

Washington State Energy Code
For single family and duplex construction
Prescriptive Method (2009 WSEC Chapter 6)

The prescriptive approach is the simplest method of WSEC code compliance. Meet all the minimum insulation levels required by one of the options, choose an additional credit and the project complies with the building envelope.

Washington State Energy Code Prescriptive Approach - Worksheet Instructions

For the Washington State Energy Code, the prescriptive approach is the simplest method of code compliance. However, depending on the prescriptive option and exceptions used, documentation of compliance can be quite complex.

This set of forms has been developed to assist permit applicants documenting compliance with the Washington State Energy Code, (2009 edition). These forms are provided as a compliance tool but it is the decision of each individual jurisdiction if completion of them is a submittal requirement. These forms contain embedded formulas and links. They are intended to be completed using Excel® software.

The following forms provide much of the required documentation for plan review. The details noted here must also be shown on the drawings (WSEC 104.2).

This form is not a substitute for the energy code itself. To obtain a copy of the energy code, go to the following web address. <http://www.energy.wsu.edu/code>

Which worksheets do I need to complete?

There are three worksheets included in this set of forms.

General Compliance Worksheet:

Glazing Schedule Worksheet:

Heating Sizing Worksheet:

Heating Sizing Worksheet:

The energy and residential code requires a heating and cooling sizing calculations for all projects. If you are using this set of worksheets to size the heating system, you will need to complete all the worksheets. **If a ACCA Manual J (or equivalent) heating and/or cooling system sizing calculation is submitted, the heating size worksheet does not need to be completed.** It is important to note that the codes also require a cooling system size calculation. This form will not provide the cooling calculation. It does not have the needed solar gains function. If a cooling system is included in the submission, perform a Manual J or equivalent calculation.

Glazing Schedule Worksheet:

There are three reasons to complete the Glazing Schedule. **If none apply to your project, you do not need to complete the Glazing Schedule worksheet.** A glazing schedule is required to meet the following conditions.

1. *The Prescriptive option includes a glazing to floor area limit (WSEC 602.7.2)*
2. *Not all the windows, skylights or doors comply with the maximum U-factor requirement. Qualification will be demonstrated using an area weighted window, skylight or door U-factor (WSEC 602.7.2)*
3. *As part of the heating and cooling system sizing calculation (IRC M1401.3 & WSEC 503.2.2)*

General Compliance worksheet:

The General Compliance worksheet documents the prescriptive option chosen to show compliance. It also provides a few checks on insulation compliance that need more detailed input. This worksheet is also used to document the reason for submission of the Glazing Worksheet.

If you are choosing a limited glazing area prescriptive option, completing the Glazing Schedule will be the first task.

Completing the General Compliance Worksheet

This is a simple fill in form.

Fill in project information on this worksheet. It will be copied to the other worksheets.

Note what options will be chosen to show compliance.

Note the glazing documentation included.

If you are using an unlimited glazing path, all windows and doors meet the maximum U-factor requirements and a Manual J (or approved alternative) heating system size calculation is submitted, this is the only form that needs to be completed.

Completing the Glazing Schedule Worksheet:

Exterior Doors:

The exterior door section is for swinging doors only. Enter sliding doors in the vertical glazing section of the worksheet.

If a swinging door includes glazing, it may be entered in the vertical glazing schedule or in the exterior door schedule.

Obtain NFRC tested U-factors from the door manufacturer or use U-factors from WSEC Tables.

Table 10-6A Default U-Factors for Vertical Glazing (use for doors with greater than 50% glazing.)

Table 10-6C Default U-factors for Doors (limited to doors with less than 50% glazing.)

Area of windows, doors and skylights are measured using the rough opening area.

Glazing area in exterior doors is added to the total glazing area of the project as follows:

If greater than 50%, 100% of the area is entered in the door glazing area.

If less than or equal to 50%, only the glazed area will be entered in the door glazing area.

Exempt Door: One door, 24 feet or less is not included in the U-factor of glazing area calculations. You must calculate the door area to assure it is 24 square feet or less. This also enters the door heat loss into the heating system size calculation.

Vertical and Horizontal Glazing:

Obtain NFRC tested U-factors from the glazing supplier. These will give the most accurate and likely the most favorable results. If you can't obtain this data, the tables in Chapter 10 of the WSEC must be used.

For default U-factors for vertical glazing, refer to table 10-6A

If window manufacturer can legitimately be claimed as a "small business" (as defined in Chapter 2 of the WSEC), you may use table 10-6B for default U-factors. Note: the term "small business" refers to the glazing manufacturer, not the builder or building owner.

For default U-factors for overhead glazing, refer to table 10-6E

If doors are being entered into the vertical glazing table, refer to table 10-6C and 10-6D.

Garden Window Exception Schedule

The WSEC allows double glazed, unrated garden windows with a wood or vinyl frame to be exempt from the U-factor calculation under the following rules.

The total area of this exemption is limited to 1 percent of the conditioned floor area up to a maximum

The area of the glazing must be multiplied by 3 and added to the total glazing area for the project.

Completing the Heating System Size Worksheet

This worksheet is used to calculate the design heat load of the structure. It also calculates the maximum heating system size required by code. This worksheet does not perform required cooling load calculations. Use Manual J or equivalent for cooling system size calculations.

Go to the Outdoor Design Temperature Worksheet Tab. Locate the outdoor design temperature for a location near the project site. [You need to enter the design temperature on this worksheet.](#)

Calculate and enter the volume of the interior space in the building (floor area x ceiling height).

Measure the dimensions of each exterior building assembly, wall, attic floor etc. Enter the area next to the R-value description that matches the construction. If a construction method is selected that is not represented here, select values from Chapter 10 of the WSEC and enter it in one of the blank spaces at the end of each components section.

Enter the correction factor for duct location. If the ducts are indoors, enter 1. If the ducts are in the crawl space, attic or garage, enter 1.15.

TABLE 9-1
ENERGY CREDITS (DEBITS)

<u>OPTION</u>	<u>DESCRIPTION</u>	<u>CREDIT(S)</u>
1a	<u>HIGH EFFICIENCY HVAC EQUIPMENT 1:</u> Gas, propane or oil-fired furnace or boiler with minimum AFUE of 92%, or Air-source heat pump with minimum HSPF of 8.5.	1
1b	<u>HIGH EFFICIENCY HVAC EQUIPMENT 2:</u> Closed-loop ground source heat pump; with a minimum COP of 3.3.	2
1c	<u>HIGH EFFICIENCY HVAC EQUIPMENT 3:</u> <u>DUCTLESS SPLIT SYSTEM HEAT PUMPS, ZONAL CONTROL:</u> In home 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.	1
2	<u>HIGH EFFICIENCY HVAC DISTRIBUTION</u> All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Locating system components in conditioned crawl spaces is not permitted under this option. Electric resistance heat is not permitted under this option. Direct combustion heating equipment with AFUE less than 80% is not permitted under this option.	1
3a	<u>EFFICIENT BUILDING ENVELOPE 1:</u> Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U = .28 floor R-38, slab on grade R-10 full, below grade slab R-10 full. or Component performance compliance: Reduce the Target UA from Table 5-1 by 5%, as determined using EQUATION 1.	0.5
3b	<u>EFFICIENT BUILDING ENVELOPE 2:</u> Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U = .25 and wall R-21 plus R-4 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full, and R-21 plus R-5 below grade basement walls. or Component performance compliance: Reduce the Target UA from Table 5.1 by 15%, as determined using EQUATION 1.	1
3c	<u>SUPER-EFFICIENT BUILDING ENVELOPE 3:</u>	

	<p>Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U = .22 and wall R-21 plus R-12 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full and R-21 plus R-12 below grade basement walls and R-49 advanced ceiling and vault.</p> <p>or</p> <p>Component performance compliance: Reduce the Target UA from Table 5.1 by 30%, as determined using EQUATION 1.</p>	2
4a	<p><u>AIR LEAKAGE CONTROL AND EFFICIENT</u> Envelope leakage reduced to SLA of 0.00020 building and</p> <p>All whole house ventilation requirements as determined by Section M1508 of the Washington State Residential Code shall be met with a heat recovery ventilation system in accordance with Section M1508.7 of that Code.</p>	0.5
4b	<p><u>ADDITIONAL AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION:</u> Envelope leakage reduced to SLA of 0.00015 building and</p> <p>All whole house ventilation requirements as determined by</p>	1
5a	<p><u>EFFICIENT WATER HEATING:</u>¹ Water heating system shall include one of the following: Gas, propane or oil water heater with a minimum EF of 0.62. or Electric Water Heater with a minimum EF of .93. and for both cases All showerhead and kitchen sink faucets installed in the house shall meet be rated at 1.75 GPM or less. All other lavatory faucets shall be rated at 1.0 GPM or less.²</p>	0.5
5b	<p><u>HIGH EFFICIENCY WATER HEATING:</u>¹ Water heating system shall include one of the following: Gas, propane or oil water heater with a minimum EF of 0.82. 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 Systems. or Electric heat pump water heater with a minimum EF of 2.0.</p>	1.5
6	<p><u>SMALL DWELLING UNIT 1:</u>¹ Dwelling units less than 1500 square feet in floor area with less than 300 square feet of window + door area. Additions to existing building that are less than 750 square feet of heated floor area.</p>	1
7	<p><u>LARGE DWELLING UNIT 1:</u>¹ Dwelling units exceeding 5000 square feet of floor area shall be assessed a deduction for purposes of complying with Section 901 of this Code.</p>	-1

8	<p><u>RENEWABLE ELECTRIC ENERGY:</u></p> <p>For each 1200 kWh of electrical generation provided annually by on-site wind or solar equipment a 0.5 credit shall be allowed, up to 3 credits. Generation shall be calculated as follows:</p> <p>For solar electric systems, the design shall be demonstrated to meet this requirement using the National Renewable Energy Laboratory calculator PVWATTS. Documentation noting solar access shall be included on the plans.</p> <p>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.</p>	0.5
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Footnotes:

1. Interior Duct Placement: Ducts included as Option 2 of Table 9-1 shall be placed wholly within the heated envelope of the housing unit. The placement shall be inspected and certified to receive the credits associated with this option.

EXCEPTION:

Ducts complying with this section may have up to 5% of the total linear feet of ducts located in the exterior cavities or buffer spaces of the dwelling. If this exception is used the ducts will be tested to the following standards:

Post-construction test: Leakage to outdoors shall be less than or equal to 1 CFM per 100 ft² of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

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

(a) 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.

(b) 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.

(c) 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

Overhead Glazing

Plan ID	Component Description	Glazing Ref.	Glazing U

Qt.	Width Feet	Height Feet		

Area	UA

Sum of Area and UA
Area Weighted U = UA/Area

Double Glazed Garden Windows Section 602.7.2 Exception

Plan ID	Component Description

Qt.	Width Feet	Height Feet		

Area	UA

Sum of Area
Sum of Area X 3 (This total is automatically included in the glazing area total.)
Glazing UA for Heating System Size Only = Area X 0.63
