# LOOPLAD<sup>® 2021</sup>

# Load Report

Manual J8 Load Calculation

Project #:1

Project Information						
roject #: 1			Notes:			
ame: Post Office Road						
ocation: Waitsfield						
Ianual J Load Summary						
Total Heating: 34,174 Btu/hr	Total Sensibl	le: 12,431 Btu/hr	Total Latent: 2,428	Btu/hr		
Outdoor Conditions			Indoor Conditions			
Location:	Morri	sville-Stowe State		Heating	Cooling	
		AP,Vermont	Room Temp:	65 - 68 °F	65 - 75 °F	
Elevation:		132	Design Temp Diff:	76.0 °F	7.4 °F	
Lautude.	Heating	Cooling	Humidity:	35	50	
Dry Bulb	-8.0 °F	82.4 °F	Moisture Diff (Grains):		19.1	
Daily Range:	0.0 1	Medium				
Wet Bulb:		68.6 °F				
Infiltration			Ventilation			
Method:		Simple	Num Occupants:	4		
Stories:		. 1	·	Heating		Cooling
Construction:		Tight	Туре:	Heat Recovery	Туре:	Heat Recovery
Exposure Category:	Three	or Four Exposures	ACH:	0.29	ACH:	0.30
Num Fireplaces:		None	Outside Air:	108 cfm	Outside Air:	108 cfm
Net Air Changes (Heat/Cool):		0.11 / 0.06	Sensible Eff:	50 %	Sensible Eff:	50 %
Net Flow (Heat/Cool):		40 cfm / 21 cfm				
Floorplan/Levels						
Basement		993 ft <sup>2</sup>	Total Heated Area:	3,136 ft <sup>2</sup>		
Main Floor		1,336 ft <sup>2</sup>	Total Cooled Area:	3,092 ft <sup>2</sup>		
Second Floor		807 ft <sup>2</sup>				

(1)  $\Delta T$ : Difference between supply air and return air (2) Estimated air flow based on specified supply air  $\Delta T$ 

Length = ft Area = ft<sup>2</sup> Temperature = °F Flowrate = USGPM Air Flow = cfm Heat Loss = Btu/hr Unit Heat Loss = Btu/(hr·ft<sup>2</sup>) Rv = hr·ft<sup>2</sup>·°F/btu Head Loss = ft water RH = Radiant Floor Heating BB = Baseboard FA = Forced Air OTH = Other Heating SM = Snowmelt N = Not Heated

#### Project #:1

## Constructions

#### Walls

Code	Description	U-Value	Area	Heating	Cooling
Custom		0.029	222	0	0
Custom		0.029	902	2,016	0
Custom		0.033	276	700	28
Custom		0.029	1,898	4,230	255
Custom		0.029	410	0	4

#### **Below Grade Walls**

Code	Description	U-Value	Area	Heating	Cooling
Custom (6 ft)		0.033	569	1,034	0

#### Floors

Code	Description	U-Value	Area	Heating	Cooling
21B-24-r	Embedded Slab -	0.100	993	1,704	0
Concrete Thin Slab-r	Concrete Thin Slab -	0.159	349	5,592	133
Concrete Thin Slab-r	Concrete Thin Slab -	0.159	44	174	17

## Ceilings

Code	Description	U-Value	Area	Heating	Cooling
16A-56md	No radiant barrier over ceiling or same type of air space behind an attic knee wall; R-56 Insulation; Materials: Asphalt Shingles(a), Metal(m), Wood Shakes(w), Tar / Gravel(x), Membrane(z), Tile, Slate or Concrete; Colors: Dark(d), Light(I), White(w);	0.018	1,339	1,832	1,505

Rv = hr·ft<sup>2.</sup>°F/btu N = Not Heated

# Glazing

#### Windows

Code	Description	Exposure	U-Value	SHGC	Area	Heating	Cooling
Custom	, BlindsMedium45 (50%), 1', 1' above.	E	0.20	0.27	63	959	1,346
Custom	, BlindsMedium45 (50%), 1', 1' above.	N	0.20	0.26	18	0	76
Custom	, BlindsMedium45 (50%), 1', 1' above.	N	0.20	0.26	125	1,907	534
Custom	, BlindsMedium45 (50%), 1', 1' above.	E	0.20	0.26	20	304	412
Custom	, BlindsMedium45 (50%), 1', 1' above.	N	0.20	0.27	63	955	274
Custom	, BlindsMedium45 (50%), 1', 1' above.	N	0.20	0.26	36	0	170
Custom	, BlindsMedium45 (50%), 1', 1' above.	E	0.20	0.27	16	234	373
Custom	, BlindsMedium45 (50%), 2'-6", 1' above.	S	0.20	0.27	47	681	371
Custom	, BlindsMedium45 (50%), 1', 1' above.	W	0.20	0.26	40	608	823
Custom	, BlindsMedium45 (50%), 1', 1' above.	N	0.20	0.26	36	0	99
Custom	, BlindsMedium45 (50%), 1', 1' above.	S	0.20	0.27	11	162	92
Custom	, BlindsMedium45 (50%), 2'-6", 1' above.	S	0.20	0.27	109	1,655	647
Custom	, BlindsMedium45 (50%), 2'-6", 1' above.	S	0.20	0.27	96	1,459	419
Custom	, BlindsMedium45 (50%), 1', 1' above.	W	0.20	0.27	20	311	436

#### Internal Loads

Description	Sensible	Latent
Default (1,200 Btuh)	1,200	0
4 Occupants:	920	800
Total	2,120	800

#### **Other Loads**

Blower Load

1,706 Btu/hr

#### Load Breakdown

Name	Heating	Sensible	Latent
Windows*	9,236	6,070	
Skylights*	0	0	
Doors	0	0	
Walls	6,946	287	
Below Grade Walls	1,034		
Ceilings	1,832	1,505	
Floors	0	150	
Infiltration	3,252	165	262
Internal		2,120	800
Other	0		
Duct Loads	0	0	0
Ventilation	4,403	429	1,366
Humidification	0		
Piping Load	0		
Radiant Back Loss	7,471		
Blower Heat		1,706	
AED*		0	
Total	34,174	12,431	2,428
Total Area	3,136 ft <sup>2</sup>	3,092 ft <sup>2</sup>	

\*Average Load Procedure

Heating ΔT <sup>1</sup> : 70.0	JSHR: 0.84
Cooling ΔT <sup>1</sup> : 20.0	MJ8 Tons: 1.24
Est. Heating CFM <sup>2</sup> : 0	SqFt/Ton: 2497
Est. Cooling CFM <sup>2</sup> : 479	CFM/SqFt: 0.15

#### Heating Load Breakdown



Sensible Load Breakdown



(1)  $\Delta T$ : Difference between supply air and return air(2) Estimated air flow based on specified supply air  $\Delta T$ Length = ft Area = ft²Temperature = °FFlowrate = USGPMAir Flow = cfmHeat Loss = Btu/hrUnit Heat Loss = Btu/(hr·ft²)Rv = hr·ft²·°F/btuHead Loss = ft waterRH = Radiant Floor HeatingBB = BaseboardFA = Forced AirOTH = Other HeatingSM = SnowmeltN = Not Heated

#### AED





Average Load: 9,735 Btu/hr Excursion Limit: 12,656 Btu/hr Peak Load: 11,880 Btu/hr AED Load: 0 Btu/hr

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Zone	Area	Room Temp	Total Load
Zone 101	993	68	7,919
Zone 201	1,336	65 - 68	17,667
Zone 301	807	68	8,588

# **Heating Rooms**

Room	Area	Room Temp	Total Load*
Bathroom	50	68	457
Bathroom	54	68	414
Bedroom 2	165	68	2,289
Bedroom 4	171	68	1,606
Dining Room	135	68	2,727
Foyer	199	68	887
Hallway	163	68	756
Kitchen	249	68	4,919
Living Room	184	68	2,611
Master Bathroom	123	68	1,207
Master Bedroom	200	65	1,749
Office	102	68	1,155
Office	202	68	2,587
Powder Room	49	68	628
Room 1	53	68	935
Room 1	203	68	947
Room 2	142	68	1,262
Room 3	44	68	141
Room 3	95	68	2,371
Room 5	173	68	1,669
Room 6	84	68	315
Room 6	278	68	2,287
Room 7	18	68	255

\* The sum of room loads may not be equal to the project total due to additional system loads.

# **Cooling Zones**

Zone	Area	Room Temp	AED	Sensible Load
Entire Building	3,092	65 - 75	YES	10,296

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See end of report for important Notes and Disclaimers.

#### Project #:1

(Average Load Procedure)

#### **Cooling Rooms**

Room	Area	Room Temp	AED	Sensible Load*
Bathroom	50	75	YES	37
Bathroom	54	75	YES	98
Bedroom 2	165	75	NO	963
Bedroom 4	171	75	YES	490
Dining Room	135	75	NO	977
Foyer	199	75	YES	252
Hallway	163	75	YES	294
Kitchen	249	75	NO	1,620
Living Room	184	75	NO	2,308
Master Bathroom	123	75	NO	488
Master Bedroom	200	65	NO	1,401
Office	202	75	NO	940
Office	102	75	NO	994
Powder Room	49	75	YES	127
Room 1	53	75	YES	125
Room 1	203	75	YES	139
Room 2	142	75	NO	1,021
Room 3	95	75	NO	997
Room 5	173	75	NO	916
Room 6	84	75	YES	149
Room 6	278	75	YES	353
Room 7	18	75	NO	200

\* (Average Load Procedure) The sum of room loads may not equal the project total due to variations in solar gain and system loads.

# Warnings

The sensible load for some rooms peak during late fall or early winter. This behavior is caused by glass that faces South East, South or South West. Room temperature may be difficult to control if zoning is not provided.

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