

Project Name: Massachusetts

Address:

OUTDOOR DESIGN CONDITIONS

Weather station: Lawrence Municipal AP

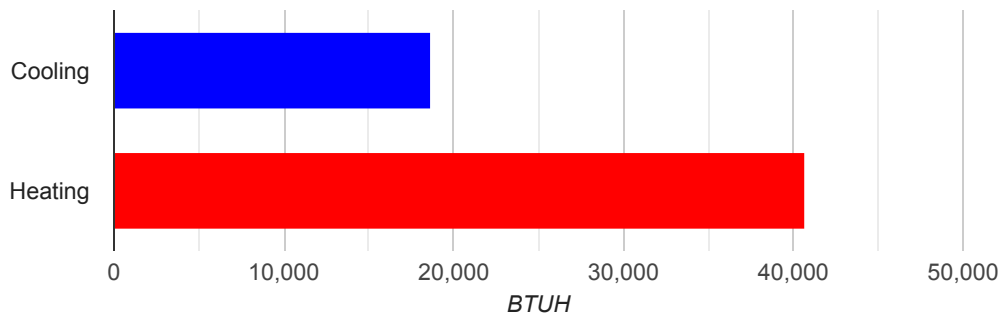
Summer Outdoor F:	88	Summer Indoor F:	75	Design Grains:	31	Daily Range:	Medium
Winter Outdoor F:	9	Winter Indoor F:	70	Cooling RH:	50	Elevation (Ft):	151

LOAD CALCULATION TOTALS

HVAC System: Zone 2 - 1st floor

Heated square footage:	2,540	Heating BTUH:	40,668
Cooled square footage:	2,540	Cooling BTUH:	18,622
Heated volume (above grade CF):	14,224	CFM:	847
Cooled volume (above grade CF):	14,224	Sensible cooling:	16,781
Exposed wall area (SF):	1,396	Latent cooling:	1,841
		SHR:	0.901

Load Calculation



Approved ACCA MJ8 Calculations

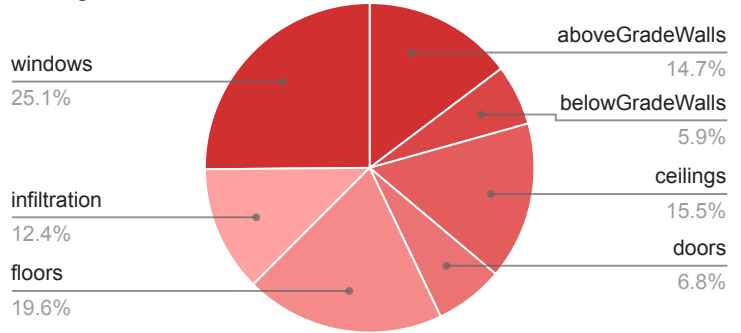
Calculations are based on the ACCA Manual J 8th Edition and are approved by ACCA. All computed calculations are estimates on building use, weather data, and inputted values such as R-Values, window types, duct loss, etc. Equipment selections should meet both the latent and sensible gain as well as building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



HEATING AND COOLING LOADS

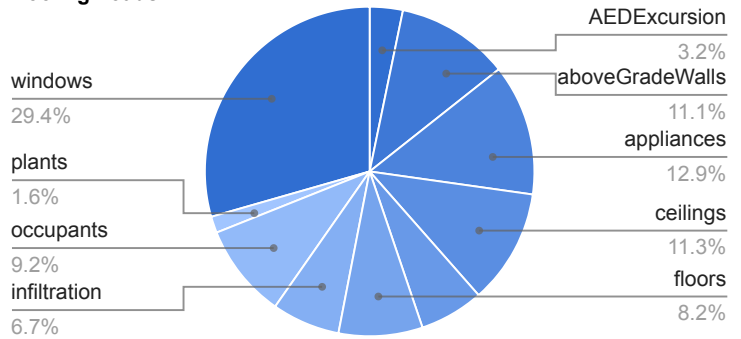
HEATING LOADS		
SECTION	AREA	HEAT LOSS
aboveGradeWalls	1,006	5,981
belowGradeWalls	708	2,419
ceilings	1,166	6,296
doors	96	2,752
floors	2,024	7,965
infiltration	0	5,032
skylights	0	0
windows	294	10,222
Totals		40,668

Heating Loads



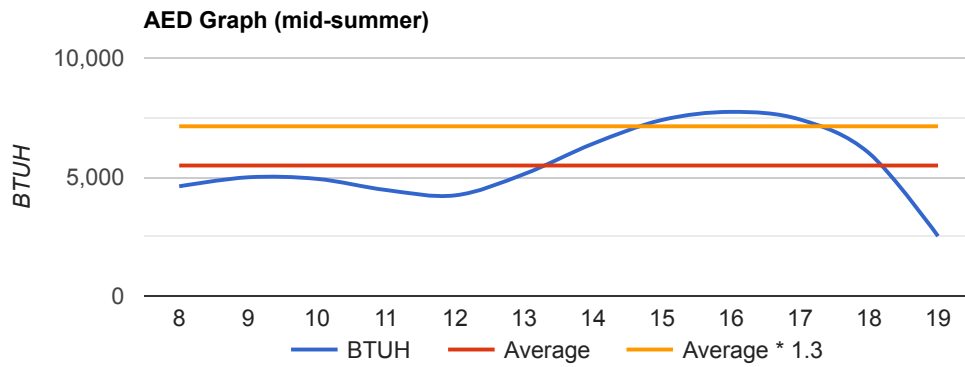
COOLING LOADS			
SECTION	AREA	SENSIBLE	LATENT
AEDExcursion	0	605	0
aboveGradeWalls	1,006	2,066	0
appliances	0	2,400	0
belowGradeWalls	708	0	0
ceilings	1,166	2,099	0
doors	96	1,173	0
floors	2,024	1,533	0
infiltration	0	503	741
occupants	0	920	800
plants	0	0	300
skylights	0	0	0
windows	294	5,482	0
Totals		16,781	1,841

Cooling Loads

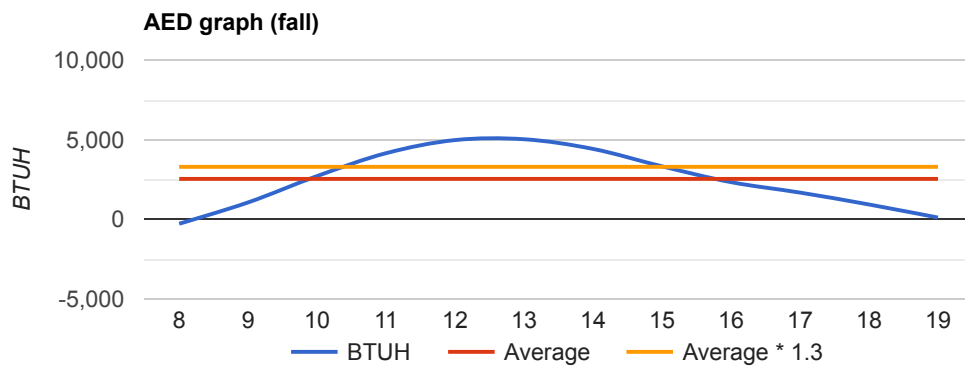


FENESTRATION LOADS

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).



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 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.099	Exposure: Area:	N 56	Heating BTUH: Cooling BTUH:	338 63
System generated wall - E 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.099	Exposure: Area:	E 44	Heating BTUH: Cooling BTUH:	266 50
System generated wall - W 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.099	Exposure: Area:	W 44	Heating BTUH: Cooling BTUH:	266 50
System generated wall - S 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.099	Exposure: Area:	S 32	Heating BTUH: Cooling BTUH:	193 36
System generated wall - W 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.099	Exposure: Area:	W 60	Heating BTUH: Cooling BTUH:	362 68
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:	N 80	Heating BTUH: Cooling BTUH:	473 187
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:	S 20	Heating BTUH: Cooling BTUH:	118 47
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:	W 380	Heating BTUH: Cooling BTUH:	2,248 888
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 36	Heating BTUH: Cooling BTUH:	213 84
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 254	Heating BTUH: Cooling BTUH:	1,503 594

BELOW GRADE WALLS						
System generated wall - N 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.056	Area:	168	Heating:	574
System generated wall - E 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.056	Area:	132	Heating:	451
System generated wall - W 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: U Value:	15B11-0w-x 0.056	Area:	132	Heating:	451

BELOW GRADE WALLS

System generated wall - S 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: 15B11-0w-x U Value: 0.056	Area: 96	Heating: 328
System generated wall - W 8 inch brick, stone or concrete, Wood framing, R-11 cavity insulation, None board insulation.	Construction nr: 15B11-0w-x U Value: 0.056	Area: 180	Heating: 615

WINDOWS

Default small windows for wall id 2499544 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 12 Exposure: N	U Value: 0.57 SHGC: 0.56	Heating BTUH: 417 Cooling BTUH: 153
Default medium windows for wall id 2499544 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 12 Exposure: N	U Value: 0.57 SHGC: 0.56	Heating BTUH: 417 Cooling BTUH: 153
Default small windows for wall id 2499545 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 12 Exposure: S	U Value: 0.57 SHGC: 0.56	Heating BTUH: 417 Cooling BTUH: 55
Default medium windows for wall id 2499545 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 36 Exposure: S	U Value: 0.57 SHGC: 0.56	Heating BTUH: 1,252 Cooling BTUH: 165
Default large windows for wall id 2499545 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 36 Exposure: S	U Value: 0.57 SHGC: 0.56	Heating BTUH: 1,252 Cooling BTUH: 165
Default large windows for wall id 2499546 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 36 Exposure: W	U Value: 0.57 SHGC: 0.56	Heating BTUH: 1,252 Cooling BTUH: 1,100
Default small windows for wall id 2499546 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 12 Exposure: W	U Value: 0.57 SHGC: 0.56	Heating BTUH: 417 Cooling BTUH: 367
Default medium windows for wall id 2499546 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 36 Exposure: W	U Value: 0.57 SHGC: 0.56	Heating BTUH: 1,252 Cooling BTUH: 1,100
Default small windows for wall id 2499571 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 12 Exposure: N	U Value: 0.57 SHGC: 0.56	Heating BTUH: 417 Cooling BTUH: 153
Default medium windows for wall id 2499571 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 24 Exposure: N	U Value: 0.57 SHGC: 0.56	Heating BTUH: 834 Cooling BTUH: 305
Default small windows for wall id 2500468 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 6 Exposure: E	U Value: 0.57 SHGC: 0.56	Heating BTUH: 209 Cooling BTUH: 161
Default medium windows for wall id 2500468 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 24 Exposure: E	U Value: 0.57 SHGC: 0.56	Heating BTUH: 834 Cooling BTUH: 643
Default large windows for wall id 2500468 Window, NFRC rated, Clear glass.	Construction nr: 1G Area: 36 Exposure: E	U Value: 0.57 SHGC: 0.56	Heating BTUH: 1,252 Cooling BTUH: 964

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 encapsulated attic.	Construction nr: tb14E U Value: 0.6	Area: 616	Heating BTUH: 3,326 Cooling BTUH: 1,109
Back side ceiling Ceiling under encapsulated attic.	Construction nr: tb14E U Value: 0.6	Area: 550	Heating BTUH: 2,970 Cooling BTUH: 990

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 2499544 Wood Door, Hollow Core.	Construction nr: U Value:	11 0.47	Area: Exposure:	24 N	Heating BTUH: Cooling BTUH:	688 293
Default doors for wall id 2499545 Wood Door, Hollow Core.	Construction nr: U Value:	11 0.47	Area: Exposure:	24 S	Heating BTUH: Cooling BTUH:	688 293
Default doors for wall id 2499571 Wood Door, Hollow Core.	Construction nr: U Value:	11 0.47	Area: Exposure:	24 N	Heating BTUH: Cooling BTUH:	688 293
Default doors for wall id 2500468 Wood Door, Hollow Core.	Construction nr: U Value:	11 0.47	Area: Exposure:	24 E	Heating BTUH: Cooling BTUH:	688 293

FLOORS						
System generated floor. Basement floor, no floor insulation.	Construction nr: Area:	21A 616	Heating U Value: Cooling U Value:	0.027 0	Heating BTUH: Cooling BTUH: F Value:	1,015 0 N/A
System generated floor. Basement floor, no floor insulation.	Construction nr: Area:	21A 480	Heating U Value: Cooling U Value:	0.027 0	Heating BTUH: Cooling BTUH: F Value:	791 0 N/A
System generated floor. Floor over enclosed unconditioned crawl space or basement, no floor insulation, Carpet or hardwood.	Construction nr: Area:	19A-0cp 928	Heating U Value: Cooling U Value:	0.295 0.295	Heating BTUH: Cooling BTUH: F Value:	6,160 1,533 N/A

VENTILATION	
There are no components for this section.	

HOT WATER PIPING	
There are no components for this section.	

DUCTS	
There are no components for this section.	

INFILTRATION					
Leakage Category:	Average	NCFM Heating: NCFM Cooling:	230 108	Heating BTUH: Sensible BTUH: Latent BTUH:	5,032 503 741

BLOWER MOTOR	
There are no components for this section.	

WINTER HUMIDIFICATION	
There are no components for this section.	

OCCUPANTS					
Nr. Occupants:	4	Sensible BTUH:	920	Latent BTUH:	800

APPLIANCES					
Standard kitchen and utility room, lighting:	2,400 BTUH	Quantity:	2,400	Sensible BTUH: Latent BTUH:	2,400

PLANTS					
Plant Size:	small	Quantity:	5	Latent BTUH:	50

PLANTS

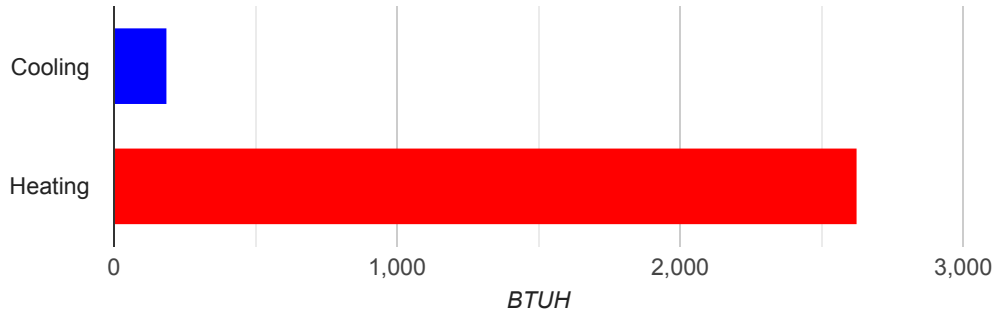
Plant Size:	medium	Quantity:	5	Latent BTUH:	100
Plant Size:	large	Quantity:	5	Latent BTUH:	150

ROOM DETAIL

Room name: Workshop

Heated square footage:	480	Total Cooling BTUH:	186
Cooled square footage:	480	Total Heating BTUH:	2,621
Heated volume (above grade CF):	1,440	CFM:	5
Cooled volume (above grade CF):	1,440		
Exposed wall area (SF):	92		

Load Calculation



ROOM DETAIL

Room name: Exercise

Heated square footage:

616

Cooled square footage:

616

Heated volume (above grade CF):

1,232

Cooled volume (above grade CF):

1,232

Exposed wall area (SF):

144

Total Cooling BTUH:

1,400

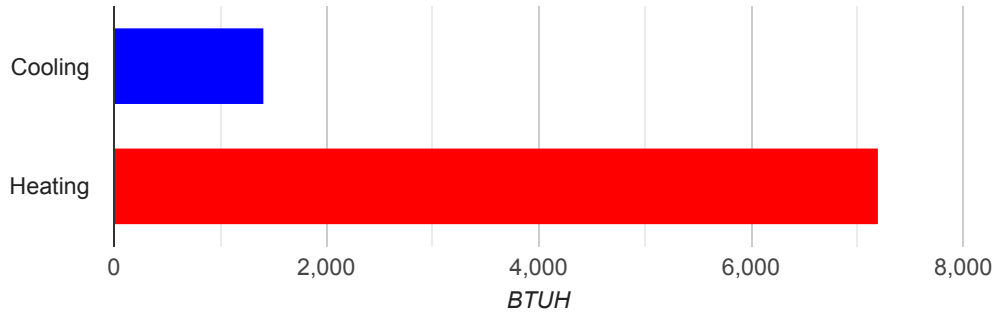
Total Heating BTUH:

7,205

CFM:

66

Load Calculation

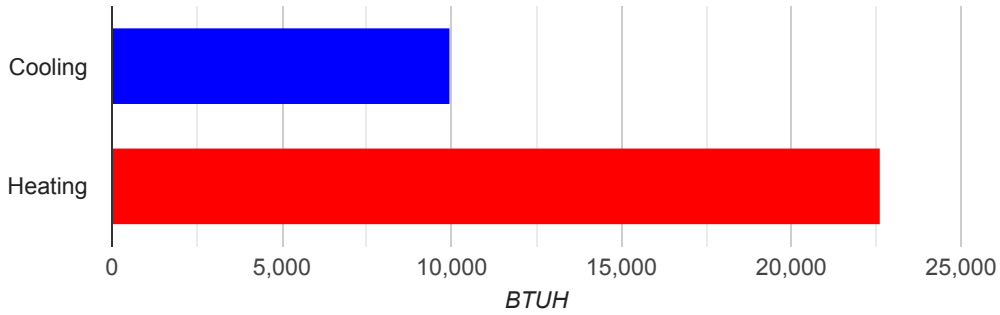


ROOM DETAIL

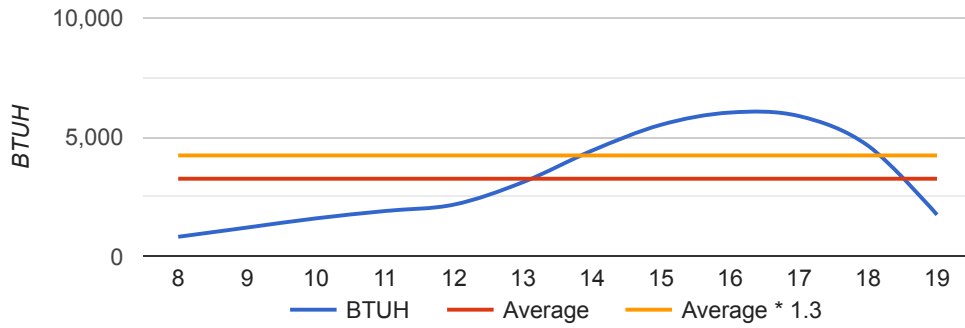
Room name: Back side

Heated square footage:	928	Total Cooling BTUH:	9,928
Cooled square footage:	928	Total Heating BTUH:	22,617
Heated volume (above grade CF):	7,424	CFM:	482
Cooled volume (above grade CF):	7,424		
Exposed wall area (SF):	720		

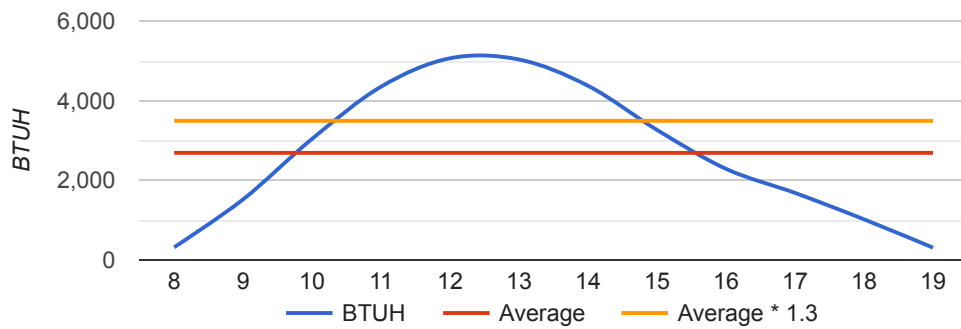
Load Calculation



AED Graph (mid-summer)



AED graph (fall)

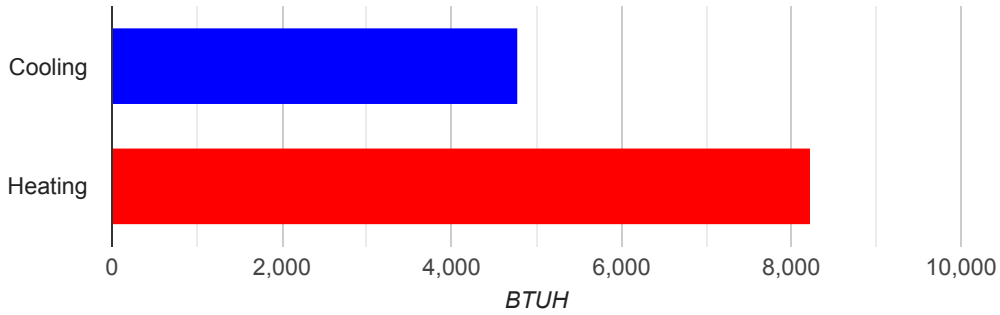


ROOM DETAIL

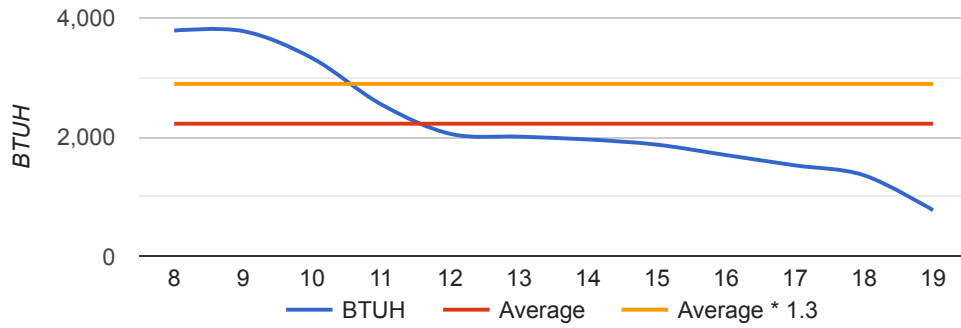
Room name: Front side

Heated square footage:	516	Total Cooling BTUH:	4,777
Cooled square footage:	516	Total Heating BTUH:	8,225
Heated volume (above grade CF):	4,128	CFM:	229
Cooled volume (above grade CF):	4,128		
Exposed wall area (SF):	440		

Load Calculation



AED Graph (mid-summer)



AED graph (fall)

