PRMU20240404

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

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

Messages / Results *

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

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

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

ANALYSIS SET UP

What code compliance pathway are you using?	**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 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	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

Baseline UA Total	186.4	**Proposed UA Total**	184.0
Required Credits	4.5	**Proposed Credits**	6.5 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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	795 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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		115.5	34.7
								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	1,207	65
			Sum of Area and UA	1,207	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		134	72
				Sum of Perimeter and FP	134	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	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 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	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	184	
Envelope Heat Load Sum of UA X ΔT	9,383 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	13,105 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	13,105 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	16,382 Btu / Hour	

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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

* 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 -- 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 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	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

Baseline UA Total	177.7	**Proposed UA Total**	175.5
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.3%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	765 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	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

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

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		126	68
				Sum of Perimeter and FP	126	68

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	Conditioned 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	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	175	
Envelope Heat Load Sum of UA X ΔT	8,949 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	12,531 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	15,664 Btu / Hour	

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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 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	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

Baseline UA Total	149.0	**Proposed UA Total**	146.9
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.5%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	624 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6	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 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	1,083	58
			Sum of Area and UA	**1,083**	**58**

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		115	62
				Sum of Perimeter and FP	115	62

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

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

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

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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	624 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,304 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 ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	10,412	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	13,015	Btu / Hour

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Synthesis 9, LLC
Brett Lindsay
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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 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	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

Baseline UA Total	161.0	**Proposed UA Total**	158.7
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.4%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	732 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	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 and UA	**63.0**	**18.9**
									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	1,144	62
			Sum of Area and UA	**1,144**	**62**

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		122	66
				Sum of Perimeter and FP	122	66

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	Conditioned 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	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 ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	11,523 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	14,404 Btu / Hour	

Project Information
East Town Crossing, Unit 105
Building G
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 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	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

Baseline UA Total	149.0	**Proposed UA Total**	146.9
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.5%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	624 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6	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 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	1,083	58
			Sum of Area and UA	**1,083**	**58**

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		115	62
				Sum of Perimeter and FP	115	62

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	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	
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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	624 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	5,304 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 ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	10,412	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	13,015	Btu / Hour

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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

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ANALYSIS SET UP

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Occupancy Type?	**R2 Multifamily**
Code Version?	**WSEC 2018**
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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	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

Baseline UA Total	161.0	**Proposed UA Total**	158.7
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.4%
		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)
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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 3.6**	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

Conditioned Floor Area, Proposed Design	732 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height 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 and UA	**63.0**	**18.9**
									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	1,144	62
			Sum of Area and UA	**1,144**	**62**

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		122	66
				Sum of Perimeter and FP	122	66

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	Conditioned Space

Is Duct Testing Required? No

Links to Download Forms, Checklists and Other Resources

Compliance Certificate	Compliance Certificate	Instructions
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Existing Construction	Affidavit, Existing	
New Construction	Affidavit, New	
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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	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 ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	11,523 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	14,404 Btu / Hour	

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Building G
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Contact Information
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253-468-4117

Messages / Results *

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

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

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

ANALYSIS SET UP

What code compliance pathway are you using?	**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 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	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

Baseline UA Total	186.4	**Proposed UA Total**	184.0
Required Credits	4.5	**Proposed Credits**	6.5 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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	795 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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		115.5	34.7
								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	1,207	65
			Sum of Area and UA	1,207	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		134	72
				Sum of Perimeter and FP	134	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	Conditioned 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	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	184	
Envelope Heat Load Sum of UA X ΔT	9,383 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	13,105 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	13,105 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	16,382 Btu / Hour	

Project Information
East Town Crossing, Unit 108
Building G
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

* 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 -- 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 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	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

Baseline UA Total	177.7	**Proposed UA Total**	175.5
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.3%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	765 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	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

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

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		126	68
				Sum of Perimeter and FP	126	68

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	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 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	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	175	
Envelope Heat Load Sum of UA X ΔT	8,949 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	12,531 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	15,664 Btu / Hour	

Project Information
East Town Crossing, Unit 201
Building G
Pioneer & Shaw, Puyallup

Contact Information
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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?	**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 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	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	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	114.3	**Proposed UA Total**	111.8
Required Credits	4.5	**Proposed Credits**	6.5 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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	795 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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	115.5	34.7
									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	1,207	65
			Sum of Area and UA	1,207	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
				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	Conditioned 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	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	112	
Envelope Heat Load Sum of UA X ΔT	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,426 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	11,782 Btu / Hour	

Project Information
East Town Crossing, Unit 202
Building G
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 -- 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 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	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

Baseline UA Total	109.8	**Proposed UA Total**	107.5
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.1%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	765 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	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

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	1,128	61
			Sum of Area and UA	1,128	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	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 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	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	108	
Envelope Heat Load Sum of UA X ΔT	5,485 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,066 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	11,333 Btu / Hour	

Project Information
East Town Crossing, Unit 203
Building G
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

* 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 -- 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 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	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

Baseline UA Total	87.0	**Proposed UA Total**	84.9
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.5%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	628 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6	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 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	1,083	58
			Sum of Area and UA	1,083	58

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Conditioned 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	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 ΔT	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	7,269 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	9,086 Btu / Hour	

Project Information
East Town Crossing, Unit 204
Building G
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

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	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

Baseline UA Total	95.0	**Proposed UA Total**	92.7
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.4%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	732 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height 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 and UA		63.0	18.9
								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	1,144	62
			Sum of Area and UA	1,144	62

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	Conditioned 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	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 ΔT	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	8,155 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	10,194 Btu / Hour	

Project Information
East Town Crossing, Unit 205
Building G
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

* 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 -- 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 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	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

Baseline UA Total	87.0	**Proposed UA Total**	84.9
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.5%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	628 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6	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 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	1,083	58
			Sum of Area and UA	**1,083**	**58**

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Conditioned 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	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 ΔT	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	7,269 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	9,086 Btu / Hour	

Project Information
East Town Crossing, Unit 206
Building G
Pioneer & Shaw, Puyallup

Contact Information
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Brett Lindsay
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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

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	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

Baseline UA Total	95.0	**Proposed UA Total**	92.7
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.4%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	732 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height 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 and UA	**63.0**	**18.9**
									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	1,144	62
			Sum of Area and UA	**1,144**	**62**

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	Conditioned 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	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 ΔT	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	8,155 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	10,194 Btu / Hour	

Project Information
East Town Crossing, Unit 207
Building G
Pioneer & Shaw, Puyallup

Contact Information
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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?	**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 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	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	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	114.3	**Proposed UA Total**	111.8
Required Credits	4.5	**Proposed Credits**	6.5 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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	795 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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	115.5	34.7
									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	1,207	65
			Sum of Area and UA	1,207	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	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 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	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	112	
Envelope Heat Load Sum of UA X ΔT	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,426 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	11,782 Btu / Hour	

Project Information
East Town Crossing, Unit 208
Building G
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 -- 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 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	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

Baseline UA Total	109.8	**Proposed UA Total**	107.5
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.1%
		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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	764 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	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

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	1,128	61
			Sum of Area and UA	1,128	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	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 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	764 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,494 ft3	
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	108	
Envelope Heat Load Sum of UA X ΔT	5,485 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,062 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	11,327 Btu / Hour	

Project Information
East Town Crossing, Unit 301
Building G
Pioneer & Shaw, Puyallup

Contact Information
Synthesis 9, LLC
Brett Lindsay
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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 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	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

Baseline UA Total	127.5	**Proposed UA Total**	125.4
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.7%
		UA Reduction	2.1

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	795 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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	115.5	34.7
									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 (Code Baseline, Option 1.1-1.4)	10-7	0.027	795	21.5
			Sum of Area and UA	795	21.5

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	1,060	57
			Sum of Area and UA	1,060	57

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	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 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	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 ΔT	6,394 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	10,116 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	10,116 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	12,645 Btu / Hour	

Project Information
East Town Crossing, Unit 302
Building G
Pioneer & Shaw, Puyallup

Contact Information
Synthesis 9, LLC
Brett Lindsay
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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 -- 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 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	116	34.7	0.300	116	34.7
Flat/Vaulted Ceilings U =	0.027	765	20.7	0.027	765	20.7
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

Baseline UA Total	122.7	**Proposed UA Total**	120.7
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.6%
		UA Reduction	2.0

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	765 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	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**

Flat/Vaulted Ceilings

Plan ID	Component Description	Ref.	Attic U	Area	UA
	R49 blown Attic STD baffled (Code Baseline, Option 1.1-1.4)	10-7	0.027	765	20.7
			Sum of Area and UA	**765**	**20.7**

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	989	53
			Sum of Area and UA	**989**	**53**

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	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 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	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 ΔT	6,157	Btu / Hour
Air Leakage Heat Load ((Volume X 0.6) X ΔT) 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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	9,739	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	12,173	Btu / Hour

Project Information
East Town Crossing, Unit 303
Building G
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

* 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 -- 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 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	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

Baseline UA Total	96.9	**Proposed UA Total**	95.0
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.0%
		UA Reduction	1.9

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	628 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6	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 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 (Code Baseline, Option 1.1-1.4)	10-7	0.027	628	17.0
			Sum of Area and UA	**628**	**17.0**

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	957	52
			Sum of Area and UA	**957**	**52**

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	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 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	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	95	
Envelope Heat Load Sum of UA X ΔT	4,846 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	7,786 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	7,786 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	9,733 Btu / Hour	

Project Information
East Town Crossing, Unit 304
Building G
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?	**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 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	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

Baseline UA Total	107.2	**Proposed UA Total**	105.2
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.9%
		UA Reduction	2.0

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	732 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	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 and UA	**63.0**	**18.9**
									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 (Code Baseline, Option 1.1-1.4)	10-7	0.027	732	19.8
			Sum of Area and UA	**732**	**19.8**

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	1,010	55
			Sum of Area and UA	**1,010**	**55**

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	Conditioned 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	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	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	8,792 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	10,990 Btu / Hour	

Project Information
East Town Crossing, Unit 305
Building G
Pioneer & Shaw, Puyallup

Contact Information
Synthesis 9, LLC
Brett Lindsay
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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

* 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 -- 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 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	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

Baseline UA Total	96.9	**Proposed UA Total**	95.0
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	2.0%
		UA Reduction	1.9

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 3.6**	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

Conditioned Floor Area, Proposed Design	628 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
	Exempt			-						-	-
1	3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	4	0	24.0	7.20
2	6	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 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 (Code Baseline, Option 1.1-1.4)	10-7	0.027	628	17.0
			Sum of Area and UA	**628**	**17.0**

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	957	52
			Sum of Area and UA	**957**	**52**

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

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

Is this a hydronic heating system?	No
Location of Ducts	Unducted
Location of Air Handler	Conditioned 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	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	95	
Envelope Heat Load Sum of UA X ΔT	4,846 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	7,786 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	7,786 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	9,733 Btu / Hour	

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East Town Crossing, Unit 306
Building G
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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?	**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 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	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

Baseline UA Total	107.2	**Proposed UA Total**	105.2
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.9%
		UA Reduction	2.0

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	732 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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: 2

	Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Width Inch	Height Feet	Height 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 and UA		**63.0**	**18.9**
								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 (Code Baseline, Option 1.1-1.4)	10-7	0.027	732	19.8
			Sum of Area and UA	**732**	**19.8**

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	1,010	55
			Sum of Area and UA	**1,010**	**55**

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	Conditioned 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	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	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 For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1	8,792 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	10,990 Btu / Hour	

Project Information
East Town Crossing, Unit 307
Building G
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 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	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

Baseline UA Total	127.5	**Proposed UA Total**	125.4
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.7%
		UA Reduction	2.1

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	795 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	3	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	4	0	72.0	21.60
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	115.5	34.7
									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 (Code Baseline, Option 1.1-1.4)	10-7	0.027	795	21.5
			Sum of Area and UA	795	21.5

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	1,060	57
			Sum of Area and UA	1,060	57

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	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 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	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 ΔT	6,394 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	10,116 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	10,116 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	12,645 Btu / Hour	

Project Information
East Town Crossing, Unit 308
Building G
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 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	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

Baseline UA Total	122.7	**Proposed UA Total**	120.7
Required Credits	4.5	**Proposed Credits**	6.5 from Tables 406.2 and 406.3
		UA Percent Reduction	1.6%
		UA Reduction	2.0

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	5.5	6.5

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 3.6**	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

Conditioned Floor Area, Proposed Design	764 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
A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
B	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	2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	6	0	36.0	10.80
3	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**

Flat/Vaulted Ceilings

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

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	989	53
			Sum of Area and UA	**989**	**53**

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	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 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	764 ft2	
Conditioned Volume Leave blank to use default of 8.5 ft. ceiling height	6,494 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 ΔT	6,156 Btu / Hour	
Air Leakage Heat Load ((Volume X 0.6) X ΔT) X .018))	3,577 Btu / Hour	
Building Design Heat Load Air Leakage + Envelope Heat Loss	9,733 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	9,733 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	12,166 Btu / Hour	