

Air System Design Load Summary for 22161 Kitchen RTU-1

Project Name: SONIC
Prepared by:

04/19/2022
03:02PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1600 COOLING OA DB / WB 93.4 °F / 75.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 29.6 °F / 24.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	90 ft²	724	-	90 ft²	-	-
Wall Transmission	465 ft²	444	-	465 ft²	764	-
Roof Transmission	388 ft²	458	-	388 ft²	366	-
Window Transmission	90 ft²	575	-	90 ft²	1768	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	23 ft²	199	-	23 ft²	380	-
Floor Transmission	388 ft²	0	-	388 ft²	536	-
Partitions	447 ft²	298	-	447 ft²	514	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	388 W	1324	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	10276 W	35062	-	0	0	-
People	4	980	820	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	1892	974	-	0	0
Safety Factor	10% / 10%	4195	179	5%	216	0
>> Total Zone Loads	-	46150	1973	-	4545	0
Zone Conditioning	-	46162	1973	-	5244	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	2160 CFM	0	-	2160 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Supply Fan Load	2160 CFM	0	-	2160 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	46162	1973	-	5244	0
Central Cooling Coil	-	46162	1979	-	0	0
Central Heating Coil	-	0	-	-	5244	-
>> Total Conditioning	-	46162	1979	-	5244	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Design Load Summary for 22161 Kitchen RTU-2

Project Name: SONIC
Prepared by:

04/19/2022
03:02PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1200 COOLING OA DB / WB 89.7 °F / 74.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 29.6 °F / 24.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	8 ft²	39	-	8 ft²	-	-
Wall Transmission	1397 ft²	1390	-	1397 ft²	2295	-
Roof Transmission	748 ft²	741	-	748 ft²	705	-
Window Transmission	8 ft²	36	-	8 ft²	154	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	51 ft²	140	-	51 ft²	588	-
Floor Transmission	748 ft²	0	-	748 ft²	1206	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	748 W	2552	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	19790 W	67523	-	0	0	-
People	6	1470	1230	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	22756	3223	-	0	0
Safety Factor	10% / 10%	9665	445	5%	247	0
>> Total Zone Loads	-	106312	4898	-	5194	0
Zone Conditioning	-	106763	4898	-	5209	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	4970 CFM	0	-	4970 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Supply Fan Load	4970 CFM	0	-	4970 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	106763	4898	-	5209	0
Central Cooling Coil	-	106763	4903	-	0	0
Central Heating Coil	-	0	-	-	5209	-
>> Total Conditioning	-	106763	4903	-	5209	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

JOB #: 22161
 JOB NAME: SONIC Lake City FL Site Adapt
 JOB LOCATION: Lake City, FL
 DATE: 4.19.22
 DESIGNER: RJB
 CODE USED: 2020 FL Codes

COOLING	UNIT	RTU-1	RTU-2
	ZONE	KITCHEN	KITCHEN
	LOADS		
	OA SENS LOAD (BTU/H)	22464	22464
	OA LATENT LOAD (BTU/H)	29084	29084
	OA LOAD TOTAL (BTU/H)	51548	51548
	OA LOAD TOTAL (TONS)	4.30	4.30
	INDR TOTAL LOAD (BTU/H)	48123	111210
	INDR TOTAL LOAD (TONS)	4.01	9.27
	INDR SENS LOAD (BTU/H)	46150	106312
	INDR LAT LOAD (BTU/H)	1973	4898
	10% SF SENS LOAD (BTU/H)	4195	9665
	10% SF LAT LOAD (BTU/H)	179	445
	TOTAL LOADS WITH 10% SAFETY FACTOR		
	TOTAL LOAD (TONS)	8.31	13.56
	TOTAL SENS LOAD (TONS)	5.72	10.73
	TOTAL LAT LOAD (TONS)	2.59	2.83
	TOTAL LOAD (MBH)	262.4	
	TOTAL LOADS WITH 0% SAFETY FACTOR		
	TOTAL LOAD (TONS)	7.94	12.72
TOTAL SENS LOAD (TONS)	5.37	9.93	
TOTAL LAT LOAD (TONS)	2.57	2.79	
UNIT SELECTION			
TONNAGE	12.5	12.5	
SA CFM/TON	320	320	
SA CFM	4000	4000	
OA CFM	1300	1300	
RA CFM	2700	2700	
MIXED AIR TEMPS			
DESIGN TEMP			
SUMMER MIXED AIR DB	83.2	83.2	
SUMMER MIXED AIR WB	69.6	69.6	
WINTER MIXED AIR DB	55.5	55.5	
UNIT CAPACITY			
55%RH	55%RH		
NET TOTAL CAPACITY (BTU/H)	142693	142693	
NET SENS. CAPACITY (BTU/H)	95044	95044	
NET LAT. CAPACITY (BTU/H)	47649	47649	
NET TOTAL CAPACITY (TONS)	11.89	11.89	
NET SENS. CAPACITY (TONS)	7.92	7.92	
NET LAT. CAPACITY (TONS)	3.97	3.97	
COMPARISON			
RTU-1	RTU-2		
NET UNIT CAPACITY (MINUS) TOTAL LOAD WITH 10% SF			
TOTAL (TONS)	3.59	(1.67)	
SENSIBLE (TONS)	2.20	(2.81)	
LATENT (TONS)	1.38	1.14	
NET UNIT CAPACITY (MINUS) TOTAL LOAD WITH 0% SF			
TOTAL (TONS)	3.95	(0.83)	
SENSIBLE (TONS)	2.55	(2.01)	
LATENT (TONS)	1.40	1.18	
HUMIDITY CONTROL NEEDED?	YES	YES	
0% SF TOTALS - TOTAL (TONS)	3.12		
0% SF TOTALS - SENS (TONS)	0.55		
0% SF TOTALS - LATENT (TONS)	2.57		

DP1 DP2
 64.8 64.8
 LAT1 LAT2
 60.4 60.4

1.91
 (0.61)
 2.52

HEATING

UNIT	RTU-1	RTU-2
ZONE	KITCHEN	KITCHEN
TONNAGE	12.5	12.5
SA CFM	4000	4000
OA CFM	1300	1300
LOADS (WITH 5% SF BUILT IN)		
OA SENS. LOAD (BTU/H)	53914	53914
INDR SENS. LOAD (BTU/H)	0	0
TOTAL LOAD (BTU/H)	53914	53914
TOTAL LOAD (MBH)	107.8	
UNIT CAPACITY		
AUX SIZE	MED	MED
GAS INPUT (BTU/H)	180000	180000
*GAS OUTPUT (BTU/H)	144000	144000
ELEC HEAT/HP AUX. HEAT(KW)		
HP HEAT AT AMBIENT (BTU/H)		
MIXED AIR TEMP	55.5	55.5
GAS HEAT SA TEMP	88.9	88.9
ELEC HEAT/HP AUX. HEAT SA TEMP**	55.5	55.5
HP (LOW-TEMP HEAT+AUX. HEAT) SA TEMP	55.5	55.5
COMPARISON		
TOTAL (BTU/H)	90086	90086

* DERATE GAS OUTPUT 4% FOR EVERY 1000 FT. WHEN THE ALTITUDE MEETS OR EXCEEDS 2000 FT. (EXAMPLE: DERATE 8% FOR A 2000 FT. ALTITUDE)
 ** HEAT PUMP AUX. HEAT SHOULD BE SIZED FOR SUPPLY AIR TEMP MIN. 70 DEGREES (INTERIOR ROOM CONDITION)