

Air System Sizing Summary for AHU/CU-1

Project Name: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

Air System Information

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

Number of zones:.....1
Floor Area:.....1697.0 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:.....3.7 Tons
Total coil load:.....44.9 MBH
Sensible coil load:.....38.2 MBH
Coil airflow:.....1600 CFM
Sensible heat ratio:.....0.850
Area per unit load:.....453.2 sqft/Ton
Load per unit area:.....26.5 BTU/(hr-sqft)

Load occurs at:.....Aug 1500
OA DB / WB:.....91.0/77.0 F
Entering DB / WB:.....75.9/62.5 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:.....23.3 MBH
Coil airflow:.....1600 CFM
Load per unit area:.....13.7 BTU/(hr-sqft)

Load occurs at:.....Des Htg
Ent DB / Lvg DB:.....67.7/81.2 F

Supply Fan Sizing Data

Actual max airflow:.....1600 CFM
Standard airflow:.....1599 CFM
Actual max airflow per unit area:.....0.94 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:.....145 CFM
Airflow per unit floor area:.....0.09 CFM/sqft

Airflow per person:.....20.71 CFM/person

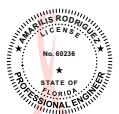
Space Sizing Data

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
LIVING ROOM	14.6	658	Aug 1500	8.4	704.2	0.93
DINING ROOM	20.9	942	Aug 1500	11.8	992.8	0.95
Zone	35.4	1600	Aug 1500	20.3	1697.0	0.94

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: 23-0822 CASAS OHAD
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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	732 sqft	7364	-	732 sqft	-	-
Wall Transmission	474 sqft	1080	-	474 sqft	1332	-
Roof Transmission	0 sqft	0	-	0 sqft	0	-
Window Transmission	732 sqft	10292	-	732 sqft	16514	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	56 sqft	1198	-	56 sqft	1214	-
Floor Transmission	1697 sqft	0	-	1697 sqft	1190	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	2036 W	6948	-	0 W	0	-
Electric Equipment	2036 W	6948	-	0 W	0	-
People	7	1610	840	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	-	35439	840	-	20250	0
Thermostat and Pulldown Adjustment	-	-414	0	-	-100	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	145 CFM	2593	5877	145 CFM	3742	0
Supply Fan Load	1600 CFM	593	-	1600 CFM	-593	-
>> Total System Loads	-	38212	6717	-	23300	0
Central Cooling Coil	-	38212	6719	-	0	0
Central Heating Coil	-	0	-	-	23300	-
>> Total Coil Loads	-	38212	6719	-	23300	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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:42PM

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 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-2

Project Name: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

Air System Information

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

Number of zones: **1**
Floor Area: **1518.0** 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: **3.7** Tons
Total coil load: **44.9** MBH
Sensible coil load: **38.4** MBH
Coil airflow: **1600** CFM
Sensible heat ratio: **0.854**
Area per unit load: **405.5** sqft/Ton
Load per unit area: **29.6** BTU/(hr-sqft)

Load occurs at: **Aug 1600**
OA DB / WB: **90.7/76.9** F
Entering DB / WB: **75.6/62.2** F
Leaving DB / WB: **53.4/52.1** F
Coil ADP: **50.9** F
Bypass Factor: **0.100**
Resulting RH: **.46** %
Design supply temp: **53.0** F

Central Heating Coil Sizing Data

Max coil load: **20.2** MBH
Coil airflow: **1600** CFM
Load per unit area: **13.3** BTU/(hr-sqft)

Load occurs at: **Des Htg**
Ent DB / Lvg DB: **68.4/80.1** F

Supply Fan Sizing Data

Actual max airflow: **1600** CFM
Standard airflow: **1599** CFM
Actual max airflow per unit area: **1.05** 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: **110** CFM
Airflow per unit floor area: **0.07** CFM/sqft

Airflow per person: **27.50** 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
FAMILY ROOM	17.5	774	Aug 1600	9.6	501.3	1.54
KITCHEN	8.5	376	Aug 1300	1.5	519.0	0.72
PANTRY	2.4	107	Aug 1300	1.2	150.0	0.71
POWDER	0.3	13	Aug 2000	0.0	51.0	0.25
STAIR	7.7	338	Aug 1600	5.1	296.7	1.14
Zone	36.2	1600	Aug 1600	17.5	1518.0	1.05

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: 23-0822 CASAS OHAD
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	547 sqft	10512	-	547 sqft	-	-
Wall Transmission	1187 sqft	3435	-	1187 sqft	3333	-
Roof Transmission	201 sqft	146	-	201 sqft	145	-
Window Transmission	547 sqft	7642	-	547 sqft	12344	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	30 sqft	911	-	30 sqft	636	-
Floor Transmission	1518 sqft	0	-	1518 sqft	1006	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1562 W	5329	-	0 W	0	-
Electric Equipment	1562 W	5329	-	0 W	0	-
People	4	920	480	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	2000	1650	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	36224	2130	-	17463	0
Thermostat and Pulldown Adjustment	-	-386	0	-	483	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	110 CFM	1923	4441	110 CFM	2854	0
Supply Fan Load	1600 CFM	593	-	1600 CFM	-593	-
>> Total System Loads	-	38354	6571	-	20207	0
Central Cooling Coil	-	38354	6572	-	0	0
Central Heating Coil	-	0	-	-	20207	-
>> Total Coil Loads	-	38354	6572	-	20207	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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

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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:.....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-3

Project Name: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

Air System Information

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

Number of zones:.....1
Floor Area:.....1755.0 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:.....42.9 MBH
Sensible coil load:.....34.5 MBH
Coil airflow:.....1600 CFM
Sensible heat ratio:.....0.803
Area per unit load:.....490.8 sqft/Ton
Load per unit area:.....24.5 BTU/(hr-sqft)

Load occurs at:.....Aug 1600
OA DB / WB:.....90.7/76.9 F
Entering DB / WB:.....75.7/63.8 F
Leaving DB / WB:.....55.7/54.6 F
Coil ADP:.....53.5 F
Bypass Factor:.....0.100
Resulting RH:.....52 %
Design supply temp:.....55.4 F

Central Heating Coil Sizing Data

Max coil load:.....21.6 MBH
Coil airflow:.....1600 CFM
Load per unit area:.....12.3 BTU/(hr-sqft)

Load occurs at:.....Des Htg
Ent DB / Lvg DB:.....68.0/80.5 F

Supply Fan Sizing Data

Actual max airflow:.....1600 CFM
Standard airflow:.....1599 CFM
Actual max airflow per unit area:.....0.91 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:.....125 CFM
Airflow per unit floor area:.....0.07 CFM/sqft

Airflow per person:.....31.25 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
BATH 113	1.6	82	Aug 1500	1.0	127.0	0.64
BATH 116	1.6	82	Aug 1500	1.0	127.0	0.64
BATH 124	1.9	93	Aug 1700	1.3	106.0	0.88
BEDROOM 112	5.1	253	Aug 1400	3.0	278.5	0.91
BEDROOM 117	5.1	253	Aug 1400	3.0	278.5	0.91
GYM	5.2	259	Aug 1400	3.0	207.6	1.25
HALL	5.7	284	Aug 1500	4.5	328.0	0.86
LAUNDRY	2.1	107	Aug 2000	0.1	93.2	1.15
MAIDS	3.2	159	Aug 1700	1.3	174.0	0.92
POOL BATH	1.0	51	Aug 1400	0.8	35.2	1.45
Zone	32.1	1600	Aug 1500	19.0	1755.0	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 AHU/CU-3

Project Name: 23-0822 CASAS OHAD
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	588 sqft	5872	-	588 sqft	-	-
Wall Transmission	996 sqft	2541	-	996 sqft	2797	-
Roof Transmission	616 sqft	447	-	616 sqft	444	-
Window Transmission	588 sqft	8210	-	588 sqft	13261	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	60 sqft	1988	-	60 sqft	1272	-
Floor Transmission	1755 sqft	0	-	1755 sqft	1267	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1468 W	5008	-	0 W	0	-
Electric Equipment	1468 W	5008	-	0 W	0	-
People	4	1400	1450	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1500	2600	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	31973	4050	-	19040	0
Thermostat and Pulldown Adjustment	-	-300	0	-	-47	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	125 CFM	2192	4400	125 CFM	3223	0
Supply Fan Load	1600 CFM	593	-	1600 CFM	-593	-
>> Total System Loads	-	34459	8450	-	21623	0
Central Cooling Coil	-	34459	8455	-	0	0
Central Heating Coil	-	0	-	-	21623	-
>> Total Coil Loads	-	34459	8455	-	21623	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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
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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:.....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
BATH 113

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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

Air System Information

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

Number of zones: **1**
Floor Area: **1575.6** 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: **3.5** Tons
Total coil load: **42.5** MBH
Sensible coil load: **37.1** MBH
Coil airflow: **1600** CFM
Sensible heat ratio: **0.873**
Area per unit load: **444.9** sqft/Ton
Load per unit area: **27.0** 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: **54.1/52.8** F
Coil ADP: **51.7** F
Bypass Factor: **0.100**
Resulting RH: **.46** %
Design supply temp: **53.8** F

Central Heating Coil Sizing Data

Max coil load: **26.3** MBH
Coil airflow: **1600** CFM
Load per unit area: **16.7** BTU/(hr-sqft)

Load occurs at: **Des Htg**
Ent DB / Lvg DB: **68.2/83.4** F

Supply Fan Sizing Data

Actual max airflow: **1600** CFM
Standard airflow: **1599** CFM
Actual max airflow per unit area: **1.02** 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: **28.75** 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 210	1.4	66	Aug 1500	1.0	75.0	0.88
BATH 216	1.4	66	Aug 1500	1.0	75.0	0.88
BEDROOM 209	5.2	240	Aug 1500	3.0	286.8	0.84
BEDROOM 217	6.0	276	Aug 1700	3.9	286.8	0.96
HALL 2SD FL	11.7	534	Aug 1600	9.7	360.0	1.48
NURSERY	4.2	193	Aug 1500	2.3	246.0	0.78
PLAY ROOM	5.0	227	Aug 1500	3.0	246.0	0.92
Zone	35.0	1600	Aug 1500	23.8	1575.6	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-4

Project Name: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

	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	877 sqft	8617	-	877 sqft	-	-
Wall Transmission	1035 sqft	2548	-	1035 sqft	2907	-
Roof Transmission	1575 sqft	1144	-	1575 sqft	1134	-
Window Transmission	877 sqft	12255	-	877 sqft	19794	-
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	1352 W	4613	-	0 W	0	-
Electric Equipment	1352 W	4613	-	0 W	0	-
People	4	920	480	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	300	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	34710	780	-	23835	0
Thermostat and Pulldown Adjustment	-	-234	0	-	96	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	2023	4622	115 CFM	2968	0
Supply Fan Load	1600 CFM	593	-	1600 CFM	-593	-
>> Total System Loads	-	37091	5402	-	26306	0
Central Cooling Coil	-	37091	5406	-	0	0
Central Heating Coil	-	0	-	-	26306	-
>> Total Coil Loads	-	37091	5406	-	26306	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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:42PM

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
BATH 210

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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

Air System Information

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

Number of zones: **1**
Floor Area: **1555.0** 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: **4.4** Tons
Total coil load: **52.2** MBH
Sensible coil load: **47.1** MBH
Coil airflow: **2000** CFM
Sensible heat ratio: **0.901**
Area per unit load: **357.2** sqft/Ton
Load per unit area: **33.6** BTU/(hr-sqft)

Load occurs at: **Aug 1600**
OA DB / WB: **90.7/76.9** F
Entering DB / WB: **75.3/61.6** F
Leaving DB / WB: **53.5/52.2** F
Coil ADP: **51.1** F
Bypass Factor: **0.100**
Resulting RH: **.45** %
Design supply temp: **52.9** F

Central Heating Coil Sizing Data

Max coil load: **27.9** MBH
Coil airflow: **2000** CFM
Load per unit area: **18.0** BTU/(hr-sqft)

Load occurs at: **Des Htg**
Ent DB / Lvg DB: **68.5/81.4** F

Supply Fan Sizing Data

Actual max airflow: **2000** CFM
Standard airflow: **1999** CFM
Actual max airflow per unit area: **1.29** 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: **100** CFM
Airflow per unit floor area: **0.06** CFM/sqft

Airflow per person: **50.00** 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
HALL 2SD FL(E)	5.5	241	Aug 1500	4.6	132.0	1.83
HALL ON MASTER	0.8	35	Aug 1300	0.4	97.5	0.36
HER MASTER CLOSET	3.5	152	Aug 1700	2.2	232.0	0.66
HIS MASTER CLOSET	2.7	118	Aug 2000	0.1	190.5	0.62
MASTER BATH	6.3	278	Aug 1500	4.3	297.5	0.94
MASTER BEDROOM	15.9	698	Aug 1700	7.1	335.5	2.08
STAIR 2ND FL	11.3	494	Aug 1600	8.2	270.0	1.83
Zone	45.6	2000	Aug 1600	26.9	1555.0	1.29

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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

	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	851 sqft	13696	-	851 sqft	-	-
Wall Transmission	2031 sqft	5622	-	2031 sqft	5704	-
Roof Transmission	1555 sqft	1129	-	1555 sqft	1120	-
Window Transmission	851 sqft	11884	-	851 sqft	19194	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	40 sqft	971	-	40 sqft	862	-
Floor Transmission	0 sqft	0	-	0 sqft	0	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	1375 W	4690	-	0 W	0	-
Electric Equipment	1351 W	4610	-	0 W	0	-
People	2	460	240	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	2500	800	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	45562	1040	-	26879	0
Thermostat and Pulldown Adjustment	-	-960	0	-	-754	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Ventilation Load	100 CFM	1744	4111	100 CFM	2554	0
Supply Fan Load	2000 CFM	741	-	2000 CFM	-741	-
>> Total System Loads	-	47087	5151	-	27937	0
Central Cooling Coil	-	47087	5150	-	0	0
Central Heating Coil	-	0	-	-	27937	-
>> Total Coil Loads	-	47087	5150	-	27937	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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:42PM

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:.....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
HALL 2SD FL(E)

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 M-AHU/CU-1

Project Name: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

Air System Information

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

Number of zones: **1**
Floor Area: **548.0** 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: **0.9** Tons
Total coil load: **11.0** MBH
Sensible coil load: **10.3** MBH
Coil airflow: **436** CFM
Sensible heat ratio: **0.932**
Area per unit load: **597.1** sqft/Ton
Load per unit area: **20.1** BTU/(hr-sqft)

Load occurs at: **Aug 1700**
OA DB / WB: **89.9/76.7** F
Entering DB / WB: **74.3/60.5** F
Leaving DB / WB: **52.5/51.2** F
Coil ADP: **50.1** F
Bypass Factor: **0.100**
Resulting RH: **.45** %
Design supply temp: **52.7** F

Central Heating Coil Sizing Data

Max coil load: **5.7** MBH
Coil airflow: **436** CFM
Load per unit area: **10.4** BTU/(hr-sqft)

Load occurs at: **Des Htg**
Ent DB / Lvg DB: **69.8/81.9** F

Supply Fan Sizing Data

Actual max airflow: **436** CFM
Standard airflow: **436** CFM
Actual max airflow per unit area: **0.80** CFM/sqft

Fan motor BHP: **0.06** BHP
Fan motor kW: **0.05** 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
GARAGE 127	10.0	436	Aug 1800	5.9	548.0	0.80

System Design Load Summary for M-AHU/CU-1

Project Name: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:41PM

	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	25 sqft	201	-	25 sqft	-	-
Wall Transmission	677 sqft	2008	-	677 sqft	1902	-
Roof Transmission	548 sqft	409	-	548 sqft	395	-
Window Transmission	25 sqft	333	-	25 sqft	554	-
Skylight Transmission	0 sqft	0	-	0 sqft	0	-
Door Loads	162 sqft	1403	-	162 sqft	2333	-
Floor Transmission	548 sqft	0	-	548 sqft	555	-
Partitions/Ceilings	0 sqft	0	-	0 sqft	0	-
Overhead Lighting	822 W	2805	-	0 W	0	-
Electric Equipment	658 W	2244	-	0 W	0	-
People	0	0	0	0	0	0
Infiltration	-	103	248	-	155	1
Miscellaneous	-	500	500	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>>Total Zone Loads	-	10005	748	-	5895	1
Thermostat and Pulldown Adjustment	-	98	0	-	-47	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	436 CFM	162	-	436 CFM	-162	-
>> Total System Loads	-	10265	748	-	5686	1
Central Cooling Coil	-	10265	749	-	0	0
Central Heating Coil	-	0	-	-	5686	-
>> Total Coil Loads	-	10265	749	-	5686	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: 23-0822 CASAS OHAD
Prepared by: ARPE Engineering, Inc.

11/27/2023
02:42PM

General Details:

Air System Name:.....M-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:.....436.0 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
GARAGE 127

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 %