

# 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

A New Residence For Megan & Teddy Dann  
 3008 & 0th Avenue S.E.  
 Mercer Island WA 98040

## Contact Information

Rudolph Architects james@rudolpharchitects.net  
 915 Rucker Avenue  
 Everett WA 98201

**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](#)

Merger Island

Design Temperature Difference ( $\Delta T$ ) 45  
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

## Area of Building

### Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

3,551

### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.5

Conditioned Volume  
 33,735

## Glazing and Doors

[Instructions](#)

U-0.22

**U-Factor X Area = UA**  
 0.220 X 1,208 = 265.65

## Skylights

[Instructions](#)

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

## Insulation

### Attic

[Instructions](#)

R-49

**U-Factor X Area = UA**  
 0.026 X 840 = 21.84

### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-49 Advanced

**U-Factor X Area = UA**  
 0.020 X 561 = 11.22

### Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 INT plus R-4 ci

**U-Factor X Area = UA**  
 0.043 X 3,322 = 142.85

### Floors

[Instructions](#)

R-38

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

### Below Grade Walls (see Figure 1)

[Instructions](#)

R-21 int plus R-5 ci

**U-Factor X Area = UA**  
 0.028 X 1,501 = 42.03

### Slab Below Grade (see Figure 1)

[Instructions](#)

R-21 int Plus R-5 ci

**F-Factor X Length = UA**  
 0.303 X 182 = 55.15

### Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Fully Insulated

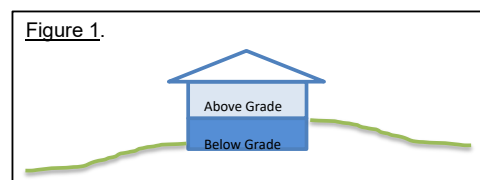
**F-Factor X Length = UA**  
 0.360 X 0 = ---

## Location of Ducts

[Instructions](#)

Conditioned Space

**Duct Leakage Coefficient**  
 1.00



<b>Sum of UA</b>	538.73
<b>Envelope Heat Load</b>	24,243 Btu / Hour
<i>Sum of UA x <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	16,395 Btu / Hour
<i>Volume x 0.6 x <math>\Delta T</math> x 0.018</i>	
<b>Building Design Heat Load</b>	40,638 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
<b>Building and Duct Heat Load</b>	40,638 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>	50,797 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>	