



**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 or (360) 956-2042 for assistance.

**Project Information**

1 Bed End Unit - 3 Story Stack  
 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) 2,136

**Average Ceiling Height**

[Instructions](#) Average Ceiling Height (ft) 9.1

Conditioned Volume 19,438

**Glazing and Doors**

[Instructions](#) U-0.22

**U-Factor X Area = UA**  
 0.220 X 357 = 78.54

**Skylights**

[Instructions](#)

**U-Factor X Area = UA**  
 0.50 X 0 = ---

**Insulation**

**Attic**

[Instructions](#) R-49

**U-Factor X Area = UA**  
 0.026 X 825 = 21.45

**Single Rafter or Joist Vaulted Ceilings**

[Instructions](#) No Vaulted Ceilings in this project.

**U-Factor X Area = UA**  
 --- X 0 = ---

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

[Instructions](#) R-21 Intermediate

**U-Factor X Area = UA**  
 0.056 X 2,624 = 146.96

**Floors**

[Instructions](#) No Floors above unconditioned spaces.

**U-Factor X Area = UA**  
 --- X --- = ---

**Below Grade Walls (see Figure 1)**

[Instructions](#) R-21 Interior

**U-Factor X Area = UA**  
 0.042 X 0 = ---

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

[Instructions](#) No Slab Below Grade in this project.

**F-Factor X Length = UA**  
 0.303 X b = ---

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

[Instructions](#) R-10 Perimeter

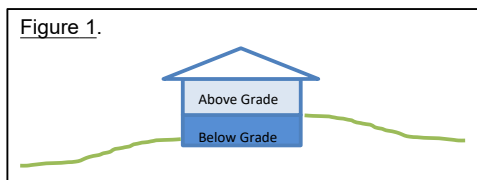
**F-Factor X Length = UA**  
 0.540 X 67 = 36.18

**Location of Ducts**

[Instructions](#) Unconditioned Space

**Duct Leakage Coefficient**  
 1.10

Figure 1.



<b>Sum of UA</b>	283.13
<b>Envelope Heat Load</b>	14,439 Btu / Hour
<i>Sum of UA x <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	10,706 Btu / Hour
<i>Volume x 0.6 x <math>\Delta T</math> x 0.018</i>	
<b>Building Design Heat Load</b>	25,146 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
<b>Building and Duct Heat Load</b>	27,660 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>	34,575 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>	