Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2015 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This calculator will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Please fill out all of 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 call the WSU Energy Extension Program at (360) 956-2042 for assistance.

Project Information

Morelli Residence
8454 W Mercer Way
Mercer Island, WA 98040

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 — Mercer Island

Design Temperature Difference (ΔT) 45
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area

Instructions — Conditioned Floor Area (sq ft): 1,711

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 7.8

Conditioned Volume: 13,346

Glazing and Doors

Instructions — U-0.30

U-Factor	X	Area	=	UA
0.300		588		176.43

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50				---

Insulation

Attic

Instructions — R-49

U-Factor	X	Area	=	UA
0.026		451		11.73

Single Rafter or Joist Vaulted Ceilings

Instructions — Select R-Value

U-Factor	X	Area	UA
No selection			---

Above Grade Walls *(see Figure 1)*

Instructions — R-21 Intermediate

U-Factor	X	Area	UA
0.056		1,404	78.62

Floors

Instructions — No Floors above unconditioned spaces.

U-Factor	X	Area	UA

Below Grade Walls *(see Figure 1)*

Instructions — No Below Grade Walls in this project.

U-Factor	X	Area	UA
0.028			

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 — Select R-Value

F-Factor	X	Length	UA
No selection			---

Location of Ducts

Instructions — Unconditioned Space

Duct Leakage Coefficient
1.10

Figure 1.

Sum of UA	266.78	
Envelope Heat Load *Sum of UA X ΔT*	12,005	Btu / Hour
Air Leakage Heat Load *Volume X 0.6 X ΔT X .018*	6,486	Btu / Hour
Building Design Heat Load *Air Leakage + Envelope Heat Loss*	18,491	Btu / Hour
Building and Duct Heat Load *Ducts in unconditioned space: Sum of Building Heat Loss X 1.10* *Ducts in conditioned space: Sum of Building Heat Loss X 1*	20,340	Btu / Hour
Maximum Heat Equipment Output *Building and Duct Heat Loss X 1.40 for Forced Air Furnace* *Building and Duct Heat Loss X 1.25 for Heat Pump*	25,425	Btu / Hour