

## Air System Sizing Summary for AHU-Sys

Project Name: VA - Honolulu Hawaii - 02-25-2016  
Prepared by: Mazzetti

02/25/2016  
03:34PM

### Air System Information

Air System Name ..... **AHU-Sys**  
Equipment Class ..... **CW AHU**  
Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **87250.0** ft<sup>2</sup>  
Location ..... **Honolulu, Hawaii**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone CFM ..... **Sum of space airflow rates**  
Space CFM ..... **Individual peak space loads**

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

### Central Cooling Coil Sizing Data

Total coil load ..... **389.2** Tons  
Total coil load ..... **4670.1** MBH  
Sensible coil load ..... **3822.4** MBH  
Coil CFM at Jul 1500 ..... **159237** CFM  
Max block CFM ..... **159237** CFM  
Sum of peak zone CFM ..... **159237** CFM  
Sensible heat ratio ..... **0.818**  
ft<sup>2</sup>/Ton ..... **224.2**  
BTU/(hr-ft<sup>2</sup>) ..... **53.5**  
Water flow @ 10.0 °F rise ..... **934.51** gpm

Load occurs at ..... **Jul 1500**  
OA DB / WB ..... **89.9 / 77.2** °F  
Entering DB / WB ..... **78.8 / 65.1** °F  
Leaving DB / WB ..... **56.5 / 55.3** °F  
Coil ADP ..... **54.1** °F  
Bypass Factor ..... **0.100**  
Resulting RH ..... **46** %  
Design supply temp. .... **53.5** °F  
Zone T-stat Check ..... **1 of 1** OK  
Max zone temperature deviation ..... **0.0** °F

### Central Heating Coil Sizing Data

Max coil load ..... **452.8** MBH  
Coil CFM at Des Htg ..... **159237** CFM  
Max coil CFM ..... **159237** CFM  
Water flow @ 20.0 °F drop ..... **45.30** gpm

Load occurs at ..... **Des Htg**  
BTU/(hr-ft<sup>2</sup>) ..... **5.2**  
Ent. DB / Lvg DB ..... **70.6 / 73.2** °F

### Supply Fan Sizing Data

Actual max CFM ..... **159237** CFM  
Standard CFM ..... **159145** CFM  
Actual max CFM/ft<sup>2</sup> ..... **1.83** CFM/ft<sup>2</sup>

Fan motor BHP ..... **0.00** BHP  
Fan motor kW ..... **0.00** kW  
Fan static ..... **0.00** in wg

### Outdoor Ventilation Air Data

Design airflow CFM ..... **17450** CFM  
CFM/ft<sup>2</sup> ..... **0.20** CFM/ft<sup>2</sup>

CFM/person ..... **20.00** CFM/person

## Zone Sizing Summary for AHU-Sys

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Air System Type ..... **SZCAV**

Number of zones ..... **1**  
Floor Area ..... **87250.0** ft<sup>2</sup>  
Location ..... **Honolulu, Hawaii**

### Sizing Calculation Information

#### Zone and Space Sizing Method:

Zone CFM ..... **Sum of space airflow rates**  
Space CFM ..... **Individual peak space loads**

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

### Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft <sup>2</sup> )	Zone CFM/ft <sup>2</sup>
Zone 1	3695.4	159237	159237	Jul 1500	263.2	87250.0	1.83

### 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 <sup>2</sup> )	Space CFM/ft <sup>2</sup>
<b>Zone 1</b>							
Block Load	1	3695.4	Jul 1500	159237	263.2	87250.0	1.83

## Air System Design Load Summary for AHU-Sys

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 89.9 °F / 77.2 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 61.0 °F / 51.1 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	20600 ft²	1727238	-	20600 ft²	-	-
Wall Transmission	19805 ft²	137809	-	19805 ft²	53129	-
Roof Transmission	73750 ft²	138886	-	73750 ft²	24351	-
Window Transmission	7100 ft²	99300	-	7100 ft²	85910	-
Skylight Transmission	13500 ft²	100927	-	13500 ft²	87318	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	87250 ft²	0	-	87250 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	104700 W	357230	-	0	0	-
Task Lighting	43625 W	148846	-	0	0	-
Electric Equipment	174500 W	595391	-	0	0	-
People	873	213760	178863	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	175969	8943	5%	12535	0
>> Total Zone Loads	-	3695355	187806	-	263244	0
Zone Conditioning	-	3587065	187806	-	250654	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	159237 CFM	0	-	159237 CFM	0	-
Ventilation Load	17450 CFM	235309	659697	17450 CFM	202153	0
Supply Fan Load	159237 CFM	0	-	159237 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	3822374	847503	-	452807	0
Central Cooling Coil	-	3822375	847683	-	0	0
Central Heating Coil	-	0	-	-	452807	-
>> Total Conditioning	-	3822375	847683	-	452807	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

## Zone Design Load Summary for AHU-Sys

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Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 89.9 °F / 77.2 °F			HEATING OA DB / WB 61.0 °F / 51.1 °F		
	OCCUPIED T-STAT 75.0 °F			OCCUPIED T-STAT 72.0 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	20600 ft²	1727238	-	20600 ft²	-	-
Wall Transmission	19805 ft²	137809	-	19805 ft²	53129	-
Roof Transmission	73750 ft²	138886	-	73750 ft²	24351	-
Window Transmission	7100 ft²	99300	-	7100 ft²	85910	-
Skylight Transmission	13500 ft²	100927	-	13500 ft²	87318	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	87250 ft²	0	-	87250 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	104700 W	357230	-	0	0	-
Task Lighting	43625 W	148846	-	0	0	-
Electric Equipment	174500 W	595391	-	0	0	-
People	873	213760	178863	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	175969	8943	5%	12535	0
>> Total Zone Loads	-	3695355	187806	-	263244	0

## Space Design Load Summary for AHU-Sys

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**TABLE 1.1.A. COMPONENT LOADS FOR SPACE " Block Load " IN ZONE " Zone 1 "**

	<b>DESIGN COOLING</b>			<b>DESIGN HEATING</b>		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 89.9 °F / 77.2 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 61.0 °F / 51.1 °F OCCUPIED T-STAT 72.0 °F		
		Sensible	Latent		Sensible	Latent
<b>SPACE LOADS</b>	<b>Details</b>	<b>(BTU/hr)</b>	<b>(BTU/hr)</b>	<b>Details</b>	<b>(BTU/hr)</b>	<b>(BTU/hr)</b>
Window & Skylight Solar Loads	20600 ft²	1727238	-	20600 ft²	-	-
Wall Transmission	19805 ft²	137809	-	19805 ft²	53129	-
Roof Transmission	73750 ft²	138886	-	73750 ft²	24351	-
Window Transmission	7100 ft²	99300	-	7100 ft²	85910	-
Skylight Transmission	13500 ft²	100927	-	13500 ft²	87318	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	87250 ft²	0	-	87250 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	104700 W	357230	-	0	0	-
Task Lighting	43625 W	148846	-	0	0	-
Electric Equipment	174500 W	595391	-	0	0	-
People	873	213760	178863	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	175969	8943	5%	12535	0
<b>&gt;&gt; Total Zone Loads</b>	<b>-</b>	<b>3695355</b>	<b>187806</b>	<b>-</b>	<b>263244</b>	<b>0</b>

**TABLE 1.1.B. ENVELOPE LOADS FOR SPACE " Block Load " IN ZONE " Zone 1 "**

				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr-ft²-°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
<b>NE EXPOSURE</b>						
WALL	3257	0.250	-	25821	-	8950
WINDOW 1	2600	1.100	0.560	36363	69886	31460
<b>SE EXPOSURE</b>						
WALL	5087	0.250	-	37171	-	13978
WINDOW 1	1280	1.100	0.560	17902	28069	15488
<b>NW EXPOSURE</b>						
WALL	5734	0.250	-	39371	-	15756
WINDOW 1	1440	1.100	0.560	20140	48500	17424
<b>SW EXPOSURE</b>						
WALL	5100	0.250	-	34017	-	14014
WINDOW 1	1280	1.100	0.560	17902	35618	15488
<b>E EXPOSURE</b>						
WALL	627	0.063	-	1428	-	432
WINDOW 1	500	1.100	0.560	6993	15342	6050
<b>H EXPOSURE</b>						
ROOF	73750	0.030	-	138886	-	24351
SKYLIGHT	13500	0.588	0.811	100927	1529822	87318