

Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2018 and 2021 Washington State Energy Code (WSEC) . 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.

This tool is for the permitting purposes only. A Manual J calculation is required to meet the requirement of the Washington State Energy Code.

Project Information

RKK CONSTRUCTION
4115 78th Ave SE
Mercer Island, WA 98004

Contact Information

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Bellevue, WA 98040

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 25

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)

4,718

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.5

Conditioned Volume

44,821

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
0.280 X 988 = 276.67

Skylights

[Instructions](#)

U-Factor X Area = UA
0.50 X [] = 0.00

Insulation

Attic

[Instructions](#)

R-60

U-Factor X Area = UA
0.024 X 1,911 = 45.86

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38

U-Factor X Area = UA
0.026 X 172 = 4.47

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 INT plus R-5 ci

U-Factor X Area = UA
0.041 X 4,394 = 180.14

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
0.025 X 741 = 18.53

Below Grade Walls and Slabs (see Figure 1)

[Instructions](#)

Wall & Slab R21 Batt w/TB

Depth 7' depth

Wall U-Factor X Area = UA
0.035 X 1,629 = 57.02

Slab F-Factor X Length = UA
0.500 X 181 = 90.50

Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA
0.360 X 181 = 65.16

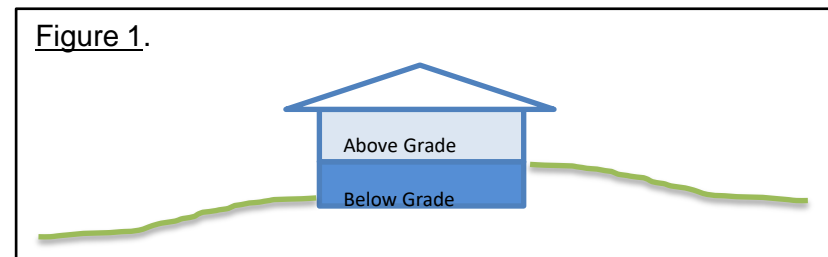
Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient

1.000



Sum of UA	738.35
Envelope Heat Load	33,226 Btu / Hour
<i>Sum of UA x ΔT</i>	
Air Leakage Heat Load	21,783 Btu / Hour
<i>Volume x 0.6 x ΔT x 0.018</i>	
Building Design Heat Load	55,009 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
Building and Duct Heat Load	55,009 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	68,761 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>	