

Project Name:

Address:

OUTDOOR DESIGN CONDITIONS

Weather station: Mukilto, Paine Field-Snohomish Co. AP

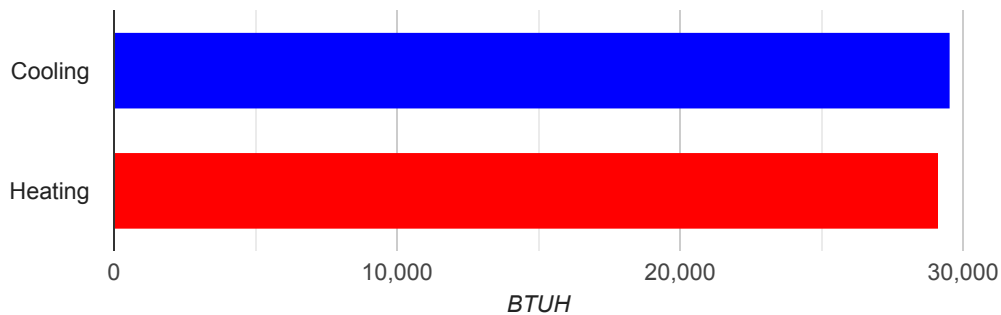
Summer Outdoor F:	90	Summer Indoor F:	70	Design Grains:	-3	Daily Range:	Medium
Winter Outdoor F:	22	Winter Indoor F:	70	Cooling RH:	45	Elevation (Ft):	620

LOAD CALCULATION TOTALS

HVAC System: HVAC System 1

Heated square footage:	1,312	Heating BTUH:	29,094
Cooled square footage:	1,312	Cooling BTUH:	29,534
Heated volume (above grade CF):	10,748	CFM:	1,389
Cooled volume (above grade CF):	10,748	Sensible cooling:	27,516
Exposed wall area (SF):	1,309	Latent cooling:	2,019
		SHR:	0.932

Load Calculation



Approved ACCA MJ8 Calculations

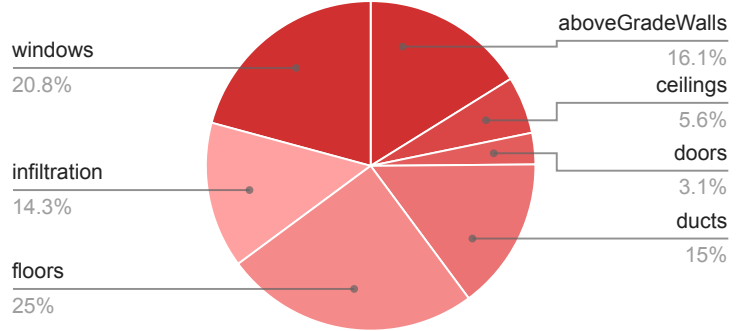
Calculations are based on the ACCA Manual J 8th Edition and are approved by ACCA. All computed calculations are estimates on building use, weather data, and inputted values such as R-Values, window types, duct loss, etc. Equipment selections should meet both the latent and sensible gain as well as building heat loss.



HEATING AND COOLING LOADS

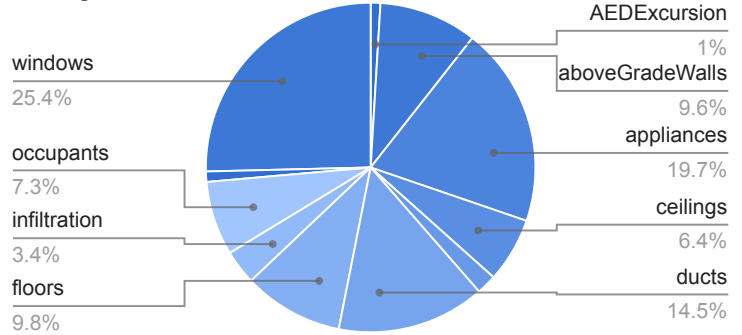
HEATING LOADS		
SECTION	AREA	HEAT LOSS
aboveGradeWalls	1,009	4,698
ceilings	1,312	1,637
doors	48	899
ducts	0	4,361
floors	1,312	7,276
infiltration	0	4,175
skylights	0	0
windows	252	6,048
Totals		29,094

Heating Loads



COOLING LOADS			
SECTION	AREA	SENSIBLE	LATENT
AEDExcursion	0	282	0
aboveGradeWalls	1,009	2,848	0
appliances	0	5,446	358
ceilings	1,312	1,876	0
doors	48	580	0
ducts	0	4,043	250
floors	1,312	2,903	0
infiltration	0	889	110
occupants	0	1,150	1,000
plants	0	0	300
skylights	0	0	0
windows	252	7,499	0
Totals		27,516	2,019

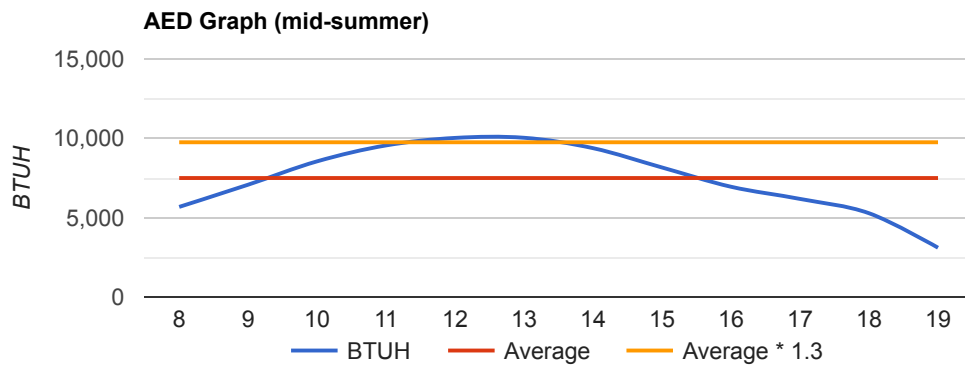
Cooling Loads



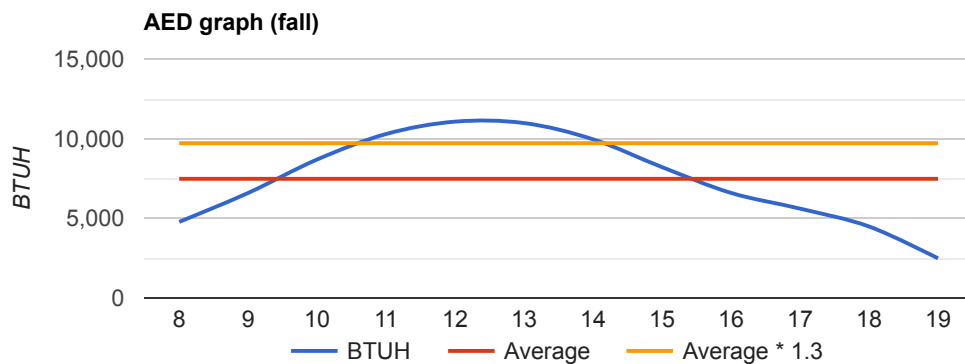
FENESTRATION LOADS

Warning (0): 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).

Warning (1): The sensible load for this application peaks during late fall or early winter. This behavior is caused by glass that faces SouthEast, South or SouthWest. Some rooms may be noticeably cooler or warmer than the temperature set point if zoning is not provided. Simultaneous heating and cooling may be required.



This graph represents hourly aggregate fenestration loads in mid-summer.



This graph represents hourly aggregate fenestration loads in October.

COMPONENT LOADS

ABOVE GRADE WALLS						
System generated wall - N						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	N 54	Heating BTUH: Cooling BTUH:	251 152
System generated wall - E						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	E 70	Heating BTUH: Cooling BTUH:	326 198
System generated wall - S						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	S 54	Heating BTUH: Cooling BTUH:	251 152
System generated wall - S						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	S 88	Heating BTUH: Cooling BTUH:	410 248
System generated wall - N						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	N 84	Heating BTUH: Cooling BTUH:	391 237
System generated wall - S						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	S 84	Heating BTUH: Cooling BTUH:	391 237
System generated wall - W						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	W 177	Heating BTUH: Cooling BTUH:	824 500
System generated wall - E						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	E 62	Heating BTUH: Cooling BTUH:	289 175
System generated wall - S						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	S 78	Heating BTUH: Cooling BTUH:	363 220
System generated wall - N						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	N 90	Heating BTUH: Cooling BTUH:	419 254
System generated wall - S						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	S 90	Heating BTUH: Cooling BTUH:	419 254
System generated wall - N						
Frame Wall, Wood framing, R-11 cavity insulation, Stucco or Siding.	Construction nr: U Value:	12B-0s w 0.097	Exposure: Area:	N 78	Heating BTUH: Cooling BTUH:	363 220

BELOW GRADE WALLS

There are no components for this section.

WINDOWS

Default small windows for wall id 3587702						
Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 101

WINDOWS

Default medium windows for wall id 3587702 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 203
Default small windows for wall id 3587703 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 E	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 202
Default medium windows for wall id 3587703 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 E	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 405
Default small windows for wall id 3587719 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 227
Default medium windows for wall id 3587719 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 453
Default small windows for wall id 3587738 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 453
Default medium windows for wall id 3587738 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 453
Default small windows for wall id 3587811 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 203
Default medium windows for wall id 3587811 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 203
Default small windows for wall id 3587809 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 453
Default medium windows for wall id 3587809 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 453
Default small windows for wall id 3587810 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 W	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 459
Default small windows for wall id 3587713 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 E	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 202
Default medium windows for wall id 3587713 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 E	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 405
Default small windows for wall id 3587714 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 227
Default medium windows for wall id 3587714 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 453
Default small windows for wall id 3587732 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 101
Default medium windows for wall id 3587732 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 24 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	576 406
Default small windows for wall id 3587733 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 227
Default medium windows for wall id 3587733 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 24 S	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	576 906
Default small windows for wall id 3587739 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 6 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	144 101

WINDOWS

Default medium windows for wall id 3587739 Window, NFRC rated, Clear glass.	Construction nr: Area: Exposure:	1G 12 N	U Value: SHGC:	0.5 0.67	Heating BTUH: Cooling BTUH:	288 203
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Window cooling BTUHs shown here are daily average values. See AED graphs for details of fenestration loads during the day.

CEILINGS

System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	99	Heating BTUH: Cooling BTUH:	124 142
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	81	Heating BTUH: Cooling BTUH:	101 116
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	168	Heating BTUH: Cooling BTUH:	210 240
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	252	Heating BTUH: Cooling BTUH:	314 360
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	120	Heating BTUH: Cooling BTUH:	150 172
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	100	Heating BTUH: Cooling BTUH:	125 143
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	396	Heating BTUH: Cooling BTUH:	494 566
System generated ceiling. Ceiling under attic or attic knee wall, Asphalt shingles, Dark, R-38.	Construction nr: U Value:	16B-38 ad 0.026	Area:	96	Heating BTUH: Cooling BTUH:	120 137

SKYLIGHTS

There are no components for this section.

Skylight cooling BTUHs shown here are daily average values. See AED graphs for details of fenestration loads during the day.

DOORS

Default doors for wall id 3587732 Wood Door, Solid Core.	Construction nr: U Value:	11 0.39	Area: Exposure:	24 N	Heating BTUH: Cooling BTUH:	449 290
Default doors for wall id 3587733 Wood Door, Solid Core.	Construction nr: U Value:	11 0.39	Area: Exposure:	24 S	Heating BTUH: Cooling BTUH:	449 290

FLOORS

System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: Area:	19A-0cp 99	Heating U Value: Cooling U Value:	0.295 0.295	Heating BTUH: Cooling BTUH: F Value:	549 219 N/A
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FLOORS

System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 81	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 449 Cooling BTUH: 179 F Value: N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 168	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 932 Cooling BTUH: 372 F Value: N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 252	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 1,398 Cooling BTUH: 558 F Value: N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 120	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 666 Cooling BTUH: 266 F Value: N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 100	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 555 Cooling BTUH: 221 F Value: N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 396	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 2,196 Cooling BTUH: 876 F Value: N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: 19A-0cp Area: 96	Heating U Value:0.295 Cooling U Value:0.295	Heating BTUH: 532 Cooling BTUH: 212 F Value: N/A

VENTILATION

There are no components for this section.

HOT WATER PIPING

There are no components for this section.

DUCTS

System generated ducts (below conditioned space) Closed Crawl Space - Radial	EHLF: 0.085 ESGF: 0.046 ELG: 173	Heating BTUH: 2,114 Sensible BTUH: 1,072 Latent BTUH: 173
System generated ducts (above conditioned space) Attic - Radial	EHLF: 0.091 ESGF: 0.128 ELG: 77	Heating BTUH: 2,247 Sensible BTUH: 2,971 Latent BTUH: 77

INFILTRATION

Leakage Category: Average	NCFM Heating: 81 NCFM Cooling: 41	Heating BTUH: 4,175 Sensible BTUH: 889 Latent BTUH: 110
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BLOWER MOTOR

There are no components for this section.

WINTER HUMIDIFICATION

There are no components for this section.

OCCUPANTS

Nr. Occupants:	1	Sensible BTUH:	230	Latent BTUH:	200
Nr. Occupants:	4	Sensible BTUH:	920	Latent BTUH:	800

APPLIANCES

Color television	Quantity:	1	Sensible BTUH:	683	Latent BTUH:	0
Computer and monitor	Quantity:	1	Sensible BTUH:	538	Latent BTUH:	0
Light Fixture - 100W	Quantity:	3	Sensible BTUH:	1,023	Latent BTUH:	0
Range with hood and exhaust to outdoors	Quantity:	1	Sensible BTUH:	0	Latent BTUH:	0
Dishwasher	Quantity:	1	Sensible BTUH:	1,024	Latent BTUH:	358
Refrigerator or Freezer - 16CuFt	Quantity:	1	Sensible BTUH:	1,000	Latent BTUH:	0
Vented clothes dryer	Quantity:	1	Sensible BTUH:	427	Latent BTUH:	0
Clothes washing machine	Quantity:	1	Sensible BTUH:	51	Latent BTUH:	0
Refrigerator or Freezer - 12CuFt	Quantity:	1	Sensible BTUH:	700	Latent BTUH:	0

PLANTS

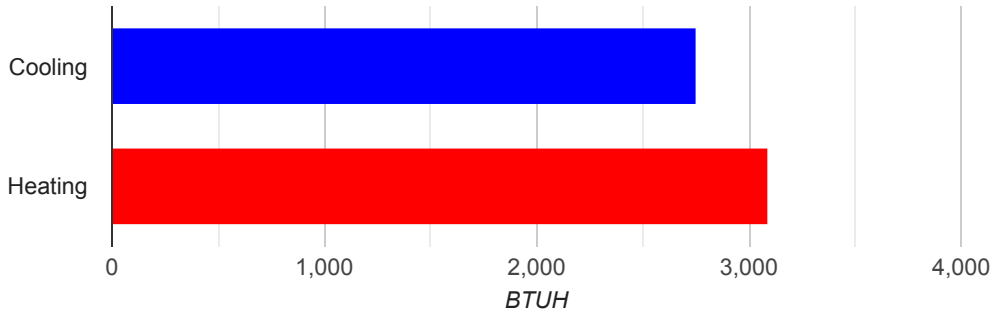
Plant Size:	medium	Quantity:	5	Latent BTUH:	100
Plant Size:	large	Quantity:	5	Latent BTUH:	150
Plant Size:	small	Quantity:	5	Latent BTUH:	50

ROOM DETAIL

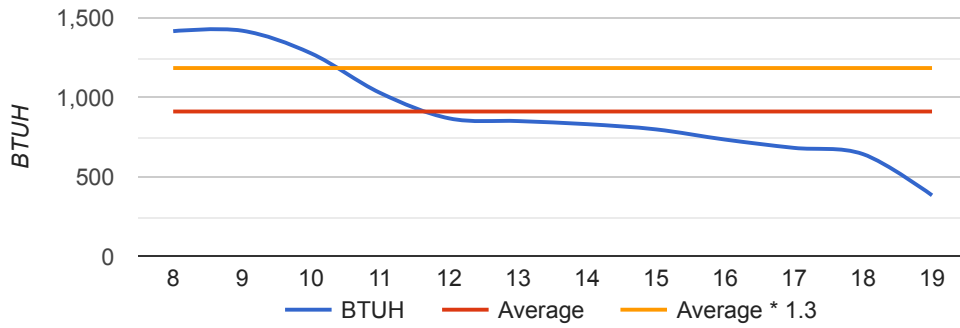
Room name: Master Bedroom

Heated square footage:	99	Total Cooling BTUH:	2,751
Cooled square footage:	99	Total Heating BTUH:	3,087
Heated volume (above grade CF):	792	CFM:	128
Cooled volume (above grade CF):	792		
Exposed wall area (SF):	160		

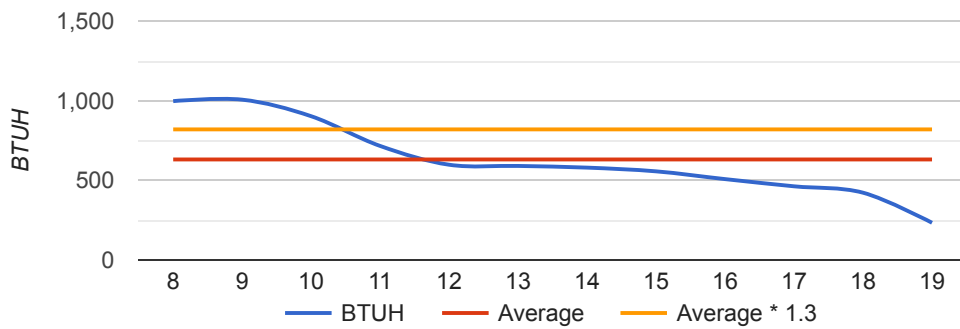
Load Calculation



AED Graph (mid-summer)



AED graph (fall)

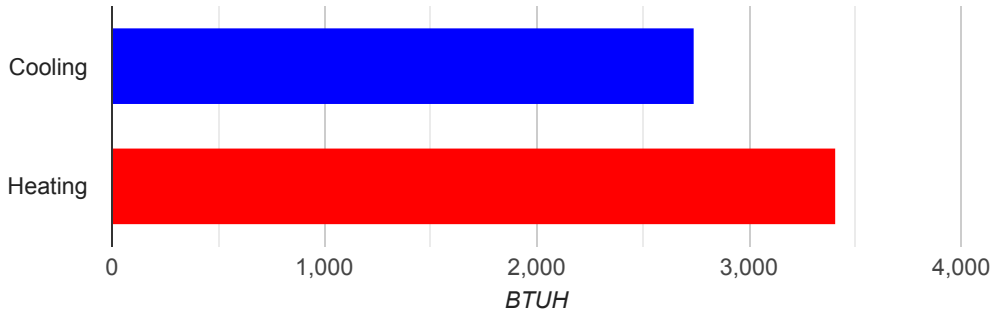


ROOM DETAIL

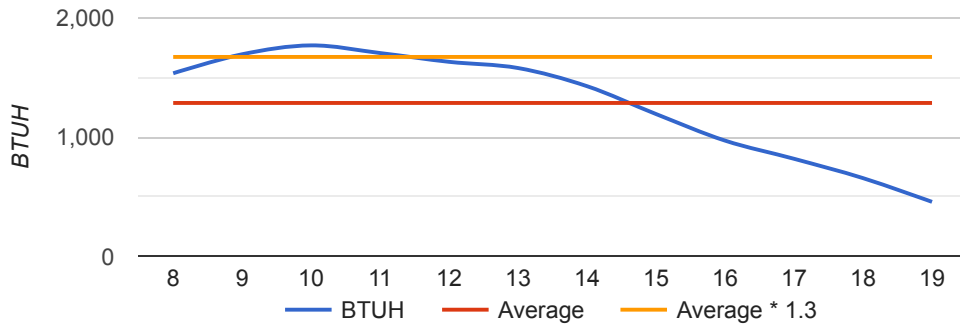
Room name: Guest Room

Heated square footage:	120	Total Cooling BTUH:	2,741
Cooled square footage:	120	Total Heating BTUH:	3,402
Heated volume (above grade CF):	960	CFM:	137
Cooled volume (above grade CF):	960		
Exposed wall area (SF):	176		

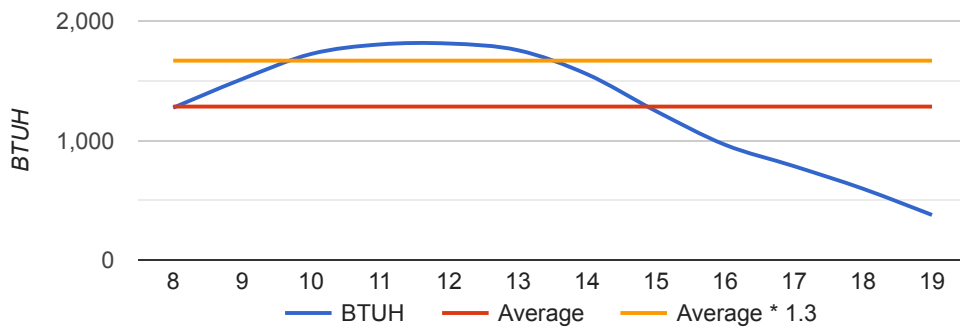
Load Calculation



AED Graph (mid-summer)



AED graph (fall)



ROOM DETAIL

Room name: Den

Heated square footage:

81

Cooled square footage:

81

Heated volume (above grade CF):

648

Cooled volume (above grade CF):

648

Exposed wall area (SF):

72

Total Cooling BTUH:

1,609

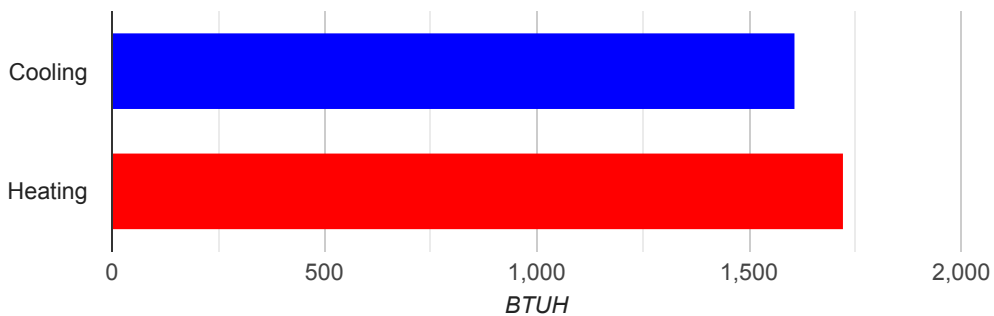
Total Heating BTUH:

1,721

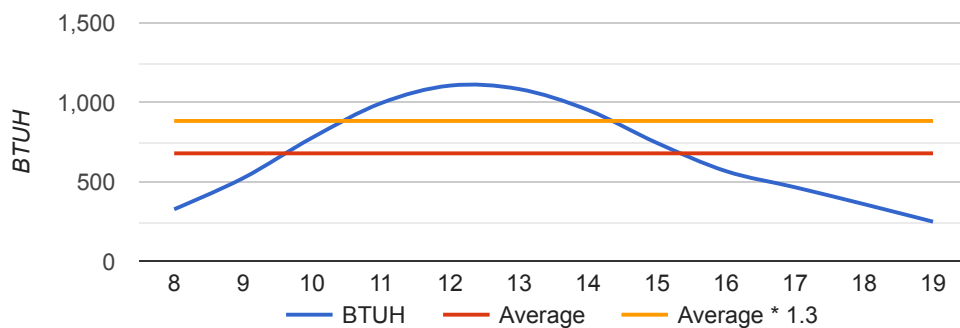
CFM:

80

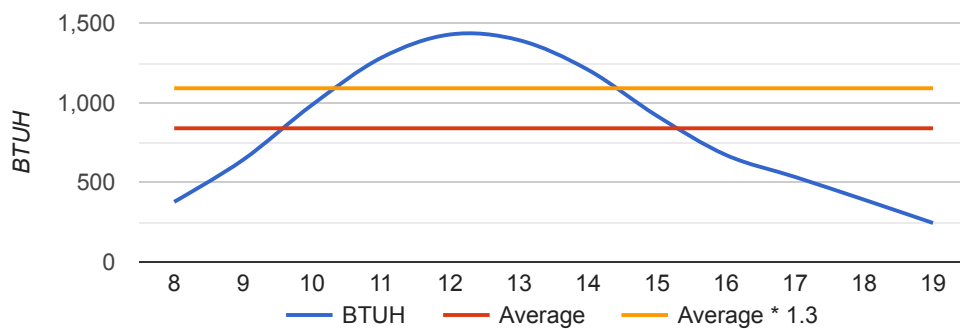
Load Calculation



AED Graph (mid-summer)



AED graph (fall)

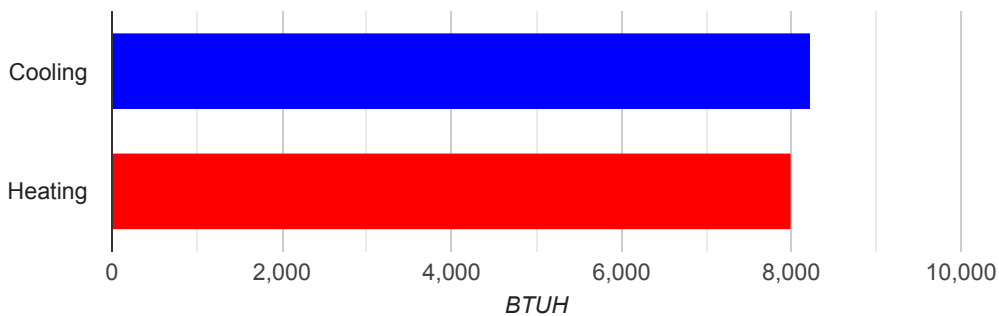


ROOM DETAIL

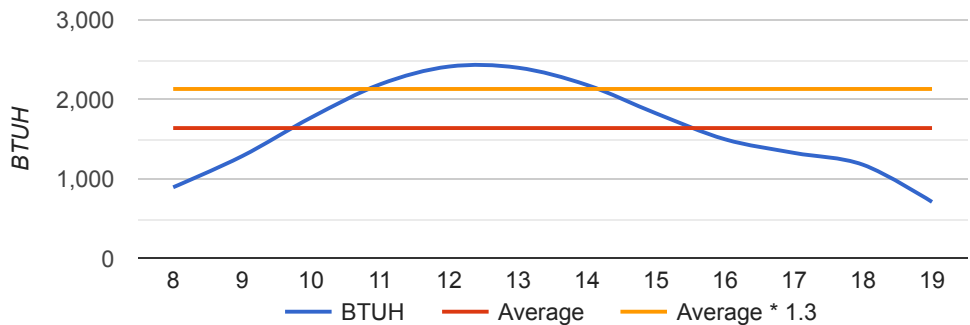
Room name: Kitchen/Family

Heated square footage:	396	Total Cooling BTUH:	8,219
Cooled square footage:	396	Total Heating BTUH:	7,982
Heated volume (above grade CF):	3,168	CFM:	393
Cooled volume (above grade CF):	3,168		
Exposed wall area (SF):	288		

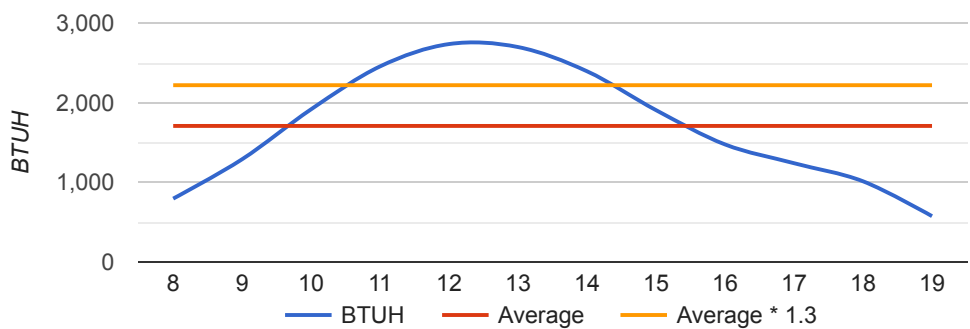
Load Calculation



AED Graph (mid-summer)



AED graph (fall)

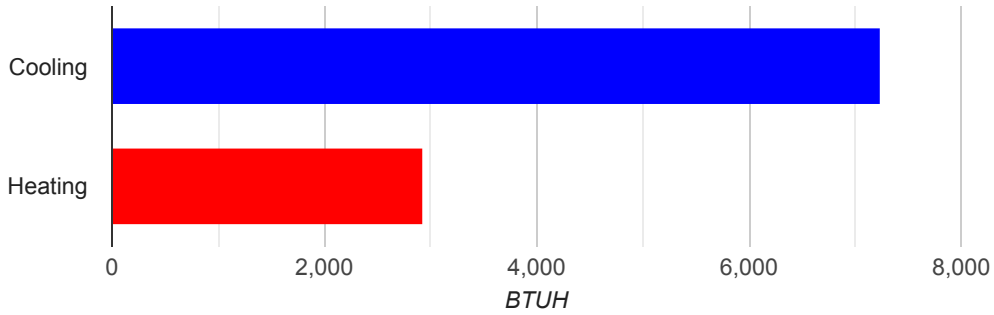


ROOM DETAIL

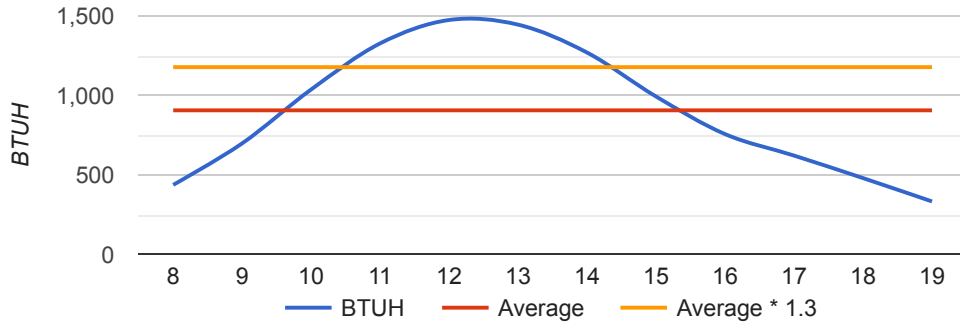
Room name: Family Room

Heated square footage:	168	Total Cooling BTUH:	7,235
Cooled square footage:	168	Total Heating BTUH:	2,922
Heated volume (above grade CF):	1,344	CFM:	311
Cooled volume (above grade CF):	1,344		
Exposed wall area (SF):	112		

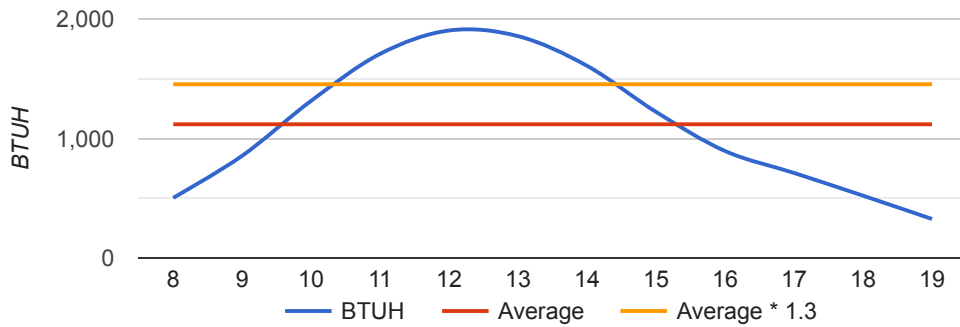
Load Calculation



AED Graph (mid-summer)



AED graph (fall)

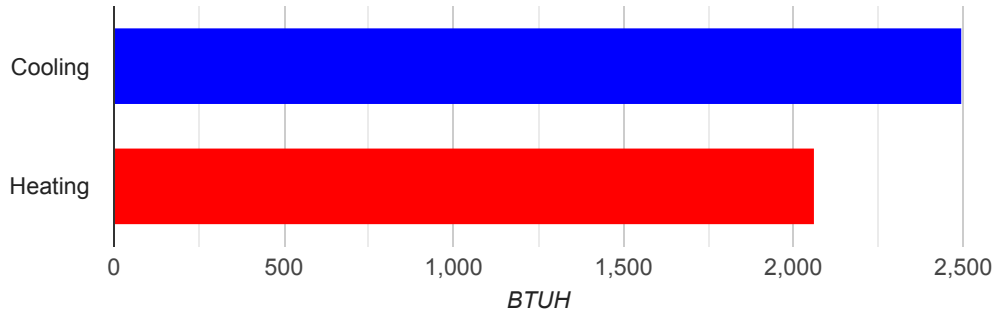


ROOM DETAIL

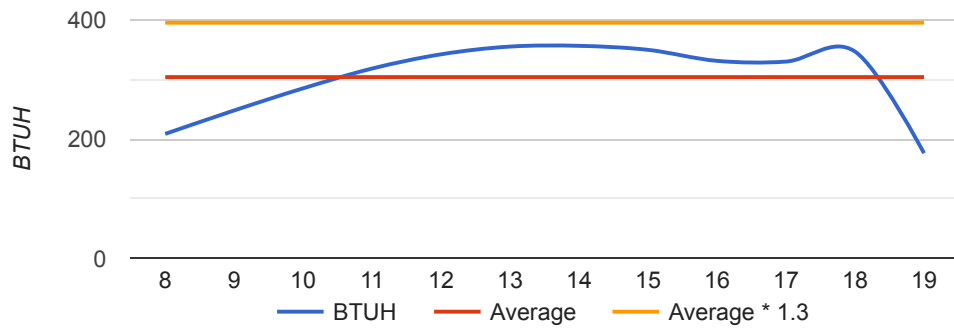
Room name: Laundry Room

Heated square footage:	96	Total Cooling BTUH:	2,494
Cooled square footage:	96	Total Heating BTUH:	2,063
Heated volume (above grade CF):	768	CFM:	125
Cooled volume (above grade CF):	768		
Exposed wall area (SF):	96		

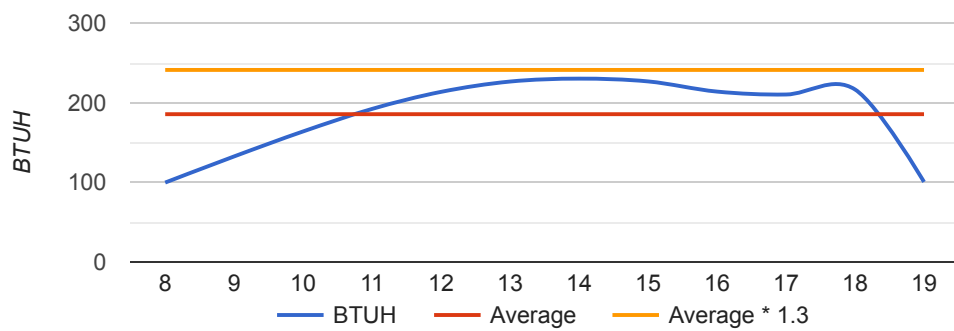
Load Calculation



AED Graph (mid-summer)



AED graph (fall)

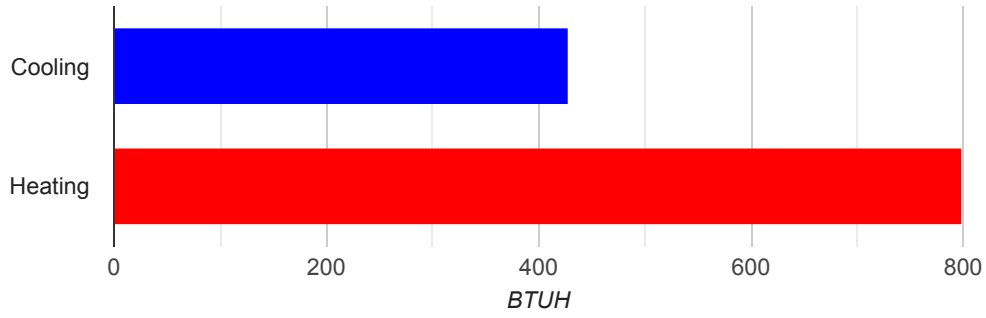


ROOM DETAIL

Room name: Hallway

Heated square footage:	100	Total Cooling BTUH:	428
Cooled square footage:	100	Total Heating BTUH:	799
Heated volume (above grade CF):	800	CFM:	21
Cooled volume (above grade CF):	800		
Exposed wall area (SF):	0		

Load Calculation



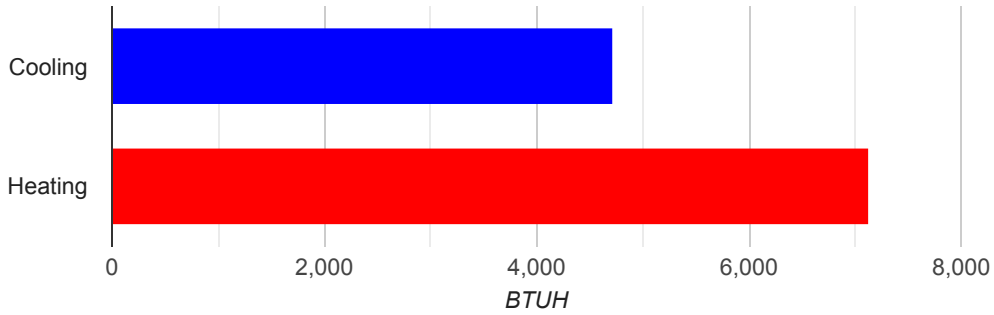
ROOM DETAIL

Room name: Garage

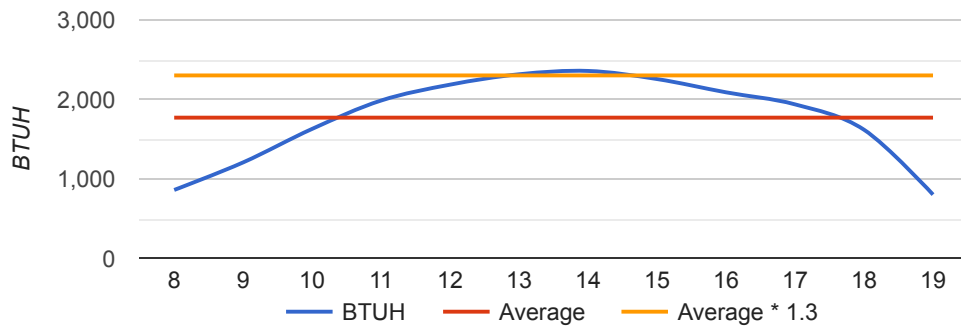
Heated square footage: 252
Cooled square footage: 252
Heated volume (above grade CF): 2,268
Cooled volume (above grade CF): 2,268
Exposed wall area (SF): 405

Total Cooling BTUH: 4,714
Total Heating BTUH: 7,117
CFM: 236

Load Calculation



AED Graph (mid-summer)



AED graph (fall)

