Project Information

Project #:

Notes: BASELINE

Name: ▮▮▮▮▮ - Baseline

Location: ▮▮▮▮▮ Drive, Lincoln NE

Outdoor Conditions

Location: Lincoln Municipal AP, Nebraska

Elevation: 1188'

Latitude: 41

	Heating	Cooling
Dry Bulb:	0.0 °F	94.0 °F
Daily Range:		Medium
Wet Bulb:		74.0 °F

Infiltration

Method: Maximum ACH50

Stories: 2

Exposure Category: Three or Four Exposures

Wind Shielding: 4 - Mostly Shielded Exposures

Max ACH50: 2.50

Net Air Changes (H/C): 0.08/0.00

Net Flow (H/C): 29 cfm/0 cfm

Total Heating: 34,331 Btu/hr
Total Sensible: 13,663 Btu/hr
Total Latent: 3,677 Btu/hr

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 ft²	2,465 ft²	

*Average Load Procedure

Heating ΔT[1]: 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

565-590 CFM (handwritten annotation)

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

Indoor Conditions

	Heating	Cooling
Room Temp:	68 °F	75 °F
Design Temp Diff:	68.0 °F	19.0 °F
Humidity:	35	50
Moisture Diff (Grains):		32.2

Ventilation

Num Occupants: 7

	Heating		Cooling
Type:	Outside Air	Type:	Outside Air
ACH:	0.23	ACH:	0.23
Outside Air:	79 cfm	Outside Air:	79 cfm
Other Exhaust:	0 cfm	Other Exhaust:	0 cfm

Floorplan/Levels

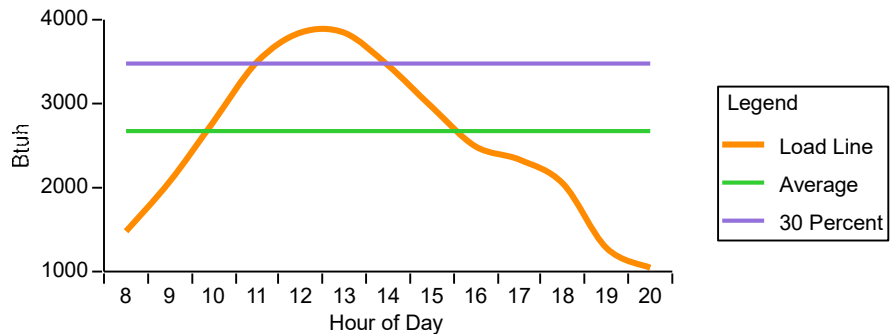| Basement	1,084 ft²
Main Floor	1,381 ft²
Total Heated Area:	2,465 ft²
Total Cooled Area:	2,465 ft²

Heating Load Breakdown
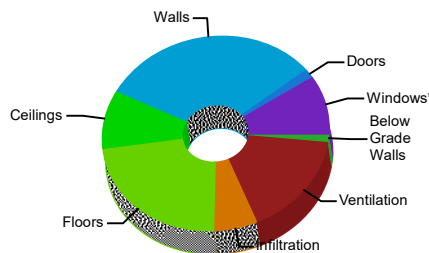
Sensible Load Breakdown
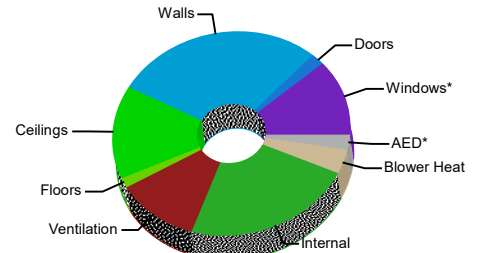
Fenestration Load vs Hour of Day - Block Load (Summer)

Average Load: 2,673 Btu/hr

Peak Load: 3,846 Btu/hr

Excursion Limit: 3,475 Btu/hr

AED Load: 371 Btu/hr

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)

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).

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Disclaimers

(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/btu   Head Loss = ft water   RH = Radiant Floor Heating
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HeatCAD® 2021

PROJECT: - Baseline

CUSTOMER:

PROJECT NO.:

SCALE:
1/8"=1'

DRAWING NAME:
Basement

DRAWN BY:

Created Using HeatCAD 2021 21.0.0780 (12/31/2021)

DATE:
12/31/2021

REVISIONS

No	Desc	Date

PAGE NO.
1

Floor plan labels:

21'
18'-1"

14'-9"

SA SA SA (Living Room area)
SA (Basement Bedroom area)

Living Room
Heat: 7,627 Btu/hr
Cool: 1,451 Btu/hr

Basement Bedroom
Heat: 1,946 Btu/hr
Cool: 542 Btu/hr

20'-5"
30'-6"

RA

Laundry
Heat: 1,909 Btu/hr
Cool: 246 Btu/hr

Bath #3
Heat: 965 Btu/hr
Cool: 140 Btu/hr

Basement Closet
Heat: 58 Btu/hr
Cool: 0 Btu/hr

change to 7" w/ new grill

SA

5'-8"
5'-11"
6'

RA
RA
RA

SA SA

Mech Room
Heat: 1,346 Btu/hr
Cool: 288 Btu/hr

8'-2"

21'-3"

Garage
Not Heated

21'

N

DISCLAIMER:
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.

PROJECT: - Baseline

CUSTOMER:

PROJECT NO.:

SCALE:
3/16"=1'

DRAWING NAME:
Main Floor

DRAWN BY:

Created Using HeatCAD 2021 21.0.0780 (12/31/2021)

DATE:
12/31/2021

REVISIONS

No	Desc	Date

PAGE NO.
2

Floor plan labels:

Master Closet
Heat: 912 Btu/hr
Cool: 325 Btu/hr

Master Bath
Heat: 641 Btu/hr
Cool: 271 Btu/hr

Master Bedroom
Heat: 1,319 Btu/hr
Cool: 1,245 Btu/hr

Kitchen
Heat: 2,762 Btu/hr
Cool: 1,298 Btu/hr

Kitchen / Dining
Heat: 1,599 Btu/hr
Cool: 2,580 Btu/hr

Bath #2
Heat: 360 Btu/hr
Cool: 152 Btu/hr

Hallway
Heat: 157 Btu/hr
Cool: 104 Btu/hr

Room 5
Heat: 8 Btu/hr
Cool: 6 Btu/hr

Add in closet?

Bed #1
Heat: 2,182 Btu/hr
Cool: 1,048 Btu/hr

Bed #2
Heat: 1,641 Btu/hr
Cool: 875 Btu/hr

Dining
Heat: 3,176 Btu/hr
Cool: 1,165 Btu/hr

Dimensions: 8'-11", 12'-1", 6', 9'-1", 17'-4", 8', 29'-9", 14', 4'-11", 35'-7", 2'-5", 3', 10'-10", 10'-6", 22'-1", 10'-6", 10'-10", 18'-5", 7'-7", 5'-11", 6'

SA, RA labels throughout

HeatCAD® 2021

<div align="right">

Load Report
Manual J8 Load Calculation

December 31, 2021

</div>

Project Information

Project #:   Notes:

Name: ██████████ - Baseline

Location: ██████████ Drive, Lincoln NE

Manual J Load Summary

Total Heating: 34,331 Btu/hr   **Total Sensible: 13,663 Btu/hr**   **Total Latent: 3,677 Btu/hr**

Outdoor Conditions

Location:		Lincoln Municipal AP,Nebraska
Elevation:		1188'
Latitude:		41
	Heating	**Cooling**
Dry Bulb:	0.0 °F	94.0 °F
Daily Range:		Medium
Wet Bulb:		74.0 °F

Indoor Conditions

	Heating	**Cooling**
Room Temp:	68 °F	75 °F
Design Temp Diff:	68.0 °F	19.0 °F
Humidity:	35	50
Moisture Diff (Grains):		32.2

Infiltration

Method:	Maximum ACH50
Stories:	2
Exposure Category:	Three or Four Exposures
Wind Shielding:	4 - Mostly Shielded Exposures
Max ACH50:	2.50
Net Air Changes (Heat/Cool):	0.08 / 0.00
Net Flow (Heat/Cool):	29 cfm / 0 cfm

Ventilation

Num Occupants:	7		
	Heating		**Cooling**
Type:	Outside Air	Type:	Outside Air
ACH:	0.23	ACH:	0.23
Outside Air:	79 cfm	Outside Air:	79 cfm
Other Exhaust:	0 cfm	Other Exhaust:	0 cfm

Floorplan/Levels

Basement	1,084 ft²	Total Heated Area:	2,465 ft²
Main Floor	1,381 ft²	Total Cooled Area:	2,465 ft²

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(1) ΔT: Difference between supply air and return air   (2) Estimated air flow based on specified supply air ΔT   Created Using HeatCAD 2021 (1/1/2022)

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   Version:21.0.0780 R (Trial)

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

See end of report for important Notes and Disclaimers.   Page 1 of 9

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
11O	Metal Door with Polystyrene Core with Storm	4.8	18	235	134
11O	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

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Version:21.0.0780 R (Trial)

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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

Blower Load	512 Btu/hr

(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/btu

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Version:21.0.0780 R (Trial)

See end of report for important Notes and Disclaimers.

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1 Occupants:	230	200
Room Total	230	200

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

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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 ft²	2,465 ft²	

*Average Load Procedure
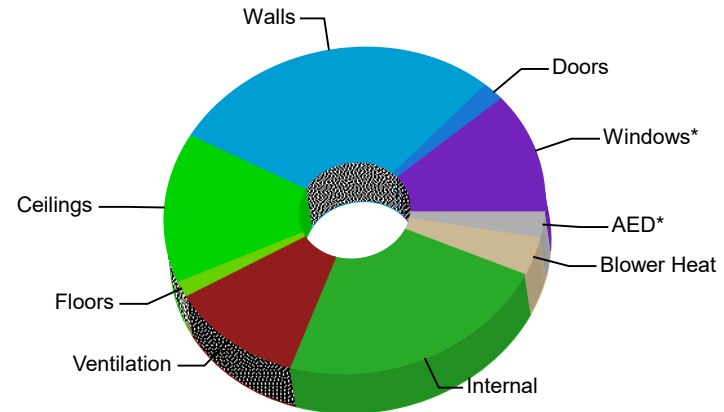
Heating ΔT¹: 20.0
Cooling ΔT¹: 22.0
Est. Heating CFM²: 1350
Est. Cooling CFM²: 495

JSHR: 0.79
MJ8 Tons: 1.45
SqFt/Ton: 1706
CFM/SqFt: 0.20

Heating Load Breakdown
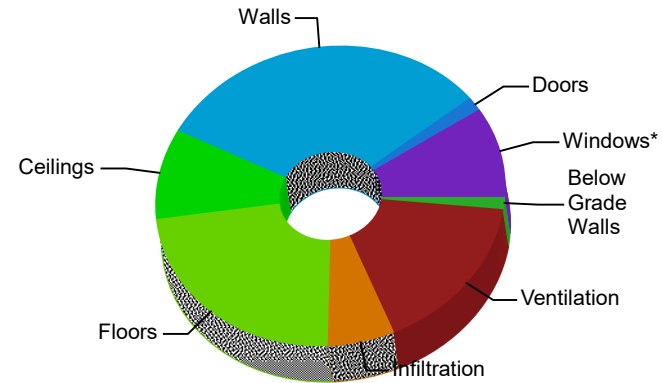
Sensible Load Breakdown

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

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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 = ft²   Temperature = °F   Flowrate = USGPM   Air Flow = cfm   Heat Loss = Btu/hr   Unit Heat Loss = Btu/(hr·ft²)   Rv = hr·ft²·°F/btu
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(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.

(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/btu

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