# Air System Sizing Summary for AHU-1.1/CU-1.1 (WOMENS RR) Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

Air System Information

12/08/2020 02:33PM

Air System Name AHU-1.1/CU-1.1 (WOMENS RR)		Number of zenes		
Equipment Class PKG VERT		Number of zonesFloor Area	T	642
Air System TypeSZCAV		Location	2340.0	11-
All System TypeSZCAV		Location	Talianassee, Florida	
Sizing Calculation Information				
Zone and Space Sizing Method:				
Zone CFM Sum of space airflow rates		Calculation Months		
Space CFMIndividual peak space loads		Sizing Data	User-Modified	
Central Cooling Coil Sizing Data				
Total coil load7.0	Tons	Load occurs at	lup 1500	
Total coil load		OA DB / WB		°E
Sensible coil load 51.3		Entering DB / WB		
Coil CFM at Jun 15001600				
Max block CFM1600		Leaving DB / WB Coil ADP	50.07 55.5	°E
Sum of peak zone CFM 1600		Bypass Factor		Г
Sensible heat ratio	CFIVI			0/
		Resulting RH		
ft²/Ton 362.2		Design supply temp.		
BTU/(hr-ft²)33.1		Zone T-stat Check		
Water flow @ 10.0 °F rise		Max zone temperature deviation	0.0	Г
Central Heating Coil Sizing Data				
Max coil load73.5	MBH	Load occurs at	Des Hta	
Coil CFM at Des Htg1600		BTU/(hr-ft²)		
Max coil CFM		Ent. DB / Lvg DB	43.8 / 86.4	°F
Water flow @ 20.0 °F dropN/A				
Supply Fan Sizing Data				
Actual max CFM1600	CEM	Fan motor BHP	0.42	BHP
Standard CFM 1596	CEM	Fan motor kW		
Actual max CFM/ft² 0.63	CEM/ft²	Fan static		
Actual max Crivint	CHIVIT	i an statio	1.00	wg
Outdoor Ventilation Air Data				COMPANY OF THE CO.
Outdoor Ventilation Air Data Design airflow CFM	CFM	CFM/person	133.33	CFM/perso



## Zone Sizing Summary for AHU-1.1/CU-1.1 (WOMENS RR)

Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers 12/08/2020 02:33PM

Air System Information

 Number of zones
 1

 Floor Area
 2540.0
 ft²

 Location
 Tallahassee, Florida

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 User-Modified

### **Zone Sizing Data**

	Maximum	Design	Minimum	Time	Maximum	Zone	
	Cooling	Air	Air	of	Heating	Floor	
	Sensible	Flow	Flow	Peak	Load	Area	Zone
Zone Name	(MBH)	(CFM)	(CFM)	Load	(MBH)	(ft²)	CFM/ft²
Zone 1	34.6	1600	1600	Aug 1500	32.3	2540.0	0.63

#### **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 (ft²)	Space CFM/ft²
Zone 1							
WOMEN'S RESTROOM	1	34.6	Aug 1500	1604	32.3	2540.0	0.63

# Air System Design Load Summary for AHU-1.1/CU-1.1 (WOMENS RR) Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

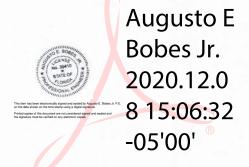
	DES	IGN COOLING		DES	IGN HEATING	
	COOLING DATA A	T Jun 1500		HEATING DATA AT	DES HTG	
	COOLING OA DB	WB 94.0 °F / 7	7.0 °F	HEATING OA DB /	WB 25.0 °F / 2	1.0 °F
		Sensible	Latent		Sensible	Latent
ZONE LOADS	Details	(BTU/hr)	(BTU/hr)	Details	(BTU/hr)	(BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	O ft²	-	-
Wall Transmission	2354 ft²	6467	-	2354 ft²	14702	-
Roof Transmission	2540 ft²	8179		2540 ft²	5142	-
Window Transmission	O ft²	0	7-	0 ft²	0	
Skylight Transmission	O ft²	0		0 ft²	0	-
Door Loads	126 ft²	791	-	126 ft²	2268	-
Floor Transmission	2540 ft²	0	-	2540 ft²	4149	-
Partitions	O ft²	0	-	0 ft²	0	
Ceiling	O ft²	0	-	O ft²	0	
Overhead Lighting	3810 W	12999	-	0	0	
Task Lighting	0 W	0	1-2	0	0	
Electric Equipment	0 W	0	-	0	0	19
People	12	2940	2460	0	0	0
Infiltration		2538	3632	-	6011	0
Miscellaneous		0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	33914	6092		32272	0
Zone Conditioning	-	32665	6092	-	31586	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	1600 CFM	0		1600 CFM	0	
Ventilation Load	1600 CFM	17527	26796	1600 CFM	42934	C
Supply Fan Load	1600 CFM	1067	and the same of th	1600 CFM	-1067	
Space Fan Coil Fans	-	0			0	
Duct Heat Gain / Loss	0%	0		0%	0	
>> Total System Loads	-	51259	32888	-	73453	C
Central Cooling Coil	_	51259	32891		0	(
Central Heating Coil	-	0			73453	
>> Total Conditioning		51259	32891		73453	(
Key:		values are clg lo		The Additional Control of the Contro	values are htg lo values are clg lo	

## Air System Sizing Summary for AHU-1.2/CU-1.2 (MENS RR)

Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

Air System Information

Air System NameAHU-1.2/CU-1.2 (MENS RR)		Number of zones	1	
Equipment ClassPKG VERT		Floor Area	1940.0	ft <sup>2</sup>
Air System Type SZCAV		Location	Tallahassee, Florida	
Sizing Calculation Information Zone and Space Sizing Method:				
Zone CFM Sum of space airflow rates		Calculation Months	Jan to Dec	
Space CFMIndividual peak space loads		Sizing Data	User-Modified	
Central Cooling Coil Sizing Data				
Total coil load5.3	Tons	Load occurs at	Aug 1500	
Total coil load64.0	MBH	OA DB / WB	95.0 / 77.0	°F
Sensible coil load41.1		Entering DB / WB		
Coil CFM at Aug 15001400	CFM	Leaving DB / WB	58.5 / 57.3	°F
Max block CFM1400	CFM	Coil ADP	55.5	°F
Sum of peak zone CFM	CFM	Bypass Factor		
Sensible heat ratio0.642		Resulting RH	54	%
ft²/Ton363.5		Design supply temp.	55.0	°F
BTU/(hr-ft²)		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 load59.3	MBH	Load occurs at	Des Htg	
Coil CFM at Des Htg1400	CFM	BTU/(hr-ft²)		
Max coil CFM1400	CFM	Ent. DB / Lvg DB	46.5 / 85.8	°F
Water flow @ 20.0 °F dropN/A				
Supply Fan Sizing Data				2000
Actual max CFM1400	CFM	Fan motor BHP	0.37	BHP
Standard CFM 1397	CFM	Fan motor kW	0.27	kW
Actual max CFM/ft <sup>2</sup> 0.72	CFM/ft²	Fan static	1.00	in wg
Outdoor Ventilation Air Data			g/selections	1-11
Design airflow CFM1400	CFM	CFM/person	175.00	CFM/perso
CFM/ft² 0.72	CFM/ft²			
GFINI/TI*				



## Zone Sizing Summary for AHU-1.2/CU-1.2 (MENS RR)

Project Name: I-10 Rest Area Columbia County FI
Prepared by: Bobes Associates Consulting Engineers

12/08/2020 02:33PM

Air System Information

Air System Name AHU-1.2/CU-1.2 (MENS RR)
Equipment Class PKG VERT
Air System Type SZCAV

Number of zones \_\_\_\_\_\_1
Floor Area \_\_\_\_\_\_\_1940.0 ft²
Location \_\_\_\_\_\_Tallahassee, Florida

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 User-Modified

### **Zone Sizing Data**

	Maximum Cooling	Design Air	Minimum Air	Time	Maximum Heating	Zone	
Zone Name	Sensible (MBH)	(CFM)	(CFM)	Peak Load	Load (MBH)	Area (ft²)	Zone CFM/ft²
Zone 1	27.0	1400	1400	Aug 1500	26.6	1940.0	0.72

### **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 (ft²)	Space CFM/ft²
Zone 1							
MEN'S RESTROOM	1	27.0	Aug 1500	1253	26.6	1940.0	0.65

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# Air System Design Load Summary for AHU-1.2/CU-1.2 (MENS RR) Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

12/08/2020 02:33PM

	DES	IGN COOLING		DES	IGN HEATING	
	COOLING DATA A	T Aug 1500		HEATING DATA AT	DES HTG	
	COOLING OA DB	WB 95.0 °F / 7	7.0 °F	HEATING OA DB /	WB 25.0 °F / 2	1.0 °F
ZONE LOADS	Detaile	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
ZONE LOADS	Details	I MICH COMPONENT	(610/111)	0 ft²	(BTO/III)	(BTO/III)
Window & Skylight Solar Loads	0 ft²	0		2/201/02	10116	
Wall Transmission	1940 ft²	6005		1940 ft²	12116	-
Roof Transmission	1940 ft²	6027		1940 ft²	3927	
Window Transmission	0 ft²	0		0 ft²	0	
Skylight Transmission	0 ft²	0	•	0 ft²	0	-
Door Loads	126 ft²	841	-	126 ft²	2268	
Floor Transmission	1940 ft²	0	-	1940 ft²	3303	357
Partitions	0 ft²	0	-	O ft²	0	15
Ceiling	0 ft <sup>2</sup>	0	-	0 ft²	0	15
Overhead Lighting	2910 W	9929		0	0	-
Task Lighting	0 W	0	= = = = = = = = = = = = = = = = = = = =	0	0	-
Electric Equipment	0 W	0	-	0	0	
People	8	1960	1640	0	0	0
Infiltration	3,5	2226	2680	-	5008	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads		26988	4320	-	26623	0
Zone Conditioning	-	25674	4320	-	26470	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	1400 CFM	0	-	1400 CFM	0	
Ventilation Load	1400 CFM	14515	18595	1400 CFM	33781	C
Supply Fan Load	1400 CFM	934	_	1400 CFM	-934	
Space Fan Coil Fans		0	( <del>-</del>	-	0	
Duct Heat Gain / Loss	0%	0		0%	0	
>> Total System Loads		41123	22915	-	59317	0
Central Cooling Coil		41123	22915		0	C
Central Heating Coil		0	-		59317	
>> Total Conditioning		41123	22915		59317	(
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

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# Air System Sizing Summary for AHU-1.3/CU-1.3 (OFFICE) Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

Air System Information

12/08/2020 02:33PM

Air System Name AHU-1.3/CU-1.3 (OFFICE)		Number of zones	1	
Equipment Class		Floor Area	182.0	ft <sup>2</sup>
Air System TypeSZCAV		Location	Tallahassee, Florida	
Sizing Calculation Information				
Zone and Space Sizing Method:				
Zone CFM Sum of space airflow rates		Calculation Months	Jan to Dec	
Space CFM Individual peak space loads		Sizing Data	Calculated	
Control Cooling Coil Sining Data				
Central Cooling Coil Sizing Data	Tons	Load occurs at	Jul 1600	
Total coil load	MRH	OA DB / WB	94.4 / 76.9	°F
Total coil load 6.6	MDH	Entering DB / WB	77.4 / 65.2	°F
Sensible coil load5.1	CEM	Leaving DB / WB	56.4 / 55.3	°F
Coil CFM at Jul 1600226	CEM	Coil ADP	54.1	°F
Max block CFM 226	CEM	Bypass Factor	0.100	3
Sum of peak zone CFM226 Sensible heat ratio0.770	CFIVI	Resulting RH	52	%
Sensible neat ratio		Design supply temp.	55.0	°F
ft²/Ton329.1		Zone T-stat Check	1 of 1	OK
BTU/(hr-ft²)		Max zone temperature deviation	0.0	°F
Water now @ 10.0 1 noe				
Central Heating Coil Sizing Data			514	
Max coil load5.3	MBH	Load occurs at	Des Htg	
Coil CFM at Des Htg226	CFM	BTU/(hr-ft²)	29.0	0.5
Max coil CFM 226	CFM	Ent. DB / Lvg DB	65.7 / 87.4	F
Water flow @ 20.0 °F dropN/A				
Supply Fan Sizing Data				
Actual max CFM226	CFM	Fan motor BHP	0.06	BHP
Standard CFM 225	CFM	Fan motor kW	0.04	kW
Actual max CFM/ft² 1.24	CFM/ft²	Fan static	1.00	in wg
Out of Market Na Bata				
Outdoor Ventilation Air Data	CEM	CFM/person	7.50	CFM/pers
Design airflow CFM15	CEM/ft2	C PO. OC		
CFM/ft <sup>2</sup> 0.08	OF WITH			



Augusto E Bobes Jr. 2020.12.0 8 15:06:48 -05'00'

### Zone Sizing Summary for AHU-1.3/CU-1.3 (OFFICE)

Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers 12/08/2020 02:33PM

Air System Information

Air System Name AHU-1.3/CU-1.3 (OFFICE)
Equipment Class SPLT AHU
Air System Type SZCAV

Number of zones \_\_\_\_\_\_1
Floor Area \_\_\_\_\_\_\_182.0 ft²
Location \_\_\_\_\_\_Tallahassee, Florida

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**

	Maximum	Design	Minimum	Time	Maximum	Zone	
	Cooling	Air	Air	of	Heating	Floor	
	Sensible	Flow	Flow	Peak	Load	Area	Zone
Zone Name	(MBH)	(CFM)	(CFM)	Load	(MBH)	(ft²)	CFM/ft <sup>2</sup>
Zone 1	4.8	226	226	Aug 1500	4.9	182.0	1.24

### **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 (ft²)	Space CFM/ft²
Zone 1							
OFFICE 011	1	4.8	Aug 1500	226	4.9	182.0	1.24

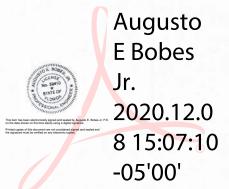
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	DES	IGN COOLING		DES	IGN HEATING		
	COOLING DATA A	T Jul 1600		HEATING DATA A	T DES HTG		
	COOLING OA DB	WB 94.4 °F / 7	6.9 °F	HEATING OA DB / WB 25.0 °F / 21.0 °F			
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)	
Window & Skylight Solar Loads	9 ft²	214	-	9 ft²	-	A	
Wall Transmission	394 ft²	1265		394 ft²	2461		
Roof Transmission	182 ft²	540		182 ft²	368		
Window Transmission	9 ft²	74	_	9 ft²	203		
Skylight Transmission	O ft²	0		0 ft²	0		
Door Loads	21 ft²	139	-	21 ft²	378		
Floor Transmission	182 ft²	0	-	182 ft²	426		
Partitions	O ft²	0		O ft²	0	-	
Ceiling	O ft²	0		O ft²	0		
Overhead Lighting	273 W	931		0	0		
Task Lighting	0 W	0	-	0	0		
Electric Equipment	182 W	621		0	0		
People	2	560	540	0	0	0	
Infiltration	-	444	579		1028	0	
Miscellaneous	-	0	0	-	0	C	
Safety Factor	0% / 0%	0	0	0%	0	C	
>> Total Zone Loads		4788	1119	-	4863	0	
Zone Conditioning	-	4663	1119		4720	0	
Plenum Wall Load	0%	0	-	0	0		
Plenum Roof Load	0%	0	2	0	0		
Plenum Lighting Load	0%	0	_	0	0		
Return Fan Load	226 CFM	0	-	226 CFM	0		
Ventilation Load	15 CFM	294	410		704	C	
Supply Fan Load	226 CFM	151		226 CFM	-151		
Space Fan Coil Fans	-	0	-	100	0		
Duct Heat Gain / Loss	0%	0	-	0%	0		
>> Total System Loads		5108	1529		5273		
Central Cooling Coil	-	5108	1529	-	0	(	
Central Heating Coil	-	0		-	5273		
>> Total Conditioning	to the state of th	5108	1529		5273	(	
Key:		itive values are clg loads Positive values are lative values are htg loads Negative values are					

## Air System Sizing Summary for AHU-1.4/CU-1.4 (BREAK RM) Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

Air System Information

1	ft²
Tallahassee, Florida  Jan to Dec	
Aug 1700	
93.2 / 76.5	°F
	S
	%
55.0	°F
1 of 1	OK
e deviation 0.0	
Des Htg	
30.6	
64.0 / 85.4	°F
0.07	BHP
0.05	kW
1.00	in wg
445-200	
7.50	CFM/perso
	78.1 / 66.0 56.2 / 55.1 53.7 0.100 53 55.0 1 of 1



## Zone Sizing Summary for AHU-1.4/CU-1.4 (BREAK RM)

Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers 12/08/2020 02:33PM

Air System Information

 
 Number of zones
 1

 Floor Area
 208.0
 ft²

 Location
 Tallahassee, Florida

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**

	Maximum Cooling	Design Air	Minimum Air	Time	Maximum Heating	Zone	
	Sensible	Flow	Flow	Peak	Load	Area	Zone
Zone Name	(MBH)	(CFM)	(CFM)	Load	(MBH)	(ft²)	CFM/ft²
Zone 1	6.0	276	276	Aug 1700	5.3	208.0	1.33

### 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 (ft²)	Space CFM/ft²
Zone 1							
BREAK RM 007	1	6.0	Aug 1700	276	5.3	208.0	1.33

# Air System Design Load Summary for AHU-1.4/CU-1.4 (BREAK RM) Project Name: I-10 Rest Area Columbia County FI Prepared by: Bobes Associates Consulting Engineers

	DES	IGN COOLING	DESIGN HEATING HEATING DATA AT DES HTG HEATING OA DB / WB 25.0 °F / 21.0 °F			
	COOLING DATA A	T Aug 1700				
	COOLING OA DB	/WB 93.2 °F / 7				
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	9 ft²	365	-	9 ft²	-	-
Wall Transmission	434 ft²	1548	-	434 ft²	2711	-
Roof Transmission	208 ft²	487	-	208 ft²	421	-
Window Transmission	9 ft²	71	-	9 ft²	203	-
Skylight Transmission	O ft²	0	-	0 ft²	0	Ž.
Door Loads	21 ft²	133	_	21 ft²	378	-
Floor Transmission	208 ft²	0	-	208 ft²	480	2
Partitions	O ft²	0	-	0 ft²	0	-
Ceiling	O ft²	0	_	0 ft²	0	-
Overhead Lighting	312 W	1065	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	208 W	710	-	0	0	-
People	4	1120	1080	0	0	0
Infiltration	-	454	614	Ve.	1125	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads		5952	1694		5317	0
Zone Conditioning	-	5796	1694	-	5144	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0		0	0	4
Plenum Lighting Load	0%	0		0	0	
Return Fan Load	276 CFM	0	_	276 CFM	0	-
Ventilation Load	30 CFM	546	794	30 CFM	1415	0
Supply Fan Load	276 CFM	184	-	276 CFM	-184	-
Space Fan Coil Fans		0			0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	
>> Total System Loads		6526	2489		6374	0
Central Cooling Coil		6526	2489	-	0	0
Central Heating Coil	-	0	-	-	6374	
>> Total Conditioning		6526	2489		6374	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		