

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

Simpson Residence
 6454 E Mercer Way
 Mercer Island, WA 98004

Contact Information

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

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

5,488

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.5

Conditioned Volume
 52,139

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 1,394 = 390.38

Skylights

[Instructions](#)

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

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 1,102 = 28.66

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38 Vented

U-Factor X Area = UA
 0.027 X 2,016 = 54.42

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 5,444 = 304.86

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 2,071 = 51.78

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

U-Factor X Area = UA
 0.028 X --- = ---

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

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

Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Perimeter

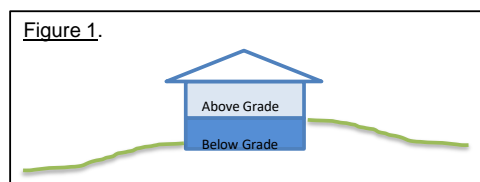
F-Factor X Length = UA
 0.540 X 21 = 11.07

Location of Ducts

[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient
 1.10



Sum of UA	841.16
Envelope Heat Load	37,852 Btu / Hour
<i>Sum of UA x ΔT</i>	
Air Leakage Heat Load	25,339 Btu / Hour
<i>Volume x 0.6 x ΔT x 0.018</i>	
Building Design Heat Load	63,192 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
Building and Duct Heat Load	69,511 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>	
Maximum Heat Equipment Output	86,889 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>	