

<b>Project Information</b>
East Town Crossing, Unit 101 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.41, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,207	67.6	0.054	1,207	65.2
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	134	72.1	0.540	134	72.1
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		186.4	<b>Proposed UA Total</b>		184.0
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.3%
				<b>UA Reduction</b>		2.4

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R406.3 Energy Credits					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

<b>Conditioned Floor Area, Proposed Design</b>	795	sq. ft
<b>Classification</b> Small Dwelling Unit		
<b>Notes</b>		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt									0	0.0
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U									0.300	

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U									0	

Vertical Glazing Schedule										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt			-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
Sum of Area and UA									115.5	34.7
Vertical Glazing Area Weighted U									0.300	
Vertical Glazing and Doors Area Weighted U									0.300	

Flat/Vaulted Ceilings										
Plan ID	Component Description	Ref.	Attic U	Area	UA					
							No ceiling/roof in thermal envelope	NA	-	
Sum of Area and UA					0	0.0				

Walls (Above Grade)										
Plan ID	Component Description	Ref.	Wall U	Net Area	UA					
							R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,207
Sum of Area and UA					1,207	65				

Floor (over crawl or exterior)										
Plan ID	Component Description	Ref.	Floor U	Area	UA					
						Sum of Area and UA				

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		134	72
Sum of Perimeter and FP					134	72

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		795 ft2
Conditioned Volume		6,758 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		184
Envelope Heat Load		9,383 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		3,722 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load		13,105 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,105 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		16,382 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

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<b>Messages / Results *</b>
UA Reduction = 2.26, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,128	63.1	0.054	1,128	60.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	126	67.9	0.540	126	67.9
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		177.7	<b>Proposed UA Total</b>		175.5
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.3%
				<b>UA Reduction</b>		2.3
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

Conditioned Floor Area, Proposed Design		765	sq. ft
Classification		Small Dwelling Unit	
Notes			

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U										0.300

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

Vertical Glazing Schedule											Rows to Show
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA	
Exempt					Feet	Inch	Feet	Inch			
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25	
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80	
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60	
Sum of Area and UA									115.5	34.7	
Vertical Glazing Area Weighted U										0.300	
Vertical Glazing and Doors Area Weighted U										0.300	

Flat/Vaulted Ceilings											
Plan ID	Component Description	Ref.	Attic U							Area	UA
	No ceiling/roof in thermal envelope	NA	-								0.0
Sum of Area and UA									0	0.0	

Walls (Above Grade)											
Plan ID	Component Description	Ref.	Wall U							Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054							1,128	61
Sum of Area and UA									1,128	61	

Floor (over crawl or exterior)											
Plan ID	Component Description	Ref.	Floor U							Area	UA
Sum of Area and UA									0	0	

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		126	68
Sum of Perimeter and FP					126	68

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a>	
	New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC	<a href="#">Prescriptive Checklist</a>	
Alterations (Remodel) Worksheet	<a href="#">Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	765 ft2	
Conditioned Volume	6,503 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	175	
Envelope Heat Load	8,949 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	3,582 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	12,531 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	12,531 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	15,664 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
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Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.17, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 624 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>Baseline</b>					
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,083	60.6	0.054	1,083	58.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	115	62.0	0.540	115	62.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		149.0	<b>Proposed UA Total</b>		146.9
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5 from Tables 406.2 and 406.3
				<b>UA Percent Reduction</b>		1.5%
				<b>UA Reduction</b>		2.2
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

Conditioned Floor Area, Proposed Design 624 sq. ft

Classification Small Dwelling Unit

Notes

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt									0	0.0
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U										0.300

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

Vertical Glazing Schedule

Rows to Show 2

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt			-						-	-
1 3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2 6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
Sum of Area and UA									48.0	14.4
Vertical Glazing Area Weighted U										0.300
Vertical Glazing and Doors Area Weighted U										0.300

Flat/Vaulted Ceilings

Plan ID	Component Description	Ref.	Attic U	Area	UA
	No ceiling/roof in thermal envelope	NA	-		0.0
Sum of Area and UA				0	0.0

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,083	58
Sum of Area and UA				1,083	58

Floor (over crawl or exterior)

Plan ID	Component Description	Ref.	Floor U	Area	UA
Sum of Area and UA				0	0



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		115	62
Sum of Perimeter and FP					115	62

Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

Ventilation Requirements			
Number of Bedrooms	1		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	45 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required? No			

Links to Download Forms, Checklists and Other Resources		Link	
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>	
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>		
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a>		
	New Construction <a href="#">Affidavit, New</a>		
Prescriptive Checklist for 2018 WSEC	<a href="#">Prescriptive Checklist</a>		
Alterations (Remodel) Worksheet	<a href="#">Worksheet</a>		

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>	
Nearest Weather Station	Puyallup		
Indoor Design Temperature	70 F		
Outdoor Design Temperature	19 F		
Design Temperature Difference (ΔT)	51 F		
Conditioned Floor Area, Proposed Design	624 ft2		
Conditioned Volume	5,304 ft3		
<small>Leave blank to use default of 8.5 ft. ceiling height</small>			
HVAC System Type	Heat Pump		
Location of HVAC Distribution System	Unducted		
Sum of UA, including exempt door and window	147		
Envelope Heat Load	7,490 Btu / Hour		
<small>Sum of UA X ΔT</small>			
Air Leakage Heat Load	2,921 Btu / Hour		
<small>((Volume X 0.6) X ΔT) X 0.018)</small>			
Building Design Heat Load	10,412 Btu / Hour		
<small>Air Leakage + Envelope Heat Loss</small>			
Building and Duct Heat Load	10,412 Btu / Hour		
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>			
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>			
Maximum Heat Equipment Output	13,015 Btu / Hour		
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>			
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>			

<b>Project Information</b>
East Town Crossing, Unit 104 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.29, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Baseline</b>		<b>Proposed Design</b>	
			<b>U</b>	<b>Area</b>	<b>UA</b>	
Doors U =	0.300	40	12.0		0.300	40
Overhead Glazing U =	0.500	0	0.0			0
Vertical Glazing U =	0.300	63	18.9		0.300	63
Flat/Vaulted Ceilings U =	0.027	0	0.0			0
Wall (above grade) U =	0.056	1,144	64.1		0.054	1,144
Floors over Crawlspace U =	0.029	0	0.0			0
Slab on Grade F =	0.540	122	66.0		0.540	122
Below Grade Wall U =	0.042	0	0.0			0
Below Grade Slab F =	0.570	0	0.0			0
				<b>Baseline UA Total</b>	161.0	<b>Proposed UA Total</b>
				<b>Required Credits</b>	4.5	158.7
						<b>Proposed Credits</b>
						6.5
						1.4%
						<b>UA Percent Reduction</b>
						2.3
						<b>UA Reduction</b>
						2.3
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
			<b>Energy Credits</b>	<b>5.5</b>	

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

Conditioned Floor Area, Proposed Design 732 sq. ft

Classification Small Dwelling Unit

Notes

**Exterior Doors**

Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt									0	0.0
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U									0.300	

**Overhead Glazing**

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

**Vertical Glazing Schedule**

Rows to Show 2

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt			-						-	-
1 3	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2 5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
Sum of Area and UA									63.0	18.9
Vertical Glazing Area Weighted U									0.300	
Vertical Glazing and Doors Area Weighted U									0.300	

**Flat/Vaulted Ceilings**

Plan ID	Component Description	Ref.	Attic U	Area	UA
	No ceiling/roof in thermal envelope	NA	-		0.0
Sum of Area and UA				0	0.0

**Walls (Above Grade)**

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,144	62
Sum of Area and UA				1,144	62

**Floor (over crawl or exterior)**

Plan ID	Component Description	Ref.	Floor U	Area	UA
Sum of Area and UA				0	0

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		122	66
Sum of Perimeter and FP					122	66

Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

Ventilation Requirements			
Number of Bedrooms	2		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	55 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a>	
	New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC	<a href="#">Prescriptive Checklist</a>	
Alterations (Remodel) Worksheet	<a href="#">Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	732 ft2	
Conditioned Volume	6,222 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	159	
Envelope Heat Load	8,096 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	3,427 Btu / Hour	((Volume X 0.6) X ΔT) X 0.018)
Building Design Heat Load	11,523 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	11,523 Btu / Hour	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1
Maximum Heat Equipment Output	14,404 Btu / Hour	Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems

<b>Project Information</b>
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<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.17, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 624 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,083	60.6	0.054	1,083	58.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	115	62.0	0.540	115	62.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		149.0	<b>Proposed UA Total</b>		146.9
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.5%
				<b>UA Reduction</b>		2.2

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R406.3 Energy Credits					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

<b>Conditioned Floor Area, Proposed Design</b>	624	sq. ft
<b>Classification</b>	Small Dwelling Unit	
<b>Notes</b>		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
<b>Sum of Area and UA</b>									40	12.0
<b>Exterior Doors Area Weighted U</b>										0.300

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
									0	
<b>Sum of Area and UA</b>									0	0
<b>Overhead Glazing Area Weighted U</b>										

Vertical Glazing Schedule											Rows to Show	
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA		
Exempt					Feet	Inch	Feet	Inch				
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20	2
2	6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20	
<b>Sum of Area and UA</b>									48.0	14.4		
<b>Vertical Glazing Area Weighted U</b>										0.300		
<b>Vertical Glazing and Doors Area Weighted U</b>										0.300		

Flat/Vaulted Ceilings										
Plan ID	Component Description	Ref.	Attic U						Area	UA
	No ceiling/roof in thermal envelope	NA	-							0.0
<b>Sum of Area and UA</b>									0	0.0

Walls (Above Grade)										
Plan ID	Component Description	Ref.	Wall U						Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054						1,083	58
<b>Sum of Area and UA</b>									1,083	58

Floor (over crawl or exterior)										
Plan ID	Component Description	Ref.	Floor U						Area	UA
<b>Sum of Area and UA</b>									0	0

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		115	62
Sum of Perimeter and FP					115	62

Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

Ventilation Requirements			
Number of Bedrooms	1		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	45 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a>	
	New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC	<a href="#">Prescriptive Checklist</a>	
Alterations (Remodel) Worksheet	<a href="#">Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	624 ft2	
Conditioned Volume	5,304 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	147	
Envelope Heat Load	7,490 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	2,921 Btu / Hour	((Volume X 0.6) X ΔT) X 0.018)
Building Design Heat Load	10,412 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	10,412 Btu / Hour	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1
Maximum Heat Equipment Output	13,015 Btu / Hour	Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems

<b>Project Information</b>
East Town Crossing, Unit 106 Building A Pioneer & Shaw, Puyallup
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<b>Messages / Results *</b>
UA Reduction = 2.29, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,144	64.1	0.054	1,144	61.8
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	122	66.0	0.540	122	66.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		161.0	<b>Proposed UA Total</b>		158.7
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.4%
				<b>UA Reduction</b>		2.3

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

**Table R406.2 Fuel Normalization Credits**

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

**Table R406.3 Energy Credits**

Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope		0.0	
2	Air Leakage Control and Efficient Ventilation		0.0	
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		0.0	
7	Appliance Package		0.0	
<b>Energy Credits</b>			<b>5.5</b>	

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



<b>Conditioned Floor Area, Proposed Design</b>	732	sq. ft
<b>Classification</b> Small Dwelling Unit		
<b>Notes</b>		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
<b>Sum of Area and UA</b>									<b>40</b>	<b>12.0</b>
<b>Exterior Doors Area Weighted U</b>										<b>0.300</b>

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
<b>Sum of Area and UA</b>									<b>0</b>	<b>0</b>
<b>Overhead Glazing Area Weighted U</b>										

Vertical Glazing Schedule											
										Rows to Show	
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA	
Exempt					Feet	Inch	Feet	Inch			
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2	5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
<b>Sum of Area and UA</b>									<b>63.0</b>	<b>18.9</b>	
<b>Vertical Glazing Area Weighted U</b>										<b>0.300</b>	
<b>Vertical Glazing and Doors Area Weighted U</b>										<b>0.300</b>	

Flat/Vaulted Ceilings											
Plan ID	Component Description	Ref.	Attic U							Area	UA
	No ceiling/roof in thermal envelope	NA	-								0.0
<b>Sum of Area and UA</b>									<b>0</b>	<b>0.0</b>	

Walls (Above Grade)											
Plan ID	Component Description	Ref.	Wall U							Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054							1,144	62
<b>Sum of Area and UA</b>									<b>1,144</b>	<b>62</b>	

Floor (over crawl or exterior)											
Plan ID	Component Description	Ref.	Floor U							Area	UA
<b>Sum of Area and UA</b>									<b>0</b>	<b>0</b>	

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		122	66
Sum of Perimeter and FP					122	66

Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

Ventilation Requirements			
Number of Bedrooms	2		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	55 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>	
Nearest Weather Station		Puyallup	
Indoor Design Temperature		70 F	
Outdoor Design Temperature		19 F	
Design Temperature Difference (ΔT)		51 F	
Conditioned Floor Area, Proposed Design		732 ft2	
Conditioned Volume		6,222 ft3	
	Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump	
Location of HVAC Distribution System		Unducted	
Sum of UA, including exempt door and window		159	
Envelope Heat Load		8,096 Btu / Hour	
	Sum of UA X ΔT		
Air Leakage Heat Load		3,427 Btu / Hour	
	((Volume X 0.6) X ΔT) X 0.18)		
Building Design Heat Load		11,523 Btu / Hour	
	Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		11,523 Btu / Hour	
	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
	For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output		14,404 Btu / Hour	
	Building and Duct Heat Loss X 1.25 for heat pumps		
	Building and Duct Heat Loss X 1.40 for all other systems		

<b>Project Information</b>
East Town Crossing, Unit 107 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.41, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>Baseline</b>		<b>U</b>	<b>Area</b>	<b>UA</b>	
Doors U =	0.300	40	0.300	40	12.0	
Overhead Glazing U =	0.500	0		0	0.0	
Vertical Glazing U =	0.300	116	0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0		0	0.0	
Wall (above grade) U =	0.056	1,207	0.054	1,207	65.2	
Floors over Crawlspace U =	0.029	0		0	0.0	
Slab on Grade F =	0.540	134	0.540	134	72.1	
Below Grade Wall U =	0.042	0		0	0.0	
Below Grade Slab F =	0.570	0		0	0.0	
	<b>Baseline UA Total</b>		<b>Proposed UA Total</b>			
	186.4		184.0			
	<b>Required Credits</b>		<b>Proposed Credits</b>			
	4.5		6.5			from Tables 406.2 and 406.3
			<b>UA Percent Reduction</b>			
			1.3%			
			<b>UA Reduction</b>			
			2.4			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0		kWh
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		134	72
Sum of Perimeter and FP					134	72

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		795 ft2
Conditioned Volume		6,758 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		184
Envelope Heat Load		9,383 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		3,722 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load		13,105 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,105 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		16,382 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
East Town Crossing, Unit 108 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.26, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,128	63.1	0.054	1,128	60.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	126	67.9	0.540	126	67.9
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		177.7	<b>Proposed UA Total</b>		175.5
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.3%
				<b>UA Reduction</b>		2.3
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

<b>Conditioned Floor Area, Proposed Design</b>			765	sq. ft
<b>Classification</b>		Small Dwelling Unit		
<b>Notes</b>				

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U									0.300	

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U									0	

Vertical Glazing Schedule											Rows to Show	3
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA		
Exempt					Feet	Inch	Feet	Inch				
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25		
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80		
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60		
Sum of Area and UA									115.5	34.7		
Vertical Glazing Area Weighted U									0.300			
Vertical Glazing and Doors Area Weighted U									0.300			

Flat/Vaulted Ceilings												
Plan ID	Component Description	Ref.	Attic U		Area		UA					
	No ceiling/roof in thermal envelope	NA	-									
Sum of Area and UA									0	0.0		

Walls (Above Grade)												
Plan ID	Component Description	Ref.	Wall U		Net Area		UA					
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054				1,128	61				
Sum of Area and UA									1,128	61		

Floor (over crawl or exterior)												
Plan ID	Component Description	Ref.	Floor U		Area		UA					
Sum of Area and UA									0	0		

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		126	68
Sum of Perimeter and FP					126	68

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources	Link
Compliance Certificate	<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a> New Construction <a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	<a href="#">Prescriptive Checklist</a> <a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	765 ft2	
Conditioned Volume	6,503 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	175	
Envelope Heat Load	8,949 Btu / Hour	
Sum of UA X ΔT		
Air Leakage Heat Load	3,582 Btu / Hour	
((Volume X 0.6) X ΔT) X .018))		
Building Design Heat Load	12,531 Btu / Hour	
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load	12,531 Btu / Hour	
For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output	15,664 Btu / Hour	
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		



<b>Project Information</b>
East Town Crossing, Unit 201 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
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<b>Messages / Results *</b>
UA Reduction = 2.41, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,207	67.6	0.054	1,207	65.2
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
		<b>Baseline UA Total</b>	114.3		<b>Proposed UA Total</b>	111.8
		<b>Required Credits</b>	4.5		<b>Proposed Credits</b>	6.5
					<b>UA Percent Reduction</b>	2.1%
					<b>UA Reduction</b>	2.4

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R406.3 Energy Credits					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

Conditioned Floor Area, Proposed Design	795	sq. ft
Classification Small Dwelling Unit		
Notes		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U										0.300

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

Vertical Glazing Schedule											Rows to Show	3
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA		
Exempt					Feet	Inch	Feet	Inch				
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80		
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60		
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25		
Sum of Area and UA									115.5	34.7		
Vertical Glazing Area Weighted U										0.300		
Vertical Glazing and Doors Area Weighted U										0.300		

Flat/Vaulted Ceilings											
Plan ID	Component Description	Ref.	Attic U							Area	UA
	No ceiling/roof in thermal envelope	NA	-								0.0
Sum of Area and UA									0	0.0	

Walls (Above Grade)											
Plan ID	Component Description	Ref.	Wall U							Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054							1,207	65
Sum of Area and UA									1,207	65	

Floor (over crawl or exterior)											
Plan ID	Component Description	Ref.	Floor U							Area	UA
	No floors in thermal envelope	NA	-								0
Sum of Area and UA									0	0	

Slab on Grade (less than 2 feet below grade)							
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP	
Sum of Perimeter and FP					0	0	

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced <small>Verify system meets definition of 'Balanced Whole-House Ventilation'</small>
Is the system Distributed?	Distributed <small>Verify system meets definition of 'Distributed Whole-House Ventilation'</small>
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a> New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	<a href="#">Prescriptive Checklist Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	795 ft2	
Conditioned Volume	6,758 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	112	
Envelope Heat Load	5,704 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	3,722 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X 0.18)</small>		
Building Design Heat Load	9,426 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	9,426 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	11,782 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
East Town Crossing, Unit 202 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.26, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,128	63.1	0.054	1,128	60.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		109.8	<b>Proposed UA Total</b>		107.5
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5 from Tables 406.2 and 406.3
	<b>UA Percent Reduction</b>					2.1%
	<b>UA Reduction</b>					2.3
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		kWh	0.0	
7	Appliance Package			0.0	
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced <small>Verify system meets definition of 'Balanced Whole-House Ventilation'</small>
Is the system Distributed?	Distributed <small>Verify system meets definition of 'Distributed Whole-House Ventilation'</small>
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a> New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	<a href="#">Prescriptive Checklist Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	765 ft2	
Conditioned Volume	6,503 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	108	
Envelope Heat Load	5,485 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	3,582 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	9,066 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	9,066 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	11,333 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
East Town Crossing, Unit 203 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.17, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 628 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,083	60.6	0.054	1,083	58.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		87.0	<b>Proposed UA Total</b>		84.9
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		2.5%
				<b>UA Reduction</b>		2.2
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>				
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope		0.0	
2	Air Leakage Control and Efficient Ventilation		0.0	
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		0.0	
7	Appliance Package		0.0	
<b>Energy Credits</b>			<b>5.5</b>	

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

<b>Conditioned Floor Area, Proposed Design</b>	628	sq. ft
<b>Classification</b> Small Dwelling Unit		
<b>Notes</b>		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
<b>Sum of Area and UA</b>									<b>40</b>	<b>12.0</b>
<b>Exterior Doors Area Weighted U</b>										<b>0.300</b>

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
<b>Sum of Area and UA</b>									<b>0</b>	<b>0</b>
<b>Overhead Glazing Area Weighted U</b>										

Vertical Glazing Schedule											Rows to Show	2
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA		
Exempt					Feet	Inch	Feet	Inch				
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20	
2	6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20	
<b>Sum of Area and UA</b>									<b>48.0</b>	<b>14.4</b>		
<b>Vertical Glazing Area Weighted U</b>										<b>0.300</b>		
<b>Vertical Glazing and Doors Area Weighted U</b>										<b>0.300</b>		

Flat/Vaulted Ceilings										
Plan ID	Component Description	Ref.	Attic U						Area	UA
	No ceiling/roof in thermal envelope	NA	-							0.0
<b>Sum of Area and UA</b>									<b>0</b>	<b>0.0</b>

Walls (Above Grade)										
Plan ID	Component Description	Ref.	Wall U						Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054						1,083	58
<b>Sum of Area and UA</b>									<b>1,083</b>	<b>58</b>

Floor (over crawl or exterior)										
Plan ID	Component Description	Ref.	Floor U						Area	UA
	No floors in thermal envelope	NA	-							0
<b>Sum of Area and UA</b>									<b>0</b>	<b>0</b>



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements			
Number of Bedrooms	1		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced		Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed		Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	45 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		628 ft2
Conditioned Volume		5,338 ft3
	Leave blank to use default of 8.5 ft. ceiling height	
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		85
Envelope Heat Load		4,329 Btu / Hour
	Sum of UA X ΔT	
Air Leakage Heat Load		2,940 Btu / Hour
	((Volume X 0.6) X ΔT) X 0.18)	
Building Design Heat Load		7,269 Btu / Hour
	Air Leakage + Envelope Heat Loss	
Building and Duct Heat Load		7,269 Btu / Hour
	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	
	For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output		9,086 Btu / Hour
	Building and Duct Heat Loss X 1.25 for heat pumps	
	Building and Duct Heat Loss X 1.40 for all other systems	

<b>Project Information</b>
East Town Crossing, Unit 204 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.29, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,144	64.1	0.054	1,144	61.8
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		95.0	<b>Proposed UA Total</b>		92.7
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		2.4%
				<b>UA Reduction</b>		2.3

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

**Table R406.2 Fuel Normalization Credits**

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

**Table R406.3 Energy Credits**

Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope		0.0	
2	Air Leakage Control and Efficient Ventilation		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		0.0	
7	Appliance Package		0.0	
<b>Energy Credits</b>			<b>5.5</b>	

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

Conditioned Floor Area, Proposed Design	732	sq. ft
Classification	Small Dwelling Unit	
Notes		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U										0.300

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

Vertical Glazing Schedule											Rows to Show
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA	
Exempt					Feet	Inch	Feet	Inch			
3	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40	2
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50	
Sum of Area and UA									63.0	18.9	
Vertical Glazing Area Weighted U										0.300	
Vertical Glazing and Doors Area Weighted U										0.300	

Flat/Vaulted Ceilings											
Plan ID	Component Description	Ref.	Attic U							Area	UA
	No ceiling/roof in thermal envelope	NA	-								0.0
Sum of Area and UA									0	0.0	

Walls (Above Grade)											
Plan ID	Component Description	Ref.	Wall U							Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054							1,144	62
Sum of Area and UA									1,144	62	

Floor (over crawl or exterior)											
Plan ID	Component Description	Ref.	Floor U							Area	UA
	No floors in thermal envelope	NA	-								0
Sum of Area and UA									0	0	

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

Verify system meets definition of 'Balanced Whole-House Ventilation'  
 Verify system meets definition of 'Distributed Whole-House Ventilation'

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources	Link
Compliance Certificate	<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a> New Construction <a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC	<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet	<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	732 ft2	
Conditioned Volume	6,222 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	93	
Envelope Heat Load	4,728 Btu / Hour	
Sum of UA X ΔT		
Air Leakage Heat Load	3,427 Btu / Hour	
((Volume X 0.6) X ΔT) X 0.018)		
Building Design Heat Load	8,155 Btu / Hour	
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load	8,155 Btu / Hour	
For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output	10,194 Btu / Hour	
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		

<b>Project Information</b>
East Town Crossing, Unit 205 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.17, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 628 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,083	60.6	0.054	1,083	58.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		<b>87.0</b>	<b>Proposed UA Total</b>		<b>84.9</b>
	<b>Required Credits</b>		<b>4.5</b>	<b>Proposed Credits</b>		<b>6.5</b> from Tables 406.2 and 406.3
	<b>UA Percent Reduction</b>					<b>2.5%</b>
	<b>UA Reduction</b>					<b>2.2</b>
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		kWh	0.0	
7	Appliance Package			0.0	
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

<b>Conditioned Floor Area, Proposed Design</b>	628	sq. ft
<b>Classification</b> Small Dwelling Unit		
<b>Notes</b>		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt									0	0.0
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
<b>Sum of Area and UA</b>									<b>40</b>	<b>12.0</b>
<b>Exterior Doors Area Weighted U</b>										<b>0.300</b>

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
<b>Sum of Area and UA</b>									<b>0</b>	<b>0</b>
<b>Overhead Glazing Area Weighted U</b>										

Vertical Glazing Schedule										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt			-						-	-
1	3 U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6 U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
<b>Sum of Area and UA</b>									<b>48.0</b>	<b>14.4</b>
<b>Vertical Glazing Area Weighted U</b>										<b>0.300</b>
<b>Vertical Glazing and Doors Area Weighted U</b>										<b>0.300</b>

Flat/Vaulted Ceilings										
Plan ID	Component Description	Ref.	Attic U						Area	UA
	No ceiling/roof in thermal envelope	NA	-							0.0
<b>Sum of Area and UA</b>									<b>0</b>	<b>0.0</b>

Walls (Above Grade)										
Plan ID	Component Description	Ref.	Wall U						Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054						1,083	58
<b>Sum of Area and UA</b>									<b>1,083</b>	<b>58</b>

Floor (over crawl or exterior)										
Plan ID	Component Description	Ref.	Floor U						Area	UA
	No floors in thermal envelope	NA	-							0
<b>Sum of Area and UA</b>									<b>0</b>	<b>0</b>

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements			
Number of Bedrooms	1		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	45 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	628 ft2	
Conditioned Volume	5,338 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	85	
Envelope Heat Load	4,329 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	2,940 Btu / Hour	((Volume X 0.6) X ΔT) X 0.18)
Building Design Heat Load	7,269 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	7,269 Btu / Hour	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1
Maximum Heat Equipment Output	9,086 Btu / Hour	Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems

<b>Project Information</b>
East Town Crossing, Unit 206 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.29, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,144	64.1	0.054	1,144	61.8
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		95.0	<b>Proposed UA Total</b>		92.7
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		2.4%
				<b>UA Reduction</b>		2.3

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

**Table R406.2 Fuel Normalization Credits**

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

**Table R406.3 Energy Credits**

Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope		0.0	
2	Air Leakage Control and Efficient Ventilation		0.0	
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		0.0	
7	Appliance Package		0.0	
<b>Energy Credits</b>			<b>5.5</b>	

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**





Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements		
Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	55 CFM	

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		732 ft2
Conditioned Volume		6,222 ft3
	Leave blank to use default of 8.5 ft. ceiling height	
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		93
Envelope Heat Load		4,728 Btu / Hour
	Sum of UA X ΔT	
Air Leakage Heat Load		3,427 Btu / Hour
	((Volume X 0.6) X ΔT) X 0.018)	
Building Design Heat Load		8,155 Btu / Hour
	Air Leakage + Envelope Heat Loss	
Building and Duct Heat Load		8,155 Btu / Hour
	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	
	For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output		10,194 Btu / Hour
	Building and Duct Heat Loss X 1.25 for heat pumps	
	Building and Duct Heat Loss X 1.40 for all other systems	

<b>Project Information</b>
East Town Crossing, Unit 207 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.41, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,207	67.6	0.054	1,207	65.2
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		<b>114.3</b>	<b>Proposed UA Total</b>		<b>111.8</b>
	<b>Required Credits</b>		<b>4.5</b>	<b>Proposed Credits</b>		<b>6.5</b> from Tables 406.2 and 406.3
	<b>UA Percent Reduction</b>					<b>2.1%</b>
	<b>UA Reduction</b>					<b>2.4</b>
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>				
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope		0.0	
2	Air Leakage Control and Efficient Ventilation		0.0	
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		0.0	
7	Appliance Package		0.0	
<b>Energy Credits</b>			<b>5.5</b>	

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**

Conditioned Floor Area, Proposed Design		795	sq. ft
Classification Small Dwelling Unit			
Notes			

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
Sum of Area and UA									40	12.0
Exterior Doors Area Weighted U										0.300

Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

Vertical Glazing Schedule											Rows to Show
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA	
Exempt					Feet	Inch	Feet	Inch			
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80	
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60	
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25	
Sum of Area and UA									115.5	34.7	
Vertical Glazing Area Weighted U										0.300	
Vertical Glazing and Doors Area Weighted U										0.300	

Flat/Vaulted Ceilings										
Plan ID	Component Description	Ref.	Attic U						Area	UA
	No ceiling/roof in thermal envelope	NA	-							0.0
Sum of Area and UA									0	0.0

Walls (Above Grade)										
Plan ID	Component Description	Ref.	Wall U						Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054						1,207	65
Sum of Area and UA									1,207	65

Floor (over crawl or exterior)										
Plan ID	Component Description	Ref.	Floor U						Area	UA
	No floors in thermal envelope	NA	-							0
Sum of Area and UA									0	0

Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		795 ft2
Conditioned Volume		6,758 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		112
Envelope Heat Load		5,704 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		3,722 Btu / Hour
<small>((Volume X 0.6) X ΔT) X 0.18)</small>		
Building Design Heat Load		9,426 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		9,426 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		11,782 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
East Town Crossing, Unit 208 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.26, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 764 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,128	63.1	0.054	1,128	60.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		109.8	<b>Proposed UA Total</b>		107.5
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5 from Tables 406.2 and 406.3
	<b>UA Percent Reduction</b>					2.1%
	<b>UA Reduction</b>					2.3
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		kWh	0.0	
7	Appliance Package			0.0	
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced <small>Verify system meets definition of 'Balanced Whole-House Ventilation'</small>
Is the system Distributed?	Distributed <small>Verify system meets definition of 'Distributed Whole-House Ventilation'</small>
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a> New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	<a href="#">Prescriptive Checklist Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	764 ft2	
Conditioned Volume	6,494 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	108	
Envelope Heat Load	5,485 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	3,577 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	9,062 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	9,062 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	11,327 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



<b>Project Information</b>
East Town Crossing, Unit 301 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.12, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Baseline</b>		<b>Proposed Design</b>	
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	795	21.5	0.027	795	21.5
Wall (above grade) U =	0.056	1,060	59.4	0.054	1,060	57.3
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		127.5	<b>Proposed UA Total</b>		125.4
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.7%
				<b>UA Reduction</b>		2.1
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced <small>Verify system meets definition of 'Balanced Whole-House Ventilation'</small>
Is the system Distributed?	Distributed <small>Verify system meets definition of 'Distributed Whole-House Ventilation'</small>
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a> New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	<a href="#">Prescriptive Checklist Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltinw.com/resources/hvac-sizing-tool">https://betterbuiltinw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	795 ft2	
Conditioned Volume	6,758 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	125	
Envelope Heat Load	6,394 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	3,722 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	10,116 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	10,116 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	12,645 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
East Town Crossing, Unit 302 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
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<b>Messages / Results *</b>
UA Reduction = 1.98, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Baseline</b>		<b>Proposed Design</b>	
			<b>U</b>	<b>Area</b>	<b>UA</b>	
Doors U =	0.300	40	12.0		0.300	40
Overhead Glazing U =	0.500	0	0.0			0
Vertical Glazing U =	0.300	116	34.7		0.300	116
Flat/Vaulted Ceilings U =	0.027	765	20.7		0.027	765
Wall (above grade) U =	0.056	989	55.4		0.054	989
Floors over Crawlspace U =	0.029	0	0.0			0
Slab on Grade F =	0.540	0	0.0			0
Below Grade Wall U =	0.042	0	0.0			0
Below Grade Slab F =	0.570	0	0.0			0
				<b>Baseline UA Total</b>	122.7	
				<b>Required Credits</b>	4.5	
						<b>Proposed UA Total</b>
						120.7
						<b>Proposed Credits</b>
						6.5
						<b>UA Percent Reduction</b>
						1.6%
						<b>UA Reduction</b>
						2.0
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	<b>Heat Pump, air-to-air or air to water</b>	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	<b>Option 3.6</b>	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	<b>Option 5.5</b>	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy			kWh	0.0
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced <small>Verify system meets definition of 'Balanced Whole-House Ventilation'</small>
Is the system Distributed?	Distributed <small>Verify system meets definition of 'Distributed Whole-House Ventilation'</small>
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a>	New Construction <a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	<a href="#">Prescriptive Checklist Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	765 ft2	
Conditioned Volume	6,503 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	121	
Envelope Heat Load	6,157 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	3,582 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	9,739 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	9,739 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	12,173 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		

<b>Project Information</b>
East Town Crossing, Unit 303 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 1.91, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 628 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>Baseline</b>		<b>U</b>	<b>Area</b>	<b>UA</b>	
Doors U =	0.300	40	0.300	40	12.0	
Overhead Glazing U =	0.500	0		0	0.0	
Vertical Glazing U =	0.300	48	0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	628	0.027	628	17.0	
Wall (above grade) U =	0.056	957	0.054	957	51.7	
Floors over Crawlspace U =	0.029	0		0	0.0	
Slab on Grade F =	0.540	0		0	0.0	
Below Grade Wall U =	0.042	0		0	0.0	
Below Grade Slab F =	0.570	0		0	0.0	
	<b>Baseline UA Total</b>		<b>Proposed UA Total</b>			
	96.9		95.0			
	<b>Required Credits</b>		<b>Proposed Credits</b>			
	4.5		6.5			from Tables 406.2 and 406.3
			<b>UA Percent Reduction</b>			
			2.0%			
			<b>UA Reduction</b>			
			1.9			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0		kWh
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**





Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements			
Number of Bedrooms	1		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced		Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed		Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	45 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		628 ft2
Conditioned Volume		5,338 ft3
	Leave blank to use default of 8.5 ft. ceiling height	
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		95
Envelope Heat Load		4,846 Btu / Hour
	Sum of UA X ΔT	
Air Leakage Heat Load		2,940 Btu / Hour
	((Volume X 0.6) X ΔT) X 0.18)	
Building Design Heat Load		7,786 Btu / Hour
	Air Leakage + Envelope Heat Loss	
Building and Duct Heat Load		7,786 Btu / Hour
	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	
	For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output		9,733 Btu / Hour
	Building and Duct Heat Loss X 1.25 for heat pumps	
	Building and Duct Heat Loss X 1.40 for all other systems	

<b>Project Information</b>
East Town Crossing, Unit 304 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.02, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9
Flat/Vaulted Ceilings U =	0.027	732	19.8	0.027	732	19.8
Wall (above grade) U =	0.056	1,010	56.6	0.054	1,010	54.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		107.2	<b>Proposed UA Total</b>		105.2
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5 from Tables 406.2 and 406.3
				<b>UA Percent Reduction</b>		1.9%
				<b>UA Reduction</b>		2.0
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements			
Number of Bedrooms	2		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced		Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed		Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	55	CFM	

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		732 ft2
Conditioned Volume		6,222 ft3
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		105
Envelope Heat Load		5,365 Btu / Hour
Sum of UA X ΔT		
Air Leakage Heat Load		3,427 Btu / Hour
((Volume X 0.6) X ΔT) X 0.18)		
Building Design Heat Load		8,792 Btu / Hour
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		8,792 Btu / Hour
For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output		10,990 Btu / Hour
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		

<b>Project Information</b>
East Town Crossing, Unit 305 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 1.91, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 628 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Baseline</b>		<b>Proposed Design</b>	
			<b>U</b>	<b>Area</b>	<b>UA</b>	
Doors U =	0.300	40	12.0		0.300	40
Overhead Glazing U =	0.500	0	0.0			0
Vertical Glazing U =	0.300	48	14.4		0.300	48
Flat/Vaulted Ceilings U =	0.027	628	17.0		0.027	628
Wall (above grade) U =	0.056	957	53.6		0.054	957
Floors over Crawlspace U =	0.029	0	0.0			0
Slab on Grade F =	0.540	0	0.0			0
Below Grade Wall U =	0.042	0	0.0			0
Below Grade Slab F =	0.570	0	0.0			0
		<b>Baseline UA Total</b>	<b>96.9</b>		<b>Proposed UA Total</b>	<b>95.0</b>
		<b>Required Credits</b>	<b>4.5</b>		<b>Proposed Credits</b>	<b>6.5</b>
					from Tables 406.2 and 406.3	
					<b>UA Percent Reduction</b>	<b>2.0%</b>
					<b>UA Reduction</b>	<b>1.9</b>
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0		kWh
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements		
Number of Bedrooms	1	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	45 CFM	

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		628 ft2
Conditioned Volume		5,338 ft3
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		95
Envelope Heat Load		4,846 Btu / Hour
Sum of UA X ΔT		
Air Leakage Heat Load		2,940 Btu / Hour
((Volume X 0.6) X ΔT) X 0.18)		
Building Design Heat Load		7,786 Btu / Hour
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		7,786 Btu / Hour
For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output		9,733 Btu / Hour
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		

<b>Project Information</b>
East Town Crossing, Unit 306 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.02, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

**ANALYSIS SET UP**

What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

**RESULTS - Comparison of Baseline and Proposed Design**

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9
Flat/Vaulted Ceilings U =	0.027	732	19.8	0.027	732	19.8
Wall (above grade) U =	0.056	1,010	56.6	0.054	1,010	54.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
<b>Baseline UA Total</b>			107.2	<b>Proposed UA Total</b>		105.2
<b>Required Credits</b>			4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.9%
				<b>UA Reduction</b>		2.0

from Tables 406.2 and 406.3

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R406.3 Energy Credits					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**





Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements			
Number of Bedrooms	2		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced		Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed		Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403		
Whole House Mechanical Ventilation Airflow Rate	55 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>	
Is this a hydronic heating system?	No		
Location of Ducts	Unducted		
Location of Air Handler	Conditioned Space		
Is Duct Testing Required?	No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		732 ft2
Conditioned Volume		6,222 ft3
	Leave blank to use default of 8.5 ft. ceiling height	
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		105
Envelope Heat Load		5,365 Btu / Hour
	Sum of UA X ΔT	
Air Leakage Heat Load		3,427 Btu / Hour
	((Volume X 0.6) X ΔT) X 0.18)	
Building Design Heat Load		8,792 Btu / Hour
	Air Leakage + Envelope Heat Loss	
Building and Duct Heat Load		8,792 Btu / Hour
	For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	
	For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output		10,990 Btu / Hour
	Building and Duct Heat Loss X 1.25 for heat pumps	
	Building and Duct Heat Loss X 1.40 for all other systems	

<b>Project Information</b>
East Town Crossing, Unit 307 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 2.12, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>Baseline</b>					
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	795	21.5	0.027	795	21.5
Wall (above grade) U =	0.056	1,060	59.4	0.054	1,060	57.3
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		127.5	<b>Proposed UA Total</b>		125.4
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.7%
				<b>UA Reduction</b>		2.1
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		<a href="#">Compliance Certificate</a> <a href="#">Instructions</a>
Insulation Certificate for Residential New Construction		<a href="#">Insulation Certificate</a>
Duct Testing Affidavits		
	Existing Construction	<a href="#">Affidavit, Existing</a>
	New Construction	<a href="#">Affidavit, New</a>
Prescriptive Checklist for 2018 WSEC		<a href="#">Prescriptive Checklist</a>
Alterations (Remodel) Worksheet		<a href="#">Worksheet</a>

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		795 ft2
Conditioned Volume		6,758 ft3
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		125
Envelope Heat Load		6,394 Btu / Hour
Sum of UA X ΔT		
Air Leakage Heat Load		3,722 Btu / Hour
((Volume X 0.6) X ΔT) X .018))		
Building Design Heat Load		10,116 Btu / Hour
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		10,116 Btu / Hour
For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output		12,645 Btu / Hour
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		

<b>Project Information</b>
East Town Crossing, Unit 308 Building A Pioneer & Shaw, Puyallup
<b>Contact Information</b>
Synthesis 9, LLC Brett Lindsay <a href="mailto:blindsay@synthesis9.com">blindsay@synthesis9.com</a> 253-468-4117

<b>Messages / Results *</b>
UA Reduction = 1.98, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

\* Results assume your inputs are complete and correct. Results do not constitute an approval. Analysis should be reviewed by your AHJ.

<b>ANALYSIS SET UP</b>	
What code compliance pathway are you using?	<b>Prescriptive Path Compliance with Option 1 (preferred)</b>
Project Building Type?	<b>New Construction</b>
Occupancy Type?	<b>R2 Multifamily</b>
Code Version?	<b>WSEC 2018</b>
Classification:	Small Dwelling Unit -- 764 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

<b>RESULTS - Comparison of Baseline and Proposed Design</b>						
<b>Component Performance, R occupancies</b>			<b>Proposed Design</b>			
	<b>Baseline</b>					
	<b>U</b>	<b>Area</b>	<b>UA</b>	<b>U</b>	<b>Area</b>	<b>UA</b>
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	764	20.6	0.027	764	20.6
Wall (above grade) U =	0.056	989	55.4	0.054	989	53.4
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	<b>Baseline UA Total</b>		122.7	<b>Proposed UA Total</b>		120.7
	<b>Required Credits</b>		4.5	<b>Proposed Credits</b>		6.5
				<b>UA Percent Reduction</b>		1.6%
				<b>UA Reduction</b>		2.0
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

<b>Table R406.2 Fuel Normalization Credits</b>					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

<b>Table R406.3 Energy Credits</b>					
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope		0.0		
2	Air Leakage Control and Efficient Ventilation		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0	kWh	
7	Appliance Package		0.0		
<b>Energy Credits</b>			<b>5.5</b>		

\*Refer to WSEC 2018 Table R406.3 for complete option descriptions and requirements

**THERMAL ENVELOPE DETAILS - Proposed Design**



Slab on Grade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	No slab on grade	NA	-			0
Sum of Perimeter and FP					0	0

Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced
Is the system Distributed?	Distributed
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) <a href="http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20">http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20</a>
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned Space	
Is Duct Testing Required? No		

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate	<a href="#">Compliance Certificate</a>	<a href="#">Instructions</a>
Insulation Certificate for Residential New Construction	<a href="#">Insulation Certificate</a>	
Duct Testing Affidavits	Existing Construction <a href="#">Affidavit, Existing</a>	
	New Construction <a href="#">Affidavit, New</a>	
Prescriptive Checklist for 2018 WSEC	<a href="#">Prescriptive Checklist</a>	
Alterations (Remodel) Worksheet	<a href="#">Worksheet</a>	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	764 ft2	
Conditioned Volume	6,494 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	121	
Envelope Heat Load	6,156 Btu / Hour	
Sum of UA X ΔT		
Air Leakage Heat Load	3,577 Btu / Hour	
((Volume X 0.6) X ΔT) X .018))		
Building Design Heat Load	9,733 Btu / Hour	
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load	9,733 Btu / Hour	
For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1		
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output	12,166 Btu / Hour	
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		