

## Air System Sizing Summary for Sistema 0TE08

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE08**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **66,0** m²  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Central Cooling Coil Sizing Data

Total coil load ..... **8,2** kW  
Sensible coil load ..... **6,2** kW  
Coil L/s at Feb 1600 ..... **468** L/s  
Max block L/s ..... **468** L/s  
Sum of peak zone L/s ..... **468** L/s  
Sensible heat ratio ..... **0,765**  
m²/kW ..... **8,1**  
W/m² ..... **123,8**  
Water flow @ 5,6 °K rise ..... **0,35** L/s

Load occurs at ..... **Feb 1600**  
OA DB / WB ..... **32,6 / 22,2** °C  
Entering DB / WB ..... **24,1 / 17,0** °C  
Leaving DB / WB ..... **12,0 / 11,3** °C  
Coil ADP ..... **10,6** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **52** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0** °K

### Central Heating Coil Sizing Data

Max coil load ..... **3,1** kW  
Coil L/s at Des Htg ..... **468** L/s  
Max coil L/s ..... **468** L/s  
Water flow @ 11,1 °K drop ..... **0,07** L/s

Load occurs at ..... **Des Htg**  
W/m² ..... **47,0**  
Ent. DB / Lvg DB ..... **17,9 / 23,9** °C

### Supply Fan Sizing Data

Actual max L/s ..... **468** L/s  
Standard L/s ..... **425** L/s  
Actual max L/(s-m²) ..... **7,09** L/(s-m²)

Fan motor BHP ..... **0,29** BHP  
Fan motor kW ..... **0,22** kW  
Fan static ..... **250** Pa

### Outdoor Ventilation Air Data

Design airflow L/s ..... **96** L/s  
L/(s-m²) ..... **1,45** L/(s-m²)

L/s/person ..... **8,70** L/s/person

## Zone Sizing Summary for Sistema 0TE08

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
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### Air System Information

Air System Name ..... **Sistema 0TE08**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **66,0** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	5,1	468	468	Feb 1700	2,1	66,0	7,09

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE08 - Z1 - S01	1	5,1	Feb 1700	468	2,1	66,0	7,09

## Air System Design Load Summary for Sistema 0TE08

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	3 m²	83	-	3 m²	-	-
Wall Transmission	57 m²	1259	-	57 m²	1291	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	3 m²	144	-	3 m²	173	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	31 m²	538	-	31 m²	564	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	990 W	822	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1320 W	1215	-	0	0	-
People	11	592	661	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	233	33	5%	101	0
>> Total Zone Loads	-	4886	694	-	2130	0
Zone Conditioning	-	4911	694	-	2141	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	468 L/s	0	-	468 L/s	0	-
Ventilation Load	96 L/s	1122	1229	96 L/s	1181	0
Supply Fan Load	468 L/s	217	-	468 L/s	-217	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	6250	1923	-	3105	0
Central Cooling Coil	-	6250	1923	-	0	0
Central Heating Coil	-	0	-	-	3105	-
>> Total Conditioning	-	6250	1923	-	3105	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE09

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

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11:28

## Air System Information

Air System Name ..... **Sistema 0TE09**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **66,0** m²  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **8,4** kW  
Sensible coil load ..... **6,4** kW  
Coil L/s at Jan 1500 ..... **477** L/s  
Max block L/s ..... **477** L/s  
Sum of peak zone L/s ..... **477** L/s  
Sensible heat ratio ..... **0,769**  
m²/kW ..... **7,9**  
W/m² ..... **126,5**  
Water flow @ 5,6 °K rise ..... **0,36** L/s

Load occurs at ..... **Jan 1500**  
OA DB / WB ..... **32,9 / 22,3** °C  
Entering DB / WB ..... **24,2 / 17,0** °C  
Leaving DB / WB ..... **11,9 / 11,3** °C  
Coil ADP ..... **10,6** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **52** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **0 of 1** OK  
Max zone temperature deviation ..... **0,0** °K

## Central Heating Coil Sizing Data

Max coil load ..... **2,9** kW  
Coil L/s at Des Htg ..... **477** L/s  
Max coil L/s ..... **477** L/s  
Water flow @ 11,1 °K drop ..... **0,06** L/s

Load occurs at ..... **Des Htg**  
W/m² ..... **43,3**  
Ent. DB / Lvg DB ..... **17,9 / 23,3** °C

## Supply Fan Sizing Data

Actual max L/s ..... **477** L/s  
Standard L/s ..... **433** L/s  
Actual max L/(s-m²) ..... **7,23** L/(s-m²)

Fan motor BHP ..... **0,30** BHP  
Fan motor kW ..... **0,22** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **96** L/s  
L/(s-m²) ..... **1,45** L/(s-m²)

L/s/person ..... **8,70** L/s/person

## Zone Sizing Summary for Sistema 0TE09

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
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### Air System Information

Air System Name ..... **Sistema 0TE09**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **66,0** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	5,2	477	477	Jan 1700	1,9	66,0	7,23

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE09 - Z1 - S01	1	5,2	Jan 1700	477	1,9	66,0	7,23

## Air System Design Load Summary for Sistema 0TE09

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 22,3 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	11 m²	320	-	11 m²	-	-
Wall Transmission	49 m²	1389	-	49 m²	1109	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	11 m²	582	-	11 m²	693	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	990 W	811	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1320 W	1208	-	0	0	-
People	11	578	661	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	244	33	5%	90	0
>> Total Zone Loads	-	5131	694	-	1892	0
Zone Conditioning	-	5059	694	-	1898	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	477 L/s	0	-	477 L/s	0	-
Ventilation Load	96 L/s	1141	1236	96 L/s	1179	0
Supply Fan Load	477 L/s	221	-	477 L/s	-221	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	6421	1930	-	2856	0
Central Cooling Coil	-	6421	1930	-	0	0
Central Heating Coil	-	0	-	-	2856	-
>> Total Conditioning	-	6421	1930	-	2856	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE10

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

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## Air System Information

Air System Name ..... **Sistema 0TE10**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **31,2** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **3,9** kW  
Sensible coil load ..... **3,3** kW  
Coil L/s at Feb 1600 ..... **261** L/s  
Max block L/s ..... **261** L/s  
Sum of peak zone L/s ..... **261** L/s  
Sensible heat ratio ..... **0,836**  
m<sup>2</sup>/kW ..... **8,0**  
W/m<sup>2</sup> ..... **125,3**  
Water flow @ 5,6  K rise ..... **0,17** L/s

Load occurs at ..... **Feb 1600**  
OA DB / WB ..... **32,6 / 22,2**  C  
Entering DB / WB ..... **23,3 / 16,2**  C  
Leaving DB / WB ..... **11,9 / 11,2**  C  
Coil ADP ..... **10,6**  C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **51** %  
Design supply temp. .... **12,0**  C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0**  K

## Central Heating Coil Sizing Data

Max coil load ..... **1,8** kW  
Coil L/s at Des Htg ..... **261** L/s  
Max coil L/s ..... **261** L/s  
Water flow @ 11,1  K drop ..... **0,04** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **58,9**  
Ent. DB / Lvg DB ..... **18,8 / 25,2**  C

## Supply Fan Sizing Data

Actual max L/s ..... **261** L/s  
Standard L/s ..... **238** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **8,38** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,16** BHP  
Fan motor kW ..... **0,12** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **33** L/s  
L/(s-m<sup>2</sup>) ..... **1,05** L/(s-m<sup>2</sup>)

L/s/person ..... **10,90** L/s/person

## Zone Sizing Summary for Sistema 0TE10

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

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11:28

### Air System Information

Air System Name ..... **Sistema 0TE10**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **31,2** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	2,8	261	261	Feb 1700	1,5	31,2	8,38

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE10 - Z1 - S01	1	2,8	Feb 1700	261	1,5	31,2	8,38



## Air System Design Load Summary for Sistema 0TE10

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600 COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	5 m²	167	-	5 m²	-	-
Wall Transmission	23 m²	517	-	23 m²	530	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	5 m²	288	-	5 m²	346	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	31 m²	538	-	31 m²	564	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	468 W	389	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	624 W	574	-	0	0	-
People	3	161	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	132	9	5%	72	0
>> Total Zone Loads	-	2766	189	-	1513	0
Zone Conditioning	-	2767	189	-	1552	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	261 L/s	0	-	261 L/s	0	-
Ventilation Load	33 L/s	383	450	33 L/s	405	0
Supply Fan Load	261 L/s	121	-	261 L/s	-121	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	3271	639	-	1836	0
Central Cooling Coil	-	3271	639	-	0	0
Central Heating Coil	-	0	-	-	1836	-
>> Total Conditioning	-	3271	639	-	1836	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE11

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

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## Air System Information

Air System Name ..... **Sistema 0TE11**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **44,8** m²  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **4,8** kW  
Sensible coil load ..... **4,1** kW  
Coil L/s at Jan 1500 ..... **328** L/s  
Max block L/s ..... **328** L/s  
Sum of peak zone L/s ..... **328** L/s  
Sensible heat ratio ..... **0,848**  
m²/kW ..... **9,3**  
W/m² ..... **108,1**  
Water flow @ 5,6 °K rise ..... **0,21** L/s

Load occurs at ..... **Jan 1500**  
OA DB / WB ..... **32,9 / 22,3** °C  
Entering DB / WB ..... **23,4 / 16,2** °C  
Leaving DB / WB ..... **11,9 / 11,3** °C  
Coil ADP ..... **10,7** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **50** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **0 of 1** OK  
Max zone temperature deviation ..... **0,1** °K

## Central Heating Coil Sizing Data

Max coil load ..... **1,9** kW  
Coil L/s at Des Htg ..... **328** L/s  
Max coil L/s ..... **328** L/s  
Water flow @ 11,1 °K drop ..... **0,04** L/s

Load occurs at ..... **Des Htg**  
W/m² ..... **42,2**  
Ent. DB / Lvg DB ..... **18,7 / 24,0** °C

## Supply Fan Sizing Data

Actual max L/s ..... **328** L/s  
Standard L/s ..... **298** L/s  
Actual max L/(s-m²) ..... **7,31** L/(s-m²)

Fan motor BHP ..... **0,20** BHP  
Fan motor kW ..... **0,15** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **40** L/s  
L/(s-m²) ..... **0,88** L/(s-m²)

L/s/person ..... **13,17** L/s/person

## Zone Sizing Summary for Sistema 0TE11

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

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### Air System Information

Air System Name ..... **Sistema 0TE11**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **44,8** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	3,6	328	328	Jan 1600	1,6	44,8	7,31

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE11 - Z1 - S01	1	3,6	Jan 1600	328	1,6	44,8	7,31

## Air System Design Load Summary for Sistema 0TE11

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 22,3 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	8 m²	240	-	8 m²	-	-
Wall Transmission	34 m²	956	-	34 m²	764	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	8 m²	436	-	8 m²	519	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	12 m²	208	-	12 m²	216	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	672 W	550	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	896 W	820	-	0	0	-
People	3	158	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	168	9	5%	75	0
>> Total Zone Loads	-	3537	189	-	1575	0
Zone Conditioning	-	3486	189	-	1558	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	328 L/s	0	-	328 L/s	0	-
Ventilation Load	40 L/s	469	547	40 L/s	483	0
Supply Fan Load	328 L/s	152	-	328 L/s	-152	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	4107	736	-	1889	0
Central Cooling Coil	-	4107	736	-	0	0
Central Heating Coil	-	0	-	-	1889	-
>> Total Conditioning	-	4107	736	-	1889	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE12

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

## Air System Information

Air System Name ..... **Sistema 0TE12**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **48,0** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **5,6** kW  
Sensible coil load ..... **4,8** kW  
Coil L/s at Jan 1600 ..... **389** L/s  
Max block L/s ..... **389** L/s  
Sum of peak zone L/s ..... **389** L/s  
Sensible heat ratio ..... **0,863**  
m<sup>2</sup>/kW ..... **8,6**  
W/m<sup>2</sup> ..... **115,8**  
Water flow @ 5,6  K rise ..... **0,24** L/s

Load occurs at ..... **Jan 1600**  
OA DB / WB ..... **32,6 / 22,2**  C  
Entering DB / WB ..... **23,2 / 16,1**  C  
Leaving DB / WB ..... **11,9 / 11,3**  C  
Coil ADP ..... **10,7**  C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **50** %  
Design supply temp. .... **12,0**  C  
Zone T-stat Check ..... **0 of 1** OK  
Max zone temperature deviation ..... **0,1**  K

## Central Heating Coil Sizing Data

Max coil load ..... **2,4** kW  
Coil L/s at Des Htg ..... **389** L/s  
Max coil L/s ..... **389** L/s  
Water flow @ 11,1  K drop ..... **0,05** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **50,5**  
Ent. DB / Lvg DB ..... **18,8 / 24,5**  C

## Supply Fan Sizing Data

Actual max L/s ..... **389** L/s  
Standard L/s ..... **353** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **8,10** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,24** BHP  
Fan motor kW ..... **0,18** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **41** L/s  
L/(s-m<sup>2</sup>) ..... **0,86** L/(s-m<sup>2</sup>)

L/s/person ..... **13,70** L/s/person

## Zone Sizing Summary for Sistema 0TE12

Project Name: OS6955 - MUSEU DA IMIGRACAO - TERREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE12**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **48,0** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	4,2	389	389	Jan 1600	2,2	48,0	8,10

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE12 - Z1 - S01	1	4,2	Jan 1600	389	2,2	48,0	8,10

## Air System Design Load Summary for Sistema 0TE12

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	8 m²	230	-	8 m²	-	-
Wall Transmission	34 m²	989	-	34 m²	775	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	8 m²	433	-	8 m²	519	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	42 m²	725	-	42 m²	761	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	720 W	598	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	960 W	884	-	0	0	-
People	3	161	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	201	9	5%	103	0
>> Total Zone Loads	-	4221	189	-	2159	0
Zone Conditioning	-	4140	189	-	2102	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	389 L/s	0	-	389 L/s	0	-
Ventilation Load	41 L/s	476	572	41 L/s	501	0
Supply Fan Load	389 L/s	180	-	389 L/s	-180	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	4796	762	-	2423	0
Central Cooling Coil	-	4796	762	-	0	0
Central Heating Coil	-	0	-	-	2423	-
>> Total Conditioning	-	4796	762	-	2423	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE13

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

## Air System Information

Air System Name ..... **Sistema 0TE13**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **36,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **3,1** kW  
Sensible coil load ..... **2,7** kW  
Coil L/s at Jan 1600 ..... **218** L/s  
Max block L/s ..... **218** L/s  
Sum of peak zone L/s ..... **218** L/s  
Sensible heat ratio ..... **0,869**  
m<sup>2</sup>/kW ..... **11,8**  
W/m<sup>2</sup> ..... **84,6**  
Water flow @ 5,6  K rise ..... **0,13** L/s

Load occurs at ..... **Jan 1600**  
OA DB / WB ..... **32,6 / 22,2**  C  
Entering DB / WB ..... **23,1 / 16,0**  C  
Leaving DB / WB ..... **11,9 / 11,2**  C  
Coil ADP ..... **10,6**  C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **50** %  
Design supply temp. .... **12,0**  C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0**  K

## Central Heating Coil Sizing Data

Max coil load ..... **1,6** kW  
Coil L/s at Des Htg ..... **218** L/s  
Max coil L/s ..... **218** L/s  
Water flow @ 11,1  K drop ..... **0,03** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **43,3**  
Ent. DB / Lvg DB ..... **18,8 / 25,5**  C

## Supply Fan Sizing Data

Actual max L/s ..... **218** L/s  
Standard L/s ..... **198** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **5,95** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,14** BHP  
Fan motor kW ..... **0,10** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **24** L/s  
L/(s-m<sup>2</sup>) ..... **0,66** L/(s-m<sup>2</sup>)

L/s/person ..... **24,00** L/s/person



## Zone Sizing Summary for Sistema 0TE13

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... Sistema 0TE13  
Equipment Class ..... CW AHU  
Air System Type ..... SZCAV

Number of zones ..... 1  
Floor Area ..... 36,6 m<sup>2</sup>  
Location ..... Sao Paulo, Brazil

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... Sum of space airflow rates  
Space L/s ..... Individual peak space loads

Calculation Months ..... Jan to Dec  
Sizing Data ..... Calculated

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	2,4	218	218	Jan 1700	1,4	36,6	5,95

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE13 - Z1 - S01	1	2,4	Jan 1700	218	1,4	36,6	5,95

## Air System Design Load Summary for Sistema 0TE13

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	32 m²	812	-	32 m²	735	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	32 m²	555	-	32 m²	582	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	549 W	456	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	366 W	337	-	0	0	-
People	1	54	60	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	111	3	5%	66	0
>> Total Zone Loads	-	2324	63	-	1383	0
Zone Conditioning	-	2308	63	-	1392	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	218 L/s	0	-	218 L/s	0	-
Ventilation Load	24 L/s	281	342	24 L/s	294	0
Supply Fan Load	218 L/s	101	-	218 L/s	-101	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	2690	405	-	1585	0
Central Cooling Coil	-	2690	406	-	0	0
Central Heating Coil	-	0	-	-	1585	-
>> Total Conditioning	-	2690	406	-	1585	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

## Air System Sizing Summary for Sistema 0TE14

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE14**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **124,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Central Cooling Coil Sizing Data

Total coil load ..... **9,2** kW  
Sensible coil load ..... **7,6** kW  
Coil L/s at Jan 1600 ..... **589** L/s  
Max block L/s ..... **589** L/s  
Sum of peak zone L/s ..... **589** L/s  
Sensible heat ratio ..... **0,827**  
m<sup>2</sup>/kW ..... **13,6**  
W/m<sup>2</sup> ..... **73,5**  
Water flow @ 5,6  K rise ..... **0,39** L/s

Load occurs at ..... **Jan 1600**  
OA DB / WB ..... **32,6 / 22,2**  C  
Entering DB / WB ..... **23,6 / 16,4**  C  
Leaving DB / WB ..... **11,9 / 11,2**  C  
Coil ADP ..... **10,6**  C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **50** %  
Design supply temp. .... **12,0**  C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0**  K

### Central Heating Coil Sizing Data

Max coil load ..... **2,7** kW  
Coil L/s at Des Htg ..... **589** L/s  
Max coil L/s ..... **589** L/s  
Water flow @ 11,1  K drop ..... **0,06** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **21,7**  
Ent. DB / Lvg DB ..... **18,4 / 22,6**  C

### Supply Fan Sizing Data

Actual max L/s ..... **589** L/s  
Standard L/s ..... **535** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **4,72** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,37** BHP  
Fan motor kW ..... **0,27** kW  
Fan static ..... **250** Pa

### Outdoor Ventilation Air Data

Design airflow L/s ..... **91** L/s  
L/(s-m<sup>2</sup>) ..... **0,73** L/(s-m<sup>2</sup>)

L/s/person ..... **18,16** L/s/person

## Zone Sizing Summary for Sistema 0TE14

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE14**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **124,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	6,4	589	589	Jan 1700	1,9	124,6	4,72

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE14 - Z1 - S01	1	6,4	Jan 1700	589	1,9	124,6	4,72

## Air System Design Load Summary for Sistema 0TE14

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4 m²	137	-	4 m²	-	-
Wall Transmission	43 m²	903	-	43 m²	966	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	4 m²	206	-	4 m²	247	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	33 m²	564	-	33 m²	592	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	1869 W	1553	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2492 W	2294	-	0	0	-
People	5	269	301	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	296	15	5%	90	0
>> Total Zone Loads	-	6221	316	-	1895	0
Zone Conditioning	-	6235	316	-	1858	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	589 L/s	0	-	589 L/s	0	-
Ventilation Load	91 L/s	1062	1269	91 L/s	1115	0
Supply Fan Load	589 L/s	272	-	589 L/s	-272	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	7569	1584	-	2700	0
Central Cooling Coil	-	7569	1584	-	0	0
Central Heating Coil	-	0	-	-	2700	-
>> Total Conditioning	-	7569	1584	-	2700	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE15

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

## Air System Information

Air System Name ..... **Sistema 0TE15**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **124,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **12,2** kW  
Sensible coil load ..... **10,6** kW  
Coil L/s at Jan 1500 ..... **857** L/s  
Max block L/s ..... **857** L/s  
Sum of peak zone L/s ..... **857** L/s  
Sensible heat ratio ..... **0,867**  
m<sup>2</sup>/kW ..... **10,2**  
W/m<sup>2</sup> ..... **98,2**  
Water flow @ 5,6  K rise ..... **0,53** L/s

Load occurs at ..... **Jan 1500**  
OA DB / WB ..... **32,9 / 22,3**  C  
Entering DB / WB ..... **23,0 / 15,9**  C  
Leaving DB / WB ..... **11,7 / 11,0**  C  
Coil ADP ..... **10,5**  C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **50** %  
Design supply temp. .... **12,0**  C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0**  K

## Central Heating Coil Sizing Data

Max coil load ..... **4,6** kW  
Coil L/s at Des Htg ..... **857** L/s  
Max coil L/s ..... **857** L/s  
Water flow @ 11,1  K drop ..... **0,10** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **37,2**  
Ent. DB / Lvg DB ..... **19,0 / 23,9**  C

## Supply Fan Sizing Data

Actual max L/s ..... **857** L/s  
Standard L/s ..... **779** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **6,88** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,53** BHP  
Fan motor kW ..... **0,40** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **91** L/s  
L/(s-m<sup>2</sup>) ..... **0,73** L/(s-m<sup>2</sup>)

L/s/person ..... **18,16** L/s/person

## Zone Sizing Summary for Sistema 0TE15

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE15**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **124,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	9,3	857	857	Feb 1600	3,8	124,6	6,88

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE15 - Z1 - S01	1	9,3	Feb 1600	857	3,8	124,6	6,88

## Air System Design Load Summary for Sistema 0TE15

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 22,3 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	16 m²	633	-	16 m²	-	-
Wall Transmission	90 m²	2349	-	90 m²	2036	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	16 m²	872	-	16 m²	1039	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	33 m²	568	-	33 m²	592	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	1869 W	1530	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2492 W	2280	-	0	0	-
People	5	263	301	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	425	15	5%	183	0
>> Total Zone Loads	-	8920	316	-	3850	0
Zone Conditioning	-	9113	316	-	3911	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	857 L/s	0	-	857 L/s	0	-
Ventilation Load	91 L/s	1103	1311	91 L/s	1125	0
Supply Fan Load	857 L/s	397	-	857 L/s	-397	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	10613	1626	-	4639	0
Central Cooling Coil	-	10613	1627	-	0	0
Central Heating Coil	-	0	-	-	4639	-
>> Total Conditioning	-	10613	1627	-	4639	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		



# Air System Sizing Summary for Sistema 0TE16

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

## Air System Information

Air System Name ..... **Sistema 0TE16**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **37,2** m²  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **5,4** kW  
Sensible coil load ..... **4,9** kW  
Coil L/s at Feb 1600 ..... **408** L/s  
Max block L/s ..... **408** L/s  
Sum of peak zone L/s ..... **408** L/s  
Sensible heat ratio ..... **0,898**  
m²/kW ..... **6,8**  
W/m² ..... **146,3**  
Water flow @ 5,6 °K rise ..... **0,23** L/s

Load occurs at ..... **Feb 1600**  
OA DB / WB ..... **32,6 / 22,2** °C  
Entering DB / WB ..... **22,8 / 15,7** °C  
Leaving DB / WB ..... **11,9 / 11,2** °C  
Coil ADP ..... **10,7** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **49** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **0 of 1** OK  
Max zone temperature deviation ..... **0,0** °K

## Central Heating Coil Sizing Data

Max coil load ..... **2,3** kW  
Coil L/s at Des Htg ..... **408** L/s  
Max coil L/s ..... **408** L/s  
Water flow @ 11,1 °K drop ..... **0,05** L/s

Load occurs at ..... **Des Htg**  
W/m² ..... **61,2**  
Ent. DB / Lvg DB ..... **19,4 / 24,5** °C

## Supply Fan Sizing Data

Actual max L/s ..... **408** L/s  
Standard L/s ..... **371** L/s  
Actual max L/(s-m²) ..... **10,98** L/(s-m²)

Fan motor BHP ..... **0,25** BHP  
Fan motor kW ..... **0,19** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **30** L/s  
L/(s-m²) ..... **0,81** L/(s-m²)

L/s/person ..... **15,00** L/s/person

## Zone Sizing Summary for Sistema 0TE16

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE16**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **37,2** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	4,4	408	408	Feb 1700	2,0	37,2	10,98

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE16 - Z1 - S01	1	4,4	Feb 1700	408	2,0	37,2	10,98

## Air System Design Load Summary for Sistema 0TE16

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	11 m²	589	-	11 m²	-	-
Wall Transmission	54 m²	1407	-	54 m²	1234	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	11 m²	577	-	11 m²	693	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	558 W	464	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1116 W	1027	-	0	0	-
People	2	108	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	209	6	5%	96	0
>> Total Zone Loads	-	4381	126	-	2023	0
Zone Conditioning	-	4351	126	-	2093	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	408 L/s	0	-	408 L/s	0	-
Ventilation Load	30 L/s	350	427	30 L/s	372	0
Supply Fan Load	408 L/s	189	-	408 L/s	-189	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	4889	553	-	2276	0
Central Cooling Coil	-	4889	553	-	0	0
Central Heating Coil	-	0	-	-	2276	-
>> Total Conditioning	-	4889	553	-	2276	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE17

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

## Air System Information

Air System Name ..... **Sistema 0TE17**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **12,4** m²  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **0,4** kW  
Sensible coil load ..... **0,3** kW  
Coil L/s at Dec 1700 ..... **20** L/s  
Max block L/s ..... **20** L/s  
Sum of peak zone L/s ..... **20** L/s  
Sensible heat ratio ..... **0,753**  
m²/kW ..... **32,7**  
W/m² ..... **30,6**  
Water flow @ 5,6 °K rise ..... **0,02** L/s

Load occurs at ..... **Dec 1700**  
OA DB / WB ..... **31,5 / 22,1** °C  
Entering DB / WB ..... **24,9 / 17,4** °C  
Leaving DB / WB ..... **11,9 / 11,2** °C  
Coil ADP ..... **10,4** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **49** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0** °K

## Central Heating Coil Sizing Data

Max coil load ..... **0,1** kW  
Coil L/s at Des Htg ..... **20** L/s  
Max coil L/s ..... **20** L/s  
Water flow @ 11,1 °K drop ..... **0,00** L/s

Load occurs at ..... **Des Htg**  
W/m² ..... **9,5**  
Ent. DB / Lvg DB ..... **16,6 / 22,0** °C

## Supply Fan Sizing Data

Actual max L/s ..... **20** L/s  
Standard L/s ..... **18** L/s  
Actual max L/(s-m²) ..... **1,61** L/(s-m²)

Fan motor BHP ..... **0,01** BHP  
Fan motor kW ..... **0,01** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **6** L/s  
L/(s-m²) ..... **0,50** L/(s-m²)

L/s/person ..... **0,00** L/s/person

## Zone Sizing Summary for Sistema 0TE17

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE17**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **12,4** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	0,2	20	20	Dec 1800	0,0	12,4	1,61

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE17 - Z1 - S01	1	0,2	Dec 1800	20	0,0	12,4	1,61

## Air System Design Load Summary for Sistema 0TE17

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Dec 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 31,5 °C / 22,1 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	2 m²	45	-	2 m²	48	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	186 W	157	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	10	0	5%	2	0
>> Total Zone Loads	-	212	0	-	50	0
Zone Conditioning	-	212	0	-	50	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	20 L/s	0	-	20 L/s	0	-
Ventilation Load	6 L/s	64	94	6 L/s	76	0
Supply Fan Load	20 L/s	9	-	20 L/s	-9	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	286	94	-	117	0
Central Cooling Coil	-	286	94	-	0	0
Central Heating Coil	-	0	-	-	117	-
>> Total Conditioning	-	286	94	-	117	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

## Air System Sizing Summary for Sistema 0TE18

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE18**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **13,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Central Cooling Coil Sizing Data

Total coil load ..... **1,8** kW  
Sensible coil load ..... **1,6** kW  
Coil L/s at Feb 1600 ..... **128** L/s  
Max block L/s ..... **128** L/s  
Sum of peak zone L/s ..... **128** L/s  
Sensible heat ratio ..... **0,867**  
m<sup>2</sup>/kW ..... **7,6**  
W/m<sup>2</sup> ..... **131,8**  
Water flow @ 5,6 °K rise ..... **0,08** L/s

Load occurs at ..... **Feb 1600**  
OA DB / WB ..... **32,6 / 22,2** °C  
Entering DB / WB ..... **23,0 / 15,9** °C  
Leaving DB / WB ..... **11,9 / 11,2** °C  
Coil ADP ..... **10,7** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **50** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0** °K

### Central Heating Coil Sizing Data

Max coil load ..... **0,6** kW  
Coil L/s at Des Htg ..... **128** L/s  
Max coil L/s ..... **128** L/s  
Water flow @ 11,1 °K drop ..... **0,01** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **45,8**  
Ent. DB / Lvg DB ..... **18,8 / 23,3** °C

### Supply Fan Sizing Data

Actual max L/s ..... **128** L/s  
Standard L/s ..... **116** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **9,39** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,08** BHP  
Fan motor kW ..... **0,06** kW  
Fan static ..... **250** Pa

### Outdoor Ventilation Air Data

Design airflow L/s ..... **13** L/s  
L/(s-m<sup>2</sup>) ..... **0,92** L/(s-m<sup>2</sup>)

L/s/person ..... **12,50** L/s/person

## Zone Sizing Summary for Sistema 0TE18

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE18**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **13,6** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	1,4	128	128	Feb 1700	0,6	13,6	9,39

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE18 - Z1 - S01	1	1,4	Feb 1700	128	0,6	13,6	9,39



## Air System Design Load Summary for Sistema 0TE18

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,6 °C / 22,2 °C			HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	3 m²	182	-	3 m²	-	-
Wall Transmission	16 m²	357	-	16 m²	366	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	3 m²	144	-	3 m²	173	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	204 W	169	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	408 W	376	-	0	0	-
People	1	54	60	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	64	3	5%	27	0
>> Total Zone Loads	-	1345	63	-	566	0
Zone Conditioning	-	1348	63	-	530	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	128 L/s	0	-	128 L/s	0	-
Ventilation Load	13 L/s	147	175	13 L/s	151	0
Supply Fan Load	128 L/s	59	-	128 L/s	-59	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	1554	238	-	622	0
Central Cooling Coil	-	1554	238	-	0	0
Central Heating Coil	-	0	-	-	622	-
>> Total Conditioning	-	1554	238	-	622	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

# Air System Sizing Summary for Sistema 0TE19

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

## Air System Information

Air System Name ..... **Sistema 0TE19**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **5,3** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

## Sizing Calculation Information

### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

## Central Cooling Coil Sizing Data

Total coil load ..... **0,6** kW  
Sensible coil load ..... **0,5** kW  
Coil L/s at Dec 1600 ..... **46** L/s  
Max block L/s ..... **46** L/s  
Sum of peak zone L/s ..... **46** L/s  
Sensible heat ratio ..... **0,931**  
m<sup>2</sup>/kW ..... **9,1**  
W/m<sup>2</sup> ..... **109,9**  
Water flow @ 5,6  K rise ..... **0,03** L/s

Load occurs at ..... **Dec 1600**  
OA DB / WB ..... **32,1 / 22,2**  C  
Entering DB / WB ..... **22,5 / 15,5**  C  
Leaving DB / WB ..... **11,9 / 11,2**  C  
Coil ADP ..... **10,7**  C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **49** %  
Design supply temp. .... **12,0**  C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0**  K

## Central Heating Coil Sizing Data

Max coil load ..... **0,4** kW  
Coil L/s at Des Htg ..... **46** L/s  
Max coil L/s ..... **46** L/s  
Water flow @ 11,1  K drop ..... **0,01** L/s

Load occurs at ..... **Des Htg**  
W/m<sup>2</sup> ..... **77,0**  
Ent. DB / Lvg DB ..... **19,5 / 27,5**  C

## Supply Fan Sizing Data

Actual max L/s ..... **46** L/s  
Standard L/s ..... **42** L/s  
Actual max L/(s-m<sup>2</sup>) ..... **8,76** L/(s-m<sup>2</sup>)

Fan motor BHP ..... **0,03** BHP  
Fan motor kW ..... **0,02** kW  
Fan static ..... **250** Pa

## Outdoor Ventilation Air Data

Design airflow L/s ..... **3** L/s  
L/(s-m<sup>2</sup>) ..... **0,50** L/(s-m<sup>2</sup>)

L/s/person ..... **0,00** L/s/person

## Zone Sizing Summary for Sistema 0TE19

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE19**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **5,3** m<sup>2</sup>  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	0,5	46	46	Dec 1700	0,4	5,3	8,76

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE19 - Z1 - S01	1	0,5	Dec 1700	46	0,4	5,3	8,76

## Air System Design Load Summary for Sistema 0TE19

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Dec 1600 COOLING OA DB / WB 32,1 °C / 22,2 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	3 m²	89	-	3 m²	-	-
Wall Transmission	9 m²	180	-	9 m²	200	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	3 m²	136	-	3 m²	173	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	80 W	66	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	24	0	5%	19	0
>> Total Zone Loads	-	494	0	-	392	0
Zone Conditioning	-	492	0	-	397	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	46 L/s	0	-	46 L/s	0	-
Ventilation Load	3 L/s	29	40	3 L/s	33	0
Supply Fan Load	46 L/s	21	-	46 L/s	-21	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	542	40	-	408	0
Central Cooling Coil	-	542	40	-	0	0
Central Heating Coil	-	0	-	-	408	-
>> Total Conditioning	-	542	40	-	408	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

## Air System Sizing Summary for Sistema 0TE20

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... **Sistema 0TE20**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **5,0** m²  
Location ..... **Sao Paulo, Brazil**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... **Sum of space airflow rates**  
Space L/s ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**  
Sizing Data ..... **Calculated**

### Central Cooling Coil Sizing Data

Total coil load ..... **1,1** kW  
Sensible coil load ..... **1,1** kW  
Coil L/s at Jan 1700 ..... **93** L/s  
Max block L/s ..... **93** L/s  
Sum of peak zone L/s ..... **93** L/s  
Sensible heat ratio ..... **0,967**  
m²/kW ..... **4,6**  
W/m² ..... **219,3**  
Water flow @ 5,6 °K rise ..... **0,05** L/s

Load occurs at ..... **Jan 1700**  
OA DB / WB ..... **32,0 / 22,1** °C  
Entering DB / WB ..... **22,3 / 15,2** °C  
Leaving DB / WB ..... **11,9 / 11,2** °C  
Coil ADP ..... **10,7** °C  
Bypass Factor ..... **0,100**  
Resulting RH ..... **49** %  
Design supply temp. .... **12,0** °C  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0,0** °K

### Central Heating Coil Sizing Data

Max coil load ..... **0,7** kW  
Coil L/s at Des Htg ..... **93** L/s  
Max coil L/s ..... **93** L/s  
Water flow @ 11,1 °K drop ..... **0,01** L/s

Load occurs at ..... **Des Htg**  
W/m² ..... **137,6**  
Ent. DB / Lvg DB ..... **19,9 / 26,7** °C

### Supply Fan Sizing Data

Actual max L/s ..... **93** L/s  
Standard L/s ..... **85** L/s  
Actual max L/(s-m²) ..... **18,62** L/(s-m²)

Fan motor BHP ..... **0,06** BHP  
Fan motor kW ..... **0,04** kW  
Fan static ..... **250** Pa

### Outdoor Ventilation Air Data

Design airflow L/s ..... **3** L/s  
L/(s-m²) ..... **0,50** L/(s-m²)

L/s/person ..... **0,00** L/s/person

## Zone Sizing Summary for Sistema 0TE20

Project Name: OS6955 - MUSEU DA IMIGRACAO - T RREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

### Air System Information

Air System Name ..... Sistema 0TE20  
Equipment Class ..... CW AHU  
Air System Type ..... SZCAV

Number of zones ..... 1  
Floor Area ..... 5,0 m<sup>2</sup>  
Location ..... Sao Paulo, Brazil

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone L/s ..... Sum of space airflow rates  
Space L/s ..... Individual peak space loads

Calculation Months ..... Jan to Dec  
Sizing Data ..... Calculated

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (kW)	Design Air Flow (L/s)	Minimum Air Flow (L/s)	Time of Peak Load	Maximum Heating Load (kW)	Zone Floor Area (m <sup>2</sup> )	Zone L/(s-m <sup>2</sup> )
Zone 1	1,0	93	93	Feb 1700	0,7	5,0	18,62

### Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

### Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m <sup>2</sup> )	Space L/(s-m <sup>2</sup> )
<b>Zone 1</b>							
Sist 0TE20 - Z1 - S01	1	1,0	Feb 1700	93	0,7	5,0	18,62

## Air System Design Load Summary for Sistema 0TE20

Project Name: OS6955 - MUSEU DA IMIGRACAO - TÉRREO  
Prepared by: EPT Engenharia S/C Ltda

11/13/2020  
11:28

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700 COOLING OA DB / WB 32,0 °C / 22,1 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 7,2 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	3 m²	146	-	3 m²	-	-
Wall Transmission	21 m²	507	-	21 m²	484	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	3 m²	139	-	3 m²	173	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	0 m²	0	-	0 m²	0	-
Overhead Lighting	75 W	63	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	100 W	93	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	47	0	5%	33	0
>> Total Zone Loads	-	995	0	-	690	0
Zone Conditioning	-	989	0	-	700	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	93 L/s	0	-	93 L/s	0	-
Ventilation Load	3 L/s	27	36	3 L/s	31	0
Supply Fan Load	93 L/s	43	-	93 L/s	-43	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	1060	36	-	688	0
Central Cooling Coil	-	1060	36	-	0	0
Central Heating Coil	-	0	-	-	688	-
>> Total Conditioning	-	1060	36	-	688	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		