

Envelope Requirements Summary, pg 1

Zones 4c/5b ENV-REQ

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all f

Revised Oct 2013

Minimum Requirements for Prescriptive Compliance *This table summarizes prescriptive compliance requirements for opaque elements and fenestration. Refer to Tables C402.1.2, C402.2 and C402.3 in the 2012 WSEC for important footnotes that apply to these tables. Refer to Section C402 for all applicable requirements that apply for each envelope element type and applicable exceptions.*

Prescriptive Path Occupancy Group	Table C402.2 Insulation Minimum R-Value		Table C402.1.2 Assembly Maximum U-factor	
	All Other	Group R	All Other	Group R
Opaque Elements				
Roofs				
Insulation Entirely above Deck	R-30 c.i.	R-38 c.i.	U-0.034	U-0.031
Metal Building (with R-3.5 thermal blocks) ^{Note 3}	R-25 + R-11 Ls	R-25 + R-11 Ls	U-0.031	U-0.031
Attic and Other	R-49	R-49	U-0.021	U-0.021
Walls, Above-grade				
Mass	R-9.5 c.i.	R-13.3 c.i.	U-0.104 ^{Note 6}	U-0.078
Metal Building	R-13 + R-13 c.i.	R-13 + R-13 c.i.	U-0.052	U-0.052
Steel Framed	R-13 + R-10c.i.	R-19 + R-8.5 c.i.	U-0.055	U-0.055
Wood Framed and Other	R-21 int	R-21 int	U-0.054	U-0.054
Below Grade Wall ^{Note 4}	Same as above grade		Same as above grade	
Floors				
Mass	R-30 c.i.	R-30 c.i.	U-0.031	U-0.031
Steel Joist	R-38 + R-10 c.i.	R-38 + R-10 c.i.	U-0.029	U-0.029
Wood Framed and Other	R-30	R-30	U-0.029	U-0.029
Slab-On-Grade Floors				
Unheated	R-10 for 24 in. (from top of slab)		F-0.54	F-0.54
Heated ^{Note 5}	R-10 perimeter & under entire slab		F-0.55	F-0.55
Opaque Doors				
Swinging	No R-Value for prescriptive		U-0.37	U-0.37
Roll-up or sliding	R-4.75	R-4.75	No U-Value for prescriptive compliance.	
	<i>Table C402.3 - 0-30% of wall area, or 30%-40% per Section C402.3.1.1 DLZ</i>		<i>Section C402.3.1.3 High Performance Fenestration Option - 0-40% of wall area</i>	
Fenestration				
Vertical Fenestration				
Nonmetal framing	U-0.30	U-0.30	U-0.28	U-0.28
Metal framing (fixed)	U-0.38	U-0.38	U-0.34	U-0.34
Metal framing (operable)	U-0.40	U-0.40	U-0.36	U-0.36
Entrance doors	U-0.60	U-0.60	U-0.60	U-0.60
Skylights				
Skylights	U-0.50	U-0.50	U-0.50	U-0.50
Fenestration				
Vertical Fenestration				
	PF < 0.2: all orientations - SHGC-0.40 0.2 ≤ PF < 0.5: north - SHGC-0.44; all other - SHGC-0.48 PF ≥ 0.5: north - SHGC-0.48; all other - SHGC-0.64		PF < 0.2: all orientations - SHGC-0.35 0.2 ≤ PF < 0.5: north - SHGC-0.385; all other - SHGC-0.42 PF ≥ 0.5: north - SHGC-0.42; all other - SHGC-0.56	
Skylights	SHGC-0.35		SHGC-0.35	
Refrigerated Spaces Insulation				
Freezers - Walk-in and Warehouse				
Roof / Ceiling	R-32		No U-Value for prescriptive compliance	
Wall	R-32			
Door	R-32			
Door - transparent reach-in	triple-pane, heat-reflective treated or gas			
Floor	R-28			
Coolers - Walk-in and Warehouse				
Roof / Ceiling	R-25		No U-Value for prescriptive compliance	
Wall	R-25			
Door	R-25			
Door - transparent reach-in	double-pane, heat-reflective treated & gas fill, or comply with freezer door req.			
Floor	No Requirement			

Definitions:

Ls = Liner system -- A continuous membrane installed below the purlins and uninterrupted by framing members. Uncompressed, unfaced insulation rests on top of the membrane between the purlins. Refer to Section A102.2.5.4.

c.i. = Continuous insulation -- Insulation that is continuous across all structural members without thermal bridges other than service openings and penetrations by metal fasteners with a x-sectional area of less than 0.04% of the opaque surface area of the assembly.

int = Intermediate framing -- Includes insulated headers, corners and interior partition wall to exterior wall intersections. Refer to Section A103.2 for framing definitions.

Footnote Summary:

Each table in the 2012 WSEC has footnotes applicable to specific information provided in the table. This footnote summary provides only abbreviated details from these footnotes. ***Refer to 2012 WSEC for complete footnote information.***

1 - Assembly descriptions can be found in Chapter 2 and Appendix A.

2 - Use of assembly U-factors, C-factors and F-factors from Appendix A and Chapter 3 are required unless otherwise allowed by the provisions of this Code.

3 - For metal building roofs where using R-value compliance method, a thermal spacer block is required. Otherwise use the U-factor compliance method.

4 - Where heated slabs are below-grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

5 - Heated slab F-factors shall be determined specifically for heated slabs. Unheated slab F-factors shall not be used.

6 - Non-residential CMU walls may be eligible to use Table C402.1.2 U-factor if all provisions stated in applicable footnote are met. Refer to Footnote D in Table C402.1.2 or Footnote C in Table C402.2 for eligibility requirements.

7 - Roof, wall or floor assemblies required to have continuous insulation may be eligible for alternate continuous insulation R-values if all provisions in applicable footnote are met. Refer to Footnote F in Table C402.2 for eligibility requirements.

End of Envelope Requirements Summary

Prescriptive Path, pg. 1 Zones 4c/5b ENV-PRESCRIPTIVE

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 Revised Oct 2013

Project Address Baxter Mini-Storage Bldg.	Date 09/07/2015
Occupancy Group <input checked="" type="radio"/> Commercial <input type="radio"/> Group R	For Building Department Use
Fenestration Area as % gross above-grade wall area Max. Target: 30.0%	
Skylight Area as % gross roof area Max. Target: 5.0%	
Vertical Fenestration Alternates: None Selected on ENV-SUM	

Prescriptive compliance of envelope assemblies may be accomplished by providing insulation R-values per Table C402.2 or U-factors/F-factors per Tables C-402.1.2 and C-402.3. A single project may comply via R-values for some envelope assemblies and U-factors/F-factors for others. Note compliance method taken for each assembly in spaces provided.

Building Component		R-Value for Prescriptive Compliance			U-Factor/F-Factor for Alternative Prescriptive Compliance		
		Cavity Ins. R-Value	Continuous Ins. (CI) R-Value	Alternate CI R-Value (Table C402.2 Footnote F) ¹	Assembly U-Factor	U-Factor Source (Appendix A, Chapter 3 table, or approved calculation method)	
Provide page/plan # of assembly detail and ID.							
Roofs	Deck	ID:					
		ID:					
		ID:					
	Mtl Bld ²	ID:					
		ID:					
		ID:					
Other	ID:						
	ID:						
	ID:						
Opaque Walls - Above	Mtl. Frm.	ID:					
		ID:					
		ID:					
	Mtl Bld.	ID:					
		ID:					
		ID:					
Wood ³	ID:						
	ID:						
	ID:						
Mass ⁴	ID:						
	ID:						
	ID:						
Below Grade Walls	ID:						
	ID:						
	ID:						
	ID:						
Floors	Mass	ID:					
		ID:					
		ID:					
	Framed ⁵	ID:					
ID:							
ID:							
		Perim. Ins. R-Value	Full Slab CI R-Value		F-Factor	F-Factor Source	
Slab-on-grade ⁶	Unheated	ID:					
		ID:					
		ID:					
	Heated	ID:					
		ID:					
		ID:					

- Note 1** - Calculations are required. Ratio of cross-sectional area of metal penetration through otherwise continuous insulation shall be 0.04-0.08%.
- Note 2** - Thermal spacer blocking and liner system are required for prescriptive R-Value compliance.
- Note 3** - Intermediate framing is required for prescriptive R-Value compliance in wood-framed wall assemblies.
- Note 4** - Proposed non-residential building CMU walls meeting Table C402.1.2 Footnote D requirements can enter the target U-value of 0.104.
- Note 5** - Refer to Table C402.2, Footnote E for prescriptive R-Value requirement for steel floor joist assemblies.
- Note 6** - Prescriptive slab-on-grade insulation shall extend from top of slab to minimum length per an approved method as defined in C402.2.6.

Prescriptive Path, pg. 2 Zones 4c/5b ENV-PRESCRIPTIVE

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over : Revised Oct 2013

Project Address Baxter Mini-Storage Bldg.	Date 09/07/2015
Fenestration Area as % gross above-grade wall area Max. Target: 30.0%	For Building Department Use
Skylight Area as % gross roof area Max. Target: 5.0%	
<i>Notes: 1: If vertical fenestration or skylight area exceeds maximum allowed per C402.3.1, then Target Area Adjustment of all applicable envelope elements will be calculated by the compliance form. Refer to Target Area Adjustment worksheet for this calculation. 2: Provide U-factor for the fenestration assembly, which is the combination of frame and glazing</i>	

Building Component	R-Value for Prescriptive Compliance			U-Factor/F-Factor for Alternative Prescriptive Compliance	
	Cavity Ins. R-Value	Continuous Ins. (CI) R-Value	Alternate CI R-Value (Table C402.2 Footnote F)	Assembly U-Factor	U-Factor Source (Appendix A, Chapter 3 table, or approved calculation method)
Provide page/plan # of assembly detail and ID.					
Swing Doors	ID:				
	ID:				
	ID:				
Roll-up Doors	ID:				
	ID:				
	ID:				

			Solar Heat Gain Coefficient (SHGC)			U-Factor for Prescriptive Compliance	
			Projection factor (PF) (if applicable)	SHGC Adjustment Multiplier (if applicable)	Assembly SHGC	Assembly U-Factor	U-Factor Source (NFRC, Appendix A, or Chapter 3 table)
Vertical Fenestration	Non-Metal	ID:					
		ID:					
		ID:					
		ID:					
	Metal, fixed	ID:					
		ID:					
		ID:					
		ID:					
	Metal, op.	ID:					
		ID:					
		ID:					
		ID:					
Mtl entrance	ID:						
	ID:						
	ID:						
	ID:						
Skylights	All Types	ID:					
		ID:					
		ID:					
		ID:					

Note 1 - SHGC Adjustment Multiplier based on calculated Projection Factor. Refer to Equation C4-2 Projection Factor Calculation and Table C402.3.3.1 for corresponding SHGC Multiplier.

Refrigerated Spaces, Walk-in & Warehouse

Coolers	Notes	R-Values for Prescriptive Compliance	Prescriptive U-Factor not allowed.
Walls			
Ceiling			
Doors			
Freezers			
Walls			
Ceiling			
Doors			
Floor			

Component Performance Path, pg. 1

Zones 4c/5b

ENV-UA

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised Oct 2013

Project Address Baxter Mini-Storage Bldg.	Date 09/07/2015
Occupancy Group <input checked="" type="radio"/> Commercial <input type="radio"/> Group R	For Building Department Use
Change in occupancy or space conditioning <input type="radio"/> <i>Note - Proposed UA may exceed Target UA by 10% per C101.4.4 and C101.4.5</i>	
Fenestration Area as % gross above-grade wall area 0.0% Max. Target: 30.0%	
Skylight Area as % gross roof area 0.0% Max. Target: 5.0%	
Vertical Fenestration Alternates: None Selected on ENV-SUM	

Notes: 1: If vertical fenestration or skylight area exceeds maximum allowed per C402.3.1, then Target Area Adjustment of all applicable envelope elements will be calculated by the compliance form. Refer to Target Area Adjustments worksheet for this calculation.
2: U-factors shall come from Appendix A, Chapter C303, or calculated per approved method as specified in C402.1.2.

Building Component		Proposed UA			Target UA			
		U-factor	x Area (A)	= UA (U x A)	U-factor	x Area (A)	= UA (U x A)	
Roofs	Deck	R= ID:			0.034			
		R= ID:			Above Deck Insulation	U-0.034		
		R= ID:						
	Mtl Bid	R= ID:			0.031			
		R= ID:			Metal Building	U-0.031		
		R= ID:						
	Other	R= 38 ID: Sheet 4, Cross Sections (Table A102.1)	0.031	3585	111.1	0.021	3585	75.3
		R= ID:				Single raft, attic, other	U-0.021	
		R= ID:						
Opaque Walls - Above	Mtl. Frm.	R= ID:			0.055			
		R= ID:			Steel/metal frame	U-0.055		
		R= ID:						
	Mtl Bid.	R= ID:				0.052		
		R= ID:				Metal Building	U-0.052	
		R= ID:						
	Wood/Oth	R= 21 ID: Sheet 4, Cross Sections (Table A103.3.1(5))	0.056	957	53.6	0.054	957	51.7
		R= ID:				Wood Frame, other	U-0.054	
		R= ID:						
Mass*	R= ID:				0.104			
	R= ID:				Mass Wall	U-0.104		
	R= ID:							
Below Grade Walls	R= ID:				0.104			
	R= ID:				Assumed to be Mass Wall	U-0.104		
	R= ID:							
	R= ID:							
Floors	Mass	R= ID:			0.031			
		R= ID:			Mass Floor	U-0.031		
		R= ID:						
	Framed	R= ID:				0.029		
		R= ID:				Joist/Framing	U-0.029	
		R= ID:						
		F-factor	x Perimeter	= UA(U x A)	F-factor	x Perimeter	= UA (U x A)	
Slab-on-grade	Unheated	R= ID: Sheet 4, Cross Sections (Table A106.1)	0.730	253	184.7	0.540	253	136.6
		R= ID:				Slab-On-Grade	U-0.54	
		R= ID:						
	Heated	R= ID:				0.550		
		R= ID:				Heated Slab-On-Grade	U-0.55	
		R= ID:						

*Proposed non-residential CMU walls meeting Table C402.1.2 Footnote D requirements can use the target U-value of 0.104 rather than Appendix A values. Show footnote requirements in plans.

Page 1 Subtotal

Area	UA	Area	UA
4795	349	4795	264

Component Performance Compliance (UA)

UA COMPLIES

Component Performance Path, pg. 2

Zones 4c/5b

ENV-UA

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over :

Revised Oct 2013

Project Address	Baxter Mini-Storage Bldg.	Date	09/07/2015
Fenestration Area as % gross above-grade wall area		Max. Target:	30.0%
Skylight Area as % gross roof area		Max. Target:	5.0%
<p>Notes: 1: If vertical fenestration or skylight area exceeds maximum allowed per C402.3.1, then Target Area Adjustment of all applicable envelope elements will be calculated by the compliance form. Refer to Target Area Adjustments worksheet for this calculation.</p> <p>2: Provide NFRC rated U-factor or default U-factor from Appendix A for the fenestration assembly thermal performance (combination of frame and glazing).</p> <p>3: Fenestration that separates conditioned space from a non-conditioned or semi-conditioned</p>			

Building Component		Proposed UA			Target UA			
Provide source of U-factor, page/plan # of assembly detail & ID		U-factor	x Area (A)	= UA (U x A)	U-factor	x Area (A) =	UA (U x A)	
Swing Doors	U= 0.1 ID: Sheet 3, Floor Plan - Notes (NFRC)	0.100	80	8.0	0.37	80	29.6	
	U= ID:				Opaque Swing Doors U-0.37			
	U= ID:							
Roll-up Doors	U= 0.091 ID: Sheet 3, Floor Plan - Notes (Wayne Dalton)	0.091	1008	91.7	0.37	1008	373.0	
	U= ID:				Opaque rollup & sliding U-0.37			
	U= ID:							
Vertical Fenestration	Non-Metal	U= ID:			0.30			
		U= ID:			Non-Metal Frame U-0.30			
		U= ID:						
	Metal, fixed	U= ID:				0.38		
		U= ID:				Metal Frame, Fixed U-0.38		
		U= ID:						
		U= ID:						
	Metal, op.	U= ID:				0.40		
		U= ID:				Metal Frame, Operable U-0.40		
		U= ID:						
		U= ID:						
	Mtl entrance	U= ID:				0.60		
U= ID:					Metal Entrance Door U-0.60			
U= ID:								
U= ID:								
Skylights	U= ID:				0.50			
	U= ID:				All types U-0.50			
	U= ID:							
	U= ID:							

	Area	UA	Area	UA
Page 2 Subtotal	1088	100	1088	403
Page 1 Subtotal	4795	349	4795	264
Total	5883	449	5883	666

To comply:

- Proposed Total UA shall not exceed Target Total UA.
- Proposed Total Area shall equal Target Total Area.

Component Performance Compliance (UA)

UA COMPLIES

Vertical Fenestration Target Area Adjustment Calculations

If vertical fenestration area exceeds maximum allowed per Section C402.3.1, then Target Area Adjustment of all applicable envelope elements is required. This worksheet automatically calculates these adjustments and updates target areas in the ENV-UA and ENV-SHGC worksheets. Information shown in this worksheet is for reference only and is write-protected. Submit this Target Area Adjustment form with ENV-UA and ENV-SHGC forms.

VF = Vertical fenestration DR = Opaque doors AG = Above-grade	NW = Net above grade wall (excludes fenestration and doors.) Gross Exterior Above-Grade Wall Area = VF + NW + DR
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Proposed Areas

	Vertical Fenestration ->	VF=			
	Opaque ->	NW=	957.0	DR=	1088.0
Gross Exterior AG Wall Area 2045.0	X	Max Vert. Fen. % (C402.3.1) 30.0%	÷	100	=
		613.5		100	613.5
Total Vertical Fenestration	-	Maximum Target 613.5	=	Delta Vertical Fenestration -613.5	=
		0		0	Excess Vertical Fenestration
		⇕ greater		-613.5	0
Total Vertical Fenestration	-	Excess Vertical Fenestration	=	Target Vertical Fenestration	÷
		0		0	Total Vertical Fenestration
		0		0	Target VF Multiplier
Net AG Wall Area 957.0	+	Excess Fenestration	=	Target Net Wall Area 957.0	÷
		0		957.0	Net Wall
		0		957.0	Target Net Wall Mult. 1.00

Multiplier applied to all Proposed Vertical Fenestration Areas to calculate Target Vertical Fenestration Area

Multiplier applied to all Proposed Opaque Above-Grade Wall Areas to calculate Target Above-Grade Wall Area

UA Adjustments

	Proposed Area		Target VF Mult.		Target Area
Vertical Fenestration					
Non-metal frame		X		=	
Metal frame, fixed		X		=	
Metal frame, operable		X		=	
Metal frame, entrance door		X		=	
Above-grade Wall					
Steel Frame		X		=	
Metal Building		X		=	
Wood / Other frame	957.0	X	1.00	=	957.0
Mass		X		=	
Sum of Proposed	957.0		Sum of Target		957.0

Target areas in shaded boxes are applied to target areas on ENV-UA

Sum of target above-grade wall and vertical fenestration areas are calculated to equal the sum of proposed

SHGC x A Adjustments

	Proposed Area		Target VF Mult.		Target Area
Non-North Vertical Fenestration					
PF < 0.2		X		=	
0.2 ≤ PF < 0.5		X		=	
PF ≥ 0.5		X		=	
North Vertical Fenestration					
PF < 0.2		X		=	
0.2 ≤ PF < 0.5		X		=	
PF ≥ 0.5		X		=	

SHGC target areas in shaded boxes are applied to target areas on ENV-SHGC

Skylight Target Area Adjustment Calculations

If skylight area exceeds maximum allowed per Section C402.3.1, then Target Area Adjustment of all applicable envelope elements is required. This worksheet automatically calculates these adjustments and updates target areas in the ENV-UA and ENV-SHGC worksheets. Information shown in this worksheet is for reference only and is write-protected. Submit this Target Area Adjustment form with ENV-UA and ENV-SHGC forms.

SKY = Skylight	NR - Net roof (excludes skylight)	Gross Exterior Roof Area = SKY + NR
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Proposed Areas

Skylight (Horizontal Fenestration) ->	SKY=
Opaque Roof ->	NR= 3585.0

Gross Exterior Roof Area		Max Skylight % (C402.3.1)		Maximum Skylight Fenestration Area
3585.0	X	5.0%	÷	100
				=
				179.3

Total Skylight Area		Maximum Target		Delta Skylight Area		Excess Skylight
	-	179.3	=	-179.3	=	
				0	⇕ greater	
				-179.3	=	

Total Skylight Area		Excess Skylight		Target Skylight Area		Total Skylight Area		Target SL Multiplier
	-		=		÷		=	

Multiplier applied to all Proposed Skylight Areas to calculate Target Skylight Area

Net Roof Area		Excess Skylight		Target Net Roof Area		Net Roof		Target Net Roof Mult.
3585.0	+		=	3585.0	÷	3585.0	=	1.00

Multiplier applied to all Proposed Opaque Roof Areas to calculate Target Roof Area

UA and SHGC x A Adjustments

Skylight		Proposed Area		Target SL Mult.		Target Area
	All		X		=	
Roof		Proposed Area		Target Net Wall Mult.		Target Area
	Insulation Above Deck		X		=	
	Metal Building		X		=	
	Attic / All Others	3585.0	X	1.00	=	3585.0
	Sum of Proposed	3585.0		Sum of Target		3585.0

Target areas in shaded boxes are applied to target areas on ENV-UA

Sum of target roof and skylight areas are calculated to equal the sum of proposed

SHGC Calculation

Zones 4c/5b

ENV-SHGC

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 Revised Oct 2013

Project Address Baxter Mini-Storage Bldg.	Date 09/07/2015
Fenestration Area as % gross above-grade wall area Max. Target: 30%	For Building Department Use
Skylight Area as % gross roof area Max. Target: 5%	
Vertical Fenestration Alternates: None Selected on ENV-SUM	
<i>Notes: 1 - Proposed vertical fenestration and skylight areas entered in ENV-SHGC must match proposed fenestration areas in ENV-UA. 2 - If Target Area Adjustment is required per ENV-UA, then target areas will be automatically adjusted in ENV-SHGC. Refer to Target Area Adjustments worksheet for this calculation. 3 - Provide NFRC rated SHGC or default from Table C303.1.3(3) for fenestration assembly SHGC. 4 - Fenestration that separates conditioned space from a non-conditioned or semi-conditioned space shall be included in this worksheet.</i>	

Skylights	Proposed SHGC			Target SHGC		
Provide source of SHGC, page/plan # of assembly detail & ID	SHGC	x Area (A)	= SHGC x A	SHGC	x Area (A)	= SHGC x A
ID:				0.35		
ID:				SHGC		0.35
ID:						
ID:						
ID:						
Totals				Totals		

All Non-North Vertical Fenestration+	Proposed SHGC			Target SHGC ++		
Provide source of SHGC, page/plan # of assembly detail & ID	PF	SHGC*	x Area (A) = SHGC x A	PF Category	SHGC	x Area (A) = SHGC x A
ID:	0			PF < 0.2	0.40	
ID:	0			0.2 ≤ PF < 0.5	0.48	
ID:	0			PF ≥ 0.5	0.64	
ID:	0			++ If projection factor (PF) credits are applied to the proposed design, Target SHGC will sum fenestration area by PF category.		
ID:	0					
ID:	0					
ID:	0					
ID:	0					
Totals				Totals		

+ If projection factor credit is applied, then vertical fenestration must be entered in the correct table according to orientation. If credit is not applied then all vertical fenestration can be entered in either table.

* Note: Fenestration that separates conditioned space from a non-conditioned or semi-conditioned space shall be listed here with a proposed SHGC equal to the target value.

North Vertical Fenestration+	Proposed SHGC			Target SHGC++		
Provide source of SHGC, page/plan # of assembly detail & ID	PF	SHGC*	x Area (A) = SHGC x A	PF Category	SHGC	x Area (A) = SHGC x A
ID:	0			PF < 0.2	0.40	
ID:	0			0.2 ≤ PF < 0.5	0.44	
ID:	0			PF ≥ 0.5	0.48	
ID:	0			++ If projection factor (PF) credits are applied to the proposed design, Target SHGC will sum fenestration area by PF category.		
ID:	0					
ID:	0					
ID:	0					
ID:	0					
North Total						

To comply, the Proposed total SHGC x A for all fenestration (vertical & skylights) shall not exceed the Target total SHGC x A.	Grand Total	Area	SHGC x A	Grand Total	Area	SHGC x A
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Component Performance Compliance (SHGC)

Building Permit Plans Checklist, pg. 1

ENV-CHK

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Project Address **Baxter Mini-Storage Bldg.**

Date **9/7/2015**

The following information is necessary to check a building permit application for compliance with the building envelope requirements in the Washington State Energy Code, Commercial Provisions.

Applicability (yes,no,na)	Code Section	Component	Compliance information required in permit documents	Location in Documents	Building Department Notes
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SCOPE

na	C101.5.2	Low energy spaces	Low energy spaces identified on plans		
na	C101.5.2.1 C402.1.4	Semi-heated spaces	Semi-heated spaces identified on plans		
na	C402.5 C402.6	Cooler and freezer spaces	Walk-in and refrigerated warehouse cooler and freezer spaces identified on plans		
na	C101.4.6	Mixed occupancy	Spaces with different occupancy requirements identified on plans		
yes	C101.4.4 C101.4.5	Change of occupancy/space conditioning	Existing F, S and U-occupancy building spaces undergoing a change of occupancy or space conditioning that require compliance are identified on plans		

ENVELOPE PROVISIONS

yes	C303.1	Insulation identification	Indicate identification mark shall be applied to all insulation materials	Sheet 4	
na	C303.1.3 C402.4.3	Fenestration product rating	Fenestration products shall be labeled with rated U-factor, SHGC, VT, and leakage rating		
yes	C303.1.1 C402.2	General insulation installation	Indicate installation methods, thicknesses, densities and clearances to achieve the intended R-value of all insulation materials; Where two or more layers of rigid insulation will be used, indicate that edge joints between layers are staggered	Sheet 4	
yes	C402.2.1	Roof assembly insulation	Indicate R-value(s) of cavity/continuous insulation on roof sections; Indicate framing materials on roof sections; Indicate method of framing for ceilings below vented attics and vaulted ceilings per A102.2 (std, adv); Provide area-weighted calculations for sloped insulation installed entirely above deck; Indicate R-values for thermal spacers and each insulation layer, and liner system (LS) method for metal building roofs	Sheets 4,5	
na	C402.2.1	Skylight curb insulation	Indicate curb insulation R-value on roof section if not included in skylight NFRC rating		
yes	C402.2.3 C402.2.4 C303.2.1	Above/below grade wall insulation	Indicate R-value(s) of cavity/continuous insulation on wall sections; Indicate framing materials on wall sections; Indicate method of framing for wood const per A103.2 (std, int, adv); Indicate mass of masonry walls; Indicate loose-fill core insulation material, percentage of cores filled, and frequency of grouted cores and bond beams for masonry walls; Indicate method of protection of exposed exterior basement/crawlspace wall insulation	Sheet 4	
na	C402.5 C402.6	Walk-in/refrigerated warehouse cooler and freezer insulation	Indicate insulation R-values of ceilings, walls, doors, floors on sections; Indicate method of minimizing door infiltration; Indicate type(s) of transparent doors and windows		
yes	C402.2.7	Opaque doors	Indicate rated U-factor (swinging) or R-value (roll-up/sliding) on wall sections - applies to doors with less than 50% glazed area	Sheet 3, Notes	
na	C402.2.5	Floor over outdoor or unconditioned space insulation	Indicate R-value(s) of cavity/continuous insulation on floor sections; Indicate framing material on floor sections; Indicate mass of masonry floors		
yes	C402.2.6 C303.2.1	Slab-on-grade floor insulation	Indicate R-value of continuous insulation on wall section or foundation detail; Indicate insulation extends down vertically and/or horizontally the required distance from top of slab; Indicate method of protection of exposed exterior slab edge insulation	Sheet 4	
na	C402.2.6 C303.2.1	Radiantly heated slab-on-grade floor insulation	Indicate R-value of continuous insulation on wall section or foundation detail; Indicate insulation extends down vertically from top of slab and then horizontally under the entire slab; Indicate method of protection of exposed exterior slab edge insulation		
na	C402.2.8	Radiant heating system insulation	Indicate insulation R-value behind radiant panels, U-bend/headers and bottom surface of radiantly heated floors (other than radiantly heated slab-on-grade)		

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ENV-CHK

2012 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Project Address		Baxter Mini-Storage Bldg.		Date	9/7/2015
Applicability (yes,no,na)	Code Section	Component	Compliance information required in permit documents	Location in Documents	Building Department Notes
na	C402.3.1	Vertical fenestration maximum area	Provide calculation for total vertical fenestration area as percentage of gross above grade wall area		
na	C402.3.1.2	Skylight maximum area	Provide calculation for total skylight area as percentage of gross roof area		
na	C402.3.3 C402.3.1.3 C303.1.3	U-factors, SHGC and VT for all fenestration assemblies	Indicate U-factors, SHGC and VT values in fenestration schedules; An area-weighted U-value may be used for all fenestration elements that qualify within the same fenestration category per Table C402.3; Indicate if values are NFRC or default. If default then specify frame type, glazing layers, gap width, low-e coatings, gas-fill.		
na	C402.3.1.1 Chap. 2 Definition	Increased max. vertical fenestration area with daylighting controls	Provide calculations showing that percentage of overall conditioned floor area in the daylight zone is equal to or greater than 50%; Indicate method of daylighting control in lighting equipment schedules; Indicate VT of vertical fenestration is at least 1.1 times the rated SHGC		
na	C402.3.1.2	Increased max. vertical fenestration area with high-performance glazing	Indicate high performance U-factors and SHGC values in fenestration schedules; An area-weighted U-value may be used for all fenestration elements that qualify within the same fenestration category per this section		
na	C402.3.3 C402.3.3.1	Permanent shading devices	Provide projection factor calculations (Equation C4-2) and associated SHGC multipliers for north and non-north orientations		
na	C402.3.2	Single story spaces requiring skylights	Provide calculations for percentage of conditioned floor area located within a skylight daylight zone; Provide calculations for percentage of skylight area to daylight zone under skylights, OR; Provide calculations for percentage of overall skylight effective aperture (Equation C4-1); Indicate haze factor of skylight glazing material or diffuser		

AIR LEAKAGE

na	C402.4.1.1 C402.4.2	Air barrier construction and sealing	Indicate location of continuous air barrier on plans and sections; Provide details for all joints, transitions in materials, penetrations in air barrier and note method of sealing (caulked, gasketed, or other approved method)		
na	C402.4.5.1	Stairway and shaft vents	Indicate locations of all stairway and shaft vents; Provide leakage rating of motorized dampers in mechanical equipment schedules; Indicate method of emergency operation - activation of fire alarm or interruption of power		
yes	C402.4.5.2	Outdoor air intakes, exhausts and relief openings	Indicate locations of all outside air intakes, exhausts and relief outlets, including those integral to mechanical equipment; Provide in mechanical equipment schedules leakage rating of dampers, identify whether motorized or gravity, and note any exceptions taken	Sheets 1,3,5	
na	C402.4.8	Recessed lighting in building envelope	Indicate IC rating of fixtures in lighting equipment schedules; Indicate method of sealing between light fixture housing and wall or ceiling		
na	C402.4.6	Loading dock seals	Indicate weather seal at cargo and loading dock doors		
na	C402.4.7	Vestibules	Indicate locations and dimensions of vestibules; For unconditioned vestibules, indicate which envelope assembly (interior or exterior) complies with the requirements for a conditioned space		
na	C402.4 - .1.2.3	Air barrier building test	Indicate air barrier test method in accordance with ASTM E779 or approved equivalent; Include the following requirements in project documents: (1) air barrier test report shall be submitted to jurisdiction once test is completed; (2) if test results exceed 0.4 cfm/ft2 at 0.3 in. wg then visually inspect air barrier and seal noted sources of leakage; (3) submit a follow-up report to jurisdiction noting corrective measures taken		

If "no" is selected for any question, provide explanation:

End of Building Permit Plans Checklist