

Project Information

East Town Crossing Unit 101

Building F

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117



Messages / Results *

UA Reduction = 2.41, Proposed UA is better than baseline by 1%



Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?

Project Building Type?

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ect Building Type?
Occupancy Type?
REMULTION TYPE?
Prescriptive Path Compliance with Option 1 (preferred)
New Construction
REMULTION TYPE?

Code Version: WSEC 2018
Classification: Small Dwelling Unit -- 819 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	
	U	Area	UA
Doors U =	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0
Vertical Glazing U =	0.300	104	31.1
Flat/Vaulted Ceilings U =	0.027	0	0.0
Wall (above grade) U =	0.056	1,203	67.4
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	133	72.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

Baseline UA Total 182.4
Required Credits 4.5

Pro	posed Desig	ın
U	Area	UA
0.300	40	12.0
	0	0.0
0.300	104	31.1
	0	0.0
0.054	1,203	65.0
	0	0.0
0.540	133	72.0
	0	0.0
	0	0.0

 Proposed UA Total
 180.0

 Proposed Credits
 7.0

 UA Percent Reduction
 1.3%

 UA Reduction
 2.4

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

Table R4	06.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 819 s	sq. ft
Classification Small Dwelling U	Unit
Notes	

Plan	Component		Door		Wid	lth	He	ight		ĺ
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	Area We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

Plan	Component		Glazing		Wid	th	Hei	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	pt								-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	0	60.0	18.00
11	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
						Sum	of Area	and UA	103.5	31.1
					Vertical G	lazing A	rea Wei	ghted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ghted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,203	65
				Sum of Area and UA	1,203	65

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

Plan	Component	D. 6	Slab		Olah Bada	
ID	Description	Ref.	F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		133	72
				Sum of Perimeter and FP	133	72

Below Grade Walls Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	1
									1
									l
									l
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 Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.	Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%						
Is this a hydronic heating system?	No							
Location of Ducts	Unducted							
Location of Air Handler	Unconditioned 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 Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

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	819 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	180
Envelope Heat Load Sum of UA X \(\Delta T \)	9,181 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,015 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,015 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	16,269 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 102 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.27, 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 779 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			Pro	posed Desig	ın	
	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	108	32.3		0.300	108	32.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,135	63.6		0.054	1,135	61.3	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	127	68.6		0.540	127	68.6	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ine UA Total	176.4		Propo	sed UA Total	174.1	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		<u> </u>			UA Percei	nt Reduction	4.00/	
					U	A Reduction	2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home mee	ets the WSEC) .		
				-, 1101110 11100		-		

Table R4	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	6.0	7.0						

Table R4	06.3 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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65	
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.	
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

	Conditioned Floor Area, Proposed Design 779 sq. ft						
Classification Small Dwelling Unit							
	Notes						

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
102A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
102B	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
·					·	Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

	Overhea	d Glazing										
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
İ										0		
										0		
										0		
										0		
							Sum	of Area	a and UA	0	0	0
						Overhead (Glazing A	rea We	ighted U			
							_		_			

Vertical Glazing Schedule Rows to Show ₄												
Р	Plan	Component		Glazing		Wic	ith	He	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
Ex	empt			-						-	-	
2		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25	
2 7		U=0.30 (Code Baseline)	Table 406.2	0.30	2	5	0	4	0	40.0	12.00	
9		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20	
111		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80	
							Sum	of Area	a and UA	107.5	32.3	
						Vertical C	Glazing A	Area We	ighted U		0.300	
Vertical Glazing and Doors Area Weighted U 0.30										0.300		
												Ĭ.

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,135	61
				Sum of Area and UA	1,135	61

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

Slab	Slab on Grade (less than 2 feet below grade)										
Pla	an	Component		Slab				ł			
Ш	D	Description	Ref.	F		Slab Perim	FP				
		R10 2' vertical (Code Baseline)	10-2	0.540		127	69				
					Sum of Perimeter and FP	127	69				

E	Below Grade Walls and Slabs											
	Plan	Component		Wall	Wall	Wall	Slab		Slab			
	ID	Description	Ref.	U	Area	UA	F	Slab Perim	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 Whole-House Ventilation'
Is the system Distributed?	Distributed Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

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

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	tion Affidavit, Existing	
New Construct	tion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

eating 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	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	174
Envelope Heat Load Sum of UAX AT	8,881 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,647 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,528 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,528 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	15,660 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 103 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.22, Proposed UA is better than baseline by 1%

Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 683 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			Pro	posed Desig	ın	
	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	44	13.2		0.300	44	13.2	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,108	62.0		0.054	1,108	59.8	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	118	63.7		0.540	118	63.7	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	151.0		Propos	sed UA Total	148.7	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Percei	nt Reduction		
					U	A Reduction	2.2	
If the Brown of the Control of the C			0					
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	of are ≥ thos	se required ir	Section R40	6, then the home mee	ets the WSEC			

Table R4	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	6.0	7.0					

Table R4	06.3 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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65	
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design	683 sq. ft
Classification S	mall Dwelling Unit
Notes	

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

Vertical Glazing Schedule Rows to Show 2									2		
	Plan	Component		Glazing		Wic	lth	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Ш	Exempt			-						-	-
7		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	4	0	20.0	6.00
4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
							Sum	of Area	a and UA	44.0	13.2
						Vertical C	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,108	60
				Sum of Area and UA	1,108	

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

Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		118	
	·					
			_	Sum of Perimeter and FP	118	64

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

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.er	nergy.wsu.edu/Documents/Duct%20Testing%20Standards%20
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned 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 Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ystem 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	683_ ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,806 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	149
Envelope Heat Load Sum of UA X Δ T	7,586 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,198 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,783 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,783 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	13,479 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 104 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.32, 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? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: Wescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 761 sq. ft. Code Baseline - Baseline and proposed window areas are equal. Up to 15 sf exempt window and 24 sf exempt door allowable

SULTS - Comparison of Baseline and Proposed Design							
Component Performance, R occupancies		Baseline			Proposed Des	~	
<u>.</u>	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.30	0 -	40 12.0	
Overhead Glazing U =	0.500	0	0.0			0.0	
Vertical Glazing U =	0.300	55	16.5	0.30	0	55 16.5	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0.0	
Wall (above grade) U =	0.056	1,162	65.1	0.05	4 1,1	62 62.8	
Floors over Crawlspace U =	0.029	0	0.0			0.0	
Slab on Grade F =	0.540	125	67.2	0.54	0 1:	25 67.2	
Below Grade Wall U =	0.042	0	0.0			0.0	
Below Grade Slab F =	0.570	0	0.0			0.0	
	Baseli	ne UA Total	160.8		Proposed UA Tot	tal 158.5	
	Requ	ired Credits	4.5		Proposed Credit	ts 7.0	from Tables 406.2 and 406.3
		_		UA	Percent Reduction	4 407	
					UA Reduction	on 2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	6 ara > than	o required in	Section D40	6 than the home meets the	WSEC		

Table R4	106.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 761 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
104A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
104B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

٧	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Ш	Exempt			-						-	-
3	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
7		U=0.30 (Code Baseline)	Table 406.2	0.30	2	5	0	4	0	40.0	12.00
							Sum	of Area	a and UA	55.0	16.5
						Vertical C	Glazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

lan	Component		Attic		
ID	Description	Ref.	U	Area	UA
	No ceiling/roof in thermal envelope	NA	-		0.0

ID Description Ref. U R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054	Net Area	UA
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054		
	1,162	63

Floor (over crawl or exterior)								
Plan	Component		Floor			UA		
ID	Description	Ref.	U		Area			
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		
F	R10 2' vertical (Code Baseline)	10-2	0.540		125	67		
				Sum of Perimeter and FP	125	67		

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

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energ	gy.wsu.edu/Documents/Duct%20Testing%20Standards%20
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned Space	
I	s Duct Testing Required? No	

inks to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Constru	uction Affidavit, Existing	
New Constru	uction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ystem 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	761 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,469 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	159
Envelope Heat Load Sum of UA X ΔT	8,084 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X Δ T) X .018))	3,563 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,646 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,646 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	14,558 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 105 Building F 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 1055 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			Pro	posed Desig	jn	
	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	1,303	72.9		0.054	1,303	70.3	
Floors over Crawispace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	141	76.0		0.540	141	76.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	184.3		Propo	sed UA Total	181.7	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	1.4%	
					U	A 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 R4	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	6.0	7.0					

Table R4	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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65				
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.				
4	High Efficiency HVAC Distribution System		NA					
5.1	Efficient Water Heating		0.0					
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater				
6	Renewable Electric Energy kWh		0.0					
7	Appliance Package		0.0					
		Energy Credits	6.0					

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

	Conditioned Floor Area, Proposed Design 1,055 sq. ft				
Classification Small Dwelling Unit					
	Notes				

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
105A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
105B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

	Overhea	d Glazing										
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
İ										0		
										0		
										0		
										0		
							Sum	of Area	a and UA	0	0	0
						Overhead (Glazing A	rea We	ighted U			
							_		_			

٧	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
E	xempt			-						-	-
8		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10)	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
							Sum	of Area	a and UA	78.0	23.4
						Vertical C	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,303	70
				Sum of Area and UA	1,303	70

	Floor (ove	er crawl or exterior)						
	Plan	Component		Floor			UA	
	ID	Description	Ref.	U		Area		
,					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		141	76
				Sum of Perimeter and FP	141	76

Plan	ade Walls and Slabs Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	of Area, Len	gth 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 Whole-House Ventilation'
Is the system Distributed?	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	Unconditioned Space	
Is	Duct Testing Required? No	

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	tion Affidavit, Existing	
New Construct	tion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ystem 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	1,055ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,968 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	182
Envelope Heat Load Sum of UA X \(\Delta T \)	9,267 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(Delta T) X .018))	4,939 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	14,206 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	14,206 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	17,758 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 106 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 0.05, Proposed UA is better than baseline by 0%

Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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 1005 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			Pro	posed Desig	n	
	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	27	1.5		0.054	27	1.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	147	79.3		0.540	147	79.3	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	113.7		Propo	sed UA Total	113.7	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	0.00/	
					U	A Reduction	0.1	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meet	ts the WSEC			

Table R4	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	6.0	7.0							

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 1	905 sq. ft	
Classification Small Do	elling Unit	
Notes		

Plan	Component		Door		Wid	lth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
Exempt									0	0.0	
106A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0	
106B	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	
						Sum	of Area	a and UA	40	12.0	
					Exterior	Doors A	rea We	ighted U		0.300	

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
Sum of Area and U.									0	0
				c	Overhead (

Vertical Glazing Schedule Rows to Sho								ws to Show	3	
Plan	Component		Glazing		Wid	th	Не	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-						-	-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
8	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	a and UA	69.8	20.9
					Vertical G	lazing A	rea We	ighted U		0.300
Vertical Glazing and Doors Area Weighted U									0.300	

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		27	1
				Sum of Area and UA	27	1

Floor (ov	er crawl or exterior)						
Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
		0	0				

lan	Component	Def	Slab		Clab Basiss	FP
ID	Description	Ref.	Г		Slab Perim	ΓĽ
	R10 2' vertical (Code Baseline)	10-2	0.540		147	79
	·			Sum of Perimeter and FP	147	79

Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	1
	C	of Area, Ler	oth and IIA	0	0.0		0		_

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced Whole-House Ventilation'
Is the system Distributed?	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	Unconditioned Space
Is Du	esting Required? No

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

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	1,005 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,543 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	114
Envelope Heat Load Sum of UA X \(\Delta T \)	5,796 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,705 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,501 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,501 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	13,127 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 107 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.65, Proposed UA is better than baseline by 1%

Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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 1149 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

Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
	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	0.3	300	130	38.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,327	74.3	0.0	054	1,327	71.7	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	148	80.0	0.	540	148	80.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ne UA Total	205.2		Propos	sed UA Total	202.6	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	rom Tables 406.2 and 406.3
		_		U	A Percer	nt Reduction	4.00/	
					U	A Reduction	2.7	
the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 4								

Table R4	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	6.0	7.0					

Table R4	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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65				
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.				
4	High Efficiency HVAC Distribution System		NA					
5.1	Efficient Water Heating		0.0					
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater				
6	Renewable Electric Energy kWh			0.0				
7	Appliance Package			0.0				
			Energy Credits	6.0				

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

THERMAL ENVELOPE DETAILS - Proposed Design	

	Conditioned Floor Area, Proposed Design 1,149 sq. ft					
Classification Small Dwelling Unit						
	Notes					

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
107A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
107B	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
·						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

	Overhea	d Glazing										
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
İ										0		
										0		
										0		
										0		
							Sum	of Area	a and UA	0	0	0
						Overhead (Glazing A	rea We	ighted U			
							_		_			

Vertical Glazing Schedule Rows to Show 4										
Plan	Component		Glazing		Wic	lth	Не	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-						-	-
1 2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2 10	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
3 11	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
4 12	U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20
						Sum	of Are	a and UA	129.5	38.9
					Vertical C	Slazing A	Area We	ighted U		0.300
				Vertical G	lazing and	Doors A	Area We	ighted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,327	72
				Sum of Area and UA	1,327	72

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

lab on (Grade (less than 2 feet below grade)					
Plan	Component		Slab			
ID	Description	Ref.	F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		148	80
				Sum of Perimeter and FP	148	80

E	Below Gr	ade Walls and Slabs								
	Plan	Component		Wall	Wall	Wall	Slab		Slab	
	ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
		Sum	of Area, Ler	gth 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?	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	Unconditioned Space	
Is Du	ct Testing Required? No	

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	ion Affidavit, Existing	
New Construct	ion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

eating 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	1,149 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,767 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	203
Envelope Heat Load Sum of UA X ΔT	10,330 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta \) (X .018))	5,379 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	15,710 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	15,710 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	19,637 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results *

UA Reduction = 2.79, Proposed UA is better than baseline by 0%

Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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 1075 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			Pro	posed Desig	jn .	
	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	1,397	78.2	0.	054	1,397	75.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	1,075	580.5	0.	540	1,075	580.5	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	701.1		Propo	sed UA Total	698.3	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_		U	A Perce	nt Reduction	0.40/	
					U	A Reduction	2.8	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets t	ne WSEC).		

Table R4	106.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design	1,075 sq. ft								
Classification Small Dwelling Unit									
Notes									

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

Plan	Component		Glazing		Wid	th	Hei	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	pt								-	-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
8	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10	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 G	lazing A	rea Wei	ghted U		0.300
		Vertical Glazing and Doors Area Weighted U								

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,397	75
				Sum of Area and UA	1,397	7

F	Floor (ove	er crawl or exterior)						
	Plan	Component		Floor			UA	
	ID	Description	Ref.	U		Area		
1								
_			0	0				

lan	Component		Slab			
ID	Description	Ref.	F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		1,075	581
				Sum of Perimeter and FP	1,075	581

Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	9	um of Area, Ler	agth and IIA	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 Whole-House Ventilation'
Is the system Distributed?	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 No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space
Is Duc	esting 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 Affadavits								
Existing Construc	Existing Construction Affidavit, Existing							
New Construc	ction Affidavit, New							
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist							
Alterations (Remodel) Worksheet	Worksheet							

ystem 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	1,075 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,138 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	698
Envelope Heat Load Sum of UA X AT	35,615 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	5,033 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	40,648 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	40,648 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	50,810 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 201 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.43, 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? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: Wescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 819 sq. ft. Code Baseline - Baseline and proposed window areas are equal. Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	jn .	
	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	92	27.5		0.300	92	27.5	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,215	68.0		0.054	1,215	65.6	
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	
		_						
	Baseli	ine UA Total	107.5		Propos	sed UA Total	105.1	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Percei	nt Reduction		
					U	A Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	of are ≥ thos	se required in	Section R40	6, then the home mee	ts the WSEC			

Table R4	06.2 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	6.0	7.0

Table R4	06.3 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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	6.0	

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

	Conditioned Floor Area, Proposed Design	819 sq. ft						
Classification Small Dwelling Unit								
	Notes							
		-						

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
201A	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
201B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhe	Overhead Glazing										
Plan	Component		Glazing		Wic	dth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Are	a and UA	0	0	
				C	Overhead (Glazing A	rea We	ighted U			
											_

Vertical Glazing Schedule Rows to Show 3										
Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ıt									ı
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	0	60.0	18.00
11	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	and UA	91.5	27.5
					Vertical G	lazing A	rea Wei	ighted U		0.300
Vertical Glazing and Doors Area Weighted U 0.30									0.300	

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,215	66
				Sum of Area and UA	1,215	66

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
				Sum of Area and UA	0	0	

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

Below G	Below Grade Walls and Slabs									
Plan	Component		Wall	Wall	Wall	Slab		Slab		
ID	Description	Ref.	U	Area	UA	F	Slab Perim	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 Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy	r.wsu.edu/Documents/Duct%20Testing%20Standards%20_
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned Space	
Is	Ouct 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 Affadavits		
Existing Construc	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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	819 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	105
Envelope Heat Load Sum of UA X \(\Delta T \)	5,358 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,193 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,193 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	11,491 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 202 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.25, 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? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: Wescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 779 sq. ft. Code Baseline - Baseline and proposed window areas are equal. Up to 15 sf exempt window and 24 sf exempt door allowable

ESULTS - Comparison of Baseline and Proposed Design					D-	oposed Desig		
Component Performance, R occupancies		Baseline				-		
·	U	Area	UA	_	U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40		
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	116	34.7		0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,127	63.1		0.054	1,127	60.9	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
·				_		•		
	Baseli	ine UA Total	109.8		Propo	sed UA Total	107.5	
	Regu	ired Credits	4.5		•	osed Credits		from Tables 406.2 and 406.3
					•		0.40/	110111 Tables 406.2 and 406.3
						nt Reduction		
					ι	JA Reduction	2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 4	ne ara > that	co required in	Section P40	6 than the home me	note the WSE			

Table R4	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	6.0	7.0				

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 779 sq. ft						
Classification Small Dwelling Unit						
Notes						

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
202A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
202B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea Plan	d Glazing Component		Glazing		Wic	ith	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet		Area	UA	
									0		
									0		
									0		
									0		
									0		
Sum of Area and UA 0 0											
				c	Overhead (Glazing A	rea We	ighted U			
				,	vernead (Jiazing A	vied VVE	ngnied U			

Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot .								-	1
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
9	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
11	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
						Sum	of Area	and UA	115.5	34.7
					Vertical G	lazing A	rea Wei	ighted U		0.300
Vertical Glazing and Doors Area Weighted U 0.300										

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

Plan	Component		Wall				
ID	Description	Ref.	U		Net Area	UA	
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,127	61	
Sum of Area and UA 1.127 61							

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
				Sum of Area and UA	0	0	

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

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

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

HVAC Thermal Distribution System	Download RS-33 (2018) 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	Unconditioned 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 Affadavits		
Existing Construc	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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	779 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	108
Envelope Heat Load Sum of UA X \(\Delta T \)	5,483 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,647 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,131 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,131 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	11,413 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 203 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.21, Proposed UA is better than baseline by 3%

Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 682 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			Pro	posed Desig	ın	
Sampone in a second sec	U	Area	UA		U		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	47	14.1		0.300	47	14.1	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,105	61.9		0.054	1,105	59.7	
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	
		_						
	Baseli	ine UA Total	88.0		Propos	sed UA Total	85.8	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	2.5%	
					U	A Reduction	2.2	
If the Branced IIA < the Target IIA and the Branced Credite from Table 46	16 ara > that	co roquirod in	Section P40	6 than the home mosts	e the WSEC			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	o are 2 thos	se requirea in	Section R40	o, trien trie nome meets	s tile WSEC			

Table R4	06.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 682 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhe	ad Glazing										
Plan	Component		Glazing		Wid	dth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Are	a and UA	0	0	
				C	Overhead (Glazing A	rea We	ighted U			
											_

١	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	6	0	27.0	8.10
7		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	4	0	20.0	6.00
							Sum	of Area	a and UA	47.0	14.1
						Vertical C	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,105	60
				Sum of Area and UA	1,105	60

Plan	Component		Floor			UA
ID	Description	Ref.	U		Area	
	No floors in thermal envelope	NA	-			0
				Sum of Area and UA	0	0

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

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

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.er	nergy.wsu.edu/Documents/Duct%20Testing%20Standards%20		
Is this a hydronic heating system?	No			
Location of Ducts	Unducted			
Location of Air Handler	Unconditioned 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 Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ystem 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	682 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,797 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	86
Envelope Heat Load Sum of UA X AT	4,374 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(Delta\text{T}\) X .018))	3,193 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,567 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,567 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	9,458 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 204 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.39, Proposed UA is better than baseline by 2%

Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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 780 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

Component Performance, R occupancies		Baseline		Pr	oposed Desig	jn .	
	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,195	66.9	0.054	1,195	64.5	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	97.8	Propo	sed UA Total	95.4	
	Requ	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		<u> </u>		UA Perce	nt Reduction	0.40/	
				(JA Reduction	2.4	

Table R4	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	6.0	7.0		

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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65		
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.		
4	High Efficiency HVAC Distribution System		NA			
5.1	Efficient Water Heating			0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater		
6	Renewable Electric Energy	kWh		0.0		
7	Appliance Package			0.0		
			Energy Credits	6.0		

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

T	HERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design	780 sq. ft				
Classification Small D	welling Unit				
Notes					

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
204A	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
204B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

١	/ertical	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
2 9)	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
							Sum	of Area	a and UA	63.0	18.9
Vertical Glazing Area Weighted U 0.300											
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

ID	Component Description	Ref.	Attic U	Area	UA
	No ceiling/roof in thermal envelope	NA	-	Area	0.0

ID Description Ref. U Net Ar R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,	a UA
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054	
	95

Plan	Component		Floor			UA
ID	Description	Ref.	U		Area	
	No floors in thermal envelope	NA	-			0
				Sum of Area and UA	0	0

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

Below Gr	ade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
Sum of Area, Length and U			gth 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	on 403
Whole House Mechanical Ventilation Airflow Rate	55	5 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.v	wsu.edu/Documents/Duct%20Testing%20Standards%20
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned 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 Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ating 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	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,630 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	95
Envelope Heat Load Sum of UA X ΔT	4,867 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T) X .018))	3,652 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,518 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,518 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	10,648 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 205 Building F 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 2%

Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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 1055 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

				D	oposed Desig		
Component Performance, R occupancion		Baseline					
	U	Area	UA	U	Area	UA	
Doors U	= 0.300	40	12.0	0.300	40		
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	1,303	73.0	0.054	1,303	70.4	
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	
					•		
	Basel	line UA Total	108.4	Propo	sed UA Total	105.8	
	Regu	uired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
				· ·	nt Reduction	0.40/	Toni Tables 400.2 and 400.3
					JA Reduction	2.6	

Table R4	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	6.0	7.0		

Table R4	06.3 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	Efficient Ventilation		1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design	1,055 sq. ft
Classification	Small Dwelling Unit
Notes	

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
205A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
205B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

	Overhea	d Glazing										
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
İ										0		
										0		
										0		
										0		
							Sum	of Area	a and UA	0	0	0
						Overhead (Glazing A	rea We	ighted U			
							_		_			

٧	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
E	xempt			-						-	-
8		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10)	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
Sum of Area and UA								78.0	23.4		
						Vertical C	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,303	70
				Sum of Area and UA	1,303	70

Plan	Component		Floor			UA
ID	Description	Ref.	U		Area	
	No floors in thermal envelope	NA	-			0
				Sum of Area and UA	0	0

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

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

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced Whole-House Ventilation'
Is the system Distributed?	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	Unconditioned Space	
Is i	Ouct Testing Required? No	

nks to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Constr	ruction Affidavit, Existing	
New Constr	ruction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

ating 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	1,055 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,968 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	106
Envelope Heat Load Sum of UA X AT	5,394 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	4,939 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,333 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,333 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	12,917 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 206 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.75, Proposed UA is better than baseline by 3%

Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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 1005 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			Pro	posed Desig	ın	
	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	1,373	76.9		0.054	1,373	74.1	
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	
	Baseli	ine UA Total	109.8		Propo	sed UA Total	107.1	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	0.50/	
					U	A Reduction	2.7	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home mee	ets the WSEC			

Table R4	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	6.0	7.0					

Table R4	06.3 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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65	
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 1,005 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
206A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
206B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea Plan	d Glazing Component		Glazing		Wic	ith	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet		Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Are	a and UA	0	0	
				c	Overhead (Glazing A	rea We	ighted U			
				,	vernead (Jiazing A	vied VVE	ngnied U			

Vertica	Il Glazing Schedule							Ro	ws to Show	3
Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot .									i
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
8	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	and UA	69.8	20.9
					Vertical G	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	iahted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,373	74
				Sum of Area and UA	1,373	74

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
				Sum of Area and UA	0	0	

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

Below Gra	ade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sui	n of Area, Ler	gth 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 Whole-House Ventilation'
Is the system Distributed?	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	Unconditioned Space	
Is	ouct 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 Affadavits		
Existing Construc	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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	1,005 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,543 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	107
Envelope Heat Load Sum of UA X ΔT	5,460 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,705 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,165 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,165 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	12,707 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results *

UA Reduction = 2.65, 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 1149 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

Component Performance, R occupancies		Baseline		P	roposed Desig	gn	
_	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	1,327	74.3	0.054	1,327	71.7	
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	
	Baseli	ne UA Total	125.2	Prop	osed UA Total	122.5	
	Requi	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perc	ent Reduction	0.40/	
					UA Reduction	2.7	

Table R4	06.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 1,149 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	ith	He	ight		ĺ
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
207A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
207B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	Area We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

	Plan	Component		Glazing		Wid	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt									-	-
2	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2 1	0	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
3 1	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
4 1	2	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 C	Slazing A	rea Wei	ghted U		0.300
	Vertical Glazing and Doors Area Weighted U										0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,327	72
				Sum of Area and UA	1,327	72

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

Plan	Component		Slab				
ID	Description	Ref.	F		Slab Perim	FP	
	No slab on grade	NA	-			0	
				Sum of Perimeter and FP	0	0	

Below Gr	rade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	of Area, Ler	ngth 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 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.v	vsu.edu/Documents/Duct%20Testing%20Standards%20_
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned Space	
Is Duct Testing Required?		

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	tion Affidavit, Existing	
New Construct	tion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

eating 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	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,767 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	123
Envelope Heat Load Sum of UA X ΔT	6,249 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	5,379 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,628 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,628 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	14,535 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 208 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.79, 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 1075 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

DECINITO Communication of Description and Description								
RESULTS - Comparison of Baseline and Proposed Design Component Performance, R occupancies		Baseline			Pro	posed Desig	n	
Somponent i circimance, it occupanicies	U	Area	UA		U		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	1,397	78.2		0.054	1,397	75.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	120.6		Propos	sed UA Total	117.8	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0 f	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	2.3%	
					U	A Reduction	2.8	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6. then the home meets	s the WSEC			
	,	oo .oqanoa m		e, men ment	JJ 110EG	-		

Table R4	06.2 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	6.0	7.0

Table R4	06.3 Energy Credits				
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope	оре			
2	Air Leakage Control and Efficient Ventilation	nd Efficient Ventilation		1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 1,075 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
208A	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
208B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	Area We	ighted U		0.300

Overhea Plan	d Glazing Component		Glazing		Wic	ith	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet		Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Are	a and UA	0	0	
				c	Overhead (Glazing A	rea We	ighted U			
				,	vernead (Jiazing A	vied VVE	ngnied U			

Plan	Component		Glazing		Wid	th	Hei	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exem	pt								-	-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
8	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10	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 G	lazing A	rea Wei	ghted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ghted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,397	75
				Sum of Area and UA	1,397	75

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
				Sum of Area and UA	0	0	

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

Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	9	um of Area, Ler	agth and IIA	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 Whole-House Ventilation'
Is the system Distributed?	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 No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space
Is Duct To	sting Required? No

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

stem 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	1,075 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,138 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	118
Envelope Heat Load Sum of UA X AT	6,009 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	5,033 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,042 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,042 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	13,803 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 301 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.43, 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? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: Wescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 819 sq. ft. Code Baseline - Baseline and proposed window areas are equal. Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design							
Component Performance, R occupancies		Baseline		ı	roposed Desig	jn	
	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	92	27.5	0.300	92	27.5	
Flat/Vaulted Ceilings U =	0.027	819	22.1	0.027	819	22.1	
Wall (above grade) U =	0.056	1,215	68.0	0.054	1,215	65.6	
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	
		_					
	Baseli	ine UA Total	129.6	Proj	osed UA Total	127.2	
	Requ	ired Credits	4.5	Pro	posed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Per	ent Reduction	4.00/	
					UA Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ tho	se required in	Section R40	6, then the home meets the WS	EC.		

Table R4	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	6.0	7.0					

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design	819 sq. ft						
Classification Small Dwelling Unit							
Notes							

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
301A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
301B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhe	Overhead Glazing										
Plan	Component		Glazing		Wic	dth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
							0				
									0		
									0		
						Sum	of Are	a and UA	0	0	
				c	Overhead (Glazing A	rea We	ighted U			

Vertical Glazing Schedule Rows to Show 3										3
Plan	Component		Glazing		Wid	th	He	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt	t		-							-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	0	60.0	18.00
11	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	a and UA	91.5	27.5
					Vertical G	lazing A	rea We	ighted U		0.300
Vertical Glazing and Doors Area Weighted U									0.300	

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		819	22.1
				Sum of Area and UA	819	22.1

Plan	Component		Wall				
ID	Description	Ref.	U		Net Area	UA	
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,215	66	
Sum of Area and UA 1.215 66							

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
		0	0				

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

Below G	Below Grade Walls and Slabs									
Plan	Component		Wall	Wall	Wall	Slab		Slab		
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA		
	Sum	of Area, Ler	gth 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 Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.	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	Unconditioned 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 Affadavits		
Existing Construc	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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	819 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	127
Envelope Heat Load Sum of UA X \(\Delta T \)	6,486 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,321 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,321 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	12,901 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 302 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.25, Proposed UA is better than baseline by 2%

Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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 779 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			Pro	posed Desig	ın	
	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	114	34.2		0.300	114	34.2	
Flat/Vaulted Ceilings U =	0.027	779	21.0		0.027	779	21.0	
Wall (above grade) U =	0.056	1,127	63.1		0.054	1,127	60.8	
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	
		_						
	Baseli	ine UA Total	130.3		Propo	sed UA Total	128.1	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	rom Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	4 =0/	
					U	A Reduction	2.3	
If the Decreed HA < the Towns HA and the Decreed Condite from Table 11	> 41		C D40	C 4h 4h h	-4- 4b - MOE			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	o are ≥ tnos	se requirea in	Section R40	b, then the nome me	ets the WSEC	,.		

Table R4	06.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design	779 sq. ft
Classification Sma	all Dwelling Unit
Notes	

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
302A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
302B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
				C	verhead (Glazing A	rea We	ighted U			

Vertica	Il Glazing Schedule							Ro	ws to Show	3
Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot .								-	-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	0	3	0	6.0	1.80
9	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
11	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
						Sum	of Area	and UA	114.0	34.2
					Vertical G	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ighted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		779	21.0
				Sum of Area and UA	779	21.0

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,127	61
Sum of Area and UA 1,127 61						

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
Sum of Area and UA 0							

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

Below Grade Walls and Slabs									
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	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 Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	55 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.	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	Unconditioned 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 Affadavits		
Existing Construc	ction Affidavit, Existing	
New Construc	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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	779 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	128
Envelope Heat Load Sum of UA X ΔT	6,532 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,647 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,179 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,179 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	12,724 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 303 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 0.05, Proposed UA is better than baseline by 0%

Whole House Mechanical Ventilation Airflow Rate: 45 CFM with Run Time Percent of 100%, Balanced, Distributed

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 683 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

DECITE 0 : (D ! 10 10 10 1								
RESULTS - Comparison of Baseline and Proposed Design		Deselles			Dro	posed Desig	n	
Component Performance, R occupancies	U	Baseline Area	UA		U		UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
					0.500	40		
Overhead Glazing U =		0	0.0			0	0.0	
Vertical Glazing U =	0.300	44	13.2		0.300	44	13.2	
Flat/Vaulted Ceilings U =	0.027	683	18.4		0.027	683	18.4	
Wall (above grade) U =	0.056	24	1.3	(0.054	24	1.3	
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	
•				·				
	Baseli	ine UA Total	45.0		Propos	sed UA Total	44.9	
		ired Credits	4.5		•	sed Credits		T-bl 400 0 400 0
	Requ	lifed Oredita	4.0		•		0.40/	from Tables 406.2 and 406.3
					UA Percei	nt Reduction	0.1%	
					U	A Reduction	0.0	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	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	6.0	7.0			

Table R4	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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65				
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.			
4	High Efficiency HVAC Distribution System			NA				
5.1	Efficient Water Heating			0.0				
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater			
6	Renewable Electric Energy	kWh		0.0				
7	Appliance Package			0.0				
			Energy Credits	6.0				

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

T	HERMAL ENVELOPE DETAILS - Proposed Design	

	Conditioned Floor Area, Proposed Design	683 sq. ft						
Classification Small Dwelling Unit								
	Notes							

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
303A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
303B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Plan	Component		Glazing		Wic	lth	He	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
						Sum	of Area	a and UA	0	0
				C	verhead (Slazing A	rea We	ighted U		

١	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	lth	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Ш	Exempt			-						-	-
4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
7		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	4	0	20.0	6.00
							Sum	of Area	a and UA	44.0	13.2
						Vertical C	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

Plan	Component		Attic		
ID	Description	Ref.	U	Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	683	18.4

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		24	1
				Sum of Area and UA	24	1

Plan	Component		Floor			UA			
ID	Description	Ref.	U		Area				
	No floors in thermal envelope	NA	-			0			
Sum of Area and UA									

	Slab on G	rade (less than 2 feet below grade)						
	Plan	Component		Slab				
	ID	Description	Ref.	F		Slab Perim	FP	
		No slab on grade	NA				0	
,		0	0					

Below Gr	ade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	igth and UA	0	0.0		0	0		
					•				

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.er	nergy.wsu.edu/Documents/Duct%20Testing%20Standards%20							
Is this a hydronic heating system?	No								
Location of Ducts	Unducted								
Location of Air Handler	Unconditioned 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 Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ating 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	683 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,806 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	45
Envelope Heat Load Sum of UA X AT	2,292 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,198 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	5,489 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	5,489 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	6,861 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 304 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.39, 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? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: Wescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 780 sq. ft. Code Baseline - Baseline and proposed window areas are equal. Up to 15 sf exempt window and 24 sf exempt door allowable

ESULTS - Comparison of Baseline and Proposed Design					Dronos	ed Desig		
Component Performance, R occupancies		Baseline			•	_		
	U	Area	UA	U	Area		UA	
Doors U =	0.300	40	12.0	0.30	0	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	63	18.9	0.30	0	63	18.9	
Flat/Vaulted Ceilings U =	0.027	780	21.1	0.02	7	780	21.1	
Wall (above grade) U =	0.056	1,195	66.9	0.05	4	1,195	64.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
•								
	Baseli	ine UA Total	118.9		Proposed L	UA Total	116.5	
	Regu	ired Credits	4.5		Proposed			from Tables 406.2 and 406.3
					•		0.00/	Tom Tables 406.2 and 406.3
				UA	Percent Re			
					UA Re	eduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 4	ne are > the	se required in	Section P40	6 than the home meets the	WSEC			

Table R4	06.2 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	6.0	7.0

Table R4	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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 780 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
304A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
304B	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
					·	Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhe	ad Glazing										
Plan	Component		Glazing		Wic	dth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Are	a and UA	0	0	
				C	Overhead (Glazing A	rea We	ighted U			
											_

١	/ertical	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
2 9)	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
							Sum	of Area	a and UA	63.0	18.9
						Vertical (Glazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

Plan	Component		Attic		
ID	Description	Ref.	U	Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	780	21.1

ID Description Ref. U Net Ar R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,	a UA
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054	
	95

Plan	Component		Floor			UA
ID	Description	Ref.	U		Area	
	No floors in thermal envelope	NA	-			0
				Sum of Area and UA	0	0

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

Below Gr	ade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	of Area, Len	gth 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	on 403
Whole House Mechanical Ventilation Airflow Rate	55	5 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	Unconditioned Space	
Is	Duct Testing Required? No	

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	ion Affidavit, Existing	
New Construct	ion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

ystem 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	780 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,630 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	116
Envelope Heat Load Sum of UA X ΔT	5,941 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X Δ T) X .018))	3,652 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,592 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,592 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	11,990 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 305 Building F 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 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 1055 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		F	roposed Desig	gn	
	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	1,055	28.5	0.027	1,055	28.5	
Wall (above grade) U =	0.056	1,303	73.0	0.054	1,303	70.4	
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	
		_					
	Baseli	ine UA Total	136.9	Prop	osed UA Total	134.3	
	Requ	ired Credits	4.5	Pro	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Pero	ent Reduction	4.00/	
					UA Reduction	2.6	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets the WSI	ic.		

Table R4	06.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

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

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
305A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
305B	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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

	Overhea	d Glazing										
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
İ										0		
										0		
										0		
										0		
							Sum	of Area	a and UA	0	0	0
						Overhead (Glazing A	rea We	ighted U			
							_		_			

٧	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
E	xempt			-						-	-
8		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10)	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
							Sum	of Area	a and UA	78.0	23.4
						Vertical C	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

lan	Component		Attic		
ID	Description	Ref.	U	Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	1,055	28.5

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,303	70
				Sum of Area and UA	1,303	70

Plan	Component		Floor			UA
ID	Description	Ref.	U		Area	
	No floors in thermal envelope	NA	-			0
				Sum of Area and UA	0	0

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

Below Grade Walls and Slabs									
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	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?	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	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%					
Is this a hydronic heating system?	No				
Location of Ducts	Unducted				
Location of Air Handler	Unconditioned Space				
Is Duct Testing Required? No					

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	ion Affidavit, Existing	
New Construct	ion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

ating 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	1,055 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,968 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	134
Envelope Heat Load Sum of UA X AT	6,847 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	4,939 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,786 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,786 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	14,733 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 306 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.75, Proposed UA is better than baseline by 2%

Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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 1005 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		Р	roposed Desig	gn	
	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	1,005	27.1	0.027	1,005	27.1	
Wall (above grade) U =	0.056	1,373	76.9	0.054	1,373	74.1	
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	
		_					
	Baseli	ine UA Total	136.9	Prop	osed UA Total	134.2	
	Requ	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perc	ent Reduction	0.00/	
					UA Reduction	2.7	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ tho	se required in	Section R40	6, then the home meets the WSE	C.		

Table R4	106.2 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	6.0	7.0

Table R4	06.3 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		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 1,005 sq. ft									
Classification Small Dwelling Unit									
Notes									

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Plan	Component		Glazing		Wic	lth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
	Sum of Area and UA										
				C	verhead (Slazing A	rea We	ighted U			

Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	pt								-	-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
8	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	and UA	69.8	20.9
					Vertical G	lazing A	rea Wei	ghted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ghted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,005	27.1
				Sum of Area and UA	1,005	27.1

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,373	74
				Sum of Area and UA	1,373	74

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
				Sum of Area and UA	0	0	

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

Plan	ade Walls and Slabs Component		Wall	Wall	Wall	Slab		Slab
ID	Description	Ref.	U	Area	UA		Slab Perim	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 Whole-House Ventilation'
Is the system Distributed?	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	Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%							
Is this a hydronic heating system?	No								
Location of Ducts	Unducted								
Location of Air Handler	Unconditioned Space								
ls									

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

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	1,005 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,543 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	134
Envelope Heat Load Sum of UA X ΔT	6,844 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,705 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,549 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,549 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	14,437 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 307 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.66, 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 1149 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			Pro	posed Desig	n	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0	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	C	0.300	130	38.9	
Flat/Vaulted Ceilings U =	0.027	1,149	31.0	C	0.027	1,149	31.0	
Wall (above grade) U =	0.056	1,328	74.4	C	0.054	1,328	71.7	
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	
		_						
	Baseli	ine UA Total	156.3		Propos	sed UA Total	153.6	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_		į	UA Percei	nt Reduction	1.7%	
					U	A Reduction	2.7	
If the Drangerd LIA C the Torget LIA and the Drangerd Credite from Toble 40	OF are > that	aa raasiirad im	Castian D40	C than the hame meets	the WCEC			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	o are ≥ thos	se requirea in	Section R40	b, then the nome meets	the WSEC			

Table R4	06.2 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	6.0	7.0

Table R4	06.3 Energy Credits				
Option No.	Category	Select Options	Energy Credits	Brief Description of Selected Options*	
1	Efficient Building Envelope	lope			
2	Air Leakage Control and Efficient Ventilation	ge Control and Efficient Ventilation			2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC	ency HVAC			Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

Conditioned Floor Area, Proposed Design 1,149 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	Width Height				
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhe	ad Glazing										
Plan	Component		Glazing		Wic	dth	He	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
Sum of Area and UA									0	0	
				C	Overhead (Glazing A	rea We	ighted U			
											_

Vertical Glazing Schedule Rows to Show 4											
	Plan	Component		Glazing		Wic	ith	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Е	xempt			-						-	-
1 2		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2 10)	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
3 11		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
1 12	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20
							Sum	of Area	a and UA	129.5	38.9
						Vertical C	Glazing A	Area We	ighted U		0.300
					Vertical G	lazing and	Doors A	Area We	ighted U		0.300
										·	

Flat/Vaulted Ceilings Plan Component Attic									
ID	Description	Ref.	U		Area	UA			
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,149				
				Sum of Area and UA	1,149	31.0			

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,328	72
				Sum of Area and UA	1,328	72

Plan	Component		Floor		UA
ID	Description	Ref.	U	Area	
	No floors in thermal envelope	NA	-		0

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

E	Below Grade Walls and Slabs									
	Plan	Component		Wall	Wall	Wall	Slab		Slab	
	ID	Description	Ref.	U	Area	UA	F	Slab Perim	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 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	s%20_
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned Space	
Is Duc	Festing Required? No	

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<u>Instructions</u>
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construct	ion Affidavit, Existing	
New Construct	ion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

eating 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	1,149 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,767 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	154
Envelope Heat Load Sum of UA X ΔT	7,834 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta \) X .018))	5,379 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,213 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,213 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	16,516 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information East Town Crossing Unit 308 Building F Pioneer & Shaw, Puyallup Contact Information Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.79, 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? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: Wescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 1075 sq. ft. Code Baseline - Baseline and proposed window areas are equal. 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 Desig	gn	
	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	1,075	29.0	0.027	1,075	29.0	
Wall (above grade) U =	0.056	1,397	78.2	0.054	1,397	75.5	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ine UA Total	149.6	Pro	posed UA Total	146.9	
	Requ	ired Credits	4.5	Pro	posed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Per	cent Reduction		
					UA Reduction	2.8	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 4	06 are ≥ thos	se required in	Section R40	6, then the home meets the WS	EC.		

Table R4	106.2 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	6.0	7.0

Table R4	06.3 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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65	
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

	Conditioned Floor Area, Proposed Design 1,075 sq. ft						
Classification Small Dwelling Unit							
	Notes						

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									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
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

	Overhead Glazing											
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
İ										0		
									0			
										0		
										0		
							Sum	of Area	a and UA	0	0	0
						Overhead (Glazing A	rea We	ighted U			
							_		_			

Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exem	pt		-						-	-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
8	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
10	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 G	lazing A	rea We	ighted U		0.300
		Vertical Glazing and Doors Area Weighted U 0.300								

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,075	29.0
				Sum of Area and UA	1,075	29.0

Plan	Component		Wall				
ID	Description	Ref.	U		Net Area	UA	
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,397	75	
Sum of Area and UA 1,397 75							

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		
	No floors in thermal envelope	NA	-			0	
		Sum of Area and UA	0	0			

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

Below G	Below Grade Walls and Slabs									
Plan	Component		Wall	Wall	Wall	Slab		Slab		
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA		
	Sum	of Area, Ler	gth 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 Whole-House Ventilation'
Is the system Distributed?	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.	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	Unconditioned 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 Affadavits		
Existing Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

ystem 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	1,075 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,138 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	147
Envelope Heat Load Sum of UA X AT	7,490 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X	5,033 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,522 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,522 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	15,653 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	