

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

Messages / Results *
UA Reduction = 2.63, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1150 sq. ft. Code 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

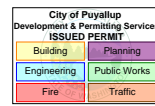
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	143	42.8	0.300	143	42.8
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,314	73.6	0.054	1,314	71.0
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	148	79.9	0.540	148	79.9
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		208.3	Proposed UA Total		205.6
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.3%
				UA Reduction		2.6
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		148	80
Sum of Perimeter and FP					148	80

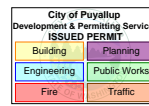
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	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://betterbuiltinw.com/resources/hvac-sizing-tool
Nearest Weather Station		Puyallup
Indoor Design Temperature		70 F
Outdoor Design Temperature		19 F
Design Temperature Difference (ΔT)		51 F
Conditioned Floor Area, Proposed Design		1,150 ft ²
Conditioned Volume		9,775 ft ³
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		206
Envelope Heat Load		10,487 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,384 Btu / Hour
<small>((Volume X 0.6) X ΔT) X 0.018</small>		
Building Design Heat Load		15,871 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		15,871 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		19,839 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 102 Building C Pioneer & Shaw, Puyallup
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Messages / Results *
UA Reduction = 2.76, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1075 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

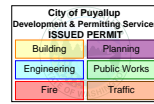
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	120	36.0	0.300	120	36.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,378	77.2	0.054	1,378	74.4
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	152	82.1	0.540	152	82.1
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		207.2	Proposed UA Total		204.5
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.3%
				UA Reduction		2.8
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		152	82
Sum of Perimeter and FP					152	82

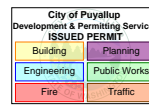
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,075 ft2	
Conditioned Volume	9,138 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	204	
Envelope Heat Load	10,429 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	5,033 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	15,462 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	15,462 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	19,328 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 103 Building C Pioneer & Shaw, Puyallup
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Messages / Results *
UA Reduction = 2.58, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1055 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,291	72.3	0.054	1,291	69.7
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	141	76.1	0.540	141	76.1
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		187.4	Proposed UA Total		184.9
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.4%
				UA Reduction		2.6

from Tables 406.2 and 406.3

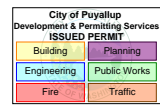
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		141	76
Sum of Perimeter and FP					141	76

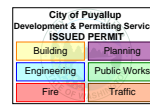
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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	70 CFM		

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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		1,055 ft2
Conditioned Volume		8,968 ft3
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		185
Envelope Heat Load		9,428 Btu / Hour
Sum of UA X ΔT		
Air Leakage Heat Load		4,939 Btu / Hour
((Volume X 0.6) X ΔT) X 0.018)		
Building Design Heat Load		14,367 Btu / Hour
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		14,367 Btu / Hour
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		
Maximum Heat Equipment Output		17,959 Btu / Hour
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		



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Messages / Results *
UA Reduction = 2.66, 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 -- 986 sq. ft. Code 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

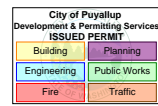
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	75	22.5	0.300	75	22.5
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,329	74.4	0.054	1,329	71.8
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	143	77.2	0.540	143	77.2
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		186.2	Proposed UA Total		183.5
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.4%
				UA Reduction		2.7
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table 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	Option 2.2	1.5	2.0 ACH50 / Heat Recovery Ventilation min eff 65% / For R2, 0.25 cfm per ft2 at 50 Pa / HRV with min SHR eff of 0.65	
3	High Efficiency HVAC	Option 3.4	2.0	Ductless Split System, Zonal Control. Min HSPF of 10.	
4	High Efficiency HVAC Distribution System		NA		
5.1	Efficient Water Heating		0.0		
5.2-5.6	Efficient Water Heating	Option 5.5	2.5	NEEA Tier 3 heat pump water heater	
6	Renewable Electric Energy		kWh	0.0	
7	Appliance Package			0.0	
Energy Credits			6.0		

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		143	77
Sum of Perimeter and FP					143	77

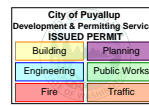
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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		986 ft2
Conditioned Volume		8,381 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		184
Envelope Heat Load		9,359 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,616 Btu / Hour
<small>((Volume X 0.6) X ΔT) X 0.18)</small>		
Building Design Heat Load		13,975 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,975 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		17,469 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 105 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.58, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1055 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,291	72.3	0.054	1,291	69.7
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	141	76.1	0.540	141	76.1
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		187.4	Proposed UA Total		184.9
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.4%
				UA Reduction		2.6

from Tables 406.2 and 406.3

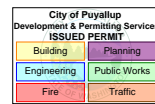
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		141	76
Sum of Perimeter and FP					141	76

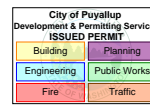
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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	70 CFM		

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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	1,055 ft2	
Conditioned Volume	8,968 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window	185	
Envelope Heat Load	9,428 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,939 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X 0.018)</small>		
Building Design Heat Load	14,367 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	14,367 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	17,959 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 106 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.56, 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 -- 986 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	120	36.0	0.300	120	36.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,282	71.8	0.054	1,282	69.2
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	143	77.2	0.540	143	77.2
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			197.0	Proposed UA Total		194.4
Required Credits			4.5	Proposed Credits		7.0
				UA Percent Reduction		1.3%
				UA Reduction		2.6

from Tables 406.2 and 406.3

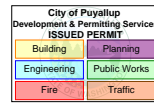
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		143	77
Sum of Perimeter and FP					143	77

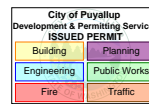
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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		986 ft2
Conditioned Volume		8,381 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		194
Envelope Heat Load		9,917 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		4,616 Btu / Hour
<small>((Volume X 0.6) X ΔT) X 0.018)</small>		
Building Design Heat Load		14,533 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		14,533 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		18,166 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 107 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.6, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1149 sq. ft. Code 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

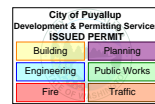
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	158	47.3	0.300	158	47.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,299	72.7	0.054	1,299	70.1
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	148	79.9	0.540	148	79.9
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		211.9	Proposed UA Total		209.3
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.2%
				UA Reduction		2.6
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		148	80
Sum of Perimeter and FP					148	80

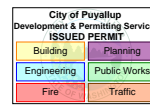
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	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		1,149 ft2
Conditioned Volume		9,767 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		209
Envelope Heat Load		10,675 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,379 Btu / Hour
<small>((Volume X 0.6) X ΔT) X 0.018</small>		
Building Design Heat Load		16,055 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		16,055 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		20,068 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



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

Messages / Results *
UA Reduction = 2.58, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1075 sq. ft. Code 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

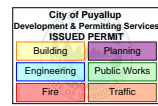
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	210	63.0	0.300	210	63.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,288	72.1	0.054	1,288	69.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	152	82.1	0.540	152	82.1
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		229.2	Proposed UA Total		226.6
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.1%
				UA Reduction		2.6
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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		152	82
Sum of Perimeter and FP					152	82

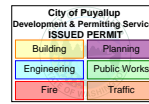
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,075 ft2	
Conditioned Volume	9,138 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	227	
Envelope Heat Load	11,558 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	5,033 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	16,591 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	16,591 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	20,739 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 201 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.63, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1150 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	158	47.3	0.300	158	47.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,314	73.6	0.054	1,314	71.0
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			132.8	Proposed UA Total		130.2
Required Credits			4.5	Proposed Credits		7.0
				UA Percent Reduction		2.0%
				UA Reduction		2.6

from Tables 406.2 and 406.3

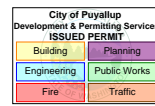
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

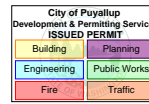
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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		1,150 ft2
Conditioned Volume		9,775 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		130
Envelope Heat Load		6,641 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,384 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		12,025 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		12,025 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		15,031 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 202 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.73, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1075 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	135	40.5	0.300	135	40.5
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,363	76.3	0.054	1,363	73.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
Baseline UA Total			128.8			126.1
Required Credits			4.5			7.0
						2.1% from Tables 406.2 and 406.3
						UA Reduction 2.7

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

Table R406.2 Fuel Normalization Credits

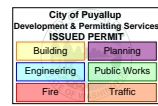
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

Table R406.3 Energy Credits

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

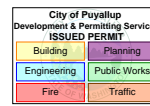
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,075 ft2	
Conditioned Volume	9,138 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	126	
Envelope Heat Load	6,431 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	5,033 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	11,464 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	11,464 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	14,330 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 203 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.62, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1055 sq. ft. Code 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

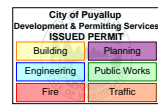
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,311	73.4	0.054	1,311	70.8
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		112.4	Proposed UA Total		109.8
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction 2.3% <small>from Tables 406.2 and 406.3</small>		
				UA Reduction 2.6		
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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	

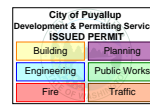
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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	70 CFM		

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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	1,055 ft2	
Conditioned Volume	8,968 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window	110	
Envelope Heat Load	5,599 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,939 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X 0.018)</small>		
Building Design Heat Load	10,539 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	10,539 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	13,173 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 204 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.71, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1005 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,353	75.8	0.054	1,353	73.1
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
Baseline UA Total			114.8			112.1
Required Credits			4.5			7.0
						2.4%
						2.7

from Tables 406.2 and 406.3

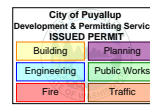
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

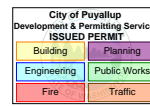
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,005 ft2	
Conditioned Volume	8,543 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	112	
Envelope Heat Load	5,715 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,705 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	10,420 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	10,420 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	13,025 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 205 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.58, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1055 sq. ft. Code 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

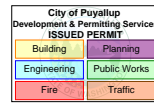
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,291	72.3	0.054	1,291	69.7
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		111.3	Proposed UA Total		108.7
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction 2.3% <small>from Tables 406.2 and 406.3</small>		
				UA Reduction 2.6		
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

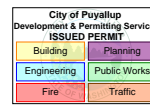
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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	70 CFM		

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		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	1,055 ft2	
Conditioned Volume	8,968 ft3	
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window	109	
Envelope Heat Load	5,544 Btu / Hour	
Sum of UA X ΔT		
Air Leakage Heat Load	4,939 Btu / Hour	
((Volume X 0.6) X ΔT) X 0.018)		
Building Design Heat Load	10,484 Btu / Hour	
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load	10,484 Btu / Hour	
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		
Maximum Heat Equipment Output	13,105 Btu / Hour	
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		



Project Information
East Town Crossing Unit 206 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.71, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1005 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,353	75.8	0.054	1,353	73.1
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
Baseline UA Total			114.8			112.1
Required Credits			4.5			7.0
						2.4%
						2.7

from Tables 406.2 and 406.3

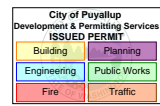
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

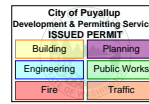
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,005 ft2	
Conditioned Volume	8,543 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	112	
Envelope Heat Load	5,715 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,705 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	10,420 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	10,420 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	13,025 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



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

Messages / Results *
UA Reduction = 2.6, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1149 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	158	47.3	0.300	158	47.3
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,299	72.7	0.054	1,299	70.1
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
Baseline UA Total			132.0	Proposed UA Total		129.4
Required Credits			4.5	Proposed Credits		7.0
				UA Percent Reduction		2.0%
				UA Reduction		2.6

from Tables 406.2 and 406.3

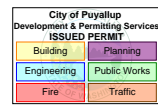
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

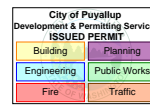
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	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		1,149 ft2
Conditioned Volume		9,767 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		129
Envelope Heat Load		6,599 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,379 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		11,979 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		11,979 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		14,973 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 208 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.73, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1075 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	135	40.5	0.300	135	40.5
Flat/Vaulted Ceilings U =	0.027	0	0.0		0	0.0
Wall (above grade) U =	0.056	1,363	76.3	0.054	1,363	73.6
Floors over Crawlspace U =	0.029	0	0.0		0	0.0
Slab on Grade F =	0.540	0	0.0		0	0.0
Below Grade Wall U =	0.042	0	0.0		0	0.0
Below Grade Slab F =	0.570	0	0.0		0	0.0
Baseline UA Total			128.8			126.1
Required Credits			4.5			7.0
						2.1% from Tables 406.2 and 406.3
						UA Reduction 2.7

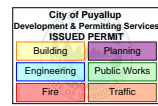
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

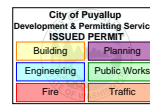
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,075 ft2	
Conditioned Volume	9,138 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	126	
Envelope Heat Load	6,431 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	5,033 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	11,464 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	11,464 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	14,330 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 301 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.33, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1151 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	158	47.3	0.300	158	47.3
Flat/Vaulted Ceilings U =	0.027	1,151	31.1	0.027	1,151	31.1
Wall (above grade) U =	0.056	1,167	65.4	0.054	1,167	63.0
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			155.7			153.3
Required Credits			4.5			7.0
				Proposed Credits		7.0
				UA Percent Reduction		1.5%
				UA Reduction		2.3

from Tables 406.2 and 406.3

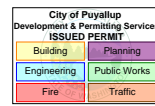
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

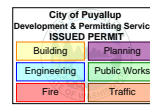
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	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		1,151 ft2
Conditioned Volume		9,784 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		153
Envelope Heat Load		7,821 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,389 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		13,209 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,209 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		16,512 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 302 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.45, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP
What code compliance pathway are you using? Prescriptive Path Compliance with Option 1 (preferred) Project Building Type? New Construction Occupancy Type? R2 Multifamily Code Version? WSEC 2018 Classification: Small Dwelling Unit -- 1075 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

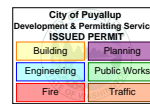
RESULTS - Comparison of Baseline and Proposed Design						
Component Performance, R occupancies			Proposed Design			
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	135	40.5	0.300	135	40.5
Flat/Vaulted Ceilings U =	0.027	1,075	29.0	0.027	1,075	29.0
Wall (above grade) U =	0.056	1,226	68.7	0.054	1,226	66.2
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		150.2	Proposed UA Total		147.7
	Required Credits		4.5	Proposed Credits		7.0
				UA Percent Reduction		1.6%
				UA Reduction		2.5
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.						

Table R406.2 Fuel Normalization Credits					
System No.	Full Description	Select System Type	Fuel Normalization Credits (406.2)	Energy Credits (406.3)	Total Credits (406.2 & 406.3)
2	For an initial heating system using a heat pump that meets federal standards for the equipment listed in Table C403.3.2(1)C or C403.3.2(2) OR Air to water heat pump units that are configured to provide both heating and cooling and are rated in accordance with AHRI 550/590. Heat pump with electric resistance or fossil-fuel supplemental heat requires compliance with WSEC 403.1.2 "Heat Pump Supplementary Heat". Packaged Terminal Heat Pumps (PTAC-HP) requires an HSPF tested value (See SBC Interpretation dated December 2020).	Heat Pump, air-to-air or air to water	1.0	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

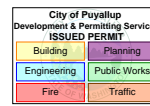
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,075 ft2	
Conditioned Volume	9,138 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	148	
Envelope Heat Load	7,534 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	5,033 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	12,567 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	12,567 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	15,709 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 303 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.33, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1055 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	1,055	28.5	0.027	1,055	28.5
Wall (above grade) U =	0.056	1,164	65.2	0.054	1,164	62.9
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			132.7			130.3
Required Credits			4.5			7.0
						1.8%
						2.3

from Tables 406.2 and 406.3

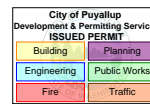
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

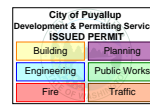
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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	70 CFM		

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		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		1,055 ft2
Conditioned Volume		8,968 ft3
Leave blank to use default of 8.5 ft. ceiling height		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		130
Envelope Heat Load		6,647 Btu / Hour
Sum of UA X ΔT		
Air Leakage Heat Load		4,939 Btu / Hour
((Volume X 0.6) X ΔT) X 0.018)		
Building Design Heat Load		11,587 Btu / Hour
Air Leakage + Envelope Heat Loss		
Building and Duct Heat Load		11,587 Btu / Hour
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		
Maximum Heat Equipment Output		14,483 Btu / Hour
Building and Duct Heat Loss X 1.25 for heat pumps		
Building and Duct Heat Loss X 1.40 for all other systems		



Project Information
East Town Crossing Unit 304 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.44, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1005 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	1,005	27.1	0.027	1,005	27.1
Wall (above grade) U =	0.056	1,221	68.4	0.054	1,221	65.9
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			134.5	Proposed UA Total		132.1
Required Credits			4.5	Proposed Credits		7.0
				UA Percent Reduction		1.8%
				UA Reduction		2.4

from Tables 406.2 and 406.3

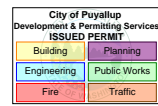
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

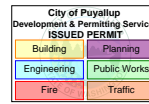
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits		
	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	1,005 ft2	
Conditioned Volume	8,543 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		132
Envelope Heat Load	6,736 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,705 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	11,441 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	11,441 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	14,301 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 305 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.33, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1055 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	1,055	28.5	0.027	1,055	28.5
Wall (above grade) U =	0.056	1,165	65.2	0.054	1,165	62.9
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			132.7	Proposed UA Total		130.4
Required Credits			4.5	Proposed Credits		7.0
				UA Percent Reduction		1.8%
				UA Reduction		2.3

from Tables 406.2 and 406.3

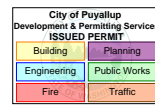
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

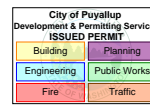
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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	70 CFM		

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

Links to Download Forms, Checklists and Other Resources		Link	
Compliance Certificate		Compliance Certificate	Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate	
Duct Testing Affidavits		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		1,055 ft2	
Conditioned Volume		8,968 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>			
HVAC System Type		Heat Pump	
Location of HVAC Distribution System		Unducted	
Sum of UA, including exempt door and window		130	
Envelope Heat Load		6,650 Btu / Hour	
<small>Sum of UA X ΔT</small>			
Air Leakage Heat Load		4,939 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X 0.018)</small>			
Building Design Heat Load		11,589 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>			
Building and Duct Heat Load		11,589 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>			
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>			
Maximum Heat Equipment Output		14,487 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>			
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>			



Project Information
East Town Crossing Unit 306 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.44, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1005 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	90	27.0	0.300	90	27.0
Flat/Vaulted Ceilings U =	0.027	1,005	27.1	0.027	1,005	27.1
Wall (above grade) U =	0.056	1,221	68.4	0.054	1,221	65.9
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			134.5	Proposed UA Total		132.1
Required Credits			4.5	Proposed Credits		7.0
				UA Percent Reduction		1.8%
				UA Reduction		2.4

from Tables 406.2 and 406.3

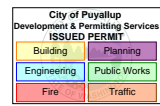
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

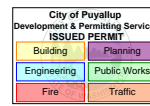
Below Grade Walls and Slabs								
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA
Sum of Area, Length and UA				0	0.0		0	0

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,005 ft2	
Conditioned Volume	8,543 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	132	
Envelope Heat Load	6,736 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	4,705 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	11,441 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	11,441 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	14,301 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 307 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.33, Proposed UA is better than baseline by 1%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1149 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	158	47.3	0.300	158	47.3
Flat/Vaulted Ceilings U =	0.027	1,149	31.0	0.027	1,149	31.0
Wall (above grade) U =	0.056	1,166	65.3	0.054	1,166	63.0
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			155.6			153.2
Required Credits			4.5			7.0
				Proposed Credits		7.0
				UA Percent Reduction		1.5%
				UA Reduction		2.3

from Tables 406.2 and 406.3

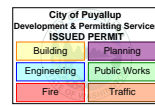
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



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

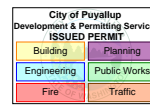
Below Grade Walls and Slabs									
Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Perim	Slab UA	
Sum of Area, Length and UA				0	0.0		0	0	

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

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

Links to Download Forms, Checklists and Other Resources		Link
Compliance Certificate		Compliance Certificate Instructions
Insulation Certificate for Residential New Construction		Insulation Certificate
Duct Testing Affidavits	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		1,149 ft2
Conditioned Volume		9,767 ft3
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type		Heat Pump
Location of HVAC Distribution System		Unducted
Sum of UA, including exempt door and window		153
Envelope Heat Load		7,815 Btu / Hour
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load		5,379 Btu / Hour
<small>((Volume X 0.6) X ΔT) X .018</small>		
Building Design Heat Load		13,194 Btu / Hour
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load		13,194 Btu / Hour
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output		16,493 Btu / Hour
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		



Project Information
East Town Crossing Unit 308 Building C Pioneer & Shaw, Puyallup
Contact Information
Synthesis 9, LLC Brett Lindsay blindsay@synthesis9.com 253-468-4117

Messages / Results *
UA Reduction = 2.45, Proposed UA is better than baseline by 2%
Whole House Mechanical Ventilation Airflow Rate: 70 CFM with Run Time Percent of 100%, Balanced, Distributed

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

ANALYSIS SET UP

What code compliance pathway are you using?	Prescriptive Path Compliance with Option 1 (preferred)
Project Building Type?	New Construction
Occupancy Type?	R2 Multifamily
Code Version?	WSEC 2018
Classification:	Small Dwelling Unit -- 1075 sq. ft.
Baseline Description:	Code Baseline - Baseline and proposed window areas are equal.
About Your Selection:	Up to 15 sf exempt window and 24 sf exempt door allowable

RESULTS - Comparison of Baseline and Proposed Design

Component Performance, R occupancies	Baseline			Proposed Design		
	U	Area	UA	U	Area	UA
Doors U =	0.300	40	12.0	0.300	40	12.0
Overhead Glazing U =	0.500	0	0.0		0	0.0
Vertical Glazing U =	0.300	135	40.5	0.300	135	40.5
Flat/Vaulted Ceilings U =	0.027	1,075	29.0	0.027	1,075	29.0
Wall (above grade) U =	0.056	1,226	68.7	0.054	1,226	66.2
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			150.2			147.7
Required Credits			4.5			7.0
				Proposed Credits		7.0
				UA Percent Reduction		1.6%
				UA Reduction		2.5

from Tables 406.2 and 406.3

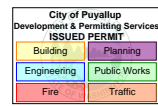
If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406 are ≥ those required in Section R406, then the home meets the WSEC.

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	6.0	7.0

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

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

THERMAL ENVELOPE DETAILS - Proposed Design



Conditioned Floor Area, Proposed Design	1,075	sq. ft
Classification Small Dwelling Unit		
Notes		

Exterior Doors										
Plan ID	Component Description	Ref.	Door U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	0.0
308A	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
308B	Code Baseline, U=0.30	-	0.30	1	3	0	6	8	20	6.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									0	0.0
									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

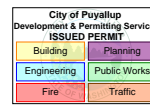
Overhead Glazing										
Plan ID	Component Description	Ref.	Glazing U	Qt.	Width		Height		Area	UA
Exempt					Feet	Inch	Feet	Inch		
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
									0	
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									0	
									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		Height		Area	UA		
Exempt					Feet	Inch	Feet	Inch				
1	U=0.30 (Code Baseline)	Table 406.2	0.30	3	6	0	5	0	90.0	27.00		
2	U=0.30 (Code Baseline)	Table 406.2	0.30	1	3	0	5	0	15.0	4.50		
3	U=0.30 (Code Baseline)	Table 406.2	0.30	1	6	0	5	0	30.0	9.00		
Sum of Area and UA									135.0	40.5		
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						1,075	29.0
Sum of Area and UA									1,075	29.0

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						1,226	66
Sum of Area and UA									1,226	66

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

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

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

Heating System Sizing - Proposed Design		Try Out BetterBuiltNW's HVAC Sizing Tool: https://betterbuiltnw.com/resources/hvac-sizing-tool
Nearest Weather Station	Puyallup	
Indoor Design Temperature	70 F	
Outdoor Design Temperature	19 F	
Design Temperature Difference (ΔT)	51 F	
Conditioned Floor Area, Proposed Design	1,075 ft2	
Conditioned Volume	9,138 ft3	
<small>Leave blank to use default of 8.5 ft. ceiling height</small>		
HVAC System Type	Heat Pump	
Location of HVAC Distribution System	Unducted	
Sum of UA, including exempt door and window	148	
Envelope Heat Load	7,534 Btu / Hour	
<small>Sum of UA X ΔT</small>		
Air Leakage Heat Load	5,033 Btu / Hour	
<small>((Volume X 0.6) X ΔT) X .018))</small>		
Building Design Heat Load	12,567 Btu / Hour	
<small>Air Leakage + Envelope Heat Loss</small>		
Building and Duct Heat Load	12,567 Btu / Hour	
<small>For ducts located in unconditioned space: Sum of Building Heat Loss X 1.1</small>		
<small>For ducts located in conditioned space or ductless: Sum of Building Heat Loss X 1</small>		
Maximum Heat Equipment Output	15,709 Btu / Hour	
<small>Building and Duct Heat Loss X 1.25 for heat pumps</small>		
<small>Building and Duct Heat Loss X 1.40 for all other systems</small>		