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

Messages / Results *

UA Reduction = 2.61, Proposed UA is better than baseline by 1%

Uha Reduction = 2.61, Proposed UA is better than baseline by 1%

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1109 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Doors U = 0.300	RESULTS - Comparison of Baseline and Proposed Design Component Performance, R occupancies		Baseline			Pr	oposed Desig	ın	
Doors U = 0.300 40 12.0 0.300 40 12.0 0.300 40 12.0 0.500 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Component Performance, R occupancies			114				<i>*</i>	
Overhead Glazing U = 0.500	B				Г				
Vertical Glazing U = 0.300 128 38.3 0.300 128 38.3			40		-	0.300	40		
Flat/Vaulted Ceilings U = 0.027 0 0.0	•		0		_		0		
Wall (above grade) U = 0.056	Vertical Glazing U =	0.300	128	38.3		0.300	128	38.3	
Floors over Crawlspace U = 0.029 0 0.0 Slab on Grade F = 0.540 146 78.8 Below Grade Wall U = 0.042 0 0.0 Below Grade Slab F = 0.570 0 0.0 Baseline UA Total 202.3 Required Credits 4.5 Proposed UA Total 199.7 Required Credits 4.5 UA Percent Reduction 1.3%	Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Slab on Grade F	Wall (above grade) U =	0.056	1,307	73.2		0.054	1,307	70.6	
Below Grade Wall U = 0.042 0 0.0 0 0 0 0.0 Below Grade Slab F = 0.570 0 0.0 0 0 0 0.0 Baseline UA Total 202.3 Proposed UA Total 199.7 Required Credits 4.5 Proposed Credits 0.0 from Tables 406.2 and 406.3 UA Percent Reduction 1.3%	Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Baseline UA Total 202.3 Proposed UA Total 199.7	Slab on Grade F =	0.540	146	78.8		0.540	146	78.8	
Baseline UA Total 202.3 Proposed UA Total 199.7 Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 406.3 UA Percent Reduction 1.3%	Below Grade Wall U =	0.042	0	0.0			0	0.0	
Required Credits 4.5 Proposed Credits 6.0 From Tables 406.2 and 406.3 UA Percent Reduction 1.3%	Below Grade Slab F =	0.570	0	0.0			0	0.0	
Required Credits 4.5 Proposed Credits 6.0 From Tables 406.2 and 406.3 UA Percent Reduction 1.3%					_				
UA Percent Reduction 1.3%		Baseli	ine UA Total	202.3		Propo	sed UA Total	199.7	
UA Percent Reduction 1.3%		Regu	ired Credits	4.5		Prop	osed Credits	6.0	from Tables 406 2 and 406 3
UA Reduction 2.6		·	L			UA Perce	nt Reduction	4.00/	10111 140100 100.2 4114 100.0
OA REGULTION 2.0									
							A Reduction	2.0	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

 $^{{}^{\}star}\text{Refer}$ to WSEC 2018 Table R406.3 for complete option descriptions and requirements

THERMAL ENVELOPE DETAILS - Proposed Design



Conditioned Floor Area, Proposed Design 1,109 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	lth	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	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		Wic	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-						-	-
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	2	0	12.0	3.60
						Sum	of Area	a and UA	127.5	38.3
					Vertical C	Slazing A	rea We	ighted U		0.300
Vertical Glazing and Doors Area Weighted U									0.300	

Flat/V	ulted Ceilings										
Plai	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		1,307	71
				Sum of Area and UA	1,307	71

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



PI	an D	Component Description	Ref.	Slab		Slab Perim	FP	
		R10 2' vertical (Code Baseline)	10-2	0.540		146		
					Sum of Perimeter and FP	146	79	

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

Ventilation Requirements	
Number of Bedrooms	3
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

HVAC Thermal Distribution System Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Tes					
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		
New Constructi		
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	9,427 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	200
Envelope Heat Load Sum of UA X AT	10,183 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	5,192 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	15,375 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	15,375 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	21,526 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results *

City of Payallap

Design Final Dates

UA Reduction = 2.79, Proposed UA is better than baseline by 1%

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1061 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

4.407	Component Performance, R occupancies		Baseline		Pr	oposed Desig	gn	
Overhead Glazing U = 0.500 0 0.0 Vertical Glazing U = 0.300 91 27.4 Flatt/Vaulted Ceilings U = 0.027 0 0.0 Wall (above grade) U = 0.056 1,397 78.2 Floors over Crawlspace U = 0.029 0 0 Slab on Grade F = 0.540 151 81.7 Below Grade Wall U = 0.042 0 0.0 Below Grade Slab F = 0.570 0 0 Baseline UA Total Required Credits 4.5 Proposed UA Total Proposed Credits 6.0		U	Area	UA	U	Area	UA	
Vertical Glazing U = 0.300 91 27.4 0.300 91 27.4	Doors U =	0.300	40	12.0	0.300	40	12.0	
Flat/Vaulted Ceilings U = 0.027 0 0.0 0.0	Overhead Glazing U =	0.500	0	0.0		0	0.0	
Wall (above grade) U = 0.056	Vertical Glazing U =	0.300	91	27.4	0.300	91	27.4	
Floors over CrawIspace U = 0.029 0 0.0 Slab on Grade F = 0.540 151 81.7 Below Grade Wall U = 0.042 0 0.0 Below Grade Slab F = 0.570 0 0.0 Baseline UA Total 199.3 Required Credits 4.5 Proposed UA Total 5.0 From Tables 406.2	Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Slab on Grade F	Wall (above grade) U =	0.056	1,397	78.2	0.054	1,397	75.4	
Below Grade Wall U = 0.042	Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Below Grade Slab F = 0.570 0 0.0 0 0.0	Slab on Grade F =	0.540	151	81.7	0.540	151	81.7	
Baseline UA Total 199.3 Proposed UA Total 196.5 Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2	Below Grade Wall U =	0.042	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2	Below Grade Slab F =	0.570	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2			_					
1 100		Baseli	ine UA Total	199.3	Propo	sed UA Total	196.5	
1.494		Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
UA Percent Reduction 1.4%			_		UA Perce	nt Reduction	1.4%	
UA Reduction 2.8						JA Reduction	2.8	

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)							
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0							

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 1,061 sq. ft	City of P Development & Po ISSUED	ermitting Services				
Classification Small Dwelling Unit						
Notes	Engineering Fire	Public Works Traffic				

Plan	Component		Door		Wid	ith	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	

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	verhead (Glazina A	rea We	iahted U		

Plar	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exem	pt		-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
7	U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20
						Sum	of Area	and UA	91.3	27.4
					Vertical G	Slazing A	rea We	ighted U		0.300
Vertical Glazing and Doors Area Weighted U 0.300										

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

Plan	Component		Wall				
ID	Description	Ref.	U		Net Area	UA	
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,397	75	
Sum of Area and UA 1.397 75							

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		151	82	
Sum of Perimeter and FP 151 82							

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

Ventilation Requirements		
Number of Bedrooms	3	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-H	ouse Ventilation'
Is the system Distributed?	Distributed Verify system meets definition of 'Distributed Whole-	House Ventilation'
Ventilation Code Section	MC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

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

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,061 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,019 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	197
Envelope Heat Load Sum of UA Χ ΔΤ	10,022 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,967 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	14,989 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	14,989 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	20,985 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 103
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	hlindsav@synthesis9.com

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1008 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		Pr	roposed Desig	jn	
	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	78	23.4	0.300	78	23.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,271	71.2	0.054	1,271	68.6	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	138	74.3	0.540	138	74.3	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ine UA Total	180.8	Propo	osed UA Total	178.3	
	Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
		_		UA Perce	ent Reduction	1.4%	
					UA Reduction	2.5	
Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40							

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design		
THERWAL ENVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design 1,008 sq. ft	City of F Development & P	Permitting Services
Classification Small Dwelling Unit	Building	Planning
Notes	Engineering Fire	Public Works Traffic
	. 0	1000 111

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	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

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

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

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

Plan	Component		Wall		
ID	Description	Ref.	U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,271	69

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



Slab on Grade (less than 2 feet below grade)							
Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP	
	R10 2' vertical (Code Baseline)	10-2	0.540		138	74	
Sum of Perimeter and FP						74	

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

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

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

Links to Download Forms, Checklists and Other Resources	Link	
Compliance Certificate	Compliance Certificate	<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	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,008 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,568 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	178
Envelope Heat Load Sum of UA X.AT	9,092 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,719 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,811 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,811 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	19,335 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results * UA Reduction = 2.7, Proposed UA is better than baseline by 1% Uha Reduction = 2.7, Proposed UA is better than baseline by 1% Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 976 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	70	20.9		0.300	70	20.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,352	75.7		0.054	1,352	73.0	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	145	78.1		0.540	145	78.1	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ne UA Total	186.8		Propo	sed UA Total	184.1	
	Requ	ired Credits	4.5		Prop	osed Credits	6.0	from Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	4 407	
						JA Reduction	2.7	
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)			
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0			

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	

THERMAL ENVELOPE DETAILS - Proposed Design		
THERWAL ENVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design 976 sq. ft	City of Development & F ISSUED	Puyallup Permitting Services D PERMIT		
Classification Small Dwelling Unit				
Notes	Engineering	Public Works Traffic		

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

Overhead Glazing											
Plan	Component		Glazing		Wic	ith	Не	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									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 3										
Plan	Component		Glazing		Wid	th	Hei	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt	t								-	1
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
						Sum	of Area	and UA	69.8	20.9
Vertical Glazing Area Weighted U 0.300										
Vertical Glazing and Doors Area Weighted U								0.300		

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		1,352	73
				Sum of Area and UA	1,352	73

F	Floor (ove	er crawl or exterior)							
	Plan	Component		Floor			UA		
	ID	Description	Ref.	U		Area			
1									
_	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		145	78
				Sum of Perimeter and FP	145	78

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?	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

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_							
No								
Unducted								
Unconditioned Space								
Is Duct Testing Required? No								
	No Unducted Unconditioned Space							

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	976 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,296 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	184
Envelope Heat Load Sum of UA X ΔT	9,387 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,569 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,956 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,956 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	19,539 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 105
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1008 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		Pr	oposed 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	78	23.4	0.300	78	23.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,271	71.2	0.054	1,271	68.6	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	138	74.3	0.540	138	74.3	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ine UA Total	180.8	Propo	sed UA Total	178.3	
	Requ	ired Credits	4.5	Prop	sed Credits	6.0	from Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	1.4%	
				ι	A Reduction	2.5	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

Table R4	06.3 Energy Credits				
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation	Efficient Ventilation			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		
THERWAL ENVELOPE DETAILS - Proposed Design		

	Conditioned Floor Area, Proposed Design	1,008 sq. ft	City of Puyallup Development & Permitting Services ISSUED PERMIT
_	Classification	mall Dwelling Unit	Building Planning
	Notes		Engineering Public Works Fire Traffic

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

Plan	Component		Glazing		Wic	ith	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

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

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

ID Description				
ib Description	Ref.	U	Net Area	UA
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10)-5	0.054	1,271	69

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



Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		138	74
	138	74				

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?	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

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

leating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://bett	terbuiltnw.com/resources/hv
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,008_ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,568 ft3	
HVAC System Type	All Other Systems (not heat pump)	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	178	
Envelope Heat Load Sum of UA X AT	9,092 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	4,719 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,811 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,811 Btu / Hour	
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	19,335 Btu / Hour	
Building and Duct Heat Loss X 1.40 for all other systems		

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

Messages / Results * UA Reduction = 2.7, Proposed UA is better than baseline by 1% Uha Reduction = 2.7, Proposed UA is better than baseline by 1% Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 976 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	70	20.9	0.300	70	20.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,352	75.7	0.054	1,352	73.0	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	145	78.1	0.540	145	78.1	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	186.8	Propo	sed UA Total	184.1	
Required Credits 4			4.5	Proposed Credits			from Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	4 407	
					JA Reduction	2.7	
oposed UA ≤ the Target UA, and the Proposed Credits from Table 40							

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	Distribution System			
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	

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design Classification	976 sq. ft Small Dwelling Unit	City of Pu Development & Per ISSUED F	ermitting Services
Notes		Engineering Fire	Public Works Traffic

Plan	Component		Door		Wid	ith	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 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			
						_		_			

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								-	1
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
						Sum	of Area	and UA	69.8	20.9
					Vertical G	lazing A	rea Wei	ghted U		0.300
Vertical Glazing and Doors Area Weighted U									0.300	

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,352	73
				Sum of Area and UA	1,352	73

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



	Plan	Component		Slab			
L	ID	Description	Ref.	F		Slab Perim	FP
I		R10 2' vertical (Code Baseline)	10-2	0.540		145	78
ſ							
ſ							
ľ							
					Sum of Perimeter and FP	145	78

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	<u>n</u> 403
Whole House Mechanical Ventilation Airflow Rate	55	CFM

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_
No	
Unducted	
Unconditioned Space	
quired? No	
	No Unducted Unconditioned Space

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	976 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,296 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	184
Envelope Heat Load Sum of UA X ΔT	9,387 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,569 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,956 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,956 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	19,539 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 107
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com

Messages / Results *			
	City of Puyallup Development & Permitting Service / ISSUED PERMIT		
UA Reduction = 2.61, Proposed UA is better than baseline by 1%	Development & Permitting S ISSUED PERMIT Building Planni Engineering Public W		
OA Neddellott - 2.01, 1 toposed OA is bellet than baseline by 170	0(X)(0)		
	Fire		

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1108 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	130	38.9	0.300	130	38.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,305	73.1	0.054	1,305	70.5	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	146	78.8	0.540	146	78.8	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ine UA Total	202.8	Propo	sed UA Total	200.2	
	Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.3
				UA Perce	nt Reduction	1.3%	
				ı	JA Reduction	2.6	
ne Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40						2.0	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

Table R4	Table R406.3 Energy Credits							
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*			
1	Efficient Building Envelope			0.0				
2	Air Leakage Control and Efficient Ventilation		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65			
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.			
4	High Efficiency HVAC Distribution System			NA				
5.1	Efficient Water Heating			0.0				
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater			
6	Renewable Electric Energy	kWh		0.0				
7	Appliance Package			0.0				
			Energy Credits	6.0				

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

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

Conditioned Floor Area, Proposed Design	1,108 sq. ft	City of Puyallup Development & Permitting Servin
Classification S	mall Dwelling Unit	Building Planning
Notes		Engineering Public Works
		Fire

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

Overhead (Glazing										
Plan	Component		Glazing		Wic	lth	He	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	
					Overhead (Glazina A	rea We	iahted U			

Vertical Glazing Schedule Rows to Show 4												
	Plan	Component		Glazing		Wic	ith	He	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
	Exempt			-						-	-	
1 1		U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60	
2 4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80	
3 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25	
4 7		U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20	
							Sum	of Area	and UA	129.5	38.9	
Vertical Glazing Area Weighted U 0.300												
					Vertical G	lazing and	Doors A	Area We	ighted 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		1,305	70
				Sum of Area and UA	1,305	70

	Floor (over crawl or exterior)							
	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	Component		Slab				
ID	Description	Ref.	F		Slab Perim	FP	
	R10 2' vertical (Code Baseline)	10-2	0.540		146	79	
,				Sum of Perimeter and FP	146	79	
				·			

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

Ventilation Requirements		
Number of Bedrooms	3	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.v	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	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	1,108_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,418 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	200
Envelope Heat Load Sum of UA X AT	10,208 Btu / Hour
Air Leakage Heat Load ((Volume × 0.6) X ΔT) X .018))	5,187 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	15,396 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	15,396 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	21,554 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results * UA Reduction = 2.77, Proposed UA is better than baseline by 1% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1061 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

U Area UA U Ar	Component Performance, R occupancies		Baseline		Pr	roposed Desig	gn	
Overhead Glazing U = 0.500 0 0.0 <th< th=""><th></th><th>U</th><th>Area</th><th>UA</th><th>U</th><th>Area</th><th>UA</th><th></th></th<>		U	Area	UA	U	Area	UA	
Vertical Glazing U = 0.300 101 30.4 0.300 101 30.4	Doors U =	0.300	40	12.0	0.300	40	12.0	
Flat/Vaulted Ceilings U = 0.027 0 0.0 0.0 0.0 0.0 Wall (above grade) U = 0.056 1,387 77.7 0.054 1,387 74.9 Floors over CrawIspace U = 0.029 0 0.0 0.0 0.0 0.0 Slab on Grade F = 0.540 151 81.7 0.540 151 81.7 Below Grade Wall U = 0.042 0 0.0 0.0 0.0 0.0 Below Grade Slab F = 0.570 0 0.0 0.0 Baseline UA Total 201.7 Proposed UA Total 199.0 1.4% Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 40 1.4% 1.4% Company	Overhead Glazing U =	0.500	0	0.0		0	0.0	
Wall (above grade) U = 0.056	Vertical Glazing U =	0.300	101	30.4	0.300	101	30.4	
Floors over Crawlspace U = 0.029 0 0.0 Slab on Grade F = 0.540 151 81.7 Below Grade Wall U = 0.042 0 0.0 Below Grade Slab F = 0.570 0 0.0 Baseline UA Total Required Credits 4.5 Proposed UA Total 199.0 WA Percent Reduction 1.4%	Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Slab on Grade F	Wall (above grade) U =	0.056	1,387	77.7	0.054	1,387	74.9	
Below Grade Wall U = 0.042 0 0.0 0 0 0.0 Below Grade Slab F = 0.570 0 0.0 0 0.0 Baseline UA Total Required Credits 4.5 Proposed UA Total 199.0 Required Credits 4.5 Proposed Credits 6.0 UA Percent Reduction 1.4%	Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Baseline UA Total 201.7 Proposed UA Total 199.0	Slab on Grade F =	0.540	151	81.7	0.540	151	81.7	
Baseline UA Total 201.7 Proposed UA Total 199.0	Below Grade Wall U =	0.042	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 40 UA Percent Reduction 1.4%	Below Grade Slab F =	0.570	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 40 UA Percent Reduction 1.4%			_					
UA Percent Reduction 1.4%		Baseli	ne UA Total	201.7	Propo	osed UA Total	199.0	
SAT GOOD REGULATION		Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.3
HA Poduction 2.9			_		UA Perce	ent Reduction	1.4%	
UA REGUCTION 2.0						UA Reduction	2.8	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design		City of Puyallup Development & Permitting Services
Classification	Small Dwelling Unit	Building Planning
Notes		Engineering Public Works
		Fire Traffic

Plan	Component		Door		Wid	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
Exempt									0	0.0	
108A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0	
108B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0	
									0	0.0	
									0	0.0	
									0	0.0	
									0	0.0	
									0	0.0	
									0	0.0	
,									0	0.0	
									0	0.0	
						Sum	of Area	and UA	40	12.0	
					Exterior	Doors A	rea We	ighted U		0.300	

et Inch	Feet	Inch	Area	UA
			0	
			0	
			0	
			0	
			0	
Sum	of Area	and UA	0	0
	Sum	Sum of Area	Sum of Area and UA	0 0 0 Sum of Area and UA 0

Plai	n Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exem	pt		-						-	_
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	and UA	101.3	30.4
					Vertical C	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ighted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	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		1,387	75
				Sum of Area and UA	1,387	75

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



Slab on Grade (less than 2 feet below grade)							
Component		Slab					
Description	Ret.	F		Slab Perim	FP		
R10 2' vertical (Code Baseline)	10-2	0.540		151	82		
			Sum of Perimeter and FP	151	82		
R	Description	Description Ref.	Description Ref. F	Description Ref. F 10 2' vertical (Code Baseline) 10-2 0.540	Description Ref. F Slab Perim		

Below Grade Walls Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	1
									1
									l
									l
Sum of Area, Length and UA 0 0.0 0 0									

Ventilation Requirements		
Number of Bedrooms	3	
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 4	403
Whole House Mechanical Ventilation Airflow Rate	70 C	CFM

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_
No	
Unducted	
Unconditioned Space	
quired? No	
	No Unducted Unconditioned Space

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,061 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,019 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	199
Envelope Heat Load Sum of UA Χ ΔΤ	10,147 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,967 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	15,115 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	15,115 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	21,161 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 201
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com

Messages / Results * UA Reduction = 2.64, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1106 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		Pro	oposed Desig	n	
	U	Area	UA	 U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	128	38.3	0.300	128	38.3	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,322	74.0	0.054	1,322	71.4	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ne UA Total	124.3	Propo	sed UA Total	121.6	
	Requ	ired Credits	4.5	Propo	sed Credits	6.0	from Tables 406.2 and 40
		_		UA Perce	nt Reduction	0.407	
				u	A Reduction	2.6	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design		
THERWAL ENVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design	1,106 sq. ft	City of Puya Development & Permi				
Classification Small Dwelling Unit						
Notes		Engineering Pu	ublic Works			
		Fire OF W	Traffic			

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

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	a and UA	0	0
				c	Overhead (Glazing A	rea We	iahted U		

	Plan	Component		Glazing		Wid	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Е	empt										-
1		U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
6		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	2	0	12.0	3.60
							Sum	of Area	and UA	127.5	38.3
						Vertical 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
	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		1,322	71
				Sum of Area and UA	1,322	71

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



	Slab on G	Grade (less than 2 feet below grade)						
	Plan	Component		Slab				
	ID	Description	Ref.	F		Slab Perim	FP	
		No slab on grade	NA	-			0	
ı								
ſ								
					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, Ler	gth and UA	0	0.0		0	0	
			•						

Ventilation Requirements		
Number of Bedrooms	3	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

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

ting 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	1,106_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,401 ft3
HVAC System Type	All Other Systems (not 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	6,203 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta \) T) X .018))	5,178 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,381 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,381 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	15,933 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 202
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com

Messages / Results * UA Reduction = 2.83, Proposed UA is better than baseline by 2% Uhange of the control of

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1061 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Doors U = 0.300 40 12.0 0.300 40 12.0 0.500 0 0.0 0.300 89 26.8 0.000 0.000 0.000 0.000 0.000 0.000	Component Performance, R occupancies		Baseline		Pr	oposed Desig	gn	
Overhead Glazing U = 0.500 0.500 0.0 Vertical Glazing U = 0.300 89 26.8 Flat/Vaulted Ceilings U = 0.027 0 0.0 Wall (above grade) U = 0.056 1,413 79.1 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 117.9 Proposed UA Total 115.1		U	Area	UA	U	Area	UA	
Vertical Glazing U = 0.300 89 26.8 0.300 89 26.8 Flat/Vaulted Ceilings U = 0.027 0 0.0 0 0.0 Wall (above grade) U = 0.056 1.413 79.1 0.054 1.413 76.3 Floors over Crawlspace U = 0.029 0 0.0 0 0.0 Slab on Grade F = 0.540 0 0.0 0 0.0 Below Grade Wall U = 0.042 0 0.0 0 0.0 Below Grade Slab F = 0.570 0 0.0 0 0.0 Baseline UA Total 117.9 Proposed UA Total 115.1	Doors U =	0.300	40	12.0	0.300	40	12.0	
Flat/Vaulted Ceilings U = 0.027 0 0.0 0 0.0 0 0.0	Overhead Glazing U =	0.500	0	0.0		C	0.0	
Wall (above grade) U = 0.056 1,413 79.1 Floors over Crawlspace U = 0.029 0 0.0 Slab on Grade F = 0.540 0 0 Below Grade Wall U = 0.042 0 0 Below Grade Slab F = 0.570 0 0 Baseline UA Total 117.9 Proposed UA Total 115.1	Vertical Glazing U =	0.300	89	26.8	0.300	89	26.8	
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 117.9 Proposed UA Total 115.1	Flat/Vaulted Ceilings U =	0.027	0	0.0		C	0.0	
Slab on Grade F = 0.540 0 0.0 0 0.0 Below Grade Wall U = 0.042 0 0.0 0 0.0 Below Grade Slab F = 0.570 0 0.0 0 0.0 Baseline UA Total 117.9 Proposed UA Total 115.1	Wall (above grade) U =	0.056	1,413	79.1	0.054	1,413	76.3	
Below Grade Wall U = 0.042 0 0.0 0 0.0 Below Grade Slab F = 0.570 0 0.0 0 0.0 Baseline UA Total 117.9 Proposed UA Total 115.1	Floors over Crawlspace U =	0.029	0	0.0		C	0.0	
Below Grade Slab F = 0.570 0 0.0 0 0.0	Slab on Grade F =	0.540	0	0.0		C	0.0	
Baseline UA Total 117.9 Proposed UA Total 115.1	Below Grade Wall U =	0.042	0	0.0		C	0.0	
	Below Grade Slab F =	0.570	0	0.0		C	0.0	
			_					
Required Credits 4.5 Proposed Credits 6.0 from Tables 40.2		Baseli	ne UA Total	117.9	Propo	sed UA Total	115.1	
		Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
UA Percent Reduction 2.4%			_		UA Perce	ent Reduction	2.4%	
UA Reduction 2.8					,	JA Reduction	2.8	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 1,061 sq. ft	City of Puyallup Development & Permitting Services ISSUED PERMIT
Classification Small Dwelling Unit	Building Planning
Notes	Engineering Public Works Fire Traffic

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
202A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
202B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
						,			0	0.0
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	Area 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	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
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	2	0	12.0	3.60
						Sum	of Area	and UA	89.3	26.8
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		1,413	76
				Sum of Area and UA	1,413	76

Plan	/er crawl or exterior) 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	
				·			

	le Walls and Slabs								1
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	S	ngth and UA	0	0.0		0	0		

Ventilation Requirements		
Number of Bedrooms	3	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-H	ouse Ventilation'
Is the system Distributed?	Distributed Verify system meets definition of 'Distributed Whole-	House Ventilation'
Ventilation Code Section	MC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

HVAC Thermal Distribution System	r.wsu.edu/Documents/Duct%20Testing%20Standards%20_	
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned Space	
Is	Ouct Testing Required? No	

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,061 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,019 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	115
Envelope Heat Load Sum of UA Χ ΔΤ	5,869 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,967 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,836 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,836 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	15,171 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

	City of Puyallup Development & Permitting Service: ISSUED PERMIT
UA Reduction = 2.57, Proposed UA is better than baseline by 2%	Building Planning Engineering Public Works Fire Traffic

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1008 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Doors U = 0.300	Component Performance, R occupancies		Baseline		Pr	oposed Desig	gn	
Overhead Glazing U = 0.500		U	Area	UA	U	Area	UA	
Vertical Glazing U = 0.300 78 23.4 0.300 78 23.4	Doors U =	0.300	40	12.0	0.300	40	12.0	
Flat/Vaulted Ceilings U = 0.027 0 0.0	Overhead Glazing U =	0.500	0	0.0		0	0.0	
Wall (above grade) U = 0.056	Vertical Glazing U =	0.300	78	23.4	0.300	78	23.4	
Floors over CrawIspace 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 107.3 Required Credits 4.5 Proposed UA Total 104.8 Proposed Credits 6.0 From Tables 406.2 and 4	Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Slab on Grade F	Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4	
Below Grade Wall U = 0.042 0 0.0 0.0 0 0.0 0.0	Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Baseline UA Total 107.3 Proposed UA Total 104.8 Required Credits 4.5 UA Percent Reduction 2.4%	Slab on Grade F =	0.540	0	0.0		0	0.0	
Baseline UA Total 107.3 Proposed UA Total 104.8 Required Credits 4.5 Proposed Credits 6.0 UA Percent Reduction 2.4%	Below Grade Wall U =	0.042	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 4 UA Percent Reduction 2.4%	Below Grade Slab F =	0.570	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 4 UA Percent Reduction 2.4%			_					
UA Percent Reduction 2.4%		Baseli	ne UA Total	107.3	Propo	sed UA Total	104.8	
CAT COOK TO CO		Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
HA Paduation 2.6			_		UA Perce	nt Reduction	2.4%	
UA REDUCTION 2.0					,	JA Reduction	2.6	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design		
THERWAL ENVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design 1,008 sq. ft Classification Small Dwelling Unit	City of Payallup Development & Frantisting Services Development & Frantisting Services Development & Frantisting Services Development & Frantisting Services
Notes	Engineering Public Works Fire Traffic

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
203A	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
203B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

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	a and UA	0	0
				c	Overhead (Glazing A	rea We	iahted U		

١	ertical (Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Ш	Exempt			-						-	-
1		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
3		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
Sum of Area and UA								78.0	23.4		
Vertical Glazing Area Weighted U									0.300		
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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

ID Description Ref. U Net Are: R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,28	
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,21	60
	09

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	

Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	of Area, Len	oth and UA	0	0.0		0	0	

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

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

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

ring 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	1,008_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,568 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	105
Envelope Heat Load Sum of UA X ΔT	5,343 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X	4,719 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,062 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,062 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	14,087 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results * UA Reduction = 2.73, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 976 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	70	20.9	0.300	70	20.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,366	76.5	0.054	1,366	73.8	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ne UA Total	109.4	Propo	sed UA Total	106.7	
	Requ	ired Credits	4.5	Propo	sed Credits	6.0	from Tables 406.2 and 406
		_		UA Perce	nt Reduction	2.5%	
				u	A Reduction	2.7	

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

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

Conditioned Floor Area, Proposed Design 976 sq. ft Classification Small Dwelling Unit	City of F Development & P ISSUED	Puyallup Permitting Services D PERMIT
Ciassification Strain Dwelling Unit	Building	Planning
Notes	Engineering	Public Works
	Fire OF V	Traffic

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

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
Sum of Area and UA 0 0											
				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
Exemp	t									i
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
						Sum	of Area	and UA	69.8	20.9
					Vertical G	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ighted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	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		1,366	74
				Sum of Area and UA	1,366	74

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



Slab on 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 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	

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_
No	
Unducted	
Unconditioned Space	
quired? No	
	No Unducted Unconditioned Space

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	976 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,296 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	107
Envelope Heat Load Sum of UA Χ ΔΤ	5,442 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,569 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,011 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,011 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	14,016 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results * UA Reduction = 2.57, Proposed UA is better than baseline by 2% Uhole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1008 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	78	23.4		0.300	78	23.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,285	71.9		0.054	1,285	69.4	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ine UA Total	107.3		Propo	sed UA Total	104.8	
	Requ	ired Credits	4.5		Prop	osed Credits	6.0	from Tables 406.2 and 406.
		_			UA Perce	nt Reduction	0.40/	
					ι	JA Reduction	2.6	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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, Pro	roposed Design 1.008 sq. ft Classification Small Dwelling Unit	City of Puyallup Development & Permitting Services //SSUED PERMIT
	Notes	Building Planning Engineering Public Works Fire Traffic

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

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

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 1		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40	
2 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00	
							Sum	of Area	a and UA	78.0	23.4	
						Vertical C	Slazing A	rea We	ighted U		0.300	
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300	

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

ID Description Ref. U Net Are: R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,28	
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,21	60
	09

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 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 UA 0 0.0 0 0										

Ventilation Requirements		
Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

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

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

ating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,008 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,568 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	105
Envelope Heat Load Sum of UA X ΔT	5,343 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	4,719 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,062 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,062 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	14,087 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 206
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com

Messages / Results * UA Reduction = 2.73, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 976 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	70	20.9		0.300	70	20.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,366	76.5		0.054	1,366	73.8	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ine UA Total	109.4		Propo	sed UA Total	106.7	
	Requ	ired Credits	4.5		Prop	osed Credits	6.0	from Tables 406.2 and 406.
		_			UA Perce	nt Reduction	0.50/	
						JA Reduction	2.7	
UA REGULATION 2.1								

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)			
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0			

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	

THERMAL ENVELOPE DETAILS - Proposed Design		
THERWAL ENVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design Classification S	976 sq. ft mall Dwelling Unit	City of Puyallup Development & Permitting \$ /ISSUED PERMIT Building Plann	ervices
Notes		Engineering Public V	orks

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

et Inch	Feet	Inch	Area	UA
			0	
			0	
			0	
			0	
			0	
Sum	of Area	and UA	0	0
	Sum	Sum of Area	Sum of Area and UA	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Plai	n 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	1	6	0	4	0	24.0	7.20
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
						Sum	of Area	and UA	69.8	20.9
					Vertical G	lazing A	rea We	ighted U		0.300
				Vertical G	lazing and	Doors A	rea We	ighted U		0.300

Plan ID	Component Description	Ref.	Attic U		Area	UA
	No ceiling/roof in thermal envelope	NA	-			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		1,366	74
				Sum of Area and UA	1,366	74

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 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, 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	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 Construction	tion Affidavit, Existing	
New Construc	tion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	976 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,296 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	107
Envelope Heat Load Sum of UA Χ ΔΤ	5,442 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,569 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,011 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,011 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	14,016 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation		
	East Town Crossing, Unit # 207		
	Building B		
	Pioneer & Shaw, Puyallup		
Building B			
	Synthesis 9, LLC		
	Brett Lindsay		
	blindsay@synthesis9.com		

Messages / Results * UA Reduction = 2.64, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1105 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	130	38.9	0.300	130	38.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,320	73.9	0.054	1,320	71.3	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ine UA Total	124.8	Propo	sed UA Total	122.1	
	Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
		<u>-</u>		UA Perce	nt Reduction	0.40/	
				ı	JA Reduction	2.6	
roposed UA ≤ the Target UA, and the Proposed Credits from Table 40				 			

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design	1,105 sq. ft	City of Puyallup Development & Permitting Services
Classification	Small Dwelling Unit	Building Planning
Notes		Engineering Public Works
		Fire Traffic

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

١	ertical (Glazing Schedule							Ro	ws to Show	4	
	Plan	Component		Glazing		Wic	ith	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	6	0	4	0	72.0	21.60	
2 4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80	
3 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25	
4 7		U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20	
							Sum	of Area	and UA	129.5	38.9	
						Vertical 0	Glazing A	Area We	ighted U		0.300	
					Vertical G	lazing and	Doors A	Area We	ighted U		0.300	

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,320	71
				Sum of Area and UA	1,320	71

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



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

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

Ventilation Requirements	
Number of Bedrooms	3
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,105 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,393 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	122
Envelope Heat Load Sum of UA X ΔΤ	6,228 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	5,173 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,401 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,401 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	15,962 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 208
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	ormation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com
	253-468-4117

Messages / Results * UA Reduction = 2.8, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1061 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Doors U				esign	roposed Des	Pi		Baseline		Component Performance, R occupancies
Overhead Glazing U = 0.500 0 0.0 Vertical Glazing U = 0.300 101 30.4 Flat/Vaulted Ceilings U = 0.027 0 0.0 Wall (above grade) U = 0.056 1,401 78.5 0.054 1,401 75.7 Floors over Crawlspace U = 0.029 0 0.0 0 0 0.0 Slab on Grade F = 0.540 0 0.0 0 0 0.0 Below Grade Wall U = 0.042 0 0.0 0 0 0 0 Below Grade Slab F = 0.570 0 0.0 0 </th <th></th> <th></th> <th></th> <th>UA</th> <th>Area</th> <th>U</th> <th>UA</th> <th>Area</th> <th>U</th> <th></th>				UA	Area	U	UA	Area	U	
Vertical Glazing U = 0.300 101 30.4 0.300 101 30.4 Flat/Vaulted Ceilings U = 0.027 0 0.0 0 0 0.0 Wall (above grade) U = 0.056 1,401 78.5 0.054 1,401 75.7 Floors over Crawlspace U = 0.029 0 0.0 0 0 0.0 Slab on Grade F = 0.540 0 0.0 0 0 0.0 Below Grade Wall U = 0.042 0 0.0 0 0 0 0 Below Grade Slab F = 0.570 0 0.0 0 0 0 0 0			12.0	40	4	0.300	12.0	40	0.300	Doors U =
Flat/Vaulted Ceilings U = 0.027 0 0.0 Wall (above grade) U = 0.056 1,401 78.5 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			0.0	0			0.0	0	0.500	Overhead Glazing U =
Wall (above grade) U = 0.056 1,401 78.5 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			30.4	101	10	0.300	30.4	101	0.300	Vertical Glazing U =
Floors over Crawispace 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			0.0	0			0.0	0	0.027	Flat/Vaulted Ceilings U =
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			75.7	,401	1,40	0.054	78.5	1,401	0.056	Wall (above grade) U =
Below Grade Wall U = 0.042 0 0.0 Below Grade Slab F = 0.570 0 0.0 0 0.0			0.0	0			0.0	0	0.029	Floors over Crawlspace U =
Below Grade Slab F = 0.570 0 0.0 0.0			0.0	0			0.0	0	0.540	Slab on Grade F =
			0.0	0			0.0	0	0.042	Below Grade Wall U =
Baseline IIA Total 120.8 Proposed IIA Total 118.0			0.0	0			0.0	0	0.570	Below Grade Slab F =
Baseline IIA Total 120.8 Proposed IIA Total 118.0										
2200 110 00 110 120.0			118.0	otal	osed UA Tota	Prope	120.8	ne UA Total	Basel	
Required Credits 4.5 Proposed Credits 6.0 from Tables	es 406.2 and 406	from Tables 406.2	6.0 f	dits	osed Credit	Prop	4.5	ired Credits	Requ	
UA Percent Reduction 2.3%				tion	ent Reductio	UA Perce		_		
UA Reduction 2.8			2.8	tion	UA Reductio					

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design	

	1,061 sq. ft	City of Puyallup Development & Permitting	p g Services
Classification Small	Dwelling Unit	Building Plan	inning
Notes		Engineering Public	c Works
		Fire OF Tra	amc

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

Vertica	al Glazing Schedule							Ro	ws to Show	3
Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot .								-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	and UA	101.3	30.4
					Vertical G	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	iahted U		0.300

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,401	76
				Sum of Area and UA	1,401	76

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	
<u> </u>				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	3
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_				
No					
Unducted					
Unconditioned Space					
Is Duct Testing Required? No					
	No Unducted Unconditioned Space				

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 Constructi	ion Affidavit, Existing	
New Constructi	ion Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	<u>Worksheet</u>	

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,061 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,019 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	118
Envelope Heat Load Sum of UA Χ ΔΤ	6,019 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,967 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,987 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,987 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	15,382 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 301
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	rmation
	Synthesis 9, LLC
	Brett Lindsay
	hlindsav@synthesis9.com

Messages / Results * UA Reduction = 2.64, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1106 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline			Pro	posed Desig	n	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0	0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	128	38.3	0	0.300	128	38.3	
Flat/Vaulted Ceilings U =	0.027	1,106	29.9	0	0.027	1,106	29.9	
Wall (above grade) U =	0.056	1,322	74.0	0	0.054	1,322	71.4	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ne UA Total	154.1		Propos	ed UA Total	151.5	
	Requi	ired Credits	4.5		Propo	sed Credits	6.0	from Tables 406.2 and 40
		_		ι	UA Percer	nt Reduction	4 =0/	
					U.	A Reduction	2.6	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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					

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

Conditioned Floor Area, Proposed Design 1,106 sq. ft	City of Puyallup Development & Permitting Services / ISSUED PERMIT
Classification Small Dwelling Unit	Building Planning
Notes	Engineering Public Works
	Fire

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

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

Vertical Glazing Schedule Rows to Show 4							4					
	Plan	Component		Glazing		Wic	ith	Не	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	i
Ц	Exempt			-						-	-	
1 1		U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60	
2 4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80	
3 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25	
4 6		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	2	0	12.0	3.60	
							Sum	of Area	a and UA	127.5	38.3	
						Vertical C	Glazing A	Area We	ighted U		0.300	ı
					Vertical G	lazing and	Doors A	Area We	ighted U		0.300	i
										•		

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,106	29.9
				Sum of Area and UA	1,106	29.9

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,322	71
				Sum of Area and UA	1,322	71

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



Plan	Component		Slab				ĺ
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	3	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'	
Is the system Distributed?	Distributed Whole-House Ventilation'	
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,106 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,401 ft3
· ·	
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	151
Envelope Heat Load Sum of UA X ΔT	7,726 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) ΧΔΤ) Χ.018))	5,178 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,904 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,904 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	18,065 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results *

City of Poyallap
Developing Services
ISSUED REBUIT
Budding
Tradic

UA Reduction = 2.83, Proposed UA is better than baseline by 2%

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1061 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline			Pr	oposed 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	89	26.8		0.300	89	26.8	
Flat/Vaulted Ceilings U =	0.027	1,061	28.6		0.027	1,061	28.6	
Wall (above grade) U =	0.056	1,413	79.1		0.054	1,413	76.3	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	146.5		Propo	sed UA Total	143.7	
	Requ	ired Credits	4.5		Prop	osed Credits	6.0	from Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	4 00/	
					ι	IA Reduction	2.8	

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

Table R4	06.3 Energy Credits				
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation		Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65
3	High Efficiency HVAC		Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	6.0	

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

THERMAL ENVELOPE DETAILS - Proposed Design	



Conditioned Floor Area, Proposed Design	1,061	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
302A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
302B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Overhead (Glazing														
Plan	Component		Glazing		Wic	lth	He	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					
				Overhead Glazing Area Weighted U											

Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot								-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	2	0	12.0	3.60
						Sum	of Area	and UA	89.3	26.8
					Vertical G	lazing A	rea Wei	ighted U		0.300
Vertical Glazing and Doors Area Weighted U 0.300										0.300

Plan ID	Component Description	Ref.	Attic U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,061	28.6
				Sum of Area and UA	1,061	28.6

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,413	76
				Sum of Area and UA	1,413	76

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



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	
				·			

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

Ventilation Requirements		
Number of Bedrooms	3	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	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 4	403
Whole House Mechanical Ventilation Airflow Rate	70 C	CFM

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_
No	
Unducted	
Unconditioned Space	
quired? No	
	No Unducted Unconditioned Space

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

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	1,061 ft2 9,019 ft3
Leave blank to use default of 8.5 ft. ceiling height	
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	144
Envelope Heat Load Sum of UA X AT	7,330 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) ΧΔΤ) Χ.018))	4,967 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,297 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,297 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	17,216 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results *

City of Payallap

Design | Style | Payallap

List | Duldro | Payallap

Duldro | Duldro | Payallap

Engineering

Fine | Traffic

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1007 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	78	23.4	0.300	78	23.4	
Flat/Vaulted Ceilings U =	0.027	1,007	27.2	0.027	1,007	27.2	
Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	134.5	Propo	sed UA Total	132.0	
	Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
		_		UA Perce	ent Reduction	1.9%	
					JA Reduction	2.6	
Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40							

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

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



	Conditioned Floor Area, Proposed Design 1,007 sq. ft	
_	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
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 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			

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 1		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40	
2 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00	
Sum of Area and UA 78.0 23.4												
Vertical Glazing Area Weighted 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		1,007	27.2
				Sum of Area and UA	1,007	27.2

ID Description Ref. U Net Are: R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,28	
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,21	60
	09

Plan	Component		Floor			UA	
ID	Description	Ref.	U		Area		İ
	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	

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

Ventilation Requirements	
Number of Bedrooms	2
Run-Time Percent in Each 4-Hour Segment	t <u>100%</u>
Is the system Balanced?	Perify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Pistributed Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	1 IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energ	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 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	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,007_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,560 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	132
Envelope Heat Load Sum of UA X AT	6,730 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	4,715 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,444 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,444 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	16,022 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information				
	East Town Crossing, Unit # 304			
	Building B			
	Pioneer & Shaw, Puyallup			
Contact Info	ormation			
	Synthesis 9, LLC			
	Brett Lindsay			
	hlindsav@synthesis9.com			

Messages / Results * UA Reduction = 2.73, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 976 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Doors U = 0.300	Component Performance, R occupancies		Baseline		Pr	oposed Desig	gn	
Overhead Glazing U = 0.500		U	Area	UA	U	Area	UA	
Vertical Glazing U = 0.300 70 20.9 0.300 70 20.9	Doors U =	0.300	40	12.0	0.300	40	12.0	
Flat/Vaulted Ceilings U = 0.027 976 26.4 0.027 976 26.4	Overhead Glazing U =	0.500	0	0.0		C	0.0	
Wall (above grade) U = 0.056 1,366 76.5 0.054 1,366 73.8	Vertical Glazing U =	0.300	70	20.9	0.300	70	20.9	
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 135.8 Required Credits 4.5 Proposed UA Total 133.1 Proposed UA Total 5.0 From Tables 406.2 and 406	Flat/Vaulted Ceilings U =	0.027	976	26.4	0.027	976	26.4	
Siab on Grade F = 0.540	Wall (above grade) U =	0.056	1,366	76.5	0.054	1,366	73.8	
Below Grade Wall U = 0.042 0 0.0 0 0.0 0.0 Below Grade Slab F = 0.570 0 0.0 0.0 0.0 Baseline UA Total Required Credits 4.5 Proposed UA Total Proposed Credits 133.1 Required Credits 4.5 Proposed Credits 6.0 UA Percent Reduction 2.0%	Floors over Crawlspace U =	0.029	0	0.0		C	0.0	
Baseline UA Total 135.8 Proposed UA Total 133.1	Slab on Grade F =	0.540	0	0.0		C	0.0	
Baseline UA Total 135.8 Proposed UA Total 133.1	Below Grade Wall U =	0.042	0	0.0		C	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 406 UA Percent Reduction 2.0%	Below Grade Slab F =	0.570	0	0.0		C	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 406 UA Percent Reduction 2.0%			_					
UA Percent Reduction 2.0%		Baseli	ne UA Total	135.8	Propo	sed UA Total	133.1	
UA Percent Reduction 2.0%		Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.3
UA Reduction 2.7			_		UA Perce	ent Reduction	0.00/	
					,	JA Reduction	2.7	

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

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

Conditioned Floor Area, Proposed Design 976 s	Development & Permitting Services
Classification Small Dwelling	Jnit ISSUED PERMIT Building Planning
Notes	Engineering Public Works
	Fire Traffic

Plan	Component		Door		Wid	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	a and UA	40	12.0
					Exterior	Doors A	Area 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	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								-	1
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	6	3	6	15.8	4.73
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
						Sum	of Area	and UA	69.8	20.9
					Vertical G	lazing A	rea Wei	ghted U		0.300
Vertical Glazing and Doors Area Weighted U										0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		976	26.4
				Sum of Area and UA	976	26.4

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,366	74
				Sum of Area and UA	1,366	74

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 FF									
				·					

Below Grade Walls and Slabs									
Plar	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%	<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	r.wsu.edu/Documents/Duct%20Testing%20Standards%20_
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Unconditioned Space	
Is	Ouct Testing Required? No	

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

Heating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	976 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,296 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	133
Envelope Heat Load Sum of UA Χ ΔΤ	6,786 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	4,569 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,355 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,355 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	15,897 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results *

UA Reduction = 2.57, Proposed UA is better than baseline by 2%

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

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1007 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		Pr	roposed Desig	gn	
	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	78	23.4	0.300	78	23.4	
Flat/Vaulted Ceilings U =	0.027	1,007	27.2	0.027	1,007	27.2	
Wall (above grade) U =	0.056	1,285	71.9	0.054	1,285	69.4	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ine UA Total	134.5	Propo	osed UA Total	132.0	
	Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
				UA Perce	ent Reduction	1.9%	
					UA Reduction	2.6	
e Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40				 			

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)						
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0						

Table R4	06.3 Energy Credits			
Option No.	otion No. Category		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	

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

Conditioned Floor Area, Proposed Design	1,007 sq. ft	City of Puyallup Development & Permitting Services		
Classification Small Dwelling Unit				
Notes		Engineering Public Works		
		Fire		

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 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											
Overhead Glazing Area Weighted U											

Vertical Glazing Schedule Rows to Show 2											
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Ш	Exempt			-						-	-
1		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
3		U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
							Sum	of Area	a and UA	78.0	23.4
Vertical Glazing Area Weighted 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		1,007	27.2
				Sum of Area and UA	1,007	27.2

ID Description Ref. U Net Are: R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,28	
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054 1,21	60
	09

Plan	rer crawl or exterior) 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	1
	No slab on grade	NA	-			0	
				Sum of Perimeter and FP	0	0	

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

Ventilation Requirements		
Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403	
Whole House Mechanical Ventilation Airflow Rate	70 CFM	

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%2					
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	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,007_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,560 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	132
Envelope Heat Load Sum of UA X AT	6,730 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	4,715 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,444 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,444 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	16,022 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Info	rmation
	East Town Crossing, Unit # 306
	Building B
	Pioneer & Shaw, Puyallup
Contact Info	rmation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com

Messages / Results * UA Reduction = 2.73, Proposed UA is better than baseline by 2% Uha Reduction = 2.73, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 55 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 976 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Doors U = 0.300	Component Performance, R occupancies		Baseline		Pr	oposed Desig	jn	
Overhead Glazing U = 0.500		U	Area	UA	U	Area	UA	
Vertical Glazing U = 0.300 70 20.9 Flat/Vaulted Ceilings U = 0.027 976 26.4 Wall (above grade) U = 0.056 1,366 76.5 0.054 1,366 73.8 Floors over Crawlspace U = 0.029 0 0.0 0.0 Slab on Grade F = 0.540 0 0.0 0.0 Below Grade Wall U = 0.042 0 0.0 0.0 Below Grade Slab F = 0.570 0 0.0 0.0 Baseline UA Total Required Credits 135.8 133.1 133.1 133.1 133.1 135.8 14.5 133.1 133.1 135.8 14.5 133.1 135.8 14.5 133.1 135.8 14.5 133.1 135.8 14.5 133.1 133.1 135.8 14.5 133.1 135.8 14.5 133.1 135.8 14.5 133.1 133.1 135.8 14.5 133.1 135.8 14.5 133.1 133.1 135.8 14.5 133.1 133.1 135.8 14.5 133.1 133.1 133.1 135.8 14.5 133.1 133.1 133.1 135.8 14.5 133.1 133.1 133.1 135.8 14.5 133.1 133.1 133.1 135.8 14.5 133.1 133.	Doors U =	0.300	40	12.0	0.300	40	12.0	
Flat/Vaulted Ceilings U = 0.027 976 26.4 Wall (above grade) U = 0.056 1,366 76.5 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 Required Credits 4.5 Proposed UA Total 133.1 Proposed UA Total 1.33.1 Proposed Credits 0.00 Tom Tables 406.2 and 406	Overhead Glazing U =	0.500	0	0.0		0	0.0	
Wall (above grade) U = 0.056 1,366 76.5 0.054 1,366 73.8 73.8 73.8 73.8 73.8	Vertical Glazing U =	0.300	70	20.9	0.300	70	20.9	
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 Required Credits 4.5 Required Credits 4.5 Froposed UA Total 133.1 Proposed UA Total 5.0 From Tables 406.2 and 406	Flat/Vaulted Ceilings U =	0.027	976	26.4	0.027	976	26.4	
Slab on Grade F = 0.540 0 0.0 0.0	Wall (above grade) U =	0.056	1,366	76.5	0.054	1,366	73.8	
Below Grade Wall U = 0.042 0 0.0	Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Baseline UA Total 135.8 Proposed UA Total 133.1	Slab on Grade F =	0.540	0	0.0		0	0.0	
Baseline UA Total 135.8 Proposed UA Total 133.1 Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 406 UA Percent Reduction 2.0%	Below Grade Wall U =	0.042	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 406 UA Percent Reduction 2.0%	Below Grade Slab F =	0.570	0	0.0		0	0.0	
Required Credits 4.5 Proposed Credits 6.0 from Tables 406.2 and 406 UA Percent Reduction 2.0%			_					
UA Percent Reduction 2.0%		Baseli	ne UA Total	135.8	Propo	sed UA Total	133.1	
OA FORMIT ROUGHT		Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.
UA Reduction 2.7			_		UA Perce	nt Reduction	2.0%	
					,	JA Reduction	2.7	

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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	

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design	976 sq. ft	City of Puyallup Development & Permitting Services
Classification Sn	nall Dwelling Unit	Building Planning
Notes		Engineering Public Works
		Fife On Virallic

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
306A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
306B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
						,			0	0.0
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

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			
											_

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

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		976	26.4
				Sum of Area and UA	976	26.4

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,366	74
				Sum of Area and UA	1,366	74

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



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

Below	Grade Walls and Slabs								
Plar	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%	<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	

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_
No	
Unducted	
Unconditioned Space	
quired? No	
	No Unducted Unconditioned Space

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	976 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	8,296 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	133
Envelope Heat Load Sum of UA X ΔT	6,786 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T \) X .018))	4,569 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,355 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,355 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	15,897 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

Project Information				
	East Town Crossing, Unit #307			
	Building B			
	Pioneer & Shaw, Puyallup			
Contact Info	ormation			
	Synthesis 9, LLC			
	Brett Lindsay			
	hlindsav@synthesis9.com			

Messages / Results * UA Reduction = 2.64, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1105 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline			Prop	posed Desig	n	
	U	Area	UA	U	J ,	Area	UA	
Doors U =	0.300	40	12.0	0.3	00	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	130	38.9	0.3	00	130	38.9	
Flat/Vaulted Ceilings U =	0.027	1,105	29.8	0.0	27	1,105	29.8	
Wall (above grade) U =	0.056	1,320	73.9	0.0	54	1,320	71.3	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ne UA Total	154.6		Propos	ed UA Total	151.9	
	Requ	ired Credits	4.5		Propos	sed Credits	6.0	from Tables 406.2 and 406
		_		UA	Percent	t Reduction	4 =0/	
					UΔ	A Reduction	2.6	

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)			
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0			

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	

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

Conditioned Floor Area, Proposed Design	1,105 sq. ft	City of Puyallup Development & Permitting Service
Classification	Small Dwelling Unit	Building Planning
Notes		Engineering Public Works
		Fire

Plan	Component		Door		Wid	ith	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	Area We	ighted U		0.300

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

	Plan	Component		Glazing		Wid	lth	He	ight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
ı	Exempt									-	-
1		U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3 5	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
1 7		U=0.30 (Code Baseline)	Table 406.2	0.30	1	7	0	2	0	14.0	4.20
							Sum	of Area	and UA	129.5	38.9
						Vertical C	Slazing A	rea Wei	ighted U		0.300
Vertical Glazing and Doors Area Weighted U									0.300		

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,105	29.8
				Sum of Area and UA	1,105	29.8

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,320	71
				Sum of Area and UA	1,320	71

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

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

Ventilation Requirements	
Number of Bedrooms	3
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Balanced Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.	wsu.edu/Documents/Duct%20Testing%20Standards%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	

ating System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	1,105_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	9,393 ft3
HVAC System Type	All Other Systems (not heat pump)
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	152
Envelope Heat Load Sum of UA X ΔT	7,749 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \(\Delta T) X \(.018 \))	5,173 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,923 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,923 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	18,092 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results * UA Reduction = 2.8, Proposed UA is better than baseline by 2% Uha Reduction = 2.8, Proposed UA is better than baseline by 2% Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP	
What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit 1061 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

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	101	30.4	0.300	101	30.4	
Flat/Vaulted Ceilings U =	0.027	1,061	28.6	0.027	1,061	28.6	
Wall (above grade) U =	0.056	1,401	78.5	0.054	1,401	75.7	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ine UA Total	149.5	Propo	sed UA Total	146.7	
	Requ	ired Credits	4.5	Prop	osed Credits	6.0	from Tables 406.2 and 406.3
		_		UA Perce	ent Reduction	4.00/	
					JA Reduction	2.8	
roposed UA ≤ the Target UA, and the Proposed Credits from Table 40							

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)
	For heating system based on electric resistance with a ductless mini-split heat pump system in accordance with Section R403.7.1 including the exception	Electric Resistance with Ductless Heat Pump	N/A for R2	6.0	6.0

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		NA 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	

THERMAL ENVELOPE DETAILS - Proposed Design		
THERWAL ENVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design	1,061 sq. ft	City of Pu	rmitting Services
Classification Small	Dwelling Unit	Building Building	Planning
Notes		Engineering Fire	Public Works
		FILE	Marianic

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
308A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
308B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
		,			, and the second	·			0	0.0
						Sum	of Area	and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

Plan	Component		Glazing		Wid	dth	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		Width		Height			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot .		-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	3	4	6	3	6	47.3	14.18
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	5	0	6	0	30.0	9.00
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
						Sum	of Area	and UA	101.3	30.4
					Vertical G	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	ighted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		1,061	28.6
				Sum of Area and UA	1,061	28.6

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,401	76
				Sum of Area and UA	1,401	76

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, Length and UA			0	0.0		0	0		

Ventilation Requirements	
Number of Bedrooms	3
Run-Time Percent in Each 4-Hour Segment	100%
Is the system Balanced?	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section 403
Whole House Mechanical Ventilation Airflow Rate	70 CFM

Download RS-33 (2018) http://www.ene	ergy.wsu.edu/Documents/Duct%20Testing%20Standards%20_
No	
Unducted	
Unconditioned Space	
quired? No	
	No Unducted Unconditioned Space

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

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	1,061 ft2 9,019 ft3
HVAC System Type Location of HVAC Distribution System	All Other Systems (not heat pump) Unducted
Sum of UA, including exempt door and window	147
Envelope Heat Load Sum of UA X AT	7,480 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) ΧΔΤ) Χ.018))	4,967 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,448 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,448 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	17,427 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	