

Project Information
East Town Crossing, Unit # 101 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.61, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1109 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			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	128	38.3	0.300	128	38.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,307	73.2	0.054	1,307	70.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	146	78.8	0.540	146	78.8
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	Baseline UA Total		202.3	Proposed UA Total		199.7
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		1.3%
				UA Reduction		2.6
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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design	1,109	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		
									0	0.0
101A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
101B	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	3	6	0	4	0	72.0	21.60	
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	1	2	6	3	0	7.5	2.25	
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	2	0	12.0	3.60	
Sum of Area and UA									127.5	38.3	
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						1,307	71
Sum of Area and UA									1,307	71

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		146	79
Sum of Perimeter and FP					146	79

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,109 ft2
Conditioned Volume		9,427 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		200
Envelope Heat Load		10,183 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,192 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		15,375 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		15,375 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		19,219 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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Messages / Results *
UA Reduction = 2.79, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1061 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			Proposed Design			
	Baseline		U	Area	UA	
Doors U =	0.300	40	0.300	40	12.0	
Overhead Glazing U =	0.500	0		0	0.0	
Vertical Glazing U =	0.300	91	0.300	91	27.4	
Flat/Vaulted Ceilings U =	0.027	0		0	0.0	
Wall (above grade) U =	0.056	1,397	0.054	1,397	75.4	
Floors over Crawlspace U =	0.029	0		0	0.0	
Slab on Grade F =	0.540	151	0.540	151	81.7	
Below Grade Wall U =	0.042	0		0	0.0	
Below Grade Slab F =	0.570	0		0	0.0	
	Baseline UA Total		Proposed UA Total			
	199.3		196.5			
	Required Credits		Proposed Credits			
	4.5		6.5			from Tables 406.2 and 406.3
			UA Percent Reduction			
			1.4%			
			UA Reduction			
			2.8			
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		
Energy Credits			5.5		

*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		151	82
Sum of Perimeter and FP					151	82

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,061 ft2	
Conditioned Volume	9,019 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	197	
Envelope Heat Load	10,022 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,967 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	14,989 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	14,989 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	18,737 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>		

Project Information
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Messages / Results *
UA Reduction = 2.54, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1008 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	
Doors U =	0.300	40	12.0		0.300	40
Overhead Glazing U =	0.500	0	0.0			0
Vertical Glazing U =	0.300	78	23.4		0.300	78
Flat/Vaulted Ceilings U =	0.027	0	0.0			0
Wall (above grade) U =	0.056	1,271	71.2		0.054	1,271
Floors over Crawlspace U =	0.029	0	0.0			0
Slab on Grade F =	0.540	138	74.3		0.540	138
Below Grade Wall U =	0.042	0	0.0			0
Below Grade Slab F =	0.570	0	0.0			0
				Baseline UA Total		Proposed UA Total
				180.8		178.3
				Required Credits		Proposed Credits
				4.5		6.5
						1.4%
						UA Percent Reduction
						2.5
						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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design		1,008	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
103A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
103B	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
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA	
					Feet	Inch	Feet	Inch			
Exempt			-						-	-	
1	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40	
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00	
Sum of Area and UA									78.0	23.4	
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							1,271	69
Sum of Area and UA									1,271	69	

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		138	74
Sum of Perimeter and FP					138	74

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	70 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20	
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool	
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	1,008 ft2		
Conditioned Volume	8,568 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		178	
Envelope Heat Load		9,092 Btu / Hour	
	<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,719 Btu / Hour	
	<small>((Volume X 0.6) X ΔT) X 0.18)</small>		
Building Design Heat Load		13,811 Btu / Hour	
	<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,811 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		17,264 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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Messages / Results *
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Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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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	70	20.9	0.300	70	20.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,352	75.7	0.054	1,352	73.0
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	145	78.1	0.540	145	78.1
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	Baseline UA Total		186.8	Proposed UA Total		184.1
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		1.4%
				UA Reduction		2.7

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		
Energy Credits			5.5		

*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		145	78
Sum of Perimeter and FP					145	78

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) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		976 ft2
Conditioned Volume		8,296 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		9,387 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,569 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load		13,956 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,956 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		17,445 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>		

Project Information
East Town Crossing, Unit # 105 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.54, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1008 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	78	23.4	0.300	78	23.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,271	71.2	0.054	1,271	68.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	138	74.3	0.540	138	74.3
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
Baseline UA Total			180.8			178.3
Required Credits			4.5			6.5
				Proposed Credits		6.5
				UA Percent Reduction		1.4%
				UA Reduction		2.5

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		
Energy Credits			5.5		

*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		138	74
Sum of Perimeter and FP					138	74

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	70 CFM	

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	
	New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,008 ft2	
Conditioned Volume	8,568 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	178	
Envelope Heat Load	9,092 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	4,719 Btu / Hour	((Volume X 0.6) X ΔT) X 0.18)
Building Design Heat Load	13,811 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	13,811 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	17,264 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

Project Information
East Town Crossing, Unit # 106 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.7, 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 976 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			Proposed Design			
	Baseline					
	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	70	20.9	0.300	70	20.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,352	75.7	0.054	1,352	73.0
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	145	78.1	0.540	145	78.1
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	Baseline UA Total		186.8	Proposed UA Total		184.1
	Required Credits		4.5	Proposed Credits		6.5 from Tables 406.2 and 406.3
				UA Percent Reduction		1.4%
				UA Reduction		2.7
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		
Energy Credits			5.5		

*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		145	78
Sum of Perimeter and FP					145	78

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) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		976 ft2
Conditioned Volume		8,296 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		184
Envelope Heat Load		9,387 Btu / Hour
Sum of UA X ΔT		
Air Leakage Heat Load		4,569 Btu / Hour
((Volume X 0.6) X ΔT) X .018))		
Building Design Heat Load		13,956 Btu / Hour
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		13,956 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		17,445 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		

Project Information
East Town Crossing, Unit # 107 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.61, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1108 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			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	130	38.9	0.300	130	38.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,305	73.1	0.054	1,305	70.5
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	146	78.8	0.540	146	78.8
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	Baseline UA Total		202.8	Proposed UA Total		200.2
	Required Credits		4.5	Proposed Credits		6.5 from Tables 406.2 and 406.3
				UA Percent Reduction		1.3%
				UA Reduction		2.6
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		
Energy Credits			5.5		

*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		146	79
Sum of Perimeter and FP					146	79

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,108 ft2
Conditioned Volume		9,418 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		200
Envelope Heat Load		10,208 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,187 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		15,396 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		15,396 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		19,245 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>		

Project Information
East Town Crossing, Unit #108 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.77, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1061 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			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	101	30.4	0.300	101	30.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,387	77.7	0.054	1,387	74.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	151	81.7	0.540	151	81.7
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
	Baseline UA Total		201.7	Proposed UA Total		199.0
	Required Credits		4.5	Proposed Credits		6.5 from Tables 406.2 and 406.3
				UA Percent Reduction		1.4%
				UA Reduction		2.8
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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design	1,061	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		
108A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
108B	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
									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	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

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	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
Sum of Area and UA									101.3	30.4
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							1,387	75
Sum of Area and UA									1,387	75	

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		151	82
Sum of Perimeter and FP					151	82

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,061 ft2	
Conditioned Volume	9,019 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	199	
Envelope Heat Load	10,147 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,967 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	15,115 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	15,115 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	18,893 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>		

Project Information
East Town Crossing, Unit # 201 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.64, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1106 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			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	128	38.3	0.300	128	38.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,322	74.0	0.054	1,322	71.4
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
	Baseline UA Total		124.3	Proposed UA Total		121.6
	Required Credits		4.5	Proposed Credits		6.5 from Tables 406.2 and 406.3
	UA Percent Reduction					2.1%
	UA Reduction					2.6
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		
Energy Credits			5.5		

*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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,106 ft ²
Conditioned Volume		9,401 ft ³
<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		122
Envelope Heat Load		6,203 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,178 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		11,381 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		11,381 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		14,226 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>		

Project Information
East Town Crossing, Unit # 202 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.83, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1061 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			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	89	26.8	0.300	89	26.8
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,413	79.1	0.054	1,413	76.3
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
	Baseline UA Total		117.9	Proposed UA Total		115.1
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.4%
				UA Reduction		2.8
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		
Energy Credits			5.5		

*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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		Existing Construction Affidavit, Existing New Construction Affidavit, New
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet		Prescriptive Checklist Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,061 ft2
Conditioned Volume		9,019 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		115
Envelope Heat Load		5,869 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,967 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load		10,836 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		10,836 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		13,545 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>		

Project Information
East Town Crossing, Unit # 203 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.57, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1008 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	78	23.4	0.300	78	23.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4
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
	Baseline UA Total		107.3	Proposed UA Total		104.8
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.4%
				UA Reduction		2.6
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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design		1,008	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
203A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
203B	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
					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
Sum of Area and UA									0	0
Overhead Glazing Area Weighted U										

Vertical Glazing Schedule										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt			-						-	-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
Sum of Area and UA									78.0	23.4
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							1,285	69
Sum of Area and UA									1,285	69	

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	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	70 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20	
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	
	New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,008 ft2	
Conditioned Volume	8,568 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	5,343 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	4,719 Btu / Hour	((Volume X 0.6) X ΔT) X 0.18)
Building Design Heat Load	10,062 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	10,062 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	12,578 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

Project Information
East Town Crossing, Unit # 204 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.73, 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 976 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			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	70	20.9	0.300	70	20.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,366	76.5	0.054	1,366	73.8
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
	Baseline UA Total		109.4	Proposed UA Total		106.7
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.5%
				UA Reduction		2.7
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		
Energy Credits			5.5		

*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) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	976 ft ²	
Conditioned Volume	8,296 ft ³	
<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	107	
Envelope Heat Load	5,442 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,569 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	10,011 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	10,011 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	12,514 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>		

Project Information
East Town Crossing, Unit # 205 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.57, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1008 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	78	23.4	0.300	78	23.4
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4
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
	Baseline UA Total		107.3	Proposed UA Total		104.8
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.4%
				UA Reduction		2.6

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	
Energy Credits			5.5	

*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	70 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20	
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,008 ft2	
Conditioned Volume	8,568 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		105
Envelope Heat Load	5,343 Btu / Hour	
	<small>Sum of UA X ΔT</small>	
Air Leakage Heat Load	4,719 Btu / Hour	
	<small>((Volume X 0.6) X ΔT) X 0.18)</small>	
Building Design Heat Load	10,062 Btu / Hour	
	<small>Air Leakage + Envelope Heat Loss</small>	
Building and Duct Heat Load	10,062 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	12,578 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>	

Project Information
East Town Crossing, Unit # 206 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.73, 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 976 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			Proposed Design			
	Baseline		U	Area	UA	
Doors U =	0.300	40	0.300	40	12.0	
Overhead Glazing U =	0.500	0		0	0.0	
Vertical Glazing U =	0.300	70	0.300	70	20.9	
Flat/Vaulted Ceilings U =	0.027	0		0	0.0	
Wall (above grade) U =	0.056	1,366	0.054	1,366	73.8	
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	
	Baseline UA Total		Proposed UA Total			
	109.4		106.7			
	Required Credits		Proposed Credits			
	4.5		6.5			from Tables 406.2 and 406.3
			UA Percent Reduction			
			2.5%			
			UA Reduction			
			2.7			
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		
Energy Credits			5.5		

*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) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	New Construction Affidavit, New
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltinw.com/resources/hvac-sizing-tool
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	976 ft2	
Conditioned Volume	8,296 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	107	
Envelope Heat Load	5,442 Btu / Hour	
Sum of UA X ΔT		
Air Leakage Heat Load	4,569 Btu / Hour	
((Volume X 0.6) X ΔT) X .018))		
Building Design Heat Load	10,011 Btu / Hour	
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load	10,011 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	12,514 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		

Project Information
East Town Crossing, Unit # 207 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.64, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1105 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	130	38.9	0.300	130	38.9
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,320	73.9	0.054	1,320	71.3
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
	Baseline UA Total		124.8	Proposed UA Total		122.1
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.1%
				UA Reduction		2.6

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		
Energy Credits			5.5		

*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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,105 ft2
Conditioned Volume		9,393 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		122
Envelope Heat Load		6,228 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,173 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		11,401 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		11,401 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		14,251 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>		

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,061 ft2
Conditioned Volume		9,019 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		118
Envelope Heat Load		6,019 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,967 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load		10,987 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		10,987 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		13,734 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>		

Project Information
East Town Crossing, Unit # 301 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.64, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1106 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			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	128	38.3	0.300	128	38.3
Flat/Vaulted Ceilings U =	0.027	1,106	29.9	0.027	1,106	29.9
Wall (above grade) U =	0.056	1,322	74.0	0.054	1,322	71.4
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
	Baseline UA Total		154.1	Proposed UA Total		151.5
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		1.7%
				UA Reduction		2.6
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		
Energy Credits			5.5		

*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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,106 ft2
Conditioned Volume		9,401 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		151
Envelope Heat Load		7,726 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,178 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		12,904 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		12,904 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		16,130 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>		

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	New Construction Affidavit, New
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,061 ft2	
Conditioned Volume	9,019 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	144	
Envelope Heat Load	7,330 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,967 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	12,297 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	12,297 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	15,372 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>		

Project Information
East Town Crossing, Unit # 303 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.57, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1007 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			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	78	23.4	0.300	78	23.4
Flat/Vaulted Ceilings U =	0.027	1,007	27.2	0.027	1,007	27.2
Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4
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
	Baseline UA Total		134.5	Proposed UA Total		132.0
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		1.9%
				UA Reduction		2.6
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		
Energy Credits			5.5		

*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	70 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20	
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	
	New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,007 ft2	
Conditioned Volume	8,560 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	132	
Envelope Heat Load	6,730 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	4,715 Btu / Hour	((Volume X 0.6) X ΔT) X 0.18)
Building Design Heat Load	11,444 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	11,444 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	14,305 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

Project Information
East Town Crossing, Unit # 304 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.73, 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 976 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	70	20.9	0.300	70	20.9
Flat/Vaulted Ceilings U =	0.027	976	26.4	0.027	976	26.4
Wall (above grade) U =	0.056	1,366	76.5	0.054	1,366	73.8
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
	Baseline UA Total		135.8	Proposed UA Total		133.1
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.0%
				UA Reduction		2.7

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		
Energy Credits			5.5		

*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) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	New Construction Affidavit, New
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	976 ft2	
Conditioned Volume	8,296 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	133	
Envelope Heat Load	6,786 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,569 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X 0.18)</small>		
Building Design Heat Load	11,355 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	11,355 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	14,194 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>		

Project Information
East Town Crossing, Unit # 305 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.57, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1007 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			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	78	23.4	0.300	78	23.4
Flat/Vaulted Ceilings U =	0.027	1,007	27.2	0.027	1,007	27.2
Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4
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
	Baseline UA Total		134.5	Proposed UA Total		132.0
	Required Credits		4.5	Proposed Credits		6.5 from Tables 406.2 and 406.3
				UA Percent Reduction		1.9%
				UA Reduction		2.6
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		
Energy Credits			5.5		

*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	70 CFM		

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20	
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing	
	New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	1,007 ft2	
Conditioned Volume	8,560 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	132	
Envelope Heat Load	6,730 Btu / Hour	Sum of UA X ΔT
Air Leakage Heat Load	4,715 Btu / Hour	((Volume X 0.6) X ΔT) X 0.018)
Building Design Heat Load	11,444 Btu / Hour	Air Leakage + Envelope Heat Loss
Building and Duct Heat Load	11,444 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	14,305 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

Project Information
East Town Crossing, Unit # 306 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.73, 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 976 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			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	70	20.9	0.300	70	20.9
Flat/Vaulted Ceilings U =	0.027	976	26.4	0.027	976	26.4
Wall (above grade) U =	0.056	1,366	76.5	0.054	1,366	73.8
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
	Baseline UA Total		135.8	Proposed UA Total		133.1
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		2.0%
				UA Reduction		2.7
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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design	976	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		
									0	0.0
306A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
306B	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
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	4	0	24.0	7.20		
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73		
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00		
Sum of Area and UA									69.8	20.9		
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
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027						976	26.4
Sum of Area and UA									976	26.4

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						1,366	74
Sum of Area and UA									1,366	74

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 <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) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affidavits	Existing Construction Affidavit, Existing New Construction Affidavit, New	
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet	Prescriptive Checklist Worksheet	

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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	976 ft2	
Conditioned Volume	8,296 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	133	
Envelope Heat Load	6,786 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,569 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	11,355 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	11,355 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	14,194 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>		

Project Information
East Town Crossing, Unit #307 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.64, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1105 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	130	38.9	0.300	130	38.9
Flat/Vaulted Ceilings U =	0.027	1,105	29.8	0.027	1,105	29.8
Wall (above grade) U =	0.056	1,320	73.9	0.054	1,320	71.3
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
Baseline UA Total			154.6	Proposed UA Total		151.9
Required Credits			4.5	Proposed Credits		6.5
				UA Percent Reduction		1.7%
				UA Reduction		2.6

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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design 1,105 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		
									0	0.0
307A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
307B	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
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										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
					Feet	Inch	Feet	Inch		
Exempt			-						-	-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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	1	2	6	3	0	7.5	2.25
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20
Sum of Area and UA									129.5	38.9
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
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027							1,105	29.8
Sum of Area and UA									1,105	29.8	

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							1,320	71
Sum of Area and UA									1,320	71	

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC		Prescriptive Checklist
Alterations (Remodel) Worksheet		Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,105 ft2
Conditioned Volume		9,393 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		152
Envelope Heat Load		7,749 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,173 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		12,923 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		12,923 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		16,153 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>		

Project Information
East Town Crossing, Unit # 308 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.8, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 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?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1061 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			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	101	30.4	0.300	101	30.4
Flat/Vaulted Ceilings U =	0.027	1,061	28.6	0.027	1,061	28.6
Wall (above grade) U =	0.056	1,401	78.5	0.054	1,401	75.7
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
	Baseline UA Total		149.5	Proposed UA Total		146.7
	Required Credits		4.5	Proposed Credits		6.5
				UA Percent Reduction		1.9%
				UA Reduction		2.8
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		
Energy Credits			5.5		

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

THERMAL ENVELOPE DETAILS - Proposed Design

Conditioned Floor Area, Proposed Design		1,061	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		
									0	0.0
308A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
308B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18	
	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00	
	3	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	24.0	7.20	
Sum of Area and UA									101.3	30.4		
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
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027						1,061	28.6
Sum of Area and UA									1,061	28.6

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						1,401	76
Sum of Area and UA									1,401	76

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	3
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	70 CFM

HVAC Thermal Distribution System		Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%20
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		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	Existing Construction	Affidavit, Existing
	New Construction	Affidavit, New
Prescriptive Checklist for 2018 WSEC Alterations (Remodel) Worksheet		Prescriptive Checklist Worksheet

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
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		1,061 ft2
Conditioned Volume		9,019 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		7,480 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,967 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load		12,448 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		12,448 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		15,560 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>		