# 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*

Forest Ave Residence
5202 Forest Ave SE
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): 5,051

### Average Ceiling Height

Instructions — Average Ceiling Height (ft): 8.9 — Conditioned Volume: 45,061

## Glazing and Doors

Instructions — U-0.30

| U-Factor | X | Area | = | UA |
|---|---|---|---|---|
| 0.300 | | 935 | | 280.47 |

## Skylights

Instructions

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

## Insulation

### Attic

Instructions — Select R-Value

| U-Factor | X | Area | = | UA |
|---|---|---|---|---|
| No selection | | | | --- |

### Single Rafter or Joist Vaulted Ceilings

Instructions — R-38 Vented

| U-Factor | X | Area | UA |
|---|---|---|---|
| 0.027 | | 2,194 | 59.24 |

### Above Grade Walls *(see Figure 1)*

Instructions — R-21 Intermediate

| U-Factor | X | Area | UA |
|---|---|---|---|
| 0.056 | | 4,798 | 268.69 |

### Floors

Instructions — R-38

| U-Factor | X | Area | UA |
|---|---|---|---|
| 0.025 | | 1,377 | 34.43 |

### Below Grade Walls *(see Figure 1)*

Instructions — R-21 Interior

| U-Factor | X | Area | UA |
|---|---|---|---|
| 0.042 | | 326 | 13.69 |

### Slab Below Grade *(see Figure 1)*

Instructions — Select conditioning

| F-Factor | X | Length | UA |
|---|---|---|---|
| No selection | | | --- |

### Slab on Grade *(see Figure 1)*

Instructions — R-10 Perimeter

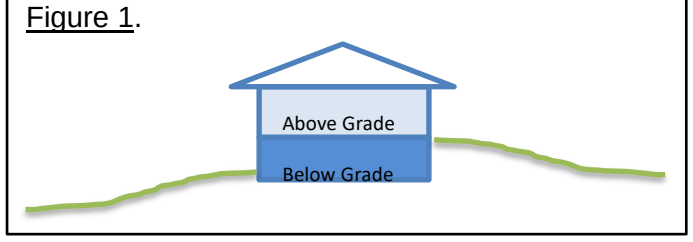
| F-Factor | X | Length | UA |
|---|---|---|---|
| 0.540 | | 220 | 118.80 |

## Location of Ducts

Instructions — Conditioned Space

**Duct Leakage Coefficient**
1.00

Figure 1.




**Sum of UA** 775.31

**Envelope Heat Load** 34,889 Btu / Hour
*Sum of UA X ΔT*

**Air Leakage Heat Load** 21,899 Btu / Hour
*Volume X 0.6 X ΔT X .018*

**Building Design Heat Load** 56,789 Btu / Hour
*Air Leakage + Envelope Heat Loss*

**Building and Duct Heat Load** 56,789 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** 70,986 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*