Simple Heating System Size: Washington State

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Project Information	*Contact Information*
Shelter 9221 14th Ave NW Units 1 & 10	Vandervort Architects -Mark Wierenga
9221 / 9223 14th Ave NW	2000 Fairview AVE E - Suite 103
Seattle, WA 98117	Seattle, WA 98102

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 (∆T)　46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)　　1,453

Average Ceiling Height
Instructions
Average Ceiling Height (ft)　　8.5

Conditioned Volume
12,351

Glazing and Doors
Instructions

U-0.28 ▼

U-Factor	X	Area	=	UA
0.280		417		116.76

Skylights
Instructions

U-Factor	X	Area	=	UA
0.50		0		---

Insulation

Attic
Instructions

Select R-Value ▼

U-Factor	X	Area	=	UA
No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced ▼

U-Factor	X	Area		UA
0.020		463		9.26

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate ▼

U-Factor	X	Area		UA
0.056		1,586		88.82

Floors
Instructions

R-38 ▼

U-Factor	X	Area		UA
0.025		464		11.60

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project. ▼

U-Factor	X	Area		UA
0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project. ▼

F-Factor	X	Length		UA
0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project. ▼

F-Factor	X	Length		UA
---		0		_____

Location of Ducts
Instructions

No Ducts ▼

Duct Leakage Coefficient
1.00

Figure 1.

Sum of UA　　226.44

Envelope Heat Load　　10,416 Btu / Hour
Sum of UA x ∆T

Air Leakage Heat Load　　6,136 Btu / Hour
Volume x 0.6 x ∆T x 0.018

Building Design Heat Load　　16,552 Btu / Hour
Air leakage + envelope heat loss

Building and Duct Heat Load　　16,552 Btu / Hour
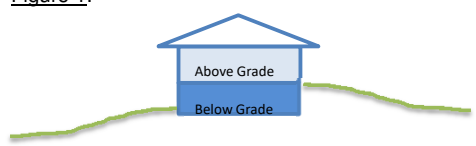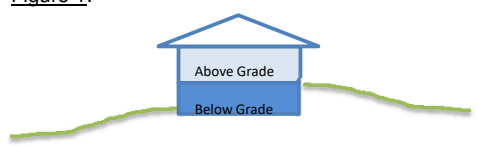*Ducts in unconditioned space: sum of building heat loss x 1.10*
Ducts in conditioned space: sum of building heat loss x 1

Maximum Heat Equipment Output　　20,690 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

(07/01/13)

Simple Heating System Size: Washington State

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Project Information	Contact Information
Shelter 9221 14th Ave NW Units 2 & 9	Vandervort Architects -Mark Wierenga
9221 / 9223 14th Ave NW	2000 Fairview AVE E - Suite 103
Seattle, WA 98117	Seattle, WA 98102

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 (ΔT)　　46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)　　**1,457**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)　　**8.5**

Conditioned Volume
12,385

Glazing and Doors
Instructions

U-0.28

U-Factor	X	Area	=	UA
0.280		296		82.88

Skylights
Instructions

U-Factor	X	Area	=	UA
0.50		0		---

Insulation

Attic
Instructions

Select R-Value

U-Factor	X	Area	=	UA
No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced

U-Factor	X	Area		UA
0.020		466		9.32

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate

U-Factor	X	Area		UA
0.056		1,221		68.38

Floors
Instructions

R-38

U-Factor	X	Area		UA
0.025		466		11.65

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project.

U-Factor	X	Area		UA
0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project.

F-Factor	X	Length		UA
0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project.

F-Factor	X	Length		UA
---		0		_____

Location of Ducts
Instructions

No Ducts

Duct Leakage Coefficient
1.00

Figure 1.

Above Grade

Below Grade

Sum of UA	172.23
Envelope Heat Load	7,922　Btu / Hour
Sum of UA x ΔT	
Air Leakage Heat Load	6,153　Btu / Hour
Volume x 0.6 x ΔT x 0.018	
Building Design Heat Load	14,075　Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	14,075　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	17,594　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	

(07/01/13)

Simple Heating System Size: Washington State

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Project Information	Contact Information
Shelter 9221 14th Ave NW Units 2a, 5a, 9a	Vandervort Architects -Mark Wierenga
9221 / 9223 14th Ave NW	2000 Fairview AVE E - Suite 103
Seattle, WA 98117	Seattle, WA 98102

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 (ΔT)   46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building
Conditioned Floor Area
Instructions

Conditioned Floor Area (sq ft)   **675**

Average Ceiling Height
Instructions

Average Ceiling Height (ft)   **8.5**

Conditioned Volume
5,738

Glazing and Doors
Instructions

U-0.28 ▼

	U-Factor	X	Area	=	UA
	0.280		**148**		41.44

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50		**0**		---

Insulation
Attic
Instructions

Select R-Value ▼

	U-Factor	X	Area	=	UA
	No selection		**0**		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced ▼

	U-Factor	X	Area		UA
	0.020		**351**		7.02

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate ▼

	U-Factor	X	Area		UA
	0.056		**366**		20.50

Floors
Instructions

R-38 ▼

	U-Factor	X	Area		UA
	0.025		**351**		8.78

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project. ▼

	U-Factor	X	Area		UA
	0.028		**0**		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project. ▼

	F-Factor	X	Length		UA
	0.303		**0**		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project. ▼

	F-Factor	X	Length		UA
	---		**0**		_____

Location of Ducts
Instructions

No Ducts ▼

Duct Leakage Coefficient
1.00

Figure 1.

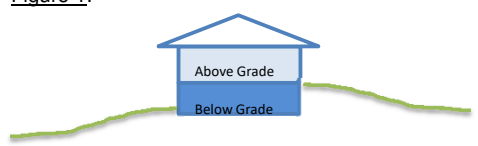|	
Sum of UA	77.73
Envelope Heat Load	3,576 Btu / Hour
Sum of UA x ΔT	
Air Leakage Heat Load	2,850 Btu / Hour
Volume x 0.6 x ΔT x 0.018	
Building Design Heat Load	6,426 Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	6,426 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10	
Ducts in conditioned space: sum of building heat loss x 1	
Maximum Heat Equipment Output	8,033 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	

(07/01/13)

Simple Heating System Size: Washington State

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Project Information
Shelter 9221 14th Ave NW Units 3 & 4
9221 / 9223 14th Ave NW
Seattle, WA 98117

Contact Information
Vandervort Architects -Mark Wierenga
2000 Fairview AVE E - Suite 103
Seattle, WA 98102

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 (∆T)   46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)   **1,322**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)   **8.5**

Conditioned Volume
11,237

Glazing and Doors
Instructions

U-0.28

	U-Factor	X	Area	=	UA
	0.280		359		100.52

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50		0		---

Insulation

Attic
Instructions
Select R-Value

	U-Factor	X	Area	=	UA
	No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions
R-49 Advanced

	U-Factor	X	Area		UA
	0.020		528		10.56

Above Grade Walls *(see Figure 1)*
Instructions
R-21 Intermediate

	U-Factor	X	Area		UA
	0.056		2,078		116.37

Floors
Instructions
R-38

	U-Factor	X	Area		UA
	0.025		427		10.68

Below Grade Walls *(see Figure 1)*
Instructions
No Below Grade Walls in this project.

	U-Factor	X	Area		UA
	0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions
No Slab Below Grade in this project.

	F-Factor	X	Length		UA
	0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions
No Slab on Grade in this project.

	F-Factor	X	Length		UA
	---		0		_____

Location of Ducts
Instructions
No Ducts

Duct Leakage Coefficient
1.00

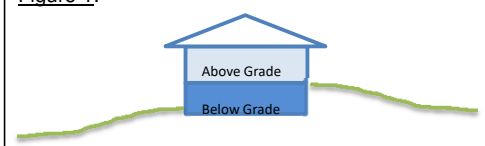|	
Sum of UA	238.12
Envelope Heat Load	10,954 Btu / Hour
Sum of UA x ∆T	
Air Leakage Heat Load	5,583 Btu / Hour
Volume x 0.6 x ∆T x 0.018	
Building Design Heat Load	16,536 Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	16,536 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10	
Ducts in conditioned space: sum of building heat loss x 1	
Maximum Heat Equipment Output	20,670 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.

Above Grade
Below Grade

Simple Heating System Size: Washington State

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Project Information
Shelter 9221 14th Ave NW Units 4a
9221 / 9223 14th Ave NW
Seattle, WA 98117

Contact Information
Vandervort Architects -Mark Wierenga
2000 Fairview AVE E - Suite 103
Seattle, WA 98102

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 (ΔT)　　46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building
Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)　　**702**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)　　**8.5**

Conditioned Volume
5,967

Glazing and Doors
Instructions

U-0.28

	U-Factor	X	Area	=	UA
	0.280		211		59.08

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50		0		---

Insulation
Attic
Instructions

Select R-Value

	U-Factor	X	Area	=	UA
	No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced

	U-Factor	X	Area		UA
	0.020		359		7.18

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate

	U-Factor	X	Area		UA
	0.056		876		49.06

Floors
Instructions

R-38

	U-Factor	X	Area		UA
	0.025		359		8.98

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project.

	U-Factor	X	Area		UA
	0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project.

	F-Factor	X	Length		UA
	0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project.

	F-Factor	X	Length		UA
	---		0		_____

Location of Ducts
Instructions

No Ducts

Duct Leakage Coefficient
1.00

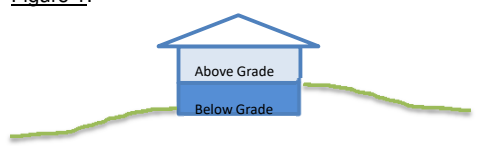|	
Sum of UA	124.29
Envelope Heat Load	5,717　Btu / Hour
Sum of UA x ΔT	
Air Leakage Heat Load	2,964　Btu / Hour
Volume x 0.6 x ΔT x 0.018	
Building Design Heat Load	8,682　Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	8,682　Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10	
Ducts in conditioned space: sum of building heat loss x 1	
Maximum Heat Equipment Output	10,852　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.

Above Grade
Below Grade

(07/01/13)

Simple Heating System Size: Washington State

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Project Information

Shelter 9221 14th Ave NW Units 5 & 6	
9221 / 9223 14th Ave NW	
Seattle, WA 98117	

Contact Information

Vandervort Architects -Mark Wierenga	
2000 Fairview AVE E - Suite 103	
Seattle, WA 98102	

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 (∆T)   46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building
Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)   **1,637**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)   **8.5**

Conditioned Volume
13,915

Glazing and Doors
Instructions

U-0.28 ▼

U-Factor	X	Area	=	UA
0.280		**379**		106.12

Skylights
Instructions

U-Factor	X	Area	=	UA
0.50		**0**		---

Insulation
Attic
Instructions

Select R-Value ▼

U-Factor	X	Area	=	UA
No selection		**0**		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced ▼

U-Factor	X	Area		UA
0.020		**607**		12.14

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate ▼

U-Factor	X	Area		UA
0.056		**2,446**		136.98

Floors
Instructions

R-38 ▼

U-Factor	X	Area		UA
0.025		**607**		15.18

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project. ▼

U-Factor	X	Area		UA
0.028		**0**		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project. ▼

F-Factor	X	Length		UA
0.303		**0**		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project. ▼

F-Factor	X	Length		UA
---		**0**		_____

Location of Ducts
Instructions

No Ducts ▼

Duct Leakage Coefficient
1.00

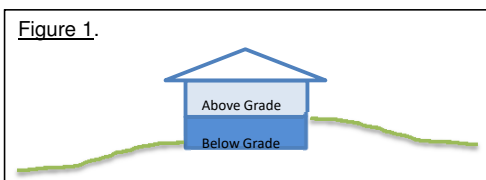|	
Sum of UA	270.41
Envelope Heat Load	12,439 Btu / Hour
Sum of UA x ∆T	
Air Leakage Heat Load	6,913 Btu / Hour
Volume x 0.6 x ∆T x 0.018	
Building Design Heat Load	19,352 Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	19,352 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10	
Ducts in conditioned space: sum of building heat loss x 1	
Maximum Heat Equipment Output	24,190 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.

(07/01/13)

Simple Heating System Size: Washington State

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Project Information	Contact Information
Shelter 9221 14th Ave NW Units 6a	Vandervort Architects -Mark Wierenga
9221 / 9223 14th Ave NW	2000 Fairview AVE E - Suite 103
Seattle, WA 98117	Seattle, WA 98102

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 (ΔT)   46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)   **670**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)   **8.5**

Conditioned Volume
5,695

Glazing and Doors
Instructions

U-0.28 ▼

	U-Factor	X	Area	=	UA
	0.280		171		47.88

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50		0		---

Insulation

Attic
Instructions

Select R-Value ▼

	U-Factor	X	Area	=	UA
	No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced ▼

	U-Factor	X	Area		UA
	0.020		534		10.68

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate ▼

	U-Factor	X	Area		UA
	0.056		559		31.30

Floors
Instructions

R-38 ▼

	U-Factor	X	Area		UA
	0.025		534		13.35

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project. ▼

	U-Factor	X	Area		UA
	0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project. ▼

	F-Factor	X	Length		UA
	0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project. ▼

	F-Factor	X	Length		UA
	---		0		_____

Location of Ducts
Instructions

No Ducts ▼

Duct Leakage Coefficient
1.00

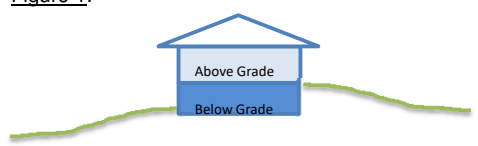|	
Sum of UA	103.21
Envelope Heat Load	4,748 Btu / Hour
Sum of UA x ΔT	
Air Leakage Heat Load	2,829 Btu / Hour
Volume x 0.6 x ΔT x 0.018	
Building Design Heat Load	7,577 Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	7,577 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10	
Ducts in conditioned space: sum of building heat loss x 1	
Maximum Heat Equipment Output	9,471 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.

Above Grade / Below Grade

(07/01/13)

Simple Heating System Size: Washington State

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Project Information	Contact Information
Shelter 9221 14th Ave NW Units 7	Vandervort Architects -Mark Wierenga
9221 / 9223 14th Ave NW	2000 Fairview AVE E - Suite 103
Seattle, WA 98117	Seattle, WA 98102

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 (∆T)   46
∆T = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)   **1,589**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)   **8.5**   Conditioned Volume   13,507

Glazing and Doors
Instructions

U-0.28

	U-Factor	X	Area	=	UA
	0.280		437		122.36

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50		0		---

Insulation

Attic
Instructions

Select R-Value

	U-Factor	X	Area	=	UA
	No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced

	U-Factor	X	Area		UA
	0.020		586		11.72

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate

	U-Factor	X	Area		UA
	0.056		2,244		125.66

Floors
Instructions

R-38

	U-Factor	X	Area		UA
	0.025		586		14.65

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project.

	U-Factor	X	Area		UA
	0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project.

	F-Factor	X	Length		UA
	0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project.

	F-Factor	X	Length		UA
	---		0		_____

Location of Ducts
Instructions

No Ducts

Duct Leakage Coefficient
1.00

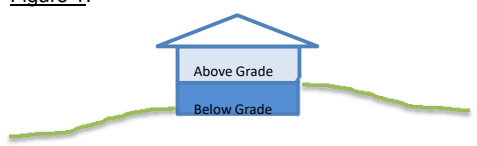|	
Sum of UA	274.39
Envelope Heat Load	12,622 Btu / Hour
Sum of UA x ∆T	
Air Leakage Heat Load	6,710 Btu / Hour
Volume x 0.6 x ∆T x 0.018	
Building Design Heat Load	19,332 Btu / Hour
Air leakage + envelope heat loss	
Building and Duct Heat Load	19,332 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10	
Ducts in conditioned space: sum of building heat loss x 1	
Maximum Heat Equipment Output	24,165 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.

Above Grade
Below Grade

(07/01/13)

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.

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.

Project Information	Contact Information
Shelter 9221 14th Ave NW Units 8	Vandervort Architects -Mark Wierenga
9221 / 9223 14th Ave NW	2000 Fairview AVE E - Suite 103
Seattle, WA 98117	Seattle, WA 98102

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 (ΔT)   46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building
Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)   **1,563**

Average Ceiling Height
Instructions
Average Ceiling Height (ft)   **8.5**

Conditioned Volume
13,286

Glazing and Doors
Instructions
[U-0.28 ▼]

U-Factor	X	Area	=	UA
0.280		385		107.80

Skylights
Instructions

U-Factor	X	Area	=	UA
0.50		0		---

Insulation
Attic
Instructions
[Select R-Value ▼]

U-Factor	X	Area	=	UA
No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions
[R-49 Advanced ▼]

U-Factor	X	Area		UA
0.020		519		10.38

Above Grade Walls *(see Figure 1)*
Instructions
[R-21 Intermediate ▼]

U-Factor	X	Area		UA
0.056		2,228		124.77

Floors
Instructions
[R-38 ▼]

U-Factor	X	Area		UA
0.025		519		12.98

Below Grade Walls *(see Figure 1)*
Instructions
[No Below Grade Walls in this project. ▼]

U-Factor	X	Area		UA
0.028		0		_____

Slab Below Grade *(see Figure 1)*
Instructions
[No Slab Below Grade in this project. ▼]

F-Factor	X	Length		UA
0.303		0		---

Slab on Grade *(see Figure 1)*
Instructions
[No Slab on Grade in this project. ▼]

F-Factor	X	Length		UA
---		0		_____

Location of Ducts
Instructions
[No Ducts ▼]

Duct Leakage Coefficient
1.00

Figure 1.

Above Grade
Below Grade

Sum of UA   255.92

Envelope Heat Load   11,772 Btu / Hour
Sum of UA x ΔT

Air Leakage Heat Load   6,600 Btu / Hour
Volume x 0.6 x ΔT x 0.018

Building Design Heat Load   18,373 Btu / Hour
Air leakage + envelope heat loss

Building and Duct Heat Load 18,373 Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10
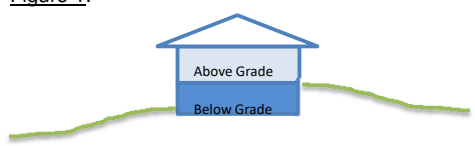*Ducts in conditioned space: sum of building heat loss x 1*

Maximum Heat Equipment Output   22,966 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

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.

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.

Project Information

| Shelter 9221 14th Ave NW Units 11 & 12 |
| 9221 / 9223 14th Ave NW |
| Seattle, WA 98117 |

Contact Information

| Vandervort Architects -Mark Wierenga |
| 2000 Fairview AVE E - Suite 103 |
| Seattle, WA 98102 |

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 (ΔT)   46
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building
Conditioned Floor Area
Instructions
Conditioned Floor Area (sq ft)   1,870

Average Ceiling Height
Instructions
Average Ceiling Height (ft)   8.5

Conditioned Volume
15,895

Glazing and Doors
Instructions

U-0.28 ▼

| U-Factor | X | Area | = | UA |
| 0.280 | | 534 | | 149.52 |

Skylights
Instructions

| U-Factor | X | Area | = | UA |
| 0.50 | | 0 | | --- |

Insulation
Attic
Instructions

Select R-Value ▼

| U-Factor | X | Area | = | UA |
| No selection | | 0 | | --- |

Single Rafter or Joist Vaulted Ceilings
Instructions

R-49 Advanced ▼

| U-Factor | X | Area | | UA |
| 0.020 | | 598 | | 11.96 |

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate ▼

| U-Factor | X | Area | | UA |
| 0.056 | | 1,956 | | 109.54 |

Floors
Instructions

R-38 ▼

| U-Factor | X | Area | | UA |
| 0.025 | | 598 | | 14.95 |

Below Grade Walls *(see Figure 1)*
Instructions

No Below Grade Walls in this project. ▼

| U-Factor | X | Area | | UA |
| 0.028 | | 0 | | _____ |

Slab Below Grade *(see Figure 1)*
Instructions

No Slab Below Grade in this project. ▼

| F-Factor | X | Length | | UA |
| 0.303 | | 0 | | --- |

Slab on Grade *(see Figure 1)*
Instructions

No Slab on Grade in this project. ▼

| F-Factor | X | Length | | UA |
| --- | | 0 | | _____ |

Location of Ducts
Instructions

No Ducts ▼

Duct Leakage Coefficient
1.00

Figure 1.

Above Grade
Below Grade

Sum of UA   285.97

Envelope Heat Load   13,154 Btu / Hour
Sum of UA x ΔT

Air Leakage Heat Load   7,897 Btu / Hour
Volume x 0.6 x ΔT x 0.018

Building Design Heat Load   21,051 Btu / Hour
Air leakage + envelope heat loss

Building and Duct Heat Load   21,051 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   26,314 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

(07/01/13)