

2021 WSEC RESIDENTIAL ENERGY & IRC VENTILATION PRESCRIPTIVE COMPLIANCE FORM

ABOUT THE PRESCRIPTIVE COMPLIANCE FORM

The 2021 WSEC & IRC Ventilation requirements, as mandated by the State Building Code Council and the Washington State Legislature, are effective March 15, 2024. This form applies to new single-family homes and single-family home additions. R-2 occupancy sections are not included.

This prescriptive compliance form assists applicants in documenting compliance with the energy and ventilation codes. The following pages provide much of the required documentation for plan review. **The details noted in this form must also be shown on the drawings.**

FORM INSTRUCTIONS

- Step 1.** On page 3, specify heating options and energy credits using the Tables that follow. Full descriptions of Energy Options are provided on page 3, with descriptions of the credits beginning on page 5.
- Step 2.** On page 12, select the method of providing whole-house ventilation (see the system coefficient on the page).
- Step 3.** On page 15, complete the heating system size form.

FORM SECTIONS

Please utilize the below links to explore and navigate the various sections of this form.

[WSEC TABLE R402.1.3](#)
[ENERGY CREDITS](#)
[ENERGY CREDIT SUMMARY TABLES](#)
[ENERGY CREDIT DETAIL TABLES](#)
[WHOLE-HOUSE MECHANICAL VENTILATION \(PRESCRIPTIVE\) IRC M1505.4](#)
[GLAZING SCHEDULE](#)
[SIMPLE HEATING SYSTEM SIZE](#)
[DOCUMENTS REQUIRED PRIOR TO FINAL COMPLIANCE PUBLICATIONS & TOOLS](#)
[ENERGY CODE WORKSHEETS](#)
[FOOTNOTE TABLES](#)

Submittal Instructions

Complete & save this form before uploading it to MyBuildingPermit.com in the "File Upload" section along with the rest of the submittal documents.

Code Reference

Building & Construction
[Title 16 SMC](#)

Resources

[WSU Energy Program](#)

Questions?

[Submit Project Guidance](#)
[Visit the Permit Center](#)

City of Sammamish
801 228th Ave SE
Sammamish, WA 98075
www.sammamish.us

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WSEC TABLE R402.1.3

WSEC TABLE R402.1.3 INSULATION & FENESTRATION REQUIREMENTS BY COMPONENT ^a		
CLIMATE ZONE	MARINE 4	
	R-VALUE ^a	U-FACTOR ^a
Fenestration ^b	n/a	0.30
Skylight	n/a	0.50
Ceiling	60	n/a
Wood Frame Wall ^{g, i}	20+5 or 13+10*	n/a
Floor	30	n/a
Below Grade Wall ^{c, h}	10/15/21 int + 5TB	n/a
Slab ^{d, f} R-Value & Depth	10, 4 ft	n/a
For SI: 1 foot = 304.8 mm, ci = continuous insulation, int = intermediate framing		
* The Continuous Exterior Insulation requirement can be omitted using the "Total UA Alternative" in WSEC Section R402.1.5.		

Please see the [corresponding footnotes](#) for this table on page 17.

RADIANT SLAB

- ☐ R-10 foam insulation, continuous with thermal break (WSEC R402.2.9.1, Table R402.1.3 Footnote d.)

LIGHTING EFFICIENCY

- ☐ **Mandatory:** All permanently installed lighting fixtures will be high efficacy (WSEC R404.1)

GLAZING SCHEDULE

The glazing schedule is not necessary if using prescriptive U-values. It may be used to facilitate input on the heating size form when not using the WSU online form.

ENERGY CREDITS

The following Energy Efficiency Credits can be completed electronically by downloading the Single-Family Prescriptive Worksheet at energy.WSU.edu (under Prescriptive Method towards the middle of the page).

Each dwelling unit in a residential building shall comply with sufficient options from Table R406.2 (fuel normalization credits) and Table 406.3 (energy credits) to achieve the following minimum number of credits. To claim this credit, the building permit drawings shall specify the option selected and the maximum tested building air leakage and show the qualifying ventilation system and its control sequence of operation.

Energy Credits continued on next page

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ENERGY CREDITS CONTINUED

- ☐ **1. Small Dwelling Unit: 5.0 credits**
 - Dwelling units less than 1,500 sf in conditioned floor area with less than 300 sf of fenestration area.
 - Additions to existing building that are greater than 500 sf of heated floor area but less than 1,500 sf.
- ☐ **2. Medium Dwelling Unit: 8.0 credits**
 - All dwelling units that are not included in #1, #3, or #4
- ☐ **3. Large Dwelling Unit: 9.0 credits**
 - Dwelling units exceeding 5,000 sf of conditioned floor area
- ☐ **4. Additions 150 square feet to 500 square feet: 2.0 credits**
 - Additions less than 150 square feet are exempt

ENERGY CREDIT SUMMARY TABLES

Before selecting your credits on these Summary Tables, review the Energy Credit Detail Tables in the corresponding tables on pages 5-12.

Energy Equalization Credits - Summary of Table R406.2			
System Type	Description of Primary Heating Source	Credits select <u>ONE</u>	User Notes
1	Combustion heating minimum 80% eff. ^d	0.0 ☐	
2	Heat pump ^e [14.3 SEER 2 or 7.5 HSPF] with supplemental: electric heating (80% eff.) <u>or</u> a combo furnace	1.5 ☐	
3	Electric resistance heat only – forced air or zonal	0.5 ☐	
4 ^c	Heat pump ^f [14.3 SEER 2 or 7.5 HSPF] <u>or</u> Air-to-Water heat pump units – AHRI 550/590	3.0 ☐	
5	Electric resistance with: 1. Inverter driven ductless mini-split in largest zone; or 2. With <2kW or less total installed heating	2.0 ☐	

Please see the [corresponding footnotes](#) for this table on page 17.

Energy Options - Summary of Table R406.3			
Energy Options	Energy Credit Option Descriptions	Credits select <u>ONE</u> from each category ^d	User Notes
1.1	Efficient Building Envelope	0.5 ☐	
1.2	Efficient Building Envelope	1.0 ☐	

Energy Options - Summary of Table R406.3 continued on next page

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Energy Options - Summary of Table R406.3 Continued			
Energy Options	Energy Credit Option Descriptions	Credits select <u>ONE</u> from each category ^d	User Notes
1.3	Efficient Building Envelope	1.5 ☐	
1.4	Efficient Building Envelope	2.5 ☐	
2.1	Air Leakage Control and Efficient Ventilation	1.0 ☐	
2.2	Air Leakage Control and Efficient Ventilation	1.5 ☐	
2.3	Air Leakage Control and Efficient Ventilation	2.0 ☐	
3.1 ^a	High Efficiency HVAC	1.0 ☐	
3.2	High Efficiency HVAC	0.5 ☐	
3.3 ^a	High Efficiency HVAC	0.5 ☐	
3.4	High Efficiency HVAC	1.5 ☐	
3.5	High Efficiency HVAC	1.5 ☐	
3.6 ^a	High Efficiency HVAC	1.0 ☐	
3.7 ^{a, d, e}	High Efficiency HVAC	2.0 ☐	
3.8 ^{a, d}	High Efficiency HVAC	1.0 ☐	
3.9	High Efficiency HVAC	1.5 ☐	
3.10	High Efficiency HVAC	2.5 ☐	
3.11	High Efficiency HVAC	0.5 ☐	
4.1	High Efficiency HVAC Distribution System	0.5 ☐	
5.1 ^d	Efficient Water Heating	0.5 ☐	
5.2	Efficient Water Heating	0.5 ☐	
5.3	Efficient Water Heating	0.5 ☐	
5.4	Efficient Water Heating	1.0 ☐	
5.5	Efficient Water Heating	1.5 ☐	
5.6	Efficient Water Heating	2.0 ☐	
5.7	Efficient Water Heating	2.5 ☐	
5.8	Efficient Water Heating	2.5 ☐	
6.1	Renewable Electric Energy (4.5 credits max) <i>A 0.5 credit for each 600 kWh of electrical generation per housing unit provided annually by on-site wind or solar equipment is allowed (up to 4.5 credits).</i>	0.5 ☐ 1.0 ☐ 1.5 ☐ 2.0 ☐ 2.5 ☐ 3.0 ☐ 3.5 ☐ 4.0 ☐ 4.5 ☐	
7.1	Appliance Package	0.5 ☐	

TOTAL CREDITS _____

Please see the [corresponding footnotes](#) for this table on page 17.

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ENERGY CREDIT DETAIL TABLES

Energy Equalization Credits Table 406.2 – Energy Credits (Single Family)

System Type	Description of Primary Heating Source	Credit
1	For combustion heating equipment meeting minimum federal efficiency standards for the equipment listed in Table C403.3.2(5) or C403.3.2(6)	0
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 and supplemental heating provided by electric resistance or A combustion furnace meeting the minimum standards listed in Table C403.2(5) ^b	1.5
3	For heating system based on electric resistance only (either forced air or Zonal)	0.5
4	For heating system using heat pump that meets federal standards for the equipment listed in Table C403.3.2(2) or C403.3.2(9) or Air-to-water heat pump units that are configured to provide both heating and cooling that are rated in accordance with AHRI 550/590	3.0
5	For heating system based on electric resistance with: 1. Inverter-driven ductless mini-split heat pump system installed in the largest zone in dwelling or 2. With 2kW or less total installed heating capacity per dwelling.	2.0

Please see the [corresponding footnotes](#) for this table on page 17.

Table 406.3 – Energy Credits (Single Family)

1. EFFICIENT BUILDING ENVELOPE OPTIONS

Only one option from Items 1.1 through 1.4 may be selected in this category. Compliance with the conductive UA targets is demonstrated using Section R402.1.5, Total UA alternative, where $[1 - (\text{Proposed UA} / \text{Target UA})] > \text{the required \%UA reduction}$.

Option	Descriptions	Credit
1.1	Prescriptive compliance is based on Table R402.1.3 with the following modifications: Vertical fenestration U = 0.22	0.5
1.2	Prescriptive compliance is based on Table R402.1.3 with the following modifications: Vertical fenestration U = 0.25 Floor R-38 Slab on grade R-10 perimeter and under entire slab Below grade slab R-10 perimeter and under entire slab Or Compliance based on section R402.1.5: Reduce the Total conductive UA by 15%	1.0

Table 406.3 – Energy Credits (Single-Family) continued on next page

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Table 406.3 – Energy Credits (Single Family) Continued

1. EFFICIENT BUILDING ENVELOPE OPTIONS

Option	Descriptions	Credit
1.3	Prescriptive compliance is based on Table R402.1.1 with the following modifications: Vertical fenestration U = 0.18 Ceiling and single-rafter or joist-vaulted R-60 advanced Wood frame wall R-21 int plus R-12 ci Floor R-38 Basement wall R-21 int plus R-12 ci Slab on grade R-10 perimeter and under entire slab Below grade slab R-10 perimeter and under entire slab Or Compliance based on Section R402.1.5: Reduce the Total conductive UA by 22.5%	1.5
1.4	Prescriptive compliance is based on Table R402.1.3 with the following modifications: Vertical fenestration U = 0.18 Ceiling and single-rafter or joist vaulted R-60 advanced Wood frame wall R-21 plus R-16 ci Floor R-48 Basement wall R-21 int plus R-16 ci Slab on grade R-20 perimeter and under entire slab Below grade slab R-20 perimeter and under entire slab Or Compliance based on Section R402.1.5: Reduce the Total conductive UA by 30%	1.0

2. AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION OPTIONS

Only one option from Items 2.1 through 2.3 may be selected in this category.

Option	Descriptions	Credit
2.1	Compliance based on R402.4.1.2: Reduce the tested air leakage to 2.0 air changes per hour maximum at 50 Pascals And All whole house ventilation requirements as determined by Section M1505.3 of the International Residential Code or Section 403.8 of the International Mechanical Code shall be met with a heat recovery ventilation system with minimum sensible heat recovery efficiency of 0.65 To qualify to claim this credit, the building permit drawings shall specify the option being selected, the maximum tested building air leakage, and show the heat recovery ventilation system and (for Option 2.1) its control sequence of operation	1.0

2. Air Leakage Control & Efficient Ventilation Options continued on next page

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Table 406.3 – Energy Credits (Single Family) Continued

2. AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION OPTIONS - CONTINUED

Option	Descriptions	Credit
2.2	Compliance based on Section R402.4.1.2: Reduce the tested air leakage to 1.5 air changes per hour maximum at 50 Pascals And All whole house ventilation requirements as determined by Section M1505.3 of the International Residential Code or Section 403.8 of the International Mechanical Code shall be met with a heat recovery ventilation system with minimum sensible heat recovery efficiency of 0.75 To qualify to claim this credit, the building permit drawings shall specify the option being selected and the maximum tested building air leakage and show the heat recovery ventilation system.	1.5
2.3	Compliance based on Section R402.4.1.2: Reduce the tested air leakage to 0.6 air changes per hour maximum at 50 Pascals And All whole house ventilation requirements as determined by Section M1505.3 of the International Residential Code or Section 403.8 of the International Mechanical Code shall be met with a heat recovery ventilation system with minimum sensible heat recovery efficiency of 0.80. Duct insulation shall comply with Section R403.3.2 To qualify to claim this credit, the building permit drawings shall specify the option being selected and the maximum tested building air leakage and show the heat recovery ventilation system.	2.0

3. HIGH-EFFICIENCY HVAC EQUIPMENT OPTIONS

Only one option from Items 3.1 through 3.10 may be selected. Item 3.11 may be taken with items 3.1 or 3.3^c only. **Reference the appendix chart for the HSPF2 Rating conversions for the HVAC selections.**

Energy Credit Option	Old HSPF	HSPF2
3.2 and 3.3 ducted central heat pump	9.5	8.45
3.5 ductless heat pump in main living area and electric resistance in other rooms	10	8.9
3.6 ducted central heat pump	11	9.8
3.6 ducted central heat pump – NEED cc VCHP list	10	8.9
3.7 ductless heat pump with no electric resistance (except footnote a)	10	8.9
3.7 ductless heat pump with no electric resistance_<24,000 Btu (except footnote a)	9	8
3.1 ^a For a System Type 1 in Table R406.2: Energy Star-rated (U.S. North) Gas or propane furnace with minimum AFUE of 95% Or Energy Star rated (U.S. North) gas or propane boiler with minimum AFUE 90%. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heating equipment type, and the minimum equipment efficiency.		1.0

3. High-Efficiency HVAC Equipment Options continued on next page

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3. HIGH-EFFICIENCY HVAC EQUIPMENT OPTIONS CONTINUED		
Option	Descriptions	Credit
3.2 ^a	For secondary heating system serving System Type 2 in table R406.2: Air-source centrally ducted heat pump with minimum HSPF of 9.5 Or Energy Star-rated (U.S. North) Gas or propane boiler with minimum AFUE of 90%. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heating equipment type, and the minimum equipment efficiency.	0.5
3.3 ^{a, c, d}	Air-source, centrally ducted heat pump with minimum HSPF2 of 8.45 (HSPF of 9.5). In areas where the winter design temperature, as specified in Appendix RC, is 23°F or below, a cold climate heat pump found on the NEEP cc ASHP qualified product list shall be used. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heating equipment type, and the minimum equipment efficiency.	0.5
3.4 ^{a, d}	Closed-loop ground source heat pump, with a minimum COP of 3.3 or Open loop water source heat pump with a maximum pumping hydraulic head of 150 feet and minimum COP of 3.6. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heating equipment type, and the minimum equipment efficiency.	1.5
3.5 ^d	Ductless mini-split heat pump system, zonal control: In homes where the primary space heating system is zonal electric heating, a ductless mini-split heat pump system with a minimum HSPF2 of 9 (HSPF of 10.0) shall be installed and provide heating to the largest zone of the housing unit. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heating equipment type, and the minimum equipment efficiency.	1.5
3.6 ^a	Air-source, centrally ducted heat pump with minimum HSPF2 of 9.4 (HSPF of 11.0). A centrally ducted air source cold climate variable capacity heat pump (cc VCHP) found on the NEEP cc VCHP qualified product list with a minimum of 9 HSPF2 (10 HSPF) may be used to satisfy this requirement. In areas where the winter design temperature, as specified in Appendix RC, is 23°F or below, an air source centrally ducted heat pump shall be a cold climate variable capacity heat pump as listed on the NEEP-qualified product list. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heating equipment type, and the minimum equipment efficiency.	1.0
3.7 ^{a, d, e}	Ductless split system heat pumps with no electric resistance heating in the primary living areas. A ductless heat pump system with a minimum HSPF2 of 9 (HSPF of 10) shall be sized and installed to provide heat to the entire dwelling unit at the design outdoor temperature. Exception: in homes with total heating loads of 24,000 or less using multi-zone mini-split systems with nominal ratings of 24,000 or less, the minimum HSPFs to claim this credit shall be 8.19 HSPF2 (or 9 HSPF). To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heated floor area calculation, the heating equipment type(s), the minimum equipment efficiency, and total installed heat capacity (by equipment type).	2.0

3. High-Efficiency HVAC Equipment Options continued on next page

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Table 406.3 – Energy Credits (Single Family) Continued

3. HIGH-EFFICIENCY HVAC EQUIPMENT OPTIONS CONTINUED		
Option	Descriptions	Credit
3.8 ^{a, d}	Air-to-water heat pump with minimum COP of 3.2 at 47°F, rated in accordance with AHRI 550/590 by an accredited or certified testing lab. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the heated floor area calculation, the heating equipment type(s), the minimum equipment efficiency, and total installed heat capacity (by equipment type).	1.0
3.9	Gas-fired heat pump(s) meeting ANSI Z21.40.2 and Z21.40.4 or CSA, with a minimum UEF of 1.15.	1.5
3.10 ^f	Combination water heating and space heating system shall include one of the following: Gas-fired heat pump water heater(s) meeting Tier 2 of the NEEA Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the water heater equipment type, the minimum equipment efficiency, and, for solar water heating systems, the calculation of the minimum energy savings.	2.5
3.11 ^c	Connected thermostat meeting ENERGY STAR Certified Smart Thermostats/EPA ENERGY STAR specifications. To qualify to claim this credit, the building permit drawings shall specify the option being selected and the thermostat mode.	0.5

Please see the [corresponding footnotes](#) for this table on page 17.

4. HIGH-EFFICIENCY HVAC DISTRIBUTION SYSTEM OPTIONS		
Option	Description	Credit
4.1	HVAC equipment and associated duct system(s) installation shall comply with the requirements of Section R403.3.2. Electric resistance heat and ductless heat pumps are not permitted under this option. Direct combustion heating equipment with AFUE less than 80% is not permitted under this option. To qualify to claim this credit, the building permit drawings shall specify the option being selected and the heating equipment type, as well as show the location of the heating and cooling equipment and all the ductwork.	0.5

Table 406.3 – Energy Credits (Single Family) continued on next page

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Table 406.3 – Energy Credits (Single Family) Continued

5. EFFICIENT WATER HEATING OPTIONS

Item 5.1 can be combined with any option. However, only one option from items 5.2 - 5.8 may be selected.

Option	Descriptions	Credit
5.1	A drain water heat recovery unit(s) shall be installed, which captures wastewater heat from at least two showers, including tub/shower combinations. It is acceptable, but not required, for sink water to be connected. Unit shall have a minimum efficiency of 40% if installed for equal flow or a minimum efficiency of 54% if installed for unequal flow. Such units shall be rated in accordance with CSA B55.1 or IAPMO IGC 346-2017 and be so labeled. To qualify to claim this credit, the building permit drawings shall include a plumbing diagram that specifies the drain water heat recovery units and the plumbing layout needed to install it. Labels or other documentation shall be provided that demonstrates the unit complies with the standard.	0.5
5.2	For Compact Hot Water Distribution system credit, the volume shall store not more than 16 ounces of water between the nearest source of heated water and the termination of the fixture supply pipe, where calculated, using Section R403.5.2. Construction documents shall indicate the ounces of water in piping between the hot water source and the termination of the fixture supply. When the hot water source is the nearest primed plumbing loop or trunk, this must be primed with an On Demand recirculation pump and must run a dedicated ambient return line from the furthest fixture or end of loop to the water heater. To qualify for this credit, the dwelling must have a minimum of 1.5 bathrooms.	0.5
5.3	Water heating system shall include Energy Star-rated gas or propane water heater with a minimum UEF of 0.80. To qualify to claim this credit, building permit drawings shall specify the option being selected, the water heater equipment type, and the minimum equipment efficiency.	0.5
5.4	Water heating system shall include one of the following: - Energy Star-rated gas or propane water heater with a minimum UEF of 0.91. Or - Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating System. Or - Water heater heated by ground source heat pump meeting the requirements of Option 3.4. To qualify to claim this credit, building permit drawings must specify the option being selected, the water heater equipment type, and the minimum equipment efficiency. For solar water heating systems, the calculation of the minimum energy savings must also be specified.	1.0
5.5	Water heating system shall include one of the following: Gas-fired heat pump water heater(s) meeting Tier 2 of the NEEA Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the water heater equipment type, and the minimum equipment efficiency. For solar water heating systems, the calculation of the minimum energy savings must also be specified.	1.5

5. Efficient Water Heating Options continued on next page

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Table 406.3 – Energy Credits (Single Family) Continued

5. EFFICIENT WATER HEATING OPTIONS CONTINUED		
Option	Descriptions	Credit
5.6	Water heating system shall include one of the following: Electric heat pump water heater meeting the standards for Tier III of NEEA's advanced water heating specification. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the water heater equipment type, and the minimum equipment efficiency.	2.5
5.7	Water heating system shall include one of the following: Electric heat pump water heater with a minimum UEF of 2.9 and utilizing a split system configuration with the air-to-refrigerant heat exchanger located outdoors. Equipment shall meet Section 4 requirements for all units of the NEEA standard Advanced Water Heating Specification with the UEF noted above. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the water heater equipment type, and the minimum equipment efficiency.	2.5
5.8	Combination water heating and space heating system shall include one of the following: Gas-fired heat pump water heater(s) meeting Tier 2 of the NEEA Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. To qualify to claim this credit, the building permit drawings shall specify the option being selected, the water heater equipment type, and the minimum equipment efficiency. For solar water heating systems, the calculation of the minimum energy savings must also be specified.	2.5
6. RENEWABLE ELECTRIC ENERGY OPTIONS		
Option	Descriptions	Credit
6.1	For each 600 kWh of electrical generation per housing unit provided annually by on-site wind or solar equipment a 0.5 credit shall be allowed, up to 4.5 credits. Generation shall be calculated as follows: For solar electric systems, the design shall be demonstrated to meet this requirement using the National Renewable Energy Laboratory calculator PVWATTS or an alternative approved by the code official. Documentation noting solar access shall be included on the plans. For wind generation projects, designs shall document annual power generation based on the following factors: The wind turbine power curve, average annual wind speed at the site, frequency distribution of the wind speed at the site, and height of the tower. To qualify to claim this credit, the building permit drawings shall specify the option being selected, show the photovoltaic or wind turbine equipment type, provide documentation of solar and wind access, and include a calculation of the minimum annual energy power production.	0.5 - 4.5

Table 406.3 – Energy Credits (Single Family) continued on next page

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Table 406.3 – Energy Credits (Single Family) Continued

7. APPLIANCE PACKAGE OPTION		
Option	Description	Credit
7.1	All of the following appliances shall be new and installed in the dwelling unit and shall meet the following standards: 1. Dishwasher, standard – Energy Star rated, Most Efficient 2021 or Dishwasher, compact – Energy Star rated (Version 6.0) 2. Refrigerator (if provided) – Energy Star rated (Version 5.1) 3. Washing machine (Residential) – Energy Star rated (Version 8.1) 4. Dryer – Energy Star rated, Most Efficient 2022 To qualify to claim this credit, the building permit drawings shall specify the option being selected, show the appliance type, and provide documentation of Energy Star compliance. At the time of inspection, all appliances shall be installed and connected to utilities. Dryer ducts and exterior dryer vent caps are not permitted to be installed in the dwelling unit.	0.5

Please see the [corresponding footnotes](#) for this table on page 17.

WHOLE-HOUSE MECHANICAL VENTILATION (PRESCRIPTIVE) IRC M1505.4

Whole-house mechanical [ventilation](#) systems shall be designed in accordance with Sections [M1505.4.1](#) through [M1505.4.4](#). Additions less than 500 square ft. of conditioned floor space are exempt per IRC R102.7.1.

Which of the four prescriptive Whole-House Ventilation Systems will you be using?

- ☐ Exhaust Fans (M1505.4.1.2)
 ☐ Supply Fans (M1505.4.1.3)
 ☐ System, Balanced (M1505.4.1.4)
 ☐ Furnace Integrated Supply (M1505.4.1.5)

INSTRUCTIONS

1. **Select** the appropriate CFM rating required using Table M1505.4.3(1) (*next page left side*).

Airflow Rate Required: _____ CFM **This is the continuous Base CFM; enter into Section 4 below if applicable**

2. **Select** continuous or intermittent CFM (for intermittent complete #3 below).

- ☐ Continuous
 ☐ Intermittent
 Complete Section 3 (below)

3. **Intermittent only:** Use Table M1505.4.3(3) (*next page, top right*) for the intermittent fan run time.

Run time %: _____ **Run time factor:** _____ **Hour(s) per 4-hour cycle:** _____
 Per Table M1505.4.3.2 Per Table M1505.4.3.2
Airflow Rate: _____ **Intermittent Airflow Rate Required:** _____
 From Section 1 above **Enter the above into Base CFM below**

4. Complete Table M1505.4.3(2) (*green table on next page, mid-right*).

Select distributed (ducted throughout) or not distributed, and based on your selection, enter the applicable **SYSTEM FACTOR** into the System Factor box below. Note that most ERVs/HRVs are balanced.

Base CFM: _____ **System Factor:** _____ **Final CFM:** _____

Whole-House Mechanical Ventilation (Prescriptive) continued on next page

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WHOLE-HOUSE MECHANICAL VENTILATION (PRESCRIPTIVE) CONTINUED

Use the tables below to complete the steps on the prior page to determine the Final CFM rating.

TABLE M1505.4.3(1) WHOLE-HOUSE MECHANICAL VENTILATION AIRFLOW RATE					
DWELLING UNIT FLOOR AREA (SQUARE FEET)	NUMBER OF BEDROOMS				
	0-1	2	3	4	5 +
	AIRFLOW IN CFM				
< 500	30	30	35	45	50
501 – 1,000	30	35	40	50	55
1,001 – 1,500	30	40	45	55	60
1,501 – 2,500	35	45	50	60	65
2,001 – 2,500	40	50	55	65	70
2,501 – 3,000	45	55	60	70	75
3,001 – 3,500	50	60	65	75	80
3,501 – 4,000	55	65	70	80	85
4,001 – 4,500	60	70	75	85	90
4,501 – 5,000	65	75	80	90	95
*5,001 – 5,500	70	80	85	95	100
5,501 – 6,000	75	85	90	100	105
6,001 – 6,500	80	90	95	105	110
6,501 – 7,000	85	95	100	110	115

For SI: 1 square ft. = 0.0929 m², 1 cubic ft. per minute = 0.0004719 m³/s; *Expanded table incrementally, based on established values.

TABLE M1505.4.3(3) INTERMITTENT OFF WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS ^{a, b}				
RUN-TIME % IN EACH 4-HOUR SEGMENT	50%	66%	75%	100%
Factor ^a	2	1.5	1.3	1.0
a	For ventilation system run-time values between those given, the factors are permitted to be determined by interpolation.			
b	Extrapolation beyond the table is prohibited.			

TABLE M1505.4.3(2) SYSTEM FACTOR		
SYSTEM TYPE	DISTRIBUTED	NOT DISTRIBUTED
☐ Balanced	☐ 1.0	☐ 1.25
☐ Not Balanced	☐ 1.25	☐ 1.5

BALANCED WHOLE-HOUSE VENTILATION
Any combination of concurrently operating residential unit mechanical exhaust and mechanical supply in which the total mechanical exhaust airflow rate is within the greater of 10% or 5 cfm of the supply.

DISTRIBUTED WHOLE-HOUSE VENTILATION
It is considered distributed when it supplies outdoor air directly (not transfer air) to each habitable space and exhausts air from all kitchens and bathrooms directly outside.

TABLE M1505.4.4(1) MINIMUM LOCAL EXHAUST RATES		
AREA TO BE EXHAUSTED	EXHAUST RATES	
	INTERMITTENT	CONTINUOUS
Open Kitchens	In accordance with Sec. M1505.4.4.3	Not Permitted
Enclosed Kitchens	In accordance with Sec. M1505.4.4.3	5 ACH based on kitchen volume
Bathrooms-Toilet Rooms	50 cfm	20 cfm

City of
Sammamish
Community Development

The below can be completed electronically by downloading the Glazing Schedule at energy.WSU.edu.

Contact Information

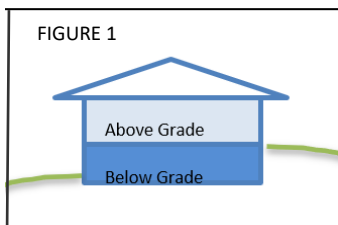
[illegible]

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SIMPLE HEATING SYSTEM SIZE

The below can be completed electronically. Please see the Heating System Sizing Calculator section at energy.WSU.edu. The heating system sizing calculator is based on the Prescriptive Requirements of the 2021 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This tool will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Project Information		Contact Information																																																																													
Heating System Type: ☐ All Other Systems ☐ Heat Pump																																																																															
To see detailed instructions for each section, place your cursor on the word "Instructions"																																																																															
Design Temperature Sammamish		Design Temperature 26 Design Temperature Difference (ΔT) 44 ΔT = Indoor (70 degrees) - Outdoor Design Temp																																																																													
Area of Building Conditioned Floor Area Conditioned Floor Area (sq ft)		Conditioned Volume																																																																													
Average Ceiling Height Average Ceiling Height (ft)		U-Factor X Area = UA X =																																																																													
Glazing and Doors Select U-Factor: U-0.30 through U-0.18		U-Factor X Area = UA 0.50 X =																																																																													
Skylights 		U-Factor X Area = UA X =																																																																													
Insulation Attic 		U-Factor X Area = UA X =																																																																													
R-60 = U-0.024; R-60 Adv. = U-0.017; R-49 = U-0.026; R-49 Adv. = U-0.020; R-38 = U-0.031; R-38 Adv. = U-0.026																																																																															
Single Rafter or Joist Vaulted Ceilings 		U-Factor X Area = UA X =																																																																													
R-60 = U-0.017; R-49 = U-0.020; R-38 = U-0.026																																																																															
Above Grade Walls (see Figure 1) 		U-Factor X Area = UA X =																																																																													
R-21 Int. = U-0.056; R-21 Int+R-4 ci = U-0.045; R-21 Int+R-5 ci = U-0.041; R-21 Int+R-12 = U-0.032 R-21 Int+R-16 ci = U-0.028																																																																															
Floors 		U-Factor X Area = UA X =																																																																													
R-30 = U-0.029; R-38 = U-0.025; R-48 = U-0.020																																																																															
Below Grade Walls and Slabs (see Figure 1) 		Wall U-Factor X Area = UA X =																																																																													
<table border="1"> <thead> <tr> <th rowspan="2">DEPTH</th> <th colspan="2">2"</th> <th colspan="2">3.5"</th> <th colspan="2">7"</th> </tr> <tr> <th>U-</th> <th>F-</th> <th>U-</th> <th>F-</th> <th>U-</th> <th>F-</th> </tr> </thead> <tbody> <tr> <td>WALL & SLAB</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>R-10 foam ext.</td> <td>0.271</td> <td>0.510</td> <td>0.075</td> <td>0.520</td> <td>0.058</td> <td>0.470</td> </tr> <tr> <td>R-11 batt</td> <td>0.185</td> <td>0.430</td> <td>0.058</td> <td>0.610</td> <td>0.051</td> <td>0.541</td> </tr> <tr> <td>R-12 foam ext.</td> <td>0.058</td> <td>0.470</td> <td>0.057</td> <td>0.570</td> <td>0.050</td> <td>0.420</td> </tr> <tr> <td>R-10 foam ext w/TB,</td> <td>0.055</td> <td>0.293</td> <td>0.064</td> <td>0.324</td> <td>0.055</td> <td>0.293</td> </tr> <tr> <td>R-10 full underslab</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>R-20 foam ext w/TB,</td> <td>0.029</td> <td>0.307</td> <td>0.038</td> <td>0.331</td> <td>0.034</td> <td>0.304</td> </tr> <tr> <td>R-10 full underslab</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>R-21 batt w/TB</td> <td>0.032</td> <td>0.505</td> <td>0.040</td> <td>0.560</td> <td>0.035</td> <td>0.500</td> </tr> </tbody> </table>		DEPTH	2"		3.5"		7"		U-	F-	U-	F-	U-	F-	WALL & SLAB							R-10 foam ext.	0.271	0.510	0.075	0.520	0.058	0.470	R-11 batt	0.185	0.430	0.058	0.610	0.051	0.541	R-12 foam ext.	0.058	0.470	0.057	0.570	0.050	0.420	R-10 foam ext w/TB,	0.055	0.293	0.064	0.324	0.055	0.293	R-10 full underslab							R-20 foam ext w/TB,	0.029	0.307	0.038	0.331	0.034	0.304	R-10 full underslab							R-21 batt w/TB	0.032	0.505	0.040	0.560	0.035	0.500	Slab F-Factor X Length = UA X =	
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Location of Ducts 		Duct Leakage Coefficient 																																																																													
Conditioned space = 1.000; Unconditioned space = 1.100; No ducts = 1.000																																																																															



Sum of UA
Envelope Heat Load Btu / Hour
Sum of UA x ΔT
Air Leakage Heat Load Btu / Hour
Volume x 0.6 x ΔT x 0.018
Building Design Heat Load Btu / Hour
Air leakage + envelope heat loss
Building and Duct Heat Load Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10
Ducts in conditioned space: sum of building heat loss x 1
Maximum Heat Equipment Output Btu / Hour
Building and duct heat loss x 1.40 for forced air furnace
Building and duct heat loss x 1.25 for heat pump

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DOCUMENTS REQUIRED PRIOR TO FINAL

- ☐ Insulation Certification (R303.1.1)
- ☐ Blower Door Test Result Form (R402.4.1.2)
- ☐ Duct Testing Affidavit (New or Existing Construction)
- ☐ Whole House Ventilation Flow Test
- ☐ Proof of Test Results for:
 - Blower Door (air leakage test);
 - Duct Leakage; and
 - Whole House Ventilation Tests
- ☐ WSEC 2021 Certificate

COMPLIANCE PUBLICATIONS & TOOLS

Available online: [energy.WSU.edu](https://energy.wsu.edu)

- Blower Door Test Result Form
- 2021 Prescriptive Energy Code Checklist
- Duct and Blower Door Test Hand Calculator
- Duct and Blower Door Test Calculator
- Duct Testing Standard (RS-33)
- Duct Testing Affidavit (New Construction)
- Duct Testing Affidavit (Existing Construction)
- Contact jurisdiction for a modifiable copy of the Duct Testing Affidavit, via WSU.edu, Energy Program
- Air Leakage Testing
- WSEC 2021 Certificate
- Insulation Certificate
- Getting to Know Your Ventilation System: Exhaust Type – Whole House
- Benefits of Duct Sealing

ENERGY CODE WORKSHEETS

Available online: [energy.WSU.edu](https://energy.wsu.edu)

- Total UA Alternative Worksheet – rarely used
- Alterations (Remodel) Worksheet
- Code Compliance Calculator

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FOOTNOTE TABLES

WSEC TABLE R402.1.3 FOOTNOTES

- a R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity that is less than the label or design thickness of the insulation, the compressed R-value of the insulation from Appendix A Table A101.4 of [chapter 51-11C WAC](#) shall not be less than the R-value specified in the table.
- b The fenestration U-factor column excludes skylights.
- c "10/15/21+5TB" means R-10 continuous insulation on the exterior of the wall, or R-15 continuous insulation on the interior of the wall, or R-21 cavity insulation plus a thermal break between the slab and the basement wall at the interior of the basement wall. "10/15/21+5TB" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the wall. "5TB" means R-5 thermal break between floor slab and basement wall.
- d R-10 continuous insulation is required under heated slab on grade floors. See R402.2.9.1.
- e For single-rafter- or joist-vaulted ceilings, the insulation may be reduced to R-38 if the full insulation depth extends over the top plate of the exterior wall.
- f R-7.5 continuous insulation installed over an existing slab is deemed to be equivalent to the required perimeter slab insulation when applied to existing slabs complying with Section R503.1.1. If foam plastic is used, it shall meet the requirements for thermal barriers protecting foam plastics.
- g For log structures developed in compliance with Standard ICC 400, log walls shall meet the requirements for climate zone 5 of ICC 400.
- h Int. (intermediate framing) denotes framing and insulation as described in Section A103.2.2, including standard framing 16 inches on center, 78% of the wall cavity insulated, and headers insulated with a minimum of R-10 insulation.
- i The first value is cavity insulation, and the second value is continuous insulation. Therefore, "R13+10" means R-13 cavity insulation plus R-10 continuous insulation.
- j A maximum U-factor of 0.32 shall apply to vertical fenestration products installed in buildings located above 4000 feet in elevation above sea level or in windborne debris regions where protection of openings is required under Section R301.2.1 of the International Residential Code.

ENERGY EQUALIZATION CREDITS - SUMMARY OF TABLE R406.2 FOOTNOTES

- a See Section R401.1 and the residential building in Section R202 for Group R-2 scope.
- b The gas backup furnace will operate as fan-only when the heat pump is operating. The heat pump shall operate at all temperatures above 38°F (3.3°C) (or lower). Below that "changeover" temperature, the heat pump would not operate to provide space heating. The gas furnace provides heating below 38°F (3.3°C) (or lower).
- c Additional points for the HVAC system are included in Table R406.3.
- d Equipment listed in Table C403.3.2(5) or C403.3.2(6)
- e Equipment listed in Table C403.3.2(2) or C403.3.2(5)
- f Equipment listed in Table C403.2(2) or C403.2(9)

ENERGY OPTIONS SUMMARY OF TABLE R406.3 FOOTNOTES

- a An alternative heating source sized at a maximum of 0.5 W/ft² (equivalent) of heated floor area or 500 W, whichever is bigger, may be installed in the dwelling unit.
- b See Section R401.1 and the residential building in Section R202 for Group R-2 scope.

Energy Options Summary of Table R406.3 Footnotes continued on next page

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ENERGY OPTIONS SUMMARY OF TABLE R406.3 FOOTNOTES CONTINUED

- c Option 3.11 can only be taken with Options 3.1 and 3.3. To qualify to claim option 3.11 with 3.3, the system shall be a 1-2 speed heat pump system. Variable capacity heat pumps are ineligible for claiming this option.
- d This option may only be claimed if serving System Type 4 or 5 from Table R406.2.
- e Primary living areas include living, dining, kitchen, family rooms, and similar areas.
- f Option 3.10 may only be taken with Efficient Water Heating Options 5.1 or 5.2. Equipment sizing for space heating shall be calculated as provided in Section R403.7 with increased capacity to provide a minimum of 75 percent of peak hot water demand or shall be sized in accordance with approved manufacturer's specifications or guidance. Supplementary heat for water heating system shall be in accordance with Section R403.5.7.