დანართები: 18-27

ქალაქ თბილისის მუნიციპალიტეტის მერიის
და რაიონული გამგეობების
ადმინისტრაციული შენობების
ენერგოაუდიტორული შეფასება

დაგენბახ ლენდსკეიპს

სარჩევი

დანართი 18: რესურსეფექტური საინჟინრო სისტემების გეგმური მომსახურების სამუშაოები

ასეთი პროტოკოლები შეიძლება შედგენილ იქნეს საინჟნრო სისტემებისათვის მას მერე, რაც ინსტალატორი კომპანია საგარანტიო პერიოდის გასვლის შემდგომ მომსახურეობის პაკეტს გადასცემს შესაბამის სამსახურს. გარდა ქვემოთ ჩამოთვლილის სისტემებისა მსგავსი პროტოკოლები შეიქმნება სხვა მოწყობილობა/დანადგარებისათვის.

ფოტოვოლტაური პანელელებით ელ.მომარაგების სისტემა

სისტემა / სისტემის ნაწილი	სამუშაოს აღწერილობა	შენიშვნა
	ყოველდღიური	
სადენები და კაბელმზიდები	სადენების და კაბელმზიდების /ვიზუალური დათვალიერება, დაზიანების დაფიქსირება.	შესაძლებელია გაკეთდეს შიდა რესურსით
	კვირაში ერთხელ	
	თვეში ერთხელ	
	კვარტალში ერთხელ	
	სეზონურად ან 6 თვეში ერთხელ	
	წელიწადში ერთხელ	
	სხვა პერიოდულობით ან საჭიროების მიხედვით	

მზის თერმული კოლექტორები და ცხელი წყლით მომარაგების სისტემა

სისტემა / სისტემის ნაწილი	სამუშაოს აღწერილობა	შენიშვნა
	ყოველდღიური	
	კვირაში ერთხელ	
	თვეში ერთხელ	
	კვარტალში ერთხელ	
	სეზონურად ან 6 თვეში ერთხელ	
	წელიწადში ერთხელ	
	სხვა პერიოდულობით ან საჭიროების მიხედვით	

თბური ტუმბო

სისტემა / სისტემის ნაწილი	სამუშაოს აღწერილობა	შენიშვნა
	ყოველდღიური	
	კვირაში ერთხელ	

	თვეში ერთხელ	
	კვარტალში ერთხელ	
	სეზონურად ან 6 თვეში ერთხელ	
	წელიწადში ერთხელ	
	სხვა პერიოდულობით ან საჭიროების მიხედვით	

შენობის მართვის და მონიტორინგის სისტემა

სისტემა / სისტემის ნაწილი	სამუშაოს აღწერილობა	შენიშვნა
	ყოველდღიური	
	კვირაში ერთხელ	
	თვეში ერთხელ	
	კვარტალში ერთხელ	
	სეზონურად ან 6 თვეში ერთხელ	

	წელიწადში ერთხელ	
	სხვა პერიოდულობით ან საჭიროების მიხედვით	

დანართი 19: ქ. თბილისის მუნიციპალიტეტის მერიის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

აკრონიმები:

Plant Simulation Results - დანადგარის სიმულაციის შედეგები

Air System Simulation Results - საჰაერო სისტემის სიმულაციის შედეგები

Air System Information - ინფორმაცია საჰაერო სისტემის შესახებ

Size Calculation Information - ინფორმაცია ზომის კალკულაციის შესახებ

Cooling Coil Sizing Data - გამაგრილებელი კოჭის კალიბრირების მონაცემები

Heating Coil Sizing Data - გამათბობელი კოჭის კალიბრირების მონაცემები

Ventilation Fan Sizing Data - ვენტილატორის ზომის მონაცემები

Exhaust Fan Sizing Data- გამწოვი ვენტილატორის მონაცემები

Outdoor Ventilation Air Data - გარე ვენტილაციის საჰაერო მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	6227	6227	6227	1460	0	0
April	46628	46628	46628	10887	0	0
May	177124	177124	177124	41592	0	0
June	347698	347698	347698	83317	0	0
July	446182	446182	446182	109144	0	0
August	451111	451111	451111	110539	0	0
September	270842	270842	270842	64760	0	0
October	107390	107390	107390	25252	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Total	**1853200**	**1853200**	**1853200**	**446952**	**0**	**0**

Air System Simulation Results (Table 1) :

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)	Ventilation Fan (kWh)	Exhaust Fan (kWh)	Terminal Fan (kWh)
January	0	16558	0	214634	826	826	0
February	0	15245	0	212345	746	746	0
March	45	0	6190	154864	826	826	0
April	314	0	46385	0	800	800	0
May	1455	0	175468	0	826	826	0
June	5114	0	342645	0	800	800	0
July	11000	0	435184	0	826	826	0
August	13309	0	437739	0	826	826	0
September	4267	0	266450	0	800	800	0
October	1102	0	106254	5701	826	826	0
November	0	7764	0	69534	800	800	0
December	0	13267	0	176034	826	826	0
Total	**36607**	**52835**	**1816312**	**833111**	**9727**	**9727**	**0**

Air System Simulation Results (Table 2) :

Month	Lighting (kWh)	Electric Equipment (kWh)
January	48751	48751
February	43120	43120
March	48270	48270
April	44997	44997
May	48751	48751
June	46393	46393
July	46874	46874
August	48751	48751
September	44517	44517
October	48751	48751
November	46874	46874
December	46393	46393
Total	**562441**	**562441**

Air System Information

Air System Name ..... **As_build**

Air System Type **2P-FC**

Equipment Class ..... **TERM**

Number of zones	**31**	Location	**Tbilisi, Georgia**
Floor Area	**15014,0** m?		

Sizing Calculation Information

Calculation Months	**Jan to Dec**	Zone L/s Sizing	**Sum of space airflow rates**
Sizing Data	**Calculated**	Space L/s Sizing	**Individual peak space loads**

Cooling Coil Sizing Data

Total coil load	**25,6**	kW	Load occurs at	**Jul 1500**	
Sensible coil load	**23,6**	kW	OA DB / WB	**34,4 / 21,8**	°C
Coil L/s at Jul 1500	**1199**	L/s	Entering DB / WB	**34,4 / 21,8**	°C
Max coil L/s	**1199**	L/s	Leaving DB / WB	**17,2 / 16,0**	°C
Sensible heat ratio	**0,923**		Bypass Factor	**0,100**	
Water flow @ 6,0 K rise	**1,02**	L/s			

Heating Coil Sizing Data

Max coil load	**36,9**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1199**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1199**	L/s			
Water flow @ 20,0 K drop	**0,44**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1199**	L/s	Fan motor BHP	**1,40**	BHP
Standard L/s	**1137**	L/s	Fan motor kW	**1,11**	kW
Actual max L/(s·m?)	**0,08**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1199**	L/s	Standard L/s	**1137**	L/s

Actual max L/(s·m?) ..... **0,08** L/(s·m?)

Fan motor BHP ..... **1,40** BHP

Fan motor kW ..... **1,11** kW

Fan static ..... **500** Pa

Outdoor Ventilation Air Data

Design airflow L/s ..... **1199** L/s

L/(s·m?) ..... **0,08** L/(s·m?)

L/s/person **0,80**
..... L/s/person

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4726 m?	555531	-	4726 m?	-	-
Wall Transmission	4539 m?	59723	-	4539 m?	164529	-
Roof Transmission	288 m?	4042	-	288 m?	3831	-
Window Transmission	4726 m?	234631	-	4726 m?	693322	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	600 m?	0	-	600 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	150140 W	127839	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	150140 W	140188	-	0	0	-
People	1508	88195	90602	0	0	0
Infiltration	-	61585	-977	-	165039	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	5%	51336	0
>> Total Zone Loads	**-**	**1271732**	**89625**	**-**	**1078057**	**0**
Zone Conditioning	-	1237456	89625	-	1040245	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Ventilation Load	1199 L/s	10982	1791	1199 L/s	35407	0
Ventilation Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**1250658**	**91417**	**-**	**1073431**	**0**
Cooling Coil	-	19772	1957	-	0	0
Heating Coil	-	0	-	-	36906	-
Terminal Unit Cooling	-	1230886	88566	-	0	0
Terminal Unit Heating	-	0	-	-	1036542	-

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

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>> Total Conditioning	-	1250658	90523	-	1073448	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	11908	11908	11908	2766	0	0
April	85542	85542	85477	20101	0	0
May	213162	213162	213115	50080	0	0
June	334352	334352	334352	79886	0	0
July	389367	389367	389367	95223	0	0
August	394936	394936	394936	96890	0	0
September	265905	265905	265905	63359	0	0
October	150640	150640	150640	35106	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Total	**1845811**	**1845811**	**1845699**	**443410**	**0**	**0**

Air System Simulation Results (Table 1) :

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)	Ventilation Fan (kWh)	Exhaust Fan (kWh)	Terminal Fan (kWh)
January	0	16558	0	31955	826	826	0
February	0	15245	0	44719	746	746	0
March	45	0	11863	18790	826	826	0
April	314	0	85227	0	800	800	0
May	1455	0	211707	0	826	826	0
June	5114	0	329238	0	800	800	0
July	11000	0	378367	0	826	826	0
August	13309	0	381627	0	826	826	0
September	4267	0	261638	0	800	800	0
October	1102	0	149537	732	826	826	0
November	0	7764	0	2863	800	800	0
December	0	13267	0	24344	826	826	0
Total	**36607**	**52835**	**1809204**	**123404**	**9727**	**9727**	**0**

Air System Simulation Results (Table 2) :

Month	Lighting (kWh)	Electric Equipment (kWh)
January	48751	48751
February	43120	43120
March	48270	48270
April	44997	44997
May	48751	48751
June	46393	46393
July	46874	46874
August	48751	48751
September	44517	44517
October	48751	48751
November	46874	46874
December	46393	46393
Total	**562441**	**562441**

Air System Information

Air System Name ..... **As_build** Equipment Class ..... **TERM**

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_as_built 05.15.2017 09:59

Air System Type **2P-FC**

Number of zones **31**

Floor Area ..... **15014,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **25,6** kW

Sensible coil load ..... **23,6** kW

Coil L/s at Jul 1500 ..... **1199** L/s

Max coil L/s ..... **1199** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **1,02** L/s

Load occurs at ..... **Jul 1500**

OA DB / WB ..... **34,4 / 21,8** °C

Entering DB / WB ..... **34,4 / 21,8** °C

Leaving DB / WB ..... **17,2 / 16,0** °C

Bypass Factor **0,100**

Heating Coil Sizing Data

Max coil load ..... **36,9** kW

Coil L/s at Des Htg ..... **1199** L/s

Max coil L/s ..... **1199** L/s

Water flow @ 20,0 K drop ..... **0,44** L/s

Load occurs at ..... **Des Htg**

Ent. DB / Lvg DB ..... **-5,7 / 21,2** °C

Ventilation Fan Sizing Data

Actual max L/s ..... **1199** L/s

Standard L/s ..... **1137** L/s

Actual max L/(s·m?) ..... **0,08** L/(s·m?)

Fan motor BHP ..... **1,40** BHP

Fan motor kW ..... **1,11** kW

Fan static ..... **500** Pa

Exhaust Fan Sizing Data

Actual max L/s ..... **1199** L/s

Standard L/s ..... **1137** L/s

Actual max L/(s·m?) ..... **0,08** L/(s·m?)

Fan motor BHP ..... **1,40** BHP

Fan motor kW ..... **1,11** kW

Fan static ..... **500** Pa

Outdoor Ventilation Air Data

Design airflow L/s ..... **1199** L/s

L/(s·m?) ..... **0,08** L/(s·m?)

L/s/person **0,80**

..... L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4726 m?	462421	-	4726 m?	-	-
Wall Transmission	4539 m?	59723	-	4539 m?	164538	-
Roof Transmission	288 m?	4041	-	288 m?	3831	-
Window Transmission	4726 m?	52590	-	4726 m?	155400	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	600 m?	0	-	600 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	150140 W	127839	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	150140 W	140188	-	0	0	-
People	1508	88195	90602	0	0	0
Infiltration	-	61585	20823	-	165039	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	5%	24440	0
>> Total Zone Loads	**-**	**996580**	**111425**	**-**	**513249**	**0**
Zone Conditioning	-	969330	111425	-	506393	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Ventilation Load	1199 L/s	11126	2674	1199 L/s	35933	0
Ventilation Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**982677**	**114098**	**-**	**540105**	**0**
Cooling Coil	-	19772	1957	-	0	0
Heating Coil	-	0	-	-	36906	-
Terminal Unit Cooling	-	962905	112488	-	0	0
Terminal Unit Heating	-	0	-	-	503184	-
>> Total Conditioning	**-**	**982677**	**114445**	**-**	**540091**	**0**

Key:	Positive values are clg loads Negative values are htg loads	Positive values are htg loads Negative values are clg loads

Air System Simulation Results (Table 1) :

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)	Ventilation Fan (kWh)	Exhaust Fan (kWh)	Terminal Fan (kWh)
January	0	16558	0	170826	826	826	0
February	0	15245	0	170204	746	746	0
March	45	0	7281	119606	826	826	0
April	314	0	53113	0	800	800	0
May	1455	0	180441	0	826	826	0
June	5114	0	335418	0	800	800	0
July	11000	0	417334	0	826	826	0
August	13309	0	419882	0	826	826	0
September	4267	0	261296	0	800	800	0
October	1102	0	114339	4582	826	826	0
November	0	7764	0	51836	800	800	0
December	0	13267	0	140410	826	826	0
Total	**36607**	**52835**	**1789105**	**657462**	**9727**	**9727**	**0**

Air System Simulation Results (Table 2) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_as_built 05.15.2017

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Month	Lighting (kWh)	Electric Equipment (kWh)
January	48751	48751
February	43120	43120
March	48270	48270
April	44997	44997
May	48751	48751
June	46393	46393
July	46874	46874
August	48751	48751
September	44517	44517
October	48751	48751
November	46874	46874
December	46393	46393
Total	**562441**	**562441**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **31**

Floor Area ..... **15014,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **25,6** kW

Sensible coil load ..... **23,6** kW

Coil L/s at Jul 1500 ..... **1199** L/s

Max coil L/s ..... **1199** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **1,02** L/s

Load occurs at ..... **Jul 1500**

OA DB / WB ..... **34,4 / 21,8** °C

Entering DB / WB ..... **34,4 / 21,8** °C

Leaving DB / WB ..... **17,2 / 16,0** °C

Bypass Factor **0,100**

Heating Coil Sizing Data

Max coil load	**36,9**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1199**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1199**	L/s			
Water flow @ 20,0 K drop	**0,44**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1199**	L/s	Fan motor BHP	**1,40**	BHP
Standard L/s	**1137**	L/s	Fan motor kW	**1,11**	kW
Actual max L/(s·m?)	**0,08**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1199**	L/s	Fan motor BHP	**1,40**	BHP
Standard L/s	**1137**	L/s	Fan motor kW	**1,11**	kW
Actual max L/(s·m?)	**0,08**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1199**	L/s	L/s/person	**0,80**	
L/(s·m?)	**0,08**	L/(s·m?)			L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_as_built 05.15.2017

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4726 m?	541971	-	4726 m?	-	-
Wall Transmission	4539 m?	12766	-	4539 m?	32368	-
Roof Transmission	288 m?	3981	-	288 m?	3831	-
Window Transmission	4726 m?	249859	-	4726 m?	693322	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	600 m?	0	-	600 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	150140 W	127839	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	150140 W	140188	-	0	0	-
People	1508	88195	90602	0	0	0
Infiltration	-	65191	3162	-	165039	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	5%	44728	0
>> Total Zone Loads	**-**	**1229989**	**93764**	**-**	**939288**	**0**
Zone Conditioning	-	1207351	93764	-	929094	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Ventilation Load	1199 L/s	11761	1886	1199 L/s	35843	0
Ventilation Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**1221333**	**95650**	**-**	**962716**	**0**
Cooling Coil	-	20535	1403	-	0	0
Heating Coil	-	0	-	-	36906	-
Terminal Unit Cooling	-	1200798	93318	-	0	0
Terminal Unit Heating	-	0	-	-	925805	-
>> Total Conditioning	**-**	**1221333**	**94720**	**-**	**962711**	**0**

Key:	Positive values are clg loads Negative values are htg loads	Positive values are htg loads Negative values are clg loads

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	7817	7817	7817	1820	0	0
April	57317	57317	57317	13342	0	0
May	193667	193667	193667	45434	0	0
June	361106	361106	361106	86515	0	0
July	452723	452723	452723	110835	0	0
August	455956	455956	455956	111838	0	0
September	280759	280759	280759	67117	0	0
October	121388	121388	121388	28477	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Total	**1930732**	**1930732**	**1930732**	**465379**	**0**	**0**

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_as_built 05.15.2017

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Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)	Ventilation Fan (kWh)	Exhaust Fan (kWh)	Terminal Fan (kWh)
January	0	16558	0	169896	826	826	0
February	0	15245	0	169386	746	746	0
March	45	0	7280	118987	826	826	0
April	314	0	53103	0	800	800	0
May	1455	0	180201	0	826	826	0
June	5114	0	334812	0	800	800	0
July	11000	0	416523	0	826	826	0
August	13309	0	419149	0	826	826	0
September	4267	0	260963	0	800	800	0
October	1102	0	114416	4562	826	826	0
November	0	7764	0	51421	800	800	0
December	0	13267	0	139605	826	826	0
Total	**36607**	**52835**	**1786447**	**653857**	**9727**	**9727**	**0**

Air System Simulation Results (Table 2) :

Month	Lighting (kWh)	Electric Equipment (kWh)
January	48751	48751
February	43120	43120
March	48270	48270
April	44997	44997
May	48751	48751
June	46393	46393
July	46874	46874
August	48751	48751
September	44517	44517
October	48751	48751
November	46874	46874
December	46393	46393
Total	**562441**	**562441**

Air System Information

Air System Name ..... **As_build**

Air System Type **2P-FC**

Equipment Class ..... **TERM**

Number of zones	**31**	Location	**Tbilisi, Georgia**
Floor Area	**15014,0** m?		

Sizing Calculation Information

Calculation Months	**Jan to Dec**	Zone L/s Sizing	**Sum of space airflow rates**
Sizing Data	**Calculated**	Space L/s Sizing	**Individual peak space loads**

Cooling Coil Sizing Data

Total coil load	**25,6**	kW	Load occurs at	**Jul 1500**	
Sensible coil load	**23,6**	kW	OA DB / WB	**34,4 / 21,8**	°C
Coil L/s at Jul 1500	**1199**	L/s	Entering DB / WB	**34,4 / 21,8**	°C
Max coil L/s	**1199**	L/s	Leaving DB / WB	**17,2 / 16,0**	°C
Sensible heat ratio	**0,923**		Bypass Factor	**0,100**	
Water flow @ 6,0 K rise	**1,02**	L/s			

Heating Coil Sizing Data

Max coil load	**36,9**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1199**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1199**	L/s			
Water flow @ 20,0 K drop	**0,44**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1199**	L/s	Fan motor BHP	**1,40**	BHP
Standard L/s	**1137**	L/s	Fan motor kW	**1,11**	kW
Actual max L/(s·m?)	**0,08**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1199**	L/s	Standard L/s	**1137**	L/s

Actual max L/(s·m?) ..... **0,08** L/(s·m?)

Fan motor BHP ..... **1,40** BHP

Fan motor kW ..... **1,11** kW

Fan static ..... **500** Pa

Outdoor Ventilation Air Data

Design airflow L/s ..... **1199** L/s

L/(s·m?) ..... **0,08** L/(s·m?)

L/s/person **0,80**

..... L/s/person

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	**Details**	**Sensible (W)**	**Latent (W)**	**Details**	**Sensible (W)**	**Latent (W)**
Window & Skylight Solar Loads	4726 m?	541971	-	4726 m?	-	-
Wall Transmission	4539 m?	12766	-	4539 m?	32368	-
Roof Transmission	288 m?	1264	-	288 m?	1478	-
Window Transmission	4726 m?	249859	-	4726 m?	693322	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	600 m?	0	-	600 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	150140 W	127839	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	150140 W	140188	-	0	0	-
People	1508	88195	90602	0	0	0
Infiltration	-	65191	3145	-	165039	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	5%	44610	0
>> Total Zone Loads	**-**	**1227272**	**93747**	**-**	**936817**	**0**
Zone Conditioning	-	1204531	93747	-	926888	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Ventilation Load	1199 L/s	11761	1886	1199 L/s	35843	0
Ventilation Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**1218513**	**95633**	**-**	**960510**	**0**
Cooling Coil	-	20535	1403	-	0	0
Heating Coil	-	0	-	-	36906	-
Terminal Unit Cooling	-	1197978	93305	-	0	0
Terminal Unit Heating	-	0	-	-	923599	-

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_rebuilt 05.15.2017

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>> Total Conditioning	**-**	**1218513**	**94707**	**-**	**960505**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	6910	6910	6910	1617	0	0
April	51751	51751	51751	12068	0	0
May	190049	190049	190049	44604	0	0
June	368687	368687	368687	88305	0	0
July	470603	470603	470603	115076	0	0
August	473912	473912	473912	116111	0	0
September	286098	286098	286098	68397	0	0
October	114046	114046	114046	26809	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Total	**1962057**	**1962057**	**1962057**	**472985**	**0**	**0**

Air System Simulation Results (Table 1) :

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)	Ventilation Fan (kWh)	Exhaust Fan (kWh)	Terminal Fan (kWh)
January	0	6534	0	214619	826	826	0
February	0	6300	0	212346	746	746	0
March	45	0	6331	147485	826	826	0
April	311	0	47667	0	800	800	0
May	1395	0	176784	0	826	826	0
June	4745	0	342957	0	800	800	0
July	10064	0	435259	0	826	826	0
August	12260	0	437864	0	826	826	0
September	4029	0	266579	0	800	800	0
October	1098	0	107179	4975	826	826	0
November	0	2402	0	69339	800	800	0
December	0	5075	0	176138	826	826	0
Total	**33948**	**20312**	**1820619**	**824901**	**9727**	**9727**	**0**

Air System Simulation Results (Table 2) :

Month	Vent. Reclaim Device (kWh)	Lighting (kWh)	Electric Equipment (kWh)
January	0	48751	48751
February	0	43120	43120
March	0	48270	48270
April	0	44997	44997
May	0	48751	48751
June	0	46393	46393
July	0	46874	46874
August	0	48751	48751
September	0	44517	44517
October	0	48751	48751
November	0	46874	46874
December	0	46393	46393
Total	**0**	**562441**	**562441**

Plant Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_rebuilt 05.15.2017

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Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	7183	7183	7183	1678	0	0
April	54259	54259	54259	12642	0	0
May	192997	192997	192997	45278	0	0
June	368440	368440	368440	88223	0	0
July	466609	466609	466609	114079	0	0
August	469759	469759	469759	115061	0	0
September	286223	286223	286223	68413	0	0
October	117347	117347	117347	27562	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Total	**1962817**	**1962817**	**1962817**	**472935**	**0**	**0**

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	17109	17109	16790	4065	0	0
April	107262	107262	103317	25003	0	0
May	225059	225059	223336	52856	0	0
June	327986	327986	327817	78484	0	0
July	369033	369033	369033	90450	0	0
August	374114	374114	374114	92047	0	0
September	261302	261302	261302	62234	0	0
October	166510	166510	166510	38804	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Total	**1848375**	**1848375**	**1842220**	**443942**	**0**	**0**

Air System Simulation Results (Table 1) :

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)	Ventilation Fan (kWh)	Exhaust Fan (kWh)	Terminal Fan (kWh)
January	0	1975	0	3448	826	826	0
February	0	2482	0	10287	746	746	0
March	45	0	19078	82	826	826	0
April	312	0	117556	0	800	800	0
May	1399	0	242290	0	826	826	0
June	4751	0	346746	0	800	800	0
July	10072	0	382394	0	826	826	0
August	12266	0	383301	0	826	826	0
September	4035	0	274801	0	800	800	0
October	1099	0	177639	28	826	826	0
November	0	217	0	3	800	800	0
December	0	1228	0	1413	826	826	0
Total	**33978**	**5902**	**1943806**	**15262**	**9727**	**9727**	**0**

Air System Simulation Results (Table 2) :

Month	Vent. Reclaim Device (kWh)	Lighting (kWh)	Electric Equipment (kWh)
January	0	48751	48751
February	0	43120	43120
March	0	48270	48270
April	0	44997	44997
May	0	48751	48751
June	0	46393	46393
July	0	46874	46874
August	0	48751	48751
September	0	44517	44517
October	0	48751	48751
November	0	46874	46874
December	0	46393	46393
Total	**0**	**562441**	**562441**

Air System Information

Air System Name ..... **As_build** Equipment Class ..... **TERM**

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: CITY-HALL_rebuilt 05.15.2017 03:18

Air System Type **2P-FC**

Number of zones **31**

Floor Area ..... **15014,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load	**17,0**	kW	Load occurs at	**Jun 1500**	
Sensible coil load	**15,8**	kW	OA DB / WB	**33,8 / 21,8**	°C
Coil L/s at Jun 1500	**1199**	L/s	Entering DB / WB	**28,7 / 20,3**	°C
Max coil L/s	**1199**	L/s	Leaving DB / WB	**17,2 / 16,4**	°C
Sensible heat ratio	**0,929**		Bypass Factor	**0,100**	
Water flow @ 6,0 K rise	**0,68**	L/s			

Heating Coil Sizing Data

Max coil load	**18,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1199**	L/s	Ent. DB / Lvg DB	**7,5 / 21,2**	°C
Max coil L/s	**1199**	L/s			
Water flow @ 20,0 K drop	**0,23**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1199**	L/s	Fan motor BHP	**1,40**	BHP
Standard L/s	**1137**	L/s	Fan motor kW	**1,11**	kW
Actual max L/(s·m?)	**0,08**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1199**	L/s	Standard L/s	**1137**	L/s

Actual max L/(s·m?) ..... **0,08** L/(s·m?)

Fan motor BHP ..... **1,40** BHP

Fan motor kW ..... **1,11** kW

Fan static ..... **500** Pa

Outdoor Ventilation Air Data

Design airflow L/s ..... **1199** L/s

L/(s·m?) ..... **0,08** L/(s·m?)

L/s/person **0,80**
..... L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_as_built 05.18.2017

Prepared by: 12:09

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4726 m?	520447	-	4726 m?	-	-
Wall Transmission	4539 m?	12277	-	4539 m?	32368	-
Roof Transmission	288 m?	1286	-	288 m?	1478	-
Window Transmission	4726 m?	52590	-	4726 m?	155400	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	600 m?	0	-	600 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	150140 W	127839	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	150140 W	140188	-	0	0	-
People	1508	88195	90602	0	0	0
Infiltration	-	61585	20992	-	165039	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	5%	17714	0
>> Total Zone Loads	**-**	**1004405**	**111594**	**-**	**371999**	**0**
Zone Conditioning	-	977511	111594	-	364687	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Ventilation Load	1199 L/s	5497	1930	1199 L/s	18071	0
Ventilation Fan Load	1199 L/s	1110	-	1199 L/s	-1110	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**985229**	**113524**	**-**	**380538**	**0**
Cooling Coil	-	14275	920	-	0	0
Heating Coil	-	0	-	-	18835	-
Terminal Unit Cooling	-	970954	113288	-	0	0

Terminal Unit Heating	-	0	-	-	361752	-	
>> Total Conditioning	**-**	**985229**	**114208**	**-**	**380586**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

დანართი 20: გლდანის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1270	1270	1270	294	n/a	n/a
April	9337	9337	9337	2168	n/a	n/a
May	26864	26864	26864	6285	n/a	n/a
June	44179	44179	44179	10557	n/a	n/a
July	53582	53582	53582	13059	n/a	n/a
August	51834	51834	51834	12659	n/a	n/a
September	33089	33089	33089	7907	n/a	n/a
October	15612	15612	15612	3662	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**235768**	**235768**	**235768**	**56590**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_as_built 05.18.2017

Prepared by: 12:09

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9203	0	7072
February	0	8474	0	7547
March	25	0	1245	6935
April	175	0	9162	0
May	809	0	26055	0
June	2843	0	41337	0
July	6114	0	47467	0
August	7398	0	44437	0
September	2372	0	30718	0
October	613	0	14999	348
November	0	4316	0	1409
December	0	7374	0	6178
Total	**20347**	**29367**	**215421**	**29488**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **14,2** kW

Sensible coil load ..... **13,1** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,57** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,5**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**667**	L/s			
Water flow @ 20,0 K drop	**0,25**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	
L/(s·m?)	**0,48**	L/(s·m?)			L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_new_windows 05.18.2017

Prepared by: 12:12

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	85954	-	503 m?	-	-
Wall Transmission	369 m?	4893	-	369 m?	13009	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	503 m?	14202	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12863	-	0	0	-
People	101	5925	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	14258	609	10%	6151	0
>> Total Zone Loads	**-**	**156841**	**6696**	**-**	**67656**	**0**
Zone Conditioning	-	150850	6696	-	68122	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	617	-	667 L/s	-617	-
Ventilation Load	667 L/s	5995	2260	667 L/s	20278	0
Ventilation Fan Load	667 L/s	617	-	667 L/s	-617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**158079**	**8955**	**-**	**87166**	**0**
Cooling Coil	-	10990	1088	-	0	0
Heating Coil	-	0	-	-	20513	-
Terminal Unit Cooling	-	147090	8043	-	0	0

Terminal Unit Heating	-	0	-	-	66659	-
>> Total Conditioning	**-**	**158079**	**9131**	**-**	**87172**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1107	1107	1107	257	n/a	n/a
April	7848	7848	7848	1825	n/a	n/a
May	20900	20900	20900	4890	n/a	n/a
June	33308	33308	33308	7956	n/a	n/a
July	40250	40250	40250	9807	n/a	n/a
August	39776	39776	39776	9709	n/a	n/a
September	25433	25433	25433	6072	n/a	n/a
October	13204	13204	13204	3084	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**181826**	**181826**	**181826**	**43600**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_new_windows 05.18.2017

Prepared by: 12:12

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9203	0	1962
February	0	8474	0	2633
March	25	0	1082	3825
April	175	0	7673	0
May	809	0	20091	0
June	2843	0	30466	0
July	6114	0	34135	0
August	7398	0	32379	0
September	2372	0	23061	0
October	613	0	12591	190
November	0	4316	0	259
December	0	7374	0	1751
Total	**20347**	**29367**	**161479**	**10619**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **14,2** kW

Sensible coil load ..... **13,1** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,57** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,5**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**667**	L/s			
Water flow @ 20,0 K drop	**0,25**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	
L/(s·m?)	**0,48**	L/(s·m?)			L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_walls_insulation 05.18.2017

Prepared by: 12:15

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	53323	-	503 m?	-	-
Wall Transmission	369 m?	4893	-	369 m?	13009	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	503 m?	5704	-	503 m?	16805	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12863	-	0	0	-
People	101	5925	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	10145	609	10%	3647	0
>> Total Zone Loads	**-**	**111598**	**6696**	**-**	**40112**	**0**
Zone Conditioning	-	106928	6696	-	39588	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	617	-	667 L/s	-617	-
Ventilation Load	667 L/s	6036	2214	667 L/s	20240	0
Ventilation Fan Load	667 L/s	617	-	667 L/s	-617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**114199**	**8909**	**-**	**58593**	**0**
Cooling Coil	-	10990	1088	-	0	0
Heating Coil	-	0	-	-	20513	-
Terminal Unit Cooling	-	103209	7834	-	0	0

Terminal Unit Heating	-	0	-	-	38086	-
>> Total Conditioning	**-**	**114199**	**8922**	**-**	**58600**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1411	1411	1411	327	n/a	n/a
April	10175	10175	10175	2364	n/a	n/a
May	27440	27440	27440	6419	n/a	n/a
June	43550	43550	43550	10407	n/a	n/a
July	52084	52084	52084	12703	n/a	n/a
August	50257	50257	50257	12284	n/a	n/a
September	32602	32602	32602	7790	n/a	n/a
October	16328	16328	16328	3823	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**233847**	**233847**	**233847**	**56117**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_walls_insulation 05.18.2017

Prepared by: 12:15

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9203	0	4122
February	0	8474	0	4799
March	25	0	1387	4705
April	175	0	10000	0
May	809	0	26632	0
June	2843	0	40708	0
July	6114	0	45970	0
August	7398	0	42859	0
September	2372	0	30230	0
October	613	0	15715	242
November	0	4316	0	624
December	0	7374	0	3656
Total	**20347**	**29367**	**213500**	**18147**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **14,2** kW

Sensible coil load ..... **13,1** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,57** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,5**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**667**	L/s			
Water flow @ 20,0 K drop	**0,25**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	
L/(s·m?)	**0,48**	L/(s·m?)			L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_walls&roof_insulation 05.18.2017

Prepared by: 12:18

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	85954	-	503 m?	-	-
Wall Transmission	369 m?	982	-	369 m?	2560	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	503 m?	14202	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12863	-	0	0	-
People	101	5925	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	13867	609	10%	5106	0
>> Total Zone Loads	**-**	**152540**	**6696**	**-**	**56162**	**0**
Zone Conditioning	-	147822	6696	-	55887	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	617	-	667 L/s	-617	-
Ventilation Load	667 L/s	6059	2443	667 L/s	20272	0
Ventilation Fan Load	667 L/s	617	-	667 L/s	-617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**155116**	**9139**	**-**	**74925**	**0**
Cooling Coil	-	10990	1088	-	0	0
Heating Coil	-	0	-	-	20513	-
Terminal Unit Cooling	-	144126	8215	-	0	0

Terminal Unit Heating	-	0	-	-	54403	-
>> Total Conditioning	**-**	**155116**	**9302**	**-**	**74917**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1448	1448	1448	336	n/a	n/a
April	10286	10286	10286	2391	n/a	n/a
May	27104	27104	27104	6340	n/a	n/a
June	42503	42503	42503	10156	n/a	n/a
July	50628	50628	50628	12350	n/a	n/a
August	48972	48972	48972	11972	n/a	n/a
September	32036	32036	32036	7653	n/a	n/a
October	16549	16549	16549	3871	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**229527**	**229527**	**229527**	**55068**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_walls&roof_insulation 05.18.2017

Prepared by: 12:18

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9203	0	2846
February	0	8474	0	3693
March	25	0	1423	3916
April	175	0	10112	0
May	809	0	26296	0
June	2843	0	39660	0
July	6114	0	44514	0
August	7398	0	41575	0
September	2372	0	29664	0
October	613	0	15936	200
November	0	4316	0	311
December	0	7374	0	2533
Total	**20347**	**29367**	**209179**	**13498**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **14,2** kW

Sensible coil load ..... **13,1** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,57** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,5**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**667**	L/s			
Water flow @ 20,0 K drop	**0,25**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	
L/(s·m?)	**0,48**	L/(s·m?)			L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_rebuild 05.18.2017

Prepared by: 02:32

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	85954	-	503 m?	-	-
Wall Transmission	369 m?	982	-	369 m?	2560	-
Roof Transmission	500 m?	2232	-	500 m?	2566	-
Window Transmission	503 m?	14202	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12863	-	0	0	-
People	101	5925	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	13389	609	10%	4697	0
>> Total Zone Loads	**-**	**147277**	**6696**	**-**	**51668**	**0**
Zone Conditioning	-	143386	6696	-	51407	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	617	-	667 L/s	-617	-
Ventilation Load	667 L/s	6080	2511	667 L/s	20270	0
Ventilation Fan Load	667 L/s	617	-	667 L/s	-617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**150700**	**9206**	**-**	**70443**	**0**
Cooling Coil	-	10990	1088	-	0	0
Heating Coil	-	0	-	-	20513	-
Terminal Unit Cooling	-	139710	8376	-	0	0

Terminal Unit Heating	-	0	-	-	49922	-	
>> Total Conditioning	**-**	**150700**	**9464**	**-**	**70435**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)
January	0	0	0	0
February	0	0	0	0
March	1830	1830	1792	432
April	11126	11126	10836	2610
May	22526	22526	22450	5297
June	31784	31784	31775	7594
July	36817	36817	36817	8973
August	36415	36415	36415	8892
September	24382	24382	24382	5814
October	15372	15372	15372	3582
November	0	0	0	0
December	0	0	0	0
Total	**180252**	**180252**	**179839**	**43193**

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_rebuild 05.18.2017

Prepared by: 02:32

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	1894	0	35
February	0	1911	0	112
March	25	0	1805	12
April	174	0	10952	0
May	777	0	21749	0
June	2637	0	29146	0
July	5590	0	31227	0
August	6805	0	29610	0
September	2237	0	22145	0
October	611	0	14762	2
November	0	249	0	0
December	0	1221	0	24
Total	**18856**	**5276**	**161396**	**184**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **9,4** kW

Sensible coil load ..... **8,8** kW

Coil L/s at Jun 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,38** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**10,4**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**667**	L/s			
Water flow @ 20,0 K drop	**0,12**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	
L/(s·m?)	**0,48**	L/(s·m?)		L/s/person	

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_vent_reclaim 05.18.2017

Prepared by: 02:29

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	53323	-	503 m?	-	-
Wall Transmission	369 m?	982	-	369 m?	2560	-
Roof Transmission	500 m?	2232	-	500 m?	2566	-
Window Transmission	503 m?	5704	-	503 m?	16805	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12863	-	0	0	-
People	101	5925	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	9276	609	10%	2193	0
>> Total Zone Loads	**-**	**102034**	**6696**	**-**	**24125**	**0**
Zone Conditioning	-	98570	6696	-	24583	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	617	-	667 L/s	-617	-
Ventilation Load	667 L/s	3028	2301	667 L/s	10144	0
Ventilation Fan Load	667 L/s	617	-	667 L/s	-617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**102833**	**8996**	**-**	**33492**	**0**
Cooling Coil	-	7962	517	-	0	0
Heating Coil	-	0	-	-	10370	-
Terminal Unit Cooling	-	94871	8510	-	0	0

Terminal Unit Heating	-	0	-	-	23122	-	
>> Total Conditioning	**-**	**102833**	**9026**	**-**	**33492**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1496	1496	1496	347	n/a	n/a
April	10545	10545	10545	2451	n/a	n/a
May	27786	27786	27786	6498	n/a	n/a
June	44191	44191	44191	10553	n/a	n/a
July	53090	53090	53090	12932	n/a	n/a
August	51307	51307	51307	12524	n/a	n/a
September	33052	33052	33052	7894	n/a	n/a
October	16292	16292	16292	3814	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**237759**	**237759**	**237759**	**57013**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Gldani_vent_reclaim 05.18.2017

Prepared by: 02:29

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	3106	0	7075
February	0	2776	0	7528
March	25	0	1471	3863
April	173	0	10372	0
May	776	0	27010	0
June	2636	0	41555	0
July	5590	0	47500	0
August	6803	0	44504	0
September	2235	0	30817	0
October	610	0	15682	88
November	0	1064	0	1341
December	0	2261	0	6095
Total	**18848**	**9207**	**218911**	**25990**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **9,5** kW

Sensible coil load ..... **8,8** kW

Coil L/s at Jun 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,38** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**10,4**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**667**	L/s			
Water flow @ 20,0 K drop	**0,12**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,78**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,62**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	
L/(s·m?)	**0,48**	L/(s·m?)			L/s/person

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_as_built 05.19.2017

Prepared by: 07:31

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	85954	-	503 m?	-	-
Wall Transmission	369 m?	4893	-	369 m?	13009	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	503 m?	14202	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12863	-	0	0	-
People	101	5925	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	14258	609	10%	6151	0
>> Total Zone Loads	**-**	**156841**	**6696**	**-**	**67656**	**0**
Zone Conditioning	-	150850	6696	-	68122	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	617	-	667 L/s	-617	-
Ventilation Load	667 L/s	2997	2256	667 L/s	10139	0
Ventilation Fan Load	667 L/s	617	-	667 L/s	-617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**155082**	**8951**	**-**	**77027**	**0**
Cooling Coil	-	7992	522	-	0	0
Heating Coil	-	0	-	-	10375	-
Terminal Unit Cooling	-	147090	8607	-	0	0

Terminal Unit Heating	-	0	-	-	66659	-
>> Total Conditioning	**-**	**155082**	**9129**	**-**	**77033**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

დანართი 21: ვაკის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	617	617	617	142	n/a	n/a
March	1311	1311	1311	304	n/a	n/a
April	9608	9608	9608	2235	n/a	n/a
May	26573	26573	26573	6217	n/a	n/a
June	44997	44997	44997	10731	n/a	n/a
July	52542	52542	52542	12814	n/a	n/a
August	52370	52370	52370	12805	n/a	n/a
September	33926	33926	33926	8078	n/a	n/a
October	16073	16073	16073	3753	n/a	n/a
November	3501	3501	3501	813	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**241518**	**241518**	**241518**	**57892**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_as_built 05.19.2017

Prepared by: 07:31

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9660	0	7006
February	0	8852	617	7441
March	17	0	1293	7078
April	125	0	9483	938
May	624	0	25949	37
June	2308	0	42689	0
July	5039	0	47503	0
August	6205	0	46165	0
September	1848	0	32078	9
October	436	0	15637	375
November	0	4582	3501	1495
December	0	7773	0	6107
Total	**16604**	**30867**	**224915**	**30486**

Air System Information

Air System Name ..... **Vake**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **12,5** kW

Sensible coil load ..... **12,5** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **1,000**

Water flow @ 5,6 K rise ..... **0,54** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**18,0 / 16,8**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 22,0**	°C
Max coil L/s	**667**	L/s			
Water flow @ 11,1 K drop	**0,46**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,00**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,00**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_new_windows 05.19.2017

Prepared by: 07:40

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1600 COOLING OA DB / WB 33,5 °C / 21,7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	68891	-	503 m?	-	-
Wall Transmission	369 m?	4855	-	369 m?	13009	-
Roof Transmission	500 m?	6389	-	500 m?	6651	-
Window Transmission	503 m?	16013	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11432	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12730	-	0	0	-
People	101	5729	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**126039**	**6087**	**-**	**61506**	**0**
Zone Conditioning	-	122468	6087	-	59412	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	0	-	667 L/s	0	-
Ventilation Load	667 L/s	8183	2222	667 L/s	19543	0
Ventilation Fan Load	667 L/s	0	-	667 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**130651**	**8309**	**-**	**78955**	**0**
Cooling Coil	-	11842	195	-	0	0
Heating Coil	-	0	-	-	21131	-
Terminal Unit Cooling	-	118809	8225	-	0	0

Terminal Unit Heating	-	0	-	-	57830	-
>> Total Conditioning	**-**	**130651**	**8420**	**-**	**78960**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	661	661	661	152	n/a	n/a
March	1116	1116	1116	259	n/a	n/a
April	7937	7937	7937	1854	n/a	n/a
May	20653	20653	20653	4838	n/a	n/a
June	33716	33716	33716	8045	n/a	n/a
July	39447	39447	39447	9630	n/a	n/a
August	39959	39959	39959	9790	n/a	n/a
September	25818	25818	25818	6147	n/a	n/a
October	13350	13350	13350	3112	n/a	n/a
November	3492	3492	3492	808	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**186149**	**186149**	**186149**	**44636**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_new_windows 05.19.2017

Prepared by: 07:40

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9660	0	2025
February	0	8852	661	2619
March	17	0	1099	4019
April	125	0	7812	481
May	624	0	20029	24
June	2308	0	31408	0
July	5039	0	34407	0
August	6205	0	33754	0
September	1848	0	23970	6
October	436	0	12913	230
November	0	4582	3492	291
December	0	7773	0	1777
Total	**16604**	**30867**	**169545**	**11471**

Air System Information

Air System Name ..... **Vake**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **12,5** kW

Sensible coil load ..... **12,5** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **1,000**

Water flow @ 5,6 K rise ..... **0,54** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**18,0 / 16,8**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 22,0**	°C
Max coil L/s	**667**	L/s			
Water flow @ 11,1 K drop	**0,46**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,00**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,00**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_walls_insulation 05.19.2017

Prepared by: 07:41

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1600 COOLING OA DB / WB 33,5 °C / 21,7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	42737	-	503 m?	-	-
Wall Transmission	369 m?	4855	-	369 m?	13009	-
Roof Transmission	500 m?	6389	-	500 m?	6651	-
Window Transmission	503 m?	6431	-	503 m?	16805	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11432	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12730	-	0	0	-
People	101	5729	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**90303**	**6087**	**-**	**36466**	**0**
Zone Conditioning	-	88129	6087	-	35544	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	0	-	667 L/s	0	-
Ventilation Load	667 L/s	8198	2187	667 L/s	19570	0
Ventilation Fan Load	667 L/s	0	-	667 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**96327**	**8274**	**-**	**55114**	**0**
Cooling Coil	-	11842	195	-	0	0
Heating Coil	-	0	-	-	21131	-
Terminal Unit Cooling	-	84486	8112	-	0	0

Terminal Unit Heating	-	0	-	-	33989	-	
>> Total Conditioning	**-**	**96327**	**8306**	**-**	**55120**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	775	775	775	178	n/a	n/a
March	1460	1460	1460	339	n/a	n/a
April	10421	10421	10421	2434	n/a	n/a
May	27121	27121	27121	6351	n/a	n/a
June	44427	44427	44427	10598	n/a	n/a
July	50957	50957	50957	12437	n/a	n/a
August	50762	50762	50762	12421	n/a	n/a
September	33473	33473	33473	7971	n/a	n/a
October	16862	16862	16862	3933	n/a	n/a
November	4079	4079	4079	946	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**240338**	**240338**	**240338**	**57607**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_walls_insulation 05.19.2017

Prepared by: 07:41

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9660	0	4055
February	0	8852	775	4737
March	17	0	1443	4830
April	125	0	10296	499
May	624	0	26497	24
June	2308	0	42119	0
July	5039	0	45918	0
August	6205	0	44557	0
September	1848	0	31625	7
October	436	0	16425	271
November	0	4582	4079	726
December	0	7773	0	3610
Total	**16604**	**30867**	**223734**	**18761**

Air System Information

Air System Name ..... **Vake**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **12,5** kW

Sensible coil load ..... **12,5** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **1,000**

Water flow @ 5,6 K rise ..... **0,54** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**18,0 / 16,8**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 22,0**	°C
Max coil L/s	**667**	L/s			
Water flow @ 11,1 K drop	**0,46**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,00**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,00**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_walls&roof_insulation 05.19.2017

Prepared by: 07:43

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 34,1 °C / 21,7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	68061	-	503 m?	-	-
Wall Transmission	369 m?	1065	-	369 m?	2560	-
Roof Transmission	500 m?	6277	-	500 m?	6651	-
Window Transmission	503 m?	16918	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11432	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12730	-	0	0	-
People	101	5729	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**122212**	**6087**	**-**	**51056**	**0**
Zone Conditioning	-	120025	6087	-	49135	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	0	-	667 L/s	0	-
Ventilation Load	667 L/s	8642	1958	667 L/s	19537	0
Ventilation Fan Load	667 L/s	0	-	667 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**128667**	**8045**	**-**	**68673**	**0**
Cooling Coil	-	12266	0	-	0	0
Heating Coil	-	0	-	-	21131	-
Terminal Unit Cooling	-	116401	8166	-	0	0

Terminal Unit Heating	-	0	-	-	47547	-
>> Total Conditioning	**-**	**128667**	**8166**	**-**	**68678**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	826	826	826	190	n/a	n/a
March	1492	1492	1492	347	n/a	n/a
April	10509	10509	10509	2461	n/a	n/a
May	26801	26801	26801	6281	n/a	n/a
June	43369	43369	43369	10347	n/a	n/a
July	49520	49520	49520	12090	n/a	n/a
August	49522	49522	49522	12128	n/a	n/a
September	32924	32924	32924	7839	n/a	n/a
October	17075	17075	17075	3982	n/a	n/a
November	4302	4302	4302	997	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**236340**	**236340**	**236340**	**56661**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_walls&roof_insulation 05.19.2017

Prepared by: 07:43

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9660	0	2767
February	0	8852	826	3615
March	17	0	1475	4003
April	125	0	10384	387
May	624	0	26176	24
June	2308	0	41061	0
July	5039	0	44480	0
August	6205	0	43317	0
September	1848	0	31076	6
October	436	0	16639	219
November	0	4582	4302	369
December	0	7773	0	2411
Total	**16604**	**30867**	**219737**	**13802**

Air System Information

Air System Name ..... **Vake**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **12,5** kW

Sensible coil load ..... **12,5** kW

Coil L/s at Jul 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **1,000**

Water flow @ 5,6 K rise ..... **0,54** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**18,0 / 16,8**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**-5,7 / 22,0**	°C
Max coil L/s	**667**	L/s			
Water flow @ 11,1 K drop	**0,46**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,00**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,00**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_rebuild 05.19.2017

Prepared by: 07:45

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1600 COOLING OA DB / WB 34,1 °C / 21,7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	68061	-	503 m?	-	-
Wall Transmission	369 m?	1065	-	369 m?	2560	-
Roof Transmission	500 m?	1929	-	500 m?	2566	-
Window Transmission	503 m?	16918	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11432	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12730	-	0	0	-
People	101	5729	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**117863**	**6087**	**-**	**46971**	**0**
Zone Conditioning	-	115889	6087	-	45082	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	0	-	667 L/s	0	-
Ventilation Load	667 L/s	8644	1984	667 L/s	19530	0
Ventilation Fan Load	667 L/s	0	-	667 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**124533**	**8071**	**-**	**64612**	**0**
Cooling Coil	-	12266	0	-	0	0
Heating Coil	-	0	-	-	21131	-
Terminal Unit Cooling	-	112267	8173	-	0	0

Terminal Unit Heating	-	0	-	-	43486	-	
>> Total Conditioning	**-**	**124533**	**8173**	**-**	**64617**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	1128	1128	1103	270	n/a	n/a
March	1789	1789	1707	421	n/a	n/a
April	10902	10902	10312	2515	n/a	n/a
May	22171	22171	21953	5212	n/a	n/a
June	32191	32191	32169	7703	n/a	n/a
July	35840	35840	35840	8776	n/a	n/a
August	36466	36466	36466	8974	n/a	n/a
September	24789	24789	24789	5896	n/a	n/a
October	15563	15563	15563	3627	n/a	n/a
November	5368	5368	5356	1256	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**186207**	**186207**	**185257**	**44649**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_rebuild 05.19.2017

Prepared by: 07:45

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	2526	0	35
February	0	2569	1128	116
March	17	0	1772	25
April	123	0	10779	7
May	577	0	21594	0
June	2041	0	30150	0
July	4377	0	31463	0
August	5447	0	31019	0
September	1663	0	23127	1
October	429	0	15134	5
November	0	1192	5368	0
December	0	1837	0	25
Total	**14673**	**8124**	**171534**	**214**

Air System Information

Air System Name ..... **Vake**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **8,1** kW

Sensible coil load ..... **8,1** kW

Coil L/s at Aug 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **1,000**

Water flow @ 5,6 K rise ..... **0,35** L/s

Load occurs at	**Aug 1500**		Leaving DB / WB	**18,0 / 16,8**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,6 / 20,1**	°C			

Heating Coil Sizing Data

Max coil load	**11,3**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**7,2 / 22,0**	°C
Max coil L/s	**667**	L/s			
Water flow @ 11,1 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,00**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,00**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_vent_reclaim 05.19.2017

Prepared by: 07:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1700 COOLING OA DB / WB 32,8 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	42243	-	503 m?	-	-
Wall Transmission	369 m?	1015	-	369 m?	2560	-
Roof Transmission	500 m?	2101	-	500 m?	2566	-
Window Transmission	503 m?	6170	-	503 m?	16805	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11586	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12799	-	0	0	-
People	101	5830	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**81743**	**6087**	**-**	**21931**	**0**
Zone Conditioning	-	80479	6087	-	21686	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	0	-	667 L/s	0	-
Ventilation Load	667 L/s	3820	2145	667 L/s	9842	0
Ventilation Fan Load	667 L/s	0	-	667 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**84299**	**8231**	**-**	**31528**	**0**
Cooling Coil	-	7450	0	-	0	0
Heating Coil	-	0	-	-	11288	-
Terminal Unit Cooling	-	76849	8344	-	0	0

Terminal Unit Heating	-	0	-	-	20246	-	
>> Total Conditioning	**-**	**84299**	**8344**	**-**	**31534**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	702	702	702	161	n/a	n/a
March	1514	1514	1514	352	n/a	n/a
April	10707	10707	10707	2504	n/a	n/a
May	27471	27471	27471	6431	n/a	n/a
June	44977	44977	44977	10724	n/a	n/a
July	51915	51915	51915	12661	n/a	n/a
August	51686	51686	51686	12639	n/a	n/a
September	33881	33881	33881	8063	n/a	n/a
October	16780	16780	16780	3914	n/a	n/a
November	4071	4071	4071	944	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**243705**	**243705**	**243705**	**58395**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for Vake

Project Name: Vake_vent_reclaim 05.19.2017

Prepared by: 07:28

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	3763	0	7021
February	0	3440	702	7437
March	17	0	1497	4082
April	122	0	10585	266
May	576	0	26895	1
June	2040	0	42937	0
July	4375	0	47540	0
August	5444	0	46242	0
September	1661	0	32221	1
October	428	0	16352	101
November	0	1847	4071	1467
December	0	2890	0	6024
Total	**14662**	**11941**	**229043**	**26401**

Air System Information

Air System Name ..... **Vake**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1377,6** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **8,1** kW

Sensible coil load ..... **8,1** kW

Coil L/s at Aug 1500 ..... **667** L/s

Max coil L/s ..... **667** L/s

Sensible heat ratio **1,000**

Water flow @ 5,6 K rise ..... **0,35** L/s

Load occurs at	**Aug 1500**		Leaving DB / WB	**18,0 / 16,8**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,6 / 20,1**	°C			

Heating Coil Sizing Data

Max coil load	**11,4**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**667**	L/s	Ent. DB / Lvg DB	**7,1 / 22,0**	°C
Max coil L/s	**667**	L/s			
Water flow @ 11,1 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**667**	L/s	Fan motor BHP	**0,00**	BHP
Standard L/s	**632**	L/s	Fan motor kW	**0,00**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**667**	L/s	L/s/person	**6,58**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Didube_as_built 05.17.2017

Prepared by: 11:14

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1600 COOLING OA DB / WB 33,5 °C / 21,7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	503 m?	68891	-	503 m?	-	-
Wall Transmission	369 m?	4855	-	369 m?	13009	-
Roof Transmission	500 m?	6389	-	500 m?	6651	-
Window Transmission	503 m?	16013	-	503 m?	41845	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	791 m?	0	-	791 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13776 W	11432	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13776 W	12730	-	0	0	-
People	101	5729	6087	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**126039**	**6087**	**-**	**61506**	**0**
Zone Conditioning	-	122468	6087	-	59412	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	667 L/s	0	-	667 L/s	0	-
Ventilation Load	667 L/s	4091	2221	667 L/s	9772	0
Ventilation Fan Load	667 L/s	0	-	667 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**126560**	**8307**	**-**	**69183**	**0**
Cooling Coil	-	7751	0	-	0	0
Heating Coil	-	0	-	-	11359	-
Terminal Unit Cooling	-	118809	8419	-	0	0

Terminal Unit Heating	-	0	-	-	57830	-
>> Total Conditioning	**-**	**126560**	**8419**	**-**	**69189**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

დანართი 22: დიდუბის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1389	1389	1389	322	n/a	n/a
April	10262	10262	10262	2383	n/a	n/a
May	29210	29210	29210	6832	n/a	n/a
June	47766	47766	47766	11410	n/a	n/a
July	57301	57301	57301	13967	n/a	n/a
August	55112	55112	55112	13463	n/a	n/a
September	35464	35464	35464	8475	n/a	n/a
October	16765	16765	16765	3933	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**253267**	**253267**	**253267**	**60785**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Didube_as_built 05.17.2017

Prepared by: 11:14

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	7343
February	0	8294	0	7728
March	24	0	1364	6621
April	171	0	10091	0
May	791	0	28418	0
June	2782	0	44983	0
July	5985	0	51316	0
August	7241	0	47871	0
September	2321	0	33142	0
October	600	0	16165	321
November	0	4224	0	1467
December	0	7218	0	6418
Total	**19917**	**28745**	**233350**	**29899**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_new_windows 05.17.2017

Prepared by: 11:17

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	89758	-	571 m?	-	-
Wall Transmission	290 m?	3878	-	290 m?	10219	-
Roof Transmission	500 m?	7017	-	500 m?	6651	-
Window Transmission	571 m?	22347	-	571 m?	65844	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	15285	597	10%	8271	0
>> Total Zone Loads	**-**	**168139**	**6567**	**-**	**90986**	**0**
Zone Conditioning	-	164201	6567	-	88328	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	5984	2568	652 L/s	19664	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**171393**	**9135**	**-**	**106784**	**0**
Cooling Coil	-	10757	1065	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	160636	8150	-	0	0

Terminal Unit Heating	-	0	-	-	86711	-
>> Total Conditioning	**-**	**171393**	**9215**	**-**	**106790**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1221	1221	1221	283	n/a	n/a
April	8673	8673	8673	2016	n/a	n/a
May	22556	22556	22556	5277	n/a	n/a
June	35436	35436	35436	8470	n/a	n/a
July	42234	42234	42234	10302	n/a	n/a
August	41431	41431	41431	10125	n/a	n/a
September	26829	26829	26829	6411	n/a	n/a
October	14139	14139	14139	3306	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**192519**	**192519**	**192519**	**46191**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_new_windows 05.17.2017

Prepared by: 11:17

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	1525
February	0	8294	0	2181
March	24	0	1197	3165
April	171	0	8502	0
May	791	0	21764	0
June	2782	0	32654	0
July	5985	0	36249	0
August	7241	0	34190	0
September	2321	0	24507	0
October	600	0	13540	146
November	0	4224	0	147
December	0	7218	0	1352
Total	**19917**	**28745**	**172603**	**8515**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_walls_insulation 05.17.2017

Prepared by: 11:23

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	59304	-	571 m?	-	-
Wall Transmission	290 m?	3878	-	290 m?	10219	-
Roof Transmission	500 m?	7017	-	500 m?	6651	-
Window Transmission	571 m?	6475	-	571 m?	19077	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	10653	597	10%	3595	0
>> Total Zone Loads	**-**	**117181**	**6567**	**-**	**39542**	**0**
Zone Conditioning	-	114242	6567	-	39531	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	5985	2475	652 L/s	19839	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**121435**	**9041**	**-**	**58161**	**0**
Cooling Coil	-	10757	1065	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	110678	8109	-	0	0

Terminal Unit Heating	-	0	-	-	38088	-
>> Total Conditioning	**-**	**121435**	**9174**	**-**	**58167**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1507	1507	1507	350	n/a	n/a
April	10920	10920	10920	2554	n/a	n/a
May	29659	29659	29659	6964	n/a	n/a
June	47274	47274	47274	11292	n/a	n/a
July	56105	56105	56105	13745	n/a	n/a
August	53805	53805	53805	13187	n/a	n/a
September	35042	35042	35042	8338	n/a	n/a
October	17342	17342	17342	4045	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**251654**	**251654**	**251654**	**60475**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_walls_insulation 05.17.2017

Prepared by: 11:23

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	5051
February	0	8294	0	5632
March	24	0	1483	4968
April	171	0	10749	0
May	791	0	28867	0
June	2782	0	44492	0
July	5985	0	50120	0
August	7241	0	46564	0
September	2321	0	32720	0
October	600	0	16742	247
November	0	4224	0	873
December	0	7218	0	4499
Total	**19917**	**28745**	**231738**	**21271**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Didube_as_built 05.17.2017

Prepared by: AECOM 11:26

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	95596	-	571 m?	-	-
Wall Transmission	290 m?	779	-	290 m?	2011	-
Roof Transmission	500 m?	7017	-	500 m?	6651	-
Window Transmission	571 m?	16122	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	14937	597	10%	5616	0
>> Total Zone Loads	**-**	**164304**	**6567**	**-**	**61781**	**0**
Zone Conditioning	-	159261	6567	-	61968	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	5909	2373	652 L/s	19885	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**166379**	**8940**	**-**	**80645**	**0**
Cooling Coil	-	10757	1065	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	155622	7938	-	0	0

Terminal Unit Heating	-	0	-	-	60572	-	
>> Total Conditioning	**-**	**166379**	**9003**	**-**	**80651**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1534	1534	1534	356	n/a	n/a
April	11015	11015	11012	2577	n/a	n/a
May	29323	29323	29323	6884	n/a	n/a
June	46196	46196	46196	11027	n/a	n/a
July	54638	54638	54638	13366	n/a	n/a
August	52530	52530	52530	12858	n/a	n/a
September	34465	34465	34465	8203	n/a	n/a
October	17545	17545	17545	4091	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**247246**	**247246**	**247242**	**59362**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Didube_as_built 05.17.2017

Prepared by: AECOM 11:26

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	3722
February	0	8294	0	4472
March	24	0	1509	4149
April	171	0	10844	0
May	791	0	28532	0
June	2782	0	43414	0
July	5985	0	48653	0
August	7241	0	45289	0
September	2321	0	32144	0
October	600	0	16945	202
November	0	4224	0	501
December	0	7218	0	3302
Total	**19917**	**28745**	**227329**	**16349**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_rebuild 05.18.2017

Prepared by: 02:26

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	95596	-	571 m?	-	-
Wall Transmission	290 m?	779	-	290 m?	2011	-
Roof Transmission	500 m?	2218	-	500 m?	2554	-
Window Transmission	571 m?	16122	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	14457	597	10%	5207	0
>> Total Zone Loads	**-**	**159026**	**6567**	**-**	**57274**	**0**
Zone Conditioning	-	155672	6567	-	57439	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	5969	2548	652 L/s	19880	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**162849**	**9115**	**-**	**76111**	**0**
Cooling Coil	-	10757	1065	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	152091	8278	-	0	0

Terminal Unit Heating	-	0	-	-	56038	-
>> Total Conditioning	**-**	**162849**	**9342**	**-**	**76117**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1909	1909	1876	451	n/a	n/a
April	11704	11704	11449	2753	n/a	n/a
May	24042	24042	23979	5654	n/a	n/a
June	34027	34027	34020	8127	n/a	n/a
July	39098	39098	39098	9528	n/a	n/a
August	38389	38389	38389	9374	n/a	n/a
September	25840	25840	25840	6162	n/a	n/a
October	16091	16091	16091	3750	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**191102**	**191102**	**190742**	**45799**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_rebuild 05.18.2017

Prepared by: 02:26

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	1926	0	66
February	0	1918	0	180
March	24	0	1885	15
April	170	0	11534	0
May	761	0	23282	0
June	2582	0	31445	0
July	5474	0	33625	0
August	6661	0	31728	0
September	2190	0	23651	0
October	598	0	15493	2
November	0	269	0	0
December	0	1268	0	48
Total	**18460**	**5381**	**172643**	**311**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **9,2** kW

Sensible coil load ..... **8,6** kW

Coil L/s at Jun 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,37** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**10,2**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,12**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_vent_reclaim 05.18.2017

Prepared by: 02:22

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	59304	-	571 m?	-	-
Wall Transmission	290 m?	779	-	290 m?	2011	-
Roof Transmission	500 m?	2232	-	500 m?	2566	-
Window Transmission	571 m?	6475	-	571 m?	19077	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	9864	597	10%	2365	0
>> Total Zone Loads	**-**	**108508**	**6567**	**-**	**26020**	**0**
Zone Conditioning	-	106121	6567	-	25893	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	2991	2474	652 L/s	9927	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**110321**	**9041**	**-**	**34611**	**0**
Cooling Coil	-	7766	500	-	0	0
Heating Coil	-	0	-	-	10153	-
Terminal Unit Cooling	-	102555	8650	-	0	0

Terminal Unit Heating	-	0	-	-	24462	-
>> Total Conditioning	**-**	**110321**	**9150**	**-**	**34614**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1613	1613	1613	374	n/a	n/a
April	11425	11425	11425	2655	n/a	n/a
May	30116	30116	30116	7042	n/a	n/a
June	47799	47799	47799	11412	n/a	n/a
July	56822	56822	56822	13843	n/a	n/a
August	54578	54578	54578	13327	n/a	n/a
September	35432	35432	35432	8463	n/a	n/a
October	17462	17462	17462	4090	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**255245**	**255245**	**255245**	**61205**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Didube_vent_reclaim 05.18.2017

Prepared by: 02:22

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	3068	0	7321
February	0	2735	0	7715
March	24	0	1589	3737
April	170	0	11255	0
May	760	0	29357	0
June	2581	0	45218	0
July	5472	0	51350	0
August	6658	0	47919	0
September	2188	0	33244	0
October	597	0	16864	80
November	0	1056	0	1395
December	0	2245	0	6367
Total	**18450**	**9105**	**236795**	**26616**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **9,3** kW

Sensible coil load ..... **8,6** kW

Coil L/s at Jun 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,37** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**10,2**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,12**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Nadzaladevi_as_built 05.17.2017

Prepared by: 02:51

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	95596	-	571 m?	-	-
Wall Transmission	290 m?	3878	-	290 m?	10219	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	571 m?	16122	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	15247	597	10%	6437	0
>> Total Zone Loads	**-**	**167713**	**6567**	**-**	**70810**	**0**
Zone Conditioning	-	163196	6567	-	70642	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	2966	2450	652 L/s	9924	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**167371**	**9017**	**-**	**79358**	**0**
Cooling Coil	-	7791	505	-	0	0
Heating Coil	-	0	-	-	10155	-
Terminal Unit Cooling	-	159580	8856	-	0	0

Terminal Unit Heating	-	0	-	-	69210	-
>> Total Conditioning	**-**	**167371**	**9361**	**-**	**79365**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

დანართი 23: ნაძალადევის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	627	627	627	147	n/a	n/a
April	4718	4718	4718	1102	n/a	n/a
May	16363	16363	16363	3848	n/a	n/a
June	33064	33064	33064	7935	n/a	n/a
July	44882	44882	44882	10960	n/a	n/a
August	45520	45520	45520	11126	n/a	n/a
September	24697	24697	24697	5920	n/a	n/a
October	9459	9459	9459	2236	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**179330**	**179330**	**179330**	**43275**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Nadzaladevi_as_built 05.17.2017

Prepared by: 02:51

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9799	0	9628
February	0	9022	0	9677
March	27	0	600	12229
April	186	0	4532	0
May	861	0	15502	0
June	3027	0	30038	0
July	6510	0	38372	0
August	7877	0	37643	0
September	2525	0	22172	0
October	652	0	8806	804
November	0	4595	0	2983
December	0	7852	0	7968
Total	**21665**	**31268**	**157665**	**43289**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **41**

Floor Area ..... **840,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **15,1** kW

Sensible coil load ..... **14,0** kW

Coil L/s at Jul 1500 ..... **710** L/s

Max coil L/s ..... **710** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,60** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**710**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**710**	L/s			
Water flow @ 20,0 K drop	**0,26**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**710**	L/s	L/s/person	**5,14**	L/s/person
L/(s·m?)	**0,84**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_new_windows 05.17.2017

Prepared by: 03:08

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	43617	-	330 m?	-	-
Wall Transmission	501 m?	6564	-	501 m?	17658	-
Roof Transmission	432 m?	5747	-	432 m?	5741	-
Window Transmission	330 m?	14794	-	330 m?	38054	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	183 m?	0	-	183 m?	0	-
Partitions	988 m?	10776	-	988 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	9994 W	8405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14985 W	13921	-	0	0	-
People	138	7946	8296	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	11177	830	10%	6145	0
>> Total Zone Loads	**-**	**122948**	**9126**	**-**	**67599**	**0**
Zone Conditioning	-	117698	9126	-	65490	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	710 L/s	657	-	710 L/s	-657	-
Ventilation Load	710 L/s	7914	983	710 L/s	21366	0
Ventilation Fan Load	710 L/s	657	-	710 L/s	-657	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**126926**	**10109**	**-**	**85541**	**0**
Cooling Coil	-	13109	1007	-	0	0
Heating Coil	-	0	-	-	21842	-
Terminal Unit Cooling	-	113838	9294	-	0	0

Terminal Unit Heating	-	0	-	-	63721	-	
>> Total Conditioning	**-**	**126947**	**10301**	**-**	**85563**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	630	630	630	147	n/a	n/a
April	4534	4534	4534	1055	n/a	n/a
May	14216	14216	14216	3338	n/a	n/a
June	27295	27295	27295	6547	n/a	n/a
July	37029	37029	37029	9040	n/a	n/a
August	38124	38124	38124	9324	n/a	n/a
September	20835	20835	20835	4988	n/a	n/a
October	9057	9057	9057	2129	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**151721**	**151721**	**151721**	**36568**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_new_windows 05.17.2017

Prepared by: 03:08

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9799	0	3534
February	0	9022	0	3952
March	27	0	604	7677
April	186	0	4348	0
May	861	0	13355	0
June	3027	0	24269	0
July	6510	0	30519	0
August	7877	0	30248	0
September	2525	0	18310	0
October	652	0	8404	551
November	0	4595	0	994
December	0	7852	0	2963
Total	**21665**	**31268**	**130056**	**19671**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **41**

Floor Area ..... **840,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **15,1** kW

Sensible coil load ..... **14,0** kW

Coil L/s at Jul 1500 ..... **710** L/s

Max coil L/s ..... **710** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,60** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**710**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**710**	L/s			
Water flow @ 20,0 K drop	**0,26**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**710**	L/s	L/s/person	**5,14**	L/s/person
L/(s·m?)	**0,84**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_walls_insulation 05.17.2017

Prepared by: 03:43

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	28818	-	330 m?	-	-
Wall Transmission	501 m?	6564	-	501 m?	17658	-
Roof Transmission	432 m?	5747	-	432 m?	5741	-
Window Transmission	330 m?	4286	-	330 m?	11025	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	183 m?	0	-	183 m?	0	-
Partitions	988 m?	10776	-	988 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	9994 W	8405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14985 W	13921	-	0	0	-
People	138	7946	8296	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	8646	830	10%	3442	0
>> Total Zone Loads	**-**	**95111**	**9126**	**-**	**37867**	**0**
Zone Conditioning	-	90928	9126	-	36842	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	710 L/s	657	-	710 L/s	-657	-
Ventilation Load	710 L/s	7940	900	710 L/s	21472	0
Ventilation Fan Load	710 L/s	657	-	710 L/s	-657	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**100182**	**10026**	**-**	**57000**	**0**
Cooling Coil	-	13109	1007	-	0	0
Heating Coil	-	0	-	-	21842	-
Terminal Unit Cooling	-	87094	9203	-	0	0

Terminal Unit Heating	-	0	-	-	35180	-
>> Total Conditioning	**-**	**100203**	**10210**	**-**	**57022**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	830	830	830	193	n/a	n/a
April	6059	6059	6059	1408	n/a	n/a
May	18400	18400	18400	4316	n/a	n/a
June	33686	33686	33686	8072	n/a	n/a
July	43618	43618	43618	10654	n/a	n/a
August	44080	44080	44080	10782	n/a	n/a
September	25416	25416	25416	6083	n/a	n/a
October	11435	11435	11435	2685	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**183524**	**183524**	**183524**	**44192**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_walls_insulation 05.17.2017

Prepared by: 03:43

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9799	0	3003
February	0	9022	0	3195
March	27	0	803	6586
April	186	0	5873	0
May	861	0	17539	0
June	3027	0	30659	0
July	6510	0	37108	0
August	7877	0	36203	0
September	2525	0	22891	0
October	652	0	10783	556
November	0	4595	0	757
December	0	7852	0	2643
Total	**21665**	**31268**	**161859**	**16740**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **41**

Floor Area ..... **840,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **15,1** kW

Sensible coil load ..... **14,0** kW

Coil L/s at Jul 1500 ..... **710** L/s

Max coil L/s ..... **710** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,60** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**710**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**710**	L/s			
Water flow @ 20,0 K drop	**0,26**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**710**	L/s	L/s/person	**5,14**	L/s/person
L/(s·m?)	**0,84**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_walls&roof_insulation 05.17.2017

Prepared by: 09:49

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1700 COOLING OA DB / WB 32,8 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	47304	-	330 m?	-	-
Wall Transmission	501 m?	1355	-	501 m?	3605	-
Roof Transmission	432 m?	5841	-	432 m?	5741	-
Window Transmission	330 m?	10079	-	330 m?	27453	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	183 m?	0	-	183 m?	0	-
Partitions	988 m?	10605	-	988 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	9994 W	8405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14985 W	13921	-	0	0	-
People	138	7946	8296	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	10546	830	10%	3680	0
>> Total Zone Loads	**-**	**116002**	**9126**	**-**	**40479**	**0**
Zone Conditioning	-	111892	9126	-	39624	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	710 L/s	657	-	710 L/s	-657	-
Ventilation Load	710 L/s	7477	1254	710 L/s	21537	0
Ventilation Fan Load	710 L/s	657	-	710 L/s	-657	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**120684**	**10380**	**-**	**59847**	**0**
Cooling Coil	-	12658	1336	-	0	0
Heating Coil	-	0	-	-	21842	-
Terminal Unit Cooling	-	108067	9167	-	0	0

Terminal Unit Heating	-	0	-	-	38006	-
>> Total Conditioning	**-**	**120725**	**10502**	**-**	**59848**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	706	706	706	164	n/a	n/a
April	5118	5118	5118	1191	n/a	n/a
May	16314	16314	16314	3832	n/a	n/a
June	31267	31267	31267	7503	n/a	n/a
July	41632	41632	41632	10178	n/a	n/a
August	42429	42429	42429	10385	n/a	n/a
September	23706	23706	23706	5679	n/a	n/a
October	10180	10180	10180	2395	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**171352**	**171352**	**171352**	**41329**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_walls&roof_insulation 05.17.2017

Prepared by: 09:49

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9799	0	5237
February	0	9022	0	5278
March	27	0	680	8638
April	186	0	4932	0
May	861	0	15453	0
June	3027	0	28241	0
July	6510	0	35122	0
August	7877	0	34552	0
September	2525	0	21181	0
October	652	0	9527	688
November	0	4595	0	1585
December	0	7852	0	4412
Total	**21665**	**31268**	**149687**	**25839**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **41**

Floor Area ..... **840,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **15,1** kW

Sensible coil load ..... **14,0** kW

Coil L/s at Jul 1500 ..... **710** L/s

Max coil L/s ..... **710** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,60** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**21,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**710**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**710**	L/s			
Water flow @ 20,0 K drop	**0,26**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**710**	L/s	L/s/person	**5,14**	L/s/person
L/(s·m?)	**0,84**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_as_built 05.18.2017

Prepared by: AECOM 03:09

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	46454	-	330 m?	-	-
Wall Transmission	501 m?	1411	-	501 m?	3605	-
Roof Transmission	432 m?	1781	-	432 m?	2236	-
Window Transmission	330 m?	10673	-	330 m?	27453	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	183 m?	0	-	183 m?	0	-
Partitions	988 m?	10776	-	988 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	9994 W	8405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14985 W	13921	-	0	0	-
People	138	7946	8296	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	10137	830	10%	3329	0
>> Total Zone Loads	**-**	**111504**	**9126**	**-**	**36623**	**0**
Zone Conditioning	-	107417	9126	-	36027	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	710 L/s	657	-	710 L/s	-657	-
Ventilation Load	710 L/s	7932	735	710 L/s	21551	0
Ventilation Fan Load	710 L/s	657	-	710 L/s	-657	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**116663**	**9861**	**-**	**56263**	**0**
Cooling Coil	-	13109	1007	-	0	0
Heating Coil	-	0	-	-	21842	-
Terminal Unit Cooling	-	103594	9057	-	0	0

Terminal Unit Heating	-	0	-	-	34439	-
>> Total Conditioning	**-**	**116702**	**10064**	**-**	**56281**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	798	798	798	185	n/a	n/a
April	5499	5499	5499	1278	n/a	n/a
May	14663	14663	14663	3439	n/a	n/a
June	25407	25407	25407	6088	n/a	n/a
July	33249	33249	33249	8128	n/a	n/a
August	34456	34456	34456	8448	n/a	n/a
September	19759	19759	19759	4725	n/a	n/a
October	10260	10260	10260	2395	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**144092**	**144092**	**144092**	**34687**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_as_built 05.18.2017

Prepared by: AECOM 03:09

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	3586	0	316
February	0	3450	0	424
March	27	0	771	1274
April	183	0	5317	0
May	822	0	13841	0
June	2799	0	22608	0
July	5942	0	27307	0
August	7240	0	27216	0
September	2373	0	17386	0
October	648	0	9612	114
November	0	1435	0	56
December	0	2869	0	297
Total	**20033**	**11341**	**124058**	**2481**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **41**

Floor Area ..... **840,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **10,1** kW

Sensible coil load ..... **9,3** kW

Coil L/s at Jun 1500 ..... **710** L/s

Max coil L/s ..... **710** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,40** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**11,0**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**710**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**710**	L/s			
Water flow @ 20,0 K drop	**0,13**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**710**	L/s	L/s/person	**5,14**	L/s/person
L/(s·m?)	**0,84**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_vent_reclaim 05.18.2017

Prepared by: 02:48

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1700 COOLING OA DB / WB 32,8 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	29345	-	330 m?	-	-
Wall Transmission	501 m?	1303	-	501 m?	3475	-
Roof Transmission	432 m?	1813	-	432 m?	2215	-
Window Transmission	330 m?	4048	-	330 m?	11025	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	183 m?	0	-	183 m?	0	-
Partitions	988 m?	10605	-	988 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	9994 W	8405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14985 W	13921	-	0	0	-
People	138	7946	8296	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	7739	830	10%	1672	0
>> Total Zone Loads	**-**	**85126**	**9126**	**-**	**18387**	**0**
Zone Conditioning	-	81596	9126	-	18057	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	710 L/s	657	-	710 L/s	-657	-
Ventilation Load	710 L/s	3752	1194	710 L/s	10797	0
Ventilation Fan Load	710 L/s	657	-	710 L/s	-657	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**86663**	**10320**	**-**	**27540**	**0**
Cooling Coil	-	8906	632	-	0	0
Heating Coil	-	0	-	-	11045	-
Terminal Unit Cooling	-	77795	9712	-	0	0

Terminal Unit Heating	-	0	-	-	16495	-	
>> Total Conditioning	**-**	**86701**	**10344**	**-**	**27540**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	665	665	665	156	n/a	n/a
April	5039	5039	5039	1174	n/a	n/a
May	16687	16687	16687	3920	n/a	n/a
June	32926	32926	32926	7896	n/a	n/a
July	44349	44349	44349	10822	n/a	n/a
August	44947	44947	44947	10981	n/a	n/a
September	24595	24595	24595	5892	n/a	n/a
October	9732	9732	9732	2296	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**178940**	**178940**	**178940**	**43138**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Nadzaladevi_vent_reclaim 05.18.2017

Prepared by: 02:48

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	4487	0	9621
February	0	4210	0	9653
March	27	0	639	8295
April	182	0	4856	0
May	821	0	15866	0
June	2797	0	30128	0
July	5940	0	38409	0
August	7237	0	37710	0
September	2370	0	22225	0
October	648	0	9084	430
November	0	1960	0	2956
December	0	3613	0	7952
Total	**20022**	**14271**	**158917**	**38907**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **41**

Floor Area ..... **840,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **10,0** kW

Sensible coil load ..... **9,3** kW

Coil L/s at Jun 1500 ..... **710** L/s

Max coil L/s ..... **710** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,40** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**11,2**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**710**	L/s	Ent. DB / Lvg DB	**7,5 / 21,2**	°C
Max coil L/s	**710**	L/s			
Water flow @ 20,0 K drop	**0,13**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**710**	L/s	Fan motor BHP	**0,83**	BHP
Standard L/s	**673**	L/s	Fan motor kW	**0,66**	kW
Actual max L/(s·m?)	**0,84**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**710**	L/s	L/s/person	**5,14**	L/s/person
L/(s·m?)	**0,84**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Mtatsminda_as_built 05.18.2017

Prepared by: 09:00

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	43617	-	330 m?	-	-
Wall Transmission	501 m?	6564	-	501 m?	17658	-
Roof Transmission	432 m?	5747	-	432 m?	5741	-
Window Transmission	330 m?	14794	-	330 m?	38054	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	183 m?	0	-	183 m?	0	-
Partitions	988 m?	10776	-	988 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	9994 W	8405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14985 W	13921	-	0	0	-
People	138	7946	8296	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	11177	830	10%	6145	0
>> Total Zone Loads	**-**	**122948**	**9126**	**-**	**67599**	**0**
Zone Conditioning	-	117698	9126	-	65490	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	710 L/s	657	-	710 L/s	-657	-
Ventilation Load	710 L/s	3957	908	710 L/s	10683	0
Ventilation Fan Load	710 L/s	657	-	710 L/s	-657	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**122969**	**10033**	**-**	**74858**	**0**
Cooling Coil	-	9152	267	-	0	0
Heating Coil	-	0	-	-	11159	-
Terminal Unit Cooling	-	113838	9960	-	0	0

Terminal Unit Heating	-	0	-	-	63721	-
>> Total Conditioning	**-**	**122990**	**10227**	**-**	**74880**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

დანართი 24: მთაწმინდის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1853	1853	1853	430	n/a	n/a
April	13911	13911	13911	3233	n/a	n/a
May	42581	42581	42581	9974	n/a	n/a
June	73830	73830	73830	17652	n/a	n/a
July	94281	94281	94281	22947	n/a	n/a
August	97242	97242	97242	23705	n/a	n/a
September	60715	60715	60715	14484	n/a	n/a
October	28996	28996	28996	6776	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**413410**	**413410**	**413410**	**99201**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Mtatsminda_as_built 05.18.2017

Prepared by: 09:00

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	24109	0	5164
February	0	22198	0	7353
March	137	0	1716	16329
April	952	0	12959	0
May	4021	0	38561	0
June	12028	0	61802	0
July	23955	0	70327	0
August	27711	0	69532	0
September	10998	0	49717	0
October	3510	0	25486	754
November	0	11306	0	692
December	0	19318	0	4589
Total	**83311**	**76932**	**330099**	**34881**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **5**

Floor Area ..... **3174,9** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **48,1** kW

Sensible coil load ..... **38,4** kW

Coil L/s at Jul 1500 ..... **1746** L/s

Max coil L/s ..... **1746** L/s

Sensible heat ratio **0,798**

Water flow @ 6,0 K rise ..... **1,92** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**15,2 / 14,1**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**53,7**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1746**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1746**	L/s			
Water flow @ 20,0 K drop	**0,64**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1746**	L/s	L/s/person	**5,50**	L/s/person
L/(s·m?)	**0,55**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_new_windows 05.18.2017

Prepared by: 09:08

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	577 m?	88413	-	577 m?	-	-
Wall Transmission	2073 m?	16497	-	2073 m?	40959	-
Roof Transmission	1155 m?	15377	-	1155 m?	15362	-
Window Transmission	577 m?	18454	-	577 m?	47467	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	31749 W	26701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	31749 W	29496	-	0	0	-
People	317	18270	19075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	21321	1907	10%	10379	0
>> Total Zone Loads	**-**	**234530**	**20982**	**-**	**114167**	**0**
Zone Conditioning	-	228669	20982	-	111967	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Ventilation Load	1746 L/s	19449	4838	1746 L/s	52236	0
Ventilation Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**251352**	**25820**	**-**	**160970**	**0**
Cooling Coil	-	36249	9375	-	0	0
Heating Coil	-	0	-	-	53739	-
Terminal Unit Cooling	-	215103	16501	-	0	0

Terminal Unit Heating	-	0	-	-	107264	-	
>> Total Conditioning	**-**	**251352**	**25876**	**-**	**161003**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1499	1499	1499	348	n/a	n/a
April	11209	11209	11209	2605	n/a	n/a
May	34569	34569	34569	8102	n/a	n/a
June	60065	60065	60065	14369	n/a	n/a
July	78093	78093	78093	19006	n/a	n/a
August	81783	81783	81783	19944	n/a	n/a
September	49893	49893	49893	11901	n/a	n/a
October	24910	24910	24910	5814	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**342021**	**342021**	**342021**	**82088**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_new_windows 05.18.2017

Prepared by: 09:08

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	24109	0	2274
February	0	22198	0	3586
March	137	0	1362	13498
April	952	0	10257	0
May	4021	0	30549	0
June	12028	0	48037	0
July	23955	0	54138	0
August	27711	0	54072	0
September	10998	0	38894	0
October	3510	0	21400	714
November	0	11306	0	238
December	0	19318	0	1957
Total	**83311**	**76932**	**258710**	**22267**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **5**

Floor Area ..... **3174,9** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **48,1** kW

Sensible coil load ..... **38,4** kW

Coil L/s at Jul 1500 ..... **1746** L/s

Max coil L/s ..... **1746** L/s

Sensible heat ratio **0,798**

Water flow @ 6,0 K rise ..... **1,92** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**15,2 / 14,1**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**53,7**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1746**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1746**	L/s			
Water flow @ 20,0 K drop	**0,64**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1746**	L/s	L/s/person	**5,50**	L/s/person
L/(s·m?)	**0,55**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_walls_insulation 05.18.2017

Prepared by: 09:15

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	577 m?	55421	-	577 m?	-	-
Wall Transmission	2073 m?	16039	-	2073 m?	40959	-
Roof Transmission	1155 m?	14009	-	1155 m?	15362	-
Window Transmission	577 m?	7495	-	577 m?	19278	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	31749 W	26701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	31749 W	29496	-	0	0	-
People	317	18270	19075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	16743	1907	10%	7560	0
>> Total Zone Loads	**-**	**184175**	**20982**	**-**	**83159**	**0**
Zone Conditioning	-	179772	20982	-	84334	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Ventilation Load	1746 L/s	19520	4716	1746 L/s	52471	0
Ventilation Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**202526**	**25698**	**-**	**133572**	**0**
Cooling Coil	-	36249	9375	-	0	0
Heating Coil	-	0	-	-	53739	-
Terminal Unit Cooling	-	166277	16292	-	0	0

Terminal Unit Heating	-	0	-	-	79833	-	
>> Total Conditioning	**-**	**202526**	**25667**	**-**	**133572**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	2502	2502	2502	580	n/a	n/a
April	16951	16951	16951	3946	n/a	n/a
May	44459	44459	44459	10415	n/a	n/a
June	73090	73090	73090	17481	n/a	n/a
July	91168	91168	91168	22222	n/a	n/a
August	93807	93807	93807	22907	n/a	n/a
September	59531	59531	59531	14204	n/a	n/a
October	30957	30957	30957	7227	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**412465**	**412465**	**412465**	**98981**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_walls_insulation 05.18.2017

Prepared by: 09:15

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	24109	0	2457
February	0	22198	0	3997
March	137	0	2366	10604
April	952	0	15999	0
May	4021	0	40438	0
June	12028	0	61062	0
July	23955	0	67213	0
August	27711	0	66097	0
September	10998	0	48532	0
October	3510	0	27447	645
November	0	11306	0	280
December	0	19318	0	2298
Total	**83311**	**76932**	**329154**	**20281**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **5**

Floor Area ..... **3174,9** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **48,1** kW

Sensible coil load ..... **38,4** kW

Coil L/s at Jul 1500 ..... **1746** L/s

Max coil L/s ..... **1746** L/s

Sensible heat ratio **0,798**

Water flow @ 6,0 K rise ..... **1,92** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**15,2 / 14,1**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**53,7**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1746**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1746**	L/s			
Water flow @ 20,0 K drop	**0,64**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1746**	L/s	L/s/person	**5,50**	L/s/person
L/(s·m?)	**0,55**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_walls&roof_insulation 05.18.2017

Prepared by: 09:18

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	577 m?	88413	-	577 m?	-	-
Wall Transmission	2073 m?	10743	-	2073 m?	14351	-
Roof Transmission	1155 m?	15377	-	1155 m?	15362	-
Window Transmission	577 m?	18454	-	577 m?	47467	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	31749 W	26701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	31749 W	29496	-	0	0	-
People	317	18270	19075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	20745	1907	10%	7718	0
>> Total Zone Loads	**-**	**228200**	**20982**	**-**	**84898**	**0**
Zone Conditioning	-	223934	20982	-	82036	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Ventilation Load	1746 L/s	19561	5090	1746 L/s	52401	0
Ventilation Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**246729**	**26072**	**-**	**131203**	**0**
Cooling Coil	-	36249	9375	-	0	0
Heating Coil	-	0	-	-	53739	-
Terminal Unit Cooling	-	210480	16484	-	0	0

Terminal Unit Heating	-	0	-	-	77464	-
>> Total Conditioning	**-**	**246729**	**25859**	**-**	**131203**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	2567	2567	2567	596	n/a	n/a
April	17222	17222	17222	4016	n/a	n/a
May	43647	43647	43647	10229	n/a	n/a
June	70629	70629	70629	16893	n/a	n/a
July	87800	87800	87800	21404	n/a	n/a
August	90880	90880	90880	22198	n/a	n/a
September	58234	58234	58234	13893	n/a	n/a
October	31474	31474	31474	7343	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**402452**	**402452**	**402452**	**96571**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_walls&roof_insulation 05.18.2017

Prepared by: 09:18

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	24109	0	581
February	0	22198	0	1729
March	137	0	2430	8551
April	952	0	16270	0
May	4021	0	39626	0
June	12028	0	58601	0
July	23955	0	63845	0
August	27711	0	63169	0
September	10998	0	47236	0
October	3510	0	27964	528
November	0	11306	0	19
December	0	19318	0	475
Total	**83311**	**76932**	**319141**	**11883**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **5**

Floor Area ..... **3174,9** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **48,1** kW

Sensible coil load ..... **38,4** kW

Coil L/s at Jul 1500 ..... **1746** L/s

Max coil L/s ..... **1746** L/s

Sensible heat ratio **0,798**

Water flow @ 6,0 K rise ..... **1,92** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**15,2 / 14,1**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**53,7**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1746**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1746**	L/s			
Water flow @ 20,0 K drop	**0,64**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1746**	L/s	L/s/person	**5,50**	L/s/person
L/(s·m?)	**0,55**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_rebuild 05.18.2017

Prepared by: 09:21

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	577 m?	88413	-	577 m?	-	-
Wall Transmission	2073 m?	10743	-	2073 m?	14351	-
Roof Transmission	1155 m?	4766	-	1155 m?	5927	-
Window Transmission	577 m?	18454	-	577 m?	47467	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	31749 W	26701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	31749 W	29496	-	0	0	-
People	317	18270	19075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	19684	1907	10%	6775	0
>> Total Zone Loads	**-**	**216529**	**20982**	**-**	**74520**	**0**
Zone Conditioning	-	213940	20982	-	72177	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Ventilation Load	1746 L/s	19621	5144	1746 L/s	52441	0
Ventilation Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**236795**	**26126**	**-**	**121384**	**0**
Cooling Coil	-	36249	9375	-	0	0
Heating Coil	-	0	-	-	53739	-
Terminal Unit Cooling	-	200546	16989	-	0	0

Terminal Unit Heating	-	0	-	-	67645	-	
>> Total Conditioning	**-**	**236795**	**26364**	**-**	**121384**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	3308	3308	3287	796	n/a	n/a
April	19177	19177	18854	4546	n/a	n/a
May	38417	38417	38311	9052	n/a	n/a
June	57108	57108	57108	13674	n/a	n/a
July	70399	70399	70399	17153	n/a	n/a
August	74081	74081	74081	18119	n/a	n/a
September	47393	47393	47393	11295	n/a	n/a
October	29787	29787	29787	6942	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**339670**	**339670**	**339220**	**81576**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_rebuild 05.18.2017

Prepared by: 09:21

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	5771	0	14
February	0	6139	0	85
March	137	0	3171	148
April	947	0	18230	0
May	3937	0	34479	0
June	11477	0	45631	0
July	22555	0	47844	0
August	26200	0	47881	0
September	10635	0	36758	0
October	3505	0	26283	44
November	0	1028	0	0
December	0	4156	0	8
Total	**79393**	**17094**	**260277**	**299**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **5**

Floor Area ..... **3174,9** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **35,9** kW

Sensible coil load ..... **27,0** kW

Coil L/s at Jun 1500 ..... **1746** L/s

Max coil L/s ..... **1746** L/s

Sensible heat ratio **0,753**

Water flow @ 6,0 K rise ..... **1,43** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**15,2 / 14,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**27,4**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1746**	L/s	Ent. DB / Lvg DB	**7,5 / 21,2**	°C
Max coil L/s	**1746**	L/s			
Water flow @ 20,0 K drop	**0,33**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1746**	L/s	L/s/person	**5,50**	L/s/person
L/(s·m?)	**0,55**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_vent_reclaim 05.18.2017

Prepared by: 09:06

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	577 m?	55421	-	577 m?	-	-
Wall Transmission	2073 m?	10790	-	2073 m?	14351	-
Roof Transmission	1155 m?	4285	-	1155 m?	5927	-
Window Transmission	577 m?	7495	-	577 m?	19278	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	31749 W	26701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	31749 W	29496	-	0	0	-
People	317	18270	19075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	15246	1907	10%	3956	0
>> Total Zone Loads	**-**	**167704**	**20982**	**-**	**43511**	**0**
Zone Conditioning	-	162304	20982	-	44258	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Ventilation Load	1746 L/s	9693	3628	1746 L/s	26303	0
Ventilation Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**175231**	**24610**	**-**	**67327**	**0**
Cooling Coil	-	26556	7785	-	0	0
Heating Coil	-	0	-	-	27436	-
Terminal Unit Cooling	-	148728	17307	-	0	0

Terminal Unit Heating	-	0	-	-	39891	-	
>> Total Conditioning	**-**	**175285**	**25091**	**-**	**67327**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	2133	2133	2133	494	n/a	n/a
April	16685	16685	16685	3884	n/a	n/a
May	44761	44761	44761	10486	n/a	n/a
June	73833	73833	73833	17638	n/a	n/a
July	93006	93006	93006	22618	n/a	n/a
August	95895	95895	95895	23364	n/a	n/a
September	60581	60581	60581	14440	n/a	n/a
October	30699	30699	30699	7164	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**417592**	**417592**	**417592**	**100088**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Mtatsminda_vent_reclaim 05.18.2017

Prepared by: 09:06

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	10481	0	5163
February	0	9956	0	7335
March	137	0	1996	6959
April	946	0	15739	0
May	3935	0	40826	0
June	11474	0	62358	0
July	22553	0	70453	0
August	26197	0	69698	0
September	10632	0	49949	0
October	3504	0	27195	128
November	0	3762	0	659
December	0	8389	0	4486
Total	**79378**	**32588**	**338214**	**24730**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **5**

Floor Area ..... **3174,9** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **35,9** kW

Sensible coil load ..... **27,0** kW

Coil L/s at Jun 1500 ..... **1746** L/s

Max coil L/s ..... **1746** L/s

Sensible heat ratio **0,753**

Water flow @ 6,0 K rise ..... **1,43** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**15,2 / 14,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**27,6**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1746**	L/s	Ent. DB / Lvg DB	**7,4 / 21,2**	°C
Max coil L/s	**1746**	L/s			
Water flow @ 20,0 K drop	**0,33**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1746**	L/s	Fan motor BHP	**2,04**	BHP
Standard L/s	**1655**	L/s	Fan motor kW	**1,62**	kW
Actual max L/(s·m?)	**0,55**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1746**	L/s	L/s/person	**5,50**	L/s/person
L/(s·m?)	**0,55**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Chughureti_as_built 05.18.2017

Prepared by: 07:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	577 m?	88413	-	577 m?	-	-
Wall Transmission	2073 m?	16497	-	2073 m?	40959	-
Roof Transmission	1155 m?	15377	-	1155 m?	15362	-
Window Transmission	577 m?	18454	-	577 m?	47467	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	31749 W	26701	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	31749 W	29496	-	0	0	-
People	317	18270	19075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	21321	1907	10%	10379	0
>> Total Zone Loads	**-**	**234530**	**20982**	**-**	**114167**	**0**
Zone Conditioning	-	228669	20982	-	111967	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Ventilation Load	1746 L/s	9724	4825	1746 L/s	26118	0
Ventilation Fan Load	1746 L/s	1617	-	1746 L/s	-1617	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**241628**	**25807**	**-**	**134851**	**0**
Cooling Coil	-	26525	7779	-	0	0
Heating Coil	-	0	-	-	27621	-
Terminal Unit Cooling	-	215103	18071	-	0	0

Terminal Unit Heating	-	0	-	-	107264	-
>> Total Conditioning	**-**	**241628**	**25851**	**-**	**134885**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

დანართი 25: ჩუღურეთის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	163	163	163	39	n/a	n/a
April	1286	1286	1286	302	n/a	n/a
May	5546	5546	5546	1304	n/a	n/a
June	10997	10997	10997	2637	n/a	n/a
July	14969	14969	14969	3647	n/a	n/a
August	15498	15498	15498	3780	n/a	n/a
September	9005	9005	9005	2154	n/a	n/a
October	3295	3295	3295	778	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**60760**	**60760**	**60760**	**14641**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Chughureti_as_built 05.18.2017

Prepared by: 07:28

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	4019	0	3181
February	0	3701	0	3694
March	11	0	152	5088
April	76	0	1210	0
May	353	0	5193	0
June	1241	0	9756	0
July	2670	0	12299	0
August	3231	0	12267	0
September	1036	0	7970	0
October	268	0	3027	255
November	0	1885	0	682
December	0	3221	0	2724
Total	**8886**	**12825**	**51874**	**15624**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **2**

Floor Area ..... **406,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **6,2** kW

Sensible coil load ..... **5,7** kW

Coil L/s at Jul 1500 ..... **291** L/s

Max coil L/s ..... **291** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,25** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**9,0**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**291**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**291**	L/s			
Water flow @ 20,0 K drop	**0,11**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**291**	L/s	L/s/person	**4,30**	L/s/person
L/(s·m?)	**0,72**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_new_windows 05.18.2017

Prepared by: 07:34

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	72 m?	13265	-	72 m?	-	-
Wall Transmission	432 m?	5581	-	432 m?	15218	-
Roof Transmission	262 m?	3172	-	262 m?	3479	-
Window Transmission	72 m?	2329	-	72 m?	5990	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	4062 W	3416	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4062 W	3774	-	0	0	-
People	68	3896	4067	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	3543	407	10%	2469	0
>> Total Zone Loads	**-**	**38975**	**4474**	**-**	**27155**	**0**
Zone Conditioning	-	37780	4474	-	26138	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	291 L/s	270	-	291 L/s	-270	-
Ventilation Load	291 L/s	3241	806	291 L/s	8638	0
Ventilation Fan Load	291 L/s	270	-	291 L/s	-270	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**41560**	**5280**	**-**	**34236**	**0**
Cooling Coil	-	5377	413	-	0	0
Heating Coil	-	0	-	-	8959	-
Terminal Unit Cooling	-	36183	4862	-	0	0

Terminal Unit Heating	-	0	-	-	25278	-
>> Total Conditioning	**-**	**41560**	**5275**	**-**	**34236**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	115	115	115	27	n/a	n/a
April	947	947	947	223	n/a	n/a
May	4538	4538	4538	1067	n/a	n/a
June	9337	9337	9337	2239	n/a	n/a
July	12930	12930	12930	3150	n/a	n/a
August	13559	13559	13559	3307	n/a	n/a
September	7596	7596	7596	1817	n/a	n/a
October	2773	2773	2773	654	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**51796**	**51796**	**51796**	**12484**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_new_windows 05.18.2017

Prepared by: 07:34

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	4019	0	2422
February	0	3701	0	2956
March	11	0	104	4697
April	76	0	870	0
May	353	0	4185	0
June	1241	0	8096	0
July	2670	0	10260	0
August	3231	0	10328	0
September	1036	0	6561	0
October	268	0	2505	255
November	0	1885	0	466
December	0	3221	0	2045
Total	**8886**	**12825**	**42910**	**12842**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **2**

Floor Area ..... **406,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **6,2** kW

Sensible coil load ..... **5,7** kW

Coil L/s at Jul 1500 ..... **291** L/s

Max coil L/s ..... **291** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,25** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**9,0**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**291**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**291**	L/s			
Water flow @ 20,0 K drop	**0,11**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**291**	L/s	L/s/person	**4,30**	L/s/person
L/(s·m?)	**0,72**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_walls_insulation 05.18.2017

Prepared by: 07:37

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	72 m?	7393	-	72 m?	-	-
Wall Transmission	432 m?	5794	-	432 m?	15218	-
Roof Transmission	262 m?	3614	-	262 m?	3479	-
Window Transmission	72 m?	868	-	72 m?	2406	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	4062 W	3459	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4062 W	3793	-	0	0	-
People	68	3959	4067	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	2888	407	10%	2110	0
>> Total Zone Loads	**-**	**31769**	**4474**	**-**	**23212**	**0**
Zone Conditioning	-	30943	4474	-	22161	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	291 L/s	270	-	291 L/s	-270	-
Ventilation Load	291 L/s	2861	728	291 L/s	8625	0
Ventilation Fan Load	291 L/s	270	-	291 L/s	-270	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**34343**	**5202**	**-**	**30247**	**0**
Cooling Coil	-	4985	341	-	0	0
Heating Coil	-	0	-	-	8959	-
Terminal Unit Cooling	-	29358	4860	-	0	0

Terminal Unit Heating	-	0	-	-	21288	-
>> Total Conditioning	**-**	**34343**	**5201**	**-**	**30247**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	292	292	292	68	n/a	n/a
April	2069	2069	2069	481	n/a	n/a
May	6156	6156	6156	1443	n/a	n/a
June	10310	10310	10310	2471	n/a	n/a
July	13216	13216	13216	3229	n/a	n/a
August	13733	13733	13733	3360	n/a	n/a
September	8573	8573	8573	2048	n/a	n/a
October	4196	4196	4196	981	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**58546**	**58546**	**58546**	**14081**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_walls_insulation 05.18.2017

Prepared by: 07:37

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	4019	0	240
February	0	3701	0	551
March	11	0	281	2228
April	76	0	1992	0
May	353	0	5803	0
June	1241	0	9069	0
July	2670	0	10545	0
August	3231	0	10503	0
September	1036	0	7537	0
October	268	0	3929	115
November	0	1885	0	17
December	0	3221	0	229
Total	**8886**	**12825**	**49660**	**3381**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **2**

Floor Area ..... **406,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **6,2** kW

Sensible coil load ..... **5,7** kW

Coil L/s at Jul 1500 ..... **291** L/s

Max coil L/s ..... **291** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,25** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**9,0**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**291**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**291**	L/s			
Water flow @ 20,0 K drop	**0,11**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**291**	L/s	L/s/person	**4,30**	L/s/person
L/(s·m?)	**0,72**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_walls&roof_insulation 05.18.2017

Prepared by: 07:39

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	72 m?	13265	-	72 m?	-	-
Wall Transmission	432 m?	1151	-	432 m?	2995	-
Roof Transmission	262 m?	3172	-	262 m?	3479	-
Window Transmission	72 m?	2329	-	72 m?	5990	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	4062 W	3416	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4062 W	3774	-	0	0	-
People	68	3896	4067	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	3100	407	10%	1246	0
>> Total Zone Loads	**-**	**34103**	**4474**	**-**	**13709**	**0**
Zone Conditioning	-	33014	4474	-	13789	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	291 L/s	270	-	291 L/s	-270	-
Ventilation Load	291 L/s	3232	696	291 L/s	8766	0
Ventilation Fan Load	291 L/s	270	-	291 L/s	-270	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**36785**	**5170**	**-**	**22016**	**0**
Cooling Coil	-	5377	413	-	0	0
Heating Coil	-	0	-	-	8959	-
Terminal Unit Cooling	-	31408	4756	-	0	0

Terminal Unit Heating	-	0	-	-	13066	-
>> Total Conditioning	**-**	**36785**	**5169**	**-**	**22024**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	302	302	302	70	n/a	n/a
April	2114	2114	2114	491	n/a	n/a
May	5983	5983	5983	1402	n/a	n/a
June	9763	9763	9763	2340	n/a	n/a
July	12460	12460	12460	3045	n/a	n/a
August	13071	13071	13071	3199	n/a	n/a
September	8297	8297	8297	1982	n/a	n/a
October	4322	4322	4322	1009	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**56312**	**56312**	**56312**	**13539**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_walls&roof_insulation 05.18.2017

Prepared by: 07:39

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	4019	0	29
February	0	3701	0	144
March	11	0	291	1742
April	76	0	2037	0
May	353	0	5630	0
June	1241	0	8522	0
July	2670	0	9790	0
August	3231	0	9840	0
September	1036	0	7262	0
October	268	0	4055	84
November	0	1885	0	1
December	0	3221	0	17
Total	**8886**	**12825**	**47426**	**2018**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **2**

Floor Area ..... **406,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **6,2** kW

Sensible coil load ..... **5,7** kW

Coil L/s at Jul 1500 ..... **291** L/s

Max coil L/s ..... **291** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,25** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**9,0**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**291**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**291**	L/s			
Water flow @ 20,0 K drop	**0,11**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**291**	L/s	L/s/person	**4,30**	L/s/person
L/(s·m?)	**0,72**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_rebuild 05.18.2017

Prepared by: 07:41

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Sep 1700 COOLING OA DB / WB 32,0 °C / 20,7 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	72 m?	13767	-	72 m?	-	-
Wall Transmission	432 m?	948	-	432 m?	2995	-
Roof Transmission	262 m?	733	-	262 m?	1342	-
Window Transmission	72 m?	2013	-	72 m?	5990	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	4062 W	3416	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4062 W	3774	-	0	0	-
People	68	3896	4067	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	2855	407	10%	1033	0
>> Total Zone Loads	**-**	**31403**	**4474**	**-**	**11359**	**0**
Zone Conditioning	-	30881	4474	-	11026	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	291 L/s	270	-	291 L/s	-270	-
Ventilation Load	291 L/s	2821	264	291 L/s	8745	0
Ventilation Fan Load	291 L/s	270	-	291 L/s	-270	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**34241**	**4738**	**-**	**19232**	**0**
Cooling Coil	-	4926	0	-	0	0
Heating Coil	-	0	-	-	8959	-
Terminal Unit Cooling	-	29315	4743	-	0	0

Terminal Unit Heating	-	0	-	-	10273	-
>> Total Conditioning	**-**	**34241**	**4743**	**-**	**19232**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	361	361	361	85	n/a	n/a
April	2426	2426	2422	574	n/a	n/a
May	5461	5461	5459	1288	n/a	n/a
June	8159	8159	8159	1955	n/a	n/a
July	10231	10231	10231	2500	n/a	n/a
August	10911	10911	10911	2674	n/a	n/a
September	6895	6895	6895	1645	n/a	n/a
October	4216	4216	4216	982	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**48659**	**48659**	**48654**	**11702**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_rebuild 05.18.2017

Prepared by: 07:41

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	1138	0	0
February	0	1198	0	1
March	11	0	350	92
April	75	0	2350	0
May	339	0	5122	0
June	1151	0	7008	0
July	2442	0	7790	0
August	2975	0	7936	0
September	978	0	5917	0
October	267	0	3950	6
November	0	272	0	0
December	0	875	0	0
Total	**8237**	**3484**	**40423**	**99**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **2**

Floor Area ..... **406,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **4,1** kW

Sensible coil load ..... **3,8** kW

Coil L/s at Jun 1500 ..... **291** L/s

Max coil L/s ..... **291** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,16** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**4,6**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**291**	L/s	Ent. DB / Lvg DB	**7,4 / 21,2**	°C
Max coil L/s	**291**	L/s			
Water flow @ 20,0 K drop	**0,06**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**291**	L/s	L/s/person	**4,30**	L/s/person
L/(s·m?)	**0,72**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_vent_reclaim 05.18.2017

Prepared by: 07:32

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	72 m?	8229	-	72 m?	-	-
Wall Transmission	432 m?	1151	-	432 m?	2995	-
Roof Transmission	262 m?	970	-	262 m?	1342	-
Window Transmission	72 m?	935	-	72 m?	2406	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	4062 W	3416	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4062 W	3774	-	0	0	-
People	68	3896	4067	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	2237	407	10%	674	0
>> Total Zone Loads	**-**	**24609**	**4474**	**-**	**7417**	**0**
Zone Conditioning	-	23518	4474	-	6971	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	291 L/s	270	-	291 L/s	-270	-
Ventilation Load	291 L/s	1613	427	291 L/s	4360	0
Ventilation Fan Load	291 L/s	270	-	291 L/s	-270	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**25670**	**4901**	**-**	**10791**	**0**
Cooling Coil	-	3764	111	-	0	0
Heating Coil	-	0	-	-	4599	-
Terminal Unit Cooling	-	21896	4796	-	0	0

Terminal Unit Heating	-	0	-	-	6192	-	
>> Total Conditioning	**-**	**25661**	**4907**	**-**	**10791**	**0**	
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**			

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	178	178	178	42	n/a	n/a
April	1516	1516	1516	354	n/a	n/a
May	5822	5822	5822	1366	n/a	n/a
June	10974	10974	10974	2629	n/a	n/a
July	14750	14750	14750	3590	n/a	n/a
August	15279	15279	15279	3724	n/a	n/a
September	8985	8985	8985	2147	n/a	n/a
October	3484	3484	3484	820	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**60988**	**60988**	**60988**	**14673**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Chughureti_vent_reclaim 05.18.2017

Prepared by: 07:32

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	2045	0	3179
February	0	1867	0	3680
March	11	0	167	3366
April	75	0	1441	0
May	338	0	5483	0
June	1151	0	9823	0
July	2441	0	12309	0
August	2973	0	12306	0
September	976	0	8009	0
October	266	0	3217	79
November	0	896	0	652
December	0	1645	0	2703
Total	**8232**	**6453**	**52756**	**13658**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **2**

Floor Area ..... **406,2** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **4,1** kW

Sensible coil load ..... **3,8** kW

Coil L/s at Jun 1500 ..... **291** L/s

Max coil L/s ..... **291** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,16** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**4,6**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**291**	L/s	Ent. DB / Lvg DB	**7,3 / 21,2**	°C
Max coil L/s	**291**	L/s			
Water flow @ 20,0 K drop	**0,06**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**291**	L/s	Fan motor BHP	**0,34**	BHP
Standard L/s	**276**	L/s	Fan motor kW	**0,27**	kW
Actual max L/(s·m?)	**0,72**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**291**	L/s	L/s/person	**4,30**	L/s/person
L/(s·m?)	**0,72**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Isani_as_built 05.18.2017

Prepared by: 01:16

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1700 COOLING OA DB / WB 33,3 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	72 m?	13265	-	72 m?	-	-
Wall Transmission	432 m?	5581	-	432 m?	15218	-
Roof Transmission	262 m?	3172	-	262 m?	3479	-
Window Transmission	72 m?	2329	-	72 m?	5990	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	145 m?	0	-	145 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	4062 W	3416	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	4062 W	3774	-	0	0	-
People	68	3896	4067	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	3543	407	10%	2469	0
>> Total Zone Loads	**-**	**38975**	**4474**	**-**	**27155**	**0**
Zone Conditioning	-	37780	4474	-	26138	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	291 L/s	270	-	291 L/s	-270	-
Ventilation Load	291 L/s	1621	804	291 L/s	4319	0
Ventilation Fan Load	291 L/s	270	-	291 L/s	-270	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**39940**	**5278**	**-**	**29917**	**0**
Cooling Coil	-	3756	110	-	0	0
Heating Coil	-	0	-	-	4640	-
Terminal Unit Cooling	-	36183	5163	-	0	0

Terminal Unit Heating	-	0	-	-	25278	-
>> Total Conditioning	**-**	**39939**	**5273**	**-**	**29917**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

დანართი 26: ისანის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1364	1364	1364	316	n/a	n/a
April	9806	9806	9806	2278	n/a	n/a
May	27213	27213	27213	6365	n/a	n/a
June	45273	45273	45273	10797	n/a	n/a
July	53532	53532	53532	13035	n/a	n/a
August	52972	52972	52972	12922	n/a	n/a
September	34456	34456	34456	8213	n/a	n/a
October	16583	16583	16583	3875	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**241197**	**241197**	**241197**	**57802**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Isani_as_built 05.18.2017

Prepared by: 01:16

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	7346
February	0	8294	0	7711
March	24	0	1339	6676
April	171	0	9634	0
May	791	0	26421	0
June	2782	0	42491	0
July	5985	0	47547	0
August	7241	0	45730	0
September	2321	0	32135	0
October	600	0	15983	334
November	0	4224	0	1456
December	0	7218	0	6438
Total	**19917**	**28745**	**221281**	**29961**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_new_windows 05.18.2017

Prepared by: 01:19

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	70664	-	571 m?	-	-
Wall Transmission	290 m?	3328	-	290 m?	10219	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	571 m?	16122	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	12698	597	10%	6437	0
>> Total Zone Loads	**-**	**139683**	**6567**	**-**	**70810**	**0**
Zone Conditioning	-	135670	6567	-	69787	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	5930	2403	652 L/s	19752	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**142809**	**8970**	**-**	**88331**	**0**
Cooling Coil	-	10757	1065	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	132052	8150	-	0	0

Terminal Unit Heating	-	0	-	-	68240	-
>> Total Conditioning	**-**	**142809**	**9215**	**-**	**88320**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1197	1197	1197	278	n/a	n/a
April	8340	8340	8340	1944	n/a	n/a
May	21294	21294	21294	4986	n/a	n/a
June	33904	33904	33904	8087	n/a	n/a
July	39931	39931	39931	9723	n/a	n/a
August	40224	40224	40224	9816	n/a	n/a
September	26283	26283	26283	6263	n/a	n/a
October	14032	14032	14032	3272	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**185205**	**185205**	**185205**	**44368**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_new_windows 05.18.2017

Prepared by: 01:19

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	1492
February	0	8294	0	2177
March	24	0	1173	3210
April	171	0	8168	0
May	791	0	20503	0
June	2782	0	31121	0
July	5985	0	33946	0
August	7241	0	32983	0
September	2321	0	23962	0
October	600	0	13432	151
November	0	4224	0	138
December	0	7218	0	1320
Total	**19917**	**28745**	**165288**	**8488**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_walls_insulation 05.18.2017

Prepared by: 01:22

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	43837	-	571 m?	-	-
Wall Transmission	290 m?	3328	-	290 m?	10219	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	571 m?	6475	-	571 m?	19077	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	9051	597	10%	3595	0
>> Total Zone Loads	**-**	**99561**	**6567**	**-**	**39543**	**0**
Zone Conditioning	-	97565	6567	-	39439	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	6004	2503	652 L/s	19803	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**104777**	**9070**	**-**	**58034**	**0**
Cooling Coil	-	10757	1065	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	94020	8112	-	0	0

Terminal Unit Heating	-	0	-	-	37961	-
>> Total Conditioning	**-**	**104777**	**9177**	**-**	**58040**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1462	1462	1462	339	n/a	n/a
April	10435	10435	10435	2427	n/a	n/a
May	27695	27695	27695	6479	n/a	n/a
June	44870	44870	44870	10701	n/a	n/a
July	52396	52396	52396	12767	n/a	n/a
August	51722	51722	51722	12627	n/a	n/a
September	33988	33988	33988	8102	n/a	n/a
October	17098	17098	17098	3992	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**239666**	**239666**	**239666**	**57434**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_walls_insulation 05.18.2017

Prepared by: 01:22

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	5105
February	0	8294	0	5601
March	24	0	1437	5019
April	171	0	10264	0
May	791	0	26904	0
June	2782	0	42087	0
July	5985	0	46412	0
August	7241	0	44481	0
September	2321	0	31667	0
October	600	0	16498	261
November	0	4224	0	862
December	0	7218	0	4508
Total	**19917**	**28745**	**219750**	**21356**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_walls&roof_insulation 05.18.2017

Prepared by: 01:25

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	67858	-	571 m?	-	-
Wall Transmission	290 m?	746	-	290 m?	2011	-
Roof Transmission	500 m?	6911	-	500 m?	6651	-
Window Transmission	571 m?	17149	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	12252	597	10%	5616	0
>> Total Zone Loads	**-**	**134769**	**6567**	**-**	**61781**	**0**
Zone Conditioning	-	133006	6567	-	62010	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	6429	2122	652 L/s	19807	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**140644**	**8688**	**-**	**80609**	**0**
Cooling Coil	-	11172	763	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	129471	7985	-	0	0

Terminal Unit Heating	-	0	-	-	60525	-
>> Total Conditioning	**-**	**140644**	**8749**	**-**	**80604**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1495	1495	1495	347	n/a	n/a
April	10510	10510	10510	2447	n/a	n/a
May	27351	27351	27351	6401	n/a	n/a
June	43823	43823	43823	10451	n/a	n/a
July	50968	50968	50968	12419	n/a	n/a
August	50449	50449	50449	12320	n/a	n/a
September	33436	33436	33436	7968	n/a	n/a
October	17321	17321	17321	4041	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**235353**	**235353**	**235353**	**56394**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_walls&roof_insulation 05.18.2017

Prepared by: 01:25

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	9008	0	3767
February	0	8294	0	4465
March	24	0	1470	4212
April	171	0	10339	0
May	791	0	26560	0
June	2782	0	41041	0
July	5985	0	44983	0
August	7241	0	43207	0
September	2321	0	31115	0
October	600	0	16721	220
November	0	4224	0	478
December	0	7218	0	3306
Total	**19917**	**28745**	**215437**	**16448**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **13,9** kW

Sensible coil load ..... **12,8** kW

Coil L/s at Jul 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **0,56** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**20,1**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,24**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_rebuild 05.18.2017

Prepared by: 02:39

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	67858	-	571 m?	-	-
Wall Transmission	290 m?	746	-	290 m?	2011	-
Roof Transmission	500 m?	2194	-	500 m?	2566	-
Window Transmission	571 m?	17149	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	11780	597	10%	5208	0
>> Total Zone Loads	**-**	**129581**	**6567**	**-**	**57287**	**0**
Zone Conditioning	-	127533	6567	-	57068	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	6419	2076	652 L/s	19797	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**135161**	**8643**	**-**	**75657**	**0**
Cooling Coil	-	11172	763	-	0	0
Heating Coil	-	0	-	-	20079	-
Terminal Unit Cooling	-	123989	7933	-	0	0

Terminal Unit Heating	-	0	-	-	55600	-
>> Total Conditioning	**-**	**135161**	**8696**	**-**	**75679**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1865	1865	1801	440	n/a	n/a
April	11238	11238	10857	2633	n/a	n/a
May	22767	22767	22633	5355	n/a	n/a
June	32608	32608	32592	7785	n/a	n/a
July	36907	36907	36907	8994	n/a	n/a
August	37218	37218	37218	9095	n/a	n/a
September	25248	25248	25248	6010	n/a	n/a
October	15929	15929	15929	3711	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**183780**	**183780**	**183184**	**44024**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Isani_rebuild 05.18.2017

Prepared by: 02:39

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	1966	0	59
February	0	1932	0	175
March	24	0	1840	16
April	170	0	11068	0
May	761	0	22006	0
June	2585	0	30023	0
July	5480	0	31427	0
August	6671	0	30547	0
September	2193	0	23055	0
October	598	0	15331	2
November	0	279	0	0
December	0	1291	0	43
Total	**18484**	**5468**	**165297**	**295**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **9,3** kW

Sensible coil load ..... **8,6** kW

Coil L/s at Jun 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,928**

Water flow @ 6,0 K rise ..... **0,37** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,8 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**10,2**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,12**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	43837	-	571 m?	-	-
Wall Transmission	290 m?	689	-	290 m?	2011	-
Roof Transmission	500 m?	2232	-	500 m?	2566	-
Window Transmission	571 m?	6475	-	571 m?	19077	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	8309	597	10%	2365	0
>> Total Zone Loads	**-**	**91395**	**6567**	**-**	**26020**	**0**
Zone Conditioning	-	89550	6567	-	26420	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	2992	2450	652 L/s	9927	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**93750**	**9016**	**-**	**35138**	**0**
Cooling Coil	-	7765	500	-	0	0
Heating Coil	-	0	-	-	10153	-
Terminal Unit Cooling	-	85985	8547	-	0	0
Terminal Unit Heating	-	0	-	-	24992	-

>> Total Conditioning	-	93750	9048	-	35145	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1581	1581	1581	367	n/a	n/a
April	10939	10939	10939	2546	n/a	n/a
May	28094	28094	28094	6572	n/a	n/a
June	45309	45309	45309	10800	n/a	n/a
July	53069	53069	53069	12916	n/a	n/a
August	52464	52464	52464	12794	n/a	n/a
September	34427	34427	34427	8202	n/a	n/a
October	17265	17265	17265	4030	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**243149**	**243149**	**243149**	**58227**	n/a	n/a

Air System Simulation Results (Table 1) :

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	3089	0	7328
February	0	2743	0	7702
March	24	0	1556	3709
April	170	0	10769	0
May	760	0	27334	0
June	2585	0	42724	0
July	5479	0	47590	0
August	6670	0	45794	0
September	2192	0	32235	0
October	598	0	16668	78
November	0	1066	0	1404
December	0	2254	0	6379
Total	**18479**	**9151**	**224670**	**26600**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **1346,8** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **9,3** kW

Sensible coil load ..... **8,6** kW

Coil L/s at Jun 1500 ..... **652** L/s

Max coil L/s ..... **652** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,37** L/s

Load occurs at ..... **Jun 1500**

OA DB / WB ..... **33,8 / 21,8** °C

Entering DB / WB ..... **28,7 / 20,3** °C

Leaving DB / WB ..... **17,2 / 16,4** °C

Bypass Factor **0,100**

Heating Coil Sizing Data

Max coil load	**10,2**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**652**	L/s	Ent. DB / Lvg DB	**7,5 / 21,2**	°C
Max coil L/s	**652**	L/s			
Water flow @ 20,0 K drop	**0,12**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**652**	L/s	Fan motor BHP	**0,76**	BHP
Standard L/s	**619**	L/s	Fan motor kW	**0,60**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**652**	L/s	L/s/person	**6,57**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_as_built 05.22.2017

Prepared by: 11:35

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	571 m?	70664	-	571 m?	-	-
Wall Transmission	290 m?	3328	-	290 m?	10219	-
Roof Transmission	500 m?	7016	-	500 m?	6651	-
Window Transmission	571 m?	16122	-	571 m?	47502	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	13468 W	11467	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	13468 W	12575	-	0	0	-
People	99	5811	5970	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	12698	597	10%	6437	0
>> Total Zone Loads	**-**	**139683**	**6567**	**-**	**70810**	**0**
Zone Conditioning	-	135670	6567	-	69787	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	652 L/s	604	-	652 L/s	-604	-
Ventilation Load	652 L/s	2965	2399	652 L/s	9876	0
Ventilation Fan Load	652 L/s	604	-	652 L/s	-604	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**139844**	**8966**	**-**	**78455**	**0**
Cooling Coil	-	7792	505	-	0	0
Heating Coil	-	0	-	-	10203	-
Terminal Unit Cooling	-	132052	8708	-	0	0

Terminal Unit Heating	-	0	-	-	68240	-
>> Total Conditioning	**-**	**139844**	**9213**	**-**	**78443**	**0**

დანართი 27: სამგორის რაიონის გამგეობის შენობის ენერგოკომპონენტების სიმულაციური ანალიზის მონაცემები

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1775	1775	1775	411	n/a	n/a
April	11652	11652	11652	2707	n/a	n/a
May	33336	33336	33336	7815	n/a	n/a
June	58443	58443	58443	13986	n/a	n/a
July	74547	74547	74547	18180	n/a	n/a
August	77648	77648	77648	18968	n/a	n/a
September	46757	46757	46757	11163	n/a	n/a
October	23627	23627	23627	5515	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**327784**	**327784**	**327784**	**78745**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_as_built 05.22.2017

Prepared by: 11:35

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	23709	0	10826
February	0	21830	0	11442
March	64	0	1711	16080
April	450	0	11201	0
May	2083	0	31253	0
June	7323	0	51120	0
July	15751	0	58795	0
August	19058	0	58590	0
September	6110	0	40647	0
October	1579	0	22048	948
November	0	11118	0	2946
December	0	18997	0	9133
Total	**52418**	**75654**	**275367**	**51375**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **3592,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **36,6** kW

Sensible coil load ..... **33,8** kW

Coil L/s at Jul 1500 ..... **1717** L/s

Max coil L/s ..... **1717** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **1,46** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**52,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1717**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1717**	L/s			
Water flow @ 20,0 K drop	**0,63**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1717**	L/s	L/s/person	**6,71**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_new_windows 05.22.2017

Prepared by: 11:37

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1700 COOLING OA DB / WB 32,8 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	50202	-	330 m?	-	-
Wall Transmission	1184 m?	15020	-	1184 m?	41715	-
Roof Transmission	1305 m?	17660	-	1305 m?	17360	-
Window Transmission	330 m?	10080	-	330 m?	27453	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	35920 W	30209	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	35920 W	33372	-	0	0	-
People	256	14722	15370	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	17126	1537	10%	8653	0
>> Total Zone Loads	**-**	**188391**	**16907**	**-**	**95181**	**0**
Zone Conditioning	-	180423	16907	-	94248	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Ventilation Load	1717 L/s	18016	4974	1717 L/s	51963	0
Ventilation Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**201619**	**21881**	**-**	**143031**	**0**
Cooling Coil	-	30625	3232	-	0	0
Heating Coil	-	0	-	-	52846	-
Terminal Unit Cooling	-	170994	18743	-	0	0

Terminal Unit Heating	-	0	-	-	90261	-
>> Total Conditioning	**-**	**201619**	**21975**	**-**	**143107**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	1624	1624	1624	376	n/a	n/a
April	10392	10392	10392	2413	n/a	n/a
May	29098	29098	29098	6822	n/a	n/a
June	51041	51041	51041	12218	n/a	n/a
July	65720	65720	65720	16032	n/a	n/a
August	69375	69375	69375	16957	n/a	n/a
September	41209	41209	41209	9837	n/a	n/a
October	21731	21731	21731	5068	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**290190**	**290190**	**290190**	**69722**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_new_windows 05.22.2017

Prepared by: 11:37

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	23709	0	9215
February	0	21830	0	9659
March	64	0	1560	14020
April	450	0	9941	0
May	2083	0	27015	0
June	7323	0	43718	0
July	15751	0	49969	0
August	19058	0	50318	0
September	6110	0	35100	0
October	1579	0	20152	918
November	0	11118	0	2438
December	0	18997	0	7721
Total	**52418**	**75654**	**237772**	**43971**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **3592,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **36,6** kW

Sensible coil load ..... **33,8** kW

Coil L/s at Jul 1500 ..... **1717** L/s

Max coil L/s ..... **1717** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **1,46** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**52,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1717**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1717**	L/s			
Water flow @ 20,0 K drop	**0,63**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1717**	L/s	L/s/person	**6,71**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_walls_insulation 05.22.2017

Prepared by: 11:40

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	30601	-	330 m?	-	-
Wall Transmission	1184 m?	15843	-	1184 m?	41715	-
Roof Transmission	1305 m?	18038	-	1305 m?	17360	-
Window Transmission	330 m?	3980	-	330 m?	11025	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	35920 W	30585	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	35920 W	33539	-	0	0	-
People	256	14962	15370	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	14755	1537	10%	7010	0
>> Total Zone Loads	**-**	**162301**	**16907**	**-**	**77111**	**0**
Zone Conditioning	-	156425	16907	-	77920	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Ventilation Load	1717 L/s	16791	4314	1717 L/s	52099	0
Ventilation Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**176395**	**21222**	**-**	**126839**	**0**
Cooling Coil	-	29404	2009	-	0	0
Heating Coil	-	0	-	-	52846	-
Terminal Unit Cooling	-	146992	19319	-	0	0

Terminal Unit Heating	-	0	-	-	74014	-
>> Total Conditioning	**-**	**176395**	**21328**	**-**	**126860**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	2215	2215	2215	514	n/a	n/a
April	14073	14073	14073	3276	n/a	n/a
May	35051	35051	35051	8217	n/a	n/a
June	56581	56581	56581	13540	n/a	n/a
July	69811	69811	69811	17055	n/a	n/a
August	72844	72844	72844	17830	n/a	n/a
September	45486	45486	45486	10857	n/a	n/a
October	26077	26077	26077	6078	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**322139**	**322139**	**322139**	**77368**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_walls_insulation 05.22.2017

Prepared by: 11:40

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	23709	0	2724
February	0	21830	0	3612
March	64	0	2151	7828
April	450	0	13623	0
May	2083	0	32968	0
June	7323	0	49258	0
July	15751	0	54060	0
August	19058	0	53787	0
September	6110	0	39376	0
October	1579	0	24498	667
November	0	11118	0	380
December	0	18997	0	2465
Total	**52418**	**75654**	**269721**	**17675**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **3592,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **36,6** kW

Sensible coil load ..... **33,8** kW

Coil L/s at Jul 1500 ..... **1717** L/s

Max coil L/s ..... **1717** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **1,46** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**52,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1717**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1717**	L/s			
Water flow @ 20,0 K drop	**0,63**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1717**	L/s	L/s/person	**6,71**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Samgori_walls&roof_insullation 05.22.2017

Prepared by: 11:46

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1800 COOLING OA DB / WB 32,2 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	49328	-	330 m?	-	-
Wall Transmission	1184 m?	3243	-	1184 m?	8209	-
Roof Transmission	1305 m?	18038	-	1305 m?	17360	-
Window Transmission	330 m?	9911	-	330 m?	27453	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	35920 W	30585	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	35920 W	33539	-	0	0	-
People	256	14962	15370	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	15960	1537	10%	5302	0
>> Total Zone Loads	**-**	**175565**	**16907**	**-**	**58324**	**0**
Zone Conditioning	-	170245	16907	-	57220	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Ventilation Load	1717 L/s	16817	4578	1717 L/s	52162	0
Ventilation Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**190242**	**21486**	**-**	**106201**	**0**
Cooling Coil	-	29404	2009	-	0	0
Heating Coil	-	0	-	-	52846	-
Terminal Unit Cooling	-	160839	19582	-	0	0

Terminal Unit Heating	-	0	-	-	53377	-
>> Total Conditioning	**-**	**190242**	**21590**	**-**	**106223**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	2268	2268	2268	527	n/a	n/a
April	14287	14287	14287	3337	n/a	n/a
May	34080	34080	34080	8001	n/a	n/a
June	53808	53808	53808	12879	n/a	n/a
July	66058	66058	66058	16144	n/a	n/a
August	69547	69547	69547	17043	n/a	n/a
September	44046	44046	44046	10510	n/a	n/a
October	26618	26618	26618	6201	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**310711**	**310711**	**310711**	**74642**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary for As_build

Project Name: Samgori_walls&roof_insullation 05.22.2017

Prepared by: 11:46

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	23709	0	264
February	0	21830	0	832
March	64	0	2203	5560
April	450	0	13836	0
May	2083	0	31997	0
June	7323	0	46485	0
July	15751	0	50307	0
August	19058	0	50489	0
September	6110	0	37936	0
October	1579	0	25040	522
November	0	11118	0	3
December	0	18997	0	134
Total	**52418**	**75654**	**258294**	**7315**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **3592,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **36,6** kW

Sensible coil load ..... **33,8** kW

Coil L/s at Jul 1500 ..... **1717** L/s

Max coil L/s ..... **1717** L/s

Sensible heat ratio **0,923**

Water flow @ 6,0 K rise ..... **1,46** L/s

Load occurs at	**Jul 1500**		Leaving DB / WB	**17,2 / 16,0**	°C
OA DB / WB	**34,4 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**34,4 / 21,8**	°C			

Heating Coil Sizing Data

Max coil load	**52,8**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1717**	L/s	Ent. DB / Lvg DB	**-5,7 / 21,2**	°C
Max coil L/s	**1717**	L/s			
Water flow @ 20,0 K drop	**0,63**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1717**	L/s	L/s/person	**6,71**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_rebuild 05.22.2017

Prepared by: 11:48

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	49589	-	330 m?	-	-
Wall Transmission	1184 m?	3101	-	1184 m?	8209	-
Roof Transmission	1305 m?	5826	-	1305 m?	6698	-
Window Transmission	330 m?	9317	-	330 m?	27453	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	35920 W	30585	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	35920 W	33539	-	0	0	-
People	256	14962	15370	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	14692	1537	10%	4236	0
>> Total Zone Loads	**-**	**161611**	**16907**	**-**	**46596**	**0**
Zone Conditioning	-	155641	16907	-	43730	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Ventilation Load	1717 L/s	15719	5016	1717 L/s	52066	0
Ventilation Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**174540**	**21923**	**-**	**92615**	**0**
Cooling Coil	-	28312	2802	-	0	0
Heating Coil	-	0	-	-	52846	-
Terminal Unit Cooling	-	146201	19463	-	0	0

Terminal Unit Heating	-	0	-	-	39791	-
>> Total Conditioning	**-**	**174513**	**22266**	**-**	**92637**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	3569	3569	3339	836	n/a	n/a
April	18531	18531	17662	4307	n/a	n/a
May	32943	32943	32740	7755	n/a	n/a
June	46699	46699	46697	11202	n/a	n/a
July	56027	56027	56027	13700	n/a	n/a
August	59990	59990	59990	14728	n/a	n/a
September	38454	38454	38454	9166	n/a	n/a
October	27314	27314	27314	6367	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**283528**	**283528**	**282224**	**68060**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_rebuild 05.22.2017

Prepared by: 11:48

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	2679	0	10
February	0	3148	0	98
March	64	0	3505	38
April	449	0	18082	0
May	2003	0	30940	0
June	6798	0	39902	0
July	14412	0	41615	0
August	17551	0	42439	0
September	5771	0	32683	0
October	1574	0	25741	29
November	0	161	0	0
December	0	1196	0	4
Total	**48622**	**7184**	**234906**	**179**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **3592,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **24,3** kW

Sensible coil load ..... **22,6** kW

Coil L/s at Jun 1500 ..... **1717** L/s

Max coil L/s ..... **1717** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,97** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**26,7**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1717**	L/s	Ent. DB / Lvg DB	**7,6 / 21,2**	°C
Max coil L/s	**1717**	L/s			
Water flow @ 20,0 K drop	**0,32**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1717**	L/s	L/s/person	**6,71**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_vent_reclaim 05.22.2017

Prepared by: 11:51

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 31,6 °C / 21,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	30763	-	330 m?	-	-
Wall Transmission	1184 m?	3101	-	1184 m?	8209	-
Roof Transmission	1305 m?	5826	-	1305 m?	6698	-
Window Transmission	330 m?	3742	-	330 m?	11025	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	35920 W	30585	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	35920 W	33539	-	0	0	-
People	256	14962	15370	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	12252	1537	10%	2593	0
>> Total Zone Loads	**-**	**134769**	**16907**	**-**	**28525**	**0**
Zone Conditioning	-	130299	16907	-	29355	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Ventilation Load	1717 L/s	7861	5310	1717 L/s	26167	0
Ventilation Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**141340**	**22218**	**-**	**52342**	**0**
Cooling Coil	-	20451	1319	-	0	0
Heating Coil	-	0	-	-	26679	-
Terminal Unit Cooling	-	120889	20926	-	0	0

Terminal Unit Heating	-	0	-	-	25725	-
>> Total Conditioning	**-**	**141340**	**22246**	**-**	**52404**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		

Plant Simulation Results (Table 1) :

Month	Cooling Coil Load (kWh)	Plant Cooling Load (kWh)	Chiller Output (kWh)	Chiller Input (kWh)	Primary Water Dist. Pump (kWh)	Secondary Water Dist. Pump (kWh)
January	0	0	0	0	n/a	n/a
February	0	0	0	0	n/a	n/a
March	2472	2472	2472	574	n/a	n/a
April	15212	15212	15212	3546	n/a	n/a
May	35818	35818	35818	8391	n/a	n/a
June	58534	58534	58534	13993	n/a	n/a
July	73287	73287	73287	17856	n/a	n/a
August	76322	76322	76322	18635	n/a	n/a
September	46707	46707	46707	11143	n/a	n/a
October	25559	25559	25559	5957	n/a	n/a
November	0	0	0	0	n/a	n/a
December	0	0	0	0	n/a	n/a
Total	**333910**	**333910**	**333910**	**80096**	n/a	n/a

Air System Simulation Results (Table 1) :

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_vent_reclaim 05.22.2017

Prepared by: 11:51

Month	Precool Coil Load (kWh)	Preheat Coil Load (kWh)	Terminal Cooling Coil Load (kWh)	Terminal Heating Coil Load (kWh)
January	0	6135	0	10825
February	0	5865	0	11285
March	64	0	2408	8194
April	447	0	14764	0
May	2000	0	33818	0
June	6794	0	51740	0
July	14408	0	58878	0
August	17546	0	58776	0
September	5764	0	40943	0
October	1573	0	23986	242
November	0	1530	0	2762
December	0	4028	0	8983
Total	**48598**	**17559**	**285312**	**42291**

Air System Information

Air System Name ..... **As_build**

Equipment Class ..... **TERM**

Air System Type **2P-FC**

Number of zones **3**

Floor Area ..... **3592,0** m?

Location ..... **Tbilisi, Georgia**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**

Sizing Data ..... **Calculated**

Zone L/s Sizing ..... **Sum of space airflow rates**

Space L/s Sizing ..... **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load ..... **24,4** kW

Sensible coil load ..... **22,7** kW

Coil L/s at Jun 1500 ..... **1717** L/s

Max coil L/s ..... **1717** L/s

Sensible heat ratio **0,929**

Water flow @ 6,0 K rise ..... **0,97** L/s

Load occurs at	**Jun 1500**		Leaving DB / WB	**17,2 / 16,4**	°C
OA DB / WB	**33,8 / 21,8**	°C	Bypass Factor	**0,100**	
Entering DB / WB	**28,7 / 20,3**	°C			

Heating Coil Sizing Data

Max coil load	**26,9**	kW	Load occurs at	**Des Htg**	
Coil L/s at Des Htg	**1717**	L/s	Ent. DB / Lvg DB	**7,5 / 21,2**	°C
Max coil L/s	**1717**	L/s			
Water flow @ 20,0 K drop	**0,32**	L/s			

Ventilation Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Exhaust Fan Sizing Data

Actual max L/s	**1717**	L/s	Fan motor BHP	**2,00**	BHP
Standard L/s	**1628**	L/s	Fan motor kW	**1,59**	kW
Actual max L/(s·m?)	**0,48**	L/(s·m?)	Fan static	**500**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**1717**	L/s	L/s/person	**6,71**	L/s/person
L/(s·m?)	**0,48**	L/(s·m?)			

Dedicated Outdoor Air System (DOAS) Sizing Summary

Project Name: Samgori_vent_reclaim 05.22.2017

Prepared by: 11:51

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1700 COOLING OA DB / WB 32,8 °C / 21,5 °C			HEATING DATA AT DES HTG HEATING OA DB / WB -5,7 °C / -7,0 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	330 m?	50202	-	330 m?	-	-
Wall Transmission	1184 m?	15020	-	1184 m?	41715	-
Roof Transmission	1305 m?	17660	-	1305 m?	17360	-
Window Transmission	330 m?	10080	-	330 m?	27453	-
Skylight Transmission	0 m?	0	-	0 m?	0	-
Door Loads	0 m?	0	-	0 m?	0	-
Floor Transmission	772 m?	0	-	772 m?	0	-
Partitions	0 m?	0	-	0 m?	0	-
Ceiling	0 m?	0	-	0 m?	0	-
Overhead Lighting	35920 W	30209	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	35920 W	33372	-	0	0	-
People	256	14722	15370	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	17126	1537	10%	8653	0
>> Total Zone Loads	**-**	**188391**	**16907**	**-**	**95181**	**0**
Zone Conditioning	-	180423	16907	-	94248	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Ventilation Load	1717 L/s	9008	4955	1717 L/s	25982	0
Ventilation Fan Load	1717 L/s	1590	-	1717 L/s	-1590	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**192611**	**21863**	**-**	**117050**	**0**
Cooling Coil	-	21617	1542	-	0	0
Heating Coil	-	0	-	-	26864	-
Terminal Unit Cooling	-	170994	20414	-	0	0

Terminal Unit Heating	-	0	-	-	90261	-
>> Total Conditioning	**-**	**192611**	**21956**	**-**	**117125**	**0**
Key:	**Positive values are clg loads** **Negative values are htg loads**			**Positive values are htg loads** **Negative values are clg loads**		