

### Project Information

Project #: 45  
Name: 54  
Location: tinmouth

Notes:

### Manual J Load Summary

**Total Heating: 18,499 Btu/hr**      **Total Sensible: 12,330 Btu/hr**      **Total Latent: 1,587 Btu/hr**

#### Outdoor Conditions

Location: (User Specified)  
Tinmouth, Vermont  
Elevation: 1400'  
Latitude: 43.52  
Dry Bulb: Heating -3.0 °F      Cooling 82.2 °F  
Daily Range: Medium  
Wet Bulb: 68.6 °F

#### Indoor Conditions

	Heating	Cooling
Room Temp:	68 °F	76 °F
Design Temp Diff:	71.0 °F	6.2 °F
Humidity:	35	50
Moisture Diff (Grains):		18.1

#### Infiltration

Method: Maximum ACH50  
Stories: 1  
Exposure Category: One or Two Exposures  
Wind Shielding: 4 - Mostly Shielded Exposures  
Max ACH50: 0.80  
Net Air Changes (Heat/Cool): 0.07 / 0.03  
Net Flow (Heat/Cool): 17 cfm / 7 cfm

#### Ventilation

	Heating	Cooling
Num Occupants:	4	
Type:	Heat Recovery	Heat Recovery
ACH:	0.26	0.26
Outside Air:	60 cfm	60 cfm
Sensible Eff:	50 %	50 %

#### Floorplan/Levels

Basement	981 ft <sup>2</sup>	Total Heated Area:	1,973 ft <sup>2</sup>
Main Floor	992 ft <sup>2</sup>	Total Cooled Area:	1,973 ft <sup>2</sup>

(1) ΔT: Difference between supply air and return air      (2) Estimated air flow based on specified supply air ΔT  
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

**Constructions**

**Walls**

Code	Description	U-Value	Area	Heating	Cooling
Custom		0.033	223	527	29
Custom		0.030	244	526	29
wall		0.030	1,006	2,163	262

**Below Grade Walls**

Code	Description	U-Value	Area	Heating	Cooling
Custom (8 ft)		0.033	300	439	0
Custom (6 ft)		0.033	148	231	0

**Doors**

Code	Description	U-Value	Area	Heating	Cooling
11F	Wood Door with Solid Core with Metal Storm	0.280	20	398	96

**Floors**

Code	Description	U-Value	Area	Heating	Cooling
21B-24p		0.060	981	1,184	0
20P-10cp	Carpet or Hardwood Cover; R-10 board Insulation	0.081	11	65	1

**Ceilings**

Code	Description	U-Value	Area	Heating	Cooling
Custom	Insulated Ceiling Under Attic or Attic Knee Wall (Vented); R-63 Insulation; Roof Material: Metal; Roof Color: Light Color or Unpainted;	0.018	504	627	275
Custom	Insulated Ceiling Under Attic or Attic Knee Wall (Vented); R-60 Insulation; Roof Material: Metal; Roof Color: Light Color or Unpainted;	0.018	488	637	280

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**Glazing**

**Windows**

Code	Description	Exposure	U-Value	SHGC	Area	Heating	Cooling
10Bw	French Door with Double Pane Clear Glass and Wood, Wood with Metal Clad or Vinyl Frame, 1', 1' above.	E	0.60	0.39	40	1,704	1,609
1D-cw	Double pane operable window or sliding glass door, with Clear Glass - Wood, Wood with Metal Clad or Vinyl Framing, 1', 1' above.	W	0.57	0.56	40	1,619	2,237
Custom	, BlindsMedium45 (50%), 1', 1' above.	S	0.29	0.39	29	604	314
Custom	, BlindsMedium45 (50%), 1', 1' above.	N	0.29	0.39	24	494	134
Custom	, BlindsMedium45 (50%), 1', 1' above., GreenGrass	E	0.29	0.39	32	659	954
Custom	, BlindsMedium45 (50%), 1', 1' above.	E	0.29	0.39	20	412	556
Custom	, BlindsMedium45 (50%), Outside (100%), 8', 1' above., GreenGrass	W	0.29	0.39	20	412	89
Custom	, BlindsMedium45 (50%), Outside (100%), 1', 1' above., GreenGrass	E	0.29	0.39	20	412	485
Custom	, BlindsLight (50%), Outside (100%), 3', 2' above., GreenGrass	S	0.29	0.39	20	412	83
Custom	, BlindsMedium45 (50%), Outside (100%), 1', 1' above., GreenGrass	S	0.29	0.39	20	412	199
Custom	, BlindsMedium45 (50%), Outside (100%), 1', 1' above., GreenGrass	S	0.29	0.39	13	261	126
Custom	, BlindsMedium45 (50%), 1', 1' above., GreenGrass	N	0.29	0.39	12	247	67
Custom	, 1', 1' above., GreenGrass	E	0.29	0.39	16	329	645
Custom	, BlindsMedium45 (50%), 1', 1' above., GreenGrass	W	0.29	0.39	10	206	298

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**Internal Loads**

Description	Sensible	Latent
Scenario 1 (2,400 Btuh)	2,400	0
4 Occupants:	920	800
<b>Total</b>	<b>3,320</b>	<b>800</b>

(1)  $\Delta T$ : Difference between supply air and return air  
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

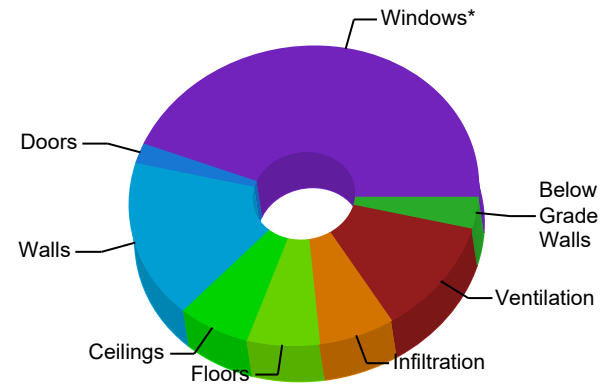
**Load Breakdown**

Name	Heating	Sensible	Latent
Windows*	8,182	7,797	
Skylights*	0	0	
Doors	398	96	
Walls	3,216	320	
Below Grade Walls	669		
Ceilings	1,264	555	
Floors	1,249	1	
Infiltration	1,280	45	81
Internal		3,320	800
Other	0		
Duct Loads	0	0	0
Ventilation	2,242	196	706
Humidification	0		
Piping Load	0		
Radiant Back Loss	0		
Blower Heat		0	
AED*		0	
<b>Total</b>	<b>18,499</b>	<b>12,330</b>	<b>1,587</b>
<b>Total Area</b>	<b>1,973 ft²</b>	<b>1,973 ft²</b>	

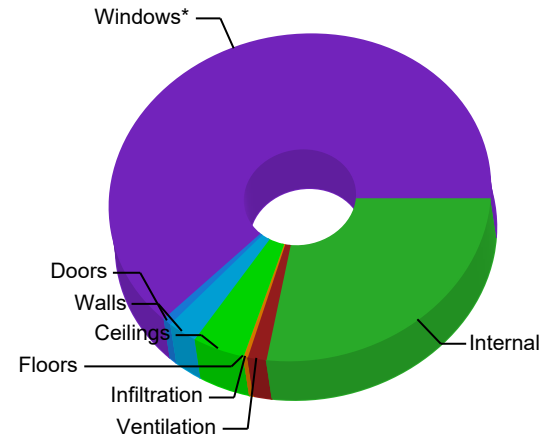
\*Average Load Procedure

Heating  $\Delta T^1$ : 70.0      JSHR: 0.89  
 Cooling  $\Delta T^1$ : 18.0      MJ8 Tons: 1.16  
 Est. Heating CFM²: 0      SqFt/Ton: 1701  
 Est. Cooling CFM²: 640      CFM/SqFt: 0.32

**Heating Load Breakdown**



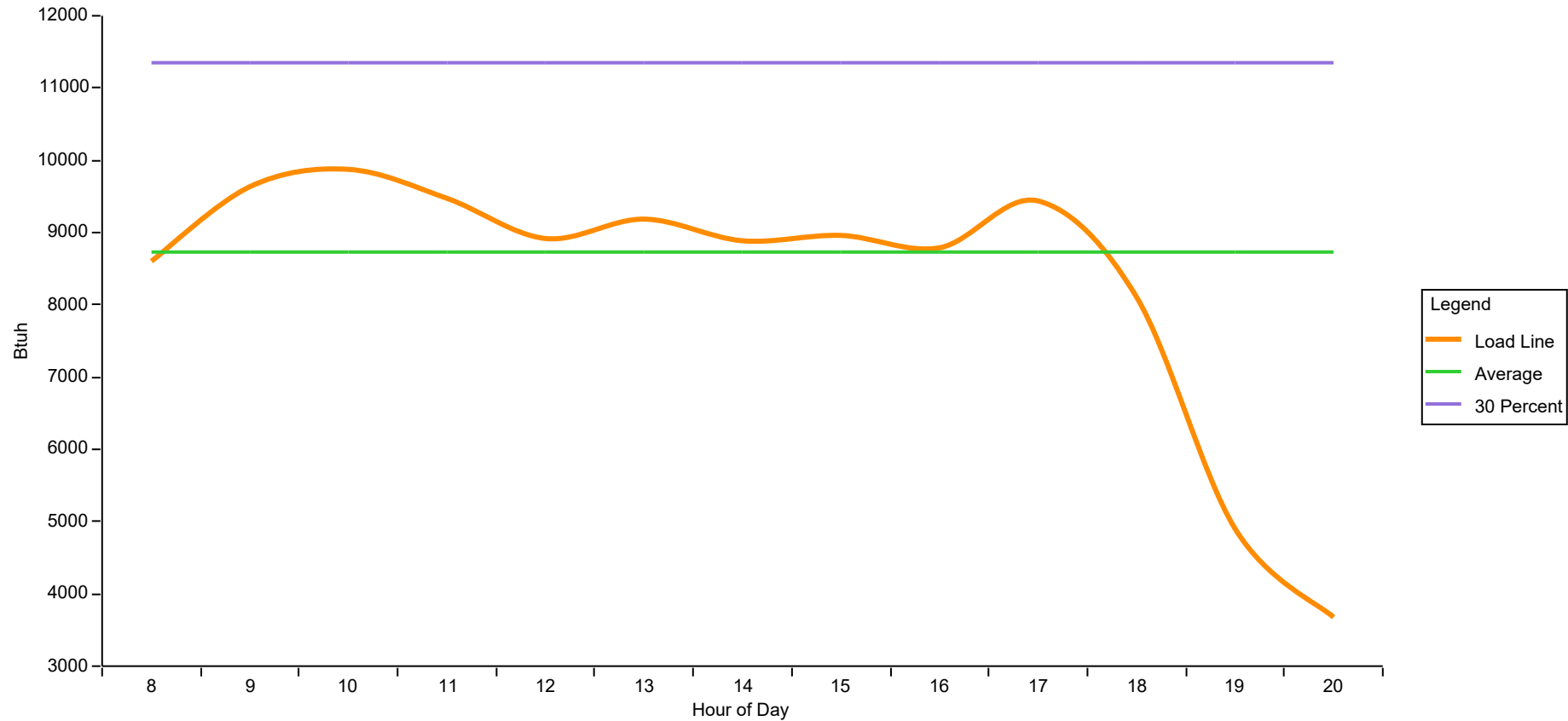
**Sensible Load Breakdown**



(1)  $\Delta T$ : Difference between supply air and return air      (2) Estimated air flow based on specified supply air  $\Delta T$   
 Length = ft   Area = ft²   Temperature = °F   Flowrate = USGPM   Air Flow = cfm   Heat Loss = Btu/hr   Unit Heat Loss = Btu/hr-ft²   Rv = hr-ft²-°F/btu  
 Head Loss = ft water   RH = Radiant Floor Heating   BB = Baseboard   FA = Forced Air   OTH = Other Heating   SM = Snowmelt   N = Not Heated

**AED**

**Fenestration Load vs Hour of Day - Block Load (Summer)**



Average Load: 8,731 Btu/hr  
Excursion Limit: 11,350 Btu/hr

Peak Load: 9,875 Btu/hr  
AED Load: 0 Btu/hr

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**Heating Zones**

Zone	Area	Room Temp	Total Load
Zone 101	981	68	7,637
Zone 201	488	68	4,789
Zone 202	504	68	6,073

**Heating Rooms**

Room	Area	Room Temp	Total Load
Bathroom	62	68	602
Closet	33	68	213
Kitchen	74	68	804
Living Room	504	68	6,073
Mudroom	185	68	1,674
Office	128	68	1,482
Pantry	5	68	14
Room 1	178	68	955
Room 2	242	68	1,798
Room 3	137	68	470
Room 4	45	68	317
Room 5	380	68	4,098

**Cooling Zones**

Zone	Area	Room Temp	AED	Sensible Load
Entire Building	1,973	76	YES	12,135

(Average Load Procedure)

**Cooling Rooms**

Room	Area	Room Temp	AED	Sensible Load
Bathroom	62	76	NO	719
Closet	33	76	YES	88
Kitchen	74	76	NO	962
Living Room	504	76	NO	5,412
Mudroom	185	76	YES	633
Office	128	76	NO	1,225
Pantry	5	76	YES	12
Room 1	178	76	NO	620
Room 2	242	76	NO	1,324

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 Head Loss = ft water   RH = Radiant Floor Heating   BB = Baseboard   FA = Forced Air   OTH = Other Heating   SM = Snowmelt   N = Not Heated

Room 3	137	76	YES	231
Room 4	45	76	YES	79
Room 5	380	76	NO	3,518

(Average Load Procedure)



## 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.

The ventilation rate for the building is less than the Manual J recommended value of 82 CFM.

## Design Locaton

Location:	Tinmouth	Altitude:	1400' ft
Province/State:	Vermont	Latitude:	43.52
Country:	United States		
Outdoor Heating Design Temp:	-3.0 °F	Wet Bulb Temperature:	68.6 °F
Outdoor Cooling Design Temp:	82.2 °F	Daily Range:	Medium
MJ8Custom			

## Disclaimers

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