Residential Energy Code Worksheet

Reviewed for code compliance
with IRC 2015
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KITSAP COUNTY
Department of Community Development

CHANGES MUST Be Approved Prior To Performing Work

The Residential Energy Code Worksheet is a tool to help you plan your energy code needs for new or remodeled homes to ensure compliance with code requirements. More resources and a copy of the energy code, optional worksheets and glazing forms can be found here.

This document will cover the following features:

- **Heating, Ventilation and Air Conditioning (HVAC):** Requirements for efficiency of heating and cooling equipment for your house.
- **Building Envelope:** Requirements and options for roofs, walls, windows - these control heat loss and leakage.
- **Water Heating:** Equipment efficiency and controls

NOTE: All of the details of your energy efficiency plan selected in this document must be clearly shown on your construction plans in order for application to be approved.

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Is this an addition to an existing structure?
No

Heating Ventilation and Air Conditioning Requirements

All options for whole house ventilation shall provide outdoor air at a continuous rate of not less than the Airflow Rate shown below. This is automatically calculated in accordance with Tables M1507.3.3(1) & 1507.3.3(2) based on square footage of structure and number of bedrooms.

Select Proposed Heating Sytem, be sure to show on plans.
Ductless Heat System: Delivers heated and cooled air directly into zone.

Select Prescriptive Whole House Ventilation	Select Square Footage of Structure	Number of Bedrooms
Intermittent Exhaust Fan (See Exception Below)	<1,500	0-1

Run-Time Percentage in Each 4 Hour Segment (Applicable to Intermittent Exhaust Fan Only)
25%

Required Airflow CFM (Label on Plans):
30

Fan Size (Applicable to Intermittent Exhaust Fan Only):
120

Exception: The whole house mechanical ventilation system is permitted to operate intermittently where the system has control that enables operation for not less than 25% of each 4 hour segment. The ventilation rate below is multiplied by the run time factor in accordance with Table 1507.3.3(2) to determine required fan size.

Please note:

Exhaust fans are required in any room where water vapor, or cooking odor is produced, i.e. kitchen, bathroom, powder room, laundry room, indoor swimming pool, spa, etc. See Table M1507.4 for the minimum exhaust fan sizes. Minimum source specific ventilation - your proposed system shall not be less.

Table M1507.4

CFM=Cubic Feet per min.	Laundry rooms or Bathrooms	Kitchens
Intermittently Operating	50 cfm	100 cfm
Continuous Operation	20 cfm	25 cfm

Required Energy Credits

Conditioned Floor Area
<1,500 Square Feet

Minimum Required Energy Credits
1.5

Total Energy Credits Selected Below
1.5

Select Options to Meet Minimum Required Energy Credits

There are five categories below, select credits to meet the calculated minimum required energy credits. **As the number of credits increase, your home becomes more energy efficient! You may elect to exceed the required number of credits.**

All selected options must be shown on the construction plans.

Key Terms:

R-Value = Thermal Resistance, time rate of heat flow through a body.
U-Factor = Thermal Transmittance, heat transmission (air to air) through a building component, equal to the time rate of heat flow per unit area and unit temperature.
Fenestration = Fenestration windows and other products with glass and non-glass glazing materials.
Glazing = Glass part of windows

Water Heating Options

1. Use the dropdown to review credits available and read description to see if you qualify.
2. **Click Select Credit -Yes** next to the option you would like to add credits to your total credits selected. A list of your selected credits selected will automatically populate a summary on the next page.

To See Details and Select Credit Choose from Options Below
Efficient Water Heating 5a -- Lowflow fixtures

Select Credit?	Credits	EFFICIENT WATER HEATING 5a:
Yes	.5	**Verify you can meet all requirements below and then click Select Credit - Yes to update total Energy Credits Selected.** ***This credit may be used in addition to other Water Heating Options in this category.***

Qualified Lowflow Fixtures:
All showerhead and kitchen sink faucets installed in the house shall be rated at 1.75 GPM or less. All other lavatory faucets shall be rated at 1.0 GPM or less.*

To qualify to claim this credit, the building permit drawings shall:

- Show all fixtures: showerheads, kitchen sink faucets and other lavatory faucets.
- Label the maximum flow rates for all showerheads, kitchen sink faucets and other lavatory faucets.

***Plumbing Fixtures Flow Ratings.** Low flow plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following requirements:

1. Residential bathroom lavatory sink faucets: Maximum flow rate - 3.8 L/min (1.0 gal/min) when

tested in accordance with ASME A112.18.1/CSA B125.1.

2. Residential kitchen faucets: Maximum flow rate - 6.6 L/min (1.75 gal/min) when tested in accordance with ASME A112.18.1/CSA B125.1.
3. Residential showerheads: Maximum flow rate - 6.6 L/min (1.75 gal/min) when tested in accordance with ASME A112.18.1/CSA B125.1

HVAC Equipment Options

1. Use the dropdown to review credits available and read description to see if you qualify.
2. **Click Select Credit -Yes** next to the option you would like to add credits to your total credits selected. A list of your selected credits selected will automatically populate a summary on the next page.

***Projects may only include credit from one space heating option, 3a, 3b, 3c or 3d. When a housing unit has two pieces of equipment (i.e., two furnaces) both must meet the standard to receive the credit.**

To See Details and Select Credit Choose from Options Below
High Efficiency HVAC Equipment 3d -- Ductless split system heat pump, zonal control

Select This Option	Credits	HIGH EFFICIENCY HVAC EQUIPMENT 3d:*
Yes	1	DUCTLESS SPLIT SYSTEM HEAT PUMPS, ZONAL CONTROL: In homes where the primary space heating system is zonal electric heating, a ductless heat pump system shall be installed and provide heating to at least one zone of the housing unit. **To qualify to claim this credit, the building permit drawings shall:** • Show location of HVAC equipment in the applicable location

***Since you have selected 3d YOU MAY NOT CHOOSE 3a, 3b or 3c.**

When a housing unit has two pieces of equipment (i.e., two furnaces) both must meet the standard to receive the credit.

Whole House Air Leakage Control and Efficiency

These credits set a standard for a structure's air tightness using a Blower Door Test. This reduces energy consumption due to air leaks. If a credit from this section is selected, Blower Door Test results are required to be on site for final inspection. Each credit contains requirements for the maximum air leakage and whole house ventilation requirements.

1. Use the dropdown to review credits available and read description to see if you qualify.
2. **Click Select Credit -Yes** next to the option you would like to add credits to your total credits selected. A list of your selected credits selected will automatically populate a summary on the next page.

To See Details and Select Credit Choose from Options Below

Building Envelope (Windows, Walls, and Floors etc.)

These credits relate to whole house energy efficiency. Each credit contains requirements for insulation (R-Values) and energy efficient windows (U-Factor).

R-value: An insulating material's resistance to conductive heat flow is rated using an R-value -- *the higher the R-value, the more effective the insulation.*

U-factor: Indicates how much energy will be lost from a building through its windows -- *the lower the U-value, the more efficient.*

1. Use the dropdown to review credits available and read description to see if you can qualify.
2. **Click Select Credit -Yes** next to the option you would like to add credits to your total credits selected. A list of your selected credits selected will automatically populate a summary on the next

page.

***All options in this category require that you :**

- **Label R-Values and U-Factors on building permit drawing in the applicable location**
- **Submit completed Glazing Schedule Form or add to construction plans for review with this worksheet.**

To See Details and Select Credit Choose from Options Below

***Would you like to see table displaying prescriptive requirements to meet Washington State Energy Code for building envelope?**
Yes

Source Specific Ventilation System and requirements

Prescriptive Energy Compliance- Table 402.1.1.		
Climate Zone	5 & Marine 4	
	R-Value [a]	U-Factor [a]
Fenestration U-Factor [b]	n/a	0.30
Skylight U-Factor	n/a	0.50
Glazed Fenestration SHGC [b e]	n/a	n/a
Ceiling	49	0.026
Wood Frame Wall [g k l]	21 int	0.056
Mass Wall R-Value [i]	21/21 [h]	0.056
Floor	30 [g]	0.029
Below Grade Wall [c k]	10/15/21 int + TB	0.042
Slab [d] R-Value & Depth	10, 2 ft	n/a

WSEC Chapter 4 Residential Energy Efficiency) This project will use the requirements of the Prescriptive Path in table R402.1.1 and incorporate the minimum values listed. In addition, based on the size of the structure, the appropriate number of additional credits.

Footnotes for Table R402.1.1:

1 foot. = 304.8 mm, ci .= continuous insulation, int .= intermediate framing.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the compressed *R*-value of the insulation from Appendix Table A101.4 shall not be less than the *R*-value specified in the table.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

c. "10/15/21.+TB" means R-10 continuous insulation on the exterior of the wall, or R-15 on the 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.+TB" 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. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall. "TB" means 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. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1. g Reserved.

h. First value is cavity insulation, second is continuous insulation or insulated siding, so "13.+5" means R-13 cavity insulation plus R-5 continuous insulation or insulated siding. If structural sheathing covers 40 percent or less of the exterior, continuous insulation *R*-value shall be permitted to be reduced by no more than R-3 in the locations where structural sheathing is used to maintain a consistent total sheathing thickness.

i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.

j. For single rafter or joist-vaulted ceilings, the insulation may be reduced to R-38.

k. Int. (intermediate framing) denotes standard framing 16 inches on center with headers insulated with a minimum of R-10 insulation.

l. Log and solid timber walls with a minimum average thickness of 3.5 inches are exempt from this insulation requirement.

Would you like to see Renewable Energy credits for on-site wind or solar?
No

Summary of Total Energy Credits

Minimum must match selected

Minimum Required Energy Credits	Total Energy Credits Selected
1.5	1.5

Energy Credit Options Selected

HIGH EFFICIENCY HVAC EQUIPMENT 3d

EFFICIENT WATER HEATING 5a

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Clicking this button does not submit your completed worksheet for review!