Period	Yes
Apply Weekend Holiday Rule	No
Use Weather File Rain Indicators	Yes
Use Weather File Snow Indicators	Yes
Number of Times Runperiod to be Repeated	1
Increment Day of Week on repeat	Yes
Start Year	2013

Control Schemes

Scheme_CoolingLoad_UpTo_1GW

Workspace = Libraries>Control Schemes

Type = Control and Sequencing Scheme

Sub Type = Cooling Load

EnergyPlus Objet = PlantEquipmentOperation:CoolingLoad

Control Schemes

Property	Value	Unit
PlantEquipmentOperation:CoolingLoad0		
Load Range [1-10] Lower Limit	0	Btu/h
Load Range [1-10] Upper Limit	**3412000000**	**Btu/h**

Scheme_HeatingLoad_UpTo_1GW

Workspace = Libraries>Control Schemes

Type = Control and Sequencing Scheme

Sub Type = Cooling Load

EnergyPlus Objet = PlantEquipmentOperation:HeatingLoad

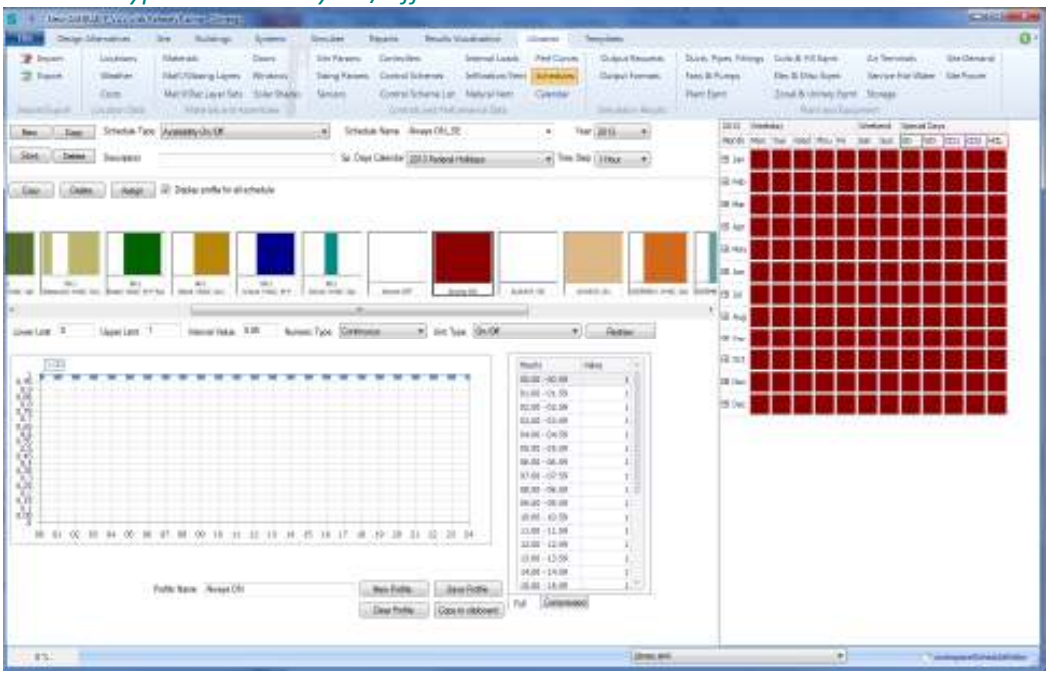
Control Schemes

Property	Value	Unit
PlantEquipmentOperation:HeatingLoad0		
Load Range [1-10] Lower Limit	0	Btu/h
Load Range [1-10] Upper Limit	**3412000000**	**Btu/h**

Schedules

AlwaysON_SE

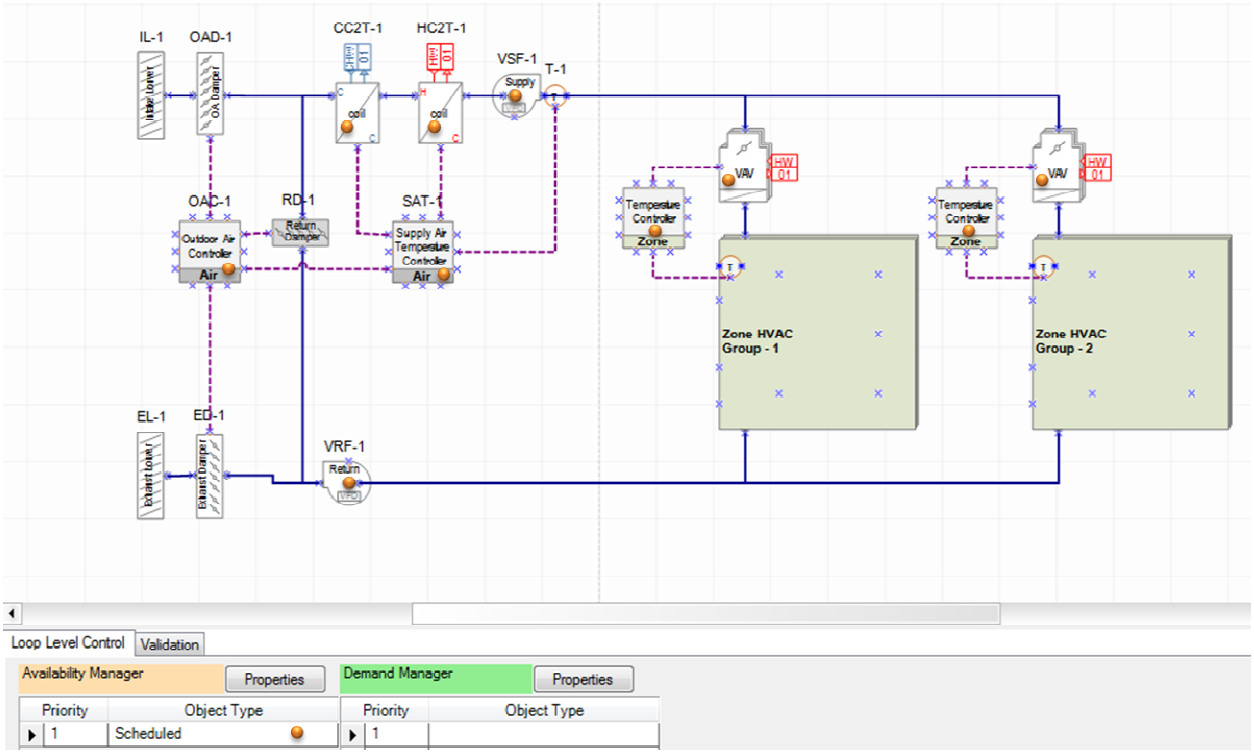
Schedule Type = Availability On/Off



Air Loop System Diagram

The Air Loop Diagram is interactive diagram. Selecting the components with the orange dot will display a pop-up dialog containing the component properties as displayed within the ASHRAE Baseline System 7 Sample File. The other components do not contain properties that influence Simergy simulations.

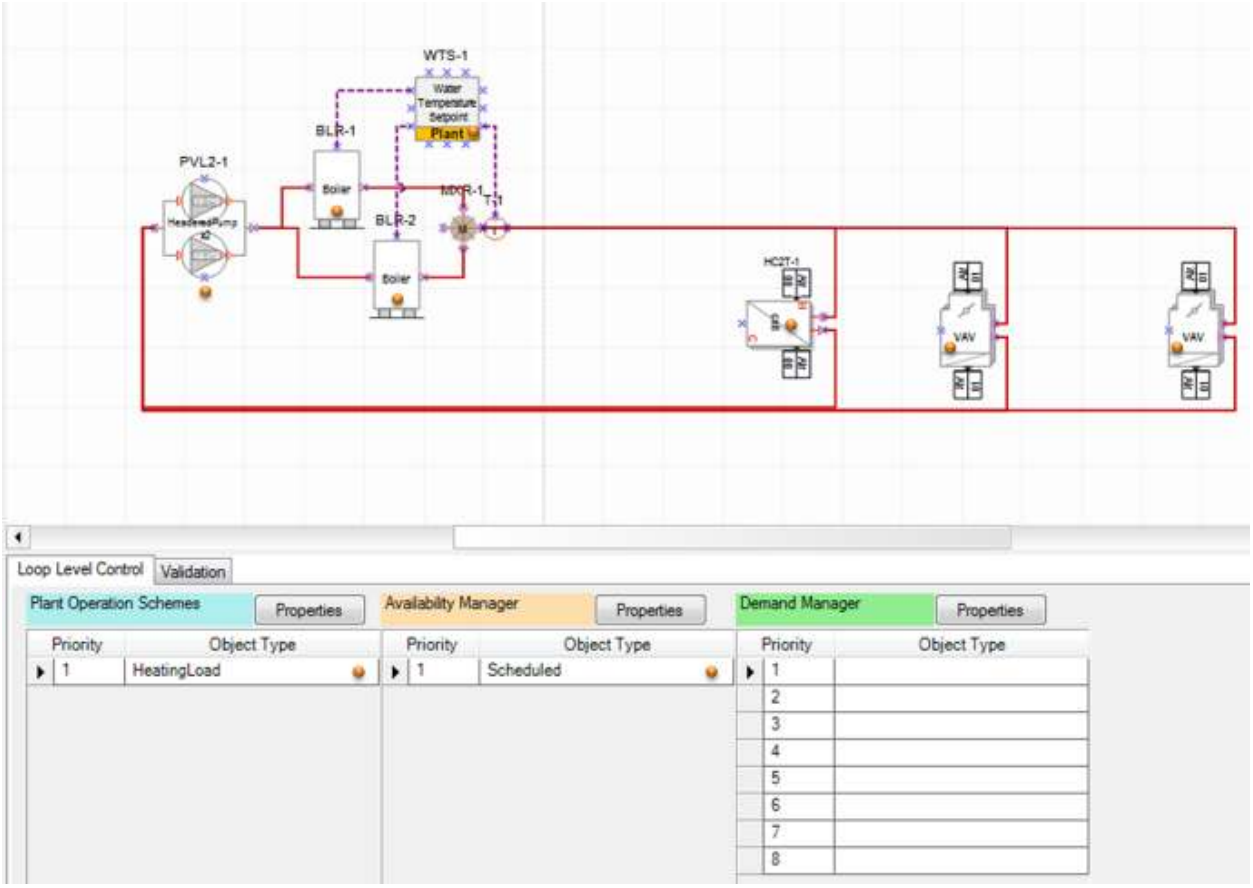
Related Topics: Air Loop Template



Hot Water Loop System Diagram

The Hot Water Loop Diagram is interactive diagram. Selecting the components with the orange dot will display a pop-up dialog containing the component properties as displayed within the ASHRAE Baseline System 7 Sample File. The other components do not contain properties that influence Simergy simulations.

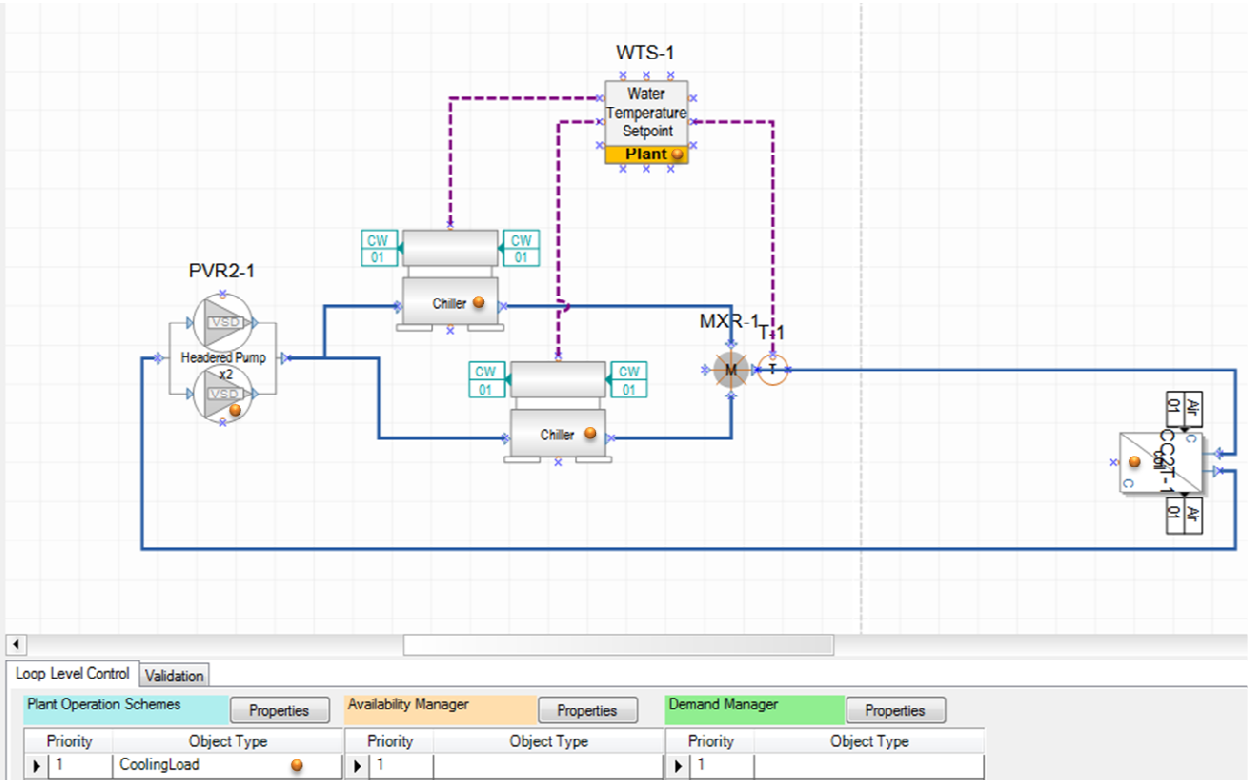
Related Topics: Hot Water Loop Template



Chilled Water Loop System Diagram

The Chilled Water Loop Diagram is interactive diagram. Selecting the components with the orange dot will display a pop-up dialog containing the component properties as displayed within the ASHRAE Baseline System 7 Sample File. The other components do not contain properties that influence Simergy simulations.

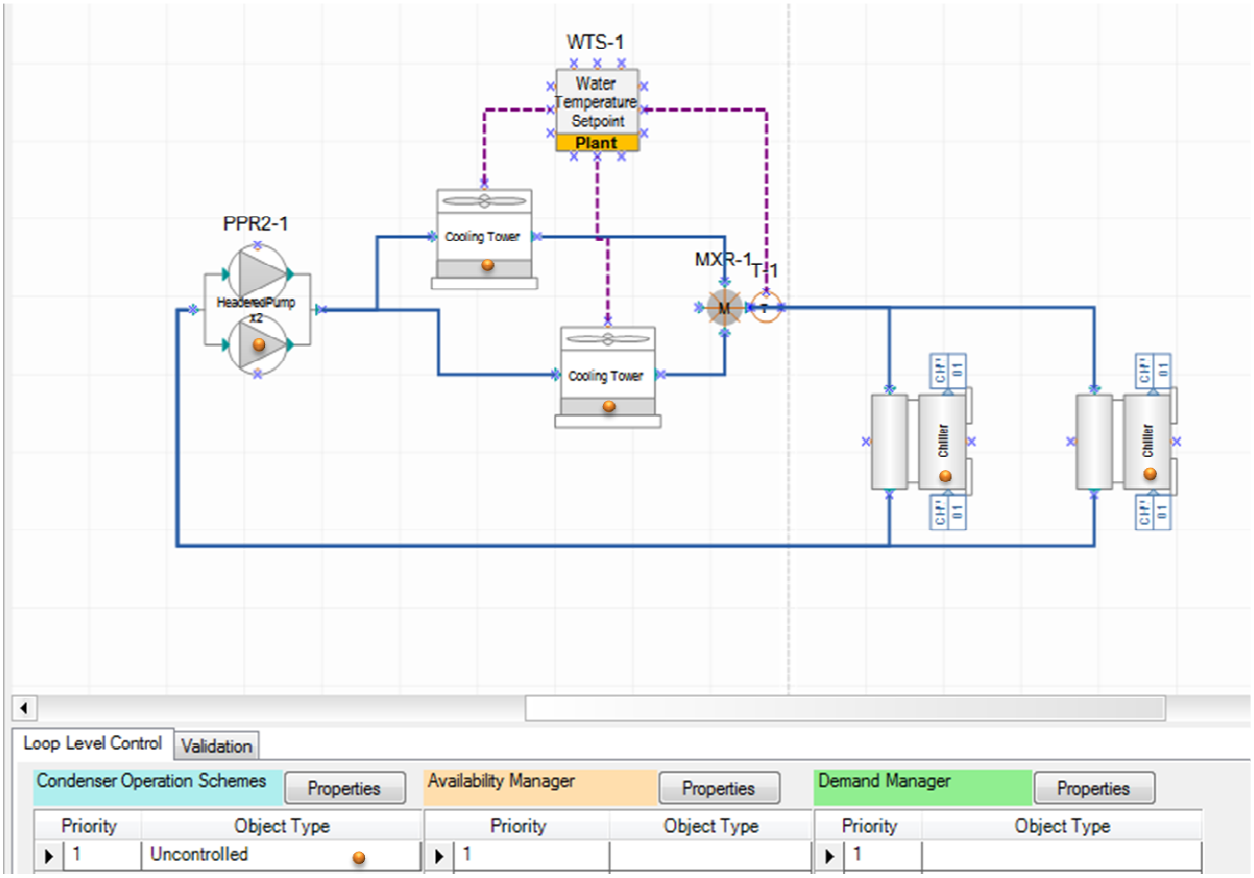
Related Topics: Chilled Water Loop Template



Condenser Water Loop System Diagram

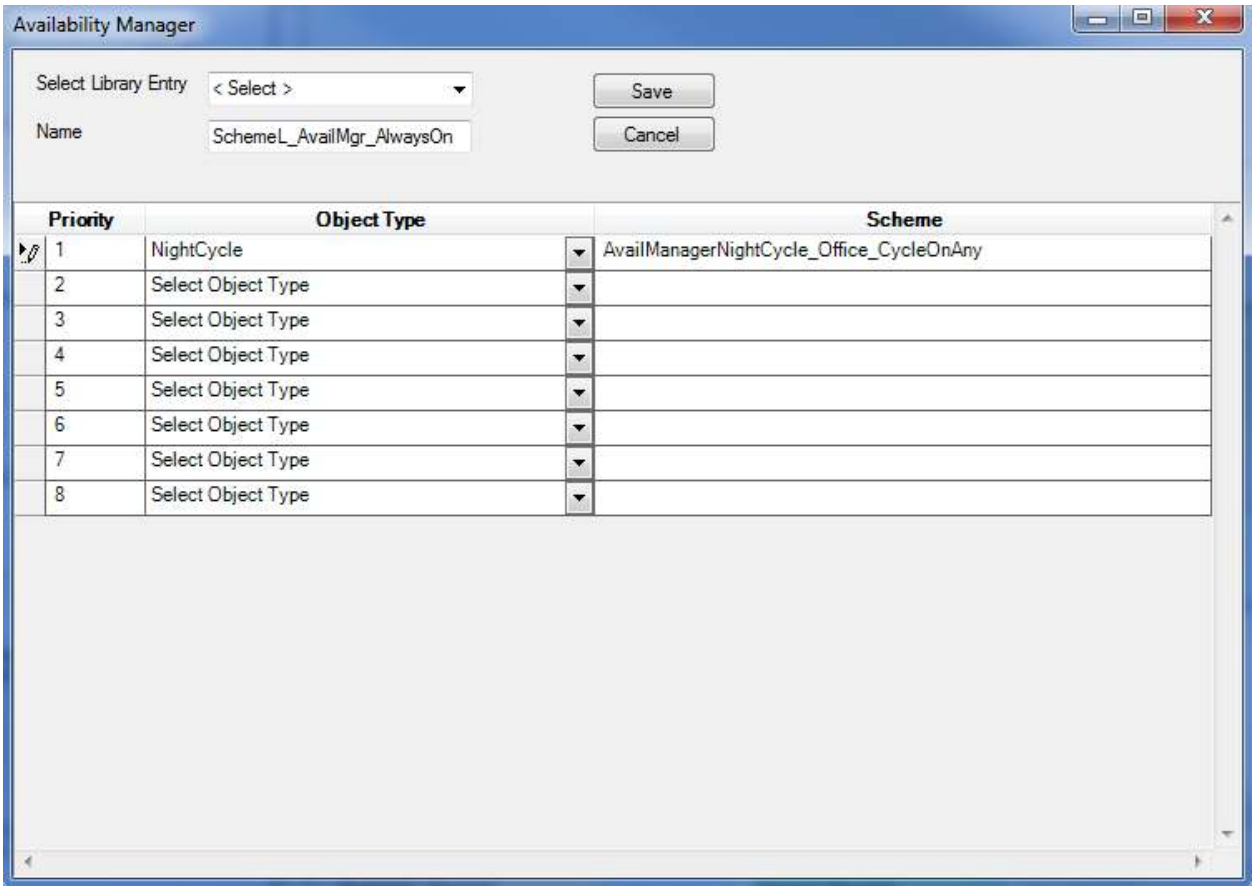
The Condenser Water Loop Diagram is interactive diagram. Selecting the components with the orange dot will display a pop-up dialog containing the component properties as displayed within the ASHRAE Baseline System 7 Sample File. The other components do not contain properties that influence Simergy simulations.

Related Topics: Condenser Water Loop Template

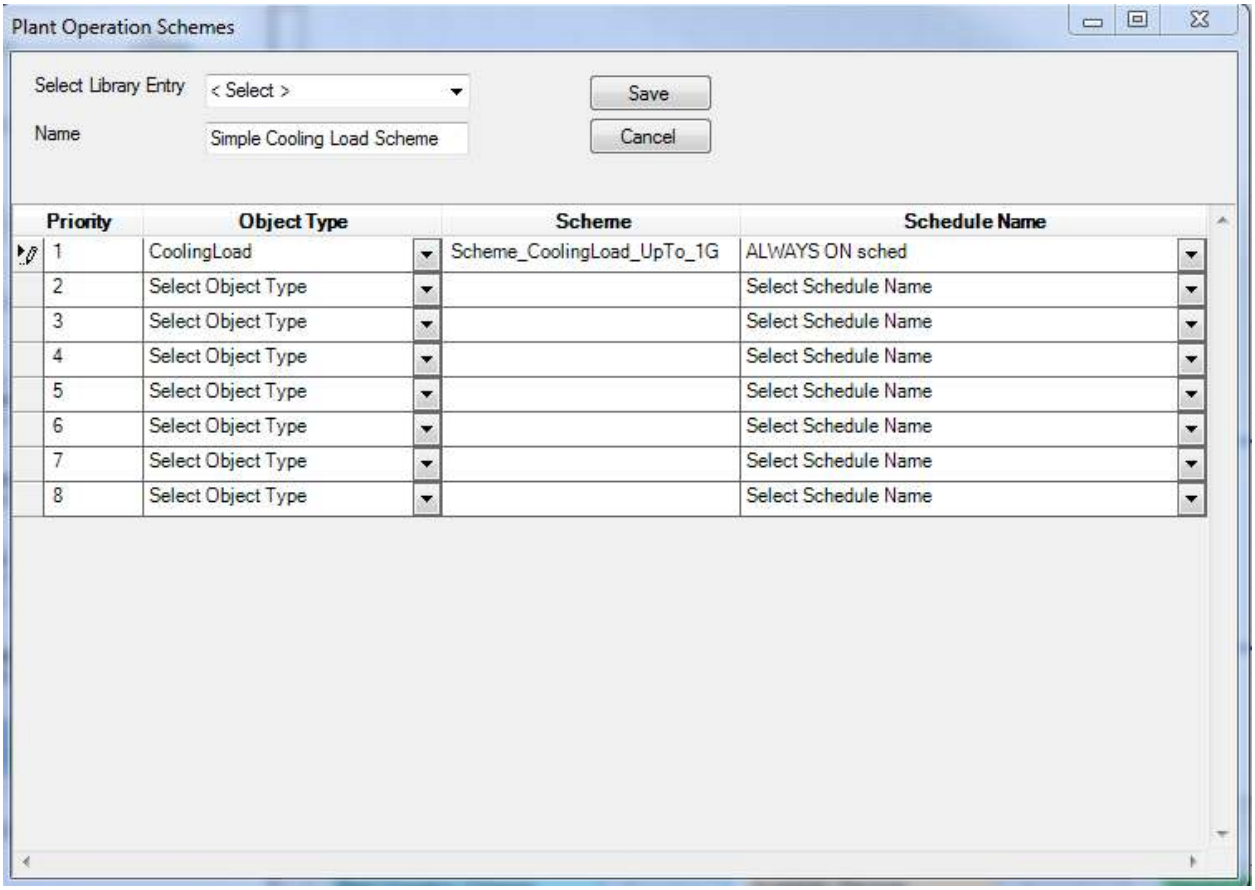


Loop Level Controls

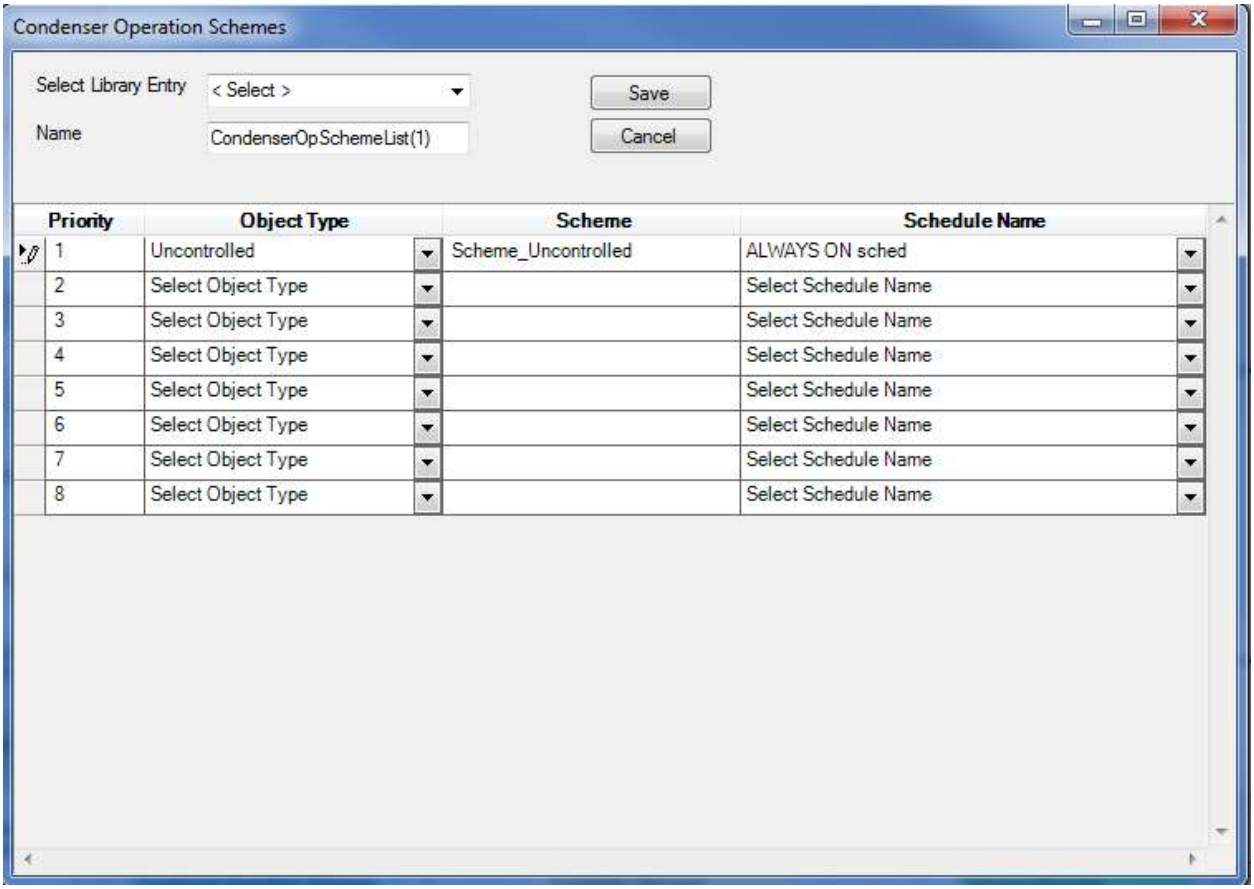
Air - Night Cycle - Loop Level Controls



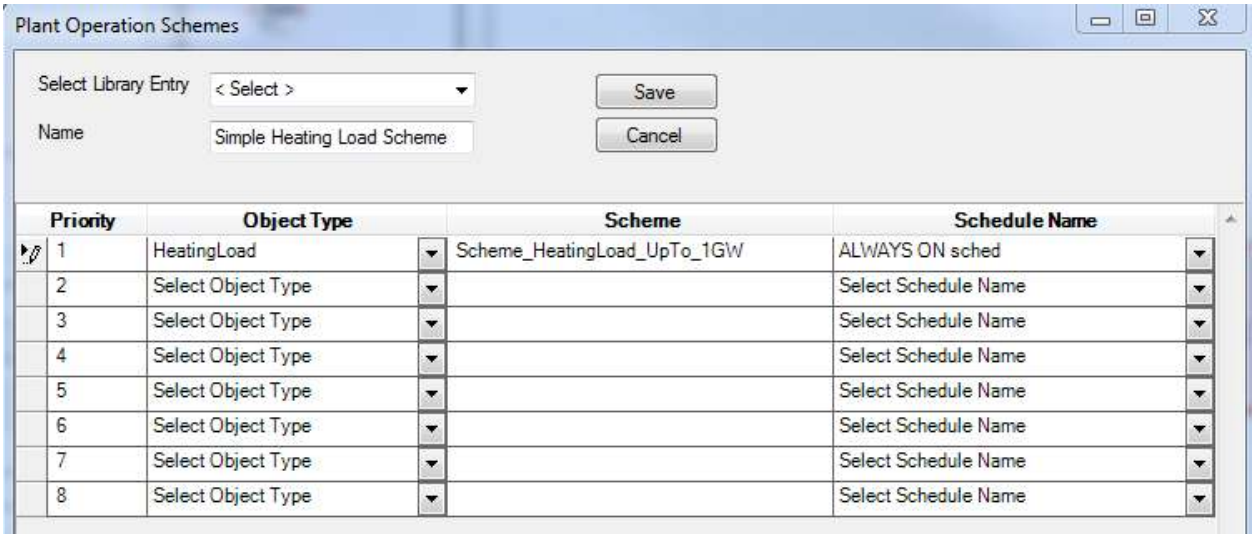
CHW Plant Operation Scheme Loop Level Controls



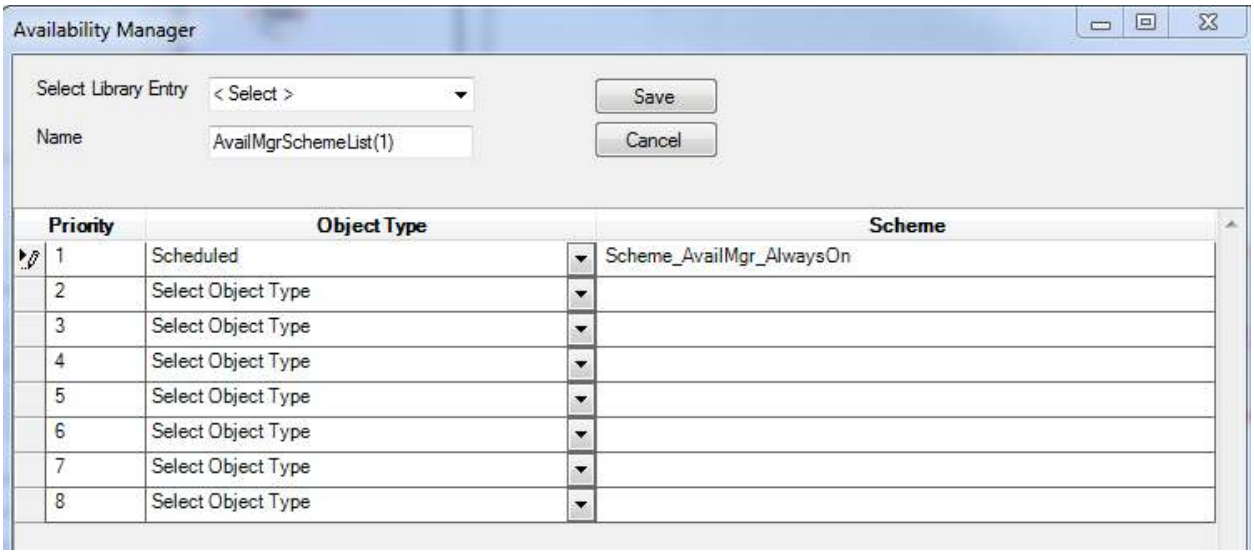
CW Condenser Operation Scheme



Hot Water Plant Operation Scheme Loop Level Controls



Hot Water Availability Manager Loop Level Controls



Components

Cooling Tower

Selected Component Information

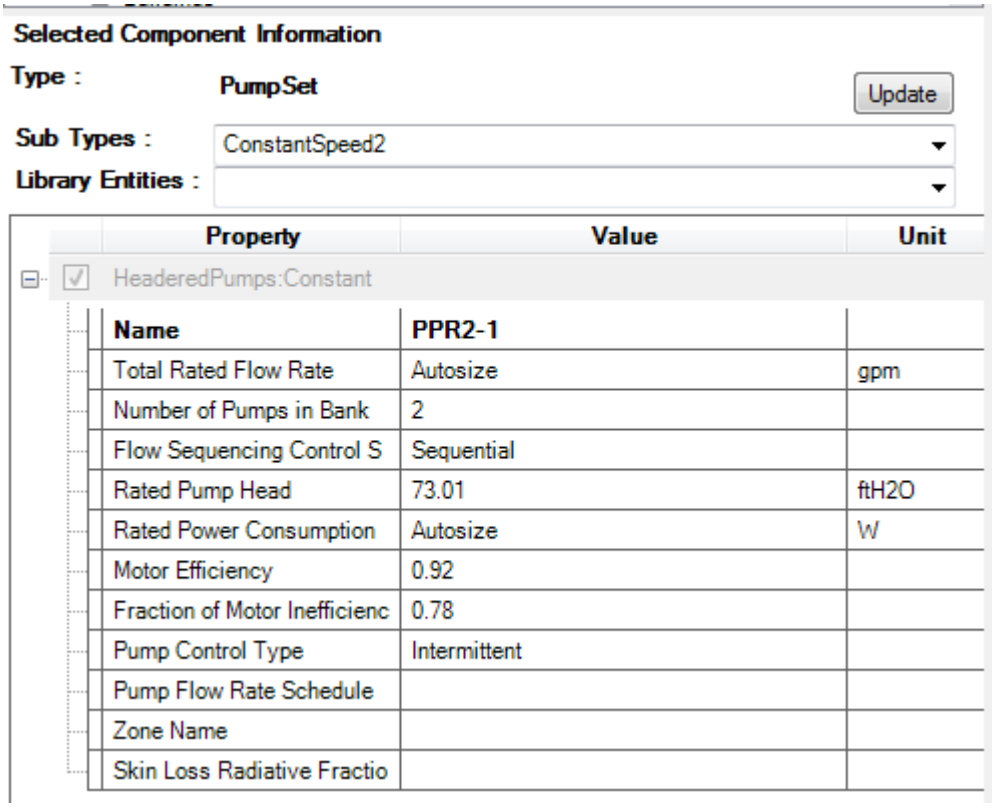
Type : **CoolingTower** Update

Sub Types : TwoSpeed

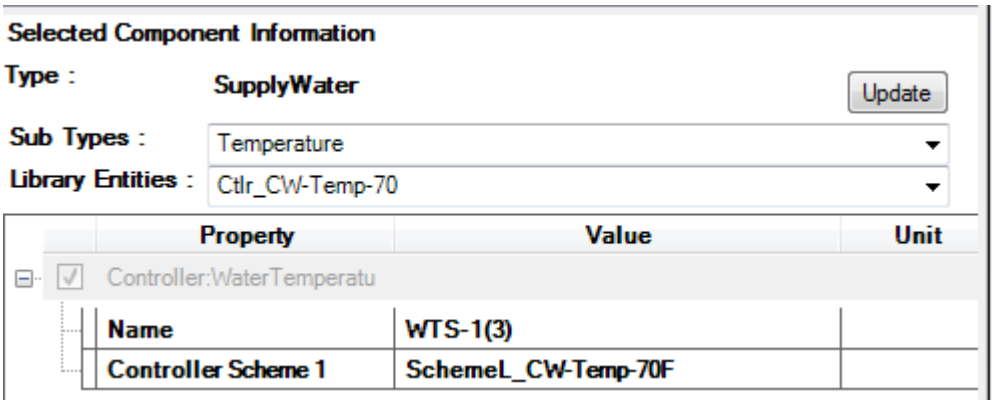
Library Entities : CoolTwr-2SP

Property	Value	Unit
CoolingTower:TwoSpeed		
Name	**CT-1(1)**	
Design Water Flow Rate	Autosize	gpm
Air Flow Rate at High Fan Speed	**Autosize**	**cfm**
Fan Power at High Fan Speed	**Autosize**	**W**
U-Factor Times Area Value at High Fan Speed	Autosize	Btu/h-F
Air Flow Rate at Low Fan Speed	**Autosize**	**cfm**
Fan Power at Low Fan Speed	**Autosize**	**W**
U-Factor Times Area Value at Low Fan Speed	Autosize	Btu/h-F
Air Flow Rate in Free Convection Regime	Autosize	cfm
U-Factor Times Area Value at Free Convection Air	Autosize	Btu/h-F
Performance Input Method	UFactorTimesAreaAnd	
High Speed Nominal Capacity		
Low Speed Nominal Capacity		
Free Convection Capacity		
Basin Heater Capacity	0	Btu/h-F
Basin Heater Setpoint Temperature	35.6	F
Basin Heater Operating Schedule Name		
Evaporation Loss Mode		
Evaporation Loss Factor	0	percent/
Drift Loss Percent	0	percent
Blowdown Calculation Mode		
Blowdown Concentration Ratio	3	
Blowdown Makeup Water Usage Schedule Name		
Supply Water Storage Tank Name		
Number of Cells	1	
Cell Control	MinimalCell	
Cell Minimum Water Flow Rate Fraction	0.33	
Cell Maximum Water Flow Rate Fraction	2.5	
Sizing Factor	0.5	

Condenser Water Headered Pumps



Condenser Water Plant Water Temperature Setpoint Controller



Chiller

Selected Component Information

Type : **Chiller** Update

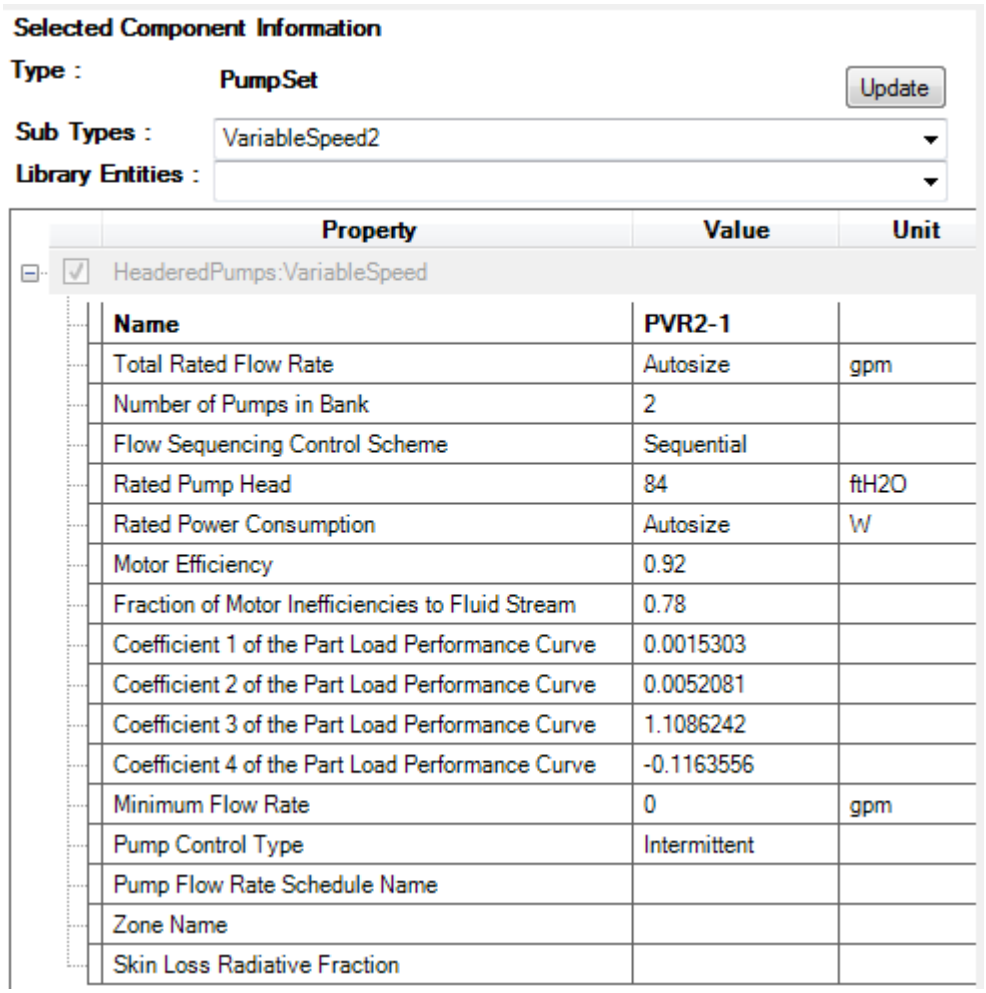
Sub Types : ChillerVaporCompressionElectric_EIR

Library Entities : Chlr_VP_WC_COMNET

Condenser loop: CW Loop - 1

Property	Value	Unit
Chiller:Electric:EIR		
Name	**CH-2(1)**	
Reference Capacity	**Autosize**	**Btu/h**
Reference COP	**3**	**Btuh/Btu**
Reference Leaving Chilled Water Temperat	44	F
Reference Entering Condenser Fluid Tempe	84.9	F
Reference Chilled Water Flow Rate	Autosize	gpm
Reference Condenser Fluid Flow Rate	Autosize	gpm
Cooling Capacity Function of Temperature	**WC-Cent-Chiller_EPlusDefault_CAP**	
Electric Input to Cooling Output Ratio Fun	**WC Screw Default 90.1-2004 EIR_fT**	
Electric Input to Cooling Output Ratio Fun	**WC-Cent-Chiller_EPlusDefault_EIR-**	
Minimum Part Load Ratio	0.1	
Maximum Part Load Ratio	1	
Optimum Part Load Ratio	1	
Minimum Unloading Ratio	0.2	
Condenser Type	WaterCooled	
Condenser Fan Power Ratio	0	Btuh/Btuh
Compressor Motor Efficiency	1	
Leaving Chilled Water Lower Temperature L	35.6	F
Chiller Flow Mode	VariableFlow	
Design Heat Recovery Water Flow Rate	0	gpm
Sizing Factor	0.5	
Basin Heater Capacity	0	Btu/h-F
Basin Heater Setpoint Temperature	35.6	F
Basin Heater Operating Schedule Name	Always OFF_SE_2013(3)	

Chilled Water Headered Pumps



Selected Component Information

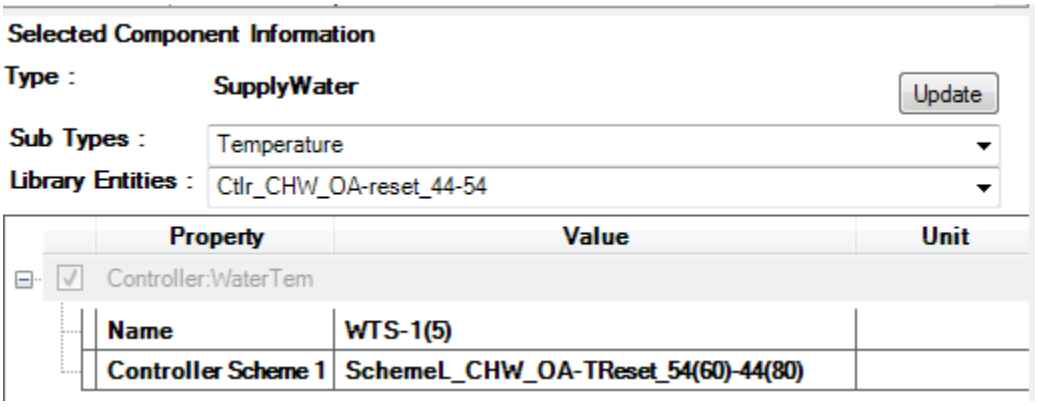
Type : **PumpSet** Update

Sub Types : VariableSpeed2

Library Entities :

Property	Value	Unit
HeaderedPumps:VariableSpeed		
Name	**PVR2-1**	
Total Rated Flow Rate	Autosize	gpm
Number of Pumps in Bank	2	
Flow Sequencing Control Scheme	Sequential	
Rated Pump Head	84	ftH2O
Rated Power Consumption	Autosize	W
Motor Efficiency	0.92	
Fraction of Motor Inefficiencies to Fluid Stream	0.78	
Coefficient 1 of the Part Load Performance Curve	0.0015303	
Coefficient 2 of the Part Load Performance Curve	0.0052081	
Coefficient 3 of the Part Load Performance Curve	1.1086242	
Coefficient 4 of the Part Load Performance Curve	-0.1163556	
Minimum Flow Rate	0	gpm
Pump Control Type	Intermittent	
Pump Flow Rate Schedule Name		
Zone Name		
Skin Loss Radiative Fraction		

Chilled Water Plant Water Temperature Setpoint Controller



Selected Component Information

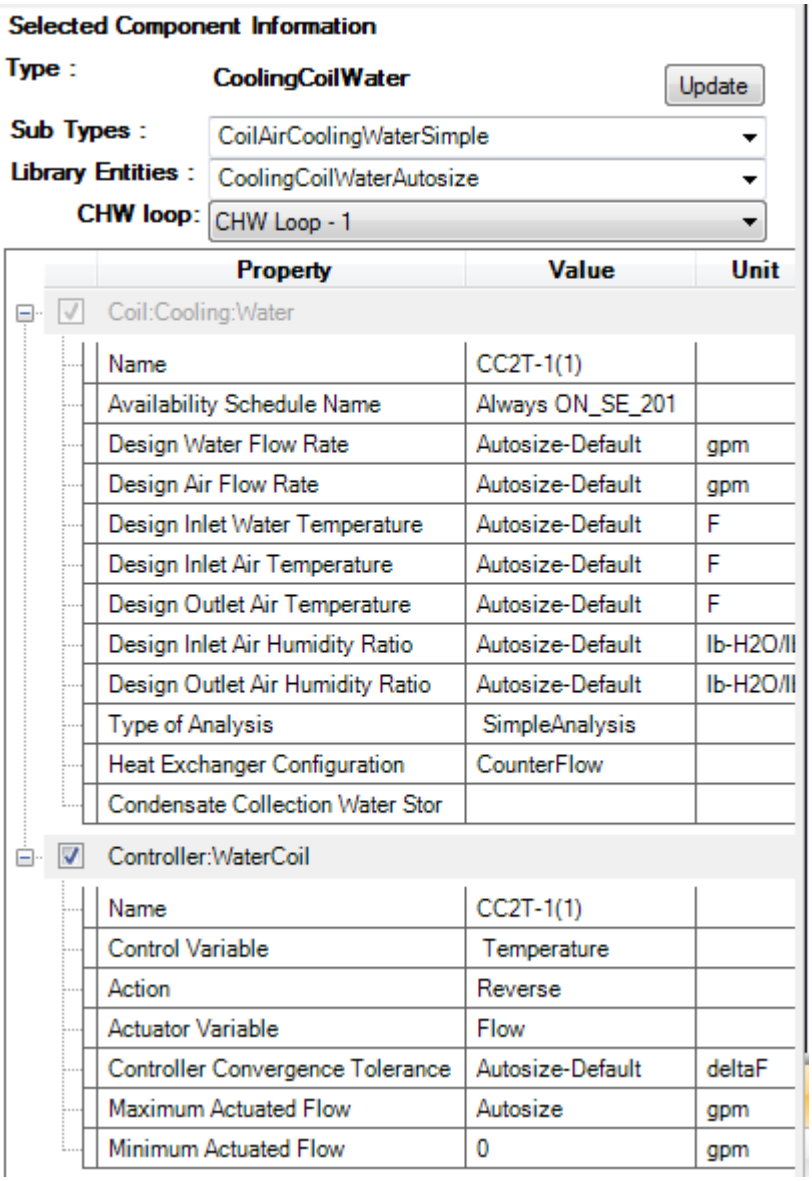
Type : **SupplyWater** Update

Sub Types : Temperature

Library Entities : Ctlr_CHW_OA-reset_44-54

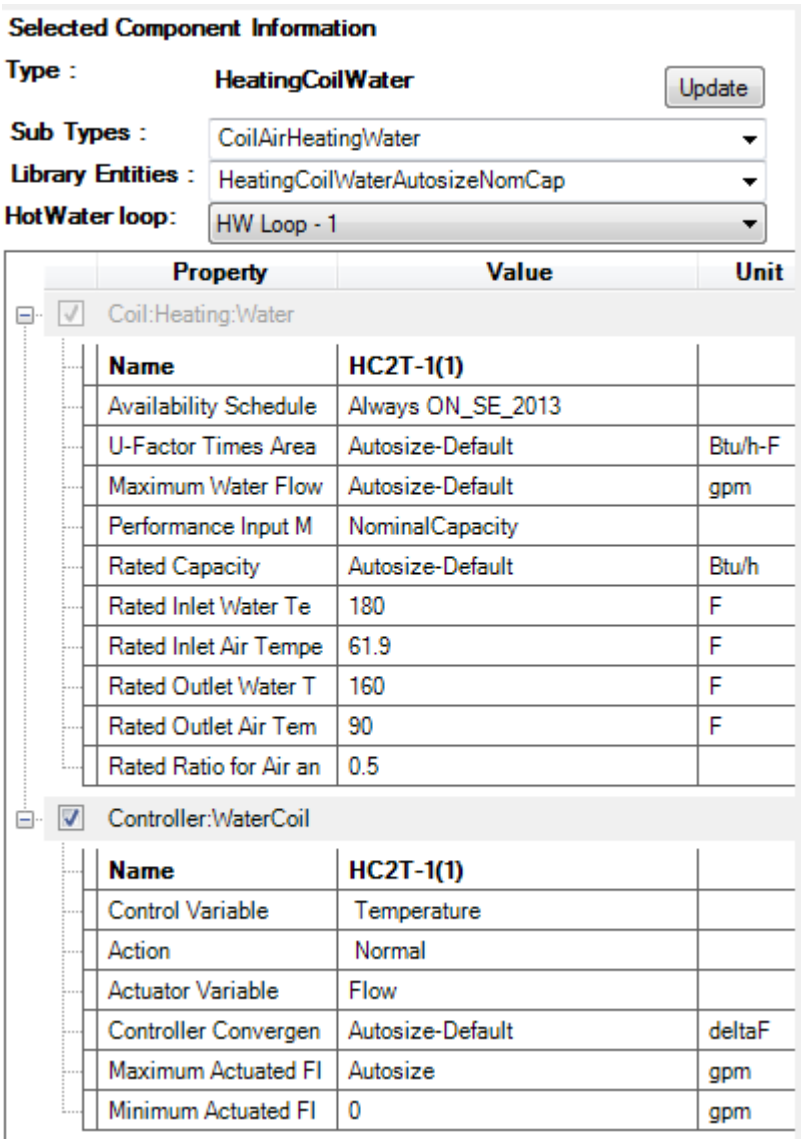
Property	Value	Unit
Controller:WaterTem		
Name	**WTS-1(5)**	
Controller Scheme 1	**SchemeL_CHW_OA-TReset_54(60)-44(80)**	

Cooling Coil



Property	Value	Unit
Coil:Cooling:Water		
Name	CC2T-1(1)	
Availability Schedule Name	Always ON_SE_201	
Design Water Flow Rate	Autosize-Default	gpm
Design Air Flow Rate	Autosize-Default	gpm
Design Inlet Water Temperature	Autosize-Default	F
Design Inlet Air Temperature	Autosize-Default	F
Design Outlet Air Temperature	Autosize-Default	F
Design Inlet Air Humidity Ratio	Autosize-Default	lb-H2O/l
Design Outlet Air Humidity Ratio	Autosize-Default	lb-H2O/l
Type of Analysis	SimpleAnalysis	
Heat Exchanger Configuration	CounterFlow	
Condensate Collection Water Stor		
Controller:WaterCoil		
Name	CC2T-1(1)	
Control Variable	Temperature	
Action	Reverse	
Actuator Variable	Flow	
Controller Convergence Tolerance	Autosize-Default	deltaF
Maximum Actuated Flow	Autosize	gpm
Minimum Actuated Flow	0	gpm

Heating Coil



Supply Fan

Selected Component Information

Type : **SupplyFan** Update

Sub Types : VariableVolume

Library Entities : SupplyFan-VSD

Property	Value	Unit
Fan:VariableVolume		
Name	**VSF-1(1)**	
Availability Schedule	**Always ON_SE_2013**	
Fan Efficiency	0.65	
Pressure Rise	**2.79**	**inH2O**
Maximum Flow Rate	Autosize	cfm
Fan Power Minimum	Fraction	
Fan Power Minimum	0.2	
Fan Power Minimum		
Motor Efficiency	0.93	
Motor In Airstream Fr	1	
Fan Power Coefficient	0.0013,0.147,0.9506,-0.0998,0	
End-Use Subcategory	General	

Variable Air Volume Air Terminal Unit with Hot Water Reheat

Selected Component Information

Type : **AirTerminal** Update

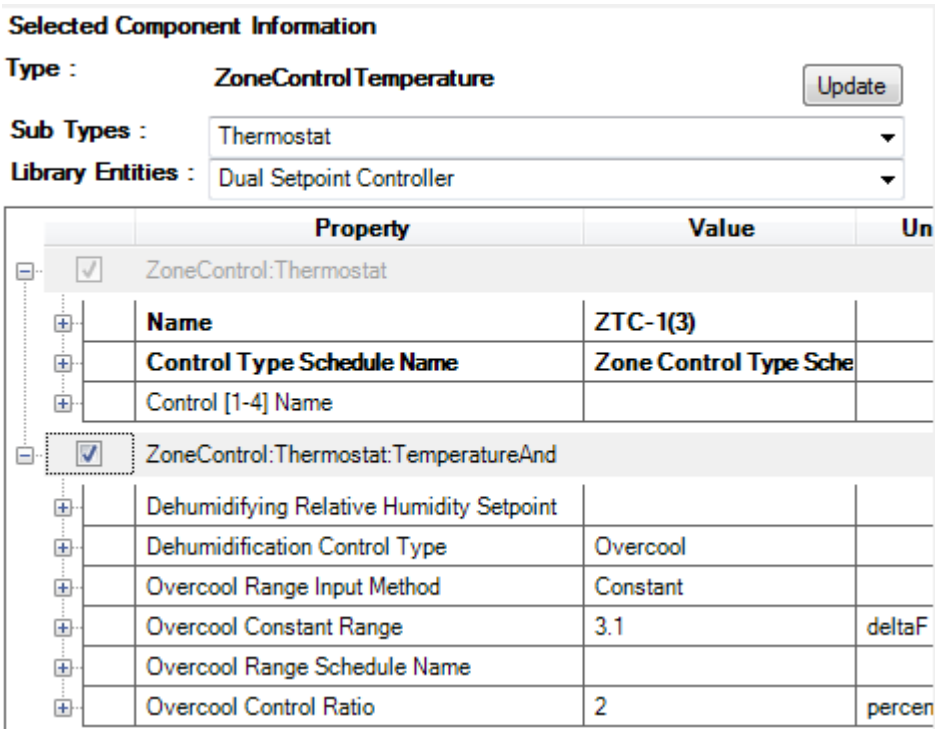
Sub Types : VAV_Reheat

Library Entities : AT_VAV-reheat-HW-30%-min

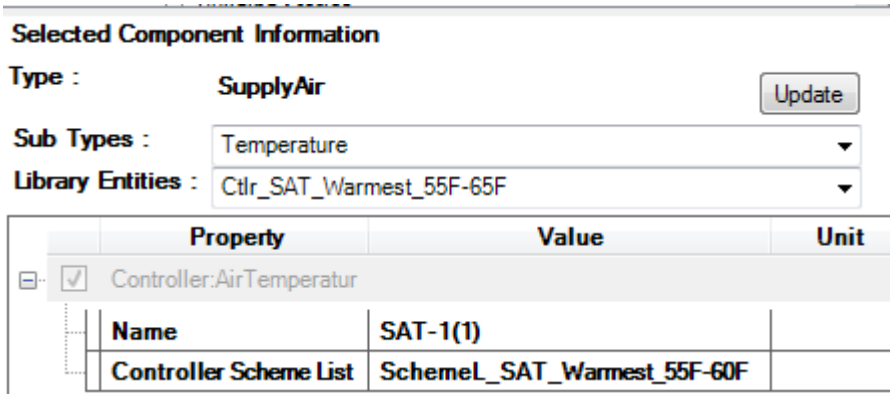
HotWater loop: HW Loop - 1

Property	Value	Unit
AirTerminal:SingleDuct:VAV:Reheat		
Name	**VAVR-1(2)**	
Availability Schedule Name	**Always ON_SE_2013**	
Maximum Air Flow Rate	Autosize	cfm
Zone Minimum Air Flow Input Method	Constant	
Constant Minimum Air Flow Fraction	0.3	
Fixed Minimum Air Flow Rate		
Minimum Air Flow Fraction Schedule Nam		
Reheat Coil Name	HeatingCoilWaterAutosi	
Maximum Hot Water or Steam Flow Rate	Autosize	gpm
Minimum Hot Water or Steam Flow Rate	0	gpm
Convergence Tolerance	0.001	
Damper Heating Action	Normal	
Maximum Flow per Zone Floor Area Durin		
Maximum Flow Fraction During Reheat		
Maximum Reheat Air Temperature	105	F
Design Specification Outdoor Air Object N		

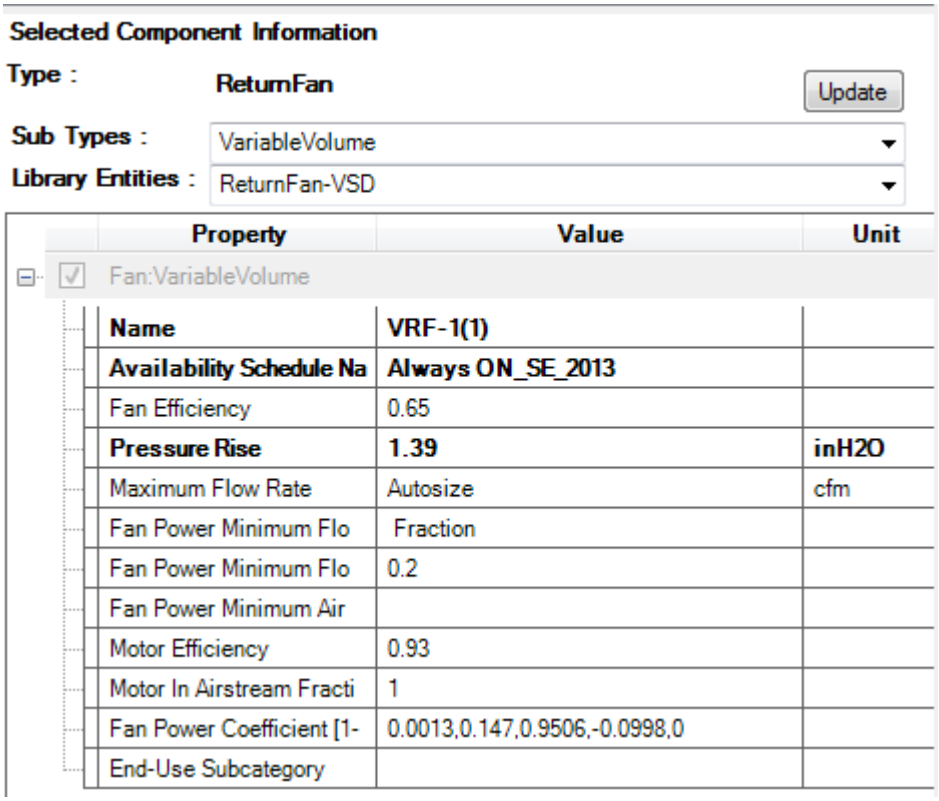
Zone Temperature Controller



Supply Air Temperature Controller



Return Fan



Property	Value	Unit
Fan:VariableVolume		
Name	**VRF-1(1)**	
Availability Schedule Na	**Always ON_SE_2013**	
Fan Efficiency	0.65	
Pressure Rise	**1.39**	**inH2O**
Maximum Flow Rate	Autosize	cfm
Fan Power Minimum Flo	Fraction	
Fan Power Minimum Flo	0.2	
Fan Power Minimum Air		
Motor Efficiency	0.93	
Motor In Airstream Fracti	1	
Fan Power Coefficient [1-	0.0013,0.147,0.9506,-0.0998,0	
End-Use Subcategory		

Outdoor Air Controller

Selected Component Information

Type : **OutdoorAir** Update

Sub Types : EconomizerControl

Library Entities : Ctlr_Economizer-FixedDB-70F

Property	Value	Unit
Controller:OutdoorAir		
Name	**OAC-1(1)**	
Minimum Outdoor Air Flow	**Autosize**	**cfm**
Maximum Outdoor Air Flow	**Autosize**	**cfm**
Economizer Control Type	FixedDryBulb	
Economizer Control Action	ModulateFlow	
Economizer Maximum Limit	70	F
Economizer Maximum Limit		
Economizer Maximum Limit		
Electronic Enthalpy Limit Cu		
Economizer Minimum Limit		
Lockout Type	NoLockout	
Minimum Limit Type	ProportionalMinimum	
Minimum Outdoor Air Sched		
Minimum Fraction of Outdoo		
Maximum Fraction of Outdo		
Mechanical Ventilation Cont		
Time of Day Economizer Co		
High Humidity Control	No	
Humidistat Control Zone Na		
High Humidity Outdoor Air F	1	
Control High Indoor Humidit	Yes	
Heat Recovery Bypass Cont	BypassWhenWithinEconomizerLimits	

Index

