HeatCAD[®] 2021

Load Summary

Manual J8 Load Calculation

December 31, 2021

Project #: Name: Location: Outdoor Conditions Location: Elevation: Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663 Total Latent: 3,677 Btr	4 - Mostly S Btu/hr	ine Lincoln NE Lincoln Municipal AP,Nebraska 1188 41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 0.08/0.00 29 cfm/0 cfm	Indoor Conditions Room Temp: Design Temp Diff: Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust:	Heating 68 °F 68.0 °F 35	Cooling 75 °F 19.0 °F 50 32.2 7 Heating Outside Air 0.23 79 cfm 0 cfm	Floorplan/Levels Basement Main Floor Total Heated Area: Total Cooled Area: Type: ACH: Outside Air: Other Exhaust:	1,084 ft² 1,381 ft² 2,465 ft² 2,465 ft² Cooling Outside Air 0.23 79 cfm 0 cfm
Location: Outdoor Conditions Location: Elevation: Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	Lincoln NE Lincoln Municipa AP,Nebraska 1188 41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	 Room Temp: Design Temp Diff: Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust: 	68 °F 68.0 °F	75 °F 19.0 °F 50 32.2 7 Heating Outside Air 0.23 79 cfm	Basement Main Floor Total Heated Area: Total Cooled Area: Type: ACH: Outside Air:	1,381 ft² 2,465 ft² 2,465 ft² Cooling Outside Air 0.23 79 cfm
Outdoor Conditions Location: Elevation: Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	Lincoln Municipal AP,Nebraska 1188 41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	 Room Temp: Design Temp Diff: Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust: 	68 °F 68.0 °F	75 °F 19.0 °F 50 32.2 7 Heating Outside Air 0.23 79 cfm	Basement Main Floor Total Heated Area: Total Cooled Area: Type: ACH: Outside Air:	1,381 ft² 2,465 ft² 2,465 ft² Cooling Outside Air 0.23 79 cfm
Location: Elevation: Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	AP,Nebraska 1188 41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	 Room Temp: Design Temp Diff: Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust: 	68 °F 68.0 °F	75 °F 19.0 °F 50 32.2 7 Heating Outside Air 0.23 79 cfm	Basement Main Floor Total Heated Area: Total Cooled Area: Type: ACH: Outside Air:	1,381 ft² 2,465 ft² 2,465 ft² Cooling Outside Air 0.23 79 cfm
Location: Elevation: Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	AP,Nebraska 1188 41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	 Room Temp: Design Temp Diff: Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust: 	68 °F 68.0 °F	75 °F 19.0 °F 50 32.2 7 Heating Outside Air 0.23 79 cfm	Basement Main Floor Total Heated Area: Total Cooled Area: Type: ACH: Outside Air:	1,381 ft² 2,465 ft² 2,465 ft² Cooling Outside Air 0.23 79 cfm
Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	1188 41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Design Temp Diff: Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust:	68.0 °F	19.0 °F 50 32.2 7 Heating Outside Air 0.23 79 cfm	Total Heated Area: Total Cooled Area: Type: ACH: Outside Air:	2,465 ft ² 2,465 ft ² Cooling Outside Air 0.23 79 cfm
Latitude: Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	41 Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Humidity: Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust:		50 32.2 7 Heating Outside Air 0.23 79 cfm	Total Cooled Area: Type: ACH: Outside Air:	2,465 ft ² Cooling Outside Air 0.23 79 cfm
Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	Cooling 94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Moisture Diff (Grains): Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust:	35	32.2 7 Heating Outside Air 0.23 79 cfm	Total Cooled Area: Type: ACH: Outside Air:	2,465 ft ² Cooling Outside Air 0.23 79 cfm
Dry Bulb: Daily Range: Wet Bulb: Infiltration Method: Stories: Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Total Heating: 34,331 Total Sensible: 13,663	0.0 °F Three 4 - Mostly S Btu/hr	94.0 °F Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Ventilation Num Occupants: Type: ACH: Outside Air: Other Exhaust:		7 Heating Outside Air 0.23 79 cfm	Type: ACH: Outside Air:	Cooling Outside Air 0.23 79 cfm
Daily Range: Net Bulb: nfiltration Method: Stories: Exposure Category: Vind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	Three 4 - Mostly S Btu/hr	Medium 74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Ventriation Num Occupants: Type: ACH: Outside Air: Other Exhaust:		Heating Outside Air 0.23 79 cfm	ACH: Outside Air:	Outside Air 0.23 79 cfm
Vet Bulb: nfiltration Method: Stories: Exposure Category: Vind Shielding: Max ACH50: Met Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	4 - Mostly S Btu/hr	74.0 °F Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Type: ACH: Outside Air: Other Exhaust:		Heating Outside Air 0.23 79 cfm	ACH: Outside Air:	Outside Air 0.23 79 cfm
nfiltration Method: Stories: Exposure Category: Vind Shielding: Max ACH50: Met Air Changes (H/C): Met Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	4 - Mostly S Btu/hr	Maximum ACH50 2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Type: ACH: Outside Air: Other Exhaust:		Outside Air 0.23 79 cfm	ACH: Outside Air:	Outside Air 0.23 79 cfm
Alethod: Stories: Exposure Category: Vind Shielding: Aax ACH50: Net Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	4 - Mostly S Btu/hr	2 or Four Exposures hielded Exposures 2.50 0.08/0.00	ACH: Outside Air: Other Exhaust:		0.23 79 cfm	ACH: Outside Air:	0.23 79 cfm
Stories: Exposure Category: Vind Shielding: Aax ACH50: Vet Air Changes (H/C): Vet Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	4 - Mostly S Btu/hr	2 or Four Exposures hielded Exposures 2.50 0.08/0.00	Outside Air: Other Exhaust:		79 cfm	Outside Air:	79 cfm
Exposure Category: Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	4 - Mostly S Btu/hr	or Four Exposures hielded Exposures 2.50 0.08/0.00	Other Exhaust:				
Vind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	4 - Mostly S Btu/hr	hielded Exposures 2.50 0.08/0.00)))		0 cfm	Other Exhaust:	0 cfm
Wind Shielding: Max ACH50: Net Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663	Btu/hr	2.50 0.08/0.00))				
Net Air Changes (H/C): Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663		0.08/0.00) 1				
Net Flow (H/C): Fotal Heating: 34,331 Fotal Sensible: 13,663			1				
Fotal Heating: 34,331 Fotal Sensible: 13,663		29 cfm/0 cfm					
otal Sensible: 13,663			Heating				
Name H	leating Ser	sible Latent	1		- Doors		Window
Vindows*	3,331 1,	631	Ceilings		Windows* Below		
Skylights*	0	0			Grade	Ceilings —	AED*
Doors	521 2	260			Walls		Blower H
Walls 1	10,811 3,	892			Ventilation	Floors -	
Below Grade Walls	523		Floors			Ventilation	
Ceilings	3,318 2,	.021		Infiltration			Internal
Floors	7,984 2	217					
nfiltration	2,119	0 0	Fenestra	tion Load v	s Hour of	Day - Block Load (Sur	nmer)
nternal	3,	160 2,000					
Other	0		4000				
Duct Loads	0	0 0	4000 -				
	-	600 1,677	1				
Humidification	0	,	3000 -				Logond
Piping Load	0						Legend
Radiant Back Loss	0		Btuh				Load Line
Blower Heat		512					- Average
AED*		371	2000 -			\	Ũ
		663 3,677					— 30 Percent
		65 ft ²	1000-				
Average Load Procedure	,400 II ⁻ 2,4	00 II ⁻	8 9	10 11 12	13 14 15 Hour of Day	16 17 18 19 20	
		SHR: 0.79			nour or Day		
		J8 Tons: 1.45 gFt/Ton: 1706	Average Load: 2,673 E	tu/hr		Peak Load: 3,846 Btu/hr	
Heating ΔT^1 : 20.0 Cooling ΔT^1 : 22.0 Est. Heating CFM ² : 1350						AED Load: 371 Btu/hr	

CFM/SqFt: 0.20 (1) ΔT : Difference between supply air and return air (2) Estimated air flow based on specified supply air ΔT

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

Created Using HeatCAD 2021 (1/1/2022) Version:21.0.0780 R (Trial)

See sections at end of report for important Notes, Assumptions and Disclaimers.

Warnings

This application has glass areas that produced relatively large cooling loads for part of the day. Zoning may be required to overcome spikes in solar load for one or more rooms. A zoned system may be required or some rooms may require zone control (provided by individual, motorized, thermostatically controlled dampers).

This application has glass areas that produced large cooling loads for part of the day. Zoning may be required to overcome solar load spikes for one or more rooms. Consider a zoned system, or provide zone control (individual, motorized, thermostatically controlled dampers) for problem room. Single speed equipment may not be suitable for the application.

This application has glass areas that produced relatively large cooling loads for part of the day. Zoning may be required to overcome spikes in solar load for one or more rooms. A zoned system may be required or some rooms may require zone control (provided by individual, motorized, thermostatically controlled dampers).

This application has glass areas that produced large cooling loads for part of the day. Zoning may be required to overcome solar load spikes for one or more rooms. Consider a zoned system, or provide zone control (individual, motorized, thermostatically controlled dampers) for problem room. Single speed equipment may not be suitable for the application.

Disclaimers

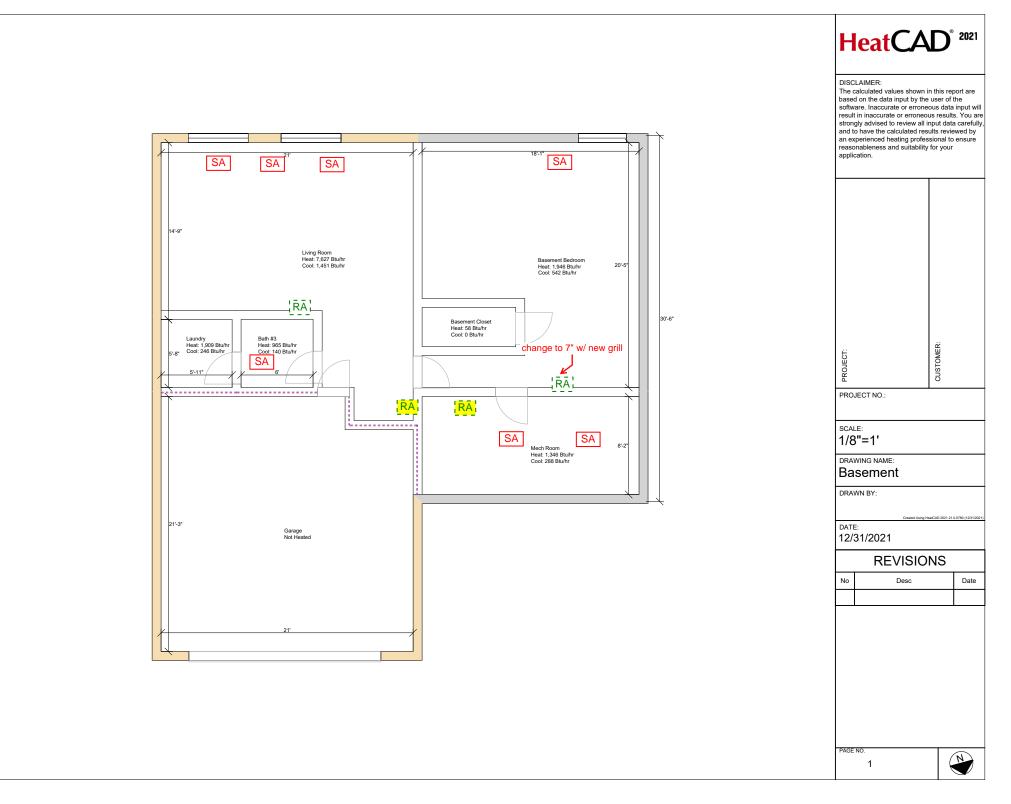
With the permission of the Air Conditioning Contractors of America ("ACCA"), material is reproduced from Manual J Residential Load Calculation (8th Edition) which is copyrighted by ACCA. The program and data are provided "as is" without warrantly of any kind either expressed or implied. The entire risk as the quality and performance of the program and data is with you. In no event will ACCA be liable to you for any damages, including without limitation any lost profits, lost savings, or other incidental or consequential damages arising out of the use or inability to use this program or the data. © 2015 Air Conditioning Contractors of America. All Rights Reserved. www.acca.org

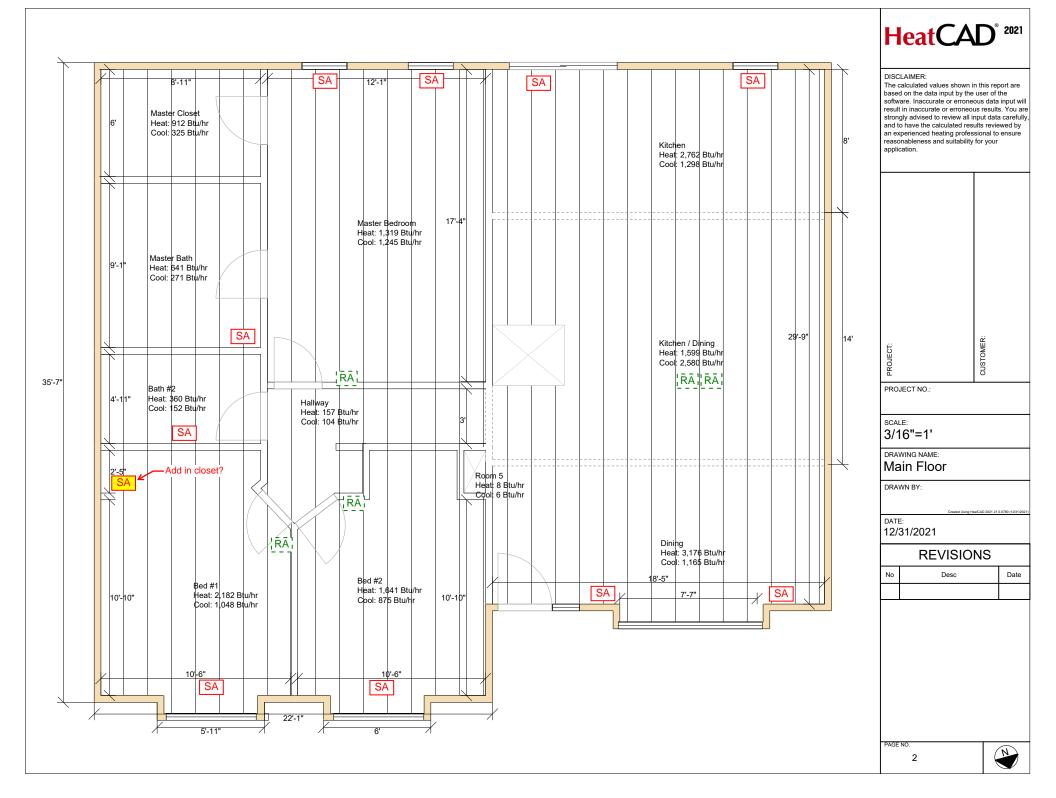
ACCA, Manual J and Powered by ACCA Manual J are registered trademarks of the Air Conditioning Contractors of America. All rights reserved.

Cold weather humidification, or some lifestyles that produce excessive moisture, may cause condensation to occur if the absolute humidity of the indoor air is too high for the momentary circumstances. Condensation can occur on surfaces or concealed within the structure, and can lead to mold, mildew, frost damage, and moisture damage. The software does not perform calculations for the estimation or detection of possible condensation problems, and it is the designers (i.e. software users) responsibility to do so independently if required. For guidance and additional cautions refer to ACCA Manual J 8th Edition, including Section 1-11 and Section 27.

The calculated values shown in this report are based on the data input by the user of the software. Inaccurate or erroneous data input will result in inaccurate or erroneous results. You are strongly advised to review all input data carefully, and to have the calculated results reviewed by an experienced heating professional to ensure reasonableness and suitability for your application.

IN NO EVENT WILL AVENIR SOFTWARE INC. ("AVENIR") OR ITS AFFILIATES BE LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT OR SPECIAL OR PUNITIVE DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION OR DATA AND THE LIKE), EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. AVENIR'S CUMULATIVE LIABILITY FROM ANY CAUSE RELATED TO OR ARISING FROM THE USE THIS REPORT, AND REGARDLESS OF THE FORM OF THE ACTION, SHALL BE LIMITED TO NO GREATER THAN THE AMOUNT OF FEES PAID TO AVENIR UNDER THE SOFTWARE LICENSE AGREEMENT.





HeatCAD[®] 2021

Load Report

Manual J8 Load Calculation

December 31, 2021

Project Information					
roject #:		Notes:			
ame: line					
ocation: Linc	oln NE				
Ianual J Load Summary					
Total Heating: 34,331 Btu/hr	Total Sensible: 13,663 Btu/h	r Total Latent: 3,677 B	8tu/hr		
Outdoor Conditions		Indoor Conditions			
Location:	Lincoln Municipal		Heating	Cooling	
	AP,Nebraska	Room Temp:	68 °F	75 °F	
Elevation:	1188'	Design Temp Diff:	68.0 °F	19.0 °F	
Latitude:	41	Humidity:	35	50	
Der a Daalle a	Heating Cooling	Moisture Diff (Grains):		32.2	
Dry Bulb:	0.0 °F 94.0 °F				
Daily Range: Wet Bulb:	Medium				
	74.0 °F				
Infiltration		Ventilation			
Method:	Maximum ACH50	Num Occupants:	7		
Stories:	2		Heating		Cooling
Exposure Category:	Three or Four Exposures	Туре:	Outside Air	Туре:	Outside Air
Wind Shielding:	4 - Mostly Shielded Exposures	ACH:	0.23	ACH:	0.23
Max ACH50:	2.50	Outside Air:	79 cfm	Outside Air:	79 cfm
Net Air Changes (Heat/Cool):	0.08 / 0.00	Other Exhaust:	0 cfm	Other Exhaust:	0 cfm
Net Flow (Heat/Cool):	29 cfm / 0 cfm				
Floorplan/Levels					
Basement	1,084 ft²	Total Heated Area:	2,465 ft ²		
Main Floor	1,381 ft²	Total Cooled Area:	2,465 ft ²		

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

Created Using HeatCAD 2021 (1/1/2022) Version:21.0.0780 R (Trial)

See end of report for important Notes and Disclaimers.

Project #:

Constructions

Walls

Code	Description	R-Value	Area	Heating	Cooling
Basement Brick		19.6	169	587	263
Basement Mech Wall		25.0	55	140	57
Basement Mech Wall		25.0	46	126	57
B1	Basement Wall	39.5	188	324	112
2x4 GWB Garage		11.2	203	1,140	467
2x4 Vinyl Siding	2x4, R-13 w/ R1.2 blackjack sheathing & Vinyl Siding	12.8	1,599	8,494	2,935

Below Grade Walls

Code	Description	R-Value	Area	Heating	Cooling
Basement Brick (4 ft)		19.6	75	187	0
Basement Brick (2 ft)		19.6	125	336	0

Doors

Code	Description	R-Value	Area	Heating	Cooling
110	Metal Door with Polystyrene Core with Storm	4.8	18	235	134
110	Metal Door with Polystyrene Core with Storm	4.8	20	286	126

Floors

Code	Description	R-Value	Area	Heating	Cooling
21A-24p		1.5	592	1,007	0
22A-0p	22A - No Edge Insulation, No insulation Below Floor, any Floor Cover	0.0	61'- 5" (P)	5,671	0
22A-2p	22A - No Edge Insulation, No insulation Below Floor, any Floor Cover	1.5	6'-9" (P)	623	0
Garage Ceilingp	includes carpet Value	28.5	309	682	217

Ceilings

Code	Description	R-Value	Area	Heating	Cooling
Attic - Cellulose (11")	11" thick, R-36.8	36.9	812	1,498	1,190
Baseline Attic	R-38 cellulose (11" settled height)	36.4	260	486	243
Vaulted Ceilings	Ceiling Below Roof Joists; R-18.5 Insulation; Roof Material: Asphalt Shingles; Roof Color: Dark;	16.9	331	1,334	589

(1) ΔT : Difference between supply air and return air(2) Estimated air flow based on specified supply air ΔT Length = ft Area = ft²Temperature = °FFlowrate = USGPMAir Flow = cfmHeat Loss = Btu/hrUnit Heat Loss = Btu/(hr·ft²)Head Loss = ft waterRH = Radiant Floor HeatingBB = BaseboardFA = Forced AirOTH = Other HeatingSM = Snowmelt

Loss = Btu/(hr·ft²) Rv = hr·ft².°F/btu SM = Snowmelt N = Not Heated

Glazing

Windows

Code	Description	Exposure	R-Value	SHGC	Area	Heating	Cooling
3-Pane Slider Door	, BlindsLight (50%), 1'-6", 2' above.	S	5	0.19	40	571	324
Custom	Triple Pane Windows, BlindsDark45 (60%), Inside (50%), 6', 2' above., GreenGrass	S	5	0.19	16	228	94
Custom	Triple Pane Windows, BlindsMedium45 (80%), Inside (50%), 2'-6", 12' above.	S	5	0.19	20	286	178
Custom	Triple Pane Windows, BlindsMedium45 (80%), Inside (50%), 2'-6", 13' above.	S	5	0.19	20	286	178
Custom	Triple Pane Windows, BlindsDark (100%), Inside (50%), 1'-6", 2'-6" above.	S	5	0.19	23	321	176
Custom	Triple Pane Windows, BlindsLight45 (100%), 1'-6", 1' above., Asphalt	N	5	0.19	40	571	226
Custom	Triple Pane Windows, BlindsLight45 (100%), 1'-6", 2' above.	S	5	0.19	9	125	62
Custom	Triple Pane Windows, 6', 0'-6" above., OldConcrete	N	5	0.19	10	143	76
Custom	Triple Pane Windows, BlindsLight45 (100%), 1'-6", 0'-4" above., GreenGrass	N	5	0.19	56	800	316

Internal Loads

Basement Bedroom	Sensible	Latent
1 Occupants:	230	200
Room Total	230	200
Kitchen / Dining	Sensible	Latent
2 Occupants:	460	400
Adjustment for Unvented Range	850	600
Refrigerator or Freezer - 12 Cubic Feet	700	0
Room Total	2,010	1,000
Master Bedroom	Sensible	Latent
2 Occupants:	460	400
Room Total	460	400
Bed #1	Sensible	Latent
1 Occupants:	230	200
Room Total	230	200
Bed #2	Sensible	Latent

Other Loads

512 Btu/hr

Unit Heat Loss = Btu/(hr·ft²) Rv = hr·ft²·°F/btu Head Loss = ft water BB = Baseboard FA = Forced Air OTH = Other Heating RH = Radiant Floor Heating SM = Snowmelt N = Not Heated

Project #:

1 Occupants:	230	200
Room Total	230	200

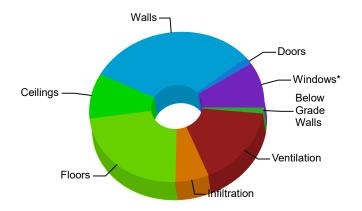
Load Breakdown

Name	Heating	Sensible	Latent
Windows*	3,331	1,631	
Skylights*	0	0	
Doors	521	260	
Walls	10,811	3,892	
Below Grade Walls	523		
Ceilings	3,318	2,021	
Floors	7,984	217	
Infiltration	2,119	0	0
Internal		3,160	2,000
Other	0		
Duct Loads	0	0	0
Ventilation	5,725	1,600	1,677
Humidification	0		
Piping Load	0		
Radiant Back Loss	0		
Blower Heat		512	
AED*		371	
Total	34,331	13,663	3,677
Total Area	2,465 ft ²	2,465 ft ²	

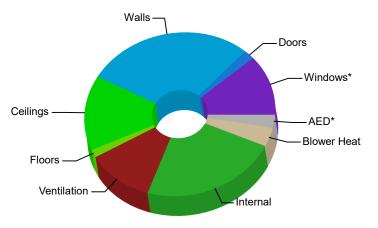
*Average Load Procedure

Heating ΔT¹: 20.0	JSHR: 0.79
Cooling ΔT^1 : 22.0	MJ8 Tons: 1.45
Est. Heating CFM ² : 1350	SqFt/Ton: 1706
Est. Cooling CFM ² : 495	CFM/SqFt: 0.20

Heating Load Breakdown

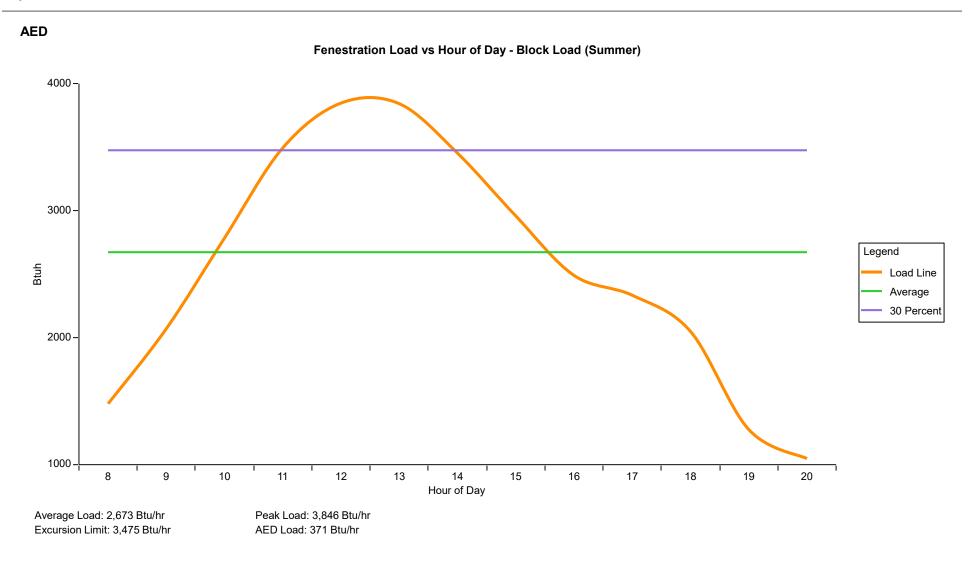


Sensible Load Breakdown



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

Created Using HeatCAD 2021 (1/1/2022) Version:21.0.0780 R (Trial)



(1) ΔT : Difference between supply air and return air 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 Created Using HeatCAD 2021 (1/1/2022) Version:21.0.0780 R (Trial)

Heating Zones

Zone	Area	Room Temp	Total Load
Zone 101 BASEMENT	592	68	3,350
Zone 102 LIVING LEVEL	492	68	10,501
Zone 201 KITCHEN / DIVING	592	68	7,545
Zone 202 MASTER	375	68	2,871
Zone 203 BEDROOMS / HALLWAY	413	68	4,340

Heating Rooms

Room	Area	Room Temp	Total Load*
Basement Bedroom	380	68	1,946
Basement Closet	34	68	58
Bath #2	50	68	360
Bath #3	43	68	965
Bed #1	157	68	2,182
Bed #2	143	68	1,641
Dining	165	68	3,176
Hallway	62	68	157
Kitchen	162	68	2,762
Kitchen / Dining	261	68	1,599
Laundry	45	68	1,909
Living Room	404	68	7,627
Master Bath	90	68	641
Master Bedroom	224	68	1,319
Master Closet	62	68	912
Mech Room	178	68	1,346
Room 5	4	68	8

* 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
C1 KITCHEN / DIVING	592	75	NO	4,965
C2 MASTER	375	75	NO	1,840
C3 BEDROOMS / HALLWAY	413	75	YES	2,179
C4 LIVING LEVEL	492	75	NO	1,837
C5 BASEMENT	592	75	YES	830

(1) ΔT : Difference between supply air and return air(2) Estimated air flow based on specified supply air ΔT Length = ft Area = ft²Temperature = °FFlowrate = USGPMAir Flow = cfmHeat Loss = Btu/hrUnit 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

Created Using HeatCAD 2021 (1/1/2022) Version:21.0.0780 R (Trial)

(Average Load Procedure)

Cooling Rooms

Room	Area	Room Temp	AED	Sensible Load*
Basement Bedroom	380	75	YES	542
Basement Closet	34	75	YES	0
Bath #2	50	75	YES	152
Bath #3	43	75	YES	140
Bed #1	157	75	YES	1,048
Bed #2	143	75	YES	875
Dining	165	75	YES	1,165
Hallway	62	75	YES	104
Kitchen	162	75	NO	1,298
Kitchen / Dining	261	75	YES	2,580
Laundry	45	75	YES	246
Living Room	404	75	NO	1,451
Master Bath	90	75	YES	271
Master Bedroom	224	75	NO	1,245
Master Closet	62	75	YES	325
Mech Room	178	75	YES	288
Room 5	4	75	YES	6

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

Warnings

This application has glass areas that produced relatively large cooling loads for part of the day. Zoning may be required to overcome spikes in solar load for one or more rooms. A zoned system may be required or some rooms may require zone control (provided by individual, motorized, thermostatically controlled dampers).

This application has glass areas that produced large cooling loads for part of the day. Zoning may be required to overcome solar load spikes for one or more rooms. Consider a zoned system, or provide zone control (individual, motorized, thermostatically controlled dampers) for problem room. Single speed equipment may not be suitable for the application.

This application has glass areas that produced relatively large cooling loads for part of the day. Zoning may be required to overcome spikes in solar load for one or more rooms. A zoned system may be required or some rooms may require zone control (provided by individual, motorized, thermostatically controlled dampers).

This application has glass areas that produced large cooling loads for part of the day. Zoning may be required to overcome solar load spikes for one or more rooms. Consider a zoned system, or provide zone control (individual, motorized, thermostatically controlled dampers) for problem room. Single speed equipment may not be suitable for the application.

Disclaimers

With the permission of the Air Conditioning Contractors of America ("ACCA"), material is reproduced from Manual J Residential Load Calculation (8th Edition) which is copyrighted by ACCA. The program and data are provided "as is" without warranty of any kind either expressed or implied. The entire risk as the quality and performance of the program and data is with you. In no event will ACCA be liable to you for any damages, including without limitation any lost profits, lost savings, or other incidental or consequential damages arising out of the use or inability to use this program or the data. © 2015 Air Conditioning Contractors of America. All Rights Reserved. www.acca.org

ACCA, Manual J and Powered by ACCA Manual J are registered trademarks of the Air Conditioning Contractors of America. All rights reserved.

Cold weather humidification, or some lifestyles that produce excessive moisture, may cause condensation to occur if the absolute humidity of the indoor air is too high for the momentary circumstances. Condensation can occur on surfaces or concealed within the structure, and can lead to mold, mildew, frost damage, and moisture damage. The software does not perform calculations for the estimation or detection of possible condensation problems, and it is the designers (i.e. software users) responsibility to do so independently if required. For guidance and additional cautions refer to ACCA Manual J 8th Edition, including Section 1-11 and Section 27.

The calculated values shown in this report are based on the data input by the user of the software. Inaccurate or erroneous data input will result in inaccurate or erroneous results. You are strongly advised to review all input data carefully, and to have the calculated results reviewed by an experienced heating professional to ensure reasonableness and suitability for your application.

IN NO EVENT WILL AVENIR SOFTWARE INC. ("AVENIR") OR ITS AFFILIATES BE LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT OR SPECIAL OR PUNITIVE DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION OR DATA AND THE LIKE), EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. AVENIR'S CUMULATIVE LIABILITY FROM ANY CAUSE RELATED TO OR ARISING FROM THE USE THIS REPORT, AND REGARDLESS OF THE FORM OF THE ACTION, SHALL BE LIMITED TO NO GREATER THAN THE AMOUNT OF FEES PAID TO AVENIR UNDER THE SOFTWARE LICENSE AGREEMENT.