

Air System Design Load Summary for 22160 BOH RTU-2

Project Name: SONIC
Prepared by:

05/05/2022
01:18PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 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	0 ft²	0	-	0 ft²	-	-
Wall Transmission	736 ft²	946	-	736 ft²	1220	-
Roof Transmission	973 ft²	1201	-	973 ft²	917	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	24 ft²	90	-	24 ft²	276	-
Floor Transmission	973 ft²	0	-	973 ft²	1005	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	973 W	3320	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	5541 W	18906	-	0	0	-
People	6	1470	1230	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	9165	0	-	0	0
Safety Factor	10% / 10%	3510	123	5%	171	0
>> Total Zone Loads	-	38607	1353	-	3590	0
Zone Conditioning	-	38517	1353	-	4017	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	1799 CFM	0	-	1799 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Supply Fan Load	1799 CFM	0	-	1799 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	38517	1353	-	4017	0
Central Cooling Coil	-	38517	1367	-	0	0
Central Heating Coil	-	0	-	-	4017	-
>> Total Conditioning	-	38517	1367	-	4017	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 22160 FOH RTU-1

Project Name: SONIC
Prepared by:

05/05/2022
01:18PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 94.0 °F / 76.0 °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	434 ft²	4086	-	434 ft²	-	-
Wall Transmission	1532 ft²	2033	-	1532 ft²	2673	-
Roof Transmission	1981 ft²	2826	-	1981 ft²	1964	-
Window Transmission	434 ft²	3613	-	434 ft²	8767	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	86 ft²	1138	-	86 ft²	1933	-
Floor Transmission	1960 ft²	0	-	1960 ft²	2858	-
Partitions	172 ft²	-9	-	172 ft²	215	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1960 W	6687	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1236 W	4217	-	0	0	-
People	70	16100	8400	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	3729	1921	-	0	0
Safety Factor	10% / 10%	4442	1032	5%	920	0
>> Total Zone Loads	-	48863	11353	-	19330	0
Zone Conditioning	-	48629	11353	-	19319	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	2859 CFM	0	-	2859 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Supply Fan Load	2859 CFM	0	-	2859 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	48629	11353	-	19319	0
Central Cooling Coil	-	48629	11358	-	0	0
Central Heating Coil	-	0	-	-	19319	-
>> Total Conditioning	-	48629	11358	-	19319	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

JOB #: 22160
JOB NAME: RIBC Lake City FL Site Adapt
JOB LOCATION: Lake City, FL
DATE: 5.5.22
DESIGNER: RJB
CODE USED: 2020 FL Codes

COOLING	UNIT	RTU-1	RTU-2
	ZONE	FRONT OF HOUSE	BACK OF HOUSE
	LOADS		
	OA SENS LOAD (BTU/H)	21600	6048
	OA LATENT LOAD (BTU/H)	24820	7830
	OA LOAD TOTAL (BTU/H)	46420	13878
	OA LOAD TOTAL (TONS)	3.87	1.16
	INDR TOTAL LOAD (BTU/H)	54994	44729
	INDR TOTAL LOAD (TONS)	4.58	3.73
	INDR SENS LOAD (BTU/H)	44829	42093
	INDR LAT LOAD (BTU/H)	10165	2636
	10% SF SENS LOAD (BTU/H)	4075	3827
	10% SF LAT LOAD (BTU/H)	924	240
	TOTAL LOADS WITH 10% SAFETY FACTOR		
	TOTAL LOAD (TONS)	8.45	4.88
	TOTAL SENS LOAD (TONS)	5.54	4.01
	TOTAL LAT LOAD (TONS)	2.92	0.87
	TOTAL LOAD (MBH)	160.0	
	TOTAL LOADS WITH 0% SAFETY FACTOR		
	TOTAL LOAD (TONS)	8.03	4.55
	TOTAL SENS LOAD (TONS)	5.20	3.69
	TOTAL LAT LOAD (TONS)	2.84	0.85
	UNIT SELECTION		
	TONNAGE	10.0	8.5
	SA CFM/TON	320	320
	SA CFM	3200	2720
	OA CFM	1000	350
	RA CFM	2200	2370
	MIXED AIR TEMPS	DESIGN TEMP	
	SUMMER MIXED AIR DB	80.3	80.1
	SUMMER MIXED AIR WB	68.0	67.7
	WINTER MIXED AIR DB	57.4	63.1
	UNIT CAPACITY	60%RH	55%RH
	NET TOTAL CAPACITY (BTU/H)	112646	96672
	NET SENS. CAPACITY (BTU/H)	75776	67061
	NET LAT. CAPACITY (BTU/H)	36870	29611
	NET TOTAL CAPACITY (TONS)	9.39	8.06
	NET SENS. CAPACITY (TONS)	6.31	5.59
	NET LAT. CAPACITY (TONS)	3.07	2.47
	COMPARISON	RTU-1	RTU-2
	NET UNIT CAPACITY (MINUS) TOTAL LOAD WITH 10% SF		
	TOTAL (TONS)	0.94	3.17
	SENSIBLE (TONS)	0.78	1.58
	LATENT (TONS)	0.16	1.60
	NET UNIT CAPACITY (MINUS) TOTAL LOAD WITH 0% SF		
	TOTAL (TONS)	1.35	3.51
	SENSIBLE (TONS)	1.12	1.90
	LATENT (TONS)	0.23	1.62
	HUMIDITY CONTROL NEEDED?	YES	YES
	0% SF TOTALS - TOTAL (TONS)	4.86	
	0% SF TOTALS - SENS (TONS)	3.01	
	0% SF TOTALS - LATENT (TONS)	1.85	

DP1	DP2
63.3	62.8
LAT1	LAT2

RTU-1	RTU-2
300	320
112062	112646
73598	75776
350	300
113522	95824
79044	65068
300	320
96672	97944
67061	70050

4.11	
2.36	
1.75	

UNIT	RTU-1	RTU-2
ZONE	FRONT OF HOUSE	BACK OF HOUSE
TONNAGE	10.0	8.5
SA CFM	3200	2720
OA CFM	1000	350
LOADS (WITH 5% SF BUILT IN)		
OA SENS. LOAD (BTU/H)	43632	14515
INDR SENS. LOAD (BTU/H)	17658	5162
TOTAL LOAD (BTU/H)	61290	19677
TOTAL LOAD (MBH)	81.0	
UNIT CAPACITY		
AUX SIZE	LOW	LOW
GAS INPUT (BTU/H)	180000	125000
*GAS OUTPUT (BTU/H)	147600	102500
ELEC HEAT/HP AUX. HEAT (KW)		
HP HEAT AT AMBIENT (BTU/H)		
MIXED AIR TEMP	57.4	63.1
GAS HEAT SA TEMP	100.1	98.0
ELEC HEAT/HP AUX. HEAT SA TEMP**	57.4	63.1
HP (LOW-TEMP HEAT+AUX. HEAT) SA TEMP	57.4	63.1
COMPARISON		
TOTAL (BTU/H)	86310	82823

* 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)