

Air System Sizing Summary for AHU/CU-1

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name: AHU/CU-1
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 1747.0 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: 3.5 Tons
Total coil load: 42.0 MBH
Sensible coil load: 34.4 MBH
Coil airflow: 1600 CFM
Sensible heat ratio: 0.817
Area per unit load: 498.9 sqft/Ton
Load per unit area: 24.1 BTU/(hr-sqft)

Load occurs at: Aug 1700
OA DB / WB: 89.9/76.7 F
Entering DB / WB: 75.5/63.6 F
Leaving DB / WB: 55.6/54.5 F
Coil ADP: 53.4 F
Bypass Factor: 0.100
Resulting RH: 51 %
Design supply temp: 55.3 F

Central Heating Coil Sizing Data

Max coil load: 18.4 MBH
Coil airflow: 1600 CFM
Load per unit area: 10.6 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 68.2/78.9 F

Supply Fan Sizing Data

Actual max airflow: 1600 CFM
Standard airflow: 1599 CFM
Actual max airflow per unit area: 0.92 CFM/sqft

Fan motor BHP: 0.23 BHP
Fan motor kW: 0.17 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 115 CFM
Airflow per unit floor area: 0.07 CFM/sqft

Airflow per person: 38.33 CFM/person

Space Sizing Data

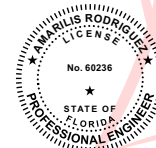
Space Name	Maximum Cooling Sensible Load MBH	Design Airflow CFM	Time of Peak Load	Maximum Heating Load MBH	Space Floor Area sqft	Space CFM/sqft
KITCHEN	10.6	523	Aug 1700	5.4	527.0	0.99
DINING	17.1	846	Aug 1600	9.2	995.0	0.85
LAUNDRY	2.2	111	Aug 1700	0.5	87.0	1.27
PANTRY	1.8	91	Aug 1700	0.9	87.0	1.04
POWDER	0.7	35	Aug 2300	0.0	51.0	0.69
Zone	32.4	1600	Aug 1600	16.0	1747.0	0.92

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

Space sizing basis: Peak space load

Zone sizing basis: Peak zone load

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System Design Load Summary for AHU/CU-1

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
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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	550 sqft	6323	-	550 sqft	-	-
Wall Transmission	594 sqft	1813	-	594 sqft	1669	-
Roof Transmission	0 sqft	0	-	0 sqft	0	-
Window Transmission	550 sqft	7148	-	550 sqft	11885	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	60 sqft	1191	-	60 sqft	1278	-
Floor Transmission	1747 sqft	0	-	1747 sqft	1197	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1548 W	5283	-	0 W	0	-
Electric Equipment	1548 W	5283	-	0 W	0	-
People	3	690	360	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	4500	3200	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	32229	3560	-	16029	0
Thermostat and Pulldown Adjustment	-	-387	0	-	27	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	115 CFM	1917	4105	115 CFM	2970	0
Supply Fan Load	1600 CFM	593	-	1600 CFM	-593	-
>> Total System Loads	-	34352	7665	-	18433	0
Central Cooling Coil	-	34352	7671	-	0	0
Central Heating Coil	-	0	-	-	18433	-
>> Total Coil Loads	-	34352	7671	-	18433	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-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:.....1600.0 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
DINING

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 AHU/CU-2

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name: AHU/CU-2
Air System Type: Single Zone CAV

Number of zones: 1
Floor Area: 612.0 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: 1.4 Tons
Total coil load: 16.6 MBH
Sensible coil load: 14.2 MBH
Coil airflow: 600 CFM
Sensible heat ratio: 0.854
Area per unit load: 442.8 sqft/Ton
Load per unit area: 27.1 BTU/(hr-sqft)

Load occurs at: Aug 1500
OA DB / WB: 91.0/77.0 F
Entering DB / WB: 75.7/62.4 F
Leaving DB / WB: 53.8/52.6 F
Coil ADP: 51.4 F
Bypass Factor: 0.100
Resulting RH: .46 %
Design supply temp: 53.5 F

Central Heating Coil Sizing Data

Max coil load: 6.8 MBH
Coil airflow: 600 CFM
Load per unit area: 11.2 BTU/(hr-sqft)

Load occurs at: Des Htg
Ent DB / Lvg DB: 68.0/78.6 F

Supply Fan Sizing Data

Actual max airflow: 600 CFM
Standard airflow: 600 CFM
Actual max airflow per unit area: 0.98 CFM/sqft

Fan motor BHP: 0.09 BHP
Fan motor kW: 0.07 kW
Fan static: 0.50 in wg

Outdoor Ventilation Air Data

Design airflow: 45 CFM
Airflow per unit floor area: 0.07 CFM/sqft

Airflow per person: 45.00 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
JR. SUITE	8.6	388	Aug 1600	4.0	310.0	1.25
HALL 120	2.9	132	Aug 1400	1.1	152.0	0.87
WIC 122	0.3	15	Aug 2300	0.0	60.0	0.25
BATH 123	1.5	69	Aug 1700	0.9	90.0	0.76
Zone	13.3	600	Aug 1600	6.0	612.0	0.98

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 AHU/CU-2

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

	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	152 sqft	1778	-	152 sqft	-	-
Wall Transmission	769 sqft	2211	-	769 sqft	2159	-
Roof Transmission	0 sqft	0	-	0 sqft	0	-
Window Transmission	152 sqft	2046	-	152 sqft	3283	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	0 sqft	0	-	0 sqft	0	-
Floor Transmission	612 sqft	0	-	612 sqft	592	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	503 W	1715	-	0 W	0	-
Electric Equipment	503 W	1715	-	0 W	0	-
People	1	230	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	3500	500	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	13195	620	-	6034	0
Thermostat and Pulldown Adjustment	-	-58	0	-	-121	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	45 CFM	805	1801	45 CFM	1157	0
Supply Fan Load	600 CFM	222	-	600 CFM	-222	-
>> Total System Loads	-	14164	2421	-	6848	0
Central Cooling Coil	-	14164	2423	-	0	0
Central Heating Coil	-	0	-	-	6848	-
>> Total Coil Loads	-	14164	2423	-	6848	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-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:.....600.0 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
BATH 123

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 AHU/CU-3

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name: **AHU/CU-3**
Air System Type: **Single Zone CAV**

Number of zones: **1**
Floor Area: **2109.0** 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: **4.5** Tons
Total coil load: **54.0** MBH
Sensible coil load: **44.9** MBH
Coil airflow: **2000** CFM
Sensible heat ratio: **0.832**
Area per unit load: **468.8** sqft/Ton
Load per unit area: **25.6** BTU/(hr-sqft)

Load occurs at: **Aug 1500**
OA DB / WB: **91.0/77.0** F
Entering DB / WB: **75.7/63.1** F
Leaving DB / WB: **54.8/53.7** F
Coil ADP: **52.5** F
Bypass Factor: **0.100**
Resulting RH: **49** %
Design supply temp: **54.4** F

Central Heating Coil Sizing Data

Max coil load: **33.1** MBH
Coil airflow: **2000** CFM
Load per unit area: **15.7** BTU/(hr-sqft)

Load occurs at: **Des Htg**
Ent DB / Lvg DB: **68.2/83.5** F

Supply Fan Sizing Data

Actual max airflow: **2000** CFM
Standard airflow: **1999** CFM
Actual max airflow per unit area: **0.95** 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: **150** CFM
Airflow per unit floor area: **0.07** CFM/sqft

Airflow per person: **30.00** 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
BATH 107/WIC 108	1.4	66	Aug 1500	0.9	104.0	0.64
ENTERTAINMENT	7.0	328	Aug 1500	4.8	430.0	0.76
MAIDS	3.5	165	Aug 1400	1.7	210.0	0.78
GYM	11.5	543	Aug 1600	7.8	270.0	2.01
LIVING	10.8	511	Aug 1500	7.9	650.0	0.79
STAIR/HALL	8.5	402	Aug 1500	5.9	445.0	0.90
Zone	42.4	2000	Aug 1600	29.1	2109.0	0.95

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 AHU/CU-3

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
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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	1050 sqft	10990	-	1050 sqft	-	-
Wall Transmission	1139 sqft	3390	-	1139 sqft	3198	-
Roof Transmission	270 sqft	190	-	270 sqft	194	-
Window Transmission	1050 sqft	14141	-	1050 sqft	22690	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	60 sqft	1667	-	60 sqft	1260	-
Floor Transmission	2109 sqft	0	-	2109 sqft	1742	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1561 W	5327	-	0 W	0	-
Electric Equipment	1561 W	5327	-	0 W	0	-
People	5	1150	600	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	2800	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	42183	3400	-	29084	0
Thermostat and Pulldown Adjustment	-	-673	0	-	834	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	150 CFM	2686	5641	150 CFM	3886	0
Supply Fan Load	2000 CFM	741	-	2000 CFM	-741	-
>> Total System Loads	-	44937	9041	-	33063	0
Central Cooling Coil	-	44937	9044	-	0	0
Central Heating Coil	-	0	-	-	33063	-
>> Total Coil Loads	-	44937	9044	-	33063	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-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:.....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
BATH 107/WIC 108

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 AHU/CU-4

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name:.....AHU/CU-4
Air System Type:.....Single Zone CAV

Number of zones:.....1
Floor Area:.....1621.0 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:.....3.6 Tons
Total coil load:.....43.3 MBH
Sensible coil load:.....37.0 MBH
Coil airflow:.....1600 CFM
Sensible heat ratio:.....0.856
Area per unit load:.....449.7 sqft/Ton
Load per unit area:.....26.7 BTU/(hr-sqft)

Load occurs at:.....Aug 1600
OA DB / WB:.....90.7/76.9 F
Entering DB / WB:.....75.6/62.5 F
Leaving DB / WB:.....54.2/53.0 F
Coil ADP:.....51.8 F
Bypass Factor:.....0.100
Resulting RH:.....47 %
Design supply temp:.....54.0 F

Central Heating Coil Sizing Data

Max coil load:.....18.5 MBH
Coil airflow:.....1600 CFM
Load per unit area:.....11.4 BTU/(hr-sqft)

Load occurs at:.....Des Htg
Ent DB / Lvg DB:.....68.0/78.8 F

Supply Fan Sizing Data

Actual max airflow:.....1600 CFM
Standard airflow:.....1599 CFM
Actual max airflow per unit area:.....0.99 CFM/sqft

Fan motor BHP:.....0.23 BHP
Fan motor kW:.....0.17 kW
Fan static:.....0.50 in wg

Outdoor Ventilation Air Data

Design airflow:.....120 CFM
Airflow per unit floor area:.....0.07 CFM/sqft

Airflow per person:.....30.00 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
HER WIC	2.8	132	Aug 1800	1.4	272.0	0.48
MASTER BATH	4.7	216	Aug 1500	3.4	360.0	0.60
MASTER BEDROOM	14.0	645	Aug 1500	7.1	645.0	1.00
FAMILY ROOM	13.3	616	Aug 1600	4.5	344.0	1.79
Zone	34.6	1600	Aug 1600	16.4	1621.0	0.99

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 AHU/CU-4

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

	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	603 sqft	4766	-	603 sqft	-	-
Wall Transmission	771 sqft	2131	-	771 sqft	2165	-
Roof Transmission	1621 sqft	1177	-	1621 sqft	1167	-
Window Transmission	603 sqft	8064	-	603 sqft	13025	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	0 sqft	0	-	0 sqft	0	-
Floor Transmission	0 sqft	0	-	0 sqft	0	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1620 W	5529	-	0 W	0	-
Electric Equipment	1620 W	5529	-	0 W	0	-
People	4	920	480	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	-	34616	1480	-	16357	0
Thermostat and Pulldown Adjustment	-	-282	0	-	-311	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	2104	4741	120 CFM	3085	0
Supply Fan Load	1600 CFM	593	-	1600 CFM	-593	-
>> Total System Loads	-	37030	6221	-	18538	0
Central Cooling Coil	-	37030	6222	-	0	0
Central Heating Coil	-	0	-	-	18538	-
>> Total Coil Loads	-	37030	6222	-	18538	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-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:.....1600.0 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
FAMILY ROOM

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 AHU/CU-5

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name:.....AHU/CU-5
Air System Type:.....Single Zone CAV

Number of zones:.....1
Floor Area:.....1176.0 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:.....2.7 Tons
Total coil load:.....32.6 MBH
Sensible coil load:.....28.5 MBH
Coil airflow:.....1200 CFM
Sensible heat ratio:.....0.875
Area per unit load:.....433.3 sqft/Ton
Load per unit area:.....27.7 BTU/(hr-sqft)

Load occurs at:.....Aug 1600
OA DB / WB:.....90.7/76.9 F
Entering DB / WB:.....75.4/61.9 F
Leaving DB / WB:.....53.4/52.1 F
Coil ADP:.....51.0 F
Bypass Factor:.....0.100
Resulting RH:.....45 %
Design supply temp:.....53.1 F

Central Heating Coil Sizing Data

Max coil load:.....17.5 MBH
Coil airflow:.....1200 CFM
Load per unit area:.....14.9 BTU/(hr-sqft)

Load occurs at:.....Des Htg
Ent DB / Lvg DB:.....68.5/82.0 F

Supply Fan Sizing Data

Actual max airflow:.....1200 CFM
Standard airflow:.....1199 CFM
Actual max airflow per unit area:.....1.02 CFM/sqft

Fan motor BHP:.....0.00 BHP
Fan motor kW:.....0.00 kW
Fan static:.....-1.00 in wg

Outdoor Ventilation Air Data

Design airflow:.....80 CFM
Airflow per unit floor area:.....0.07 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
BATH 213/ WIC 212	1.3	59	Aug 1400	0.6	96.0	0.61
BATH 215/ WIC 216	1.4	62	Aug 1400	0.7	103.0	0.60
BEDROOM 211	7.2	320	Aug 1000	3.7	235.0	1.36
BEDROOM 214	8.2	363	Aug 1600	4.6	282.0	1.29
STAIR/HALL 206	9.1	406	Aug 1600	5.2	460.0	0.88
Zone	27.1	1200	Aug 1500	14.8	1176.0	1.02

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 AHU/CU-5

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

	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	456 sqft	5698	-	456 sqft	-	-
Wall Transmission	1014 sqft	2875	-	1014 sqft	2847	-
Roof Transmission	1176 sqft	854	-	1176 sqft	847	-
Window Transmission	456 sqft	6099	-	456 sqft	9852	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	60 sqft	1470	-	60 sqft	1260	-
Floor Transmission	0 sqft	0	-	0 sqft	0	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1039 W	3543	-	0 W	0	-
Electric Equipment	1039 W	3543	-	0 W	0	-
People	4	920	480	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	2000	300	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	27003	780	-	14806	0
Thermostat and Pulldown Adjustment	-	88	0	-	618	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	80 CFM	1411	3284	80 CFM	2080	0
Supply Fan Load	1200 CFM	0	-	1200 CFM	0	-
>> Total System Loads	-	28502	4064	-	17504	0
Central Cooling Coil	-	28502	4068	-	0	0
Central Heating Coil	-	0	-	-	17504	-
>> Total Coil Loads	-	28502	4068	-	17504	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-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:.....1200.0 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:.....0.00 in wg

Ceiling Return Air Plenum Data:

Return Air Via:.....Ducted Return

Zones Included:

Zone Names
BATH 213/ WIC 212

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 AHU/CU-6

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name:.....**AHU/CU-6**
Air System Type:.....**Single Zone CAV**

Number of zones:.....**1**
Floor Area:.....**1156.0** 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:.....**2.6** Tons
Total coil load:.....**31.3** MBH
Sensible coil load:.....**27.6** MBH
Coil airflow:.....**1200** CFM
Sensible heat ratio:.....**0.880**
Area per unit load:.....**442.8** sqft/Ton
Load per unit area:.....**27.1** BTU/(hr-sqft)

Load occurs at:.....**Aug 1600**
OA DB / WB:.....**90.7/76.9** F
Entering DB / WB:.....**75.5/62.2** F
Leaving DB / WB:.....**54.2/53.0** F
Coil ADP:.....**51.8** F
Bypass Factor:.....**0.100**
Resulting RH:.....**.46** %
Design supply temp:.....**53.8** F

Central Heating Coil Sizing Data

Max coil load:.....**16.1** MBH
Coil airflow:.....**1200** CFM
Load per unit area:.....**13.9** BTU/(hr-sqft)

Load occurs at:.....**Des Htg**
Ent DB / Lvg DB:.....**68.1/80.5** F

Supply Fan Sizing Data

Actual max airflow:.....**1200** CFM
Standard airflow:.....**1199** CFM
Actual max airflow per unit area:.....**1.04** CFM/sqft

Fan motor BHP:.....**0.17** BHP
Fan motor kW:.....**0.13** kW
Fan static:.....**0.50** in wg

Outdoor Ventilation Air Data

Design airflow:.....**80** CFM
Airflow per unit floor area:.....**0.07** 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
BATH 219	1.2	56	Aug 1700	0.6	69.0	0.81
BATH 225	1.4	64	Aug 1700	0.7	68.0	0.93
BEDROOM 217	8.6	397	Aug 1700	4.7	340.0	1.17
BEDROOM 223	8.6	395	Aug 1500	5.3	297.0	1.33
HALL 222	5.9	271	Aug 1400	3.9	250.0	1.08
WIC 224	0.5	22	Aug 2000	0.1	77.0	0.29
WIC 218	0.3	16	Aug 2000	0.0	55.0	0.29
Zone	26.1	1200	Aug 1600	15.2	1156.0	1.04

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 AHU/CU-6

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

	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	490 sqft	5369	-	490 sqft	-	-
Wall Transmission	1119 sqft	3355	-	1119 sqft	3142	-
Roof Transmission	1156 sqft	840	-	1156 sqft	832	-
Window Transmission	490 sqft	6553	-	490 sqft	10584	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	30 sqft	735	-	30 sqft	630	-
Floor Transmission	0 sqft	0	-	0 sqft	0	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1000 W	3411	-	0 W	0	-
Electric Equipment	1000 W	3411	-	0 W	0	-
People	2	460	240	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	2000	300	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	26134	540	-	15188	0
Thermostat and Pulldown Adjustment	-	-395	0	-	-724	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	80 CFM	1402	3201	80 CFM	2045	0
Supply Fan Load	1200 CFM	445	-	1200 CFM	-445	-
>> Total System Loads	-	27585	3741	-	16065	0
Central Cooling Coil	-	27585	3744	-	0	0
Central Heating Coil	-	0	-	-	16065	-
>> Total Coil Loads	-	27585	3744	-	16065	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-6
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:.....1200.0 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
BATH 219

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 AHU/CU-7

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name:.....AHU/CU-7
Air System Type:.....Single Zone CAV

Number of zones:.....1
Floor Area:.....860.0 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:.....2.3 Tons
Total coil load:.....27.5 MBH
Sensible coil load:.....23.3 MBH
Coil airflow:.....932 CFM
Sensible heat ratio:.....0.846
Area per unit load:.....374.9 sqft/Ton
Load per unit area:.....32.0 BTU/(hr-sqft)

Load occurs at:.....Aug 1600
OA DB / WB:.....90.7/76.9 F
Entering DB / WB:.....74.5/61.0 F
Leaving DB / WB:.....51.3/50.1 F
Coil ADP:.....48.8 F
Bypass Factor:.....0.100
Resulting RH:.....46 %
Design supply temp:.....50.9 F

Central Heating Coil Sizing Data

Max coil load:.....12.8 MBH
Coil airflow:.....932 CFM
Load per unit area:.....14.9 BTU/(hr-sqft)

Load occurs at:.....Des Htg
Ent DB / Lvg DB:.....69.9/82.6 F

Supply Fan Sizing Data

Actual max airflow:.....932 CFM
Standard airflow:.....932 CFM
Actual max airflow per unit area:.....1.08 CFM/sqft

Fan motor BHP:.....0.14 BHP
Fan motor kW:.....0.10 kW
Fan static:.....0.50 in wg

Outdoor Ventilation Air Data

Design airflow:.....0 CFM
Airflow per unit floor area:.....0.00 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
CAR GARAGE	23.2	932	Aug 1600	13.1	860.0	1.08

System Design Load Summary for AHU/CU-7

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

	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	275 sqft	4876	-	275 sqft	-	-
Wall Transmission	670 sqft	1990	-	670 sqft	1882	-
Roof Transmission	0 sqft	0	-	0 sqft	0	-
Window Transmission	275 sqft	3674	-	275 sqft	5934	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	243 sqft	2708	-	243 sqft	4374	-
Floor Transmission	860 sqft	0	-	860 sqft	734	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	860 W	2934	-	0 W	0	-
Electric Equipment	860 W	2934	-	0 W	0	-
People	0	0	0	0	0	0
Infiltration	-	108	240	-	155	8
Miscellaneous	-	4000	4000	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	23225	4240	-	13080	8
Thermostat and Pulldown Adjustment	-	-284	0	-	110	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Supply Fan Load	932 CFM	345	-	932 CFM	-345	-
>> Total System Loads	-	23286	4240	-	12844	8
Central Cooling Coil	-	23286	4242	-	0	0
Central Heating Coil	-	0	-	-	12845	-
>> Total Coil Loads	-	23286	4242	-	12845	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-7
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:.....932.0 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
CAR GARAGE

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 AHU/CU-8

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

Air System Information

Air System Name:.....**AHU/CU-8**
Air System Type:.....**Single Zone CAV**

Number of zones:.....**1**
Floor Area:.....**600.0** 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:.....**2.5** Tons
Total coil load:.....**29.4** MBH
Sensible coil load:.....**26.1** MBH
Coil airflow:.....**1201** CFM
Sensible heat ratio:.....**0.886**
Area per unit load:.....**244.8** sqft/Ton
Load per unit area:.....**49.0** BTU/(hr-sqft)

Load occurs at:.....**Aug 1700**
OA DB / WB:.....**89.9/76.7** F
Entering DB / WB:.....**74.9/62.3** F
Leaving DB / WB:.....**54.8/53.6** F
Coil ADP:.....**52.6** F
Bypass Factor:.....**0.100**
Resulting RH:.....**48** %
Design supply temp:.....**54.6** F

Central Heating Coil Sizing Data

Max coil load:.....**16.9** MBH
Coil airflow:.....**1201** CFM
Load per unit area:.....**28.1** BTU/(hr-sqft)

Load occurs at:.....**Des Htg**
Ent DB / Lvg DB:.....**68.8/81.8** F

Supply Fan Sizing Data

Actual max airflow:.....**1201** CFM
Standard airflow:.....**1200** CFM
Actual max airflow per unit area:.....**2.00** CFM/sqft

Fan motor BHP:.....**0.17** BHP
Fan motor kW:.....**0.13** kW
Fan static:.....**0.50** in wg

Outdoor Ventilation Air Data

Design airflow:.....**50** CFM
Airflow per unit floor area:.....**0.08** CFM/sqft

Airflow per person:.....**25.00** 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
BATH 126 / WIC 125	4.2	201	Aug 1700	3.1	180.0	1.12
GUEST ROOM	21.0	1002	Aug 1500	13.2	420.0	2.39
Zone	25.2	1201	Aug 1600	16.3	600.0	2.00

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 AHU/CU-8

Project Name: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/23/2024
01:25PM

	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	567 sqft	6166	-	567 sqft	-	-
Wall Transmission	804 sqft	2213	-	804 sqft	2258	-
Roof Transmission	600 sqft	448	-	600 sqft	432	-
Window Transmission	567 sqft	7367	-	567 sqft	12250	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	30 sqft	699	-	30 sqft	630	-
Floor Transmission	600 sqft	0	-	600 sqft	731	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	648 W	2211	-	0 W	0	-
Electric Equipment	648 W	2211	-	0 W	0	-
People	2	460	240	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	3000	1200	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	24775	1440	-	16301	0
Thermostat and Pulldown Adjustment	-	-7	0	-	-271	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	50 CFM	841	1910	50 CFM	1283	0
Supply Fan Load	1201 CFM	445	-	1201 CFM	-445	-
>> Total System Loads	-	26055	3350	-	16867	0
Central Cooling Coil	-	26055	3355	-	0	0
Central Heating Coil	-	0	-	-	16867	-
>> Total Coil Loads	-	26055	3355	-	16867	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: 24-0307 Casa Robles
Prepared by: ARPE Engineering, Inc.

04/22/2024
03:22PM

General Details:

Air System Name:.....AHU/CU-8
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:.....1201.0 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
BATH 126 / WIC 125

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 %