

Air System Sizing Summary for AHU/CU-1

Project Name: Wilton Manors Fire Station#16
Prepared by: L.N.I.

06/26/2016
12:41PM

Air System Information

Air System Name	AHU/CU-1	Number of zones	1
Equipment Class	SPLT AHU	Floor Area	1678.0 ft ²
Air System Type	SZCAV	Location	Fort Lauderdale, Florida

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	User-Modified	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	4.8 Tons	Load occurs at	Jul 1500
Total coil load	57.8 MBH	OA DB / WB	91.0 / 77.0 °F
Sensible coil load	41.8 MBH	Entering DB / WB	78.6 / 67.1 °F
Coil CFM at Jul 1500	1909 CFM	Leaving DB / WB	58.3 / 57.3 °F
Max block CFM	1909 CFM	Coil ADP	56.1 °F
Sum of peak zone CFM	1909 CFM	Bypass Factor	0.100
Sensible heat ratio	0.723	Resulting RH	55 %
ft ² /Ton	348.3	Design supply temp.	58.0 °F
BTU/(hr-ft ²)	34.5	Zone T-stat Check	1 of 1 OK
Water flow @ 10.0 °F rise	N/A	Max zone temperature deviation	0.0 °F

Central Heating Coil Sizing Data

Max coil load	14.1 MBH	Load occurs at	Jan 0700
Coil CFM at Jan 0700	1909 CFM	BTU/(hr-ft ²)	8.4
Max coil CFM	1909 CFM	Ent. DB / Lvg DB	57.9 / 64.8 °F
Water flow @ 20.0 °F drop	N/A		

Supply Fan Sizing Data

Actual max CFM	1909 CFM	Fan motor BHP	0.26 BHP
Standard CFM	1908 CFM	Fan motor kW	0.21 kW
Actual max CFM/ft ²	1.14 CFM/ft ²	Fan static	0.50 in wg

Outdoor Ventilation Air Data

Design airflow CFM	305 CFM	CFM/person	5.75 CFM/person
CFM/ft ²	0.18 CFM/ft ²		

Zone Sizing Summary for AHU/CU-1

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Equipment Class SPLT AHU	Floor Area 1678.0 ft ²
Air System Type SZCAV	Location Fort Lauderdale, Florida

Sizing Calculation Information

Calculation Months Jan to Dec	Zone CFM Sizing Sum of space airflow rates
Sizing Data User-Modified	Space CFM Sizing Individual peak space loads

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Airflow (CFM)	Minimum Airflow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft ²)	Zone CFM/ft ²
Zone 1	33.7	1909	1909	Jun 1500	7.7	1678.0	1.14

Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
Bedroom area(E)	1	5.7	Jul 1500	311	0.9	499.0	0.62
Kitchen(E)	1	4.8	Jul 1400	262	1.2	190.0	1.38
Meeting Rm(E)	1	23.4	Jun 1600	1277	5.6	989.0	1.29

Air System Design Load Summary for AHU/CU-1

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06/26/2016
 12:41PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 91.0 °F / 77.0 °F			HEATING OA DB / WB 46.0 °F / 38.6 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	102 ft²	2973	-	102 ft²	-	-
Wall Transmission	254 ft²	981	-	254 ft²	1135	-
Roof Transmission	1678 ft²	6679	-	1678 ft²	2986	-
Window Transmission	102 ft²	1580	-	102 ft²	2717	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	48 ft²	1074	-	48 ft²	816	-
Floor Transmission	1290 ft²	0	-	1290 ft²	0	-
Partitions	679 ft²	1245	-	679 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	2349 W	7292	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	53	10302	6700	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1525	240	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	33652	6940	-	7654	0
Zone Conditioning	-	36264	6940	-	6945	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	1909 CFM	0	-	1909 CFM	0	-
Ventilation Load	305 CFM	4850	9048	305 CFM	7783	0
Supply Fan Load	1909 CFM	708	-	1909 CFM	-708	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	41822	15988	-	14021	0
Central Cooling Coil	-	41822	15990	-	0	0
Central Heating Coil	-	0	-	-	14021	-
>> Total Conditioning	-	41822	15990	-	14021	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 AHU/CU-2

Project Name: Wilton Manors Fire Station#16
 Prepared by: L.N.I.

06/26/2016
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Air System Information

Air System Name AHU/CU-2	Number of zones 1
Equipment Class SPLT AHU	Floor Area 1270.0 ft ²
Air System Type SZCAV	Location Fort Lauderdale, Florida

Sizing Calculation Information

Calculation Months Jan to Dec	Zone CFM Sizing Sum of space airflow rates
Sizing Data User-Modified	Space CFM Sizing Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load 3.7 Tons	Load occurs at Jun 1500
Total coil load 44.4 MBH	OA DB / WB 90.0 / 77.0 °F
Sensible coil load 35.3 MBH	Entering DB / WB 77.9 / 65.4 °F
Coil CFM at Jun 1500 1586 CFM	Leaving DB / WB 57.3 / 56.1 °F
Max block CFM 1586 CFM	Coil ADP 55.0 °F
Sum of peak zone CFM 1586 CFM	Bypass Factor 0.100
Sensible heat ratio 0.795	Resulting RH 50 %
ft ² /Ton 343.2	Design supply temp. 58.0 °F
BTU/(hr-ft ²) 35.0	Zone T-stat Check 1 of 1 OK
Water flow @ 10.0 °F rise N/A	Max zone temperature deviation 0.0 °F

Central Heating Coil Sizing Data

Max coil load 16.5 MBH	Load occurs at Jan 0700
Coil CFM at Jan 0700 1586 CFM	BTU/(hr-ft ²) 13.0
Max coil CFM 1586 CFM	Ent. DB / Lvg DB 56.9 / 66.6 °F
Water flow @ 20.0 °F drop N/A	

Supply Fan Sizing Data

Actual max CFM 1586 CFM	Fan motor BHP 0.22 BHP
Standard CFM 1585 CFM	Fan motor kW 0.17 kW
Actual max CFM/ft ² 1.25 CFM/ft ²	Fan static 0.50 in wg

Outdoor Ventilation Air Data

Design airflow CFM 200 CFM	CFM/person 15.38 CFM/person
CFM/ft ² 0.16 CFM/ft ²	

Zone Sizing Summary for AHU/CU-2

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Air System Information

Air System Name AHU/CU-2	Number of zones 1
Equipment Class SPLT AHU	Floor Area 1270.0 ft ²
Air System Type SZCAV	Location Fort Lauderdale, Florida

Sizing Calculation Information

Calculation Months Jan to Dec	Zone CFM Sizing Sum of space airflow rates
Sizing Data User-Modified	Space CFM Sizing Individual peak space loads

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Airflow (CFM)	Minimum Airflow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft ²)	Zone CFM/ft ²
Zone 1	26.4	1586	1586	Oct 1400	8.4	1270.0	1.25

Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
Hallway/Rest(E)	1	4.6	Jul 1500	253	0.8	466.0	0.54
Offices(DIE/SEC/Chef)	1	10.1	Jul 1400	552	3.1	391.0	1.41
Reception(E)	1	9.5	Nov 1400	518	2.8	218.0	2.38
Storage Rm(E)	1	1.9	Nov 1500	104	0.8	84.0	1.24
Watch(E)	1	2.9	Nov 1500	159	0.9	111.0	1.43

Air System Design Load Summary for AHU/CU-2

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 90.0 °F / 77.0 °F			HEATING OA DB / WB 46.0 °F / 38.6 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	119 ft²	4247	-	119 ft²	-	-
Wall Transmission	558 ft²	2300	-	558 ft²	2493	-
Roof Transmission	1316 ft²	5174	-	1316 ft²	2342	-
Window Transmission	119 ft²	1712	-	119 ft²	3170	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	24 ft²	484	-	24 ft²	408	-
Floor Transmission	960 ft²	0	-	960 ft²	0	-
Partitions	195 ft²	437	-	195 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1728 W	5363	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	502 W	1644	-	0	0	-
People	13	2590	2070	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	-	23951	2070	-	8413	0
Zone Conditioning	-	25885	2070	-	8420	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	1586 CFM	0	-	1586 CFM	0	-
Ventilation Load	200 CFM	2996	7042	200 CFM	5184	0
Supply Fan Load	1586 CFM	588	-	1586 CFM	-588	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	29469	9112	-	13016	0
Central Cooling Coil	-	35298	9112	-	0	0
Central Heating Coil	-	-5829	-	-	13016	-
>> Total Conditioning	-	29469	9112	-	13016	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		