

VILLA MALEBO

RAPPORT D'ETUDE THERMIQUE

du 12 octobre 2016



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Objet de l'ETUDE

Cette étude a pour objet la réalisation d'une simulation thermique dynamique des consommations énergétiques sur le logiciel d'étude thermique dynamique « DesignBuilder ». Afin d'améliorer le comportement du bâtiment et d'optimiser le dimensionnement des équipements thermique et de ventilation.

A. Hypothèses de l'étude thermique :

1. Caractéristiques du site :

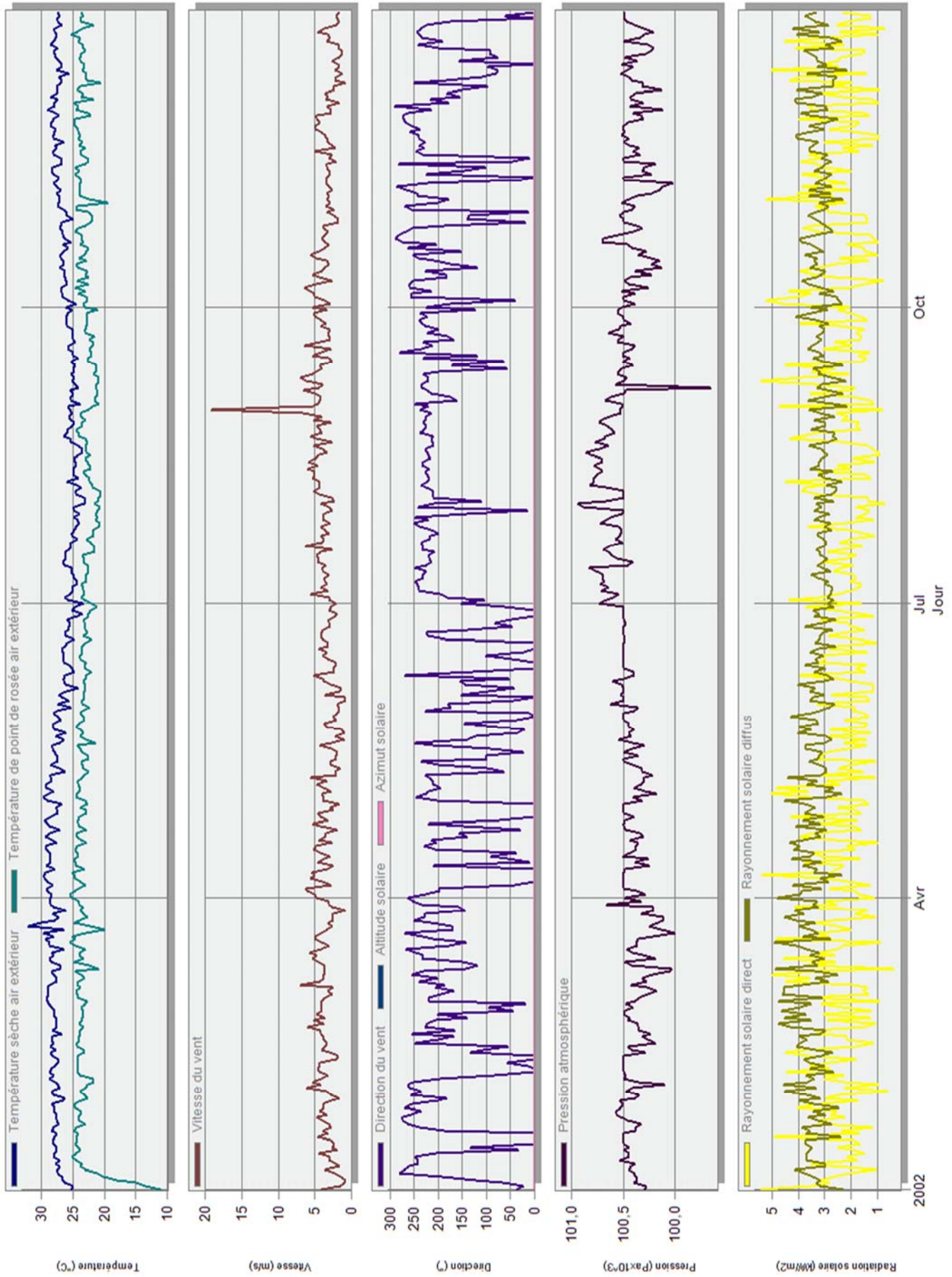
Site : République démocratique du Congo, Kinshasa
Température de base : T ext. = 25 °C
Altitude : 286 m
Latitude : 4.18 S
Longitude : 15.16 E

	Value
Program Version and Build	EnergyPlusDLL-32 8.1.0.008, 29/09/2015 10:22
Weather	Données site
Latitude [deg]	4.18 S
Longitude [deg]	15.16 E
Elevation [m]	286.00
Time Zone	1.00
North Axis Angle [deg]	0.00
Rotation for Appendix G [deg]	0.00
Hours Simulated [hrs]	8760.00

Données site - Résidence MALEBO

Journalier

Données météo



2. Parois :

Mur extérieur :

Up = 0.214W/m².K

Enduit de 2.cm
+ Parpaing de 20 cm
+Lame d'air non ventilée de 5 mm
+ Isolant Laine de roche de 10 cm
+Lame d'air non ventilée de 5 mm
+ BA13 de 15 mm

Conductivité thermique de l'isolant :
Laine de Roche : 0.033 W/m.K et R = 3.030 m².k/W

Toiture inclinée :

Up = 0.096W/m².K

Tuiles
+ Lambe d'air faiblement ventilée
+Etanchéité
+ Panneaux isolant trilatte HPU 21.5 cm
+Lame d'air non ventilée
+ Plaque de plâtre

Conductivité thermique de l'isolant :
Laine de roche : 0.023 W/m.K et R = 8.30 m².k/W

Toiture terrasse :

Up = 0.149W/m².K

Etanchéité
+ Isolant Laine de roche de 10.8 cm
+ Dalle béton
+Lame d'air non ventilée
+ Plaque de plâtre

Conductivité thermique de l'isolant :
Laine de roche : 0.026 W/m.K et R = 4.150 m².k/W

Mur intérieur :

Up = 0,653W/m².K

BA13x2
+Lame d'air non ventilée de 5 mm
+ Isolant Laine de roche de 5 cm
+Lame d'air non ventilée de 5 mm
+ BA13x2

Conductivité thermique de l'isolant :
Laine de Roche : 0.036 W/m.K et R = 1.388 m².k/W

Plancher sur extérieur :

Up = 0.265 W/m².K

Revêtement sol

- + Mortier de pose de 2 cm
- + Isolant Laine de roche de 10 cm
- + Chape de compression de 4 cm
- + Dalle béton de 15 cm
- + Enduit

Conductivité thermique de l'isolant :

Laine de roche : 0.035 W/m.K et R = 2.857 m².k/W

Plancher intermediaire :

Up = 0.382 W/m².K

Revêtement sol

- + Mortier de pose de 2 cm
- + Isolant Laine de roche de 1 cm
- + Chape de compression de 4 cm
- + Dalle béton de 15 cm
- + Lame d'air non ventilée
- + Plaque de plâtre

Conductivité thermique de l'isolant :

Laine de roche : 0.035 W/m.K et R = 0.285 m².k/W

Plancher bas sur sous-sol :

Up = 0.263 W/m².K

Revêtement sol

- + Mortier de pose de 2 cm
- + Isolant Laine de roche de 10 cm
- + Chape de compression de 4 cm
- + Dalle béton de 20 cm
- + Enduit

Conductivité thermique de l'isolant :

Laine de roche : 0.035 W/m.K et R = 2.857 m².k/W

3. Menuiseries :

Menuiseries avec doubles vitrages sur structure aluminium avec rupteur de pont thermique.

Châssis (Uf = 1.16 W/m².k)

Double vitrage peu émissif de composition 6/16/10 (Argon)

Conductivité thermique Uw = 1.20 W/m².k

Facteur solaire = 0.34

Transmission de lumière = 0.80

Epaisseur vitrage de 6 mm / 10 mm.

Lame d'argon 90% de 16mm

4 - Températures intérieures :

Température de base des zones climatisées :

Séjour :	22 °C
Salon :	22 °C
Chambres :	22 °C
Hall :	22 °C

5 - APPORTS ECLAIRAGE ET OCCUPATION :

Les apports dus à l'éclairage seront calculés sur la base de 3.3 W/m².
L'occupation de base est de 0.02 pers/m².

6 - ECS :

L'ECS sera assurée par la pompe à chaleur avec la récupération d'énergie sur l'échangeur.

7 - CLIMATISATION :

La climatisation sera assurée par un système VRV muni de récupération d'énergie pour l'ECS.

8 - VENTILATION :

La ventilation sera du type double flux sans récupération avec batterie froide à détente direct.
VMC du type Hygroréglable B de type basse consommation.

B - Simulations de l'étude thermique dynamique :

Tableau des puissances de dimensionnement froid

Zone	Température de confort (°C)	Surfaces (m ²)	Puissance de dimensionnement (kW)	Ratio apport (W/m ²)
Log RDC	26	504	35.58	70
Log R+1	26	529	39.62	74
TOTAL		1033	75.20	72.8

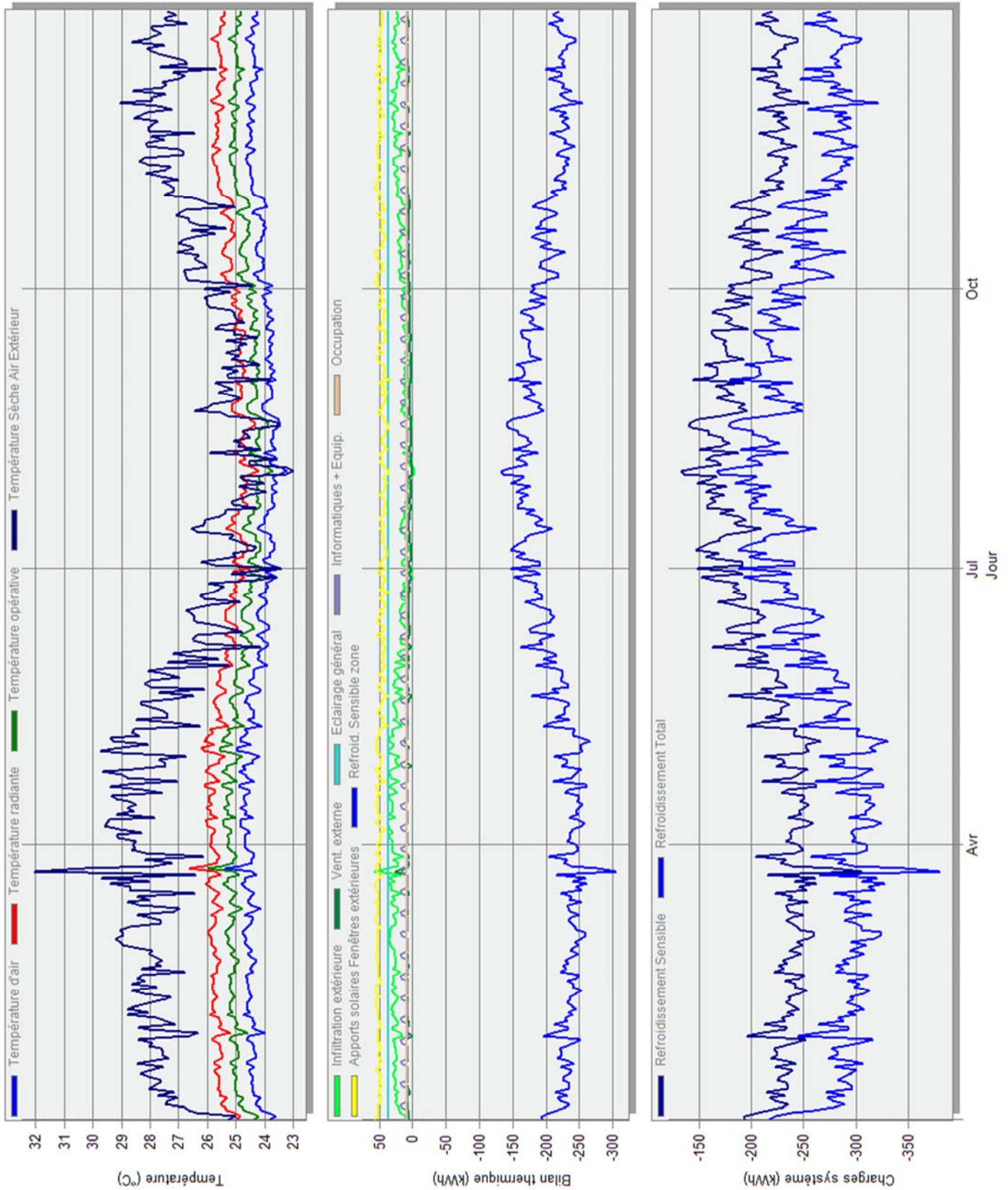
Bilan thermique et comportement du bâtiment annuel

Températures, Apports thermiques et Consommation d'énergie - Résidence MALEBO, VILLA MALEBO

Licence valide

1 Jan - 31 Dec, Journalier

EnergyPlus



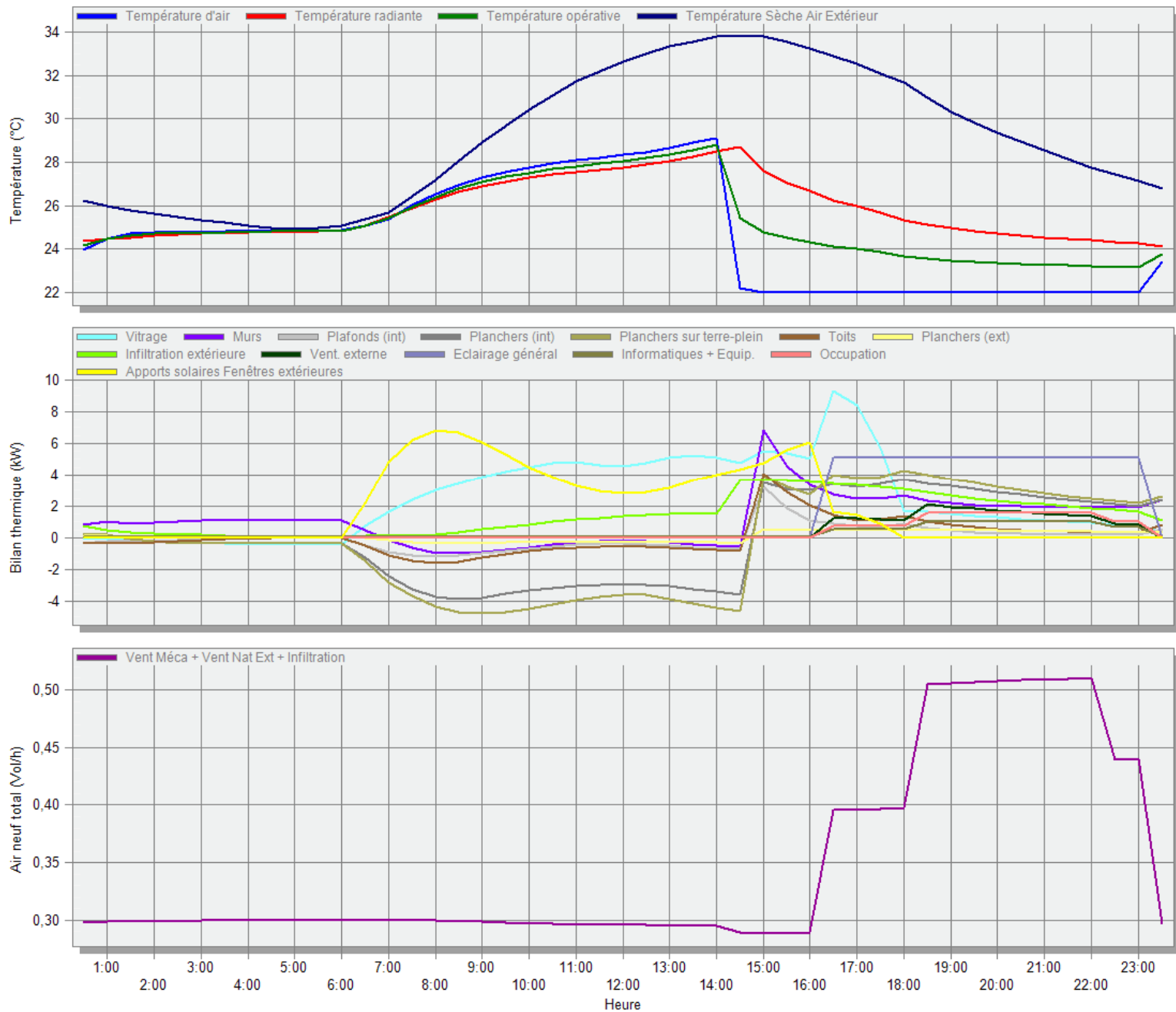
Confort et comportement du bâtiment 23 mars

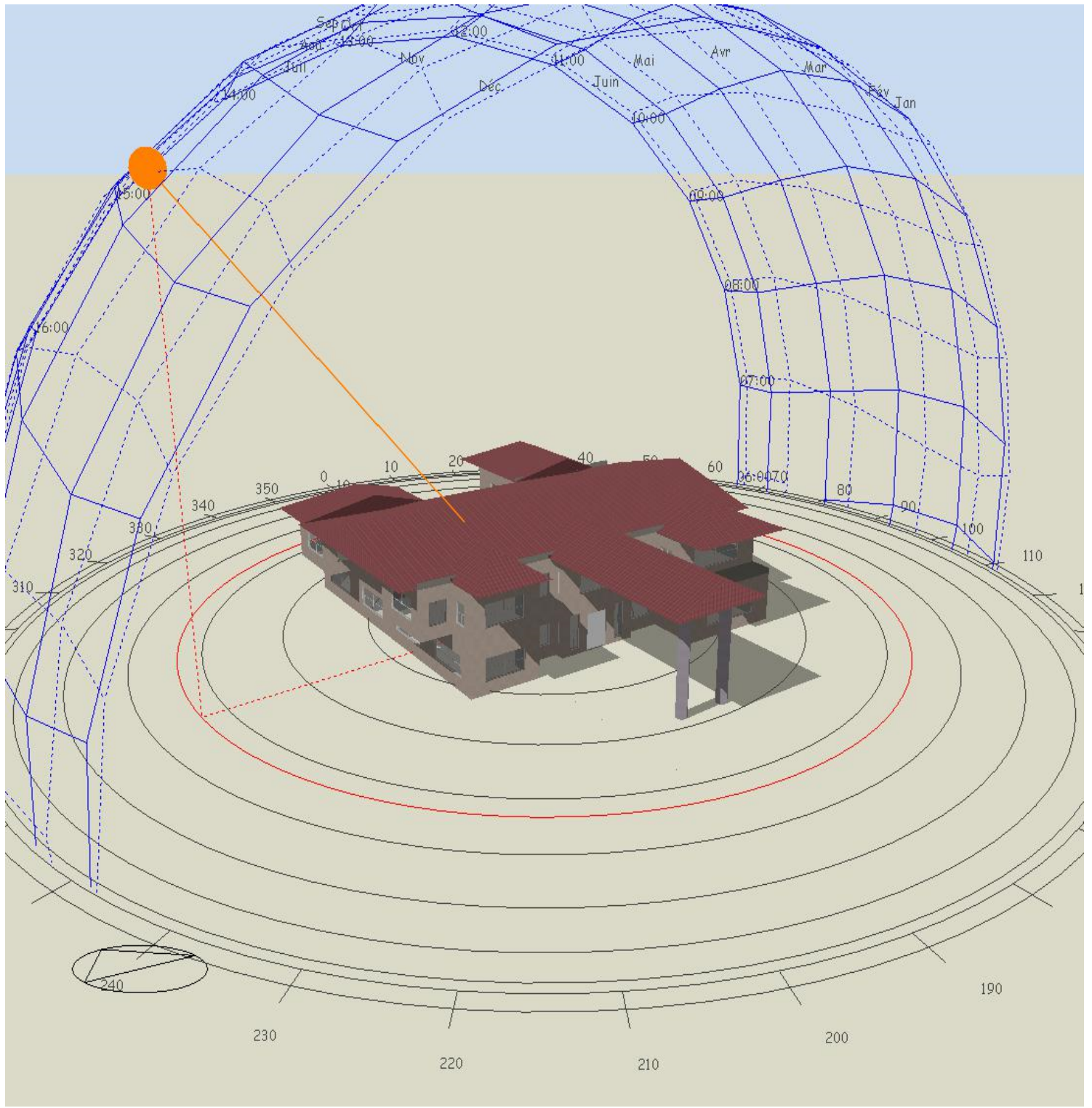
Température et apports thermiques - Résidence MALEBO, VILLA MALEBO

EnergyPlus

23 Mar, Infra-horaire

Licence valide





C - Résultats STD :

Résultats des consommations énergétiques du bâtiment

Site and Source Energy	Total Energy [kWh]	Net Conditioned Building Area [m ²]	Energy Per Conditioned Building Area [kWh/m ²]
Total Site Energy	113880	1033	110,20
(Photovoltaic) Produced electricity	14145	1033	13,69
Final Total Site Energy	99735	1033	96.55

Consommations énergétiques du bâtiment par catégorie

End Uses	Electricity [kWh]	District Cooling [kWh]	District Heating [kWh]	Water [m ³]
Heating	0	0	0	0
Cooling	0	91316,34	0	0
Interior Lighting	13069,83	0	0	0
Exterior Lighting	0	0	0	0
Interior Equipment	3627,29	0	0	0
Water Systems	0	0	5866,72	112,28
Total End Uses	16697,11	91316,34	5866,72	112,28

Analyse des consommations énergétiques du bâtiment

End Uses By Subcategory	Subcategory	Electricity [kWh]	District Cooling [kWh]	District Heating [kWh]	Water [m3]
Heating	General	0	0	0	0
Cooling	General	0	91316,34	0	0
Interior Lighting	RDC:LogRDC_ GeneralLights	6379,15	0	0	0
	R+1:LogR+1_ GeneralLights	6690,67	0	0	0
Interior Equipment	ELECTRIC EQUIPMENT RDC:LogRDC	1770,42	0	0	0
	ELECTRIC EQUIPMENT R+1:LogR+1	1856,87	0	0	0
Water Systems	DHW RDC:LogRDC	0	0	2863,44	54,80
	DHW R+1:LogR+1	0	0	3003,28	57,48

Production électrique des panneaux photovoltaïques

Mois	Energie solaire reçue plan horizontal Wh/m2.j	Energie solaire reçue plan des capteurs Wh/m2.j	Electricité produite par le système kWh/mois
Janvier	3 890	3 955	1 208
Fevrier	4 450	4 502	1 242
Mars	4 520	4 530	1 383
Avril	5 000	4 959	1 465
Mai	4 400	4 335	1 324
Juin	3 340	3 292	973
Juillet	2 520	2 490	760
Aout	2 200	2 186	667
Septembre	3 870	3 861	1 141
Octobre	4 170	4 198	1 282
Novembre	4 490	4 571	1 351
Decembre	4 320	4 419	1 349
Total energie (kWh/an)		14 145	
Total CO2 evite (kg/an) ()		5 092	
Productivite (kWh/kWc.an)		1 091	

() 360g/kWh coefficient européen (calcul réalisé sur tecsol)

D - Annexes :
Note de calcul production
photovoltaïque

Generateur photovoltaïque raccorde au reseau	
<i>Station Meteo</i>	<i>République démocratique du Congo, Kinshasa</i>
<i>Latitude du lieu</i>	<i>4 18</i>
<i>Modules PV</i>	<i>UNIVERSAL ENERGY UE M270HR (Verre/Polyester)</i>
	<i>Puissance 270 Wc</i> <i>Surface unitaire 1,641 m2</i>
<i>Orientation</i>	<i>0 degres/Sud</i>
<i>Inclinaison</i>	<i>5 degres/horizontale</i>
<i>Surface utile</i>	<i>78,76 m2</i>
<i>Puissance crete</i>	<i>12,96 kWc</i>

Mois	Energie solaire recue plan horizontal Wh/m2.j	Energie solaire recue plan des capteurs Wh/m2.j	Electricite produite par le systeme kWh/mois
<i>Janvier</i>	<i>3 890</i>	<i>3 955</i>	<i>1 208</i>
<i>Fevrier</i>	<i>4 450</i>	<i>4 502</i>	<i>1 242</i>
<i>Mars</i>	<i>4 520</i>	<i>4 530</i>	<i>1 383</i>
<i>Avril</i>	<i>5 000</i>	<i>4 959</i>	<i>1 465</i>
<i>Mai</i>	<i>4 400</i>	<i>4 335</i>	<i>1 324</i>
<i>Juin</i>	<i>3 340</i>	<i>3 292</i>	<i>973</i>
<i>Juillet</i>	<i>2 520</i>	<i>2 490</i>	<i>760</i>
<i>Aout</i>	<i>2 200</i>	<i>2 186</i>	<i>667</i>
<i>Septembre</i>	<i>3 870</i>	<i>3 861</i>	<i>1 141</i>
<i>Octobre</i>	<i>4 170</i>	<i>4 198</i>	<i>1 282</i>
<i>Novembre</i>	<i>4 490</i>	<i>4 571</i>	<i>1 351</i>
<i>Decembre</i>	<i>4 320</i>	<i>4 419</i>	<i>1 349</i>
Total energie (kWh/an)			14 145
Total CO2 evite (kg/an) ()			5 092
Productivite (kWh/kWc.an)			1 091

() 360g/kWh coefficient europeen

calcul realise sur tecsol.fr

E - Annexes : Rapport DesignBuilder

Program Version:EnergyPlusDLL-32 8.1.0.008, 09/10/2015 17:19

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Tabular Output Report in Format: HTML

Building: Building

Environment: RÉSIDENCE MALEBO ** REPUBLIQUE DEMOCRATIQUE DU CONGO, KINSHASA

Simulation Timestamp: 2015-10-09 17:19:50

Report: Annual Building Utility Performance Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

Values gathered over 8760.00 hours

Site and Source Energy

	Total Energy [kWh]	Energy Per Total Building Area [kWh/m2]	Energy Per Conditioned Building Area [kWh/m2]
Total Site Energy	113880.17	110.20	110.20
Net Site Energy	113880.17	110.20	110.20
Total Source Energy	170477.78	164.97	164.97
Net Source Energy	170477.78	164.97	164.97

Site to Source Energy Conversion Factors

	Site->Source Conversion Factor
Electricity	3.167
Natural Gas	1.084
District Cooling	1.056
District Heating	3.613
Steam	0.300
Gasoline	1.050
Diesel	1.050
Coal	1.050
Fuel Oil #1	1.050
Fuel Oil #2	1.050
Propane	1.050
Other Fuel 1	1.000
Other Fuel 2	1.000

Building Area

	Area [m2]
Total Building Area	1033.41
Net Conditioned Building Area	1033.41
Unconditioned Building Area	0.00

End Uses

	Electricity [kWh]	Natural Gas [kWh]	Additional Fuel [kWh]	District Cooling [kWh]	District Heating [kWh]	Water [m3]
Heating	0.00	0.00	0.00	0.00	0.00	0.00
Cooling	0.00	0.00	0.00	91316.34	0.00	0.00
Interior Lighting	13069.83	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	3627.29	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	5866.72	112.28
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	16697.11	0.00	0.00	91316.34	5866.72	112.28

End Uses By Subcategory

	Subcategory	Electricity [kWh]	Natural Gas [kWh]	Additional Fuel [kWh]	District Cooling [kWh]	District Heating [kWh]	Water [m3]
Heating	General	0.00	0.00	0.00	0.00	0.00	0.00
Cooling	General	0.00	0.00	0.00	91316.34	0.00	0.00
Interior Lighting	ELECTRIC EQUIPMENT#RDC:Zone1#GeneralLights	6379.15	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#R%1:Zone1#GeneralLights	6690.67	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	General	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	ELECTRIC EQUIPMENT#RDC:Zone1#05	1770.42	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#R%1:Zone1#05	1856.87	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	General	0.00	0.00	0.00	0.00	0.00	0.00
Fans	Ventilation (simple)	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	General	0.00	0.00	0.00	0.00	0.00	0.00

Humidification	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	General	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	DHW RDC:Zone1	0.00	0.00	0.00	0.00	2863.44	54.80
	DHW R%1:Zone1	0.00	0.00	0.00	0.00	3003.28	57.48
Refrigeration	General	0.00	0.00	0.00	0.00	0.00	0.00
Generators	General	0.00	0.00	0.00	0.00	0.00	0.00

Normalized Metrics

Utility Use Per Conditioned Floor Area

	Electricity Intensity [kWh/m2]	Natural Gas Intensity [kWh/m2]	Additional Fuel Intensity [kWh/m2]	District Cooling Intensity [kWh/m2]	District Heating Intensity [kWh/m2]	Water Intensity [m3/m2]
Lighting	12.65	0.00	0.00	0.00	0.00	0.00
HVAC	0.00	0.00	0.00	88.36	5.68	0.11
Other	3.51	0.00	0.00	0.00	0.00	0.00
Total	16.16	0.00	0.00	88.36	5.68	0.11

Utility Use Per Total Floor Area

	Electricity Intensity [kWh/m2]	Natural Gas Intensity [kWh/m2]	Additional Fuel Intensity [kWh/m2]	District Cooling Intensity [kWh/m2]	District Heating Intensity [kWh/m2]	Water Intensity [m3/m2]
Lighting	12.65	0.00	0.00	0.00	0.00	0.00
HVAC	0.00	0.00	0.00	88.36	5.68	0.11
Other	3.51	0.00	0.00	0.00	0.00	0.00
Total	16.16	0.00	0.00	88.36	5.68	0.11

Electric Loads Satisfied

	Electricity [kWh]	Percent Electricity [%]
Fuel-Fired Power Generation	0.00	0.00
High Temperature Geothermal*	0.00	0.00
Photovoltaic Power	0.00	0.00
Wind Power	0.00	0.00
Net Decrease in On-Site Storage	0.00	0.00
Total On-Site Electric Sources	0.00	0.00
Electricity Coming From Utility	16697.11	100.00
Surplus Electricity Going To Utility	0.00	0.00
Net Electricity From Utility	16697.11	100.00
Total On-Site and Utility Electric Sources	16697.11	100.00
Total Electricity End Uses	16697.11	100.00

On-Site Thermal Sources

	Heat [kWh]	Percent Heat [%]
Water-Side Heat Recovery	0.00	
Air to Air Heat Recovery for Cooling	0.00	
Air to Air Heat Recovery for Heating	0.00	
High-Temperature Geothermal*	0.00	
Solar Water Thermal	0.00	
Solar Air Thermal	0.00	
Total On-Site Thermal Sources	0.00	

Water Source Summary

	Water [m3]	Percent Water [%]
Rainwater Collection	0.00	0.00
Condensate Collection	0.00	0.00
Groundwater Well	0.00	0.00
Total On Site Water Sources	0.00	0.00
-	-	-
Initial Storage	0.00	0.00
Final Storage	0.00	0.00
Change in Storage	0.00	0.00
-	-	-
Water Supplied by Utility	112.28	100.00
-	-	-
Total On Site, Change in Storage, and Utility Water Sources	112.28	100.00
Total Water End Uses	112.28	100.00

Setpoint Not Met Criteria

	Degrees [deltaC]
Tolerance for Zone Heating Setpoint Not Met Time	0.20
Tolerance for Zone Cooling Setpoint Not Met Time	0.20

Comfort and Setpoint Not Met Summary

	Facility [Hours]
Time Setpoint Not Met During Occupied Heating	0.00

Time Setpoint Not Met During Occupied Cooling	0.00
Time Not Comfortable Based on Simple ASHRAE 55-2004	2490.00

Note 1: An asterisk (*) indicates that the feature is not yet implemented.

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Report: Input Verification and Results Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

General

	Value
Program Version and Build	EnergyPlusDLL-32 8.1.0.008, 09/10/2015 17:19
RunPeriod	RÉSIDENCE MALEBO
Weather File	REPUBLIQUE DEMOCRATIQUE DU CONGO, KINSHASA
Latitude [deg]	-4.18
Longitude [deg]	15.16
Elevation [m]	286.00
Time Zone	0.00
North Axis Angle [deg]	0.00
Rotation for Appendix G [deg]	0.00
Hours Simulated [hrs]	8760.00

ENVELOPE

Window-Wall Ratio

	Total	North (315 to 45 deg)	East (45 to 135 deg)	South (135 to 225 deg)	West (225 to 315 deg)
Gross Wall Area [m2]	869.46	183.86	245.90	193.69	246.01
Above Ground Wall Area [m2]	869.46	183.86	245.90	193.69	246.01
Window Opening Area [m2]	243.51	51.40	68.81	52.68	70.63
Gross Window-Wall Ratio [%]	28.01	27.96	27.98	27.20	28.71
Above Ground Window-Wall Ratio [%]	28.01	27.96	27.98	27.20	28.71

Conditioned Window-Wall Ratio

	Total	North (315 to 45 deg)	East (45 to 135 deg)	South (135 to 225 deg)	West (225 to 315 deg)
Gross Wall Area [m2]	869.46	183.86	245.90	193.69	246.01
Above Ground Wall Area [m2]	869.46	183.86	245.90	193.69	246.01
Window Opening Area [m2]	243.51	51.40	68.81	52.68	70.63
Gross Window-Wall Ratio [%]	28.01	27.96	27.98	27.20	28.71
Above Ground Window-Wall Ratio [%]	28.01	27.96	27.98	27.20	28.71

Skylight-Roof Ratio

	Total
Gross Roof Area [m2]	561.76
Skylight Area [m2]	0.00
Skylight-Roof Ratio [%]	0.00

PERFORMANCE

Zone Summary

	Area [m2]	Conditioned (Y/N)	Part of Total Floor Area (Y/N)	Volume [m3]	Multipliers	Gross Wall Area [m2]	Window Glass Area [m2]	Lighting [W/m2]	People [m2 per person]	Plug and Process [W/m2]
RDC:ZONE1	504.39	Yes	Yes	1689.71	1.00	453.61	91.32	4.9500	50.00	1.0000
R%1:ZONE1	529.02	Yes	Yes	1692.87	1.00	415.85	102.50	4.9500	50.00	1.0000
Total	1033.41			3382.58		869.46	193.82	4.9500	50.00	1.0000
Conditioned Total	1033.41			3382.58		869.46	193.82	4.9500	50.00	1.0000
Unconditioned Total	0.00			0.00		0.00	0.00			
Not Part of Total	0.00			0.00		0.00	0.00			

Report: Climatic Data Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

SizingPeriod:DesignDay

	Maximum Dry Bulb [C]	Daily Temperature Range [deltaC]	Humidity Value	Humidity Type	Wind Speed [m/s]	Wind Direction
SUMMER DESIGN DAY IN RÉSIDENCE MALEBO	33.80	8.90	24.60	Wetbulb [C]	0.00	0.00

WINTER DESIGN DAY IN RÉSIDENCE MALEBO	17.90	0.00	17.90	Wetbulb [C]	0.00	0.00
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Weather Statistics File

	Value
None	

Report: Envelope Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

Opaque Exterior

	Construction	Reflectance	U-Factor with Film [W/m2-K]	U-Factor no Film [W/m2-K]	Gross Area [m2]	Azimuth [deg]	Tilt [deg]	Cardinal Direction
RDC:ZONE1_WALL_2_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	30.08	90.00	90.00	E
RDC:ZONE1_WALL_3_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	3.02	0.00	90.00	N
RDC:ZONE1_WALL_4_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	17.73	90.01	90.00	E
RDC:ZONE1_WALL_5_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	6.54	0.22	90.00	N
RDC:ZONE1_WALL_6_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	12.41	90.00	90.00	E
RDC:ZONE1_WALL_7_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	6.53	180.00	90.00	S
RDC:ZONE1_WALL_8_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	34.99	90.00	90.00	E
RDC:ZONE1_WALL_9_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	26.39	0.00	90.00	N
RDC:ZONE1_WALL_10_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	34.51	270.00	90.00	W
RDC:ZONE1_WALL_11_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	32.40	0.00	90.00	N
RDC:ZONE1_WALL_12_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.62	90.00	90.00	E
RDC:ZONE1_WALL_13_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	3.19	0.00	90.00	N
RDC:ZONE1_WALL_14_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	6.73	90.00	90.00	E
RDC:ZONE1_WALL_15_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	3.19	180.00	90.00	S
RDC:ZONE1_WALL_16_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	4.16	90.00	90.00	E
RDC:ZONE1_WALL_17_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	3.19	0.00	90.00	N
RDC:ZONE1_WALL_18_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	6.73	90.00	90.00	E
RDC:ZONE1_WALL_19_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	3.19	180.00	90.00	S
RDC:ZONE1_WALL_20_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.34	90.00	90.00	E
RDC:ZONE1_WALL_21_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.85	0.00	90.00	N
RDC:ZONE1_WALL_22_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.38	46.98	90.00	E
RDC:ZONE1_WALL_23_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	6.10	0.00	90.00	N
RDC:ZONE1_WALL_24_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.14	313.02	90.00	W
RDC:ZONE1_WALL_25_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.85	0.00	90.00	N
RDC:ZONE1_WALL_26_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	77.31	269.96	90.00	W
RDC:ZONE1_WALL_27_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	16.12	180.00	90.00	S
RDC:ZONE1_WALL_28_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.68	90.00	90.00	E
RDC:ZONE1_WALL_29_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	12.30	179.99	90.00	S
RDC:ZONE1_WALL_30_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.54	270.00	90.00	W
RDC:ZONE1_WALL_31_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	18.85	180.00	90.00	S
RDC:ZONE1_WALL_32_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.54	90.00	90.00	E
RDC:ZONE1_WALL_33_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	12.30	180.00	90.00	S
RDC:ZONE1_WALL_34_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	13.84	270.00	90.00	W
RDC:ZONE1_WALL_35_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	23.88	180.00	90.00	S
RDC:ZONE1_GROUNDFLOOR_0_0_0	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	20.37	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_2	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	0.66	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_3	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	1.18	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_4	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	0.39	89.96	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_5	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	37.89	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_6	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	5.06	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_7	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	61.26	0.22	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_8	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	83.81	0.22	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_9	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	128.27	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_10	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	29.46	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_11	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	4.27	0.00	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_12	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	97.38	359.99	180.00	
RDC:ZONE1_GROUNDFLOOR_0_0_13	PROJET MALEBO - PLANCHER / SOUS-SOL	0.40	0.270	0.282	34.37	0.00	180.00	
RDC:ZONE1_ROOF_1_1_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	15.47	180.00	0.00	
RDC:ZONE1_ROOF_1_1_1	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	5.05	180.42	0.00	
RDC:ZONE1_ROOF_1_1_2	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	12.22	180.00	0.00	
R%1:ZONE1_WALL_2_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	18.72	90.00	90.00	E
R%1:ZONE1_WALL_3_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	25.44	0.00	90.00	N
R%1:ZONE1_WALL_4_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	26.56	270.00	90.00	W
R%1:ZONE1_WALL_5_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	30.72	0.00	90.00	N
R%1:ZONE1_WALL_6_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	21.57	90.00	90.00	E
R%1:ZONE1_WALL_7_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	20.96	0.42	90.00	N
R%1:ZONE1_WALL_8_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	4.60	269.96	90.00	W
R%1:ZONE1_WALL_9_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.60	0.00	90.00	N
R%1:ZONE1_WALL_10_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	15.68	270.00	90.00	W
R%1:ZONE1_WALL_11_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.61	180.02	90.00	S
R%1:ZONE1_WALL_12_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	30.72	269.96	90.00	W
R%1:ZONE1_WALL_13_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.63	0.00	90.00	N
R%1:ZONE1_WALL_14_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	15.68	270.00	90.00	W
R%1:ZONE1_WALL_15_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.64	180.02	90.00	S

R%1:ZONE1_WALL_16_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.39	269.96	90.00	W
R%1:ZONE1_WALL_17_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	15.63	180.00	90.00	S
R%1:ZONE1_WALL_18_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.33	90.00	90.00	E
R%1:ZONE1_WALL_19_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	11.52	179.99	90.00	S
R%1:ZONE1_WALL_20_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.42	270.00	90.00	W
R%1:ZONE1_WALL_21_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	18.24	180.00	90.00	S
R%1:ZONE1_WALL_22_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.42	90.00	90.00	E
R%1:ZONE1_WALL_23_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	11.52	180.00	90.00	S
R%1:ZONE1_WALL_24_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	7.62	270.00	90.00	W
R%1:ZONE1_WALL_25_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	23.04	180.00	90.00	S
R%1:ZONE1_WALL_26_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	16.96	90.00	90.00	E
R%1:ZONE1_WALL_27_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	2.11	180.00	90.00	S
R%1:ZONE1_WALL_28_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	43.52	90.00	90.00	E
R%1:ZONE1_WALL_29_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.218	0.226	4.99	0.00	90.00	N
R%1:ZONE1_EXTFLOOR_0_1_0	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	11.69	0.02	180.00	
R%1:ZONE1_EXTFLOOR_0_1_1	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	11.64	0.02	180.00	
R%1:ZONE1_EXTFLOOR_0_1_3	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.78	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_5	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.13	359.99	180.00	
R%1:ZONE1_EXTFLOOR_0_1_7	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.20	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_8	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.06	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_9	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.17	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_10	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.06	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_11	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.09	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_12	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.13	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_14	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	1.91	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_15	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	1.91	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_16	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.24	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_18	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.35	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_19	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.30	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_20	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	7.23	0.22	180.00	
R%1:ZONE1_EXTFLOOR_0_1_21	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.21	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_22	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	8.98	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_23	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	0.26	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_24	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	4.95	0.00	180.00	
R%1:ZONE1_EXTFLOOR_0_1_25	PROJET MALEBO - PLANCHER / EXTÉRIEUR	0.40	0.268	0.282	5.94	0.22	180.00	
R%1:ZONE1_ROOF_1_0_0	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	11.20	180.00	0.00	
R%1:ZONE1_ROOF_1_0_1	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	4.32	180.00	0.00	
R%1:ZONE1_ROOF_1_0_2	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	6.92	180.02	0.00	
R%1:ZONE1_ROOF_1_0_3	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	51.90	180.00	0.00	
R%1:ZONE1_ROOF_1_0_4	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	38.16	180.00	0.00	
R%1:ZONE1_ROOF_1_0_5	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	21.22	180.00	0.00	
R%1:ZONE1_ROOF_1_0_6	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	11.64	180.02	0.00	
R%1:ZONE1_ROOF_1_0_7	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	65.99	180.00	0.00	
R%1:ZONE1_ROOF_1_0_8	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	160.58	180.00	0.00	
R%1:ZONE1_ROOF_1_0_9	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	104.15	180.00	0.00	
R%1:ZONE1_ROOF_1_0_10	PROJET MALEBO MUR EXTÉRIEUR	0.40	0.219	0.226	52.95	180.00	0.00	

Exterior Fenestration

	Construction	Glass Area [m2]	Frame Area [m2]	Divider Area [m2]	Area of One Opening [m2]	Area of Multiplied Openings [m2]	Glass U-Factor [W/m2-K]	Glass SHGC	Glass Visible Transmittance	Frame Conductance [W/m2-K]	Divider Conductance [W/m2-K]	Shade Control	Parent Surface	Azimuth [deg]	Tilt [deg]	Cardinal Direction
RDC:ZONE1_WALL_2_0_0_0_0_0_WIN	1001	8.28	0.59	0.15	9.02	9.02	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_2_0_0	90.00	90.00	E
RDC:ZONE1_WALL_3_0_0_0_0_0_WIN	1001	0.39	0.14	0.03	0.57	0.57	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_3_0_0	0.00	90.00	N
RDC:ZONE1_WALL_4_0_0_0_0_0_WIN	1001	4.51	0.38	0.09	4.98	4.98	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_4_0_0	90.01	90.00	E
RDC:ZONE1_WALL_5_0_0_0_0_0_WIN	1001	1.38	0.20	0.05	1.62	1.62	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_5_0_0	0.22	90.00	N
RDC:ZONE1_WALL_6_0_0_0_0_0_WIN	1001	2.70	0.28	0.07	3.05	3.05	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_6_0_0	90.00	90.00	E
RDC:ZONE1_WALL_7_0_0_0_0_0_WIN	1001	1.37	0.20	0.05	1.62	1.62	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_7_0_0	180.00	90.00	S
RDC:ZONE1_WALL_8_0_0_0_0_0_WIN	1001	4.76	0.39	0.10	5.25	10.50	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_8_0_0	90.00	90.00	E
RDC:ZONE1_WALL_9_0_0_0_0_0_WIN	1001	7.25	0.54	0.13	7.92	7.92	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_9_0_0	0.00	90.00	N
RDC:ZONE1_WALL_10_0_0_0_0_0_WIN	1001	9.21	0.65	0.16	10.01	10.01	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_10_0_0	270.00	90.00	W
RDC:ZONE1_WALL_11_0_0_0_0_0_WIN	1001	8.30	0.60	0.15	9.04	9.04	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_11_0_0	0.00	90.00	N
RDC:ZONE1_WALL_12_0_0_0_0_0_WIN	1001	0.28	0.14	0.03	0.45	0.45	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_12_0_0	90.00	90.00	E
RDC:ZONE1_WALL_13_0_0_0_0_0_WIN	1001	0.44	0.15	0.03	0.62	0.62	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_13_0_0	0.00	90.00	N
RDC:ZONE1_WALL_14_0_0_0_0_0_WIN	1001	1.11	0.19	0.04	1.34	1.34	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_14_0_0	90.00	90.00	E
RDC:ZONE1_WALL_15_0_0_0_0_0_WIN	1001	0.44	0.15	0.03	0.62	0.62	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_15_0_0	180.00	90.00	S
RDC:ZONE1_WALL_16_0_0_0_0_0_WIN	1001	1.02	0.18	0.04	1.25	1.25	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_16_0_0	90.00	90.00	E
RDC:ZONE1_WALL_17_0_0_0_0_0_WIN	1001	0.44	0.15	0.03	0.62	0.62	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_17_0_0	0.00	90.00	N
RDC:ZONE1_WALL_18_0_0_0_0_0_WIN	1001	1.11	0.19	0.04	1.34	1.34	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_18_0_0	90.00	90.00	E
RDC:ZONE1_WALL_19_0_0_0_0_0_WIN	1001	0.44	0.15	0.03	0.62	0.62	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_19_0_0	180.00	90.00	S
RDC:ZONE1_WALL_20_0_0_0_0_0_WIN	1001	0.51	0.15	0.04	0.70	0.70	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_20_0_0	90.00	90.00	E
RDC:ZONE1_WALL_21_0_0_0_0_0_WIN	1001	0.52	0.15	0.04	0.71	0.71	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_21_0_0	0.00	90.00	N
RDC:ZONE1_WALL_22_0_0_0_0_0_WIN	1001	1.79	0.22	0.05	2.07	2.07	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_22_0_0	46.98	90.00	E
RDC:ZONE1_WALL_23_0_0_0_0_0_WIN	1001	1.57	0.21	0.05	1.83	1.83	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_23_0_0	0.00	90.00	N
RDC:ZONE1_WALL_24_0_0_0_0_0_WIN	1001	1.72	0.22	0.05	1.99	1.99	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_24_0_0	313.02	90.00	W
RDC:ZONE1_WALL_25_0_0_0_0_0_WIN	1001	0.52	0.15	0.04	0.71	0.71	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_25_0_0	0.00	90.00	N
RDC:ZONE1_WALL_26_0_0_0_0_0_WIN	1001	5.27	0.42	0.10	5.80	23.19	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_26_0_0	269.96	90.00	W
RDC:ZONE1_WALL_27_0_0_0_0_0_WIN	1001	4.37	0.37	0.09	4.84	4.84	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_27_0_0	180.00	90.00	S

RDC:ZONE1_WALL_28_0_0_0_0_WIN	1001	1.69	0.22	0.05	1.97	1.97	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_28_0_0	90.00	90.00	E
RDC:ZONE1_WALL_29_0_0_0_0_WIN	1001	2.67	0.27	0.07	3.02	3.02	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_29_0_0	179.99	90.00	S
RDC:ZONE1_WALL_30_0_0_0_0_WIN	1001	0.26	0.14	0.03	0.42	0.42	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_30_0_0	270.00	90.00	W
RDC:ZONE1_WALL_31_0_0_0_0_WIN	1001	1.84	0.26	0.06	2.16	4.32	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_31_0_0	180.00	90.00	S
RDC:ZONE1_WALL_32_0_0_0_0_WIN	1001	0.26	0.14	0.03	0.42	0.42	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_32_0_0	90.00	90.00	E
RDC:ZONE1_WALL_33_0_0_0_0_WIN	1001	2.67	0.27	0.07	3.02	3.02	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_33_0_0	180.00	90.00	S
RDC:ZONE1_WALL_34_0_0_0_0_WIN	1001	3.42	0.32	0.08	3.82	3.82	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_34_0_0	270.00	90.00	W
RDC:ZONE1_WALL_35_0_0_0_0_WIN	1001	6.55	0.50	0.12	7.16	7.16	1.169	0.241	0.175	23.853	23.853	Yes	RDC:ZONE1_WALL_35_0_0	180.00	90.00	S
R%1:ZONE1_WALL_2_0_0_0_0_WIN	1001	4.83	0.40	0.10	5.33	5.33	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_2_0_0	90.00	90.00	E
R%1:ZONE1_WALL_3_0_0_0_0_WIN	1001	6.98	0.52	0.13	7.63	7.63	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_3_0_0	0.00	90.00	N
R%1:ZONE1_WALL_4_0_0_0_0_WIN	1001	7.03	0.52	0.13	7.68	7.68	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_4_0_0	270.00	90.00	W
R%1:ZONE1_WALL_5_0_0_0_0_WIN	1001	7.92	0.57	0.14	8.64	8.64	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_5_0_0	0.00	90.00	N
R%1:ZONE1_WALL_6_0_0_0_0_WIN	1001	5.63	0.44	0.11	6.18	6.18	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_6_0_0	90.00	90.00	E
R%1:ZONE1_WALL_7_0_0_0_0_WIN	1001	5.73	0.45	0.11	6.29	6.29	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_7_0_0	0.42	90.00	N
R%1:ZONE1_WALL_8_0_0_0_0_WIN	1001	0.88	0.17	0.04	1.09	1.09	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_8_0_0	269.96	90.00	W
R%1:ZONE1_WALL_9_0_0_0_0_WIN	1001	1.72	0.22	0.05	1.99	1.99	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_9_0_0	0.00	90.00	N
R%1:ZONE1_WALL_10_0_0_0_0_WIN	1001	4.25	0.36	0.09	4.70	4.70	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_10_0_0	270.00	90.00	W
R%1:ZONE1_WALL_11_0_0_0_0_WIN	1001	1.72	0.22	0.05	1.99	1.99	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_11_0_0	180.02	90.00	S
R%1:ZONE1_WALL_12_0_0_0_0_WIN	1001	7.92	0.57	0.14	8.64	8.64	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_12_0_0	269.96	90.00	W
R%1:ZONE1_WALL_13_0_0_0_0_WIN	1001	1.73	0.22	0.05	2.00	2.00	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_13_0_0	0.00	90.00	N
R%1:ZONE1_WALL_14_0_0_0_0_WIN	1001	4.25	0.36	0.09	4.70	4.70	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_14_0_0	270.00	90.00	W
R%1:ZONE1_WALL_15_0_0_0_0_WIN	1001	1.73	0.22	0.05	2.00	2.00	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_15_0_0	180.02	90.00	S
R%1:ZONE1_WALL_16_0_0_0_0_WIN	1001	1.66	0.22	0.05	1.93	1.93	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_16_0_0	269.96	90.00	W
R%1:ZONE1_WALL_17_0_0_0_0_WIN	1001	4.24	0.36	0.09	4.69	4.69	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_17_0_0	180.00	90.00	S
R%1:ZONE1_WALL_18_0_0_0_0_WIN	1001	1.64	0.22	0.05	1.91	1.91	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_18_0_0	90.00	90.00	E
R%1:ZONE1_WALL_19_0_0_0_0_WIN	1001	2.55	0.27	0.06	2.88	2.88	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_19_0_0	179.99	90.00	S
R%1:ZONE1_WALL_20_0_0_0_0_WIN	1001	0.27	0.14	0.03	0.44	0.44	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_20_0_0	270.00	90.00	W
R%1:ZONE1_WALL_21_0_0_0_0_WIN	1001	5.27	0.39	0.10	5.76	5.76	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_21_0_0	180.00	90.00	S
R%1:ZONE1_WALL_22_0_0_0_0_WIN	1001	0.27	0.14	0.03	0.44	0.44	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_22_0_0	90.00	90.00	E
R%1:ZONE1_WALL_23_0_0_0_0_WIN	1001	2.55	0.27	0.06	2.88	2.88	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_23_0_0	180.00	90.00	S
R%1:ZONE1_WALL_24_0_0_0_0_WIN	1001	1.73	0.22	0.05	2.00	2.00	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_24_0_0	270.00	90.00	W
R%1:ZONE1_WALL_25_0_0_0_0_WIN	1001	6.31	0.48	0.12	6.91	6.91	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_25_0_0	180.00	90.00	S
R%1:ZONE1_WALL_26_0_0_0_0_WIN	1001	4.34	0.37	0.09	4.80	4.80	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_26_0_0	90.00	90.00	E
R%1:ZONE1_WALL_27_0_0_0_0_WIN	1001	0.18	0.13	0.03	0.35	0.35	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_27_0_0	180.00	90.00	S
R%1:ZONE1_WALL_28_0_0_0_0_WIN	1001	5.95	0.46	0.11	6.53	13.06	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_28_0_0	90.00	90.00	E
R%1:ZONE1_WALL_29_0_0_0_0_WIN	1001	0.99	0.18	0.04	1.21	1.21	1.169	0.241	0.175	23.853	23.853	Yes	R%1:ZONE1_WALL_29_0_0	0.00	90.00	N
Total or Average						243.51	1.169	0.241	0.175							
North Total or Average						51.40	1.169	0.241	0.175							
Non-North Total or Average						192.11	1.169	0.241	0.175							

Interior Fenestration

	Construction	Area of One Opening [m2]	Area of Openings [m2]	Glass U-Factor [W/m2-K]	Glass SHGC	Glass Visible Transmittance	Parent Surface
Total or Average			0.00		-	-	-

Exterior Door

	Construction	U-Factor with Film [W/m2-K]	U-Factor no Film [W/m2-K]	Gross Area [m2]	Parent Surface
RDC:ZONE1_WALL_31_0_0_2_0_2_DOOR	PROJET DE PORTE EXTERNE	5.429	5.429	4.48	RDC:ZONE1_WALL_31_0_0

Report: Lighting Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

Interior Lighting

	Zone	Lighting Power Density [W/m2]	Zone Area [m2]	Total Power [W]	End Use Subcategory	Schedule Name	Scheduled Hours/Week [hr]	Hours/Week > 1% [hr]	Full Load Hours/Week [hr]	Return Air Fraction	Conditioned (Y/N)	Consumption [GJ]
RDC:ZONE1 GENERAL LIGHTING	RDC:ZONE1	4.9500	504.39	2496.73	ELECTRIC EQUIPMENT#RDC:Zone1#GeneralLights	3350	49.00	49.00	49.00	0.0000	Y	22.96
R%1:ZONE1 GENERAL LIGHTING	R%1:ZONE1	4.9500	529.02	2618.66	ELECTRIC EQUIPMENT#R%1:Zone1#GeneralLights	3350	49.00	49.00	49.00	0.0000	Y	24.09
Interior Lighting Total		4.9500	1033.41	5115.39								47.05

Daylighting

	Zone	Daylighting Type	Control Type	Fraction Controlled	Lighting Installed in Zone [W]	Lighting Controlled [W]
None						

Exterior Lighting

	Total Watts	Astronomical Clock/Schedule	Schedule Name	Scheduled Hours/Week [hr]	Hours/Week > 1% [hr]	Full Load Hours/Week [hr]	Consumption [GJ]
Exterior Lighting Total	0.00						0.00

Report: Equipment Summary

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For: Entire Facility

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Central Plant

	Type	Nominal Capacity [W]	Nominal Efficiency [W/W]	IPLV in SI Units [W/W]	IPLV in IP Units [Btu/W-h]
None					

Cooling Coils

	Type	Design Coil Load [W]	Nominal Total Capacity [W]	Nominal Sensible Capacity [W]	Nominal Latent Capacity [W]	Nominal Sensible Heat Ratio	Nominal Efficiency [W/W]	Nominal Coil UA Value [W/C]	Nominal Coil Surface Area [m2]
None									

DX Cooling Coils

	DX Cooling Coil Type	Standard Rated Net Cooling Capacity [W]	Standard Rated Net COP [W/W]	EER [Btu/W-h]	SEER [Btu/W-h]	IEER [Btu/W-h]
None						

DX Heating Coils

	DX Heating Coil Type	High Temperature Heating (net) Rating Capacity [W]	Low Temperature Heating (net) Rating Capacity [W]	HSPF [Btu/W-h]	Region Number
None					

Heating Coils

	Type	Design Coil Load [W]	Nominal Total Capacity [W]	Nominal Efficiency [W/W]
None				

Fans

	Type	Total Efficiency [W/W]	Delta Pressure [pa]	Max Air Flow Rate [m3/s]	Rated Electric Power [W]	Rated Power Per Max Air Flow Rate [W-s/m3]	Motor Heat In Air Fraction	End Use
None								

Pumps

	Type	Control	Head [pa]	Water Flow [m3/s]	Electric Power [W]	Power Per Water Flow Rate [W-s/m3]	Motor Efficiency [W/W]
None							

Service Water Heating

	Type	Storage Volume [m3]	Input [W]	Thermal Efficiency [W/W]	Recovery Efficiency [W/W]	Energy Factor
None						

Report: HVAC Sizing Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

Zone Cooling

	Calculated Design Load [W]	User Design Load [W]	User Design Load per Area [W/m2]	Calculated Design Air Flow [m3/s]	User Design Air Flow [m3/s]	Design Day Name	Date/Time Of Peak	Thermostat Setpoint Temperature at Peak Load [C]	Indoor Temperature at Peak Load [C]	Indoor Humidity Ratio at Peak Load [kgWater/kgAir]	Outdoor Temperature at Peak Load [C]	Outdoor Humidity Ratio at Peak Load [kgWater/kgAir]
RDC:ZONE1	14381.89	16539.18	32.79	3.935	4.525	SUMMER DESIGN DAY IN RÉSIDENCE MALEBO	3/23 17:00:00	0.00	22.00	0.00845	32.55	0.01642
R%1:ZONE1	20882.07	24014.38	45.39	4.091	4.704	SUMMER DESIGN DAY IN RÉSIDENCE MALEBO	3/23 15:00:00	0.00	22.00	0.00831	33.80	0.01642

Zone Heating

	Calculated Design Load [W]	User Design Load [W]	User Design Load per Area [W/m2]	Calculated Design Air Flow [m3/s]	User Design Air Flow [m3/s]	Design Day Name	Date/Time Of Peak	Thermostat Setpoint Temperature at Peak Load [C]	Indoor Temperature at Peak Load [C]	Indoor Humidity Ratio at Peak Load [kgWater/kgAir]	Outdoor Temperature at Peak Load [C]	Outdoor Humidity Ratio at Peak Load [kgWater/kgAir]
RDC:ZONE1	0.00	0.00	0.00	0.000	0.101	WINTER DESIGN DAY IN RÉSIDENCE MALEBO		0.00	0.00	0.00000	17.90	0.01331
R%1:ZONE1	0.00	0.00	0.00	0.000	0.106	WINTER DESIGN DAY IN RÉSIDENCE MALEBO		0.00	0.00	0.00000	17.90	0.01331

System Design Air Flow Rates

	Calculated cooling [m3/s]	User cooling [m3/s]	Calculated heating [m3/s]	User heating [m3/s]
None				

Report: System Summary

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For: Entire Facility

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Economizer

	High Limit Shutoff Control	Minimum Outdoor Air [m3/s]	Maximum Outdoor Air [m3/s]	Return Air Temp Limit	Return Air Enthalpy Limit	Outdoor Air Temperature Limit [C]	Outdoor Air Enthalpy Limit [C]
None							

Demand Controlled Ventilation using Controller:MechanicalVentilation

	Controller:MechanicalVentilation Name	Outdoor Air Per Person [m3/s-person]	Outdoor Air Per Area [m3/s-m2]	Air Distribution Effectiveness in Cooling Mode	Air Distribution Effectiveness in Heating Mode	Air Distribution Effectiveness Schedule
None						

Time Not Comfortable Based on Simple ASHRAE 55-2004

	Winter Clothes [hr]	Summer Clothes [hr]	Summer or Winter Clothes [hr]
RDC:ZONE1	2490.00	2551.50	2490.00
R%1:ZONE1	2413.50	2500.00	2393.50
Facility	2490.00	2551.50	2490.00

Aggregated over the RunPeriods for Weather

Time Setpoint Not Met

	During Heating [hr]	During Cooling [hr]	During Occupied Heating [hr]	During Occupied Cooling [hr]
RDC:ZONE1	0.00	0.00	0.00	0.00
R%1:ZONE1	0.00	0.00	0.00	0.00
Facility	0.00	0.00	0.00	0.00

Aggregated over the RunPeriods for Weather

Report: Outdoor Air Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

Average Outdoor Air During Occupied Hours

	Average Number of Occupants	Nominal Number of Occupants	Zone Volume [m3]	Mechanical Ventilation [ach]	Infiltration [ach]	AFN Infiltration [ach]	Simple Ventilation [ach]
RDC:ZONE1	8.17	10.09	1689.71	0.000	0.295	0.000	0.172
R%1:ZONE1	8.57	10.58	1692.87	0.000	0.295	0.000	0.180

Values shown for a single zone without multipliers

Minimum Outdoor Air During Occupied Hours

	Average Number of Occupants	Nominal Number of Occupants	Zone Volume [m3]	Mechanical Ventilation [ach]	Infiltration [ach]	AFN Infiltration [ach]	Simple Ventilation [ach]
RDC:ZONE1	8.17	10.09	1689.71	0.000	0.138	0.000	0.051
R%1:ZONE1	8.57	10.58	1692.87	0.000	0.138	0.000	0.053

Values shown for a single zone without multipliers

Report: Object Count Summary

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For: Entire Facility

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Surfaces by Class

	Total	Outdoors
Wall	62	62
Floor	50	34
Roof	30	14
Internal Mass	0	0
Building Detached Shading	148	148
Fixed Detached Shading	0	0
Window	62	62
Door	1	1
Glass Door	0	0
Shading	0	0
Overhang	0	0
Fin	0	0
Tubular Daylighting Device Dome	0	0
Tubular Daylighting Device Diffuser	0	0

HVAC

	Count
HVAC Air Loops	0
Conditioned Zones	2
Unconditioned Zones	0
Supply Plenums	0
Return Plenums	0

Input Fields

	Count
IDF Objects	619
Defaulted Fields	42
Fields with Defaults	1732
Autosized Fields	0
Autosizable Fields	8

Autocalculated Fields	4
Autocalculatable Fields	492

Report: Sensible Heat Gain Summary

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For: Entire Facility

Timestamp: 2015-10-09 17:19:50

Annual Building Sensible Heat Gain Components

	HVAC Input Sensible Air Heating [GJ]	HVAC Input Sensible Air Cooling [GJ]	HVAC Input Heated Surface Heating [GJ]	HVAC Input Cooled Surface Cooling [GJ]	People Sensible Heat Addition [GJ]	Lights Sensible Heat Addition [GJ]	Equipment Sensible Heat Addition [GJ]	Window Heat Addition [GJ]	Interzone Air Transfer Heat Addition [GJ]	Infiltration Heat Addition [GJ]	Opaque Surface Conduction and Other Heat Addition [GJ]	Equipment Sensible Heat Removal [GJ]	Window Heat Removal [GJ]	Interzone Air Transfer Heat Removal [GJ]	Infiltration Heat Removal [GJ]	Opaque Surface Conduction and Other Heat Removal [GJ]
RDC:ZONE1	0.000	-120.453	0.000	0.000	5.661	22.965	6.373	83.920	0.000	19.592	0.001	0.000	-0.729	0.000	-0.490	-16.838
R%1:ZONE1	0.000	-140.922	0.000	0.000	5.937	24.086	6.685	70.529	0.000	18.797	15.906	0.000	-0.498	0.000	-0.521	-0.003
Total Facility	0.000	-261.374	0.000	0.000	11.598	47.051	13.058	154.448	0.000	38.389	15.907	0.000	-1.227	0.000	-1.011	-16.841

Peak Cooling Sensible Heat Gain Components

	Time of Peak	HVAC Input Sensible Air Heating [W]	HVAC Input Sensible Air Cooling [W]	HVAC Input Heated Surface Heating [W]	HVAC Input Cooled Surface Cooling [W]	People Sensible Heat Addition [W]	Lights Sensible Heat Addition [W]	Equipment Sensible Heat Addition [W]	Window Heat Addition [W]	Interzone Air Transfer Heat Addition [W]	Infiltration Heat Addition [W]	Opaque Surface Conduction and Other Heat Addition [W]	Equipment Sensible Heat Removal [W]	Window Heat Removal [W]	Interzone Air Transfer Heat Removal [W]	Infiltration Heat Removal [W]	Opaque Surface Conduction and Other Heat Removal [W]
RDC:ZONE1	24-MAR-14:01	0.00	-377344.38	0.00	0.00	0.00	0.00	504.39	7896.54	0.00	1589.67	367353.78	0.00	0.00	0.00	0.00	0.00
R%1:ZONE1	24-MAR-14:01	0.00	-538143.96	0.00	0.00	0.00	0.00	529.02	6285.92	0.00	1536.01	529793.02	0.00	0.00	0.00	0.00	0.00
Total Facility	24-MAR-14:01	0.00	-915488.34	0.00	0.00	0.00	0.00	1033.41	14182.46	0.00	3125.68	897146.80	0.00	0.00	0.00	0.00	0.00

Peak Heating Sensible Heat Gain Components

	Time of Peak	HVAC Input Sensible Air Heating [W]	HVAC Input Sensible Air Cooling [W]	HVAC Input Heated Surface Heating [W]	HVAC Input Cooled Surface Cooling [W]	People Sensible Heat Addition [W]	Lights Sensible Heat Addition [W]	Equipment Sensible Heat Addition [W]	Window Heat Addition [W]	Interzone Air Transfer Heat Addition [W]	Infiltration Heat Addition [W]	Opaque Surface Conduction and Other Heat Addition [W]	Equipment Sensible Heat Removal [W]	Window Heat Removal [W]	Interzone Air Transfer Heat Removal [W]	Infiltration Heat Removal [W]	Opaque Surface Conduction and Other Heat Removal [W]
RDC:ZONE1	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R%1:ZONE1	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Facility	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Report: Component Sizing Summary

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For: Entire Facility

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