

## 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

Plummer Residence  
9212 SE 33rd Place  
Mercer Island, WA 98040

### Contact Information

Kati Eitzman - Sturman Architects  
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Bellevue, WA 98004

### 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](#)

Mercer Island

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

45

### Area of Building

#### Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

3,956

#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

10.0

Conditioned Volume

39,560

### Glazing and Doors

[Instructions](#)

U-0.28

**U-Factor X Area = UA**  
0.280 X 1,533 = 429.35

### Skylights

[Instructions](#)

**U-Factor X Area = UA**  
0.50 X [ ] = ---

### Insulation

#### Attic

[Instructions](#)

R-49

**U-Factor X Area = UA**  
0.026 X 2,298 = 59.75

#### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-49 Advanced

**U-Factor X Area = UA**  
0.020 X 401 = 8.02

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

[Instructions](#)

R-21 Intermediate

**U-Factor X Area = UA**  
0.056 X 3,061 = 171.42

#### Floors

[Instructions](#)

R-38

**U-Factor X Area = UA**  
0.025 X 2,061 = 51.53

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

[Instructions](#)

Select R-value

**U-Factor X Area = UA**  
No selection [ ] = ---

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

[Instructions](#)

No Slab Below Grade in this project.

**F-Factor X Length = UA**  
0.303 [ ] = ---

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

[Instructions](#)

No Slab on Grade in this project.

**F-Factor X Length = UA**  
--- [ ] = ---

### Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient

1.00

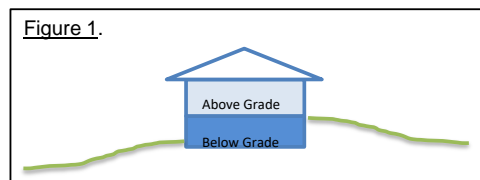


Figure 1.

<b>Sum of UA</b>	720.06
<b>Envelope Heat Load</b>	32,403 Btu / Hour
<i>Sum of UA x <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	19,226 Btu / Hour
<i>Volume x 0.6 x <math>\Delta T</math> x 0.018</i>	
<b>Building Design Heat Load</b>	51,629 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
<b>Building and Duct Heat Load</b>	51,629 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>	64,536 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>	