

## 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.

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### Project Information

2919 E Madison Street - Unit A  
Seattle, WA 98112  
Project #6814619

### Contact Information

Micaela Adams / H+dIT Collaborative  
2562 Dexter Ave N, Seattle, WA 98109  
T: 206.545.0700

### 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](#)

Seattle: Sea-Tac AP

Design Temperature Difference ( $\Delta T$ )

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

46

### Area of Building

#### Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

2,157

#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.4

Conditioned Volume

20,247

### Glazing and Doors

[Instructions](#)

U-0.28

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

0.280 X 129 = 35.98

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

0.50 X --- = ---

### Skylights

[Instructions](#)

### Insulation

#### Attic

[Instructions](#)

R-49

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

0.026 X 575 = 14.95

#### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

Select R-Value

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

No selection X --- = ---

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

[Instructions](#)

R-21 Intermediate

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

0.056 X 2,284 = 127.90

#### Floors

[Instructions](#)

R-38

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

0.025 X 230 = 5.75

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

[Instructions](#)

Select R-value

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

No selection X --- = ---

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

[Instructions](#)

Select conditioning

**F-Factor** X **Length** = **UA**

No selection X --- = ---

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

[Instructions](#)

R-10 Fully Insulated

**F-Factor** X **Length** = **UA**

0.360 X 374 = 134.66

### Location of Ducts

[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient

1.10

**Sum of UA** 319.24

**Envelope Heat Load** 14,685 Btu / Hour

*Sum of UA x  $\Delta T$*

**Air Leakage Heat Load** 10,059 Btu / Hour

*Volume x 0.6 x  $\Delta T$  x 0.018*

**Building Design Heat Load** 24,744 Btu / Hour

*Air leakage + envelope heat loss*

**Building and Duct Heat Load** 27,218 Btu / Hour

*Ducts in unconditioned space: sum of building heat loss x 1.10*

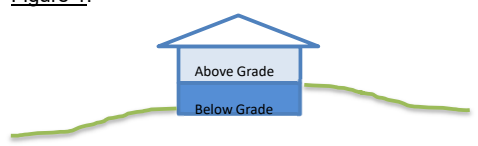
*Ducts in conditioned space: sum of building heat loss x 1*

**Maximum Heat Equipment Output** 34,023 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*

Figure 1.



## Window, Skylight and Door Schedule

### Project Information

Project #6814619-CN
2919 E Madison St, Seattle, WA 98112
Unit A

### Contact Information

Micaela Adams/H+dIT Collaborative
2562 Dexter Ave N, Seattle, WA 98109
206.545.0700

	Ref.	U-factor	Qt.	Width Feet Inch	Height Feet Inch	Area	UA
Exempt Swinging Door (24 sq. ft. max.)	Coeur	0.28	1	2 6	7 0	17.5	4.90
Exempt Glazed Fenestration (15 sq. ft. max.)	Coeur	.28	1	5 0	1 6	7.5	2.10

### Vertical Fenestration (Windows and doors)

[illegible]



0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Vertical Fenestration Area and UA
Vertical Fenestration Area Weighted U = UA/Area

451.0	126.28
	0.28

Overhead Glazing (Skylights)

Component		
Description	Ref.	U-factor

	Width		Height	
Qt.	Feet	Inch	Feet	Inch

Area	UA
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Overhead Glazing Area and UA
Overhead Glazing Area Weighted U = UA/Area

0.0	0.00
	0.00

Total Sum of Fenestration Area and UA (for heating system sizing calculations)

476.0	133.28
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### Project Information

2919 E Madison Street - Unit B  
Seattle, WA 98112  
Project #6814619

### Contact Information

Micaela Adams / H+dIT Collaborative  
2562 Dexter Ave N, Seattle, WA 98109  
T: 206.545.0700

### 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](#)

Seattle: Sea-Tac AP

Design Temperature Difference ( $\Delta T$ )

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

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Conditioned Floor Area (sq ft)

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#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.4

Conditioned Volume

20,247

### Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA  
0.280 X 129 = 35.98

### Skylights

[Instructions](#)

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

### Insulation

#### Attic

[Instructions](#)

R-49

U-Factor X Area = UA  
0.026 X 575 = 14.95

#### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

Select R-Value

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

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

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA  
0.056 X 2,284 = 127.90

#### Floors

[Instructions](#)

R-38

U-Factor X Area = UA  
0.025 X 230 = 5.75

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

[Instructions](#)

Select R-value

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

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

[Instructions](#)

Select conditioning

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

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

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA  
0.360 X 374 = 134.66

### Location of Ducts

[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient

1.10

Sum of UA 319.24

Envelope Heat Load 14,685 Btu / Hour

Sum of UA x  $\Delta T$

Air Leakage Heat Load 10,059 Btu / Hour

Volume x 0.6 x  $\Delta T$  x 0.018

Building Design Heat Load 24,744 Btu / Hour

Air leakage + envelope heat loss

Building and Duct Heat Load 27,218 Btu / Hour

Ducts in unconditioned space: sum of building heat loss x 1.10

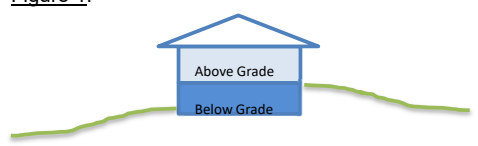
Ducts in conditioned space: sum of building heat loss x 1

Maximum Heat Equipment Output 34,023 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

Figure 1.



## Window, Skylight and Door Schedule

### Project Information

Project #6814619-CN
2919 E Madison St, Seattle, WA 98112
Unit B

### Contact Information

Micaela Adams/H+dIT Collaborative
2562 Dexter Ave N, Seattle, WA 98109
206.545.0700

	Ref.	U-factor	Qt.	Width Feet	Height Feet	Area	UA
Exempt Swinging Door (24 sq. ft. max.)	Coeur	0.28	1	2 <sup>6</sup>	7 <sup>0</sup>	17.5	4.90
Exempt Glazed Fenestration (15 sq. ft. max.)	Coeur	.28	1	5 <sup>0</sup>	1 <sup>6</sup>	7.5	2.10

### Vertical Fenestration (Windows and doors)

[illegible]



0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Vertical Fenestration Area and UA  
 Vertical Fenestration Area Weighted U = UA/Area

451.0	126.28
	0.28

Overhead Glazing (Skylights)

Component		
Description	Ref.	U-factor

	Width		Height	
Qt.	Feet	Inch	Feet	Inch

Area	UA
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Overhead Glazing Area and UA  
 Overhead Glazing Area Weighted U = UA/Area

0.0	0.00
	0.00

Total Sum of Fenestration Area and UA (for heating system sizing calculations)

476.0	133.28
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## Simple Heating System Size: Washington State

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### Project Information

2919 E Madison Street - Unit C  
Seattle, WA 98112  
Project #6814619

### Contact Information

Micaela Adams / H+dIT Collaborative  
2562 Dexter Ave N, Seattle, WA 98109  
T: 206.545.0700

### 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](#)

Seattle: Sea-Tac AP

Design Temperature Difference ( $\Delta T$ )

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

46

### Area of Building

#### Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

1,976

#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

8.4

Conditioned Volume

16,560

### Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA  
0.280 X 477 = 133.60

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

### Skylights

[Instructions](#)

### Insulation

#### Attic

[Instructions](#)

R-49

U-Factor X Area = UA  
0.026 X 464 = 12.05

#### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38 Vented

U-Factor X Area = UA  
0.027 X 241 = 6.51

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

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA  
0.056 X 1,920 = 107.50

#### Floors

[Instructions](#)

R-38

U-Factor X Area = UA  
0.025 X 400 = 10.00

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

[Instructions](#)

Select R-value

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

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

[Instructions](#)

Select conditioning

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

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

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA  
0.360 X 315 = 113.40

### Location of Ducts

[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient

1.10

Sum of UA 383.05

Envelope Heat Load 17,620 Btu / Hour

Sum of UA x  $\Delta T$

Air Leakage Heat Load 8,227 Btu / Hour

Volume x 0.6 x  $\Delta T$  x 0.018

Building Design Heat Load 25,847 Btu / Hour

Air leakage + envelope heat loss

Building and Duct Heat Load 28,432 Btu / Hour

Ducts in unconditioned space: sum of building heat loss x 1.10

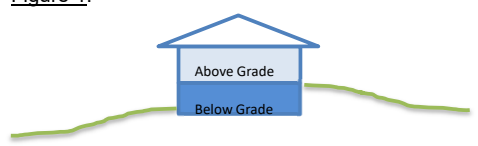
Ducts in conditioned space: sum of building heat loss x 1

Maximum Heat Equipment Output 35,540 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

Figure 1.



## Window, Skylight and Door Schedule

### Project Information

Project #6814619-CN
2919 E Madison St, Seattle, WA 98112
Unit C

### Contact Information

Micaela Adams/H+dIT Collaborative
2562 Dexter Ave N, Seattle, WA 98109
206.545.0700

	Ref.	U-factor	Qt.	Width Feet	Height Inch	Feet	Inch	Area	UA
Exempt Swinging Door (24 sq. ft. max.)	Coeur	0.28	1	2	6	7	0	17.5	4.90
Exempt Glazed Fenestration (15 sq. ft. max.)	Coeur	.28	1	2	0	3	6	7.0	1.96

### Vertical Fenestration (Windows and doors)

[illegible]





0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Vertical Fenestration Area and UA
Vertical Fenestration Area Weighted U = UA/Area

414.9	116.18
	0.28

Overhead Glazing (Skylights)

Component		
Description	Ref.	U-factor

	Width		Height	
	Feet	Inch	Feet	Inch

Area	UA
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Overhead Glazing Area and UA
Overhead Glazing Area Weighted U = UA/Area

0.0	0.00
	0.00

Total Sum of Fenestration Area and UA (for heating system sizing calculations)

439.4	123.04
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### Project Information

2919 E Madison Street - Unit D  
Seattle, WA 98112  
Project #6814619

### Contact Information

Micaela Adams / H+dIT Collaborative  
2562 Dexter Ave N, Seattle, WA 98109  
T: 206.545.0700

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☒ Heat Pump

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Seattle: Sea-Tac AP

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#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

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Conditioned Volume

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### Glazing and Doors

[Instructions](#)

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U-Factor X Area = UA  
0.280 X 477 = 133.60

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### Skylights

[Instructions](#)

### Insulation

#### Attic

[Instructions](#)

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U-Factor X Area = UA  
0.027 X 241 = 6.51

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[Instructions](#)

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U-Factor X Area = UA  
0.056 X 1,920 = 107.50

#### Floors

[Instructions](#)

R-38

U-Factor X Area = UA  
0.025 X 400 = 10.00

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

[Instructions](#)

Select R-value

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

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

[Instructions](#)

Select conditioning

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

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

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA  
0.360 X 315 = 113.40

### Location of Ducts

[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient

1.10

Sum of UA 383.05

Envelope Heat Load 17,620 Btu / Hour

Sum of UA x  $\Delta T$

Air Leakage Heat Load 8,227 Btu / Hour

Volume x 0.6 x  $\Delta T$  x 0.018

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Building and Duct Heat Load 28,432 Btu / Hour

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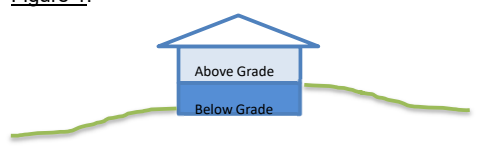
Ducts in conditioned space: sum of building heat loss x 1

Maximum Heat Equipment Output 35,540 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

Figure 1.



## Window, Skylight and Door Schedule

### Project Information

Project #6814619-CN
2919 E Madison St, Seattle, WA 98112
Unit D

### Contact Information

Micaela Adams/H+dIT Collaborative
2562 Dexter Ave N, Seattle, WA 98109
206.545.0700

	Ref.	U-factor	Qt.	Width Feet	Height Feet	Area	UA
Exempt Swinging Door (24 sq. ft. max.)	Coeur	0.28	1	2	6	17.5	4.90
Exempt Glazed Fenestration (15 sq. ft. max.)	Coeur	.28	1	2	3	7.0	1.96

### Vertical Fenestration (Windows and doors)

[illegible]



0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Vertical Fenestration Area and UA  
Vertical Fenestration Area Weighted U = UA/Area

414.9	116.18
	0.28

Overhead Glazing (Skylights)

Component		
Description	Ref.	U-factor

	Width		Height	
	Feet	Inch	Feet	Inch

Area	UA
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00
0.0	0.00

Sum of Overhead Glazing Area and UA  
Overhead Glazing Area Weighted U = UA/Area

0.0	0.00
	0.00

Total Sum of Fenestration Area and UA (for heating system sizing calculations)

439.4	123.04
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