

Air System Sizing Summary for AC-1

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

06/21/2024
09:38AM

Air System Information

Air System Name: AC-1
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 2220.2 sqft
Location: Miami, Florida

Sizing Calculation Information

Calculation Months: Aug to Aug

Calculation method: Transfer Function Method

Central Cooling Coil Sizing Data

Total coil load: 4.8 Tons
Total coil load: 57.1 MBH
Sensible coil load: 50.6 MBH
Coil airflow: 2000 CFM
Sensible heat ratio: 0.887
Area per unit load: 466.7 sqft/Ton
Load per unit area: 25.7 BTU/(hr-sqft)

Load occurs at: Aug 1700
OA DB / WB: 89.9/76.7 F
Entering DB / WB: 76.7/62.1 F
Leaving DB / WB: 53.3/51.9 F
Coil ADP: 50.6 F
Bypass Factor: 0.100
Resulting RH: .45 %
Design supply temp: 53.0 F

Central Heating Coil Sizing Data

Max coil load: 27.6 MBH
Coil airflow: 2000 CFM
Load per unit area: 12.4 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 68.5/81.3 F

Supply Fan Sizing Data

Actual max airflow: 2000 CFM
Standard airflow: 1999 CFM
Actual max airflow per unit area: 0.90 CFM/sqft

Fan motor BHP: 0.29 BHP
Fan motor kW: 0.22 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 120 CFM
Airflow per unit floor area: 0.05 CFM/sqft

Airflow per person: 20.00 CFM/person

Space Sizing Data

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
01-GUEST ENTRY	5.0	222	Aug 1700	2.7	427.8	0.52
02-MEDIA ROOM	9.7	426	Aug 1600	5.8	364.3	1.17
03-BAR	3.5	155	Aug 1600	1.9	252.2	0.62
04-DINING	12.0	529	Aug 1600	6.7	352.9	1.50
05-FAMILY ROOM	6.3	279	Aug 1400	3.5	405.0	0.69
06-KITCHEN	9.2	404	Aug 1700	4.6	418.0	0.97
Zone	45.4	2000	Aug 1600	25.2	2220.2	0.90

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: Peak space load

Zone sizing basis: Peak zone load

System Design Load Summary for AC-1

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	Aug 1700 OA DB / WB 89.9 F / 76.7 F			Design Heating Day OA DB / WB 46 F / 38.6 F		
Zone Loads based on TFM	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	815 sqft	18025	-	815 sqft	-	-
Wall Transmission	1006 sqft	3136	-	1006 sqft	2826	-
Roof Transmission	1210 sqft	0	-	1210 sqft	871	-
Window Transmission	815 sqft	10582	-	815 sqft	17595	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	99 sqft	3878	-	99 sqft	2101	-
Floor Transmission	2220 sqft	0	-	2220 sqft	1787	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1450 W	2473	-	0 W	0	-
Electric Equipment	1332 W	4545	-	0 W	0	-
People	6	1380	720	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	800	750	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	44819	1470	-	25181	0
Thermostat and Pulldown Adjustment	-	-102	0	-	72	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	100%	904	-	0	0	-
Plenum Lighting Load	50%	2473	-	0	0	-
Ventilation Load	120 CFM	1812	4971	120 CFM	3099	0
Supply Fan Load	2000 CFM	741	-	2000 CFM	-741	-
>> Total System Loads	-	50647	6441	-	27610	0
Central Cooling Coil	-	50647	6444	-	0	0
Central Heating Coil	-	0	-	-	27610	-
>> Total Coil Loads	-	50647	6444	-	27610	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Input Data

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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General Details:

Air System Name:.....AC-1
Air System Type:.....Single Zone CAV
Number of zones:.....1
System Startup:.....6
Duration of Operation:.....24

Central Cooling Coil Data:

Used?:.....YES
Supply Air Temperature:.....2000.0 F
Coil Bypass Factor:.....0.100

Central Heating Coil Data:

Used?:.....YES
Supply Temperature:.....110.0 F

Supply Fan Data:

Configuration:.....Draw-thru
Fan Performance:.....0.50 in wg

Ceiling Return Air Plenum Data:

Return Air Via:.....Return Air Plenum
Roof Heat Gain to Plenum:.....100
Lighting Heat Gain to Plenum:.....50
Wall Heat Gain to Plenum:.....0

Zones Included:

Zone Names
01-GUEST ENTRY

Thermostats Data:

Cooling T-stat: Occ:.....74.0 F
Cooling T-stat: Unocc:.....85.0 F
Heating T-stat: Occ:.....70.0 F
Heating T-stat: Unocc:.....60.0 F

Safety Factors:

Cooling Sensible Safety Factor:.....0 %
Cooling Latent Safety Factor:.....0 %
Heating Safety Factor:.....0 %

Air System Sizing Summary for AC-2

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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Air System Information

Air System Name: AC-2
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 2199.6 sqft
Location: Miami, Florida

Sizing Calculation Information

Calculation Months: Aug to Aug

Calculation method: Transfer Function Method

Central Cooling Coil Sizing Data

Total coil load: 4.4 Tons
Total coil load: 53.1 MBH
Sensible coil load: 46.9 MBH
Coil airflow: 2000 CFM
Sensible heat ratio: 0.883
Area per unit load: 497.2 sqft/Ton
Load per unit area: 24.1 BTU/(hr-sqft)

Load occurs at: Aug 1600
OA DB / WB: 90.7/76.9 F
Entering DB / WB: 75.4/62.0 F
Leaving DB / WB: 53.7/52.5 F
Coil ADP: 51.3 F
Bypass Factor: 0.100
Resulting RH: .45 %
Design supply temp: 53.5 F

Central Heating Coil Sizing Data

Max coil load: 19.3 MBH
Coil airflow: 2000 CFM
Load per unit area: 8.8 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 68.4/77.3 F

Supply Fan Sizing Data

Actual max airflow: 2000 CFM
Standard airflow: 1999 CFM
Actual max airflow per unit area: 0.91 CFM/sqft

Fan motor BHP: 0.29 BHP
Fan motor kW: 0.22 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 120 CFM
Airflow per unit floor area: 0.05 CFM/sqft

Airflow per person: 40.00 CFM/person

Space Sizing Data

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
07-PANTRY/STORAGE	3.7	167	Aug 1400	1.0	238.0	0.70
08-STAIR	6.9	309	Aug 1400	2.6	360.0	0.86
09-STUDY ROOM	14.9	673	Aug 1600	7.8	610.0	1.10
MAIDS QUARTERS	4.7	212	Aug 1000	1.5	215.0	0.98
10-HALL	3.8	171	Aug 1400	1.3	211.5	0.81
11-LAUNDRY	5.1	231	Aug 1700	1.0	195.6	1.18
12-BEDROOM 2	5.6	253	Aug 1600	2.0	369.5	0.69
Zone	44.3	2000	Aug 1600	17.1	2199.6	0.91

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: Peak space load
Zone sizing basis: Peak zone load

System Design Load Summary for AC-2

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	Aug 1600 OA DB / WB 90.7 F / 76.9 F			Design Heating Day OA DB / WB 46 F / 38.6 F		
Zone Loads based on TFM	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	344 sqft	7824	-	344 sqft	-	-
Wall Transmission	1262 sqft	3602	-	1262 sqft	3545	-
Roof Transmission	0 sqft	0	-	0 sqft	0	-
Window Transmission	344 sqft	4595	-	344 sqft	7421	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	216 sqft	6120	-	216 sqft	4444	-
Floor Transmission	2200 sqft	0	-	2200 sqft	1737	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	2200 W	7505	-	0 W	0	-
Electric Equipment	2200 W	7505	-	0 W	0	-
People	3	690	360	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	6500	1000	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	44341	1360	-	17147	0
Thermostat and Pulldown Adjustment	-	-320	0	-	-225	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	120 CFM	2097	4865	120 CFM	3087	0
Supply Fan Load	2000 CFM	741	-	2000 CFM	-741	-
>> Total System Loads	-	46860	6225	-	19268	0
Central Cooling Coil	-	46860	6229	-	0	0
Central Heating Coil	-	0	-	-	19268	-
>> Total Coil Loads	-	46860	6229	-	19268	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Input Data

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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General Details:

Air System Name:.....AC-2
Air System Type:.....Single Zone CAV
Number of zones:.....1
System Startup:.....6
Duration of Operation:.....24

Central Cooling Coil Data:

Used?:.....YES
Supply Air Temperature:.....2000.0 F
Coil Bypass Factor:.....0.100

Central Heating Coil Data:

Used?:.....YES
Supply Temperature:.....110.0 F

Supply Fan Data:

Configuration:.....Draw-thru
Fan Performance:.....0.50 in wg

Ceiling Return Air Plenum Data:

Return Air Via:.....Ducted Return

Zones Included:

Zone Names
07-PANTRY/STORAGE

Thermostats Data:

Cooling T-stat: Occ:.....74.0 F
Cooling T-stat: Unocc:.....85.0 F
Heating T-stat: Occ:.....70.0 F
Heating T-stat: Unocc:.....60.0 F

Safety Factors:

Cooling Sensible Safety Factor:.....0 %
Cooling Latent Safety Factor:.....0 %
Heating Safety Factor:.....0 %

Air System Sizing Summary for AC-3

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

06/21/2024
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Air System Information

Air System Name: AC-3
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 1597.6 sqft
Location: Miami, Florida

Sizing Calculation Information

Calculation Months: Aug to Aug

Calculation method: Transfer Function Method

Central Cooling Coil Sizing Data

Total coil load: 2.9 Tons
Total coil load: 34.4 MBH
Sensible coil load: 30.7 MBH
Coil airflow: 1400 CFM
Sensible heat ratio: 0.894
Area per unit load: 557.8 sqft/Ton
Load per unit area: 21.5 BTU/(hr-sqft)

Load occurs at: Aug 1500
OA DB / WB: 91.0/77.0 F
Entering DB / WB: 75.4/62.5 F
Leaving DB / WB: 55.1/53.9 F
Coil ADP: 52.8 F
Bypass Factor: 0.100
Resulting RH: .48 %
Design supply temp: 54.7 F

Central Heating Coil Sizing Data

Max coil load: 16.2 MBH
Coil airflow: 1400 CFM
Load per unit area: 10.1 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 68.3/79.0 F

Supply Fan Sizing Data

Actual max airflow: 1400 CFM
Standard airflow: 1399 CFM
Actual max airflow per unit area: 0.88 CFM/sqft

Fan motor BHP: 0.20 BHP
Fan motor kW: 0.15 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 85 CFM
Airflow per unit floor area: 0.05 CFM/sqft

Airflow per person: 28.33 CFM/person

Space Sizing Data

Space Name	Maximum Cooling Sensible MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
01-FOYER 2FL	8.5	410	Aug 1500	4.9	352.7	1.16
05-HALL	5.8	277	Aug 1700	2.9	210.0	1.32
02-BEDROOM 3	4.6	221	Aug 1400	2.1	318.5	0.69
03-BEDROOM 4	4.7	224	Aug 1400	2.1	329.0	0.68
04-BEDROOM 5	5.8	279	Aug 1600	3.0	387.4	0.72
Zone	29.2	1400	Aug 1600	15.0	1597.6	0.88

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: Peak space load

Zone sizing basis: Peak zone load

System Design Load Summary for AC-3

Project Name: 22-1008 CASTRO RESIDENCE
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	DESIGN COOLING			DESIGN HEATING		
	Aug 1500 OA DB / WB 91 F / 77 F			Design Heating Day OA DB / WB 46 F / 38.6 F		
Zone Loads based on TFM	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	250 sqft	5229	-	250 sqft	-	-
Wall Transmission	1422 sqft	3737	-	1422 sqft	3992	-
Roof Transmission	1598 sqft	1126	-	1598 sqft	1151	-
Window Transmission	250 sqft	3368	-	250 sqft	5404	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	216 sqft	6308	-	216 sqft	4497	-
Floor Transmission	0 sqft	0	-	0 sqft	0	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1278 W	4361	-	0 W	0	-
Electric Equipment	1198 W	4088	-	0 W	0	-
People	3	690	360	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	-	28906	360	-	15044	0
Thermostat and Pulldown Adjustment	-	-240	0	-	-536	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	85 CFM	1522	3298	85 CFM	2176	0
Supply Fan Load	1400 CFM	519	-	1400 CFM	-519	-
>> Total System Loads	-	30707	3658	-	16165	0
Central Cooling Coil	-	30707	3659	-	0	0
Central Heating Coil	-	0	-	-	16165	-
>> Total Coil Loads	-	30707	3659	-	16165	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Input Data

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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General Details:

Air System Name:.....AC-3
Air System Type:.....Single Zone CAV
Number of zones:.....1
System Startup:.....6
Duration of Operation:.....24

Central Cooling Coil Data:

Used?:.....YES
Supply Air Temperature:.....1400.0 F
Coil Bypass Factor:.....0.100

Central Heating Coil Data:

Used?:.....YES
Supply Temperature:.....110.0 F

Supply Fan Data:

Configuration:.....Draw-thru
Fan Performance:.....0.50 in wg

Ceiling Return Air Plenum Data:

Return Air Via:.....Ducted Return

Zones Included:

Zone Names
01-FOYER 2FL

Thermostats Data:

Cooling T-stat: Occ:.....74.0 F
Cooling T-stat: Unocc:.....85.0 F
Heating T-stat: Occ:.....70.0 F
Heating T-stat: Unocc:.....60.0 F

Safety Factors:

Cooling Sensible Safety Factor:.....0 %
Cooling Latent Safety Factor:.....0 %
Heating Safety Factor:.....0 %

Air System Sizing Summary for AC-4

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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Air System Information

Air System Name: AC-4
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 83.6 sqft
Location: Miami, Florida

Sizing Calculation Information

Calculation Months: Aug to Aug

Calculation method: Transfer Function Method

Central Cooling Coil Sizing Data

Total coil load: 0.3 Tons
Total coil load: 3.5 MBH
Sensible coil load: 3.4 MBH
Coil airflow: 200 CFM
Sensible heat ratio: 0.955
Area per unit load: 283.1 sqft/Ton
Load per unit area: 42.4 BTU/(hr-sqft)

Load occurs at: Aug 1400
OA DB / WB: 90.7/76.9 F
Entering DB / WB: 74.8/64.0 F
Leaving DB / WB: 59.2/58.1 F
Coil ADP: 57.4 F
Bypass Factor: 0.100
Resulting RH: 55 %
Design supply temp: 58.9 F

Central Heating Coil Sizing Data

Max coil load: 2.2 MBH
Coil airflow: 200 CFM
Load per unit area: 25.8 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 69.2/79.1 F

Supply Fan Sizing Data

Actual max airflow: 200 CFM
Standard airflow: 200 CFM
Actual max airflow per unit area: 2.39 CFM/sqft

Fan motor BHP: 0.03 BHP
Fan motor kW: 0.02 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 5 CFM
Airflow per unit floor area: 0.06 CFM/sqft

Airflow per person: 0.00 CFM/person

Space Sizing Data

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
01-STORAGE	1.5	91	Aug 1500	1.0	38.0	2.39
02-W/C	1.8	112	Aug 1100	1.1	45.6	2.46
Zone	3.3	200	Aug 1400	2.1	83.6	2.39

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: Peak space load

Zone sizing basis: Peak zone load

System Design Load Summary for AC-4

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	Aug 1400 OA DB / WB 90.7 F / 76.9 F			Design Heating Day OA DB / WB 46 F / 38.6 F		
Zone Loads based on TFM	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	0 sqft	0	-	0 sqft	-	-
Wall Transmission	190 sqft	478	-	190 sqft	534	-
Roof Transmission	84 sqft	57	-	84 sqft	60	-
Window Transmission	0 sqft	0	-	0 sqft	0	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	72 sqft	2099	-	72 sqft	1428	-
Floor Transmission	84 sqft	0	-	84 sqft	111	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	100 W	342	-	0 W	0	-
Electric Equipment	84 W	285	-	0 W	0	-
People	0	0	0	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	-	3262	0	-	2133	0
Thermostat and Pulldown Adjustment	-	-40	0	-	-34	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	5 CFM	88	159	5 CFM	128	0
Supply Fan Load	200 CFM	74	-	200 CFM	-74	-
>> Total System Loads	-	3384	159	-	2153	0
Central Cooling Coil	-	3384	160	-	0	0
Central Heating Coil	-	0	-	-	2153	-
>> Total Coil Loads	-	3384	160	-	2153	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Input Data

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

06/21/2024
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General Details:

Air System Name:.....AC-4
Air System Type:.....Single Zone CAV
Number of zones:.....1
System Startup:.....6
Duration of Operation:.....24

Central Cooling Coil Data:

Used?:.....YES
Supply Air Temperature:.....200.0 F
Coil Bypass Factor:.....0.100

Central Heating Coil Data:

Used?:.....YES
Supply Temperature:.....110.0 F

Supply Fan Data:

Configuration:.....Draw-thru
Fan Performance:.....0.50 in wg

Ceiling Return Air Plenum Data:

Return Air Via:.....Ducted Return

Zones Included:

Zone Names
01-STORAGE

Thermostats Data:

Cooling T-stat: Occ:.....74.0 F
Cooling T-stat: Unocc:.....85.0 F
Heating T-stat: Occ:.....70.0 F
Heating T-stat: Unocc:.....60.0 F

Safety Factors:

Cooling Sensible Safety Factor:.....0 %
Cooling Latent Safety Factor:.....0 %
Heating Safety Factor:.....0 %

Air System Sizing Summary for AC-5

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

06/21/2024
09:38AM

Air System Information

Air System Name: AC-5
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 1002.0 sqft
Location: Miami, Florida

Sizing Calculation Information

Calculation Months: Aug to Aug

Calculation method: Transfer Function Method

Central Cooling Coil Sizing Data

Total coil load: 3.0 Tons
Total coil load: 35.5 MBH
Sensible coil load: 32.6 MBH
Coil airflow: 1450 CFM
Sensible heat ratio: 0.917
Area per unit load: 338.4 sqft/Ton
Load per unit area: 35.5 BTU/(hr-sqft)

Load occurs at: Aug 1600
OA DB / WB: 90.7/76.9 F
Entering DB / WB: 75.1/61.7 F
Leaving DB / WB: 54.3/53.0 F
Coil ADP: 52.0 F
Bypass Factor: 0.100
Resulting RH: .46 %
Design supply temp: 53.8 F

Central Heating Coil Sizing Data

Max coil load: 16.8 MBH
Coil airflow: 1450 CFM
Load per unit area: 16.7 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 69.1/79.8 F

Supply Fan Sizing Data

Actual max airflow: 1450 CFM
Standard airflow: 1449 CFM
Actual max airflow per unit area: 1.45 CFM/sqft

Fan motor BHP: 0.21 BHP
Fan motor kW: 0.16 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 55 CFM
Airflow per unit floor area: 0.05 CFM/sqft

Airflow per person: 27.50 CFM/person

Space Sizing Data

Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
MASTER BEDROOM	21.7	994	Aug 1600	10.0	770.0	1.29
MASTER BATHROOM	10.0	456	Aug 1600	5.7	232.0	1.97
Zone	31.7	1450	Aug 1600	15.6	1002.0	1.45

Note: Table contains data for all spaces controlled by a single thermostat:

Space sizing basis: Peak space load

Zone sizing basis: Peak zone load

System Design Load Summary for AC-5

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

06/21/2024
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	DESIGN COOLING			DESIGN HEATING		
	Aug 1600 OA DB / WB 90.7 F / 76.9 F			Design Heating Day OA DB / WB 46 F / 38.6 F		
Zone Loads based on TFM	Details	Sensible BTU/hr	Latent BTU/hr	Details	Sensible BTU/hr	Latent BTU/hr
Window and Skylight Solar Loads	341 sqft	8468	-	341 sqft	-	-
Wall Transmission	1510 sqft	4484	-	1510 sqft	4241	-
Roof Transmission	1002 sqft	728	-	1002 sqft	721	-
Window Transmission	341 sqft	4558	-	341 sqft	7361	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	162 sqft	5445	-	162 sqft	3320	-
Floor Transmission	0 sqft	0	-	0 sqft	0	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	956 W	3260	-	0 W	0	-
Electric Equipment	956 W	3260	-	0 W	0	-
People	2	460	240	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1000	500	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	31663	740	-	15643	0
Thermostat and Pulldown Adjustment	-	-564	0	-	248	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	55 CFM	960	2195	55 CFM	1423	0
Supply Fan Load	1450 CFM	537	-	1450 CFM	-537	-
>> Total System Loads	-	32596	2935	-	16776	0
Central Cooling Coil	-	32596	2937	-	0	0
Central Heating Coil	-	0	-	-	16777	-
>> Total Coil Loads	-	32596	2937	-	16777	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Input Data

Project Name: 22-1008 CASTRO RESIDENCE
Prepared by: ARPE Engineering, Inc.

06/21/2024
09:39AM

General Details:

Air System Name:.....AC-5
Air System Type:.....Single Zone CAV
Number of zones:.....1
System Startup:.....6
Duration of Operation:.....24

Central Cooling Coil Data:

Used?:.....YES
Supply Air Temperature:.....1450.0 F
Coil Bypass Factor:.....0.100

Central Heating Coil Data:

Used?:.....YES
Supply Temperature:.....110.0 F

Supply Fan Data:

Configuration:.....Draw-thru
Fan Performance:.....0.50 in wg

Ceiling Return Air Plenum Data:

Return Air Via:.....Ducted Return

Zones Included:

Zone Names
MASTER BATHROOM

Thermostats Data:

Cooling T-stat: Occ:.....74.0 F
Cooling T-stat: Unocc:.....85.0 F
Heating T-stat: Occ:.....70.0 F
Heating T-stat: Unocc:.....60.0 F

Safety Factors:

Cooling Sensible Safety Factor:.....0 %
Cooling Latent Safety Factor:.....0 %
Heating Safety Factor:.....0 %