

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, (2006 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 or ventilation codes, go to the following web address. <http://www.energy.wsu.edu/code/code2006.cfm>

Which worksheets do I need to complete?

There are three worksheets included in this set of forms.

Insulation 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 this 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)*

Insulation worksheet:

The insulation worksheet documents the prescriptive option chosen to show compliance. It also provides a few checks on insulation compliance that need more detailed input. This includes the rules for single rafter joist ceiling insulation, heated slabs and in Climate Zone 2, header insulation. 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 Insulation 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.

Note how you will be meeting the single rafter joist requirements.

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:

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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.

Single Glazing and Garden Window Exception Schedule

The WSEC allows single glazing and unrated garden windows 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'

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.

Prescriptive Energy Code Compliance for Single Family and Duplex Housing: Zone 1

Project Information

Contact Information

This set of forms has been developed to assist permit applicants documenting compliance with the Washington State Energy Code, (2006 edition). This set is for type R-3 and R-4 structures located in climate zone 1.

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).

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Option	Glazing Area ¹⁰ : % of Floor	Glazing U-Factor		Door ⁹ U-Factor	Ceiling ²	Vaulted Ceiling ³	Wall ¹² Above Grade	Wall· int ⁴ Below Grade	Wall· ext ⁴ Below Grade	Floor ⁵	Slab ⁶ on Grade
		Vertical	Overhead ¹¹								
<input type="checkbox"/> I.	10%	0.32	0.58	0.20	R-38	R-30	R15	R-15	R-10	R-30	R-10
<input type="checkbox"/> IV.	Unlimited Group R-3 and R-4 Occupancies Only	0.35	0.58	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10

See WSEC table 6-1 for footnotes

Glazing Schedule Attached to Document

Does not apply. (SEE INSTRUCTIONS)

Using Prescriptive Option IV. All glazing and doors meet maximum U-factor.

Alternate heating size method submitted

Option I, Glazing to floor area limit (WSEC 602.7.2)

Area weighted window, skylight or door U-factor (WSEC 602.7.2)

As part of the heating and cooling system sizing calculation (IRC M1401.3 & WSEC 503.2.2)

Single Rafter Joist R-value (Table 6-1 or 6-2, footnote 3)

Rafter Area (square feet)

Rafter Depth (inches)

First 500 Square feet: R-30

R-38 required, joist depth exceeds 13"

Area exceeding 500 Square feet:

R-38 required in all cases

Radiant slab:

R-10 foam insulation, continuous with thermal break (WSEC 502.1.4.9)

Overhead Glazing

Plan ID	Component Description	Ref.	Glazing U

Qt.	Width		Height	
	Feet	Inch	Feet	Inch

Area	UA

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

Single Glazing and Garden Windows Section 602.7.2 Exception

Plan ID	Component Description

Qt.	Width		Height	
	Feet	Inch	Feet	Inch

Area

Sum of Area
 Sum of Area X 3 (enter this value in the glazing area total)
 Glazing UA for Heating System Size Only = Area X 1.2

Simple Heating System Size: Climate Zone 1

Project Information

Contact Information

Indoor Design Temperature 70

Outdoor Design Temperature 30

Design Temperature Difference
Indoor - Outdoor Design Temp 40

Conditioned Floor Area 0

Conditioned Volume

Glazing

Copy Sum of UA from Glazing Schedule

Attic

	U-Factor	X	Area	=	UA
R-38	0.031				
R-38 Scissor	0.035				
R-38 Advanced	0.026				

Single Rafter Joist

	U-Factor	X	Area	=	UA
R-30	0.034				
R-38	0.027				

Above Grade Walls

	U-Factor	X	Area	=	UA
R-21	0.057				

Floors

	U-Factor	X	Area	=	UA
R-30	0.029				

Below Grade Walls

	U-Factor	X	Area	=	UA
R-21 interior	0.037				
R-10 exterior	0.056				

Slab Below Grade

	F-factor	X	Length	=	UA
R-21 interior walls	0.57				
R-10 exterior walls	0.42				

Slab on Grade

	F-factor	X	Length	=	UA
R-10 perimeter	0.54				
R-10 Full - Heated	0.55				

Sum of UA

Envelope Heat Load

Sum of UA X Design Temperature Difference Btu / Hour

Air Leakage Heat Load

((Volume X 0.6) X Design Outdoor Temp) X .018) Btu / Hour

Building Design Heat Load

Air Leakage + Envelope Heat Loss Btu / Hour

Building and Duct Heat Load

1 Btu / Hour

If ducts are located in unconditioned space: Sum of Building Heat Loss X 1.15

If ducts are located in conditioned space: Sum of Building Heat Loss X 1

Maximum Heat Equipment Output

Building and Duct Heat Loss X 1.50 Btu / Hour