<b>Project Infor</b>	mation
	East Town Crossing, Unit 101
	Building A
	Pioneer & Shaw, Puyallup
Contact Info	rmation
	Synthesis 9, LLC
	Brett Lindsay
	blindsay@synthesis9.com
	253-468-4117

Messages / Results \*

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

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

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

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

Wesconstruction
R2 Multifamily
WSEC 2018
Small Dwelling Unit -- 795 sq. ft.
Code Baseline - Baseline and proposed window areas are equal.
Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline			Pre	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	116	34.7		0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,207	67.6		0.054	1,207	65.2	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	134	72.1		0.540	134	72.1	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ne UA Total	186.4		Propo	sed UA Total	184.0	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5	rom Tables 406.2 and 406.3
					UA Perce	nt Reduction	1.3%	
					ι	A Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	· · · · · · · · · · · · · · · · · · ·		O4: D40	C 4h 4h h	ata the WCE			

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

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

#### THERMAL ENVELOPE DETAILS - Proposed Design

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

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	t								0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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			

Plan	Component		Glazing		Wid	th	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	pt		-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
						Sum	of Area	and UA	115.5	34.7
					Vertical G	lazing A	rea Wei	ighted U		0.300
				Vertical G	lazing and	Doors A	rea Wei	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		1,207	65
				Sum of Area and UA	1,207	65

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	5.6	Slab		Olah Bada	
ID	Description	Ref.	ř		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		134	72
				Sum of Perimeter and FP	134	72

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

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

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

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

Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	795 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,758</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	184
Envelope Heat Load Sum of UA X \( \Delta T \)	9,383 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X .018))	3,722 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,105 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,105 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	16,382 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.26, Proposed UA is better than baseline by 1%

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

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 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		Pro	posed Desig	ın	
	U	Area	UA	 U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,128	63.1	0.054	1,128	60.9	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	126	67.9	0.540	126	67.9	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	177.7	Propo	sed UA Total	175.5	
	Requ	ired Credits	4.5	Propo	sed Credits	6.5	rom Tables 406.2 and 406.3
		_		UA Perce	nt Reduction	1.3%	
				u	A Reduction	2.3	
						2.0	

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

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

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

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

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

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

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,128	61
Sum of Area and UA 1.128						

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

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

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

Ventilation Requirements		
Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	<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	Conditioned Space	
Is Du	uct Testing Required? No	

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

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	765 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,503</b> ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	175	
Envelope Heat Load Sum of UA X AT	8,949 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X	3,582 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,531 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,531 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	<b>15,664</b> Btu / Hour	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.17, Proposed UA is better than baseline by 1%

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

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

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

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
	U	Area	UA	_	U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	48	14.4		0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,083	60.6		0.054	1,083	58.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	115	62.0		0.540	115	62.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	149.0		Propos	sed UA Total	146.9	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	1.5%	
					U	A Reduction	2.2	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ tho	se required in	Section R40	6, then the home me	ets the WSEC	).		

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

THERMAL E	NVELOPE DETAILS - Proposed Design		

Conditioned Floor Area, Proposed Design 624 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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			

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 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20	
2 6	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20	
							Sum	of Area	a and UA	48.0	14.4	
						Vertical (	Slazing A	rea We	ighted U		0.300	
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300	

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

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

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

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

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

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

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

System Sizing - Proposed Design Try	$\textbf{Out BetterBuiltNW's HVAC Sizing Tool:} \ \underline{\textbf{https://betterbuiltnw.com/resources/hvac-sizing-tool}. \\$
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	624 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>5,304</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	147
Envelope Heat Load Sum of UA X AT	7,490 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X	2,921 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,412 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,412 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	13,015 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.29, Proposed UA is better than baseline by 1%

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

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

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

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	n	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	63	18.9		0.300	63	18.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,144	64.1		0.054	1,144	61.8	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	122	66.0		0.540	122	66.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ine UA Total	161.0		Propos	sed UA Total	158.7	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5 f	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	1.4%	
					U	A Reduction	2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets	s the WSEC			

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R4	06.3 Energy Credits				
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope	elope		0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

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

Conditioned Floor Area, Proposed Design	732 <sub>sq. ft</sub>
Classification S	mall Dwelling Unit
Notes	

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

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	He	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	0
Overhead Glazing Area Weighted U											

١	ertical (	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
							Sum	of Area	a and UA	63.0	18.9
						Vertical (	Glazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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

ID Description Ref. U	Nat Assa IIA
	Net Area UA
R21 cavity+R0 foam INT 2X6W Lap (Code Baseline) 10-5 0.054	1,144 62

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

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

В	elow 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, Length and UA 0 0.0 0 0									

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

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

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

g System Sizing - Proposed Design Try Nearest Weather Station	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	732_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,222 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	159
Envelope Heat Load Sum of UA X ΔT	8,096 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T) X .018))	3,427 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,523 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,523 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	14,404 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.17, Proposed UA is better than baseline by 1%

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

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

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

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
	U	Area	UA	_	U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	48	14.4		0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,083	60.6		0.054	1,083	58.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	115	62.0		0.540	115	62.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	149.0		Propos	sed UA Total	146.9	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	1.5%	
					U	A Reduction	2.2	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ tho	se required in	Section R40	6, then the home me	ets the WSEC	).		

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design	624 sq. ft
Classification S	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	
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0	
В	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 (	Glazina A	rea We	iahted U			

Plan	Component		Glazing		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt			-							-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
6	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
						Sum	of Area	a and UA	48.0	14.4
					Vertical C	Slazing A	rea We	ighted U		0.300
				Vertical G	lazing and	Doors A	rea We	iahted U		0.300

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

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

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

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

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

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

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

, e year and a second a congression	Out BetterBuiltNW's HVAC Sizing Tool: https://l	
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	624 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>5,304</b> ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	147	
Envelope Heat Load Sum of UA X ΔT	7,490 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T) X .018))	2,921 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,412 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,412 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	<b>13,015</b> Btu / Hour	
Building and Duct Heat Loss X 1.40 for all other systems		

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

253-468-4117

Messages / Results \*

UA Reduction = 2.29, Proposed UA is better than baseline by 1%

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

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

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

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	n	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	63	18.9		0.300	63	18.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,144	64.1		0.054	1,144	61.8	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	122	66.0		0.540	122	66.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ine UA Total	161.0		Propos	sed UA Total	158.7	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5 f	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	1.4%	
					U	A Reduction	2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets	s the WSEC			

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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	0.0			
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

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

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

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
Α	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
В	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 Area Weighted 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	Vertical Glazing Schedule Rows to Show 2											
	Plan	Component		Glazing		Wic	ith	He	ight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
	Exempt			-						-	-	
1 3	3	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40	
2 5	5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50	
							Sum	of Area	a and UA	63.0	18.9	
						Vertical C	Glazing A	rea We	ighted U		0.300	
Vertical Glazing and Doors Area Weighted 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

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

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

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

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

Ventilation Requirements		
Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	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

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

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	732 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,222 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	159
Envelope Heat Load Sum of UA X AT	8,096 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X	3,427 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	11,523 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	11,523 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	<b>14,404</b> Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

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

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

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 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			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	116	34.7		0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,207	67.6		0.054	1,207	65.2	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	134	72.1		0.540	134	72.1	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	186.4		Propo	sed UA Total	184.0	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5	rom Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	1.3%	
					u	A Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	)6 are ≥ thos	se required in	Section R40	6, then the home mee	ets the WSEC			

Table R4	06.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

<sup>\*</sup>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 795 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	lth	He	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	ot								0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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

0	verhead	d Glazing										
	Plan	Component		Glazing		Wic	dth	He	eight			
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
										0		
										0		
										0		
										0		
										0		
							Sum	of Are	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	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	t									
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
						Sum	of Area	and UA	115.5	34.7
					Vertical 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		1,207	65
				Sum of Area and UA	1,207	65

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

Plan ID	Component Description	Ref.	Slab F		Slab Perim	FP
	R10 2' vertical (Code Baseline)	10-2	0.540		134	72
				Sum of Perimeter and FP	134	72

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	ngth and UA	0	0.0		0	0	

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

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

Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	795 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,758</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	184
Envelope Heat Load Sum of UA X \( \Delta T \)	9,383 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X .018))	3,722 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,105 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	13,105 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	16,382 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.26, Proposed UA is better than baseline by 1%

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

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 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		P	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	116	34.7	0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,128	63.1	0.054	1,128	60.9	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	126	67.9	0.540	126	67.9	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	177.7	Prop	osed UA Total	175.5	
	Requ	ired Credits	4.5	Prop	osed Credits	6.5	from Tables 406.2 and 406.3
		_		UA Perc	ent Reduction	1.3%	
					UA Reduction	2.3	

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

<sup>\*</sup>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 765 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		
Exemp	t								0	0.0		
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0		
В	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	Exterior Doors Area Weighted U						

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

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

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		1,128	61
				Sum of Area and UA	1,128	61

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

2

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

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

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy	Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%2						
Is this a hydronic heating system?	No							
Location of Ducts	Unducted							
Location of Air Handler	Conditioned Space							
Is Du	uct Testing Required? No							

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

Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	765_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,503</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	175
Envelope Heat Load Sum of UA X \( \Delta T \)	8,949 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X .018))	3,582 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,531 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	12,531 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	15,664 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

#### Messages / Results \*

UA Reduction = 2.41, Proposed UA is better than baseline by 2%

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

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

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

· · · · · · · · · · · · · · · · · · ·	Proposed Design  onent Performance, R occupancies Baseline Proposed Desig							
Component Performance, R occupancies	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40		
Overhead Glazing U =		0	0.0	_		0	0.0	
Vertical Glazing U =		116	34.7	_	0.300	116		
Flat/Vaulted Ceilings U =		0	0.0	_	0.000	0	0.0	
Wall (above grade) U =		1,207	67.6		0.054	1,207	65.2	
Floors over Crawlspace U =		1,207	0.0	_	0.001	1,207	0.0	
· •		0	0.0	_		0	0.0	
Slab on Grade F =		0	0.0	_		0	0.0	
Below Grade Wall U =		0	0.0	_		0	0.0	
Below Grade Slab F =	0.570	<u> </u>	0.0	L		1 0	0.0	
	Passii	ine UA Total	114.3		Drana	and IIA Tatal	111.8	
		-	4.5		-	sed UA Total		
	Required Credi				Propo	osed Credits		from Tables 406.2 and 406.3
				UA Perce	nt Reduction	2.1%		
					ι	JA Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 4								

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

<sup>\*</sup>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 sq. ft	
Classification Small Dwelling Unit	
Notes	

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

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

Plan	Il Glazing Schedule  Component		Glazing		Wid	th	Нс	eight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet		Area	UA
Exemp	ot .		-						-	-
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
						Sum	of Area	a and UA	115.5	34.7
Vertical Glazing Area Weighted U									0.300	
				Vertical GI	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
				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		1,207	65
				Sum of Area and UA	1,207	65

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	
				Sum of Perimeter and FP	0	0	

Below G	rade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	gth and UA	0	0.0		0	0		

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy.	wsu.edu/Documents/Duct%20Testing%20Standards%20_
Is this a hydronic heating system?	No	
Location of Ducts	Unducted	
Location of Air Handler	Conditioned 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 Constru	ction Affidavit, Existing	
New Constru	ction 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	795 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,758</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	112
Envelope Heat Load Sum of UA X $\Delta T$	5,704 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,722 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,426 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,426 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	11,782 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.26, Proposed UA is better than baseline by 2%

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

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 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design								
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	116	34.7		0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,128	63.1		0.054	1,128	60.9	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	109.8		Propo	sed UA Total	107.5	
	Requ	ired Credits	4.5		Prop	osed Credits	6.5 f	rom Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	2.1%	
					ι	JA Reduction	2.3	
If the December of the Auto-Table of the December of the Table of			0					
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	of are ≥ thos	se required in	Section R40	6, then the home n	neets the WSE	<b>;</b> .		

Table R4	Table R406.2 Fuel Normalization Credits										
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)						
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5						

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

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

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	t								0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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		
									0		
Sum of Area and UA 0 0										0	
Overhead Glazing Area Weighted U											

Vertical Glazing Schedule Rows to Show 3														
Plan	Component		Glazing		Glazing		Glazing		Wid	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	1	2	6	3	0	7.5	2.25				
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80				
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60				
						Sum	of Area	and UA	115.5	34.7				
					Vertical C	Slazing A	rea We	ighted U		0.300				
Vertical Glazing and Doors Area Weighted U 0.30														

	Component		Attic		
ID	Description	Ref.	U	Area	UA
N	lo 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		1,128	61				
Sum of Area and UA 1,128 61										

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

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

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

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

HVAC Thermal Distribution System	Download RS-33 (2018) http://www.energy	Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Standards%2						
Is this a hydronic heating system?	No							
Location of Ducts	Unducted							
Location of Air Handler	Conditioned Space							
Is Du	uct 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	765 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,503</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	108
<b>Envelope Heat Load</b> Sum of UA X ∆T	5,485 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) Χ ΔΤ) Χ .018))	3,582 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,066 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,066 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	11,333 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.17, Proposed UA is better than baseline by 2%

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

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

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pr	oposed Desig	jn .	
	U	Area	UA	_	U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	48	14.4		0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0			0	0.0	
Wall (above grade) U =	0.056	1,083	60.6		0.054	1,083	58.5	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
	Baseli	ine UA Total	87.0		Propo	sed UA Total	84.9	
	Requ	ired Credits	4.5		Prop	osed Credits	6.5 f	rom Tables 406.2 and 406.3
		_			UA Perce	nt Reduction	2.5%	
					ı	JA Reduction	2.2	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home n	neets the WSE	3.		

Table R4	Table R406.2 Fuel Normalization Credits										
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)						
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5						

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

<sup>\*</sup>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	628 sq. ft
Classification S	mall 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
Α	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
В	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
						Sum	of Area	a and UA	40	12.0
					Exterior	Doors A	rea We	ighted U		0.300

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

Vertical Glazing Schedule Rows to Show 2							2				
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
L	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
							Sum	of Area	a and UA	48.0	14.4
Vertical Glazing Area Weighted U									0.300		
Vertical Glazing and Doors Area Weighted 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		1,083	58
				Sum of Area and UA	1,083	58

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

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

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

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	628_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>5,338</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	85
Envelope Heat Load Sum of UA X \( \Delta T \)	4,329 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	2,940 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,269 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,269 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	9,086 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.29, Proposed UA is better than baseline by 2%

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

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 732 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

Component Performance, R occupancies		Baseline		F	roposed Desig	gn	
_	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,144	64.1	0.054	1,144	61.8	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	95.0	Prop	osed UA Total	92.7	
	Requ	ired Credits	4.5	Pro	posed Credits	6.5	from Tables 406.2 and 406.3
		_		UA Pero	ent Reduction	0.407	
					UA Reduction	2.3	

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R4	06.3 Energy Credits				
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope	fficient Building Envelope			
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package		0.0		
			Energy Credits	5.5	

<sup>\*</sup>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 732 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
Α	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
В	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 Area Weighted U								0.300

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

١	/ertical (	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	lth	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 3	1	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
							Sum	of Area	a and UA	63.0	18.9
						Vertical (	Slazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

Plan ID	Component Description	Ref.	Attic U	Area	UA
	No ceiling/roof in thermal envelope	NA		Area	0.0
	No centing/1001 in thermal envelope	INA	_		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		1,144	62
		•		Sum of Area and UA	1,144	62

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

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

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

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

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	732 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,222 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	93
Envelope Heat Load Sum of UA X AT	4,728 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,427 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,155 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,155 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	<b>10,194</b> Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

### Messages / Results \*

UA Reduction = 2.17, Proposed UA is better than baseline by 2%

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

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

Component Performance, R occupancies		Baseline		F	roposed Desig		
	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,083	60.6	0.054	1,083	58.5	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	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	87.0	Prop	osed UA Total	84.9	
	Requ	ired Credits	4.5	Pro	posed Credits	6.5	from Tables 406.2 and 406.3
		_		UA Pero	ent Reduction	2.5%	
					<b>UA Reduction</b>	2.2	

Table R4	Table R406.2 Fuel Normalization Credits						
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)		
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5		

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 62	g, ft
Classification Small Dwel	ing Unit
Notes	

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

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

١	/ertical (	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
L	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
Sum of Area and UA 48.0							48.0	14.4			
						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

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

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

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

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

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

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

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

g System Sizing - Proposed Design Try Nearest Weather Station	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	628_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,338 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	85
Envelope Heat Load Sum of UA X AT	4,329 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T) X .018))	2,940 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,269 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,269 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	9,086 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

UA Reduction = 2.29, Proposed UA is better than baseline by 2%

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

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

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

Component Performance, R occupancies		Baseline		F	roposed Desig	gn	
_	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9	
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0	
Wall (above grade) U =	0.056	1,144	64.1	0.054	1,144	61.8	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
	Baseli	ne UA Total	95.0	Prop	osed UA Total	92.7	
	Requ	ired Credits	4.5	Pro	posed Credits	6.5	from Tables 406.2 and 406.3
		_		UA Pero	ent Reduction	0.407	
					UA Reduction	2.3	

Table R4	Table R406.2 Fuel Normalization Credits										
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)						
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5						

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		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		0.0		
7	Appliance Package		0.0		
			Energy Credits	5.5	

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

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

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

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

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

١	ertical (	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
							Sum	of Area	a and UA	63.0	18.9
						Vertical (	Glazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

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		1,144	62
				Sum of Area and UA	1,144	62

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, Len	gth and UA	0	0.0		0	0	

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

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

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

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	732 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,222 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	93
Envelope Heat Load Sum of UA X AT	4,728 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \Delta T) X .018))	3,427 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,155 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,155 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	<b>10,194</b> Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

Messages / Results \*

UA Reduction = 2.41, Proposed UA is better than baseline by 2%

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

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

SULTS - Comparison of Baseline and Proposed Design  Component Performance, R occupancies		Baseline			Pro	oposed Desig	ın	
Component Performance, R occupancies	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40		
Overhead Glazing U =		0	0.0	_		0	0.0	
Vertical Glazing U =		116	34.7	_	0.300	116		
Flat/Vaulted Ceilings U =		0	0.0	_	0.000	0	0.0	
Wall (above grade) U =		1,207	67.6		0.054	1,207	65.2	
Floors over Crawlspace U =		1,207	0.0	_	0.001	1,207	0.0	
· •		0	0.0	_		0	0.0	
Slab on Grade F =		0	0.0	_		0	0.0	
Below Grade Wall U =		0	0.0	_		0	0.0	
Below Grade Slab F =	0.570	<u> </u>	0.0	L		1 0	0.0	
	Passii	ine UA Total	114.3		Drana	and IIA Tatal	111.8	
		-			-	sed UA Total		
	Requ	ired Credits	4.5		Propo	osed Credits		from Tables 406.2 and 406.3
					UA Perce	nt Reduction	2.1%	
					ι	JA Reduction	2.4	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 4								

Table R4	Table R406.2 Fuel Normalization Credits									
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)					
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5					

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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

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

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

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

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

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

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

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

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

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

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

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

Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,758</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	112
Envelope Heat Load Sum of UA $X \Delta T$	5,704 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta \) T X .018))	3,722 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,426 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,426 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	11,782 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

### Messages / Results \*

UA Reduction = 2.26, Proposed UA is better than baseline by 2%

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

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 764 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	116	34.7		0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	0	0.0		•	0	0.0	
Wall (above grade) U =	0.056	1,128	63.1		0.054	1,128	60.9	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	109.8		Propos	sed UA Total	107.5	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5 f	rom Tables 406.2 and 406.3
		_			UA Percei	nt Reduction	2.1%	
					U	A Reduction	2.3	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets	s the WSEC			
, , , , , , , , , , , , , , , , , , , ,		•		•				

Table R4	Table R406.2 Fuel Normalization Credits								
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)				
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5				

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		0.0					
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas				
4	High Efficiency HVAC Distribution System		NA					
5.1	Efficient Water Heating		0.0					
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater				
6	Renewable Electric Energy kWh		0.0					
7	Appliance Package		0.0					
		Energy Credits	5.5					

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 764 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
Α	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
В	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			
											_

Vertical	Glazing Schedule							Ro	ws to Show	3
Plan	Component		Glazing		Wid	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	1	2	6	3	0	7.5	2.25
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
						Sum	of Area	and UA	115.5	34.7
					Vertical C	Slazing A	rea We	ighted U		0.300
				Vertical G	lazing and	Doors A	rea We	iahted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	No ceiling/roof in thermal envelope	NA	-			0.0
				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		1,128	61
				Sum of Area and UA	1,128	61

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

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

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

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

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

Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	764 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>6,494</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	108
Envelope Heat Load Sum of UA X \( \Delta T \)	5,485 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X .018))	3,577 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,062 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,062 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	11,327 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

### Messages / Results \*

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

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

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 795 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

ESULTS - Comparison of Baseline and Proposed Design		D P			Proposed Desi	an .	
Component Performance, R occupancies	U	Baseline Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40		
		40		0.300	40		
Overhead Glazing U =		0	0.0		(	0.0	
Vertical Glazing U =	0.300	116	34.7	0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	795	21.5	0.027	795	21.5	
Wall (above grade) U =	0.056	1,060	59.4	0.054	1,060	57.3	
Floors over Crawlspace U =	0.029	0	0.0		C	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	
				<u></u>			
	Baseli	ine UA Total	127.5	Pro	oposed UA Total	125.4	
	Regu	ired Credits	4.5		roposed Credits		from Tables 406.2 and 406.3
			1.0		•	4.70/	ITOTT Tables 400.2 and 400.3
				UA Pe	rcent Reduction		
					UA Reduction	2.1	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	00 > 46		C D40	C 4h 4h - h 4h - 181	000		

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

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

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	t								0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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

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

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

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		795	21.5
				Sum of Area and UA	795	21.5

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,060	57
				Sum of Area and UA	1,060	57

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

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

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

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

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

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

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	795 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,758 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	125	
Envelope Heat Load Sum of UA X AT	6,394 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) ΧΔΤ) Χ.018))	3,722 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,116 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,116 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	<b>12,645</b> Btu / Hour	

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

253-468-4117

### Messages / Results \*

UA Reduction = 1.98, Proposed UA is better than baseline by 2%

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

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 765 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

SULTS - Comparison of Baseline and Proposed Design		Baseline		P	roposed Desig	ın	
Component Performance, R occupancies	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40		
Overhead Glazing U =		0	0.0	0.000	0	0.0	
· · · · · · · · · · · · · · · · · · ·		110	34.7	0.300	110		
Vertical Glazing U =		116			116		
Flat/Vaulted Ceilings U =		765	20.7	0.027	765		
Wall (above grade) U =	0.056	989	55.4	0.054	989	53.4	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
•					•		
	Baseli	ine UA Total	122.7	Prop	sed UA Total	120.7	
	Regu	ired Credits	4.5	·	osed Credits		from Tables 406.2 and 406.3
		L		UA Perc	ent Reduction	4.007	
					UA Reduction	2.0	
If the 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)						
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5						

Table 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			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh			0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

<sup>\*</sup>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 765 sq. ft	
Classification Small Dwelling Unit	
Notes	

Exterior										_
Plan	Component		Door		Wic		He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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	l 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	ıt								-	i
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
						Sum	of Area	and UA	115.5	34.7
					Vertical 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
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		765	20.7
				Sum of Area and UA	765	20.7

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		989	53
				Sum of Area and UA	989	53

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

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

Below 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	ngth and UA	0	0.0		0	0	

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

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

Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	765 ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,503 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	121
Envelope Heat Load Sum of UA X \( \Delta T \)	6,157 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X .018))	3,582 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,739 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,739 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	12,173 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

### Messages / Results \*

UA Reduction = 1.91, Proposed UA is better than baseline by 2%

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

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

Component Performance, R occupancies		Baseline		Pr	oposed Desig	jn .	
	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	628	17.0	0.027	628	17.0	
Wall (above grade) U =	0.056	957	53.6	0.054	957	51.7	
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	96.9	Propo	sed UA Total	95.0	
	Requ	ired Credits	4.5	Prop	osed Credits	6.5	from Tables 406.2 and 406.3
		<u> </u>		UA Perce	nt Reduction	2.0%	
				ι	JA Reduction	1.9	
						1.0	

Table R4	Table R406.2 Fuel Normalization Credits						
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)		
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5		

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 62	g, ft
Classification Small Dwel	ing Unit
Notes	

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

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

١	/ertical (	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
L	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
Sum of Area and UA								48.0	14.4		
						Vertical 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
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	628	17.0

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		957	52
				Sum of Area and UA	957	52

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

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

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

Ventilation Requirements		
Number of Bedrooms	1	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	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	45	CFM

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

, cycom came a reposite a congre	Out BetterBuiltNW's HVAC Sizing Tool: https://b	
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	628 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>5,338</b> ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	95	
Envelope Heat Load Sum of UA X AT	4,846 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T) X .018))	2,940 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,786 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,786 Btu / Hour	
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1		
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	<b>9,733</b> Btu / Hour	
Building and Duct Heat Loss X 1.40 for all other systems		

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

253-468-4117

#### Messages / Results \*

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

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

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

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

RESULTS - Comparison of Baseline and Proposed Design									
Component Performance, R occupancies		Baseline		P	Proposed Design				
	U	Area	UA	U	Area	UA			
Doors U =	0.300	40	12.0	0.300	40	12.0			
Overhead Glazing U =	0.500	0	0.0		0	0.0			
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9			
Flat/Vaulted Ceilings U =	0.027	732	19.8	0.027	732	19.8			
Wall (above grade) U =	0.056	1,010	56.6	0.054	1,010	54.5			
Floors over Crawlspace U =	0.029	0	0.0		0	0.0			
Slab on Grade F =	0.540	0	0.0		0	0.0			
Below Grade Wall U =	0.042	0	0.0		0	0.0			
Below Grade Slab F =	0.570	0	0.0		0	0.0			
	Baseli	ine UA Total	107.2	Prop	osed UA Total	105.2			
	Requ	ired Credits	4.5	Pro	osed Credits	6.5	from Tables 406.2 and 406.3		
		_		UA Pero	ent Reduction	4.00/			
					UA Reduction	2.0			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets the WSE	C.				

Table R4	Table R406.2 Fuel Normalization Credits										
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)						
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5						

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

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

#### THERMAL ENVELOPE DETAILS - Proposed Design

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

Plan	Component		Door		Wid	lth	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	t								0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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
Overhead Glazing Area Weighted U											

Vertical Glazing Schedule Rows to Show 2											
	Plan	Component Glazing Width Height									
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
2 5		U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
							Sum	of Area	a and UA	63.0	18.9
						Vertical (	Glazing A	rea We	ighted U		0.300
					Vertical G	lazing and	Doors A	rea We	ighted U		0.300

Plan	Component		Attic		
ID	Description	Ref.	U	Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	732	19.8

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,010	55
		•		Sum of Area and UA	1,010	55

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

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

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

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

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

System Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,222 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	105
Envelope Heat Load Sum of UA X AT	5,365 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X \( \Delta T \) X	3,427 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,792 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,792 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	10,990 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

### Messages / Results \*

UA Reduction = 1.91, Proposed UA is better than baseline by 2%

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

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

RESULTS - Comparison of Baseline and Proposed Design							
Component Performance, R occupancies		Baseline			Proposed Desig	gn	
	U	Area	UA	U	Area	UA	
Doors U =	0.300	40	12.0	0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0		C	0.0	
Vertical Glazing U =	0.300	48	14.4	0.300	48	14.4	
Flat/Vaulted Ceilings U =	0.027	628	17.0	0.027	628	17.0	
Wall (above grade) U =	0.056	957	53.6	0.054	957	51.7	
Floors over Crawlspace U =	0.029	0	0.0		C	0.0	
Slab on Grade F =	0.540	0	0.0		C	0.0	
Below Grade Wall U =	0.042	0	0.0		C	0.0	
Below Grade Slab F =	0.570	0	0.0		C	0.0	
		_					
	Baseli	ine UA Total	96.9	Pr	posed UA Total	95.0	
	Requ	ired Credits	4.5	P	oposed Credits	6.5	from Tables 406.2 and 406.3
				UA Pe	rcent Reduction	0.00/	
					UA Reduction	1.9	
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	06 are ≥ thos	se required in	Section R40	6, then the home meets the W	SEC.		

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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		0.0	
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System		NA	
5.1	Efficient Water Heating		0.0	
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy kWh		0.0	
7	Appliance Package		0.0	
		Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

Conditioned Floor Area, Proposed Design 628 sq. ft	
Classification Small Dwelling Unit	
Notes	

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

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

١	/ertical (	Glazing Schedule							Ro	ws to Show	2
	Plan	Component		Glazing		Wic	ith	He	eight		
	ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
L	Exempt			-						-	-
1 3		U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
6	i	U=0.30 (Code Baseline)	Table 406.2	0.30	1	4	0	6	0	24.0	7.20
							Sum	of Area	a and UA	48.0	14.4
						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
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	628	17.0

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		957	52
				Sum of Area and UA	957	52

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	

Belo	ow Gra	ade Walls and Slabs								
PI	lan	Component		Wall	Wall	Wall	Slab		Slab	
	ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
		Sum	gth and UA	0	0.0		0	0		

Ventilation Requirements		
Number of Bedrooms	1	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	Verify system meets definition of 'Distributed Whole-House Ventilation'
Ventilation Code Section	IMC, Section	<u>n</u> 403
Whole House Mechanical Ventilation Airflow Rate	45	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	Conditioned Space	
Is Duct Testing Required?	No	

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	628_ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	<b>5,338</b> ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	95
Envelope Heat Load Sum of UA X \( \Delta T \)	4,846 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X $\Delta$ T) X .018))	2,940 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	7,786 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	7,786 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	9,733 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

Messages / Results \*

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

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

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

Component Performance, R occupancies  Doors U =  Overhead Glazing U =	<b>U</b> 0.300	Baseline Area	UA		posed Desig		
	0.300		UA	U	Area	UA	
Overhead Glazing U =		40	12.0	0.300	40	12.0	
	0.500	0	0.0		0	0.0	
Vertical Glazing U =	0.300	63	18.9	0.300	63	18.9	
Flat/Vaulted Ceilings U =	0.027	732	19.8	0.027	732	19.8	
Wall (above grade) U =	0.056	1,010	56.6	0.054	1,010	54.5	
Floors over Crawlspace U =	0.029	0	0.0		0	0.0	
Slab on Grade F =	0.540	0	0.0		0	0.0	
Below Grade Wall U =	0.042	0	0.0		0	0.0	
Below Grade Slab F =	0.570	0	0.0		0	0.0	
		_					
	Baseli	ine UA Total	107.2	Propos	sed UA Total	105.2	
	Requ	ired Credits	4.5	Propo	sed Credits	6.5	from Tables 406.2 and 406.3
	UA Percei	nt Reduction	1.9%				
				U	A Reduction	2.0	

Table R4	Table R406.2 Fuel Normalization Credits										
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)						
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5						

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		0.0		
3	High Efficiency HVAC	Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

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

THERMAL ENVELOPE DETAILS - Proposed Design	

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

Plan	Component		Door		Wid	lth	Height			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exemp	t								0	0.0
Α	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
В	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		Width		Height			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt										-
3	U=0.30 (Code Baseline)	Table 406.2	0.30	2	6	0	4	0	48.0	14.40
5	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	6	0	15.0	4.50
						Sum	of Area	a and UA	63.0	18.9
Vertical Glazing Area Weighted U									0.300	
				Vertical G	lazing and	Doors A	rea We	iahted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		732	19.8
				Sum of Area and UA	732	19.8

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,010	55
				Sum of Area and UA	1,010	55

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

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

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

Ventilation Requirements			
Number of Bedrooms	2		
Run-Time Percent in Each 4-Hour Segment	100%		
Is the system Balanced?	Balanced	V	'erify system meets definition of 'Balanced Whole-House Ventilation'
Is the system Distributed?	Distributed	V	erify 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	HVAC Thermal Distribution System Download RS-33 (2018) http://www.energy.wsu.edu/Documents/Duct%20Testing%20Star							
Is this a hydronic heating system?	No							
Location of Ducts	Unducted							
Location of Air Handler	Conditioned Space							
I and the second se	Is Duct Testing Required? No							

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

ystem Sizing - Proposed Design Try	Out BetterBuiltNW's HVAC Sizing Tool: <a href="https://betterbuiltnw.com/resources/hvac-sizing-tool">https://betterbuiltnw.com/resources/hvac-sizing-tool</a>
Nearest Weather Station	Puyallup
Indoor Design Temperature	70 F
Outdoor Design Temperature	19 F
Design Temperature Difference (ΔT)	51 F
Conditioned Floor Area, Proposed Design	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,222 ft3
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
Sum of UA, including exempt door and window	105
Envelope Heat Load Sum of UA X ΔT	5,365 Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,427 Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	8,792 Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	8,792 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps	10,990 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	

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

253-468-4117

### Messages / Results \*

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

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

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

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

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	ın	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0		0.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	116	34.7		0.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	795	21.5		0.027	795	21.5	
Wall (above grade) U =	0.056	1,060	59.4		0.054	1,060	57.3	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	127.5		Propos	sed UA Total	125.4	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5 f	rom Tables 406.2 and 406.3
					UA Percei	nt Reduction	4.307	
					U	A Reduction	2.1	
If the Decreed HA < the Towns HA and the Decreed Condite from Table 11	· · · · · · · · · · · · · · · · · · ·		C	C 4b 4b - b				
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	b are ≥ thos	se required in	Section R40	b, then the home mee	ets the WSEC	<i>;</i> .		

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

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	ntrol and Efficient Ventilation			
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System	ficiency HVAC 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	5.5	

\*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 795 sq. ft	
Classification Small Dwelling Unit	
Notes	

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

Overhea	d Glazing										
Plan	Component		Glazing		Wic	ith	Не	ight			
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA	
									0		
									0		
									0		
									0		
									0		
						Sum	of Area	and UA	0	0	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									
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
						Sum	of Area	and UA	115.5	34.7
					Vertical G	lazing A	rea Wei	ighted U		0.300
Vertical Glazing and Doors Area Weighted U									0.300	

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		795	21.5
				Sum of Area and UA	795	21.5

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		1,060	57
				Sum of Area and UA	1,060	57

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

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

Below G	rade Walls and Slabs								
Plan	Component		Wall	Wall	Wall	Slab		Slab	
ID	Description	Ref.	U	Area	UA	F	Slab Perim	UA	
	Sum	gth and UA	0	0.0		0	0		

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

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

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

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	795 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,758 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	125	
Envelope Heat Load Sum of UA X AT	6,394 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) ΧΔΤ) Χ.018))	3,722 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,116 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	10,116 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	<b>12,645</b> Btu / Hour	

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

253-468-4117

### Messages / Results \*

UA Reduction = 1.98, Proposed UA is better than baseline by 2%

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

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

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 764 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design								
Component Performance, R occupancies		Baseline			Pro	posed Desig	n	
	U	Area	UA		U	Area	UA	
Doors U =	0.300	40	12.0	0.	.300	40	12.0	
Overhead Glazing U =	0.500	0	0.0			0	0.0	
Vertical Glazing U =	0.300	116	34.7	0.	.300	116	34.7	
Flat/Vaulted Ceilings U =	0.027	764	20.6	0.	.027	764	20.6	
Wall (above grade) U =	0.056	989	55.4	0.	.054	989	53.4	
Floors over Crawlspace U =	0.029	0	0.0			0	0.0	
Slab on Grade F =	0.540	0	0.0			0	0.0	
Below Grade Wall U =	0.042	0	0.0			0	0.0	
Below Grade Slab F =	0.570	0	0.0			0	0.0	
		_						
	Baseli	ine UA Total	122.7		Propos	sed UA Total	120.7	
	Requ	ired Credits	4.5		Propo	sed Credits	6.5 f	rom Tables 406.2 and 406.3
		_		U	JA Percei	nt Reduction	1.6%	
					U	A Reduction	2.0	
If the Drangerd LIA C the Torget LIA and the Drangerd Credite from Toble 44	OF are > the		Coation D40	C than the home meets ti	ha WEEC			
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 40	o are ≥ tnos	se requirea in	Section R40	o, then the nome meets ti	ne WSEC	•		

Table R4	106.2 Fuel Normalization Credits				
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	5.5	6.5

Table R4	06.3 Energy Credits				
Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope	:fficient Building Envelope			
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		Option 3.6	3.0	Ductless Split System with no electric resistance in primary living areas
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		Option 5.5	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	5.5	

\*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 764 sq. ft	
Classification Small Dwelling Unit	
Notes	

Plan	Component		Door		Wid	ith	He	ight		
ID	Description	Ref.	U	Qt.	Feet	Inch	Feet	Inch	Area	UA
Exempt									0	0.0
Α	Code Baseline, U=0.30		0.30	1	3	0	6	8	20	6.0
В	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 Area Weighted 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	
Overhead Glazing Area Weighted 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
Exemp	t									i
1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
						Sum	of Area	and UA	115.5	34.7
Vertical Glazing Area Weighted U 0.300										
				Vertical G	lazing and	Doors A	rea Wei	ahted U		0.300

Plan	Component		Attic			
ID	Description	Ref.	U		Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027		764	20.6
				Sum of Area and UA	764	20.6

Plan	Component		Wall			
ID	Description	Ref.	U		Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054		989	53
Sum of Area and UA 989 53						

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

2

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

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

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

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

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

Harding Oceans Oleling Branch & Design	Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
ag oyotom o.zgopooou zoo.g	
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	<b>6,494</b> ft3
Leave blank to use default of 8.5 ft. ceiling height	
HVAC System Type	Heat Pump
Location of HVAC Distribution System	Unducted
·	
Sum of UA, including exempt door and window	121
, , , , , , , , , , , , , , , , , , ,	
Envelope Heat Load	6,156 Btu / Hour
Sum of UA X $\Delta T$	
Air Leakage Heat Load	3,577 Btu / Hour
((Volume X 0.6) X $\Delta$ T) X .018))	Std / Hour
Building Design Heat Load	9,733 Btu / Hour
Air Leakage + Envelope Heat Loss	9,733   Dtd / Flodi
D. W. Committee of the control of th	0.700 Pt. (11
Building and Duct Heat Load  For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1	9,733 Btu / Hour
For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	
Maximum Heat Equipment Output  Building and Duct Heat Loss X 1.25 for heat pumps	12,166 Btu / Hour
Building and Duct Heat Loss X 1.40 for all other systems	