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BUILDING ENVELOPE - GENERAL

Check all boxes that apply.

Exceptions
Discussion of qualifying exceptions in instructions section.

Plans/Specs
Show compliance by including a drawing sheet, detail number, specification section and/or subparagraph.

1. Exceptions (Section 1312)

❑ **No Envelope Components**. The building plans do not call for new or altered building envelope components, e.g., walls, floors or roof/ceilings.

❑ **A Non-conditioned Building.** The proposed structure has no spaces heated or cooled by an HVAC system.

❑ **Exception.** All new or altered building envelope components do not comply with the requirements, Section 1312, but qualify for Exception: ❑ -1 ❑ -2 ❑ -3 ❑ -4 ❑ -5
Portions of the building that qualify:

The plans/specs show compliance in the following locations:

2. Air Leakage (Section 1312.1.1)

❑ **Complies**. Plans require penetrations in building envelope are sealed and windows and doors are caulked, gasketed or weatherstripped.
The plans/specs show compliance in the following locations:

3. Suspended Ceiling (Section 1312.1.2.1)

❑ **Complies**. Building plans do not show suspended ceilings used to separate conditioned space from unconditioned space. No exceptions permitted.

4. Recessed Light Fixtures (Section 1312.1.2.2)

❑ **Complies**. The building plans do not show recessed light fixtures installed in ceilings separating conditioned spaces from unconditioned spaces.

❑ **Exception.** The building plans require that fixtures installed in direct contact with insulation be insulation coverage (IC) rated. The plans/specs show compliance in the following locations:

5. Moisture Control (Section 1312.1.4)

❑ **Complies**. A one-perm vapor retarder is installed on the warm side (in winter) of all exterior floors, walls and ceilings, and a ground cover installed in the crawl space of both new and existing buildings where insulation is installed.
The plans/specs show compliance in the following locations:

❑ **Exception.** All new or altered building envelope components do not comply with the vapor retarder requirements of the code, but qualify for an exception. Note applicable exception.
Section 1312.1.4, Exception: ❑ -1 ❑ -2
Portions of the building that comply:

Climate Zones

6. Climate Zones

❑ **Zone 1 -** A building site is in Climate Zone 1 if its elevation is less than 3000 feet above sea level and it is in one of the following counties: Benton, Columbia, Clackamas, Clatsop, Coos, Curry, Douglas, Jackson, Josephine, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Yamhill, or Washington

❑ **Zone 2 -** Building sites not in Zone 1, or where construction site elevation is 3000 feet or higher in Zone 1, are in Zone 2.

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PRESCRIPTIVE PATH

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CLIMATE

Zone ❑-1 or ❑-2 (*select one*)

Glazing Percent Calculation

See instruction section for a discussion of glazing percent calculation.

	Window Area (total rough frame ft2)		Exterior Wall Area (gross ft2)		Glazing %	Maximum Glazing Fraction Complies
Conditioned Space		÷		X 100 =		
Semi-Conditioned Space		÷		X 100 =		
Conditioned Mechanical Penthouse		÷		X 100 =		

Windows

From Worksheet 3d, place the highest Overall Window U-factor and highest Center-of-Glass SC. Or check minimum assembly and identify window.

Window (from Worksheet 3d)	Max U-Factor[1]	Minimum Assembly
		❑
U-Value Complies		
Required Minimum Assembly (Fixed Windows)		
Required Minimum Assembly (Operable Windows and Curtainwall)		

Window (from Worksheet 3d)	Shading Coefficient[2]	Minimum Assembly
		❑
SC Complies		
Required Minimum Assembly		

The plans/specs show window compliance in the following locations:

Notes

[1] From Worksheet 3d, place the highest Overall Window U-factor or check (Minimum Assembly). See "Window Requirements" in table on the following page for specific MA requirements. Excel version will automatically insert minimum assembly requirements or greatest U-value from

[2] From Worksheet 3d, place the highest "center-of-glass" shading coefficient (SC) for glass or check MA (Minimum Assembly). See "Window Require-ments" in following table for specific MA requirements. Excel version will automatically insert minimum assembly requirements or greatest SC from Worksheet 3d. Shading Coefficient (SC) can be calculated from Solar Heat Gain Coefficient using the equation: SC = SHGC ÷ 0.87. Manufacturers data may also be used to document SC.

Walls

See instructions for a discussion of wall require-ments.

Wall / Insulation Type	R-Value Insulation Only		U-Factor[3]
		or	
		or	
		or	
		or	
		or	
		or	

Below-Grade Walls

See instructions for a discussion of requirements.

Below-Grade Walls	R-Value Insulation Only (Min. R-7.5)		U-Factor[3] (Max. 0.11)
		or	

Notes

[3] Submit Worksheet 3a for each calculated assembly U-factor

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Code Requirements - Zone 1

Discussion of these requirements in the instruction section.

ZONE 1						
		Wall Requirements			Window Requirements	
Max. Glazing Fraction[4]	Wall / Insulation Type	R-Value Insulation Only		U-Factor	Max. U-Factor	Max. Shading Coefficient
Up to 15%	CMU 'Masonry[5], w/integral loose fill[6] insulation	N/A	or	0.300	0.540[7]	0.57[7]
	Masonry or concrete[5], w/cont. exterior insulation	1.4	or	0.300		
Up to 30%	CMU Masonry[5], w/integral rigid[8] fill insulation	N/A	or	0.210	0.540[7]	0.57[7]
	Masonry or concrete[5], w/interior insulation	11	or	0.130		
	Masonry or concrete[5], w/cont. exterior insulation	2.8	or	0.210		
	Frame[9] (wood or metal framing)	13	or	0.130		
	Other *(provide short description)*	13	or	0.130		
Up to 40%	CMU Masonry[5], w/integral rigid[8] fill insulation	N/A	or	0.210	0.370[10]	0.35[10]
	Masonry or concrete[5], w/interior insulation	11	or	0.130		
	Masonry or concrete[5], w/cont. exterior insulation	2.8	or	0.210		
	Frame[9] (wood or metal framing)	13	or	0.130		
	Other *(provide short description)*	13	or	0.130		

Code Requirements - Zone 2

Discussion of these requirements in the instruction section.

ZONE 2						
		Wall Requirements			Window Requirements	
Max. Glazing Fraction[4]	Wall / Insulation Type	R-Value Insulation Only		U-Factor	Max. U-Factor	Max. Shading Coefficient
Up to 15%	CMU 'Masonry[5], w/integral loose fill[6] insulation	N/A	or	0.300	0.500[11]	0.57[11]
	Masonry or concrete[5], w/cont. exterior insulation	1.8	or	0.270		
Up to 25%	CMU Masonry[5], w/integral rigid[8] fill insulation	N/A	or	0.160	0.500[11]	0.57[11]
	Masonry or concrete[5], w/interior insulation	13	or	0.090		
	Masonry or concrete[5], w/cont. exterior insulation	4.3	or	0.160		
	Frame[9] (wood or metal framing)	19	or	0.090		
	Other *(provide short description)*	19	or	0.090		
Up to 33%	CMU Masonry[5], w/integral rigid[8] fill insulation	N/A	or	0.160	0.370[12]	0.43[12]
	Masonry or concrete[5], w/interior insulation	13	or	0.090		
	Masonry or concrete[5], w/cont. exterior insulation	4.3	or	0.160		
	Frame[9] (wood or metal framing)	19	or	0.090		
	Other *(provide short description)*	19	or	0.090		

Notes

[4] The Simplified Trade-off Approach must be used if glazing fraction exceeds allowable percentages.

[5] Minimum weight of masonry and concrete walls = 45 lb/ft2 of wall face area

[6] All cores to be filled. At least 50% of cores must be filled with vermiculite or equivalent fill insulation.

[7] Prescriptive MA (Minimum Assembly) - For **Fixed Windows:** double-glazed window with a 0.5 inch air space, low-e coating and aluminum frame. MA shading coefficient description is a tinted outboard pane of glass. For **Operable Windows or Curtainwall:** double-glazed window with a 0.5 inch air space, low-e coating and thermally broken frame. MA shading coefficient description is a tinted outboard pane of glass.

[8] All cores except bond beams must contain rigid insulation inserts approved for use in reinforced masonry walls

[9] Batt insulation installed in metal or wood frame walls shall be insulated to the full depth of the cavity, up to 6 inches in depth.

[10] Prescriptive MA (Minimum Assembly) - For **Fixed Windows:** double-glazed window with a 0.5 inch argon filled space, low-e coating (e<= 0.05) and thermal break frame. For **Operable Windows or Curtainwall:** only use Max U-Factor. MA shading coefficient description is a 0.25-inch thick glass with low-e coating (e<= 0.05) with a tinted outboard pane.

[11] Prescriptive MA (Minimum Assembly) - For **Fixed Windows:** double-glazed window with a 0.5 inch air space, low-e coating and aluminum frame. For **Operable Windows or Curtainwall:** double-glazed window with a 0.5 inch air space, low-*e* coating (*e* <= 0.1) and thermally broken frame. MA maximum shading coefficient description is a tinted outboard pane of glass.

[12] Prescriptive MA (Minimum Assembly) - For **Fixed Windows**, a double-glazed window with a 0.5 inch argon filled space, low-e coating (e<= 0.05) and thermal break frame. For **Operable Windows or Curtainwall**, only use Max U-Factor. MA shading coefficient description is a 0.25-inch thick glass with low-e coating (e<= 0.05).

PRESCRIPTIVE PATH

Roofs/ Ceilings

See instructions for a dicussion of roofs/ceilings.

Roof / Ceiling[11]	R-Value Insulation Only (Min. R-19)		U-Factor[12] (Max. 0.050)
		or	

Notes

[11] Write-in a short description for assembly with the lowest insulation R-value or the highest assembly U-factor.

[12] Submit Worksheet 3b for each calculated roof/ceiling assembly U-factor.

Skylights

Includes glazed smoke vents.

See instructions for a dicussion of skylights.

	Skylight Area (total rough frame ft2)		Roof Area (gross ft2)		Skylight % [13]	Maximum Skylight Fraction Complies
Conditioned Space		÷		X 100 =		
Semi-Conditioned Space		÷		X 100 =		
Conditioned Mechanical Penthouse		÷		X 100 =		
	Skylight Area (total rough frame ft2)		Roof/Ceiling Area (gross ft2)		Skylight Percent[13]	

Skylights

From Worksheet 3d, place highest Overall Vertical Window U-factor and highest Center-of-Glass SC.

Skylights (from Worksheet 3d)	Max U-Factor[14]	Minimum Assembly
		❑
U-Value Complies		
Required Minimum Assembly		

Skylights (from Worksheet 3d)	Shading Coefficient[15]	Minimum Assembly
		❑
SC Complies		
Required Minimum Assembly		

The plans/specs show window compliance in the following locations:

Code Require-ments

Compliance Option	Thermal Performance Overall Vertical U-Factor	Shading Coefficient Center of Glass SC
Performance	U-1.230 for overall assembly in overhead plane	SC-0.47 center-of-glass
Min. Assembly (MA)	Double glazed, 0.5-inch airspace	N/A

Notes

[13] Skylight percentage area is based on total skylight and smoke vent rough frame area divided by total conditioned roof area. Percentage must not exceed 6 percent of total roof/ceiling area in conditioned building space. The Simplified Trade-off Approach must be used if glazing fraction exceeds allowable percentages.

[14] From Worksheet 3d, place the highest Overall Vertical U-factor or write-in MA (Minimum Assembly). See "Skylight Requirements" in table above for specific MA requirements.

[15] From Worksheet 3e, place the highest "center-of-glass" shading coefficient (SC) for glass. See "Skylight Requirements" in table above for specific MA requirements. Shading Coefficient (SC) can be calculated from the Solar Heat Gain Coefficient using the equation: SC = SHGC ÷ 0.87. Manufacturers data may also be used to document SC.

PRESCRIPTIVE PATH

Part 4 of 4

Floors

See instructions for a dicussion of floors.

Floors over Unconditioned Spaces[16]	R-Value Insulation Only		U-Factor
		or	

Heated Concrete Slab Edge	R-Value Insulation Only

Heated Slab-on-Grade (Section 1312.1.2.4)

☐ **Complies**. Building plans show insulation extending downward from the top of the slab a minimum distance of 24 inches or downward and under the slab for a combined minimum distance of 24 inches or to the bottom of the thickened edge of the of slabs used as a foundation.

The plans/specs show compliance in the following locations:

Notes

[16] Write-in a short description for assembly with the lowest insulation R-value or the highest assembly U-factor.

[17] Submit Worksheet 3c for each calculated floor assembly U-factor.

[18] Write-in a short description for Heated Slab, which has heat, integrated into slab such as hydronic heat. If more than one floor type, enter the lowest insulation R-value or the highest component U-factor of any floor.

Code Requirements

Component	Compliance Options: Min. R-Value Insulation Only		Max. U-Factor
Floor over Unconditioned Spaces	11	or	0.070

Component	Climate Zone 1		Climate Zone 2
Heated Concrete Slab Edge, Min. R-Value	7.5	or	10.0

Doors

See instructions for a dicussion of doors.

Doors[19] opaque, with leaf width greater than 4'	R-Value Insulation Only (Min. R-5)		U-Factor Center-of-Panel (Max. 0.20)
		or	

Notes

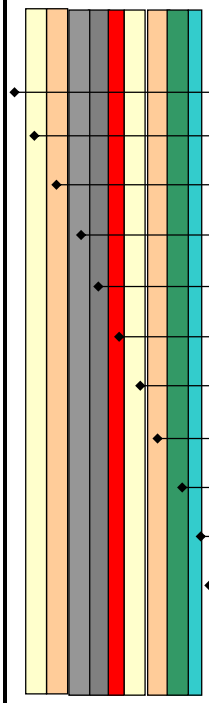
[19] Write-in a short description for Doors. If more than one door type, enter the lowest insulation R-value or the highest center-of-panel U-factor of any door. The following doors are exempt from door and window U-factor and shading coefficient requirement

Worksheet 3a | Project Name: | Page:

Wall U-factors

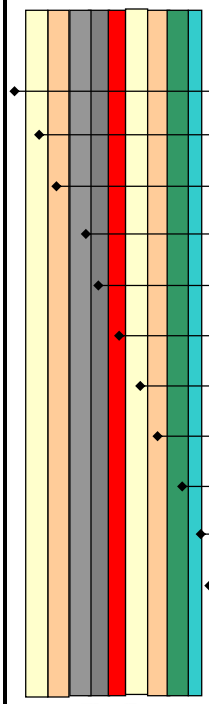
See Tables 3a through 3d for R-Values of building materials

Wall Assembly 1 - ID



(a) Layer	(b) Description	(c) Detail	(d) R-value
Exterior	Moving Air		0.17
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
Interior	Still Air		0.68
1. Total column (d)			
2. Assembly U-factor (Invert the amount in line 1)			

Wall Assembly 2 - ID



(a) Layer	(b) Description	(c) Detail	(d) R-value
Exterior	Moving Air		0.17
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
Interior	Still Air		0.68
1. Total column (d)			
2. Assembly U-factor (Invert the amount in line 1)			

Worksheet 3b Project Name: Page:

Roof U-factors

See Tables 3a through 3d for R-Values of building materials

Roof Assembly 1 - ID

(a) Layer	(b) Description	(c) Detail	(d) R-value
Exterior	Moving Air		0.17
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
Interior	Still Air		0.61
1. Total column (d)			
2. Assembly U-factor (Invert the amount in line 1)			

Roof Assembly 2 - ID

(a) Layer	(b) Description	(c) Detail	(d) R-value
Exterior	Moving Air		0.17
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
Interior	Still Air		0.61
1. Total column (d)			
2. Assembly U-factor (Invert the amount in line 1)			

Worksheet 3c | Project Name: | Page:

Floor U-factors

See Tables 3a through 3d for R-Values of building materials

Floor Assembly 1 - ID

	(a) Layer	(b) Description	(c) Detail	(d) R-value
	Interior	Still Air		0.92
	A			
	B			
	C			
	D			
	E			
	F			
	G			
	H			
	I			
	J			
	Exterior	Moving Air		0.17
1. Total column (d)				
2. Assembly U-factor (Invert the amount in line 1)				

Floor Assembly 2 - ID

	(a) Layer	(b) Description	(c) Detail	(d) R-value
	Interior	Still Air		0.92
	A			
	B			
	C			
	D			
	E			
	F			
	G			
	H			
	I			
	J			
	Exterior	Moving Air		0.17
1. Total column (d)				
2. Assembly U-factor (Invert the amount in line 1)				

Worksheet 3d

Project Name:

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Window Schedule

Window Properties - List All Window Types in Project

(a) Name	(b) Documentation Source	(c) Manufacturer's Model / No.	(d) Window Type/Class	(e) Frame Type	(f) Glass Tint	(g) Glass Thickness	(h) Other (# panes, air space, argon, low E)	(i) Center of Glass U-factor	(j) Overall Window U-factor	(k) Center of Glass SC

Column Instructions

(a) Enter the name of the window product. It is recommended that you choose a name that corresponds with that used on project plans and specifications.

(b) Provide documentation source.

Write-in "NFRC" if window is rated through NFRC 100-97 Procedure for Determining Fenestration Product Thermal Performance. Enter all columns except (i).

Write-in "ASHRAE Default W/Mfg COG" if Center-of-Glass U-factor and Shading Coefficient is available from glass manufacturer. Enter all columns. Columns (i) and (k) from manufacturer's data sheet.

Write-in "ASHRAE Default" if only descriptive parameters of window are known. Enter all columns. Columns (i), (j), and (k) from ASHRAE default table.

(c) If Document Source is either "NFRC" or "ASHRAE Default W/Mfg COG," enter the manufacturer's model number.

(d) Choices are Fixed, Operable, or Curtain Wall.

(e) Choices are wood, vinyl, reinforced vinyl, aluminum clad, insulated fiberglass, aluminum, aluminium w/thermal break (see definitions for thermal break requirements.)

(f) Enter glass tint. Write "clear" if there is no tint.

(g) Enter glass thickness

(h) Include window properties such as argon fill, low-e coating, insulating spacers, etc.

(i) COG U-factor from manufacture's data or ASHRAE 2001 Fundamentals Handbook, Chapter 30, Table 4. For NFRC rated products leave blank.

(j) Overall U-factor from NFRC rating orASHRAE 2001 Fundamentals Handbook, Chapter 30, Table 4. For skylights value must be for horizontal position.

(k) COG Shading Coefficient from manufacture's data or ASHRAE 2001 Fundamentals Handbook, Chapter 30, Table 4. For NFRC rated products SHGC is provided.

To convert SHGC to SC. SC = SHGC/0.87.

Worksheet 3e | Project Name: | Page:

Skylight Schedule

Skylight Properties - List All Skylight Types in Project

(a) Name	(b) Documentation Source	(c) Manufact-urer's Model / No.	(d) Skylight Type/Class	(e) Frame Type	(f) Glass Tint	(g) Glass Thickness	(h) Other (# panes, air space, argon, low E	(I) Center of Glass U-factor	(j) Overall Skylight U-factor	(k) Center of Glass SC

Column Instructions

(a) Enter the name of the window product. It is recommended that you choose a name that corresponds with that used on project plans and specifications.

(b) Provide documentation source.

Write-in "NFRC" if window is rated through NFRC 100-97 Procedure for Determining Fenestration Product Thermal Performance. Enter all columns except (i).

Write-in "ASHRAE Default W/Mfg COG" if Center-of-Glass U-factor and Shading Coefficient is available from glass manufacturer. Enter all columns. Columns (i) and (k) from manufacturer's data sheet.

Write-in "ASHRAE Default" if only descriptive parameters of window are known. Enter all columns. Columns (i), (j), and (k) from ASHRAE default table.

(c) If Document Source is either "NFRC" or "ASHRAE Default W/Mfg COG," enter the manufacturer's model number.

(d) Choices are Manufactured or Site Built.

(e) Choices are wood, vinyl, reinforced vinyl, aluminum clad, insulated fiberglass, aluminum, aluminium w/thermal break (see definitions for thermal break requirements.)

(f) Enter glass tint. Write "clear" if there is no tint.

(g) Enter glass thickness

(h) Include skylight properties such as argon fill, low-e coating, insulating spacers, etc.

(i) COG U-factor from manufacture's data or ASHRAE 2001 Fundamentals Handbook, Chapter 30, Table 4. For NFRC rated products leave blank.

(j) Overall U-factor from NFRC rating orASHRAE 2001 Fundamentals Handbook, Chapter 30, Table 4. For skylights value must be for horizontal position.

(k) COG Shading Coefficient from manufacture's data or ASHRAE 2001 Fundamentals Handbook, Chapter 30, Table 4. For NFRC rated products SHGC is provided.

To convert SHGC to SC. SC = SHGC/0.87.