

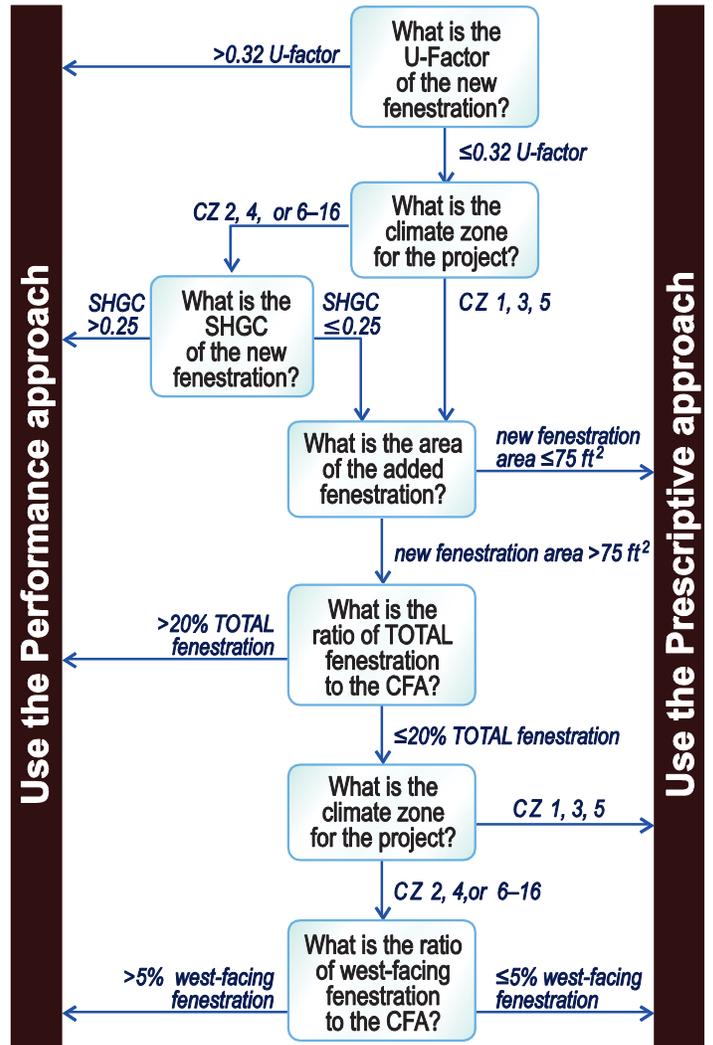
# Fenestration Alterations

## Assessing Your Project

Title 24 Prescriptive requirements for alterations affecting fenestration (windows, skylights, and doors with >3 ft<sup>2</sup> of glass) vary depending upon the fenestration added or replaced in the project.

- ✦ If you add more than 75 ft<sup>2</sup> to the building's fenestration area, the new fenestration must meet requirements for TOTAL fenestration area and WEST-facing fenestration area, as well as the U-factor and SHGC for the climate zone.
  - ✦ If you add fenestration area up to 75 ft<sup>2</sup> — or if you add up to 16 sq. ft. of new skylight area with U-factor ≤0.55 and SHGC ≤0.30 — the total/west-facing fenestration area requirements do not apply. (A skylight is fenestration installed on a roof <60° from the horizontal.)
  - ✦ If you replace existing fenestration, the replaced fenestration must meet the area-weighted U-factor and SHGC requirements of Package A. (See Prescriptive Requirements tables on the next page.)
  - ✦ Exceptions are:
    - ✧ Replacements of vertical fenestration up to 75 ft<sup>2</sup> will comply with a maximum U-factor of 0.40 in climate zones 1-16, and a maximum SHGC of 0.35 in climate zones 2, 4, and 6-16.
    - ✧ Replaced skylights are allowed a maximum U-factor of 0.55, and a maximum SHGC of 0.30.
  - ✦ If the project does not meet the prescriptive requirements:
    - ✧ Adjust your project — For example, purchase more energy efficient windows or add less fenestration area.
- OR
- ✦ Use the performance approach — This requires using approved energy modeling software.
- ✦ Check with an energy consultant before removing any existing windows or other feature.
    - ✧ You may need to use the energy efficiency values from your existing features to demonstrate compliance with the Performance approach. This would require verification by a HERS Rater of the existing features before they are changed.

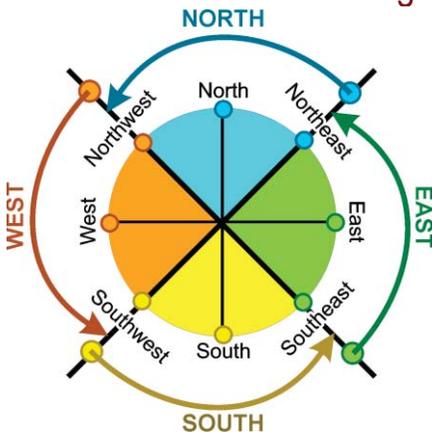
## Prescriptive or Performance? \*



\* This flowchart depicts the most common decisions regarding fenestration alteration projects. Exceptions may apply to projects that have small glazing areas and use efficient fenestration products. For example, if the fenestration area is ≤10 ft<sup>2</sup> or 0.5% of the Conditioned Floor Area (CFA), whichever is larger, it is exempt from the maximum U-factor requirement. As another example, ≤3 ft<sup>2</sup> of new glazing area installed in doors need to meet neither the U-factor nor the SHGC maximums.

For more information on exemptions, see the Standards §150.0(q), §150.1(c)3, §150.2(b)1A and §150.2(b)1B.

## Orientation & West-facing Fenestration



“Orientation” refers to the direction that the fenestration faces.

West-facing fenestration — a consideration in climate zones 2, 4, 6–16 — includes:

- ✦ A window (or a door with glass) that faces from compass orientation 236° to 315°
- ✦ Skylights tilted:
  - ✧ To the west (236° to 315°)
  - ✧ In any direction when the pitch is less than 1:12

Actual Orientation...	... Is Considered
45° east of north to 44° west of north	North-facing
45° north of west to 44° south of west	West-facing
45° west of south to 44° east of south	South-facing
45° south of east to 44° north of east	East-facing

## Mandatory Requirements

Whether you use the Prescriptive or Performance approach to demonstrate compliance, new or replacement fenestration must meet both of the following mandatory measures:

- ✦ Manufactured fenestration's air infiltration rates must be  $\leq 0.3$  cfm/ft<sup>2</sup> of window area at a pressure differential of 75 pascals.
- ✦ All new fenestration that separates conditioned space from unconditioned space or outdoors must have a maximum or weighted-average U-factor of 0.58 or lower.

**Exception:** If your project involves  $\leq 10$  ft<sup>2</sup> of fenestration OR the fenestration area is  $\leq 0.5\%$  of the total CFA (whichever is greater), it does not need to meet the maximum U-factor requirement.

## Prescriptive Requirements

The Prescriptive requirements for fenestration vary by climate zone and the type and area of the fenestration:

More than 75 ft <sup>2</sup> additional fenestration area <sup>A</sup>				
Climate Zones	U-Factor <sup>E</sup>	SHGC <sup>B,E</sup>	TOTAL Fenestration <sup>C</sup> Area % of CFA <sup>D</sup>	WEST-facing <sup>C</sup> Area % of CFA <sup>D</sup>
1, 3, 5	0.32 or lower	na	20% or less	na
2, 4, 6-16	0.32 or lower	0.25 or lower	20% or less	5% or less

75 ft <sup>2</sup> or less additional fenestration area <sup>A</sup>		
Climate Zones	U-Factor <sup>E</sup>	SHGC <sup>B,E</sup>
1, 3, 5	0.32 or lower	na
2, 4, 6-16	0.32 or lower	0.25 or lower

16 ft <sup>2</sup> or less additional skylight area		
Climate Zones	U-Factor <sup>E</sup>	SHGC <sup>B,E</sup>
1, 3, 5	0.55 or lower	na
2, 4, 6-16	0.55 or lower	0.30 or lower

<sup>A</sup> Fenestration area is the glass plus the frame. For doors with glass area less than 50% of total door area, consider the "frame" to be two inches on all sides of the glass. For doors with glass area 50% or more of the total door area, count the entire door area as glazing.

<sup>B</sup> If the fenestration has qualifying exterior shading (e.g., a permanent awning) the SHGC may be calculated taking that shading into consideration. If you use exterior shading to meet the SHGC requirement, you must submit a CF1R-ENV-03-E: "Solar Heat Gain Coefficient (SHGC) Worksheet."

<sup>C</sup> "TOTAL fenestration" is all new fenestration plus existing fenestration that remains after the alteration. See "Orientation and West-facing Fenestration" (reverse side of this sheet) for a definition of west-facing fenestration.

<sup>D</sup> "CFA" is conditioned floor area; see §100.1 "Definitions and Rules of Construction" in the Standards for details.

<sup>E</sup> Maximum area-weighted average values.

See Exception 3 to Section 150.1(c)3A for fenestration containing chromogenic glazing. (Chromogenic glazing is high performance glazing that is able to vary its transmittance appropriately in response to automatic controls based on the solar intensity. This means it has the potential to improve building energy efficiency compared to standard low-e glazing.)

## Repairs

No fenestration energy efficiency requirements apply if you:

- ✦ Replace a broken pane of glass, but not the entire window
- ✦ Uninstall fenestration components for maintenance or repair and re-install in the same location without increasing the pre-existing energy consumption.

## Documentation

### Forms

The following forms are required for residential fenestration alterations:

- ✦ **Permit**
- ✦ **CF1R-ALT-01-E** — Certificate of Compliance for Residential Alterations  
Submitted to the building department by the contractor or the home owner.
- ✦ **CF1R-ENV-02-E** (if necessary) — Area Weighted Average Calculation Worksheet  
Submitted with the CF1R-ALT-01-E when there is more than one type of window and one or more does not meet prescriptive compliance requirements.
- ✦ **CF1R-ENV-03-E** (if necessary) — Solar Heat Gain Coefficient (SHGC) Worksheet  
Submitted with the CF1R-ALT-01-E only if exterior shading devices are used to meet the SHGC requirement.
- ✦ **CF2R-ENV-01-E** — Certificate of Installation for Fenestration  
Completed and signed by the installing contractor and made available for final inspection by building department.

### NFRC Labeling

Typically, manufactured windows come with labels indicating that the NFRC (National Fenestration Rating Council) has certified the performance ratings of the window. **Leave the labels on the windows until the field inspection is done.**

		<b>World's Best Window Co.</b> Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider	
ENERGY PERFORMANCE RATINGS			
U-Factor (U.S./I-P)		Solar Heat Gain Coefficient	
<b>0.30</b>		<b>0.30</b>	
ADDITIONAL PERFORMANCE RATINGS			
Visible Transmittance		Air Leakage (U.S./I-P)	
<b>0.51</b>		<b>0.2</b>	
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>			

Manufactured fenestration not certified by NFRC must use the CEC Default values found in Table 110.6-A and Table 110.6-B in the Standards; documented per §10-111 labeling requirements, or use the equations in Reference Appendix NA6.





City of Oakley – Simplified CF1R-ALT-01-E form for Window Replacement

Permit Number \_\_\_\_\_ Address \_\_\_\_\_

***This form shall be filled out and signed by the installing contractor. Submit this form along with the permit application to obtain a permit. The original copy is retained by the Building Department. Keep the other copy with your permit.***

***Fill out the requested information in the applicable areas.***

***Fill out the Declaration Statement section completely including signature and date.***

***QUESTIONS? REQUEST ASSISTANCE FROM THE PERMIT TECH.***

**Fenestration Proposed Areas**

- Replacing Window Alone** – Replacement windows shall meet the U-Factor 0.32 or lower and SHGC value 0.25 or lower requirements of Component Package A table 150.1-A The TOTAL fenestration and WEST- facing area requirements are not applicable.
- Adding more than 75 ft<sup>2</sup>** to the buildings fenestration area, the new fenestration must meet requirements for TOTAL fenestration and WEST- facing fenestration as well as the U-factor of 0.32 or lower and the SHGC of 0.25 or lower.
- Replacing Skylights** – Maximum U-factor of 0.55 or lower and a SGHC of 0.30 or lower. The TOTAL fenestration and WEST- facing area requirements are not applicable.

Item	Fenestration Type and Frame (window, glass door or skylight)	Orientation North, East, South West	Proposed Area <sup>1</sup> (ft <sup>2</sup> )	Maximum U-factor 0.32	Maximum SHGC 0.25	NFRC or Default Value <sup>2</sup>
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

1. Fenestration area is the total glazed product (i.e., glass plus frame). When a door is less than 50% glass, the fenestration area may be the glass area plus a "2 inch frame" around the glass.
2. If applicable at this stage enter "NFRC" for NFRC Certified windows or CEC Default Values

**Altered Fenestration Allowed Areas (Complete if more than 75ft<sup>2</sup> of fenestration is added.)**

	A	B	C	D	E	F	G
	CFA of entire building	Allowed % of CFA	Existing Fenestration Area	Fenestration area removed	Fenestration area added	Total Area allowed (A x B)	Proposed Area (E-D) + C
Total fenestration area		.20					
West Fenestration Area		.05					

- I certify under penalty of perjury, under laws of the State of California, the information provided on this form is accurate and complete.
- I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Parts 1 and 6 of the California code of Regulations.

Name:	Signature:
Company:	Date:
Address:	License:
City/State/Zip	Phone:



<b>CERTIFICATE OF INSTALLATION</b>		<b>CF2R-ENV-01-E</b>
<b>Fenestration</b>		<b>(Page 1 of 2)</b>
Project Name:	Enforcement Agency: <b>City of Oakley</b>	Permit Number:
Dwelling Address:	City <b>Oakley</b>	Zip Code <b>94561</b>

*If more than one person has responsibility for installation of the items on this certificate, each person shall prepare and sign a certificate applicable to the portion of construction for which they are responsible. Alternatively, the person with chief responsibility for construction shall prepare and sign this certificate for the entire construction. The signer agrees that all applicable Mandatory Measures were met. Temporary labels are not to be removed before verification by the building inspector.*

**A. FENESTRATION/GLAZING**

Includes all Windows, Skylights, Greenhouse/Bay Windows, Glazed Doors and Skylights

1	2	3	4	5	6	7	8	9	10
Item	Manufacturer/Brand <sup>1</sup>	Installed <sup>2</sup>				Source— NFRC, CEC Default <sup>3</sup>	Number of Like Products <sup>4</sup>	Exterior Shading Devices <sup>5</sup>	Comments/Location /Special Features <sup>6</sup>
		U- factor	SHGC	Area (ft2)	Orient ation				
1									
2									
3									
4									
5									
6									

1. Temporary window labels shall not be removed until the building inspector has verified the installed windows are the same or better than listed on the CF-1R. If labels were removed before verification by the inspector, the installer must use the CEC Default values from Table 110.6-A and 110.6-B. For NFRC rated products information from the permanent labels can be used to verify efficiencies.
2. List the installed U-factor, SHGC, area and orientation for each window or like windows. Note: For each window values shall be taken from: NFRC Label, or CEC Default values from Table 110.6-A and 110.6-B.
3. For each window list the source from which the actual values were obtained (NFRC, CEC Default).
4. List the number of like products (same U-factor, SHGC, Area, and Orientation) to be installed by grouping them together.
5. If exterior shading devices are installed select the type of shading device (sunscreens, louvered, vertical roller or shades or retractable awnings or roll down or slats) or if an overhang is installed.
6. This column is reserved for Comments – Locations – Special Features to provide additional information for the field inspector.

**B. MANDATORY REQUIREMENTS FOR ALL FENESTRATION**

1	All Fenestration Products have a temporary label that lists the U-factor and SHGC.
2	Temporary label shall list how the values were determined: NFRC, or (CEC) Default Values from Table 110.6-A and 110.6-B
3	Temporary labels that use the (CEC) Defaults shall list the U-factor and SHGC followed by the appropriate default U-factor.
4	NFRC Rated products have a permanent label on the product that can be looked up in the NFRC product directory ( <a href="http://www.nfrc.org">www.nfrc.org</a> ).
5	The fenestration installed has U-factor and SHGC values less than or equal to the values listed on the CF-1R.
6	The fenestration installed area is equal to or less than the areas listed on the CF-1R
7	The fenestration is properly installed, sealed and caulked or has low expanding foam between the fenestration and framing if allowed by manufacturer to limit infiltration.
8	All gaps between the fenestration and framing are filled with insulation to a minimum R13.

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Name:	Signature:
Company :	Date:
Address:	CEA or CEPE or HERS Certification # If Applicable:
City/State/Zip:	Phone:

CERTIFICATE OF INSTALLATION		CF2R-ENV-01-E
Fenestration		(Page 2 of 2)
Project Name:	Enforcement Agency: City of Oakley	Permit Number:
Dwelling Address:	City Oakley	Zip Code 94561

<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>		
<ol style="list-style-type: none"> <li>1. I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.</li> <li>2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).</li> <li>3. I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.</li> <li>4. I reviewed a copy of the Certificate of Compliance (CF1R) approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF1R that apply to the installation have been met.</li> <li>5. <b>I will ensure that a completed, signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.</b></li> </ol>		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):





### CITY OF OAKLEY BUILDING PERMIT APPLICATION

JOB ADDRESS: \_\_\_\_\_ SUBDIV # \_\_\_\_\_ LOT # \_\_\_\_\_

PROJECT DESCRIPTION \_\_\_\_\_

PROJECT VALUATION: \$ \_\_\_\_\_ SEPTIC SYSTEM: YES  NO

PERMIT TYPE: BUILDING  MECHANICAL  ELECTRICAL  PLUMBING   
SIGN  POOL/SPA  DEMO  REROOF

LIVING AREA SQ FT: \_\_\_\_\_ DECK/PORCHES SQ FT: \_\_\_\_\_ GARAGE SQ FT: \_\_\_\_\_

PROPERTY OWNER: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_ PHONE #: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_ STATE LIC #: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_ PHONE # \_\_\_\_\_

ARCH/ENGR: \_\_\_\_\_ LIC # \_\_\_\_\_ PHONE # \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

PROJECT MANAGER: \_\_\_\_\_ PHONE #: \_\_\_\_\_

#### Permitted work hours:

Operate or perform construction or repair (which creates noise) within or adjacent to a residential land use district except during the following hours:

1. Monday through Friday: 7:30 am to 7:00 pm
2. Saturdays, Sundays & holidays: 9:00 am to 7:00 pm

Initial: \_\_\_\_\_

**ALL PERMITS REQUIRE A FINAL INSPECTION**

**ALL PERMITS HAVE AN EXPIRATION DATE, 180 DAYS FROM LAST INSPECTION**



## CITY OF OAKLEY BUILDING PERMIT APPLICATION

### LICENSED CONTRACTORS DECLARATION

I herby affirm that I am licensed under the provisions of Chapter 9 (commencing with section 7000) of the Business & Professions Code, & my license is in full force & effective. Initial: \_\_\_\_\_

### WORKMAN'S COMPENSATION

I herby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (sec. 3800 lab C) Initial: \_\_\_\_\_

### EXEMPTION FROM WORKER'S COMPENSATION INC

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Comp Laws of California Initial: \_\_\_\_\_

**NOTICE TO THE APPLICANT: *If after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked.***

### OWNER-BUILDER DECLARATION

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec7031.5), Business & Professions Code: Any City or County which requires a permit to construct, altar, improve, demolish or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License Law (Chapter 9(commencing with Section 7000) of Division 3 of the Business & Professions Code) or that he is exempt there from & the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars(\$500).

- I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business & Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, &who does such work himself or through his own employees. Provided that such improvements are not intended or offered for sale. If, however, the building improvement is sold within one year of completion, the owner/builder will have the burden of proving that he did not build or improve for the purpose of sale)
- I, as the owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec 7044 Business & Professions Code: The Contractor's License Law does not apply to an owner of property who builds/improves thereon, & who contracts for such project with a contactor(s) licensed pursuant to the Contractor's License Law)
- I am exempt under Sec. \_\_\_\_\_ Business & Professions Code for this reason.  
Applicant: \_\_\_\_\_

**NOTICE TO APPLICANT** I certify that I have read this application & state that the information on the permit is correct. I agree to comply with all City and County ordinances and state laws relating to building construction and hereby authorize representatives of this city to enter upon the above mentioned property for inspection purposes.

### SECTION 106.4.4 UNIFORM BUILDING CODE

Expiration: Every permit issued by the Building Official under the provisions of this code shall expire by limitation and become null & void, if the building or work authorized by such permit is not commenced with 180 days from the date of such permit, or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of 180 days.

APPLICANT/AGENT \_\_\_\_\_

DATE: \_\_\_\_\_