



## Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2018 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This tool will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Please complete the green drop-downs and boxes that are applicable to your project. As you make selections in the drop-downs for each section, some values will be calculated for you. If you do not see the selection you need in the drop-down options, please contact the WSU Energy Program at [energycode@energy.wsu.edu](mailto:energycode@energy.wsu.edu) or (360) 956-2042 for assistance.

### Project Information

1 Bed End Unit - 3 Story Stack w/ Basement  
Bradley Heights Apartments  
Puyallup, WA

### Contact Information

Milbrandt Architects  
25 Central Way Suite 210  
Kirkland, WA 98033 425.454.7130

### Heating System Type:

☐ All Other Systems

☒ Heat Pump

To see detailed instructions for each section, place your cursor on the word "Instructions"

### Design Temperature

[Instructions](#)

Puyallup

Design Temperature Difference ( $\Delta T$ )

51

$\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

### Area of Building

#### Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

2,761

#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.1

Conditioned Volume

25,125

### Glazing and Doors

[Instructions](#)

U-0.22

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.220		476		104.72

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.50		0		---

### Skylights

[Instructions](#)

### Insulation

#### Attic

[Instructions](#)

R-49

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.026		825		21.45

#### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
---		0		---

#### Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.056		3,236		181.21

#### Floors

[Instructions](#)

No Floors above unconditioned spaces.

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
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#### Below Grade Walls (see Figure 1)

[Instructions](#)

R-21 Interior

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.042		501		21.02

#### Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

<b>F-Factor</b>	<b>X</b>	<b>Length</b>	<b>=</b>	<b>UA</b>
0.303		0		---

#### Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Perimeter

<b>F-Factor</b>	<b>X</b>	<b>Length</b>	<b>=</b>	<b>UA</b>
0.540		712		384.48

### Location of Ducts

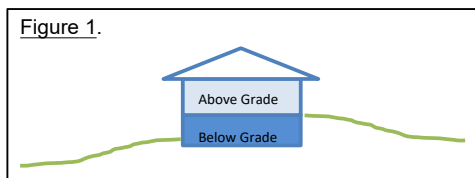
[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient

1.10

Figure 1.



FULL SIZED LEDGIBLE COLOR REPORT IS ARE REQUIRED TO BE PROVIDED BY THE PERMITTEE ON SITE FOR ALL INSPECTIONS

<b>Sum of UA</b>	712.89
<b>Envelope Heat Load</b>	36,357 Btu / Hour
<i>Sum of UA x <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	13,839 Btu / Hour
<i>Volume x 0.6 x <math>\Delta T</math> x 0.018</i>	
<b>Building Design Heat Load</b>	50,196 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
<b>Building and Duct Heat Load</b>	55,216 Btu / Hour
<i>Ducts in unconditioned space: sum of building heat loss x 1.10</i>	
<i>Ducts in conditioned space: sum of building heat loss x 1</i>	
<b>Maximum Heat Equipment Output</b>	69,020 Btu / Hour
<i>Building and duct heat loss x 1.40 for forced air furnace</i>	
<i>Building and duct heat loss x 1.25 for heat pump</i>	