

## Alterations Worksheet 2015 Washington State Energy Code

### Project Information

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9820 SE 35th PLACE

Mercer Island, WA. 98040

### Contact Information

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The Washington State Energy Code requirements for alterations are located in Chapter 5

**Alterations (remodels) do not need to obtain energy credits from Table R406.2**

Additions must meet the requirements for new construction. This includes nonconditioned space being altered to become conditioned space.

**Will the wall cavities be exposed?**

Yes

No

**If yes:** Exposed wall cavities must be insulated -  
2 X 4 wall studs require **R-15** insulation  
2 X 6 wall studs require **R-21** insulation

**Will the roof/ceiling framing cavities or attic be exposed?**

Yes

No

**If yes:** Exposed roof/ceiling assemblies must be insulated -  
Vaulted ceilings: Insulate to the full depth of the framing member while allowing for the minimum 1" ventilated space  
  
Flat ceilings: Install R-49 insulation or what the attic space can accommodate based on the roof pitch

**Will the floor framing cavities be exposed?**

Yes

No

**If yes:** Exposed floor cavities must be insulated to R-30

**Are the windows and/or doors being replaced?**

Yes

No

(includes both window or door and frames)

**If yes:** New windows and doors must have an area weighted average U-factor of  $\leq 0.30$

**Will the heating or cooling system be replaced?**

Yes

No

**If yes:** New equipment must meet current requirements and ducts need to be tested

**Will the hot water system be altered?**

Yes

No

**If yes:** New water heating equipment must meet current code requirements

**Are more than 50% of the light fixtures being changed?**

Yes

No

**If yes:** 75% of all lamps must be high efficacy (LED or CFL)

**R503.1.1 Building envelope.** Building envelope assemblies that are part of the alteration shall comply with Section R402.1.1 or R402.1.4, Sections R402.2.1 through R402.2.11, R402.3.1, R402.3.2, R402.4.3 and R402.4.4.

**Exception:** The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation. 2x4 framed walls shall be insulated to a minimum of R-15 and 2x6 framed walls shall be insulated to a minimum of R-21.
3. Construction where the existing roof, wall or floor cavity is not exposed.
4. Roof recover.
5. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing fenestration to be replaced.

**R503.1.1.1 Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and SHGC in Table R402.1.1.

**R502.1.1.2 Heating and cooling systems.** New heating, cooling and duct systems that are part of the addition shall comply with Sections R403.1, R403.2, R403.3, R403.5 and R403.6.

**Exception:** The following need not comply with the testing requirements of Section R403.3.3:

1. Additions of less than 750 square feet.
2. Duct systems that are documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in WSU RS-33.
3. Ducts with less than 40 linear feet in unconditioned spaces.
4. Existing duct systems constructed, insulated or sealed with asbestos.

**R503.1.3 Service hot water systems.** New service hot water systems that are part of the alteration shall comply with Section R403.4.

**R503.1.4 Lighting.** New lighting systems that are part of the alteration shall comply with Section R404.1.

**Exception:** Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.

**R503.2 Change in space conditioning.** Any nonconditioned or low-energy space that is altered to become *conditioned space* shall be required to be brought into full compliance with this code.

**Chen Remodel**  
9820 SE 35th Place

Conditioned Floor Area 507

**Component Performance, R occupancies**

**Code Target Values**

**Proposed Design**

Doors U = 0.300  
Overhead Glazing U = 0.500  
Vertical Glazing U = 0.300  
Flat/Vaulted Ceilings U = 0.026  
Wall (above grade) U = 0.056  
Floors U = 0.029  
Slab on Grade F = 0.540  
Below Grade Wall U = 0.042  
Below Grade Slab F = 0.570

Area	UA
25	7
10	5
66	20
639	17
1,646	92
67	2
55	30
0	0
0	0

Area	UA
25	7
10	4
920	316
639	17
791	45
67	2
55	32
0	0
0	0

Target UA Total 173  
Target Credits from Table 406.2 1.5

Proposed UA Total 423  
Proposed Credits from Table 406.2 1.5

If the Proposed UA ≤ the Target UA, and the Proposed Credits from Table 406.2 are ≥ those required in Section R406.2, then the home meets the 2015 WSEC.

**Exterior Doors**

Plan ID	Component Description	Ref.	Door U	Qt.	Width Feet	Inch	Height Feet	Inch	Area	UA
5	Solid wood door	▼ Custom	0.28	1	3	6	7	0	25	7
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0

Sum of Area and UA 25 7

**Overhead Glazing:**

Plan ID	Component Description	Ref.	Glazing U	Qt.	Width Feet	Inch	Height Feet	Inch	Area	UA
j	Velux Tested performance NAFS 2011	▼ wsec	0.43	1	2	0	5	0	10	4
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0
		▼ 0	0.00						0	0

Sum of Area and UA 10 4



Plan ID	Component Description	Ref.	Attic U	Area	UA
	R49 blown Attic STD baffled	10-7	0.027	193	5
	R38 2x @ 16 o.c. clg/floor	Custom	0.026	372	10
	R38 2x @ 16 o.c. clg/floor	Custom	0.026	74	2
		0	0.000		0
Sum of Area and UA				639	17

**Walls (Above Grade)**

Plan ID	Component Description	Ref.	Wall U	Net Area	UA
	R21 cavity+R0 foam STD 2X6W Lap	10-5	0.057	791	45
		0	0.000		0
		0	0.000		0
		0	0.000		0
Sum of Area and UA				791	45

**Floor (over crawl or exterior)**

Plan ID	Component Description	Ref.	Floor U	Area	UA
	R38 vented Joist 16oc	10-3	0.025	67	2
		0	0.000		0
		0	0.000		0
		0	0.000		0
Sum of Area and UA				67	2

**Slab on Grade (less than 2 feet below grade)**

Plan ID	Component Description	Ref.	Slab F	Slab Length	UA
	R10 2' horizontal	10-2	0.700	12	8
	R10 2' horizontal w/TB	WSU	0.540	43	23
		0	0.000		0
		0	0.000		0
Sum of Area and UA				55	32

**Below Grade Walls and Slabs**

Plan ID	Component Description	Ref.	Wall U	Wall Area	Wall UA	Slab F	Slab Length	Slab UA
		0	0.000		0.0	0.000		0
		0	0.000		0.0	0.000		0
		0	0.000		0.0	0.000		0
		0	0.000		0.0	0.000		0
Sum of Area, Length and UA			0	0.0	0	0	0	

**Table R406.2 Summary**

Opt.	Description	Credit(s)		
1a	Efficient Building Envelope 1a	0.5		<input type="checkbox"/>
1b	Efficient Building Envelope 1b	1.0		<input type="checkbox"/>
1c	Efficient Building Envelope 1c	2.0		<input type="checkbox"/>
1d	Efficient Building Envelope 1d	0.5		<input type="checkbox"/>
2a	Air Leakage Control and Efficient Ventilation 2a	0.5		<input type="checkbox"/>
2b	Air Leakage Control and Efficient Ventilation 2b	1.0		<input type="checkbox"/>
2c	Air Leakage Control and Efficient Ventilation 2c	1.5		<input type="checkbox"/>
3a	High Efficiency HVAC 3a	1.0		<input type="checkbox"/>
3b	High Efficiency HVAC 3b	1.0		<input type="checkbox"/>
3c	High Efficiency HVAC 3c	1.5		<input type="checkbox"/>
3d	High Efficiency HVAC 3d	1.0		<input type="checkbox"/>
4	High Efficiency HVAC Distribution System	1.0		<input type="checkbox"/>
5a	Efficient Water Heating 5a	0.5		<input type="checkbox"/>
5b	Efficient Water Heating 5b	1.0		<input type="checkbox"/>
5c	Efficient Water Heating 5c	1.5		<input checked="" type="checkbox"/> 1.5
5d	Efficient Water heating 5d	0.5		<input type="checkbox"/>
6	Renewable Electric Energy	0.5	<input type="text" value=""/>	<input type="checkbox"/>
Total Credits				<b>1.5</b>

\*Please refer to Table R406.2 for complete option descriptions