PRMU20240407

Project Information
East Town Crossing Unit 101
Building A
Pioneer & Shaw, Puyallup

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

Messages / Results *

UA Reduction = 2.39, Proposed UA is better than baseline by 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 -- 819 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	111	33.3	0.300	111	33.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,196	67.0	0.054	1,196	64.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	133	72.0	0.540	133	72.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	184.3	**Proposed UA Total**	181.9
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.3%
		UA Reduction	2.4

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

Table 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	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
101A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
101B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
							Sum of Area and UA		40	12.0
							Exterior Doors Area Weighted U			0.300

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
							Sum of Area and UA		0	0
							Overhead Glazing Area Weighted U			

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
2	4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
3	7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	6	67.5	20.25
								Sum of Area and UA		111.0	33.3
								Vertical Glazing Area Weighted U			0.300
								Vertical Glazing and Doors Area Weighted U			0.300

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,196	65
			Sum of Area and UA	1,196	65

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design — Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	819 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	182	
Envelope Heat Load Sum of UA X ΔT	9,275 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	13,109 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	13,109 Btu / Hour	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	16,387 Btu / Hour	

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Messages / Results *

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

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

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

ANALYSIS SET UP

What code compliance pathway are you using?	**Prescriptive Path Compliance with Option 1 (preferred)**
Project Building Type?	**New Construction**
Occupancy Type?	**R2 Multifamily**
Code Version?	**WSEC 2018**
Classification:	Small Dwelling Unit -- 779 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	134	40.1	0.300	134	40.1
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,109	62.1	0.054	1,109	59.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	127	68.6	0.540	127	68.6
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	182.7	**Proposed UA Total**	180.5
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.2%
		UA Reduction	2.2

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

Table R406.2 Fuel Normalization Credits

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	**Heat Pump, air-to-air or air to water**	1.0	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category			Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope				0.0	
2	Air Leakage Control and Efficient Ventilation				0.0	
3	High Efficiency HVAC			**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System				NA	
5.1	Efficient Water Heating				0.0	
5.2-5.6	Efficient Water Heating			**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		kWh		0.0	
7	Appliance Package				0.0	
				Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
102A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
102B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
								Sum of Area and UA	**40**	**12.0**
								Exterior Doors Area Weighted U		**0.300**

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
								Sum of Area and UA	**0**	**0**
								Overhead Glazing Area Weighted U		

Vertical Glazing Schedule

Rows to Show: 4

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	6	27.0	8.10
3	7	U=0.30 (Code Baseline)	Table 406.2	0.30	2	5	0	4	6	45.0	13.50
4	8	U=0.30 (Code Baseline)	Table 406.2	0.30	3	3	0	6	0	54.0	16.20
									Sum of Area and UA	**133.5**	**40.1**
									Vertical Glazing Area Weighted U		**0.300**
									Vertical Glazing and Doors Area Weighted U		**0.300**

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,109	60
			Sum of Area and UA	**1,109**	**60**

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

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Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	779 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	181	
Envelope Heat Load Sum of UA X ΔT	9,207	Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,647	Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,854	Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	12,854	Btu / Hour
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	16,067	Btu / Hour

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Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	104	31.1	0.300	104	31.1
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,203	67.4	0.054	1,203	65.0
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	133	72.0	0.540	133	72.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	182.4	**Proposed UA Total**	180.0
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.3%
		UA Reduction	2.4

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

Table 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)
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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 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System				NA	
5.1	Efficient Water Heating				0.0	
5.2-5.6	Efficient Water Heating			**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		kWh		0.0	
7	Appliance Package				0.0	
				Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
103A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
103B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
								Sum of Area and UA	**40**	**12.0**
								Exterior Doors Area Weighted U		**0.300**

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
								Sum of Area and UA	**0**	**0**
								Overhead Glazing Area Weighted U		

Vertical Glazing Schedule

Rows to Show: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
2	7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	6	67.5	20.25
									Sum of Area and UA	**103.5**	**31.1**
									Vertical Glazing Area Weighted U		**0.300**
									Vertical Glazing and Doors Area Weighted U		**0.300**

Flat/Vaulted Ceilings

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

Walls (Above Grade)

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

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

Number of Bedrooms	2	
Run-Time Percent in Each 4-Hour Segment	100%	
Is the system Balanced?	Balanced	Verify system meets definition of 'Balanced Whole-House Ventilation'
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Is Duct Testing Required? No

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

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

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

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

ANALYSIS SET UP

What code compliance pathway are you using?	**Prescriptive Path Compliance with Option 1 (preferred)**
Project Building Type?	**New Construction**
Occupancy Type?	**R2 Multifamily**
Code Version?	**WSEC 2018**
Classification:	Small Dwelling Unit -- 779 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	134	40.1	0.300	134	40.1
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,109	62.1	0.054	1,109	59.9
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	127	68.6	0.540	127	68.6
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	182.7	**Proposed UA Total**	180.5
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.2%
		UA Reduction	2.2

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

Table R406.2 Fuel Normalization Credits

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	**Heat Pump, air-to-air or air to water**	1.0	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
104A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
104B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
								Sum of Area and UA	**40**	**12.0**
								Exterior Doors Area Weighted U		**0.300**

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
								Sum of Area and UA	**0**	**0**
								Overhead Glazing Area Weighted U		

Vertical Glazing Schedule

Rows to Show: 4

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	6	27.0	8.10
3	7	U=0.30 (Code Baseline)	Table 406.2	0.30	2	5	0	4	6	45.0	13.50
4	8	U=0.30 (Code Baseline)	Table 406.2	0.30	3	3	0	6	0	54.0	16.20
									Sum of Area and UA	**133.5**	**40.1**
									Vertical Glazing Area Weighted U		**0.300**
									Vertical Glazing and Doors Area Weighted U		**0.300**

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,109	60
			Sum of Area and UA	**1,109**	**60**

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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	779	ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622	ft3
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	181	
Envelope Heat Load Sum of UA X ΔT	9,207	Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,647	Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	12,854	Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	12,854	Btu / Hour
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	16,067	Btu / Hour

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 = 2.42, 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 -- 819 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	111	33.3	0.300	111	33.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,209	67.7	0.054	1,209	65.3
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	113.0	**Proposed UA Total**	110.6
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.1%
		UA Reduction	2.4

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

Table 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	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
201A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
201B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
				Sum of Area and UA					40	12.0
				Exterior Doors Area Weighted U						0.300

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
				Sum of Area and UA					0	0
				Overhead Glazing Area Weighted U						

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
2	4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
3	7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	6	67.5	20.25
								Sum of Area and UA		111.0	33.3
								Vertical Glazing Area Weighted U			0.300
								Vertical Glazing and Doors Area Weighted U			0.300

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,209	65
			Sum of Area and UA	1,209	65

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design — Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	819 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	111	
Envelope Heat Load Sum of UA X ΔT	5,640 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,474 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,474 Btu / Hour	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	11,843 Btu / Hour	

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 = 2.2, 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 -- 779 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	143	42.8	0.300	143	42.8
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,100	61.6	0.054	1,100	59.4
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	116.4	**Proposed UA Total**	114.2
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.9%
		UA Reduction	2.2

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

Table R406.2 Fuel Normalization Credits

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	**Heat Pump, air-to-air or air to water**	1.0	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
202A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
202B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
				Sum of Area and UA					40	12.0
				Exterior Doors Area Weighted U						0.300

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
				Sum of Area and UA					0	0
				Overhead Glazing Area Weighted U						

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	6	81.0	24.30
3	8	U=0.30 (Code Baseline)	Table 406.2	0.30	3	3	0	6	0	54.0	16.20
									Sum of Area and UA	142.5	42.8
									Vertical Glazing Area Weighted U		0.300
									Vertical Glazing and Doors Area Weighted U		0.300

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,100	59
			Sum of Area and UA	1,100	59

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design — Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	779 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	114	
Envelope Heat Load Sum of UA X ΔT	5,822 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,647 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,469 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,469 Btu / Hour	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	11,837 Btu / Hour	

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

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

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

ANALYSIS SET UP

What code compliance pathway are you using?	**Prescriptive Path Compliance with Option 1 (preferred)**
Project Building Type?	**New Construction**
Occupancy Type?	**R2 Multifamily**
Code Version?	**WSEC 2018**
Classification:	Small Dwelling Unit -- 819 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	111	33.3	0.300	111	33.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,196	67.0	0.054	1,196	64.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	112.3	**Proposed UA Total**	109.9
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.1%
		UA Reduction	2.4

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

Table 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	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
203A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
203B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
							Sum of Area and UA		**40**	**12.0**
							Exterior Doors Area Weighted U			**0.300**

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
							Sum of Area and UA		**0**	**0**
							Overhead Glazing Area Weighted U			

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
2	7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	6	67.5	20.25
3	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		**111.0**	**33.3**
								Vertical Glazing Area Weighted U			**0.300**
								Vertical Glazing and Doors Area Weighted U			**0.300**

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,196	65
			Sum of Area and UA	**1,196**	**65**

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design — Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	819 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	110	
Envelope Heat Load Sum of UA X ΔT	5,603 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,437 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,437 Btu / Hour	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	11,797 Btu / Hour	

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 = 2.2, 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 -- 779 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	143	42.8	0.300	143	42.8
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,100	61.6	0.054	1,100	59.4
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	116.4	**Proposed UA Total**	114.2
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.9%
		UA Reduction	2.2

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

Table R406.2 Fuel Normalization Credits

System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	**Heat Pump, air-to-air or air to water**	1.0	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category			Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope				0.0	
2	Air Leakage Control and Efficient Ventilation				0.0	
3	High Efficiency HVAC			**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System				NA	
5.1	Efficient Water Heating				0.0	
5.2-5.6	Efficient Water Heating			**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		kWh		0.0	
7	Appliance Package				0.0	
				Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
204A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
204B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
				Sum of Area and UA					40	12.0
				Exterior Doors Area Weighted U						0.300

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
				Sum of Area and UA					0	0
				Overhead Glazing Area Weighted U						

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	1	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
2	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	6	81.0	24.30
3	8	U=0.30 (Code Baseline)	Table 406.2	0.30	3	3	0	6	0	54.0	16.20
								Sum of Area and UA		142.5	42.8
								Vertical Glazing Area Weighted U			0.300
								Vertical Glazing and Doors Area Weighted U			0.300

Flat/Vaulted Ceilings

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

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,100	59
			Sum of Area and UA	1,100	59

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

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

Heating System Sizing - Proposed Design — Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	779 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,622 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	114	
Envelope Heat Load Sum of UA X ΔT	5,822 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,647 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,469 Btu / Hour	
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,469 Btu / Hour	
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	11,837 Btu / Hour	

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 = 2.42, 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 -- 819 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	111	33.3	0.300	111	33.3
Flat/Vaulted Ceilings U =	0.027	819	22.1	0.027	819	22.1
Wall (above grade) U =	0.056	1,209	67.7	0.054	1,209	65.3
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	135.1	**Proposed UA Total**	132.7
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.8%
		UA Reduction	2.4

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

Table 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	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category			Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope				0.0	
2	Air Leakage Control and Efficient Ventilation				0.0	
3	High Efficiency HVAC			**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System				NA	
5.1	Efficient Water Heating				0.0	
5.2-5.6	Efficient Water Heating			**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy		kWh		0.0	
7	Appliance Package				0.0	
				Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
301A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
301B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
								Sum of Area and UA	**40**	**12.0**
								Exterior Doors Area Weighted U		**0.300**

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
								Sum of Area and UA	**0**	**0**
								Overhead Glazing Area Weighted U		

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
2	4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
3	7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	6	67.5	20.25
									Sum of Area and UA	**111.0**	**33.3**
									Vertical Glazing Area Weighted U		**0.300**
									Vertical Glazing and Doors Area Weighted U		**0.300**

Flat/Vaulted Ceilings

Plan ID	Component Description	Ref.	Attic U	Area	UA
	R49 blown Attic STD baffled	10-7	0.027	819	22.1
			Sum of Area and UA	**819**	**22.1**

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,209	65
			Sum of Area and UA	**1,209**	**65**

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

	Link	
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Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

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Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	819 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	133	
Envelope Heat Load Sum of UA X ΔT	6,768	Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834	Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,602	Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	10,602	Btu / Hour
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	13,252	Btu / Hour

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

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

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

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline U	Baseline Area	Baseline UA	Proposed Design U	Proposed Design Area	Proposed Design 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	111	33.3	0.300	111	33.3
Flat/Vaulted Ceilings U =	0.027	819	22.1	0.027	819	22.1
Wall (above grade) U =	0.056	1,132	63.4	0.054	1,132	61.1
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0

Baseline UA Total	130.8	**Proposed UA Total**	128.5
Required Credits	4.5	**Proposed Credits**	5.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.7%
		UA Reduction	2.3

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

Table 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	4.5	5.5

Table R406.3 Energy Credits

Option No.	Category		Select Options	Energy Credits	Brief Description of Selected Options*
1	Efficient Building Envelope			0.0	
2	Air Leakage Control and Efficient Ventilation			0.0	
3	High Efficiency HVAC		**Option 3.4**	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.
4	High Efficiency HVAC Distribution System			NA	
5.1	Efficient Water Heating			0.0	
5.2-5.6	Efficient Water Heating		**Option 5.5**	2.5	NEEA Tier 3 heat pump water heater
6	Renewable Electric Energy	kWh		0.0	
7	Appliance Package			0.0	
			Energy Credits	**4.5**	

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

THERMAL ENVELOPE DETAILS - Proposed Design

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

Exterior Doors

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt									0	0.0
304A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
304B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
								Sum of Area and UA	**40**	**12.0**
								Exterior Doors Area Weighted U		**0.300**

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
									0	
									0	
									0	
									0	
									0	
								Sum of Area and UA	**0**	**0**
								Overhead Glazing Area Weighted U		

Vertical Glazing Schedule

Rows to Show: 3

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
2	4	U=0.30 (Code Baseline)	Table 406.2	0.30	1	2	6	3	0	7.5	2.25
3	7	U=0.30 (Code Baseline)	Table 406.2	0.30	3	5	0	4	6	67.5	20.25
									Sum of Area and UA	**111.0**	**33.3**
									Vertical Glazing Area Weighted U		**0.300**
									Vertical Glazing and Doors Area Weighted U		**0.300**

Flat/Vaulted Ceilings

Plan ID	Component Description	Ref.	Attic U	Area	UA
	R49 blown Attic STD baffled	10-7	0.027	819	22.1
			Sum of Area and UA	**819**	**22.1**

Walls (Above Grade)

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam INT 2X6W Lap (Code Baseline)	10-5	0.054	1,132	61
			Sum of Area and UA	**1,132**	**61**

Floor (over crawl or exterior)

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

Slab on Grade (less than 2 feet below grade)

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

Below Grade Walls and Slabs

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

Ventilation Requirements

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Unconditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

	Link	
Compliance Certificate	Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction	Insulation Certificate	
Duct Testing Affadavits		
Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
Prescriptive Checklist for 2018 WSEC	Prescriptive Checklist	
Alterations (Remodel) Worksheet	Worksheet	

Heating System Sizing - Proposed Design — Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool

Nearest Weather Station	Puyallup	
Indoor Design Temperature	70	F
Outdoor Design Temperature	19	F
Design Temperature Difference (ΔT)	51	F
Conditioned Floor Area, Proposed Design	819	ft2
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,962	ft3
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	129	
Envelope Heat Load Sum of UA X ΔT	6,555	Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,834	Btu / Hour
Building Design Heat Load Air Leakage + Envelope Heat Loss	10,389	Btu / Hour
Building and Duct Heat Load For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	10,389	Btu / Hour
Maximum Heat Equipment Output Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	12,986	Btu / Hour