Air System Sizing Summary for AHU-1

Project Name: 230515-D Okeechobee Mikvah
Prepared by: Deltag

08/25/2023
10:36AM

Air System Information

Air System Name	**AHU-1**		Number of zones	**1**	
Equipment Class	**SPLT AHU**		Floor Area	**324.0**	ft²
Air System Type	**CAV/RH**		Location	**Okeechobee, Florida**	

Sizing Calculation Information

Calculation Months	**Jan to Dec**	Zone CFM Sizing	**Peak zone sensible load**
Sizing Data	**User-Modified**	Space CFM Sizing	**Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load	**3.4**	Tons	Load occurs at	**Sep 1600**	
Total coil load	**40.9**	MBH	OA DB / WB	**90.9 / 76.7**	°F
Sensible coil load	**33.9**	MBH	Entering DB / WB	**75.8 / 62.9**	°F
Coil CFM at Sep 1600	**1465**	CFM	Leaving DB / WB	**54.3 / 53.1**	°F
Max block CFM	**1465**	CFM	Coil ADP	**51.9**	°F
Sum of peak zone CFM	**1465**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.830**		Resulting RH	**48**	%
ft²/Ton	**95.2**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**126.1**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**N/A**		Max zone temperature deviation	**0.0**	°F

Supply Fan Sizing Data

Actual max CFM	**1465**	CFM	Fan motor BHP	**0.40**	BHP
Standard CFM	**1463**	CFM	Fan motor kW	**0.32**	kW
Actual max CFM/ft²	**4.52**	CFM/ft²	Fan static	**1.00**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**150**	CFM	CFM/person	**25.00**	CFM/person
CFM/ft²	**0.46**	CFM/ft²			

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Zone Sizing Summary for AHU-1

Project Name: 230515-D Okeechobee Mikvah
Prepared by: Deltag

08/25/2023
10:36AM

Air System Information

Air System Name **AHU-1**
Equipment Class ..... **SPLT AHU**
Air System Type ..... **CAV/RH**

Number of zones **1**
Floor Area ..... **324.0** ft²
Location ..... **Okeechobee, Florida**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **User-Modified**

Zone CFM Sizing ..... **Peak zone sensible load**
Space CFM Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	1465	1465	4.52	34.7	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	31.6	Sep 1600	11.0	324.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
Tevilah Rm	1	31.6	Sep 1600	1465	11.0	324.0	4.52

Air System Design Load Summary for AHU-1

Project Name: 230515-D Okeechobee Mikvah
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08/25/2023
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Sep 1600 COOLING OA DB / WB 90.9 °F / 76.7 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 36.4 °F / 36.1 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	293 ft²	18118	-	293 ft²	-	-
Wall Transmission	88 ft²	464	-	88 ft²	640	-
Roof Transmission	324 ft²	595	-	324 ft²	526	-
Window Transmission	293 ft²	3730	-	293 ft²	9435	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	324 ft²	0	-	324 ft²	437	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	259 W	746	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	6	1470	1230	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	6480	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**31603**	**1230**	**-**	**11038**	**0**
Zone Conditioning	-	30104	1230	-	10600	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	1465 CFM	0	-	1465 CFM	0	-
Ventilation Load	150 CFM	2727	5708	150 CFM	5212	0
Supply Fan Load	1465 CFM	1086	-	1465 CFM	-1086	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**33916**	**6938**	**-**	**14727**	**0**
Central Cooling Coil	-	33916	6938	-	-17385	0
Terminal Reheat Coils	-	0	-	-	32111	-
>> Total Conditioning	**-**	**33916**	**6938**	**-**	**14727**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Hourly Air System Design Day Loads for AHU-1

Project Name: 230515-D Okeechobee Mikvah
Prepared by: Deltag

08/25/2023
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DESIGN MONTH: JULY										
Hour	OA TEMP (°F)	SUPPLY AIRFLOW (CFM)	CENTRAL COOLING SENSIBLE (MBH)	CENTRAL COOLING TOTAL (MBH)	CENTRAL HEATING COIL (MBH)	PRECOOL COIL (MBH)	PREHEAT COIL (MBH)	TERMINAL COOLING (MBH)	TERMINAL HEATING (MBH)	ZONE HEATING UNIT (MBH)
0000	79.8	1465	25.8	33.0	0.0	0.0	0.0	0.0	8.6	0.0
0100	79.0	1465	25.7	32.8	0.0	0.0	0.0	0.0	9.4	0.0
0200	78.1	1465	25.5	32.6	0.0	0.0	0.0	0.0	10.1	0.0
0300	77.5	1465	25.3	32.5	0.0	0.0	0.0	0.0	10.8	0.0
0400	77.0	1465	25.2	32.3	0.0	0.0	0.0	0.0	11.4	0.0
0500	76.8	1465	25.2	32.3	0.0	0.0	0.0	0.0	11.9	0.0
0600	77.1	1465	25.2	32.3	0.0	0.0	0.0	0.0	11.9	0.0
0700	78.0	1465	25.4	32.5	0.0	0.0	0.0	0.0	11.5	0.0
0800	79.5	1465	25.9	33.0	0.0	0.0	0.0	0.0	6.6	0.0
0900	81.6	1465	26.4	33.5	0.0	0.0	0.0	0.0	5.1	0.0
1000	84.1	1465	26.8	34.0	0.0	0.0	0.0	0.0	4.2	0.0
1100	86.9	1465	27.3	34.5	0.0	0.0	0.0	0.0	3.2	0.0
1200	89.6	1465	27.8	35.0	0.0	0.0	0.0	0.0	2.3	0.0
1300	91.6	1465	28.5	35.7	0.0	0.0	0.0	0.0	0.0	0.0
1400	92.9	1465	30.3	37.6	0.0	0.0	0.0	0.0	0.0	0.0
1500	93.4	1465	31.9	39.2	0.0	0.0	0.0	0.0	0.0	0.0
1600	92.9	1465	32.9	40.2	0.0	0.0	0.0	0.0	0.0	0.0
1700	91.7	1465	33.0	40.2	0.0	0.0	0.0	0.0	0.0	0.0
1800	89.9	1465	32.2	39.5	0.0	0.0	0.0	0.0	0.0	0.0
1900	87.8	1465	30.0	37.2	0.0	0.0	0.0	0.0	0.0	0.0
2000	85.6	1465	28.9	36.1	0.0	0.0	0.0	0.0	0.0	0.0
2100	83.8	1465	27.0	34.2	0.0	0.0	0.0	0.0	0.0	0.0
2200	82.1	1465	26.5	33.7	0.0	0.0	0.0	0.0	3.3	0.0
2300	80.8	1465	26.1	33.2	0.0	0.0	0.0	0.0	7.8	0.0

Hourly Zone Loads for AHU-1

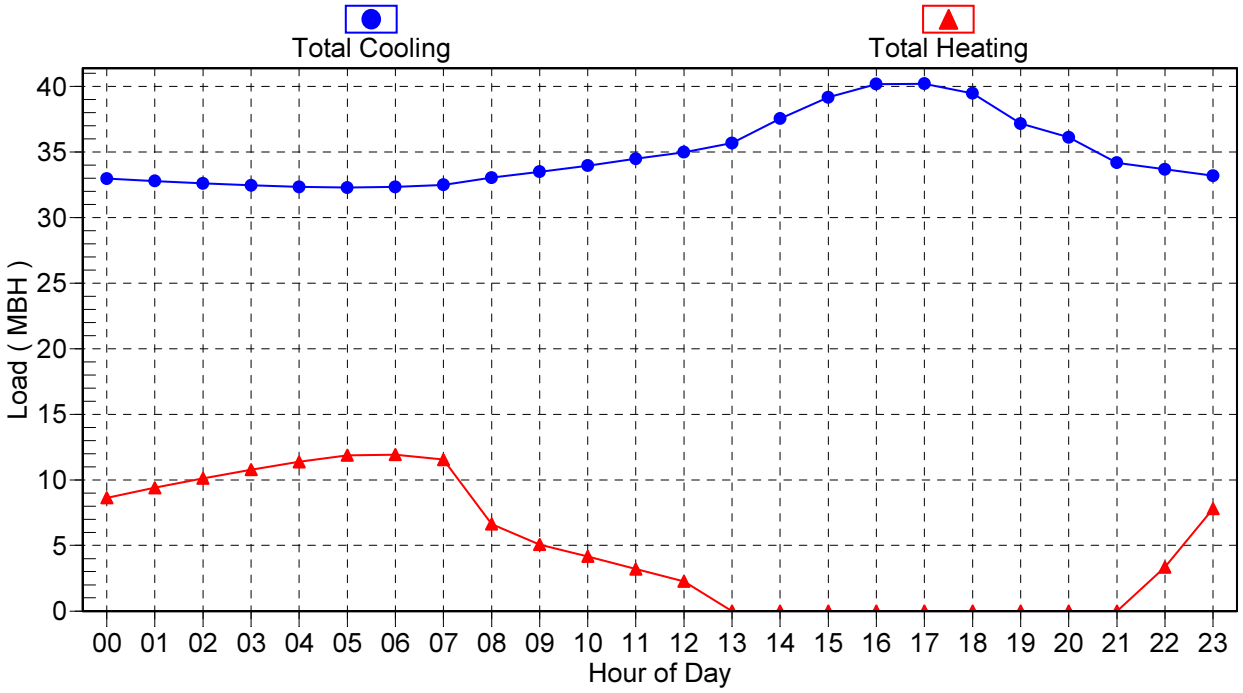
Project Name: 230515-D Okeechobee Mikvah
Prepared by: Deltag

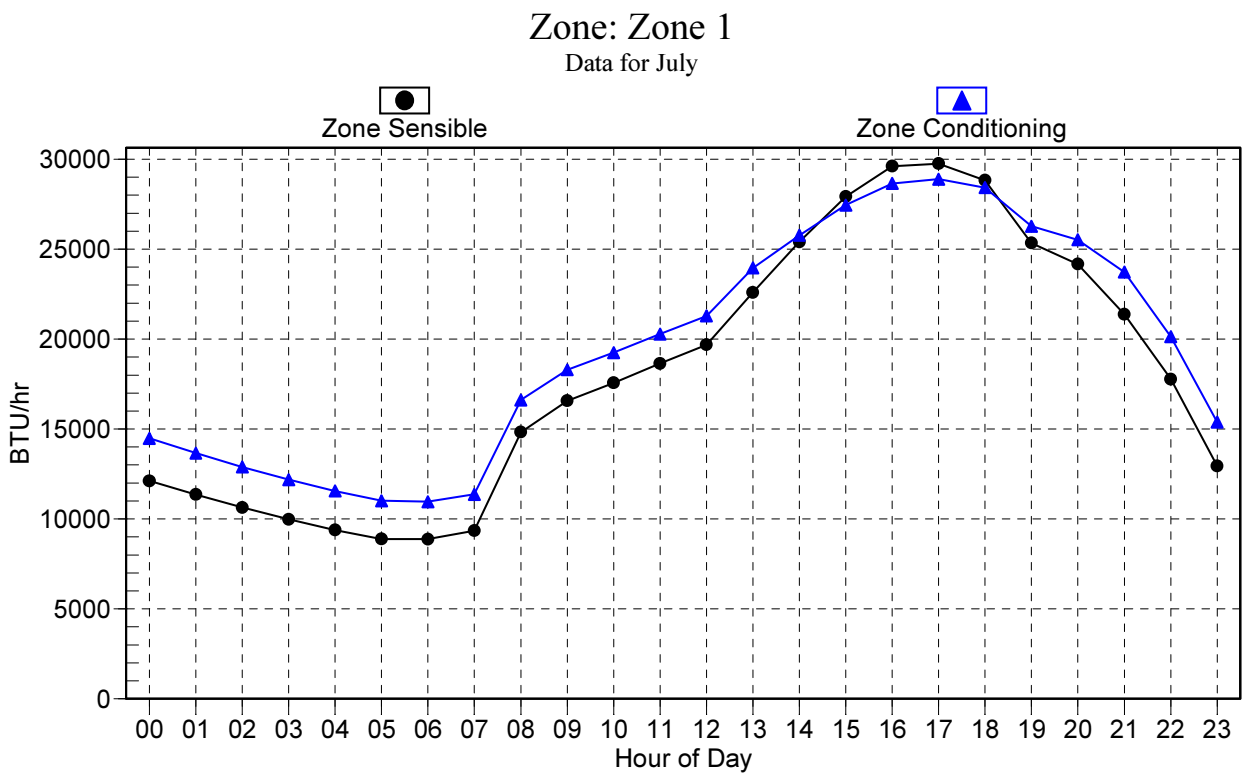
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ZONE: Zone 1
DESIGN MONTH: JULY

Hour	OA TEMP (°F)	ZONE TEMP (°F)	RH (%)	ZONE AIRFLOW (CFM)	ZONE SENSIBLE LOAD (BTU/hr)	ZONE COND (BTU/hr)	TERMINAL COOLING COIL (BTU/hr)	TERMINAL HEATING COIL (BTU/hr)	ZONE HEATING UNIT (BTU/hr)
0000	79.8	69.6	56	1464.8	12116.3	14478.9	0.0	8634.0	0.0
0100	79.0	69.6	56	1464.8	11358.7	13663.3	0.0	9397.5	0.0
0200	78.1	69.6	57	1464.8	10635.7	12889.8	0.0	10121.6	0.0
0300	77.5	69.5	57	1464.8	9976.8	12185.7	0.0	10780.8	0.0
0400	77.0	69.5	57	1464.8	9381.5	11549.9	0.0	11376.0	0.0
0500	76.8	69.5	57	1464.8	8881.6	11012.2	0.0	11879.2	0.0
0600	77.1	69.5	57	1464.8	8875.7	10956.9	0.0	11931.1	0.0
0700	78.0	69.5	57	1464.8	9345.3	11367.1	0.0	11547.1	0.0
0800	79.5	69.7	56	1464.8	14823.5	16617.1	0.0	6632.4	0.0
0900	81.6	69.8	56	1464.8	16570.0	18291.6	0.0	5064.8	0.0
1000	84.1	69.8	56	1464.8	17567.7	19246.5	0.0	4170.9	0.0
1100	86.9	69.9	56	1464.8	18644.5	20280.8	0.0	3202.6	0.0
1200	89.6	69.9	56	1464.8	19686.3	21285.1	0.0	2262.5	0.0
1300	91.6	70.2	55	1464.8	22590.8	23957.8	0.0	0.0	0.0
1400	92.9	71.3	53	1464.8	25408.6	25769.1	0.0	0.0	0.0
1500	93.4	72.4	51	1464.8	27922.6	27455.1	0.0	0.0	0.0
1600	92.9	73.1	49	1464.8	29608.3	28653.1	0.0	0.0	0.0
1700	91.7	73.3	49	1464.8	29757.3	28888.2	0.0	0.0	0.0
1800	89.9	73.0	49	1464.8	28827.1	28415.3	0.0	0.0	0.0
1900	87.8	71.6	52	1464.8	25338.2	26276.0	0.0	0.0	0.0
2000	85.6	71.2	53	1464.8	24172.3	25521.8	0.0	0.0	0.0
2100	83.8	70.0	55	1464.8	21378.7	23724.2	0.0	0.0	0.0
2200	82.1	69.9	56	1464.8	17771.0	20129.6	0.0	3344.2	0.0
2300	80.8	69.7	56	1464.8	12942.7	15374.9	0.0	7795.2	0.0

Data for July




Zone: Zone 1
Data for July
Zone Sensible
Zone Conditioning
BTU/hr
30000
25000
20000
15000
10000
5000
0
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour of Day

Air System Sizing Summary for RTU-2

Project Name: 230515-D Okeechobee Mikvah-DEHUMID
Prepared by: Deltag

10/03/2023
07:46PM

Air System Information

Air System Name	**RTU-2**		Number of zones	**1**	
Equipment Class	**PKG ROOF**		Floor Area	**2123.0**	ft²
Air System Type	**CAV/RH**		Location	**Okeechobee, Florida**	

Sizing Calculation Information

Calculation Months	**Jan to Dec**	Zone CFM Sizing	**Peak zone sensible load**
Sizing Data	**User-Modified**	Space CFM Sizing	**Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load	**14.7**	Tons	Load occurs at	**Jun 1500**	
Total coil load	**176.3**	MBH	OA DB / WB	**84.2 / 81.9**	°F
Sensible coil load	**57.7**	MBH	Entering DB / WB	**84.2 / 81.9**	°F
Coil CFM at Jun 1500	**1700**	CFM	Leaving DB / WB	**52.7 / 52.8**	°F
Max block CFM	**1700**	CFM	Coil ADP	**49.2**	°F
Sum of peak zone CFM	**1700**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.327**		Resulting RH	**60**	%
ft²/Ton	**144.5**		Design supply temp.	**53.5**	°F
BTU/(hr-ft²)	**83.0**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**N/A**		Max zone temperature deviation	**0.0**	°F

Supply Fan Sizing Data

Actual max CFM	**1700**	CFM	Fan motor BHP	**0.51**	BHP
Standard CFM	**1698**	CFM	Fan motor kW	**0.41**	kW
Actual max CFM/ft²	**0.80**	CFM/ft²	Fan static	**1.10**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**1700**	CFM	CFM/person	**48.57**	CFM/person
CFM/ft²	**0.80**	CFM/ft²			

Zone Sizing Summary for RTU-2

Project Name: 230515-D Okeechobee Mikvah-DEHUMID
Prepared by: Deltag

10/03/2023
07:46PM

Air System Information

Air System Name **RTU-2**
Equipment Class ..... **PKG ROOF**
Air System Type ..... **CAV/RH**

Number of zones **1**
Floor Area ..... **2123.0** ft²
Location ..... **Okeechobee, Florida**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **User-Modified**

Zone CFM Sizing ..... **Peak zone sensible load**
Space CFM Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	1700	1700	0.80	41.7	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	29.3	Jul 1800	18.5	2123.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
Break room	1	3.8	Jul 1800	209	1.8	86.0	2.43
Corridor 233 sf	1	2.5	Jul 1400	140	0.4	233.0	0.60
Corridor 279 sf	1	4.3	Jul 1400	238	4.6	279.0	0.85
Corridor 287 sf	1	5.2	Jul 2000	287	4.1	287.0	1.00
Electrical closet	1	0.2	Jul 1800	12	0.0	17.0	0.72
Laundry room	1	3.3	Sep 1800	183	2.5	146.0	1.25
Reception area	1	2.8	Jul 1800	153	1.5	229.0	0.67
Room X	1	0.4	Jul 1400	23	0.1	38.0	0.61
Type A prep 101	1	0.7	Jul 1400	36	0.1	89.0	0.41
Type A prep 102	1	0.7	Jul 1400	36	0.1	89.0	0.41
Type A prep 103	1	0.6	Jul 1400	35	0.1	84.0	0.41
Type A prep 104	1	0.7	Jul 1400	38	0.2	96.0	0.39
Type A prep 109	1	0.6	Jul 1400	35	0.1	85.0	0.41
Type A prep 110	1	0.7	Jul 1400	36	0.1	89.0	0.41
Type A prep 111	1	0.7	Jul 1400	36	0.1	89.0	0.41
Type A prep 112	1	0.7	Jul 1400	36	0.1	89.0	0.41
Vestibule	1	3.0	Jul 1700	166	2.4	98.0	1.69

Air System Design Load Summary for RTU-2

Project Name: 230515-D Okeechobee Mikvah-DEHUMID
Prepared by: Deltag

10/03/2023
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1500 COOLING OA DB / WB 84.2 °F / 81.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 36.4 °F / 36.1 °F		
ZONE LOADS	**Details**	**Sensible (BTU/hr)**	**Latent (BTU/hr)**	**Details**	**Sensible (BTU/hr)**	**Latent (BTU/hr)**
Window & Skylight Solar Loads	60 ft²	1187	-	60 ft²	-	-
Wall Transmission	1700 ft²	4950	-	1700 ft²	12428	-
Roof Transmission	2123 ft²	4681	-	2123 ft²	3447	-
Window Transmission	60 ft²	217	-	60 ft²	1008	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	2123 ft²	0	-	2123 ft²	1652	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1698 W	4827	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	41 W	129	-	0	0	-
People	35	8575	7175	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	3360	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**27926**	**7175**	**-**	**18534**	**0**
Zone Conditioning	-	29379	7175	-	8003	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	1700 CFM	0	-	1700 CFM	0	-
Ventilation Load	1700 CFM	26077	111454	1700 CFM	35047	0
Supply Fan Load	1700 CFM	1386	-	1700 CFM	-1386	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**56843**	**118629**	**-**	**41665**	**0**
Central Cooling Coil	-	57684	118629	-	0	0
Terminal Reheat Coils	-	-842	-	-	41665	-
>> Total Conditioning	**-**	**56843**	**118629**	**-**	**41665**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		