



East Town Crossing Unit 101

Building H

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.

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			Pr	oposed 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	100	30.0		0.300	100	30.0	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,206	67.5		0.054	1,206	65.1	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	133	71.8		0.540	133	71.8	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	181.4		Propo	sed UA Total	178.9	
	Requ	ired Credits	4.5		Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Perce	nt Reduction		
					ι	JA Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	6 are ≥ thos	se required in	Section R40	6, then the home n	neets the WSE	3.		

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



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

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

Plan	Component		Glazing		Wid	lth	He	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	4	0	10.0	3.00
4	U=0.30 (Code Baseline)	Table 406.2	0.30	6	3	0	5	0	90.0	27.00
						Sum	of Area	a and UA	100.0	30.0
					Vertical C	Slazing A	rea We	ighted U		0.300
				Vertical G	azing 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		1,206	65
				Sum of Area and UA	1,206	65

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



Slab on G	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		133	72	
				Sum of Perimeter and FP	133	72	

Below Gr	ade Walls and Slabs						1		
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?	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	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	<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	<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	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	179
Envelope Heat Load Sum of UA X AT	9,126 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	12,961 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,961 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	16,201 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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Building H

Pioneer & Shaw, Puyallup

Contact Information

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253-468-4117

Messages / Results *

UA Reduction = 2.28, 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 (pr	referred)					
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	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	103	30.8		0.300	103	30.8	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,140	63.8		0.054	1,140	61.6	
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	175.2		Propos	sed UA Total	172.9	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
	1.3%							
					U	A Reduction	2.3	
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 m	eets 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	106.3 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	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

Overhead	d Glazing										
Plan	Component		Glazing		Wic	ith	Не	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	Overhead (Glazing A	rea We	ighted U			

Vertical Glazing Schedule Rows to Show						ws to Show	3			
Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt	t									ı
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
4	U=0.30 (Code Baseline)	Table 406.2	0.30	4	3	0	5	0	60.0	18.00
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	102.5	30.8
					Vertical G	lazing A	rea Wei	ghted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ahted 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		1,140	62
				Sum of Area and UA	1,140	62

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



Slab on Grade (less than 2 feet below grade)								
Plan	Component	Ref.	Slab		Clab Daviss	FP		
ID	Description	Ret.	Г		Slab Perim	FF		
	R10 2' vertical (Code Baseline)	10-2	0.540		127	69		
							l	
				Sum of Perimeter and FP	127	69		

Ве	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	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.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 F	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	

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	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	173
Envelope Heat Load Sum of UA X ΔT	8,817 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	3,647 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,465 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,465 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	15,581 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	



East Town Crossing Unit 103

Building H

Pioneer & Shaw, Puyallup

Contact Information

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Messages / Results *

UA Reduction = 2.23, 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 657 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	38	11.3	0.300	38	11.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,114	62.4	0.054	1,114	60.2	
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	ne UA Total	149.4	Propo	sed UA Total	147.1	
	Requ	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	4 =0/	
					JA Reduction	2.2	

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



Classification Small Dwelling Unit Notes		Conditioned Floor Area, Proposed Design sq. ft						
Notes	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
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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead	d Glazing										
Plan	Component		Glazing		Wic	ith	Не	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	Overhead (Glazing A	rea We	ighted U			
						_		_			

Plan	Component		Glazing		Wid	lth	He	eight	i	
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									-	-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	6	5	0	17.5	5.25
i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	5	0	20.0	6.00
						Sum	of Area	a and UA	37.5	11.3
Vertical Glazing Area Weighted U 0.3								0.300		
Vertical Glazing and Doors Area Weighted U								ighted U		0.300

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

ID Description Ref. U	Net Area UA
	Net Area UA
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054	1,114 60

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

2



Plan	Grade (less than 2 feet below grade) Component		Slab			
ID	Description	Ref.	F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		118	64
				Sum of Perimeter and FP	118	64

Below Gr	ade Walls and Slabs						1		
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	

Ventilation Requirements	
Number of Bedrooms	1
Run-Time Percent in Each 4-Hour Segment	t 100%
Is the system Balanced?	P Balanced Whole-House Ventilation'
Is the system Distributed?	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	45 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.e	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	

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	657 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,585 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	7,503 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,076 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,579 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,579 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	13,224 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay

blindsay@synthesis9.com 253-468-4117 Messages / Results *

UA Reduction = 2.34, 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 761 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

Commence Designation Description		Danalina			Dr	oposed Desig	ın	
Component Performance, R occupancies		Baseline					<i>*</i>	
,	U	Area	UA	_	U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	48	14.3		0.300	48	14.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,170	65.5		0.054	1,170	63.2	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	125	67.5		0.540	125	67.5	
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	ne UA Total	159.3		Propo	sed UA Total	156.9	
	Requ	ired Credits	4.5		Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	4 =0/	
					ι	JA Reduction	2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	16 aro > thos	e required in	Section P40	6 then the home m	oote the WSE			

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



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

Plan Component Door Width Height								iaht			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
	·	Rei.	U	Qt.	reet		reet		Area	0.0	
Exempt						0			U		122222
104A	Code Baseline, U=0.30	-	0.30	1	3	U	6	0	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	a and UA	40	12.0	
					Exterior	Doors A	Area We	ighted U		0.300	

0	verhead	d 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	0
					c	Overhead (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			-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	5	0	12.5	3.75
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	47.5	14.3
					Vertical G	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
	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		1,170	63			
		Sum of Area and L							

Plan	Component		Floor			UA		
ID	Description	Ref.	U		Area		ı	
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		125	68			
				Sum of Perimeter and FP	125	68			

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	

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.energy.wsu.edu/Documents/Duct%20Testing%20Standar								
Is this a hydronic heating system?	No							
Location of Ducts	Unducted							
Location of Air Handler	Unconditioned Space							
Is Duct 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	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	157
Envelope Heat Load Sum of UA X AT	8,003 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,563 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,566 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,566 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	14,458 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay

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253-468-4117

Messages / Results *

UA Reduction = 2.23, 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.

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 -- 657 sq. ft. Code Baseline - Baseline and proposed window areas are equal. 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	38	11.3	0.300	38	11.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,114	62.4	0.054	1,114	60.2	
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	ne UA Total	149.4	Propo	sed UA Total	147.1	
	Requ	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	4 =0/	
					JA Reduction	2.2	

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



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

Overhead	d Glazing										
Plan	Component		Glazing		Wic	ith	Не	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	a and UA	0	0	0
				C	Overhead (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			-							-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	6	5	0	17.5	5.25
6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	5	0	20.0	6.00
						Sum	of Area	and UA	37.5	11.3
					Vertical G	Blazing 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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,114	60
				Sum of Area and UA	1,114	60

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



Slab on G	irade (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		118	64	
				Sum of Perimeter and FP	118	64	

Below Gr	ade Walls and Slabs						1		
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	1
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	45 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 Constru	ction Affidavit, Existing	
New Constru	ction Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	657_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,585 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	7,503 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,076 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,579 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,579 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	13,224 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 106

Building H

Pioneer & Shaw, Puyallup

Contact Information

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253-468-4117

Messages / Results *

UA Reduction = 2.34, 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.

What code compliance pathway are you using? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: About Your Selection: About Your Selection: Prescriptive 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

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	48	14.3	0.300	48	14.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,170	65.5	0.054	1,170	63.2	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	125	67.5	0.540	125	67.5	
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	ne UA Total	159.3	Propo	sed UA Total	156.9	
	Requ	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	4 =0/	
				ı	JA Reduction	2.3	

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		
I REKINAL ENVELOPE DETAILS - Proposed Design		



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

Plan	Component		Door		Wic	lth	He	ight		
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	and UA	40	12.0
					Exterior	Doors A	rea Wei	ighted U		0.300

Overhead	d 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	a and UA	0	0	0
				(Overhead (Glazing A	Area We	ighted U			

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	5	0	12.5	3.75
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	47.5	14.3
					Vertical G	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

Walls (Ab	pove Grade)					
Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,170	63
				Sum of Area and UA	1,170	63

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

2



Slab 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		125	68	
		•		Sum of Perimeter and FP	125	68	

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	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.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	<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	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	157
Envelope Heat Load Sum of UA X AT	8,003 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,563 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,566 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,566 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	14,458 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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roiec	t Inforn	nation

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay

blindsay@synthesis9.com 253-468-4117

Messages / Results *

UA Reduction = 2.42, 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.

What code compliance pathway are you using? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: 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	95	28.5		0.300	95	28.5	
Flat/Vaulted Ceilings U =	0.027	0	0.0		,	0	0.0	
Wall (above grade) U =	0.056	1,211	67.8		0.054	1,211	65.4	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	133	71.8		0.540	133	71.8	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	180.1		Propo	sed UA Total	177.7	
	Required Credits 4.5					sed Credits	7.0	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	4.00/	
					U	A 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	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 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
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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead	d 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	a and UA	0	0	0
				(Overhead (Glazing A	Area We	ighted U			

	Plan	Component		Glazing		Wid	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt									-	-
1 1		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	2	2	6	5	0	25.0	7.50
3 4	1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	3	0	5	0	45.0	13.50
4 5	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	6	5	0	17.5	5.25
							Sum	of Area	and UA	95.0	28.5
Vertical Glazing Area Weighted U 0.300											
					Vertical G	lazing and	Doors A	rea Wei	ahted 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		1,211	65
				Sum of Area and UA	1,211	65

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



Plan	Component		Slab				
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 Gr	ade Walls and Slabs								
	Plan	Component		Wall	Wall	Wall	Slab		Slab	
	ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
i										
	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 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.enero	y.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 Construct	ion Affidavit, Existing	
New Construct	ion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

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	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	178
Envelope Heat Load Sum of UA X ΔT	9,063 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta \) (X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,898 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,898 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	16,122 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	



East Town Crossing Unit 108

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay

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Messages / Results *

UA Reduction = 2.31, 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.

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

RESULTS - Comparison of Baseline and Proposed Design					
Component Performance, R occupancies		Baseline		Proposed Design	
	U	Area	UA	U Area UA	
Doors U =	0.300	40	12.0	0.300 40 12.0	
Overhead Glazing U =	0.500	0	0.0	0 0.0	
Vertical Glazing U =	0.300	88	26.3	0.300 88 26.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0	0 0.0	,
Wall (above grade) U =	0.056	1,155	64.7	0.054 1,155 62.4	
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	171.5	Proposed UA Total 169.2	
	Requ	ired Credits	4.5	Proposed Credits 7.0	from Tables 406.2 and 406.3
		_		UA Percent Reduction 1.3%	
				UA Reduction 2.3	1
150 B			0		J
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	6 are ≥ thos	se required in	Section R40	6, then 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 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
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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead Glazin Plan	Component		Glazing		Wic	ith	Не	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	Overhead (Glazing A	rea We	ighted U			

Vertical	I Glazing Schedule							Ro	ws to Show	3	
Plan	Component		Glazing		Wid	th	Hei	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
Exempt	t									i	
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	2	6	3	0	22.5	6.75	
4	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	0	5	0	30.0	9.00	
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50	
						Sum	of Area	and UA	87.5	26.3	
					Vertical G	lazing A	rea Wei	ighted 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		1,155	62
				Sum of Area and UA	1,155	62

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



Plan	Component		Slab			
ID	Description	Ref.	F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		127	69
				Sum of Perimeter and FP	127	69

Ве	low Gra	ade Walls and Slabs								
	Plan	Component		Wall	Wall	Wall	Slab		Slab	
	ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
		Sum	gth and UA	0	0.0		0	0		

Ventilation Requirements		
Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	<u></u>
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.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	ction 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	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	169
Envelope Heat Load Sum of UA X ΔT	8,629 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X Δ T) X .018))	3,647 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,276 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,276 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	15,345 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	



East Town Crossing Unit 201

Building H

Pioneer & Shaw, Puyallup

Contact Information

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253-468-4117

Messages / Results *

UA Reduction = 2.46, 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.

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

Component Performance, R occupancies		Baseline		Pı	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	100	30.0	0.300	100	30.0	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,231	68.9	0.054	1,231	66.5	
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	110.9	Propo	sed UA Total	108.5	
	Requi	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	0.00/	
					JA Reduction	2.5	

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		
I REKINAL ENVELOPE DETAILS - Proposed Design		



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design sq. ft	
Notes	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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead Glazin Plan	Component		Glazing		Wic	ith	Не	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	Overhead (Glazing A	rea We	ighted U			

Plan	Component		Glazing		Wid	lth	He	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	4	0	10.0	3.00
4	U=0.30 (Code Baseline)	Table 406.2	0.30	6	3	0	5	0	90.0	27.00
						Sum	of Area	a and UA	100.0	30.0
					Vertical C	Slazing A	rea We	ighted U		0.300
				Vertical G	lazing and	Doors A	rea We	iahted 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		1,231	66
				Sum of Area and UA	1,231	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 Grade Walls and Slabs											
Plan	Component		Wall	Wall	Wall	Slab		Slab			
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA			
·	Sum	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	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	<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	<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	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	108
Envelope Heat Load Sum of UA X ΔT	5,532 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,367 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,367 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	11,708 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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roi	oct.	Infor	mation	

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC
Brett Lindsay
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253-468-4117

Messages / Results *

UA Reduction = 2.36, Proposed UA is better than baseline by 2%

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

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

ANALYSIS SET UP						
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)					
Project Building Type?	New Construction					
Occupancy Type?	R2 Multifamily					
Code Version?	WSEC 2018					
Classification:	Small Dwelling Unit 801 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	103	30.8		0.300	103	30.8	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,181	66.1		0.054	1,181	63.8	
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	L		0	0.0	
		_						
	Baseli	ine UA Total	108.9		Propo	sed UA Total	106.5	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		<u>-</u>			UA Percei	nt Reduction	0.00/	
					U	A Reduction	2.4	
Kill B			0					
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 m	eets 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

THERMAL ENVELOPE DETAILS - Proposed Design	



Classification Small Dwelling Unit	Conditioned Floor Area, Proposed Design 801 sq. ft	
Nete	Classification Small Dwelling Unit	
Notes	Notes	

Plan	Component		Door		Wic	lth	He	eight		
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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead Glazin Plan	Component		Glazing		Wic	ith	Не	eight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
Sum of Area and U/										0	
				c	Overhead (Glazing A	rea We	ighted U			

Vertical	I 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
Exempt	t									i
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
4	U=0.30 (Code Baseline)	Table 406.2	0.30	4	3	0	5	0	60.0	18.00
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	102.5	30.8
Vertical Glazing Area Weighted 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		1,181	64
				Sum of Area and UA	1,181	64

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	rade (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	
				·			

Ве	low Gra	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	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	1

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		

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	

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	801 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,809 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	5,433 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X. 018))	3,750 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,183 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,183 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	11,479 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 203

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC **Brett Lindsay** blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.23, 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** R2 Multifamily Occupancy Type?

Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 657 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 F

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	38	11.3
Flat/Vaulted Ceilings U =	0.027	0	0.0
Wall (above grade) U =	0.056	1,114	62.4
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

Baseline UA Total 85.6 Required Credits 4.5

Pro	posed Desig	jn
U	Area	UA
0.300	40	12.0
	0	0.0
0.300	38	11.3
	0	0.0
0.054	1,114	60.2
	0	0.0
	0	0.0
	0	0.0
	0	0.0

Proposed UA Total 83.4 **Proposed Credits** 7.0 from Tables 406.2 and 406.3 2.6% **UA Percent Reduction** 2.2 **UA Reduction**

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	406.2 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	106.3 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



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

Plan	Component		Door		Wic	ith	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	Area We	ighted U		0.300	

verhead Glazing 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	Overhead (Slazing A	rea We	ighted U		

Plan	Component		Glazing		Width		Height			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-							-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	6	5	0	17.5	5.25
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	5	0	20.0	6.00
						Sum	of Area	a and UA	37.5	11.3
					Vertical C	Slazing A	rea We	ighted U		0.300
				Vertical G	lazing and	Doors A	rea We	iahted 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		1,114	60	
Sum of Area and UA 1,114 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 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	1
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	45 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 Constructi	on Affidavit, Existing	
New Constructi	on 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	657 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,585 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	83
Envelope Heat Load Sum of UA X AT	4,254 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X Δ T) X .018))	3,076 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,330 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,330 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	9,162 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	



East Town Crossing Unit 204

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC **Brett Lindsay** blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.34, Proposed UA is better than baseline by 3%

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?

Prescriptive Path Compliance with Option 1 (preferred) **New Construction**

Occupancy Type?

R2 Multifamily Code Version? WSEC 2018

Classification: Small Dwelling Unit -- 761 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	48	14.3
Flat/Vaulted Ceilings U =	0.027	0	0.0
Wall (above grade) U =	0.056	1,170	65.5
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0
· ·			

Baseline UA Total 91.8 Required Credits 4.5

Proposed Design U Area UA 0.300 40 12.0 0.0 0.300 48 14.3 0.0 0.054 1,170 63.2 0.0 0.0 0.0 0.0

> Proposed UA Total 89.4 **Proposed Credits** 7.0 from Tables 406.2 and 406.3 2.5% **UA Percent Reduction** 2.3 **UA Reduction**

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	7 Appliance Package			0.0					
			Energy Credits	6.0					

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



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

verhead Glazing 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	Overhead (Overhead Glazing Area Weighted U					

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	5	0	12.5	3.75
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	47.5	14.3
Vertical Glazing Area Weighted U 0.300										
Vertical Glazing and Doors Area Weighted U 0.300						Doors A				

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

Walls (Ab	pove Grade)					
Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,170	63
				Sum of Area and UA	1,170	63

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						1		
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	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.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	

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	
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	89
Envelope Heat Load Sum of UA X AT	4,561 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,563 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,124 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,124 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	10,155 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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roiec	t Inforn	nation

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com Messages / Results *

UA Reduction = 2.23, 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

253-468-4117

What code compliance pathway are you using?
Project Building Type?
Occupancy Type?

Prescriptive Path Compliance with Option 1 (preferred)
New Construction
R2 Multifamily

Code Version? WSEC 2018
Classification: Small Dwelling Unit -- 657 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	38	11.3
Flat/Vaulted Ceilings U =	0.027	0	0.0
Wall (above grade) U =	0.056	1,114	62.4
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

Baseline UA Total 85.6
Required Credits 4.5

Pı	Proposed Design								
U	Area	UA							
0.300	40	12.0							
	0	0.0							
0.300	38	11.3							
	0	0.0							
0.054	1,114	60.2							
	0	0.0							
	0	0.0							
	0	0.0							
	0	0.0							

 Proposed UA Total
 83.4

 Proposed Credits
 7.0

 UA Percent Reduction
 2.6%

 UA Reduction
 2.2

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

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



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design sq. ft	
Notes	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	a 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	lth	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 5	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	6	5	0	17.5	5.25
2 6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	5	0	20.0	6.00
Sum of Area and UA								37.5	11.3		
						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

Walls (Ab	pove Grade)					
Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,114	60
			•	Sum of Area and UA	1,114	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 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	1	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	45 CFM	

HVAC Thermal Distribution System	Download RS-33 (2018) 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 Duc	t 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	657_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,585 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	83
Envelope Heat Load Sum of UA X AT	4,254 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,076 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,330 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,330 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	9,162 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay Messages / Results *

UA Reduction = 2.34, Proposed UA is better than baseline by 3%

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.

blindsay@synthesis9.com 253-468-4117

What code compliance pathway are you using?
Project Building Type?
Occupancy Type?
Code Version?
Classification:
Baseline Description:
About Your Selection:

Wesconstruction
R2 Multifamily
WSEC 2018
Small Dwelling Unit -- 761 sq. ft.
Code 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	48	14.3		0.300	48	14.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,170	65.5		0.054	1,170	63.2	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	91.8		Propos	sed UA Total	89.4	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Percer	nt Reduction	0.50/	
					U	A Reduction	2.3	
Kill B			0					
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	ets 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



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

Plan	Component		Door		Wic	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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead Glazin Plan	Component		Glazing		Wic	ith	Не	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	Overhead (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			-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	5	0	12.5	3.75
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
Sum of Area and UA 47.5							14.3			
					Vertical G	Slazing A	rea We	ighted U		0.300
Vertical Glazing and Doors Area Weighted U 0.30							rea We	ighted U		0.300

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

Walls (Ab	pove Grade)					
Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,170	63
				Sum of Area and UA	1,170	63

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 Grade 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?	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	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		
New Construc	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	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	89
Envelope Heat Load Sum of UA X AT	4,561 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,563 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,124 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,124 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	10,155 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.45, 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.

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	83	24.8		0.300	83	24.8	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,224	68.5		0.054	1,224	66.1	
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	105.3		Propo	sed UA Total	102.8	
	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	2.4	
If the December of the Arthur Tarantal Manager of the Arthur T			0					
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 m	eets 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

THERMAL ENVELOPE DETAILS - Proposed Design		
I REKINAL ENVELOPE DETAILS - Proposed Design		



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

Plan	Component		Door		Wic	lth	He	ight			1
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	i
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	

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 Area and U										0

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt	1		-							-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	2	6	3	0	22.5	6.75
4	U=0.30 (Code Baseline)	Table 406.2	0.30	4	3	0	5	0	60.0	18.00
						Sum	of Area	and UA	82.5	24.8
					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
	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		1,224	66
				Sum of Area and UA	1,224	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 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					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	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	<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	<u>Worksheet</u>	

eating System Sizing - Proposed Design	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	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	103
Envelope Heat Load Sum of UA X AT	5,245 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	9,080 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,080 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	11,349 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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roiect	Information	

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay <u>blindsay@synthesis9.com</u> 253-468-4117

Messages / Results *

UA Reduction = 2.31, 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: Classification: Prescriptive Path Compliance with Option 1 (preferred) New Construction R2 Multifamily WSEC 2018 Small Dwelling Unit -- 778 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

ESULTS - 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	88	26.3
Flat/Vaulted Ceilings U =	0.027	0	0.0
Wall (above grade) U =	0.056	1,153	64.6
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

 Baseline UA Total
 102.8

 Required Credits
 4.5

Pro	posed Desig	ın
U	Area	UA
0.300	40	12.0
	0	0.0
0.300	88	26.3
	0	0.0
0.054	1,153	62.3
	0	0.0
	0	0.0
	0	0.0
	0	0.0

 Proposed UA Total
 100.5

 Proposed Credits
 7.0

 UA Percent Reduction
 2.2%

 UA Reduction
 2.3

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

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



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design 778 sq. ft	
Notes	Classification Small Dwelling Unit	
	Notes	

Plan	Component		Door		Wic	lth	He	eight		
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	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

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 (

Plar	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exem	pt		-						-	-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	2	6	3	0	22.5	6.75
4	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	0	5	0	30.0	9.00
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	87.5	26.3
					Vertical C	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ighted U		0.300

Flat/Vaulted Ceilings									
Plan ID	Component Description	Ref.	Attic U		Area	UA			
	No ceiling/roof in thermal envelope	NA	-			0.0			
							i		
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		1,153	62
		,		Sum of Area and UA	1,153	62

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		ĺ
	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 F								
				·				

Ве	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	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.energy.wsu.edu/Documents/Duct%20Testing%20Standards%					
Is this a hydronic heating system?	No 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	

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	778 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,613 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	101
Envelope Heat Load Sum of UA X AT	5,126 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X \(0.18 \))	3,642 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,769 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,769 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	10,961 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	



East Town Crossing Unit 301

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.17, 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?

vay are you using?
ect Building Type?
Occupancy Type?
R2 Multifamily

cupancy Type?
Code Version?

Classification:

R2 Multifamily
WSEC 2018

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 F

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	100	30.0
Flat/Vaulted Ceilings U =	0.027	819	22.1
Wall (above grade) U =	0.056	1,086	60.8
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

 Baseline UA Total
 124.9

 Required Credits
 4.5

Proposed Design U Area UA 0.300 40 12.0 0.0 0.300 100 30.0 0.027 819 22.1 0.054 1,086 58.6 0.0 0.0 0.0 0.0

 Proposed UA Total
 122.8

 Proposed Credits
 7.0

 UA Percent Reduction
 1.7%

 UA Reduction
 2.2

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

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



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design sq. ft						
Notes	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 Wei	ighted U		0.300

verhead Glazing Plan	Component		Glazing		Wic	lth	He	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
									0	
									0	
									0	
									0	
Sum of Area and UA 0 0										
				c	Overhead (Slazing 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	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	4	0	10.0	3.00
4	U=0.30 (Code Baseline)	Table 406.2	0.30	6	3	0	5	0	90.0	27.00
Sum of Area and UA 100.0 30.0										
					Vertical G	Slazing A	rea We	ighted U		0.300
Vertical Glazing and Doors Area Weighted 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	819	22.1

Walls (Above Grade)									
Plan	Component		Wall						
ID	Description	Ref.	U		Net Area	UA	İ		
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,086	59			
				Sum of Area and UA	1,086	59			

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

2



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 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	

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 Construction	Affidavit, Existing	
New Construction	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	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	123
Envelope Heat Load Sum of UA X AT	6,261 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,095 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,095 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	12,619 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 302

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.13, 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.

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 -- 801 sq. ft. Code Baseline - Baseline and proposed window areas are equal. Up to 15 sf exempt window and 24 sf exempt door allowable

DECILITY Comparison of Possiins and Proposed Posing								
RESULTS - Comparison of Baseline and Proposed Design Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
Somponent i circimance, it occupanoles	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	103	30.8		0.300	103	30.8	
Flat/Vaulted Ceilings U =	0.027	801	21.6		0.027	801	21.6	
Wall (above grade) U =	0.056	1,063	59.5		0.054	1,063	57.4	
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	123.9		Propos	sed UA Total	121.8	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	1.7%	
					U	A Reduction	2.1	
If the Drangerd LIA C the Torget LIA and the Drangerd Credite from Toble 40	OF are > that	oo voquivod im	Coation D40	C than the home mad	to 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 mee	ets 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



Classification Small Dwelling Unit	Conditioned Floor Area, Proposed Design 801 sq. ft	
N. C.	Classification Small Dwelling Unit	
Notes	Notes	

Plan	Component		Door		Wid	ith	He	eight		
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	a 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			

Vertical	I 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
Exempt	t									i
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
4	U=0.30 (Code Baseline)	Table 406.2	0.30	4	3	0	5	0	60.0	18.00
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	102.5	30.8
Vertical Glazing Area Weighted U								0.300		
				Vertical G	lazing and	Doors A	rea Wei	ahted 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		801	21.6
				Sum of Area and UA	801	21.6

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,063	57
				Sum of Area and UA	1,063	57

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	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	1

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 F	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	iction Affidavit, Existing	
New Constru	iction 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	801 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,809 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	122	
Envelope Heat Load Sum of UA X ΔT	6,211 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,750 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,961 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,961 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	12,451 Btu / Hour	
Building and Duct Heat Loss X 1.40 for all other systems		



East Town Crossing Unit 303

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay

blindsay@synthesis9.com 253-468-4117 Messages / Results *

UA Reduction = 2.02, Proposed UA is better than baseline by 2%

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

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

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 657 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		Pı	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	38	11.3	0.300	38	11.3	
Flat/Vaulted Ceilings U =	0.027	657	17.7	0.027	657	17.7	
Wall (above grade) U =	0.056	1,008	56.4	0.054	1,008	54.4	
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	ne UA Total	97.4	Propo	sed UA Total	95.4	
	Requi	ired Credits	4.5	Prop	osed Credits	7.0	from Tables 406.2 and 406.3
		_		UA Perce	ent Reduction	0.40/	
				1	JA Reduction	2.0	

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	lenewable Electric Energy kWh			0.0	
7	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		
I REKINAL ENVELOPE DETAILS - Proposed Design		



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

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 2											
	Plan	Component		Glazing		Wic	lth	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 5	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	6	5	0	17.5	5.25
2 6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	5	0	20.0	6.00
							Sum	of Area	a and UA	37.5	11.3
Vertical Glazing Area Weighted 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	657	17.7

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,008	54
Sum of Area and UA 1.008 54						

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	

Ventilation Requirements	
Number of Bedrooms	1
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	45 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 Construction	on Affidavit, Existing	
New Construction	on Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

system Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-too
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	657_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,585 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	4,866 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,076 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,942 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,942 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	9,928 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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roiect	Information	

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay <u>blindsay@synthesis9.com</u> 253-468-4117

Messages / Results *

UA Reduction = 2.12, Proposed UA is better than baseline by 2%

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

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

What code compliance pathway are you using? Project Building Type? Occupancy Type? Code Version? Classification: Baseline Description: 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 Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
Component Performance, & occupancies	U	Area	UA		U		UA	
Doors U =	_	40	12.0		0.300	40		
Overhead Glazing U =		0	0.0			0	0.0	
Vertical Glazing U =		48	14.3		0.300	48	14.3	
Flat/Vaulted Ceilings U =		760	20.5		0.027	760	20.5	
Wall (above grade) U =		1,058	59.2		0.054	1,058	57.1	
Floors over Crawispace U =		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	106.0		Propo	sed UA Total	103.9	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	from Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	0.00/	
					U	A Reduction	2.1	
If the Drengerd LIA C the Torget LIA and the Drengerd Credite from Toble 40	06 ara > tha	aa raasiirad im	Coation D40	C than the home mad	to the WCEC			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	o are ≥ tnos	se requirea in	Section R40	o, then the nome mee	its 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	fficient 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



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design 760 sq. ft	
Notes	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

Overhead	d Glazing										
Plan	Component		Glazing		Wic	ith	Не	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	a and UA	0	0	0
				C	Overhead (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			-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	5	0	12.5	3.75
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	47.5	14.3
					Vertical G	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	760	20.5

Walls (Ab	pove Grade)					
Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,058	57
				Sum of Area and UA	1,058	57

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

2



Slab on G	rade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP	
	•	NA NA			Oldo I Cillii	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 U					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	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		

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	<u>Worksheet</u>	

eating System Sizing - Proposed Design	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	760_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,460 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	104
Envelope Heat Load Sum of UA X ΔT	5,299 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,558 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,857 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,857 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	11,071 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 305

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 1.68, 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?

pathway are you using?
Project Building Type?
Occupancy Type?
R2 Multifamily

cupancy Type?
Code Version?
Classification: Small Dwelling Unit -- 567 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	208	62.3
Flat/Vaulted Ceilings U =	0.027	567	15.3
Wall (above grade) U =	0.056	838	46.9
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

Baseline UA Total 136.5
Required Credits 4.5

Pro	posed Desig	ın
U	Area	UA
0.300	40	12.0
	0	0.0
0.300	208	62.3
0.027	567	15.3
0.054	838	45.3
	0	0.0
	0	0.0
	0	0.0
	0	0.0

 Proposed UA Total
 134.8

 Proposed Credits
 7.0

 UA Percent Reduction
 1.2%

 UA Reduction
 1.7

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

Table 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			Farm	
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



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design sq. ft	
Notes	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
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 Wei	ighted U		0.300

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 Area	a and UA	0	0	0
					Overhead (Glazing A	Area We	ighted U			

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt	t		-							-
5	U=0.30 (Code Baseline)	Table 406.2	0.30	5	3	6	5	0	87.5	26.25
6	U=0.30 (Code Baseline)	Table 406.2	0.30	6	4	0	5	0	120.0	36.00
						Sum	of Area	and UA	207.5	62.3
					Vertical C	Slazing 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	567	15.3

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		838	45
				Sum of Area and UA	838	45

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	gth and UA	0	0.0		0	0			

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy	Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%2					
Is this a hydronic heating system?	No						
Location of Ducts	Unducted						
Location of Air Handler	Unconditioned Space						
Is 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				
New Constru	New Construction Affidavit, New			
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist			
Alterations (Remodel) Worksheet	Worksheet			

eating System Sizing - Proposed Design	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	567_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	4,820 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	135
Envelope Heat Load Sum of UA X ΔΤ	6,875 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta \) (X .018))	2,655 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,530 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,530 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	11,912 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 306

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC **Brett Lindsay** blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.12, Proposed UA is better than baseline by 2%

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

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

ANALYSIS SET UP

What code compliance pathway are you using? Project Building Type?

Prescriptive Path Compliance with Option 1 (preferred) **New Construction** Occupancy Type?

R2 Multifamily Code Version? WSEC 2018

Classification: Small Dwelling Unit -- 761 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

ooca Beolgii			
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	48	14.3
Flat/Vaulted Ceilings U =	0.027	761	20.5
Wall (above grade) U =	0.056	1,058	59.2
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

Baseline UA Total 106.0 **Required Credits** 4.5

P	roposed Desi	gn
U	Area	UA
0.300	40	12.0
	(0.0
0.300	48	14.3
0.027	761	20.5
0.054	1,058	57.1
	C	0.0
	(0.0
	C	0.0
	(0.0

Proposed UA Total 103.9 **Proposed Credits** 7.0 from Tables 406.2 and 406.3 2.0% **UA Percent Reduction** 2.1 **UA Reduction**

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	106.3 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	trol 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		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



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

Plan	Component		Door		Wic	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	Area We	ighted U		0.300	

verhead Glazing 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	Overhead (Slazing A	rea We	ighted U		

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt	1		-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	5	0	12.5	3.75
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	a and UA	47.5	14.3
					Vertical C	Slazing A	rea We	ighted U		0.300
				Vertical G	lazing and	Doors A	rea We	iahted 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	761	20.5

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,058	57
				Sum of Area and UA	1,058	57

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	rade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP	
	•	NA NA			Oldo I Cillii	0	
				Sum of Perimeter and FP	0	0	

Below Gr	ade Walls and Slabs						1		
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
·	Sum	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	55 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.e	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 Construc	ction Affidavit, Existing	
New Construc	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	6,469 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	104
Envelope Heat Load Sum of UA X ΔT	5,300 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	3,563 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,863 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,863 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	11,079 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 307

Building H

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 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?

vay are you using?
ect Building Type?
Occupancy Type?
R2 Multifamily

cupancy Type?
Code Version?
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

useu Design			
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	83	24.8
Flat/Vaulted Ceilings U =	0.027	819	22.1
Wall (above grade) U =	0.056	1,104	61.8
Floors over Crawlspace U =	0.029	0	0.0
Slab on Grade F =	0.540	0	0.0
Below Grade Wall U =	0.042	0	0.0
Below Grade Slab F =	0.570	0	0.0

Baseline UA Total	120.7
Required Credits	4.5

Pro	posed Desig	jn
U	Area	UA
0.300	40	12.0
	0	0.0
0.300	83	24.8
0.027	819	22.1
0.054	1,104	59.6
	0	0.0
	0	0.0
	0	0.0
	0	0.0

Proposed UA Total	118.5	
Proposed Credits	7.0	from Tables 406.2 and 406.3
UA Percent Reduction	1.8%	
IIA Reduction	2.2	

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

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	ing Envelope		0.0	
2	Air Leakage Control and Efficient Ventilation	Control and 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 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	
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	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			

Plan	Plan Component		Glazing		Width		Height			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-							-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	2	6	3	0	22.5	6.75
4	U=0.30 (Code Baseline)	Table 406.2	0.30	4	3	0	5	0	60.0	18.00
						Sum	of Area	a and UA	82.5	24.8
Vertical Glazing Area Weighted 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		1,104	60
				Sum of Area and UA	1,104	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 G	rade (less than 2 feet below grade)						
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP	
	•	NA NA			Oldo I Cillii	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	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?	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	55 CFM

HVAC Thermal Distribution System Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Stan								
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	<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	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	118
Envelope Heat Load Sum of UA X AT	6,042 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X Δ T) X .018))	3,834 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,877 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,877 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	12,346 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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East Town Crossing Unit 308

Building H

Pioneer & Shaw, Puyallup

Contact Information

Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com

253-468-4117

Messages / Results *

UA Reduction = 2.08, 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.

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 -- 778 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	88	26.3		0.300	88	26.3	
Flat/Vaulted Ceilings U =	0.027	778	21.0		0.027	778	21.0	
Wall (above grade) U =	0.056	1,039	58.2		0.054	1,039	56.1	
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	117.4		Propo	sed UA Total	115.4	
	Requ	ired Credits	4.5		Propo	sed Credits	7.0	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	4.00/	
					U	A Reduction	2.1	
If the December of the Arthur Tarantal Manager of the Arthur T			0					
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 m	eets 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



Classification Small Dwelling Unit Notes	Conditioned Floor Area, Proposed Design 778 sq. ft					
Notes	Classification Small Dwelling Unit					
	Notes					

Plan	Component		Door		Wid	ith	He	eight		
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	a 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		
									0		
									0		
									0		
									0		
Sum of Area and UA 0 0											
				C	Overhead (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								-	-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	2	6	3	0	22.5	6.75
4	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	0	5	0	30.0	9.00
5	U=0.30 (Code Baseline)	Table 406.2	0.30	2	3	6	5	0	35.0	10.50
						Sum	of Area	and UA	87.5	26.3
					Vertical G	lazing A	rea Wei	ghted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ahted 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		778	21.0
				Sum of Area and UA	778	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		1,039	56
				Sum of Area and UA	1,039	56

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	rade (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	
				·			

Ве	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	

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.energy.wsu.edu/Documents/Duct%20Testing%20Standards%
Is this a hydronic heating system?	No No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space
Is Duct	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	ction 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	778 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,613 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	115
Envelope Heat Load Sum of UA X ΔT	5,883 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X Δ T) X 018))	3,642 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,526 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,526 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	11,907 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	