

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

Yusen Residence
 3246 72nd Pl SE
 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](#)

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)

6,492

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.7

Conditioned Volume

62,972

Glazing and Doors

[Instructions](#)

U-0.25

U-Factor X Area = UA
 0.250 X 1,129 = 282.13

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X 36 = 18.00

Insulation

Attic

[Instructions](#)

None

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

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38

U-Factor X Area = UA
 0.026 X 2,213 = 57.54

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 INT plus R-5 ci

U-Factor X Area = UA
 0.041 X 3,618 = 148.35

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 395 = 9.88

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 1,872 = 65.52

Slab F-Factor X Length = UA
 0.500 X 206 = 102.83

Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA
 0.360 X 361 = 129.96

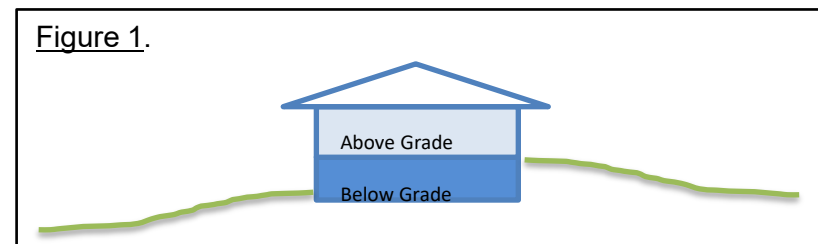
Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient

1.000



Sum of UA 814.21
Envelope Heat Load 36,639 Btu / Hour
Sum of UA x ΔT
Air Leakage Heat Load 30,605 Btu / Hour
Volume x 0.6 x ΔT x 0.018
Building Design Heat Load 67,244 Btu / Hour
Air leakage + envelope heat loss
Building and Duct Heat Load 67,244 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10
 Ducts in conditioned space: sum of building heat loss x 1
Maximum Heat Equipment Output 84,055 Btu / Hour
Building and duct heat loss x 1.40 for forced air furnace
 Building and duct heat loss x 1.25 for heat pump