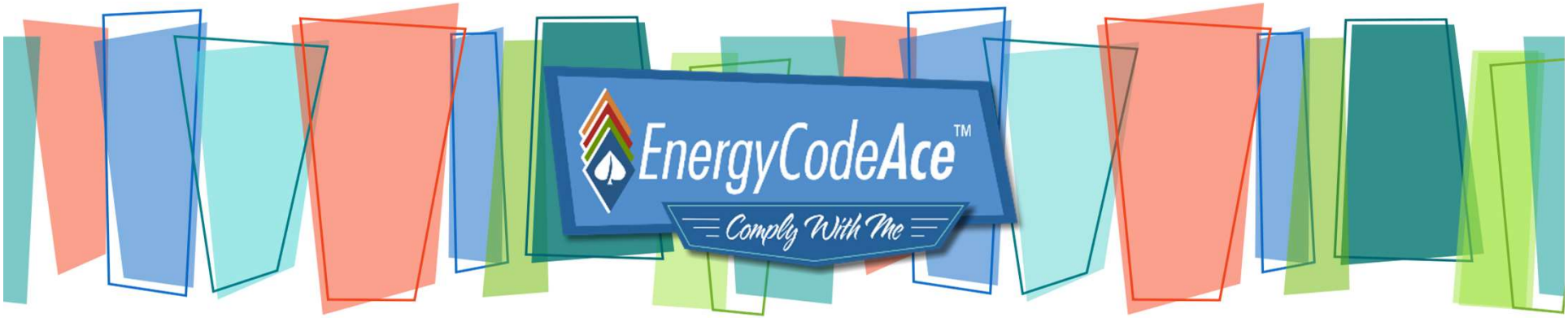

2019 Title 24, Part 6 (Energy Code) and Fenestration

Gina Rodda
Gabel Energy

August 2021

Learning Objectives

- Determine Prescriptive fenestration requirements for single-family, multifamily, hotel/motel and nonresidential new construction and alterations
- Identify the fenestration efficiency requirements in the compliance documentation
- Understand Energy Code fenestration verification requirements that must be met by the installing contractor
- Recognize when NFRC labeling versus NFRC certificates are required

Ace Training™

Ace Resources™

A suite of interactive tools to help you understand the compliance process, required forms, installation techniques and energy efficiency regulations applicable to building projects and appliances in California

Our Tools include:

- Energy Code Product Finder
- Forms Ace
- Image Ace
- Navigator Ace
- Nonres. Indoor Lighting Wheel
- Q&Ace
- Reference Ace
- Timeline Ace
- Virtual Compliance Assistant

EnergyCodeAce™
Comply With Me

Ace Tools™

Ace Resources™

A portfolio of on-demand and live online and in-person training alternatives on California's Energy Code and Title 20 regulations, tailored to a variety of industry professionals and addressing key measures

Our Training includes a variety of formats:

- In-person instructor-led
- Online instructor-led
- Online self-study
- Recorded webinars
- YouTube — live streaming & videos

Ace Tools™

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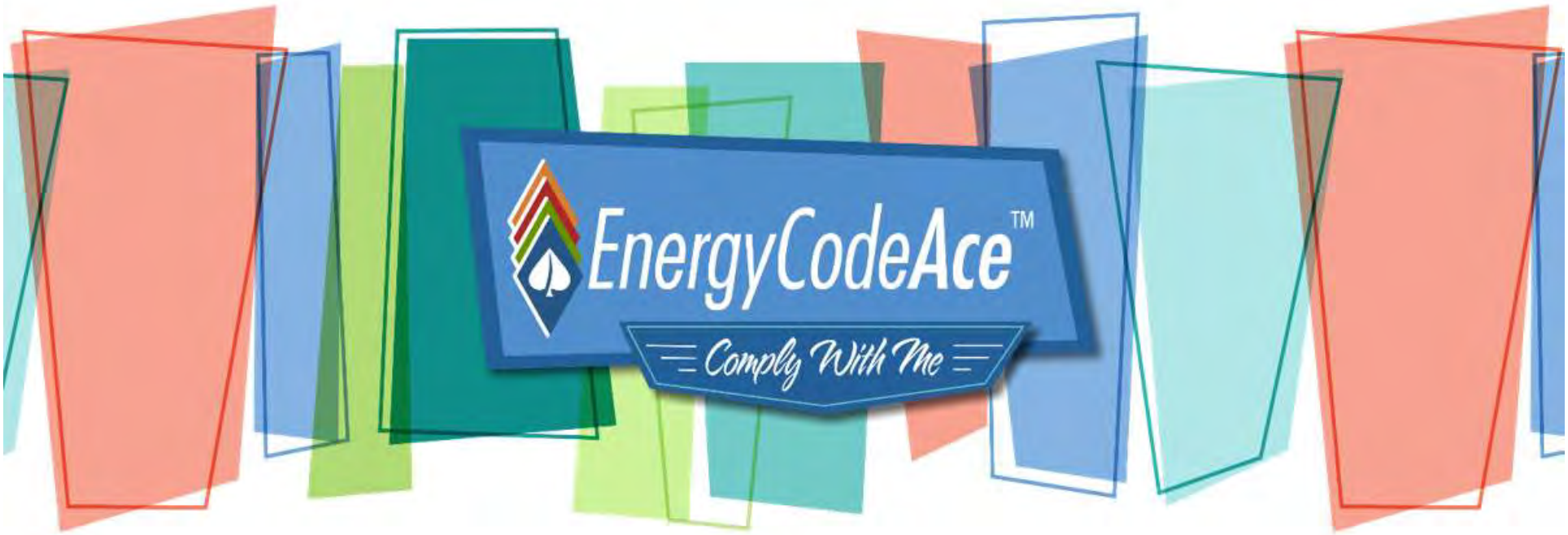
An array of downloadable materials providing practical and concise guidance on how and when to comply with California's building and appliance energy efficiency standards

Our Resources include:

- Application Guides
- Checklists
- Fact Sheets
- Submit a Question
- Trigger Sheets
- Useful Links



Join us at
www.EnergyCodeAce.com

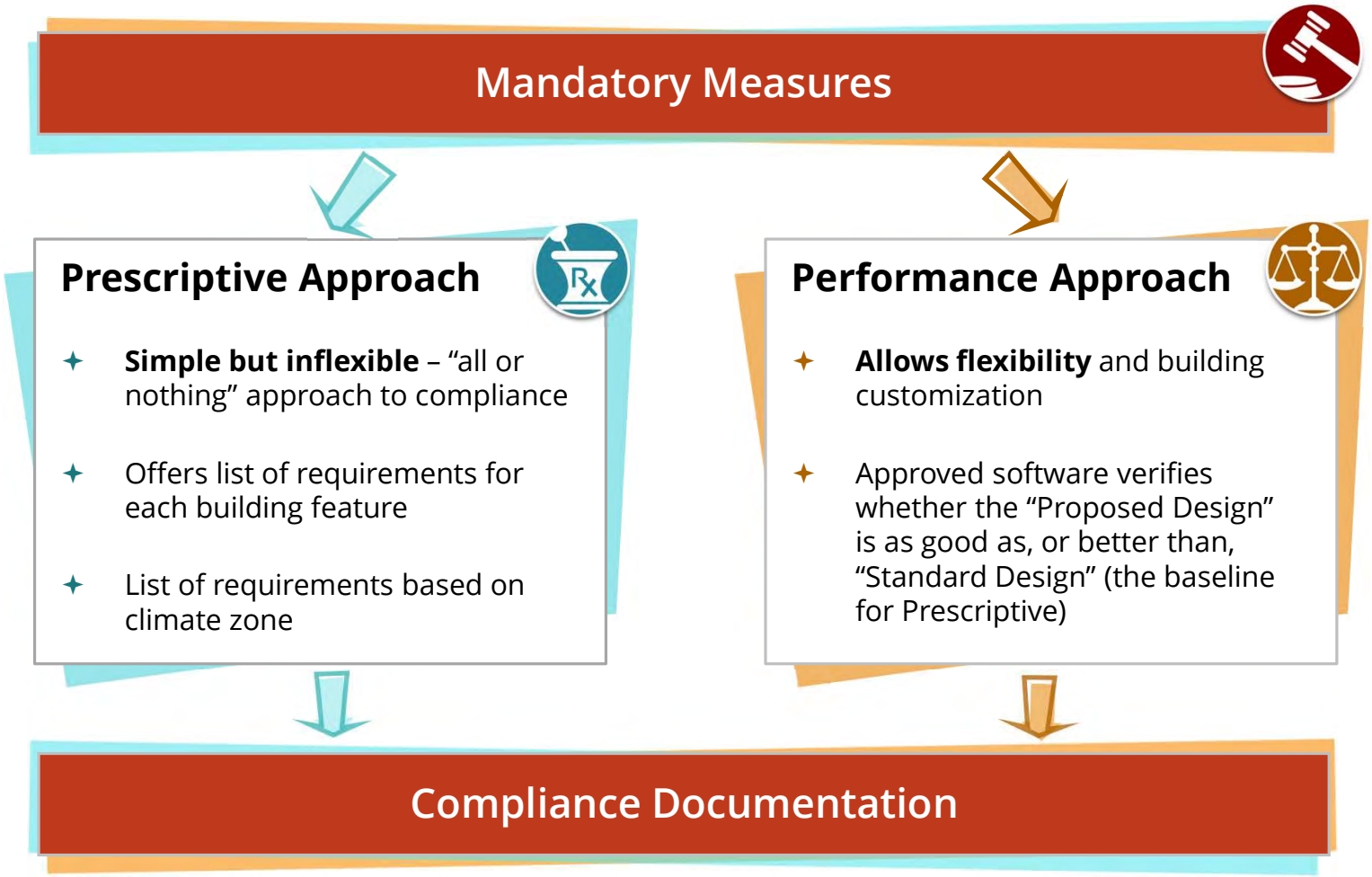
2019 Energy Code: Fenestration

1. Energy Code Basics
2. Fenestration Efficiency
3. Residential
4. Nonresidential
5. Next Steps

- **Energy Code Basics**
  - Compliance Pathways
  - Climate Zones
  - Definitions
  - Building Occupancies

Showing Energy Code Compliance (Any Project)

- Any project triggering the Energy Code must **first comply** with applicable **Mandatory Measures**
- Compliance is demonstrated using one of **two pathways** – the **Prescriptive** or **Performance Approach**
- Associated **Energy Code forms** are completed during the building process to document compliant design, installation and verification



Definitions

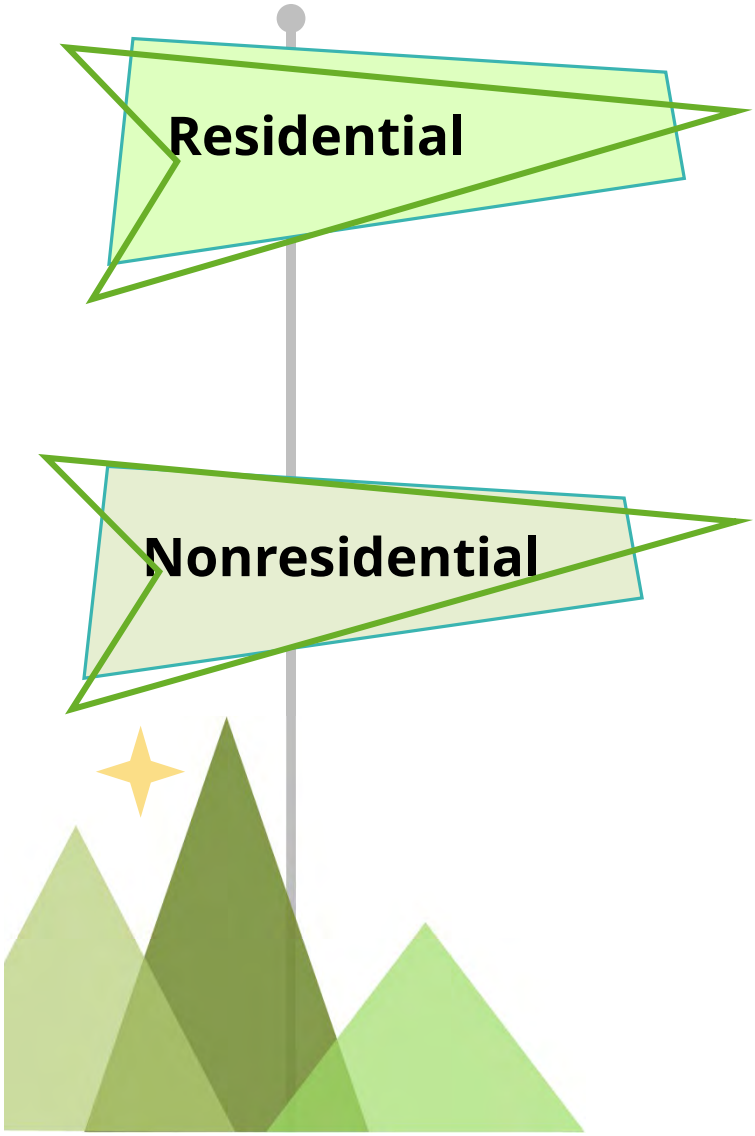
Example

Repair: Replace a broken windowpane with the sash remaining

Alteration: Replacing the sash AND the glazing

- **Alteration:** Any change to a building's water heating system, space conditioning system, indoor lighting system, outdoor lighting system, sign lighting or envelope that is not an Addition
- **Repair:** The reconstruction or renewal for the purpose of maintenance of any component, system or equipment in an existing building
  - Repairs shall not increase the preexisting energy consumption of the repaired component, system or equipment.
  - If the item is replaced instead of repaired, the replaced item is now considered an Alteration and triggers the Energy Code.

Energy Code Occupancy Types



Single Family

- Including duplexes and townhomes with three or fewer habitable stories

Multifamily

- Low-rise: Three or fewer habitable stories

Nonresidential

- Commercial, office, retail, licensed healthcare

Multifamily

- High-rise: More than three habitable stories

2019 Energy Code: Fenestration

- **Fenestration Basics**
  - Fenestration Types
  - Labeling Requirements
  - NFRC Temporary Labels
  - What is a Door?

Fenestration Types: Labeling

§110.6,
Title 24, Part 1 §10-111

Manufactured

Factory-assembled fenestration product using factory cut and formed materials

NFRC Temporary Labels

Site-Built

Factory-formed framing and glazing features assembled on site

Residential: Default Label (≤250 ft²/5% CFA)
Nonresidential: NFRC-CMA certificate or Default Label (≤200 ft²)

Field-Fabricated

Fenestration that is fabricated at the building site from elements that are not sold together

Default Label

Default Values

§110.6

If fenestration does not have a label, the default values must be used.
Default values can only be used in the Performance Approach.

TABLE 110.6-A DEFAULT FENESTRATION PRODUCT U-FACTORS

FRAME	PRODUCT TYPE	SINGLE PANE [3, 4] U-FACTOR	DOUBLE PANE [1, 3, 4] U-FACTOR	GLASS BLOCK [2,3] U-FACTOR
Metal	Operable	1.28	0.79	0.87
	Fixed	1.19	0.71	0.72
	Greenhouse/garden window	2.26	1.40	N.A.
	Doors	1.25	0.77	N.A.
	Skylight	1.98	1.30	N.A.
Metal, Thermal Break	Operable	N.A.	0.66	N.A.
	Fixed	N.A.	0.55	N.A.
	Greenhouse/garden window	N.A.	1.12	N.A.
	Doors	N.A.	0.59	N.A.
	Skylight		1.11	N.A.
Nonmetal	Operable		0.58	0.60
	Fixed		0.55	0.57
	Doors	0.99	0.53	N.A.
	Greenhouse/garden windows	1.94	1.06	N.A.
	Skylight	1.47	0.84	N.A.

1. For all dual-glazed fenestration products, adjust the listed U-factors as follows:
   a. Add 0.05 for products with dividers between panes if spacer is less than 7/16 inch wide.
   b. Add 0.05 to any product with true divided lite (dividers through the panes).
2. Translucent or transparent panels shall use glass block values when not rated by NFRC 100.
3. Visible Transmittance (VT) shall be calculated by using Reference Nonresidential Appendix NA6.
4. Windows with window film applied that is not rated by NFRC 100 shall use the default values from this table.

Res

TABLE 110.6-B DEFAULT SOLAR HEAT GAIN COEFFICIENT (SHGC)

FRAME TYPE	PRODUCT	GLAZING	FENESTRATION PRODUCT SHGC		
			Single Pane [2,3] SHGC	Double Pane [2,3] SHGC	Glass Block [1,2] SHGC
Metal	Operable	Clear	0.80	0.70	0.70
	Fixed	Clear	0.83	0.73	0.73
	Operable	Tinted	0.67	0.59	N.A.
	Fixed	Tinted	0.68	0.60	N.A.
Metal, Thermal Break	Operable	Clear	N.A.	0.63	N.A.
	Fixed	Clear	N.A.	0.69	N.A.
	Operable	Tinted	N.A.	0.53	N.A.
	Fixed	Tinted	N.A.	0.57	N.A.
Nonmetal	Operable	Clear	0.74	0.65	0.70
	Fixed	Clear	0.76	0.67	0.67
	Operable	Tinted	0.60	0.53	N.A.
	Fixed	Tinted	0.63	0.55	N.A.

1. Translucent or transparent panels shall use glass block values when not rated by NFRC 200.
2. Visible Transmittance (VT) shall be calculated by using Reference Nonresidential Appendix NA6.
3. Windows with window film applied that is not rated by NFRC 200 shall use the default values from this table

Since there is no default visible transmittance (VT) value available, the alternative is VT_C=1.0 which includes the glass and frame of the fenestration.

NA6 – Center of Glass Formulas

NA6.1, §110.6

- Manufacturer's NFRC center of glass (COG) values plus adjustments for framing type are used in formulas to calculate alternate default values for site-built fenestration. See Reference Appendix NA6 sections NA6.2, NA6.3 and NA6.4 for details.
  - A copy of the manufacturer cut sheets or data sheet shall be provided identifying the COG values as an attachment with the Fenestration Certificate of Compliance.

Single Family, Low-Rise Multifamily

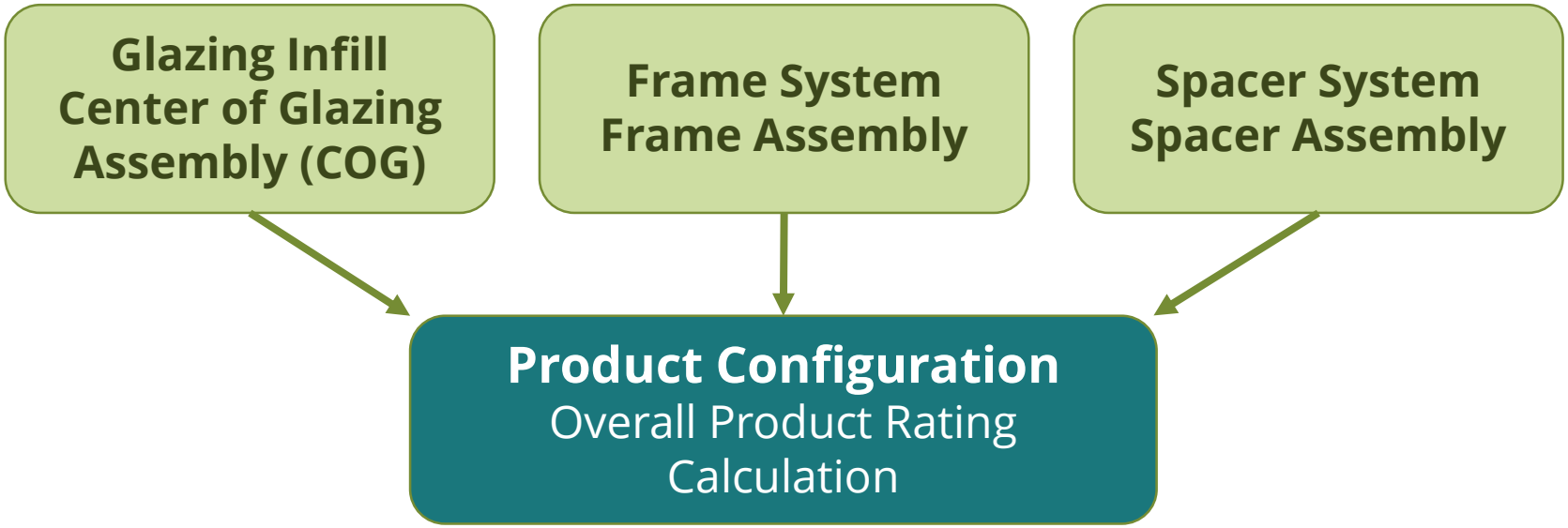
- Limited to ***≤ 250 ft²*** of site-built product ***or 5%*** of the conditioned floor area (CFA)

Nonresidential, Hotel/Motel, High-Rise Multifamily

- **New Construction:** Limited to ***≤ 200 ft²*** of site-built product

NFRC Rating

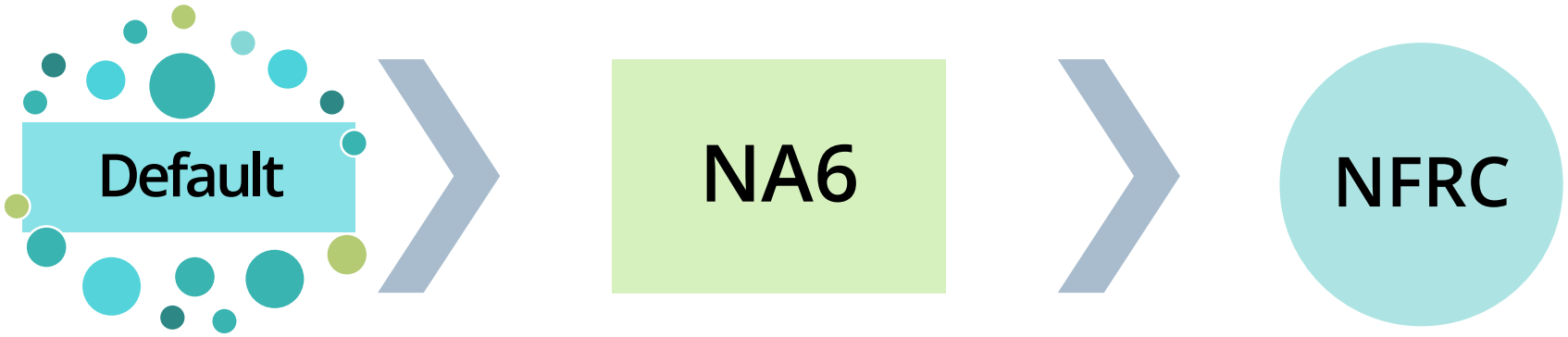
Components Behind National Fenestration Rating Council (NFRC) Rating



Performance data for these three primary components are used to generate whole-product ratings for U-factor, solar heat gain coefficient (SHGC), visible transmittance (VT) and air leakage.

Fenestration Labels

§110.6,
Title 24, Part 1 §10-111



Temporary Label

Default Label*

Temporary Label

- **Residential:** Default Label*
- **Nonresidential:** NRCC-ENV or PRF Fenestration Section, NRCA-ENV-02-F

Temporary Label

- **Residential:** NFRC
- **Nonresidential:** NFRC

Permanent Label

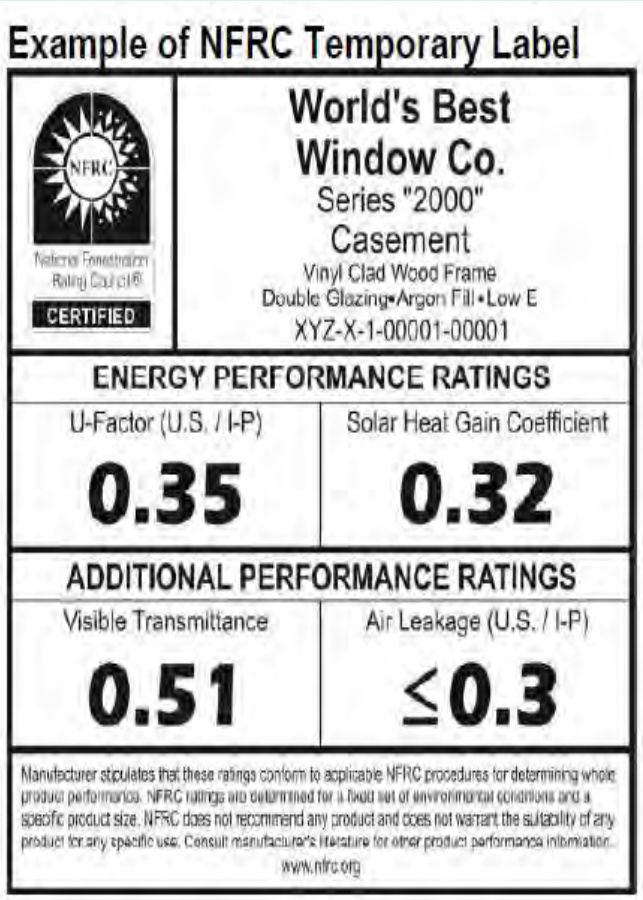
- **Manufactured:** As required by NFRC
- **Site Built:** NFRC-CMA Certificate

** There is no official "Default Label", but something must be provided in the field to confirm that default values used in the Certificate of Compliance are consistent with what was installed.*

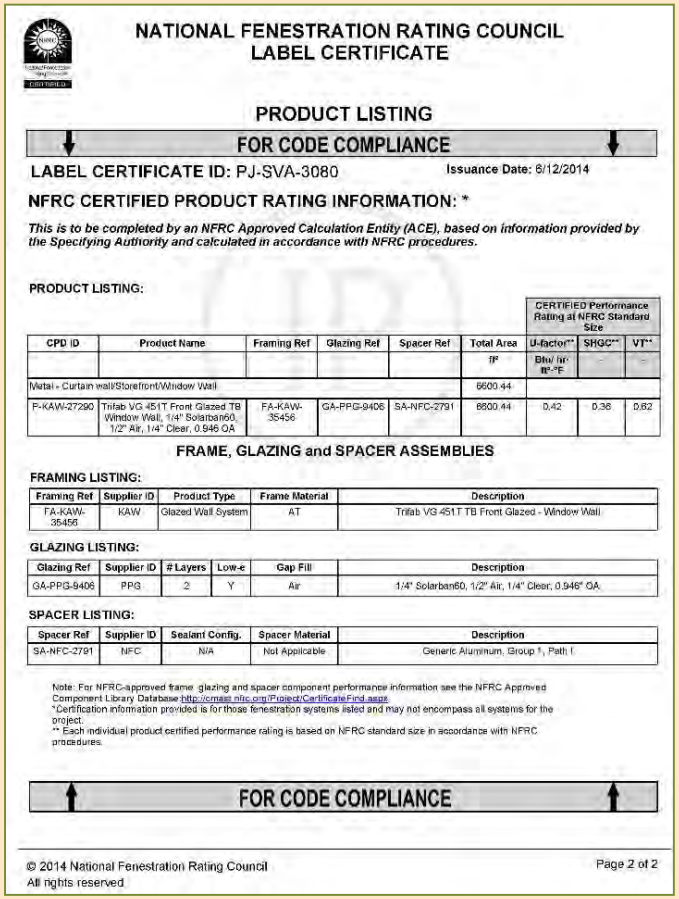
NFRC Temporary Labels

Manufactured NFRC Label

Example of NFRC Temporary Label



Site-Built NFRC-CMA Certificate



NATIONAL FENESTRATION RATING COUNCIL
LABEL CERTIFICATE

PRODUCT LISTING

FOR CODE COMPLIANCE

LABEL CERTIFICATE ID: PJ-SVA-3080 Issuance Date: 6/12/2014

NFRC CERTIFIED PRODUCT RATING INFORMATION: *

This is to be completed by an NFRC Approved Calculation Entity (ACE), based on information provided by the Specifying Authority and calculated in accordance with NFRC procedures.

PRODUCT LISTING:

CPD ID	Product Name	Framing Ref	Glazing Ref	Spacer Ref	Total Area	CERTIFIED Performance Rating at NFRC Standard Size U-factor**	SHGC**	VT**
					ft²	Btu/ hr· ft²·°F	-	-
Metal - Curtain wall/Storefront/Window Wall					6600.44			
F-KAW-27290	Trifab VG 451T Front Glazed TB Window Wall, 1/4" Solarban60, 1/2" Air, 1/4" Clear, 0.946 OA	FA-KAW-35456	GA-PPG-9406	SA-NFC-2791	6600.44	0.42	0.36	0.62

FRAME, GLAZING and SPACER ASSEMBLIES

FRAMING LISTING:

Framing Ref	Supplier ID	Product Type	Frame Material	Description
FA-KAW-35456	KAW	Glazed Wall System	AT	Trifab VG 451T TB Front Glazed - Window Wall

GLAZING LISTING:

Glazing Ref	Supplier ID	# Layers	Low-e	Gap Fill	Description
GA-PPG-9406	PPG	2	Y	Air	1/4" Solarban60, 1/2" Air, 1/4" Clear; 0.946" OA

SPACER LISTING:

Spacer Ref	Supplier ID	Sealant Config.	Spacer Material	Description
SA-NFC-2791	NFC	N/A	Not Applicable	Generic Aluminum, Group 1, Path 1

Note: For NFRC-approved frame, glazing and spacer component performance information see the NFRC Approved Component Library Database http://cmast.nfrc.org/ProjectCertificateFind.aspx
*Certification information provided is for those fenestration systems listed and may not encompass all systems for the project.
**: Each individual product certified performance rating is based on NFRC standard size in accordance with NFRC procedures.

FOR CODE COMPLIANCE

Page 2 of 2

Regulatory Advisory

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., *Governor*

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

Regulatory Advisory

December 2017

Fenestration Labeling

California's *2016 Building Energy Efficiency Standards* (Energy Standards), Section 110.6 requires manufactured fenestration products to meet labeling criteria for U-factor, Solar Heat Gain Coefficient (SHGC), Visible Transmittance (VT), and Air Leakage. Fenestration includes:

- Windows – including bay, dual-pane garden, and glass block windows.
- Exterior doors with at least 50% glazing – including sliding glass and French doors.
- Skylights – including tubular skylights and atrium roof systems.

Energy Standards Section 10-111 prescribes two options for labeling fenestration products:

1. Product certification and labeling by the National Fenestration Rating Council (NFRC)
2. A label with Energy Commission default values from Section 110.6 of the Energy Standards

Using standardized procedures to calculate U-factor and SHGC ensures that the thermal or energy efficiency performance for each type of fenestration product is accurate, and that data from different manufacturers can be easily compared and independently verified. For buildings to receive Energy Standards compliance credit for performance features such as low-emissivity, manufactured fenestration products must be tested and certified according to the NFRC.

NFRC Certification and Labeling

Section 10-111(a) of the Energy Standards designates the NFRC as the entity responsible for rating and certifying manufactured fenestration products. To verify compliance, products are required to have both a temporary and a permanent label. Temporary (removable) NFRC labels must list the U-factor, SHGC, VT, and Air Leakage values. Permanent (non-removable) NFRC labels must display t
product energy perfo
adhesively to the wi

Example of NFRC Te

ENERGY PERFORMANCE RATINGS	
U-Factor (U.S. / I-P)	Solar Heat Gain Coefficient
0.35	**0.32**
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S. / I-P)
0.51	**≤0.3**

			NFRC XYZ-13 13-T

The NFRC program ensures that participating manufacturers properly label their products, and NFRC can impose fines up to $5,000 per product line plus $100 per product for violations of labeling requirements. For more information about NFRC labeling visit http://www.nfrc.org.

California Energy Commission Default Labeling

The Energy Standards require that any manufactured fenestration products not certified by the NFRC must incorporate an alternative temporary label that lists the Energy Commission default U-factor, SHGC, and VT values from Energy Standards Section 110.6, Table 110.6-A.

Example of California Energy Commission Temporary Default Label

2016 California Energy Commission Default Label XYZ Manufacturing Co.		
Key Features:	☐ Doors	☐ Double-Pane
	☐ Skylight	☐ Glass Block
Frame Type	**Product Type:**	**Product Glazing Type:**
☐ Metal	☐ Operable	☐ Clear
☐ Non-Metal	☐ Fixed	☐ Tinted
☐ Metal, Thermal Break	☐ Greenhouse/Garden Window	☐ Single-Pane
☐ Air space 7/16 in. or greater ☐ With built-in curb ☐ Meets Thermal-Break Default Criteria	----------	To calculate VT see NA6
California Energy Commission Default U-factor =	**California Energy Commission** Default SHGC =	**California Energy Commission** Calculated VT =
Product meets the air infiltration requirements of §110.6(a)1, U-factor criteria of §110.6(a)2, SHGC criteria of §110.6(a)3 and VT criteria of §110.6(a)4 of the 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.		

Non-Compliant Labels

Manufacturer-generated values (such as "Simulated Performance Alternative" values) do not comply with the labeling requirements and cannot be used to verify fenestration compliance.

Temporary fenestration labels must not be removed before building department inspection. If temporary NFRC or default labels are not available on site for verification, the building inspector should not allow further fenestration installation until a compliant label is produced.

Building inspectors should confirm that the U-factor, SHGC, and VT values on compliant labels are equal to or better than those on the CF1R compliance document associated with the permit.

For additional questions about the *Building Energy Efficiency Standards*, contact the Energy Standards Hotline at (800) 772-3300 (within California), (916) 654-5106 (outside California), or via email at title24@energy.ca.gov.

Doors

§100.1

- If a door has 25% or more glass area, the entire rough opening is treated as fenestration.
- If a door has less than 25% glazing, the glazed area plus 2” around it is considered fenestration; the remainder is opaque door.

2019 Energy Code: Fenestration

1. Energy Code Basics
2. Fenestration Basics
3. Residential Requirements
4. Nonresidential Requirements
5. Next Steps

- **Residential Requirements**
  - Prescriptive: New Construction
    - Fenestration Efficiency
    - Fenestration Area
  - Prescriptive: Alterations
  - Compliance Documentation

New Construction

§150.1(c)3A

Mandatory

- **Maximum Weighted U-factor = 0.58**

  Exception: ≤10 ft² or 5% conditioned floor area, whichever is greater

Prescriptive

Tables 150.1-A and B: Prescriptive Envelope Criteria

CZ	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
U-factor	0.30															
SHGC	NR	0.23	NR	0.23	NR	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	NR
Total Area	20%															
West	NR	5%	NR	5%	NR	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	NR

SHGC:

Ability of the window to prevent solar heat gain when sun hitting window

SHGC= 0.23 *(was 0.25)

NFRC-rated low-e[3] product

* Excluding CZs 1, 3, 5 and 16

U-factor:

Ability of the window to prevent heat transfer

U-factor = 0.30 *(was 0.32)*

NFRC-rated dual-paned nonmetal product

U-factor = 0.58

Allowed with Performance Method but not Prescriptive Method

Prescriptive: New Construction

§150.1(c)3B/C

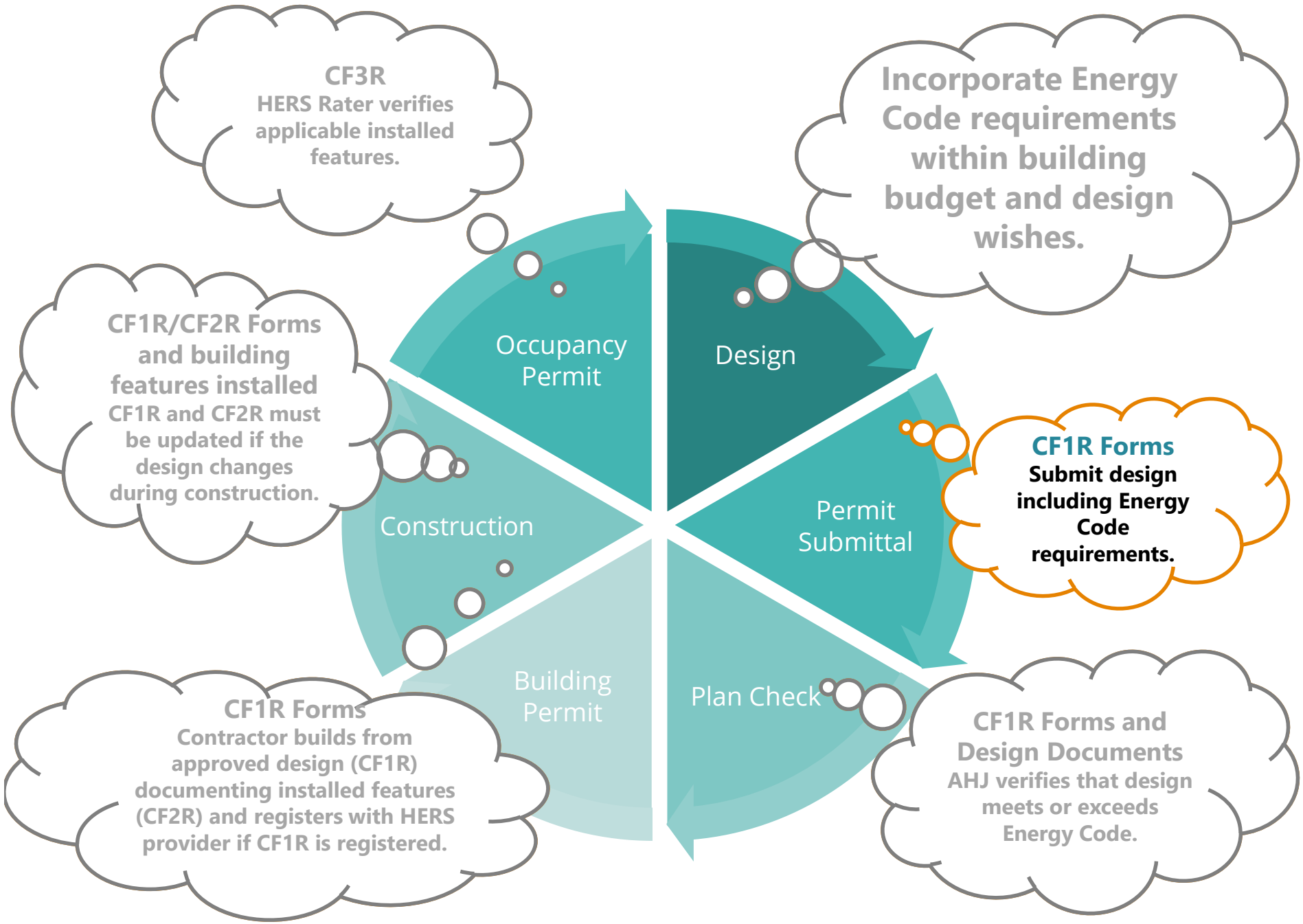
Fenestration Area Allowance

Fenestration includes skylights, windows and glass doors

- 20% fenestration area to conditioned floor area
- 5% west-facing fenestration area to conditioned floor area, excluding CZs 1, 3, 5 and 16

Prescriptive: Fenestration Alterations §150.2(b)A/B

Alterations to Vertical Window [I, J]	Prescriptive Requirements		
	Window / Floor Ratio ≤ 0.20	SHGC	U-factor
Add Vertical Window ≤ 75 ft^2	no	Table 150.1-A or B	Table 150.1-A or B
Add Vertical Window > 75 ft^2	YES	Table 150.1-A or B	Table 150.1-A or B
Replace Vertical Window ≤ 75 ft^2	no	**≤0.30**	**≤0.40**
Replace Vertical Window > 75 ft^2	no	Table 150.1-A or B	Table 150.1-A or B
Alter Existing Glass (frame and sash remain)	no	no	no


CF3R
HERS Rater verifies applicable installed features.
Incorporate Energy Code requirements within building budget and design wishes.
CF1R/CF2R Forms and building features installed
CF1R and CF2R must be updated if the design changes during construction.
Occupancy Permit
Design
Construction
Permit Submittal
CF1R Forms
Submit design including Energy Code requirements.
Building Permit
Plan Check
CF1R Forms
Contractor builds from approved design (CF1R) documenting installed features (CF2R) and registers with HERS provider if CF1R is registered.
CF1R Forms and Design Documents
AHJ verifies that design meets or exceeds Energy Code.

CF1R: Performance Compliance



Energy Code	New Construction	Additions	Alterations
2016	TDV	TDV	TDV
2019	**EDR**	TDV	TDV

Energy Design Rating (EDR):

New Construction CF1R-PRF-01-E

ENERGY DESIGN RATING				
	Energy Design Ratings		Compliance Margins	
	Efficiency[1] (EDR)	Total[2] (EDR)	Efficiency[1] (EDR)	Total[2] (EDR)
Standard Design	**53.8**	**21.5**		
Proposed Design	53.4	21.1	0.4	0.4
RESULT [3]: COMPLIES				

Time Dependent Valuation of Energy (TDV)

Alteration CF1R-PRF-01-E

ENERGY USE SUMMARY				
04	05	06	07	08
Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	23.89	24.05	-0.16	-0.7%
Space Cooling	12.15	8.64	3.51	28.9%
IAQ Ventilation	1.50	1.50	0.00	0.0%
Water Heating	12.43	13.36	-0.93	-7.5%
Photovoltaic Offset	----	0.00	0.00	----
Compliance Energy Total	**49.97**	**47.55**	**2.42**	**4.8%**

CF1R: Performance

CERTIFICATE OF COMPLIANCE

Project Name: Sample House

Calculation Description: Title 24 Analysis

Calculation Date/Time: 2020-03-27T1

Input File Name: Sample T24 2019.rib

Page 1

CF1R-PRF-01E
(Page 1 of 12)

GENERAL INFORMATION					
01	Project Name	Sample House			
02	Run Title	Title 24 Analysis			
03	Project Location	15555 Jackson Rd.			
04	City	Stockton	05	Standards Version	2019
06	Zip code	94546	07	Software Version	EnergyPro 8.1
08	Climate Zone	12	09	Front Orientation (deg/ Cardinal)	49
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	New Construction	13	Number of Bedrooms	3
14	Addition Cond. Floor Area (ft^2)	0	15	Number of Stories	1
16	Existing Cond. Floor Area (ft^2)	n/a	17	Fenestration Average U-factor	0.35
18	Total Cond. Floor Area (ft^2)	1751	19	Glazing Percentage (%)	18.28%
20	ADU Bedroom Count	0	21	ADU Conditioned Floor Area	0
22	Is Natural Gas Available?	Yes			

COMPLIANCE RESULTS	
01	Building Complies with Computer Performance
02	This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	This building incorporates one or more Special Features shown below

Registration Number: 420-P010035168A-000-000-0000000-0000

Registration Date/Time: 03/27/2020 14:28

HERS Provider: Cal Energy

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Report Version: 2019.1.108
Schema Version: rev 20200101

Report Generated: 2020-03-27 14:28:04

CF1R: Performance

CERTIFICATE OF COMPLIANCE

Project Name: Sample House

Calculation Description: Title 24 Analysis

Calculation Date/Time: 2020-03-27T1

Input File Name: Sample T24 2019.rib

Page 2

CF1R-PRF-01E
(Page 2 of 12)

ENERGY DESIGN RATING

	Energy Design Ratings		Compliance Margins	
	Efficiency[1] (EDR)	Total[2] (EDR)	Efficiency[1] (EDR)	Total[2] (EDR)
Standard Design	47.6	26.8		
Proposed Design	46	25	1.6	1.8

RESULT:[3] COMPLIES

1: Efficiency EDR includes improvements to the building envelope and more efficient equipment
2: Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries
3: Building complies when efficiency and total compliance margins are greater than or equal to zero

- Standard Design PV Capacity: 2.77 kWdc
- Proposed PV system downsized to 2.80 kWdc (a factor of 0.561) due to cap of 1 x proposed design electricity use

ENERGY USE SUMMARY

Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	23.64	18.76	4.88	20.6
Space Cooling	30.4	32.21	-1.81	-6
IAQ Ventilation	2.22	2.22	0	0
Water Heating	14.18	12.66	1.52	10.7
Self Utilization Credit	n/a	0	0	n/a
Compliance Energy Total	**70.44**	**65.85**	**4.59**	**6.5**

REQUIRED PV SYSTEMS - SIMPLIFIED

01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
2.8	NA	Standard	Fixed (roof mount)	none	true	150-270	n/a	n/a	<=7:12	96	100

Registration Number: 420-P010035168A-000-000-0000000-0000

Registration Date/Time: 03/27/2020 14:28

HERS Provider: Cal Energy

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Report Version: 2019.1.108
Schema Version: rev 20200101

Report Generated: 2020-03-27 14:28:04

CF1R: Performance

CERTIFICATE OF COMPLIANCE

Project Name: Sample House

Calculation Description: Title 24 Analysis

Calculation Date/Time: 2020-03-27T1

Input File Name: Sample T24 2019.rib

Page 5

CF1R-PRF-01E
(Page 5 of 12)

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft^2)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
Window	Window	Front Wall	Front	49	2.5	4	1	10	0.32	NFRC	0.25	NFRC	Bug Screen
Window 2	Window	Front Wall	Front	49	6	5	1	30	0.32	NFRC	0.25	NFRC	Bug Screen
Window 3	Window	Front Wall	Front	49			1	24	0.32	NFRC	0.25	NFRC	Bug Screen
Window 4	Window	Front Wall	Front	49			1	24	0.32	NFRC	0.25	NFRC	Bug Screen
Window in door	Window	Front Wall	Front	49			1	3	1.19	Table 110.6-A	0.83	Table 110.6-B	Bug Screen
Window 5	Window	Front +45 Wall		94	3	5	1	15	0.32	NFRC	0.25	NFRC	Bug Screen
Window 6	Window	Left Wall	Left	139			1	7.5	0.32	NFRC	0.25	NFRC	Bug Screen
Window 7	Window	Left Wall	Left	139			1	7.5	0.32	NFRC	0.25	NFRC	Bug Screen
Window 8	Window	Left Wall	Left	139			1	7.5	0.32	NFRC	0.25	NFRC	Bug Screen
Window 9	Window	Left Wall	Left	139			1	12.5	0.32	NFRC	0.25	NFRC	Bug Screen
Window 10	Window	Left Wall	Left	139			1	12.5	0.32	NFRC	0.25	NFRC	Bug Screen
Window 11	Window	Rear Wall	Back	229			1	30	0.32	NFRC	0.25	NFRC	Bug Screen
Window 12	Window	Rear Wall	Back	229			1	20	0.32	NFRC	0.25	NFRC	Bug Screen
Door	Window	Rear Wall	Back	229			1	40	0.32	NFRC	0.25	NFRC	Bug Screen
Window 13	Window	Rear Wall	Back	229			1	17.5	0.32	NFRC	0.25	NFRC	Bug Screen
Window 14	Window	Rear Wall	Back	229			1	4	0.32	NFRC	0.25	NFRC	Bug Screen
Door 2	Window	Right Wall	Right	319			1	40	0.32	NFRC	0.25	NFRC	Bug Screen
Window 15	Window	Front -45 Wall		4	3	5	1	15	0.32	NFRC	0.25	NFRC	Bug Screen
Garage window	Window	Garage Front Wall	Front	49			1	24	0.32	NFRC	0.25	NFRC	Bug Screen

Registration Number: 420-P010035168A-000-000-0000000-0000

Registration Date/Time: 03/27/2020 14:28

HERS Provider: Cal Energy

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Report Version: 2019.1.108
Schema Version: rev 20200101

Report Generated: 2020-03-27 14:28:04

CF1R: Alteration

STATE OF CALIFORNIA
Prescriptive Residential Alterations That Do Not Require HERS Field Verification
CEC-CF1R-ALT-05-E (Revised 01/20)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	CF1R-ALT-05-E
Prescriptive Residential Alterations That Do Not Require HERS Field Verification	Page 1 of 5
Project Name: Example	

Page 1

This compliance document is only applicable to simple alterations that do not require HERS verification for compliance. When HERS verification is required, a CF1R-ALT-01 shall first be registered with a HERS Provider Data Registry.

Alterations to Space Conditioning Systems that are exempt from HERS verification requirements may use the CF1R-ALT-05 and CF2R- ALT-05 Compliance Documents. Possible exemptions from duct leakage testing include: less than 40 ft of ducts were added or replaced; or the existing duct system was insulated with asbestos; or the existing duct system was previously tested and passed by a HERS Rater. If space conditioning systems are altered and are not exempt from HERS verification, then a CF1R-ALT-02 must be completed and registered with a HERS Provider Data Registry.

Alterations that utilize close Cell Spray Polyurethane Foam (ccSPF) with a density of 1.5 to less than 2.5 pounds per cubic foot having an R-value greater than 5.8 per inch, or Open Cell Spray Polyurethane Foam (ocSPF) with a density of 0.4 to less than 1.5 pounds per cubic foot having an R-value of 3.6 per inch, shall complete and register a CF1R-ALT-01 with a HERS Provider Data Registry.

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. All applicable Mandatory Measures shall be met. Temporary labels shall not be removed before verification by the building inspector.

A. General Information

01	Project Name:	Example	02	Date Prepared:	Example
03	Project Location:	123 Main St.	04	Building Front Orientation (deg or cardinal):	N
05	CA City:	Happyville	06	Number of Altered Dwelling Units:	1
07	Zip Code:	95000	08	Fuel Type:	Natural Gas
09	Climate Zone:	12	10	Total Conditioned Floor Area (ft^2):	1200
11	Building Type:	Single Family	12	Slab Area (ft^2)	1200

13 Project Scope (Select all that apply):

- ☐ B. Insulation
- ☑ D. & E. Fenestration/Glazing - ADD
- ☐ G. Space Conditioning System (Heating, Cooling, Duct system)
- ☐ Lighting
- ☐ C. Roof Replacement
- ☑ D. & F. Fenestration/Glazing - REPLACE
- ☐ H. Water Heating System
- ☐ Include Mandatory Measures?

CA Building Energy Efficiency Standards - 2019 Residential Compliance — January 2020

CF1R: Alteration

STATE OF CALIFORNIA
Prescriptive Residential Alterations That Do Not Require HERS Field Verification
CEC-CF1R-ALT-05-E (Revised 01/20)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	CF1R-ALT-05-E
Prescriptive Residential Alterations That Do Not Require HERS Field Verification	Page 2 of 5
Project Name: Example	

Page 2

D. Fenestration/Glazing Allowed Areas and Efficiencies (Section 150.2(b)1)

01	02	03	04		05		06		07
Alteration Type	Maximum Allowed Fenestration for All Orientations (ft^2)	Maximum Allowed West-Facing Fenestration Area Only (ft^2)	Existing Fenestration for All Orientations (ft^2)	Existing West-Facing Fenestration Area (ft^2)	Maximum Allowed U-Factor (Windows)	Maximum Allowed U-Factor (Skylights)	Maximum Allowed SHGC (Windows)	Maximum Allowed SHGC (Skylights)	Comments
Replacing fenestration	N/A	N/A	250	100	See below	N/A	See below	N/A	No skylights

E. Fenestration Proposed Areas and Efficiencies - Add (Section 150.2(b)1A)
Note: Doors with greater than or equal to 25 percent glazed area are considered glazed doors and are treated as fenestration products.

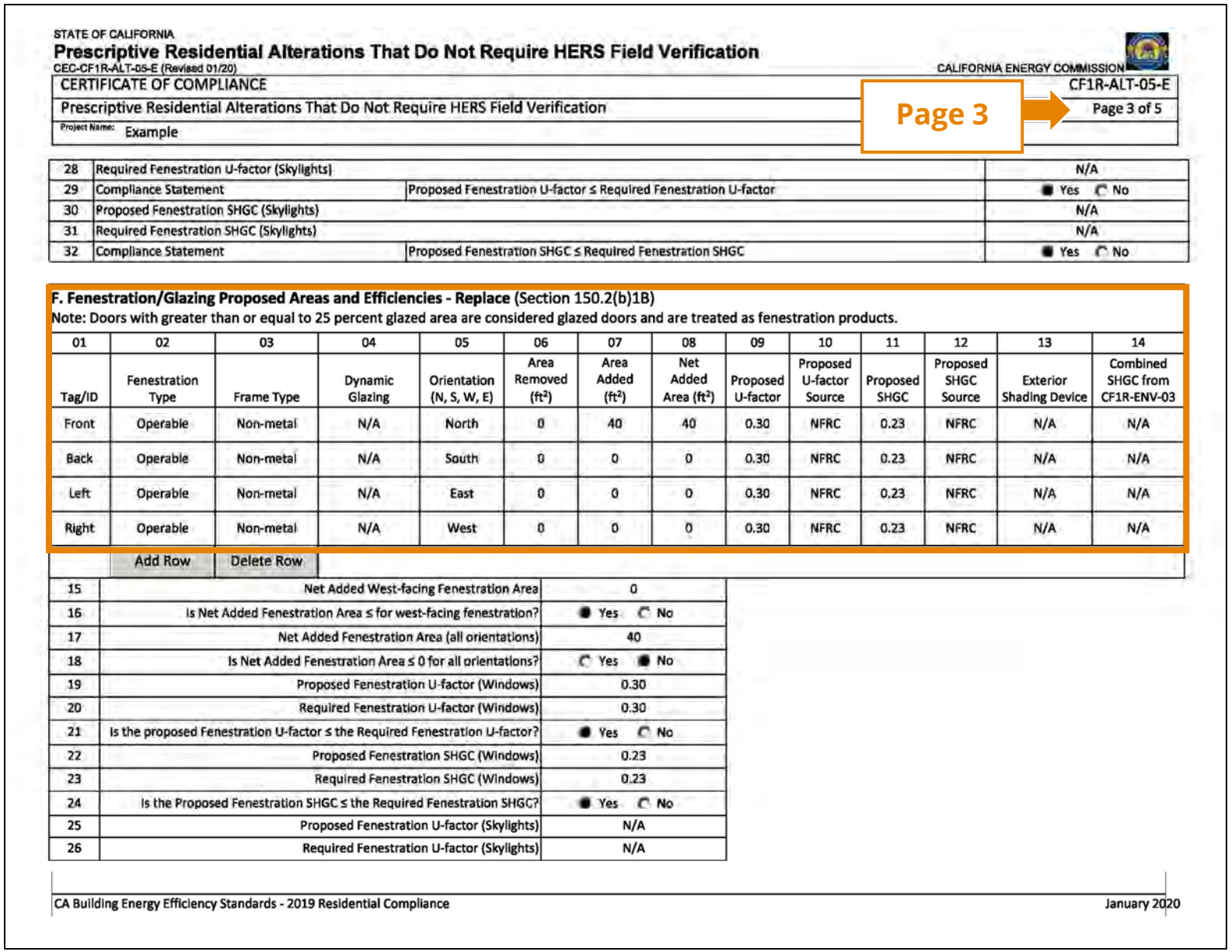
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Tag/ID	Fenestration Type	Frame Type	Dynamic Glazing	Orientation (N, S, W, E)	Number of Panes	Proposed Fenestration Area (ft^2)	Proposed West Facing Fenestration Area (ft^2)	Proposed U-factor	Proposed U-factor Source	Proposed SHGC	Proposed SHGC Source	Exterior Shading Device	Combined SHGC from CF1R-ENV-03
Front	Operable	Non-metal	N/A	North	2	40	0	0.30	NFRC	0.23	NFRC	N/A	N/A

Add Row | Delete Row

15	Total Proposed Fenestration Area		250
16	Maximum Allowed Fenestration Area		N/A
17	Compliance Statement	Total Proposed Fenestration Area ≤ Maximum Allowed Fenestration Area	● Yes ○ No
18	Total Proposed West-Facing Fenestration Area		0
19	Maximum Allowed West-Facing Fenestration Area		N/A
20	Compliance Statement	Total Proposed West-Facing Fenestration Area ≤ Maximum Allowed West-Facing Fenestration Area	● Yes ○ No
21	Proposed Fenestration U-factor (Windows)		0.30
22	Required Fenestration U-factor (Windows)		0.30
23	Compliance Statement	Proposed Fenestration U-factor ≤ Required Fenestration U-factor	● Yes ○ No
24	Proposed Fenestration SHGC (Windows)		0.23
25	Required Fenestration SHGC (Windows)		0.23
26	Compliance Statement	Proposed Fenestration SHGC ≤ Required Fenestration SHGC	● Yes ○ No
27	Proposed Fenestration U-factor (Skylights)		N/A

CA Building Energy Efficiency Standards - 2019 Residential Compliance — January 2020

CF1R: Alteration



STATE OF CALIFORNIA
Prescriptive Residential Alterations That Do Not Require HERS Field Verification
CEC-CF1R-ALT-05-E (Revised 01/20)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — CF1R-ALT-05-E
Prescriptive Residential Alterations That Do Not Require HERS Field Verification — Page 3 of 5
Project Name: Example

Page 3

28	Required Fenestration U-factor (Skylights)		N/A
29	Compliance Statement	Proposed Fenestration U-factor ≤ Required Fenestration U-factor	● Yes ○ No
30	Proposed Fenestration SHGC (Skylights)		N/A
31	Required Fenestration SHGC (Skylights)		N/A
32	Compliance Statement	Proposed Fenestration SHGC ≤ Required Fenestration SHGC	● Yes ○ No

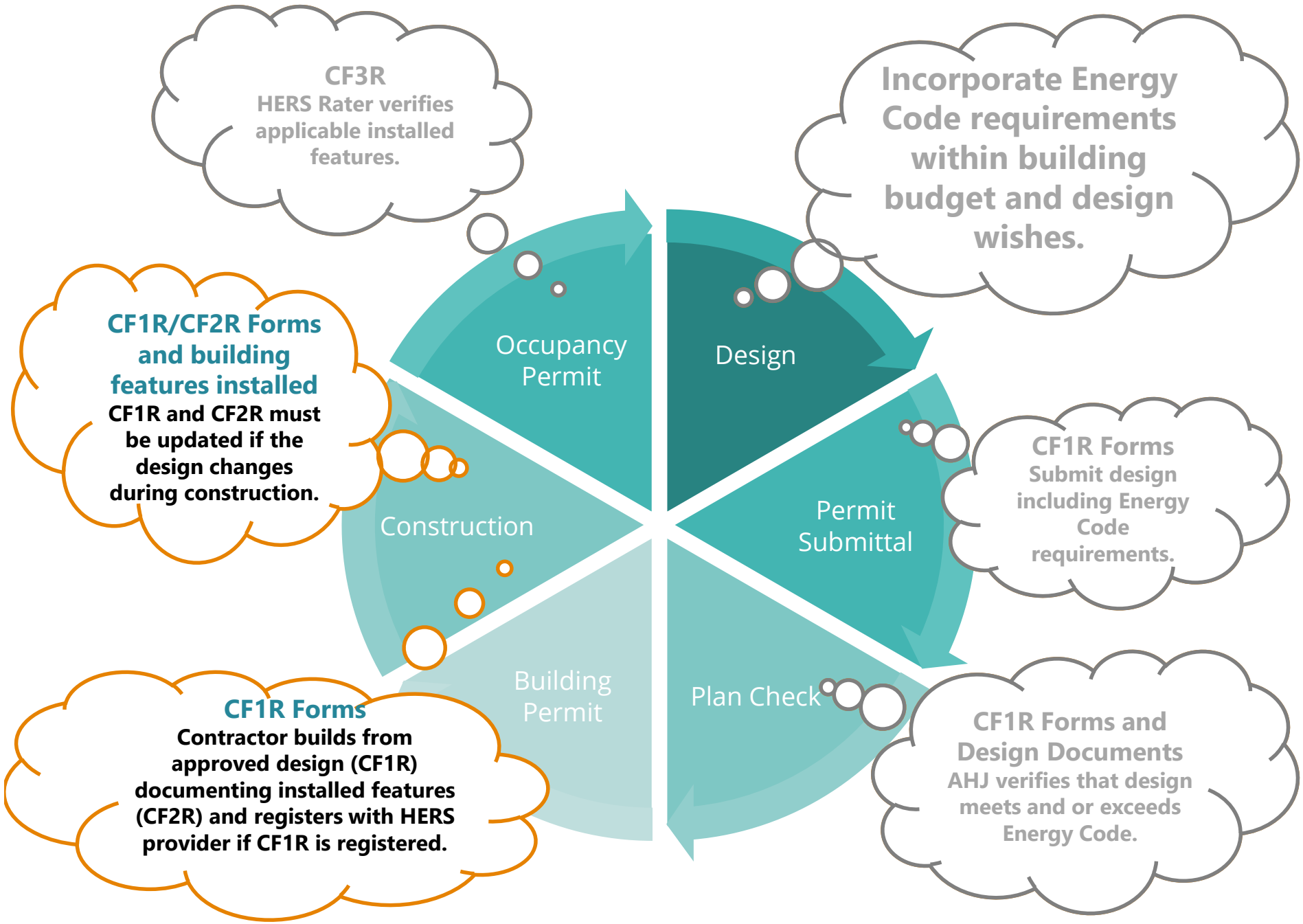
F. Fenestration/Glazing Proposed Areas and Efficiencies - Replace (Section 150.2(b)1B)
Note: Doors with greater than or equal to 25 percent glazed area are considered glazed doors and are treated as fenestration products.

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Tag/ID	Fenestration Type	Frame Type	Dynamic Glazing	Orientation (N, S, W, E)	Area Removed (ft^2)	Area Added (ft^2)	Net Added Area (ft^2)	Proposed U-factor	Proposed U-factor Source	Proposed SHGC	Proposed SHGC Source	Exterior Shading Device	Combined SHGC from CF1R-ENV-03
Front	Operable	Non-metal	N/A	North	0	40	40	0.30	NFRC	0.23	NFRC	N/A	N/A
Back	Operable	Non-metal	N/A	South	0	0	0	0.30	NFRC	0.23	NFRC	N/A	N/A
Left	Operable	Non-metal	N/A	East	0	0	0	0.30	NFRC	0.23	NFRC	N/A	N/A
Right	Operable	Non-metal	N/A	West	0	0	0	0.30	NFRC	0.23	NFRC	N/A	N/A

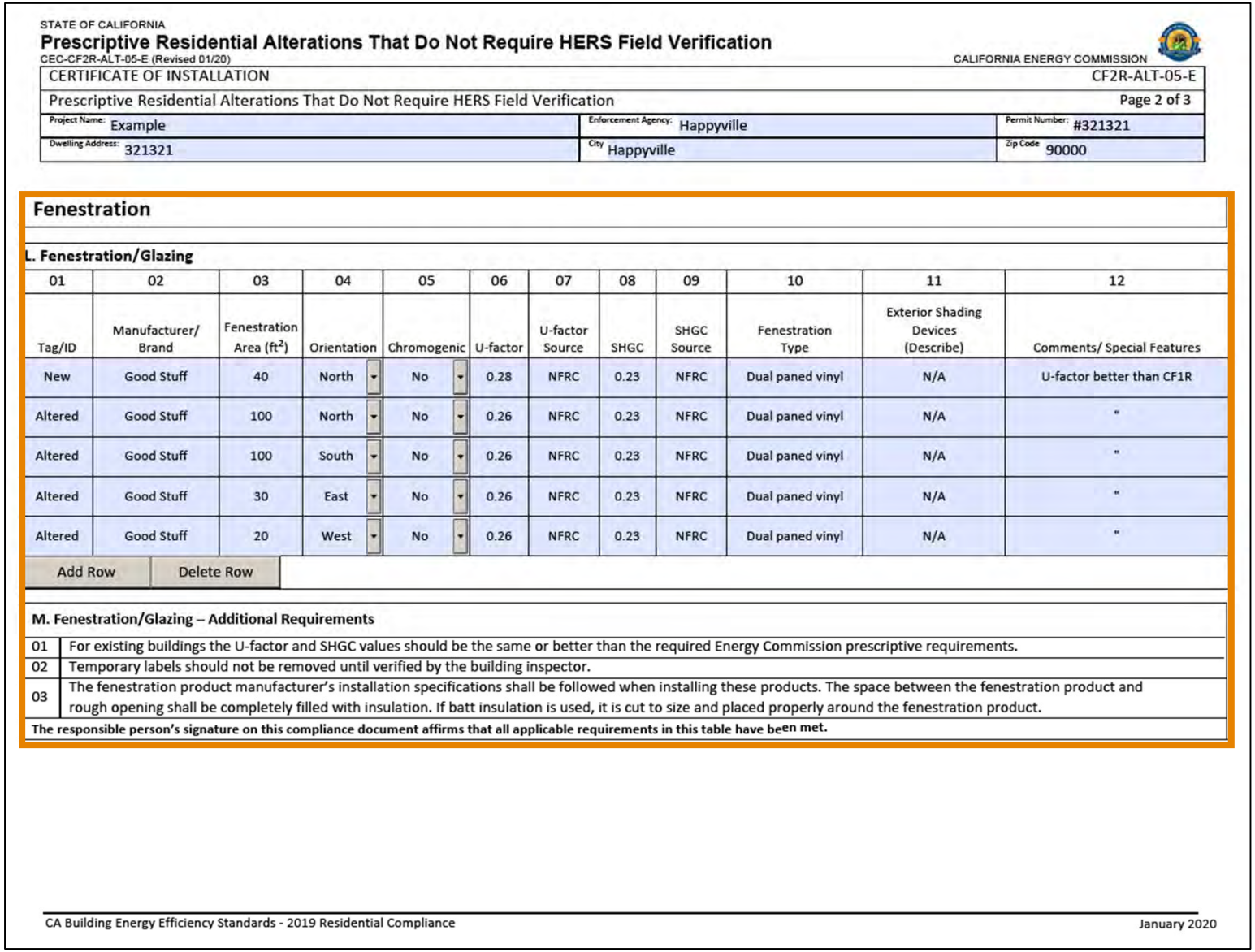
Add Row | Delete Row

15	Net Added West-facing Fenestration Area	0
16	Is Net Added Fenestration Area ≤ for west-facing fenestration?	● Yes ○ No
17	Net Added Fenestration Area (all orientations)	40
18	Is Net Added Fenestration Area ≤ 0 for all orientations?	○ Yes ● No
19	Proposed Fenestration U-factor (Windows)	0.30
20	Required Fenestration U-factor (Windows)	0.30
21	Is the proposed Fenestration U-factor ≤ the Required Fenestration U-factor?	● Yes ○ No
22	Proposed Fenestration SHGC (Windows)	0.23
23	Required Fenestration SHGC (Windows)	0.23
24	Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC?	● Yes ○ No
25	Proposed Fenestration U-factor (Skylights)	N/A
26	Required Fenestration U-factor (Skylights)	N/A

CA Building Energy Efficiency Standards - 2019 Residential Compliance — January 2020


CF3R
HERS Rater verifies applicable installed features.
Incorporate Energy Code requirements within building budget and design wishes.
CF1R/CF2R Forms and building features installed
CF1R and CF2R must be updated if the design changes during construction.
Occupancy Permit
Design
Construction
Permit Submittal
CF1R Forms
Submit design including Energy Code requirements.
Building Permit
Plan Check
CF1R Forms
Contractor builds from approved design (CF1R) documenting installed features (CF2R) and registers with HERS provider if CF1R is registered.
CF1R Forms and Design Documents
AHJ verifies that design meets and or exceeds Energy Code.

CF2R: Alteration



STATE OF CALIFORNIA

Prescriptive Residential Alterations That Do Not Require HERS Field Verification

CEC-CF2R-ALT-05-E (Revised 01/20) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION		CF2R-ALT-05-E
Prescriptive Residential Alterations That Do Not Require HERS Field Verification		Page 2 of 3
Project Name: Example	Enforcement Agency: Happyville	Permit Number: #321321
Dwelling Address: 321321	City Happyville	Zip Code 90000

Fenestration

L. Fenestration/Glazing

01	02	03	04	05	06	07	08	09	10	11	12
Tag/ID	Manufacturer/ Brand	Fenestration Area (ft^2)	Orientation	Chromogenic	U-factor	U-factor Source	SHGC	SHGC Source	Fenestration Type	Exterior Shading Devices (Describe)	Comments/ Special Features
New	Good Stuff	40	North	No	0.28	NFRC	0.23	NFRC	Dual paned vinyl	N/A	U-factor better than CF1R
Altered	Good Stuff	100	North	No	0.26	NFRC	0.23	NFRC	Dual paned vinyl	N/A	"
Altered	Good Stuff	100	South	No	0.26	NFRC	0.23	NFRC	Dual paned vinyl	N/A	"
Altered	Good Stuff	30	East	No	0.26	NFRC	0.23	NFRC	Dual paned vinyl	N/A	"
Altered	Good Stuff	20	West	No	0.26	NFRC	0.23	NFRC	Dual paned vinyl	N/A	"

Add Row | Delete Row

M. Fenestration/Glazing – Additional Requirements

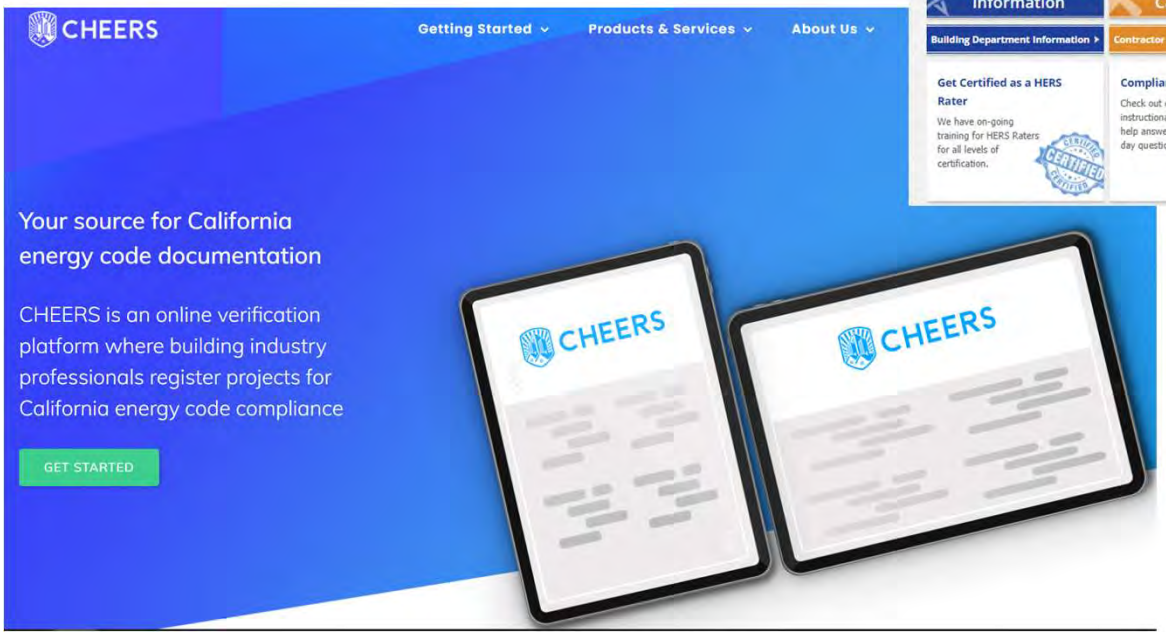
01	For existing buildings the U-factor and SHGC values should be the same or better than the required Energy Commission prescriptive requirements.
02	Temporary labels should not be removed until verified by the building inspector.
03	The fenestration product manufacturer's installation specifications shall be followed when installing these products. The space between the fenestration product and rough opening shall be completely filled with insulation. If batt insulation is used, it is cut to size and placed properly around the fenestration product.

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

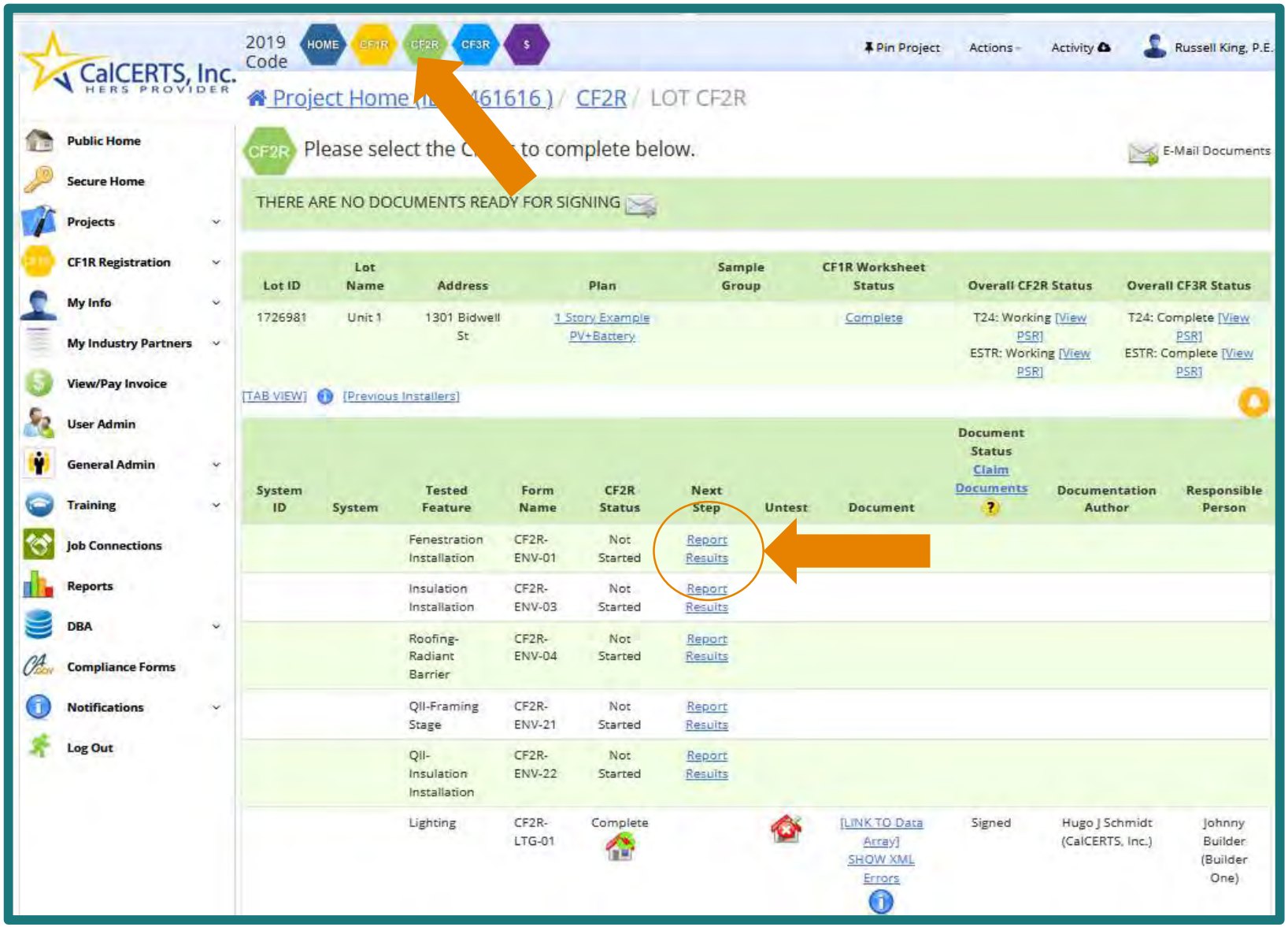
CA Building Energy Efficiency Standards - 2019 Residential Compliance — January 2020

CF2R: New Construction

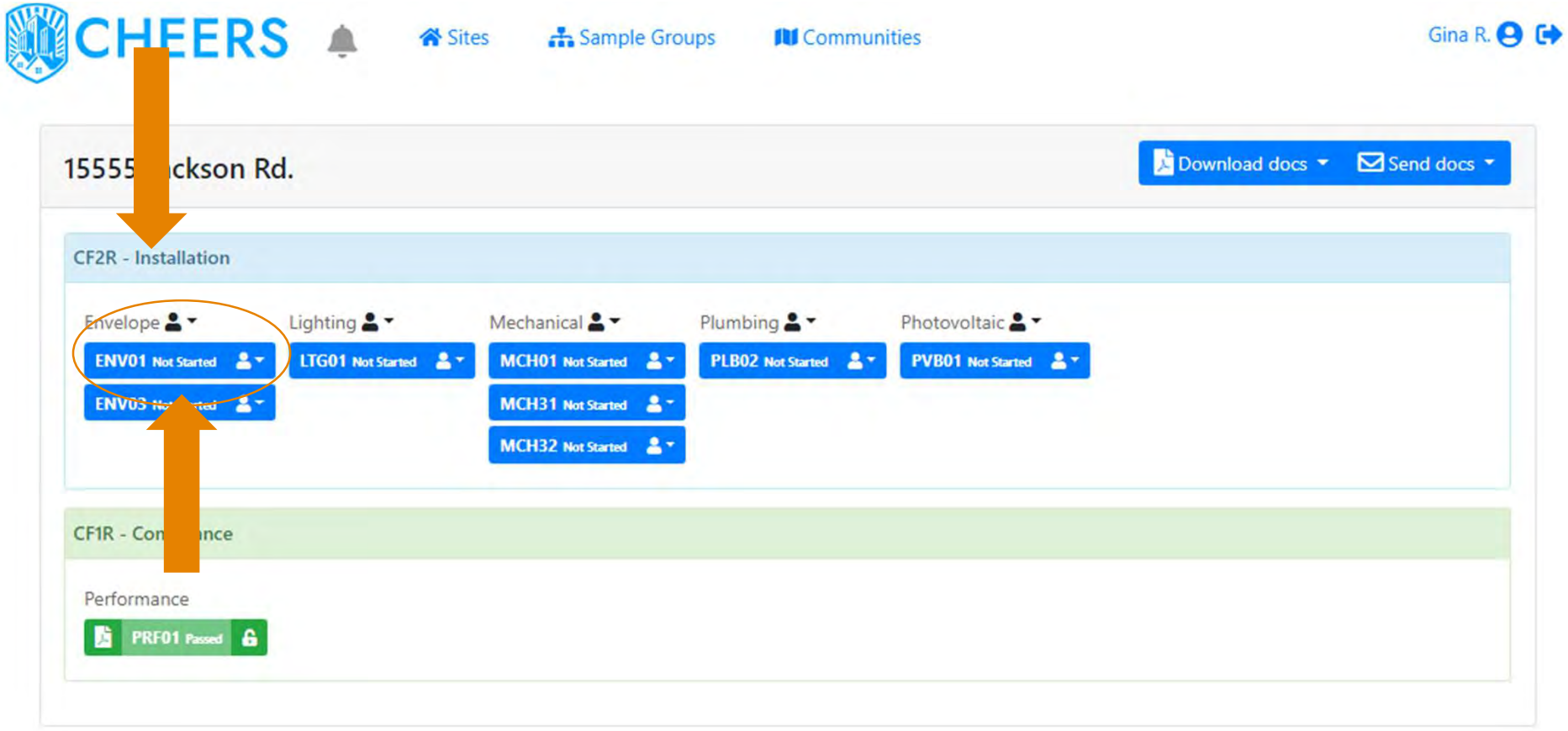
- Compliance documentation submitted with a permit application for projects with HERS measures must be registered with a HERS Provider that is approved for that type of project.



Contractor: Accessing the CF2Rs



Contractor: Accessing the CF2Rs



2019 Energy Code: Fenestration

1. Energy Code Basics
2. Fenestration Basics
3. Residential Requirements
4. Nonresidential Requirements
5. Next Steps

- **Nonresidential Requirements**
  - Prescriptive: New Construction
    - Vertical Fenestration Efficiency
    - Vertical Fenestration Area
  - Prescriptive: Alterations
  - Compliance Documentation

Vertical Fenestration Efficiency

§140.3(a)5

Mandatory

None

Prescriptive

Tables 140.3-B and C: Prescriptive Envelope Criteria

	Fixed Window	Operable Window	Curtainwall or Storefront	Glazed Doors
Max U-factor	0.36	0.46	0.41	0.45
Max RSHGC	0.25	0.22	0.26	0.23
Min VT	0.42	0.32	0.46	0.17

Overhang Benefits (RSHGC)

§140.3(a)5

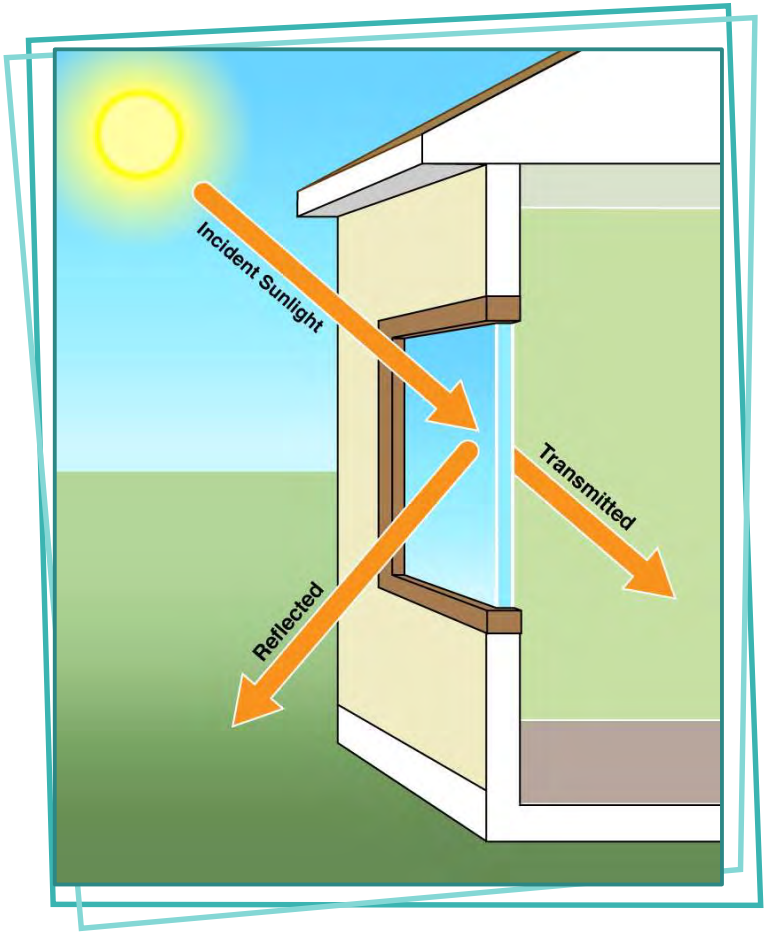
Photo courtesy of Ted Tiffany, UC Davis Health and Wellness building by WRNS Architects

Relative Solar Heat Gain Coefficient (RSHGC) incorporates the shading benefits from overhangs for vertical glazing only (does not apply to skylights).

- Overhangs can help reduce solar heat gain, which in turn reduces peak electric demand due to air conditioning.
- Overhangs are allowed in both the Prescriptive and Performance Approach.

Visible Transmittance (VT)

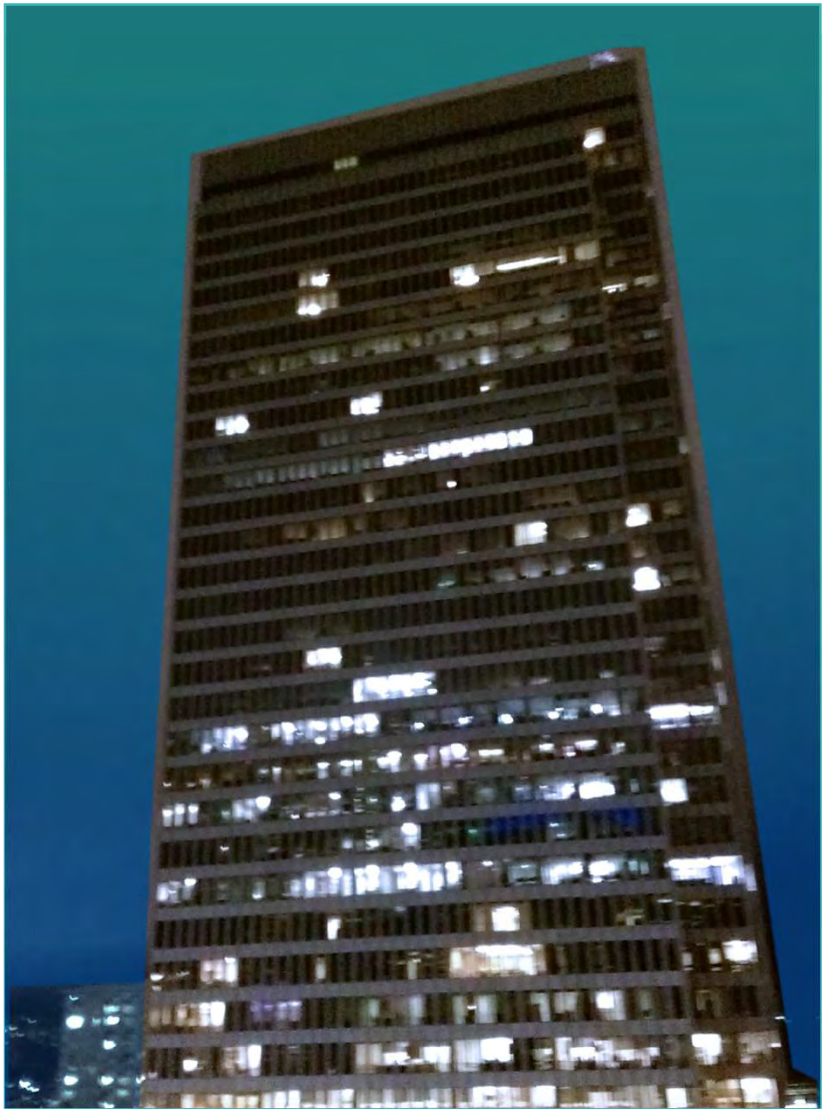
§140.3(a)5



- The fraction of visible light transmitted through the window
  - Affects the amount of daylight that enters the space
  - Separate from the Solar Heat Gain Coefficient (SHGC)
  - Ideal glazing material would have a **high VT** and **low SHGC**
  - VT value is found in manufacturer's literature

Prescriptive: New Construction Fenestration Area

§140.3(a)5



Fenestration includes skylights, windows and glass doors

- 40% vertical fenestration area to wall area for all orientations combined
- 40% west-facing vertical fenestration area to wall area
- 5% skylight to roof area

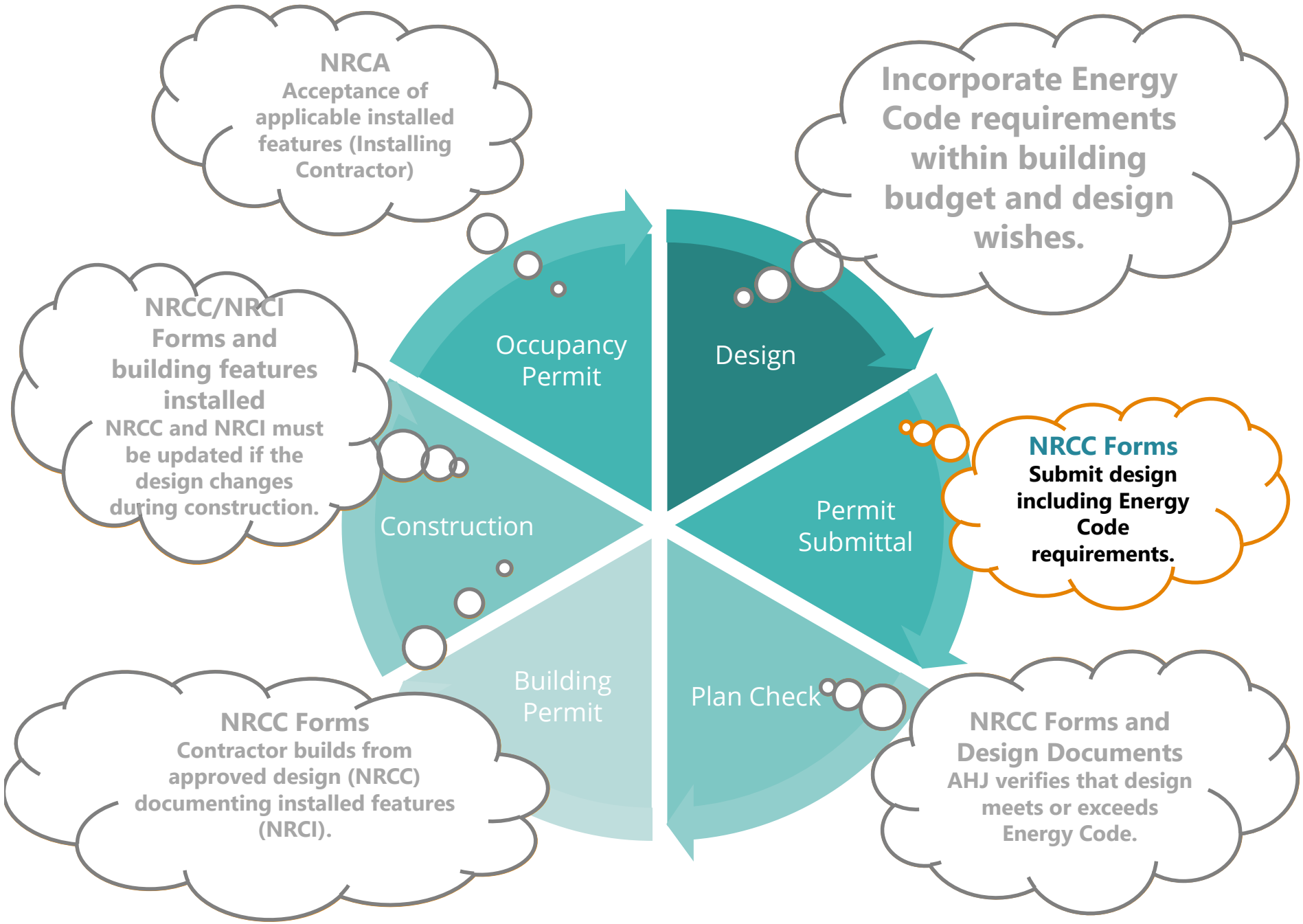
Prescriptive: Fenestration Alterations

§141.0(b)2A

Alterations to Vertical Window	Prescriptive Requirements			
	Window / Wall Ratio ≤ 0.40	VT	SHGC	U-factor
Add Vertical Window ≤ 50 ft^2	YES	no	no	Table 140.3-B or C
Add Vertical Window > 50 ft^2	YES	Table 140.3-B or C	Table 140.3-B or C	Table 140.3-B or C
Replace Vertical Window ≤ 150 ft^2	no	no	no	**Table 141.0-A**
Replace Vertical Window > 150 ft^2	no	Table 140.3-B or C	**Table 141.0-A**	**Table 141.0-A**
Alter Existing Glass (frame and sash remain)	no	no	no	no

Table 141.0-A : Prescriptive Fenestration Alterations

Climate Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
U-factor	0.47	0.47	0.58	0.47	0.58	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
RSHGC	0.41	0.31	0.41	0.31	0.41	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.41
VT	See Table 140.3-B, C and D for all Climate Zones															


NRCA
Acceptance of applicable installed features (Installing Contractor)
Incorporate Energy Code requirements within building budget and design wishes.
NRCC/NRCI Forms and building features installed
NRCC and NRCI must be updated if the design changes during construction.
Occupancy Permit
Design
Construction
Permit Submittal
NRCC Forms
Submit design including Energy Code requirements.
Building Permit
Plan Check
NRCC Forms
Contractor builds from approved design (NRCC) documenting installed features (NRCI).
NRCC Forms and Design Documents
AHJ verifies that design meets or exceeds Energy Code.

NRCC: Performance Compliance

Energy Code	New Construction	Additions	Alterations
2016	TDV	TDV	TDV
2019	**TDV**	**TDV**	**TDV**

C1. COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft ^{2}-yr)

COMPLIES

Energy Component	Standard Design (TDV)	Proposed Design (TDV)	Compliance Margin (TDV)[1]
Space Heating	5.21	1.40	3.81
Space Cooling	67.68	52.66	15.02
Indoor Fans	157.72	131.31	26.41
Heat Rejection	--	--	--
Pumps & Misc.	--	--	--
Domestic Hot Water	19.86	19.86	--
Indoor Lighting	43.47	44.14	-0.67
ENERGY STANDARDS COMPLIANCE TOTAL	**293.94**	**249.37**	**44.57 (15.2%)**

[1] *Notes: The number in parenthesis following the Compliance Margin in column 4. represents the Percent Better than Standard.*

NRCC: Performance

Project Name:	Classic Car Restoration	NRCC-PRF-01-E	Page 1 of 16
Project Address:	1111 Main Street San Diego 92102	Calculation Date/Time:	15:12, Fri, Jun 26, 2020
Input File Name:	Classic Car T24_2019 MASTER_v2_2020-06-26.cibd19x		

Page 1

A. GENERAL INFORMATION

1.	Project Location (city)	San Diego	8.	Standards Version	Compliance2019
2.	CA Zip Code	92102	9.	Compliance Software (version)	CBECC-Com 2019.1.2
3.	Climate Zone	7	10.	Weather File	SAN-DIEGO-LINDBERGH_722900_CZ2010.epw
4.	Total Conditioned Floor Area in Scope	602 ft^2	11.	Building Orientation (deg)	(W) 270 deg
5.	Total Unconditioned Floor Area	5,398 ft^2	12.	Permitted Scope of Work	NewComplete
6.	Total # of Stories (Habitable Above Grade)	1	13	Building Type(s)	Nonresidential
7.	Total # of dwelling units	0	14	Gas Type	NaturalGas

B. PROJECT SUMMARY

Table Instructions: Table B shows which building components are included in the performance calculation. If indicated as not included, the project must show compliance prescriptively if within permit application.

Building Components Complying via Performance						Building Components Complying Prescriptively	
Envelope	☒	Performance	Covered Process: Commercial Kitchens	☐	Performance	*The following building components are ONLY eligible for prescriptive compliance and should be documented on the NRCC form listed if within the scope of the permit application (i.e. compliance will not be shown on the NRCC-PRF-E).*	
	☐	Not Included		☒	Not Included		
Mechanical	☒	Performance	Covered Process: Computer Rooms	☐	Performance	Indoor Lighting (Unconditioned)§140.6	*NRCC-LTI -E is required*
	☐	Not Included		☒	Not Included	Outdoor Lighting §140.7	*NRCC-LTO-E is required*
Domestic Hot Water	☐	Performance	Covered Process: Laboratory Exhaust	☐	Performance	Sign Lighting §140.8	*NRCC -LTS-E is required*
	☒	Not Included		☒	Not Included	Mandatory Measures	
Lighting (Indoor Conditioned)	☒	Performance				*Electrical power systems, commissioning and solar ready requirements are mandatory and should be documented on the NRCC form listed if applicable (i.e. compliance will not be shown on the NRCC-PRF-E.)*	
	☐	Not Included				Electrical Power Distribution §110.11	*NRCC-ELC-E is required*
Solar Thermal Water Heating	☐	Performance				Commissioning §120.8	*NRCC-CXR-E is required*
	☒	Not Included				Solar Ready §110.10	*NRCC-SRA-E is required*

CA Building Energy Efficiency Standards- 2019 Nonresidential Compliance Report Version: NRCC-PRF-01-E-04282020-6206 Report Generated at: 2020-06-26 15:12:28

NRCC: Performance

Project Name:	Classic Car Restoration	NRCC-PRF-01-E	Page 3 of 1
Project Address:	1111 Main Street San Diego 92102	Calculation Date/Time:	15:12, Fri, Jun 26, 202
Input File Name:	Classic Car T24_2019 MASTER_v2_2020-06-26.cibd19x		

Page 3

E. HERS VERIFICATION

This Section Does Not Apply

F. ADDITIONAL REMARKS

This Section Does Not Apply

G. ENVELOPE GENERAL INFORMATION

1	2	3	4
Opaque Surfaces & Orientation	Total Gross Surface Area (ft^2)	Total Fenestration Area (ft^2)	Window to Wall Ratio (%)
North-Facing[1]	0 ft^2	0 ft^2	00.0%
East-Facing[2]	0 ft^2	0 ft^2	00.0%
South-Facing[3]	358 ft^2	0 ft^2	00.0%
West-Facing[4]	282 ft^2	112 ft^2	39.8%
Total	**639 ft^2**	**112 ft^2**	**17.5%**
Roof	0 ft^2	0 ft^2	00.0%

Notes:

[1] North-Facing is oriented to within 45 degrees of true north, including 45°00'00" east of north (NE), but excluding 45°00'00" west of north (NW).

[2] East-Facing is oriented to within 45 degrees of true east, including 45°00'00" south of east (SE), but excluding 45°00'00" north of east (NE).

[3] South-Facing is oriented to within 45 degrees of true south, including 45°00'00" west of south (SW), but excluding 45°00'00" east of south (SE).

[4] West-Facing is oriented to within 45 degrees of true west, including 45°00'00" north of due west (NW), but excluding 45°00'00" south of west (SW).

H. FENESTRATION ASSEMBLY SUMMARY §110.6

1.	2.	3.	4.	5.	6.	7.	8.	9.
Fenestration Assembly Name / Tag or I.D.	Fenestration Type / Product Type / Frame Type	Certification Method[1]	Assembly Method	Area ft^2	Overall U-factor	Overall SHGC	Overall VT	Status[2]
Default Storefront	VerticalFenestration CurtainWall MetalFramingWithThermalBreak	Default Performance	SiteBuilt	70	0.55	0.69	0.88	N
Default Glazed Door	VerticalFenestration GlazedDoor MetalFramingWithThermalBreak	Default Performance	Manufactured	42	0.59	0.63	0.53	N

CA Building Energy Efficiency Standards- 2019 Nonresidential Compliance Report Version: NRCC-PRF-01-E-04282020-6206 Report Generated at: 2020-06-26 15:12:28

NRCC: Performance

Project Name:	Classic Car Restoration	NRCC-PRF-01-E	Page 12 of 16
Project Address:	1111 Main Street San Diego 92102	Calculation Date/Time:	15:12, Fri, Jun 26, 2020
Input File Name:	Classic Car T24_2019 MASTER_v2_2020-06-26.cibd19x		

Towards the end

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections shall be made by Documentation Author to indicate which Certificates of Installation must be submitted for the features to be recognized for compliance. These documents bust be retained and provided to the building inspector during construction and can be found online at: https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Building Component	YES	NO	Form/Title	Field Inspector	
				Pass	Fail
Envelope	☒	☐	NRCI-ENV-01-E - Must be submitted for all buildings	☐	☐
Mechanical	☒	☐	NRCI-MCH-01-E - Must be submitted for all buildings	☐	☐
Plumbing	☐	☒	NRCI-PLB-01-E - Must be submitted for all buildings	☐	☐
	☐	☒	NRCI-PLB-02-E - Must be submitted for high-rise residential and hotel/ motel central hot water distribution systems to be recognized for compliance	☐	☐
	☐	☒	NRCI-PLB-03-E - Must be submitted for high-rise residential and hotel/motel single dwelling unit hot water system distribution systems to be recognized for compliance	☐	☐
	☐	☒	NRCI-PLB-21-E - Must be HERS verified for central systems in high-rise residential hotel/ motel application	☐	☐
	☐	☒	NRCI-PLB-22-E - Must be HERS verified for single dwelling unit systems in high-rise residential, hotel/motel application	☐	☐
	☐	☒	NRCI-STH-01-E - Must be submitted for solar hot water heating systems	☐	☐
Indoor Lighting	☒	☐	NRCI-LTI-01-E - Must be submitted for all buildings	☐	☐
	☐	☒	NRCI-LTI-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS) to be recognized for compliance	☐	☐
	☐	☒	NRCI-LTI-04-E - Must be submitted for two interlocked systems serving an auditorium, a convention center, a conference room, a multipurpose room, or a theater to be recognized for compliance	☐	☐
	☐	☒	NRCI-LTI-05-E - Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance	☐	☐
	☐	☒	NRCI-LTI-06-E - Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance	☐	☐
Covered Process	☐	☒	NRCI-PRC-01-E - Must be submitted for all Covered Processes	☐	☐

CA Building Energy Efficiency Standards- 2019 Nonresidential Compliance Report Version: NRCC-PRF-01-E-04282020-6206 Report Generated at: 2020-06-26 15:12:28

NRCC: Performance

Project Name:	Classic Car Restoration	NRCC-PRF-01-E	Page 13 of 16
Project Address:	1111 Main Street San Diego 92102	Calculation Date/Time:	15:12, Fri, Jun 26, 2020
Input File Name:	Classic Car T24_2019 MASTER_v2_2020-06-26.cibd19x		

Towards the end

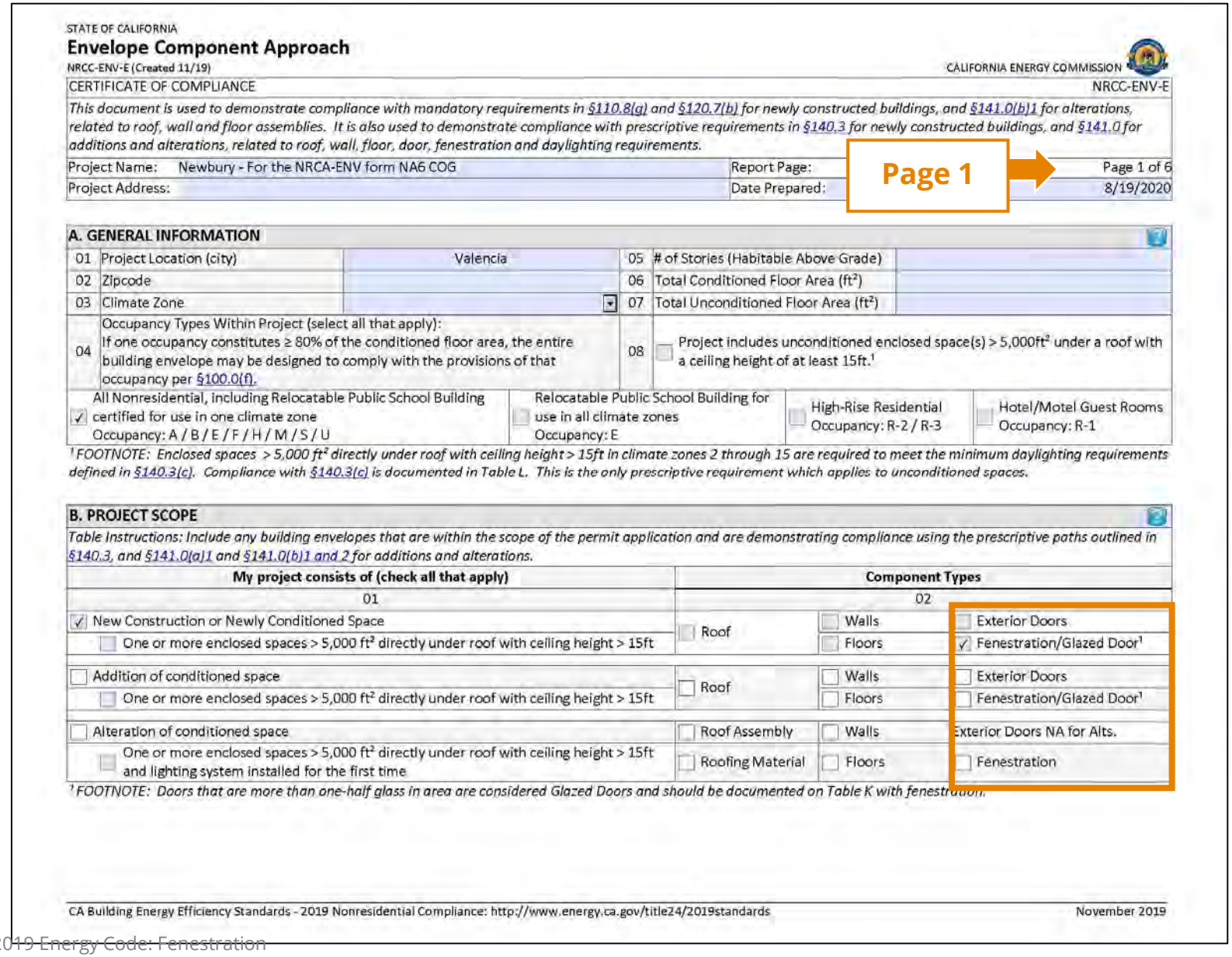
P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections shall be made by Documentation Author to indicate which Certificates of Acceptance must be submitted for the features to be recognized for compliance. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit:https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

Building Component	YES	NO	Form/Title	Field Inspector	
				Pass	Fail
Envelope	☒	☐	NRCA-ENV-02-F - NRFC label verification for fenestration	☐	☐
	☐	☐	NRCA-ENV-03-F - Daylighting Design PAFs	☐	☐
Indoor Lighting	☒	☐	NRCA-LTI-02-A - Occupancy Sensors and Automatic Time Switch Controls	☐	☐
	☒	☐	NRCA-LTI-03-A - Automatic Daylight Controls	☐	☐
	☐	☒	NRCA-LTI-04-A - Demand Responsive Lighting Controls	☐	☐
	☐	☒	NRCA-LTI-05-A - Institutional Tuning Power Adjustment Factor (PAF)	☐	☐
Covered Process	☐	☒	NRCA-PRC-02-F - Kitchen Exhaust	☐	☐
	☐	☒	NRCA-PRC-03-F - Garage Exhaust	☐	☐
	☐	☒	NRCA-PRC-12-F – Elevator Lighting and Ventilation Controls	☐	☐
	☐	☒	NRCA-PRC-13-F –Escalator and Moving Walkways Speed Control	☐	☐
	☐	☒	NRCA-PRC-14-F – Lab Exhaust Ventilation System	☐	☐
	☐	☒	NRCA-PRC-15-F - Fume Hood Automatic Sash Closures System	☐	☐

CA Building Energy Efficiency Standards- 2019 Nonresidential Compliance Report Version: NRCC-PRF-01-E-04282020-6206 Report Generated at: 2020-06-26 15:12:28

NRCC-ENV-E: Prescriptive



STATE OF CALIFORNIA

Envelope Component Approach

NRCC-ENV-E (Created 11/19) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-ENV-E

This document is used to demonstrate compliance with mandatory requirements in §110.8(g) and §120.7(b) for newly constructed buildings, and §141.0(b)1 for alterations, related to roof, wall and floor assemblies. It is also used to demonstrate compliance with prescriptive requirements in §140.3 for newly constructed buildings, and §141.0 for additions and alterations, related to roof, wall, floor, door, fenestration and daylighting requirements.

Project Name:	Newbury - For the NRCA-ENV form NA6 COG	Report Page:	Page 1 of 6
Project Address:		Date Prepared:	8/19/2020

Page 1

A. GENERAL INFORMATION

01	Project Location (city)	Valencia	05	# of Stories (Habitable Above Grade)	
02	Zipcode		06	Total Conditioned Floor Area (ft²)	
03	Climate Zone		07	Total Unconditioned Floor Area (ft²)	
04	Occupancy Types Within Project (select all that apply): If one occupancy constitutes ≥ 80% of the conditioned floor area, the entire building envelope may be designed to comply with the provisions of that occupancy per §100.0(f).		08	☐ Project includes unconditioned enclosed space(s) > 5,000ft² under a roof with a ceiling height of at least 15ft.[1]	

☑ All Nonresidential, including Relocatable Public School Building certified for use in one climate zone Occupancy: A / B / E / F / H / M / S / U	☐ Relocatable Public School Building for use in all climate zones Occupancy: E	☐ High-Rise Residential Occupancy: R-2 / R-3	☐ Hotel/Motel Guest Rooms Occupancy: R-1

[1] *FOOTNOTE: Enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft in climate zones 2 through 15 are required to meet the minimum daylighting requirements defined in §140.3(c). Compliance with §140.3(c) is documented in Table L. This is the only prescriptive requirement which applies to unconditioned spaces.*

B. PROJECT SCOPE

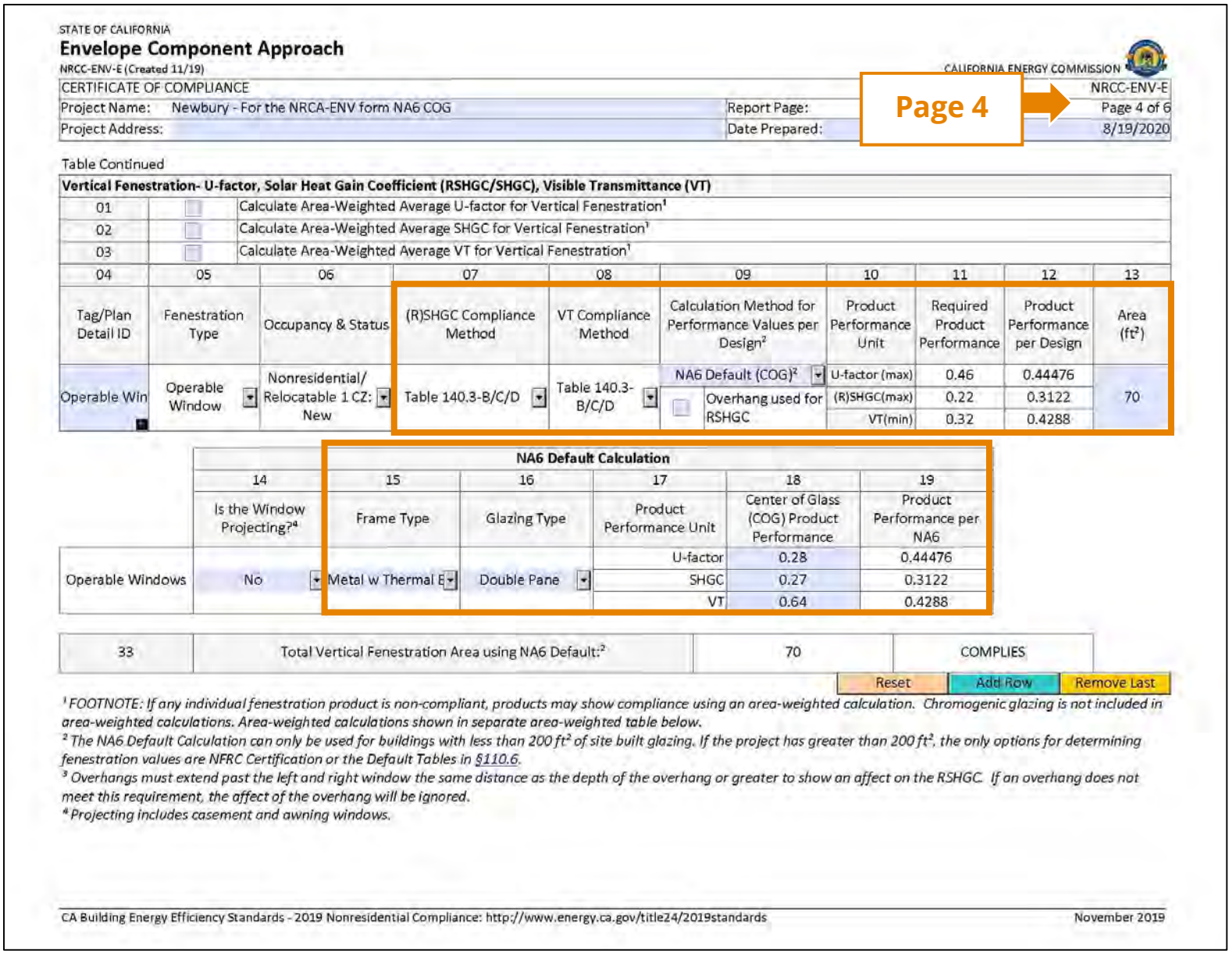
Table Instructions: Include any building envelopes that are within the scope of the permit application and are demonstrating compliance using the prescriptive paths outlined in §140.3, and §141.0(a)1 and §141.0(b)1 and 2 for additions and alterations.

My project consists of (check all that apply)	Component Types		
01	02		
☑ New Construction or Newly Conditioned Space	☐ Roof	☐ Walls	☐ Exterior Doors
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft		☐ Floors	☑ Fenestration/Glazed Door[1]
☐ Addition of conditioned space	☐ Roof	☐ Walls	☐ Exterior Doors
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft		☐ Floors	☐ Fenestration/Glazed Door[1]
☐ Alteration of conditioned space	☐ Roof Assembly	☐ Walls	Exterior Doors NA for Alts.
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft and lighting system installed for the first time	☐ Roofing Material	☐ Floors	☐ Fenestration

[1] *FOOTNOTE: Doors that are more than one-half glass in area are considered Glazed Doors and should be documented on Table K with fenestration.*

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards — November 2019

NRCC-ENV-E: Prescriptive



STATE OF CALIFORNIA
Envelope Component Approach
NRCC-ENV-E (Created 11/19)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-ENV-E
Project Name: Newbury - For the NRCA-ENV form NA6 COG	Report Page:	Page 4 of 6
Project Address:	Date Prepared:	8/19/2020

Page 4

Table Continued

Vertical Fenestration- U-factor, Solar Heat Gain Coefficient (RSHGC/SHGC), Visible Transmittance (VT)

01	☐	Calculate Area-Weighted Average U-factor for Vertical Fenestration[1]
02	☐	Calculate Area-Weighted Average SHGC for Vertical Fenestration[1]
03	☐	Calculate Area-Weighted Average VT for Vertical Fenestration[1]

04	05	06	07	08	09	10	11	12	13
Tag/Plan Detail ID	Fenestration Type	Occupancy & Status	(R)SHGC Compliance Method	VT Compliance Method	Calculation Method for Performance Values per Design[2]	Product Performance Unit	Required Product Performance	Product Performance per Design	Area (ft²)
Operable Win	Operable Window	Nonresidential/ Relocatable 1 CZ: New	Table 140.3-B/C/D	Table 140.3-B/C/D	NA6 Default (COG)[2]	U-factor (max)	0.46	0.44476	70
					☐ Overhang used for RSHGC	(R)SHGC(max)	0.22	0.3122	
						VT(min)	0.32	0.4288	

NA6 Default Calculation

	14	15	16	17	18	19
	Is the Window Projecting?[4]	Frame Type	Glazing Type	Product Performance Unit	Center of Glass (COG) Product Performance	Product Performance per NA6
Operable Windows	No	Metal w Thermal E	Double Pane	U-factor	0.28	0.44476
				SHGC	0.27	0.3122
				VT	0.64	0.4288

33	Total Vertical Fenestration Area using NA6 Default:[2]	70	COMPLIES

Reset | Add Row | Remove Last

[1] FOOTNOTE: If any individual fenestration product is non-compliant, products may show compliance using an area-weighted calculation. Chromogenic glazing is not included in area-weighted calculations. Area-weighted calculations shown in separate area-weighted table below.
[2] The NA6 Default Calculation can only be used for buildings with less than 200 ft² of site built glazing. If the project has greater than 200 ft², the only options for determining fenestration values are NFRC Certification or the Default Tables in §110.6.
[3] Overhangs must extend past the left and right window the same distance as the depth of the overhang or greater to show an affect on the RSHGC. If an overhang does not meet this requirement, the affect of the overhang will be ignored.
[4] Projecting includes casement and awning windows.

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards — November 2019

NRCC-ENV-E: Prescriptive

STATE OF CALIFORNIA
Envelope Component Approach
NRCC-ENV-E (Created 11/19)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-ENV-E
Project Name: Newbury - For the NRCA-ENV form NA6 COG	Report Page:	Page 5 of 6
Project Address:	Date Prepared:	8/19/2020

Page 5

L. DAYLIGHT IN LARGE ENCLOSED SPACES

This Section Does Not Apply

M. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

able Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, orm user must provide n explanation to be added to Table D Exceptional Conditions. These documents must be provided to the building inspector during construction and can e found online at ttp://www.energy.ca.gov/2015publications/CEC-400-2015-033/appendices/forms/NRCI

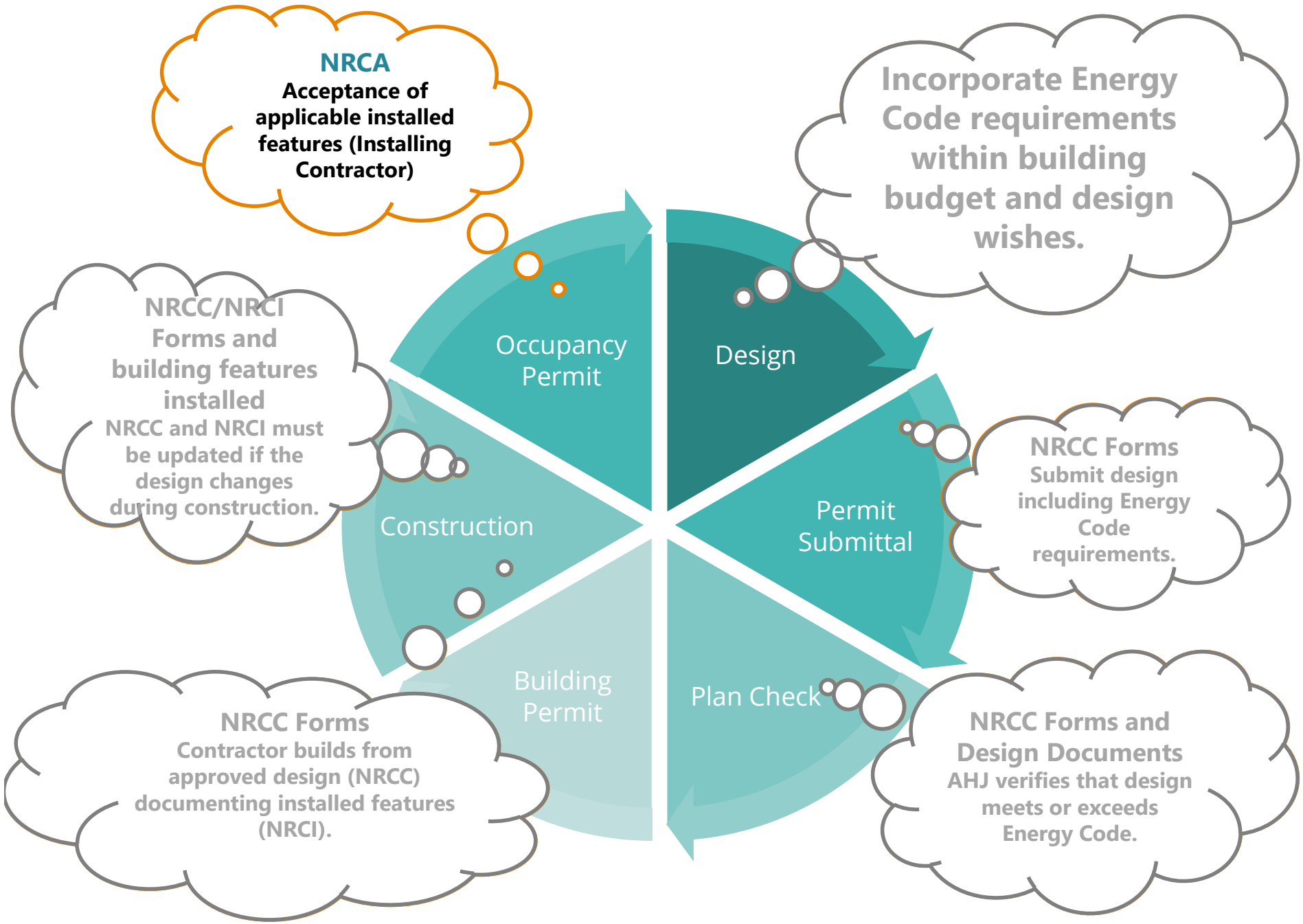
YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
◉	○	NRCI-ENV-01-E - Must be submitted for all buildings.	☐	☐

I. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

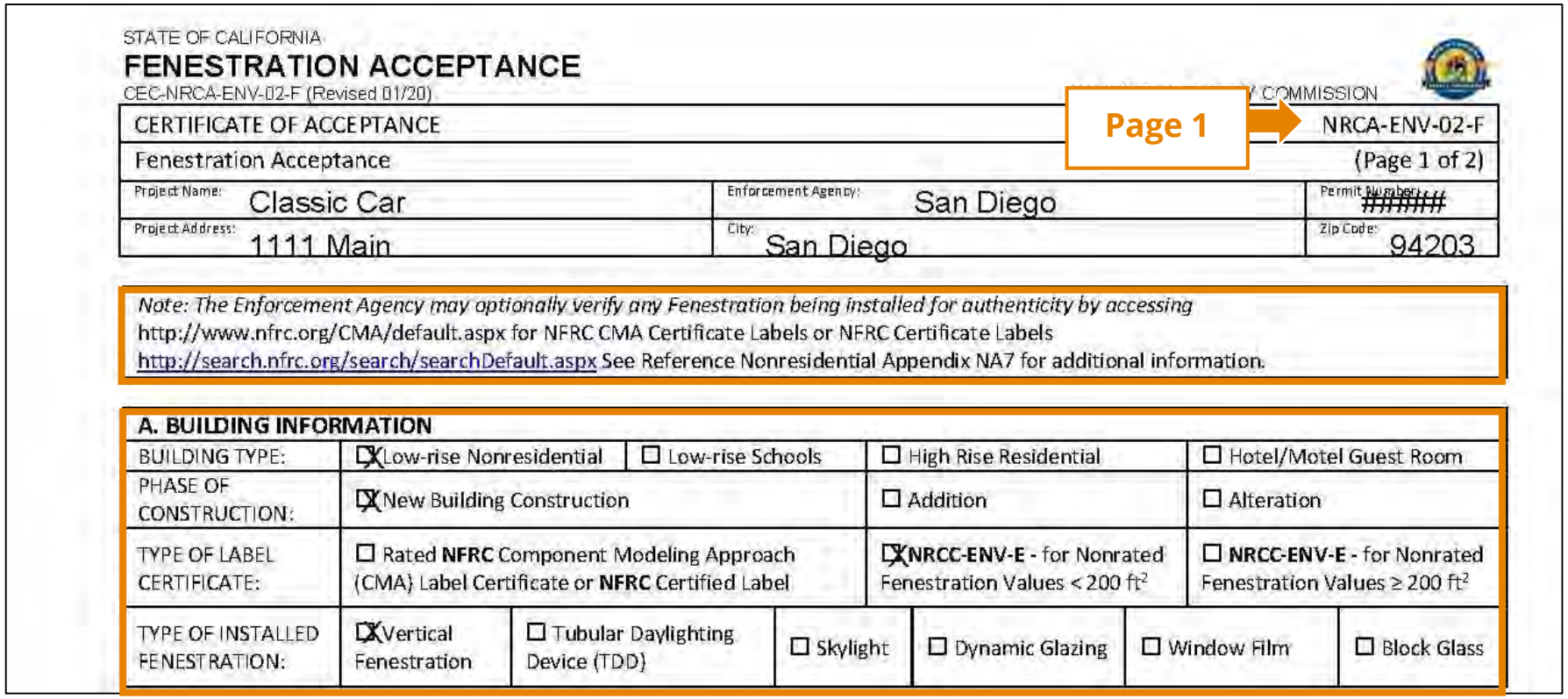
able Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, orm user must provide n explanation to be added to Table D Exceptional Conditions. These documents must be provided to the building inspector during construction and can e found online at ttp://www.energy.ca.gov/2015publications/CEC-400-2015-033/appendices/forms/NRCA/. Individuals who perform the field testing and verification wo k, and provide the nformation required for completion of the fenestration Certificate of Acceptance documentation are not required to be licensed professionals. However, he person who signs the ertificate of Acceptance document to certify compliance with the acceptance requirements shall be licensed as specified in Standards Section 10-103(a)4 and NA7.3.1.

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
◉	○	NRCA-ENV-02-F - Must be submitted for all new, added or altered fenestration.	☐	☐
		NRCA-ENV-03-F - Daylighting design indoor lighting power adjustment factors (PAF). Note: The requirement for this NRCA is indicated on the NRCC-LTI (prescriptive) or NRCC-PRF (performance) because it is only relevant if a PAF is used for clerestories, daylight redirection devices or horizontal slats.		

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards November 2019


NRCA
Acceptance of applicable installed features (Installing Contractor)
Incorporate Energy Code requirements within building budget and design wishes.
NRCC/NRCI Forms and building features installed
NRCC and NRCI must be updated if the design changes during construction.
Occupancy Permit
Design
Construction
Permit Submittal
NRCC Forms
Submit design including Energy Code requirements.
Building Permit
Plan Check
NRCC Forms
Contractor builds from approved design (NRCC) documenting installed features (NRCI).
NRCC Forms and Design Documents
AHJ verifies that design meets or exceeds Energy Code.

NRCA-ENV-02-F: Acceptance Testing



STATE OF CALIFORNIA

FENESTRATION ACCEPTANCE

CEC-NRCA-ENV-02-F (Revised 01/20)

Y COMMISSION

Page 1

CERTIFICATE OF ACCEPTANCE		NRCA-ENV-02-F
Fenestration Acceptance		(Page 1 of 2)
Project Name: Classic Car	Enforcement Agency: San Diego	Permit Number: ######
Project Address: 1111 Main	City: San Diego	Zip Code: 94203

Note: The Enforcement Agency may optionally verify any Fenestration being installed for authenticity by accessing http://www.nfrc.org/CMA/default.aspx for NFRC CMA Certificate Labels or NFRC Certificate Labels http://search.nfrc.org/search/searchDefault.aspx See Reference Nonresidential Appendix NA7 for additional information.

A. BUILDING INFORMATION

BUILDING TYPE:	☒ Low-rise Nonresidential	☐ Low-rise Schools	☐ High Rise Residential	☐ Hotel/Motel Guest Room		
PHASE OF CONSTRUCTION:	☒ New Building Construction		☐ Addition	☐ Alteration		
TYPE OF LABEL CERTIFICATE:	☐ Rated **NFRC** Component Modeling Approach (CMA) Label Certificate or **NFRC** Certified Label		☒ **NRCC-ENV-E** - for Nonrated Fenestration Values < 200 ft²	☐ **NRCC-ENV-E** - for Nonrated Fenestration Values ≥ 200 ft²		
TYPE OF INSTALLED FENESTRATION:	☒ Vertical Fenestration	☐ Tubular Daylighting Device (TDD)	☐ Skylight	☐ Dynamic Glazing	☐ Window Film	☐ Block Glass

NRCA-ENV-02-F: Acceptance Testing

B. STATEMENT OF ACCEPTANCE

This Certificate of Acceptance summarizes the results of
NA7.4. Additional related references are in Sections §10-

SUMMARY OF FENESTRATION VERIFICATION AND INSPECTIO

Individuals who perform the field testing and verification
Certificate of Acceptance documentation are not require
Certificate of Acceptance document to certify compliance
Standards Section 10-103(a)4 and NA7.3.1.

The Responsible Person or Party shall verify the thermal
product being installed matches the NFRC Label Certifica

For NFRC Rated Product *(If more than 8 fenestration products*

	01			
If Product is rated by NFRC then enter the ID # in each column. This includes any of the types of installed fenestration listed above.	NFRC Label Certificate ID #			
	PJ-EFC-331			
	05			
	NFRC Label Certificate ID #	Certificate ID #	Certificate ID #	Certificate ID #

For Nonrated Fenestration Attach a Copy of the NRCC-ENV-E

NATIONAL FENESTRATION RATING COUNCIL
LABEL CERTIFICATE

PRODUCT LISTING

FOR CODE COMPLIANCE

LABEL CERTIFICATE ID: *PJ-EFC-331* **Issuance Date:** 10/11/2019

NFRC CERTIFIED PRODUCT RATING INFORMATION: *

The NFRC Certified Product Rating Information listed here is to be used to verify that the ratings meet applicable energy code requirements.

PRODUCT LISTING:

						CERTIFIED Performance Rating at NFRC Standard Size		
CPD ID	Total Area	Name	Framing Ref	Glazing Ref	Spacer Ref	U-factor**	SHGC**	VT**
	ft²					Btu/ hr·ft²·°F	-	-
P-EFC-2767	399	2700 Storefront	FA-EFC-4471	GA-GUA-2876	SA-EF-2110	0.64	0.45	0.50
P-EFC-2768	42	5800 Storefront Door	FA-EFC-4454	GA-GUA-2876	SA-EF-2110	0.64	0.45	0.50

For All Fenestration Verify and Cross Reference: Windows (see exerpt from NRCC-ENV-E attached)

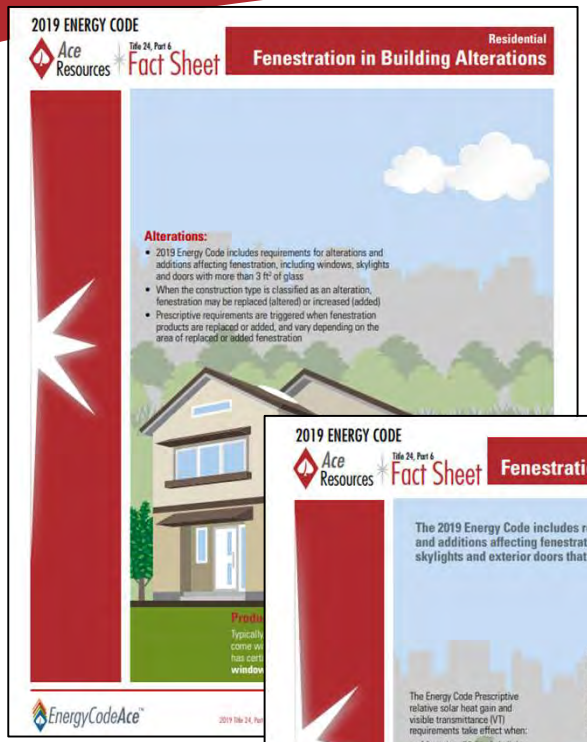
	01	02	03	04
If receipts or orders are available and it identifies the NFRC ID# then cross reference against the NFRC Label Certificate to match ID#s; or	☐ Delivery Receipt(s) ☒ Purchase Order ☐ Detailed Receipt	☐ Delivery Receipt(s) ☒ Purchase Order ☐ Detailed Receipt	☐ Delivery Receipt(s) ☐ Purchase Order ☐ Detailed Receipt	☐ Delivery Receipt(s) ☐ Purchase Order ☐ Detailed Receipt
Cross reference the efficiencies listed on the NFRC Label Certificate of **NRCC-ENV-E** *- matches the building plans window schedule of efficiencies.*	☒ Cross Reference and Matches Building Plans	☒ Cross Reference and Matches Building Plans	☐ Cross Reference and Matches Building Plans	☐ Cross Reference and Matches Building Plans

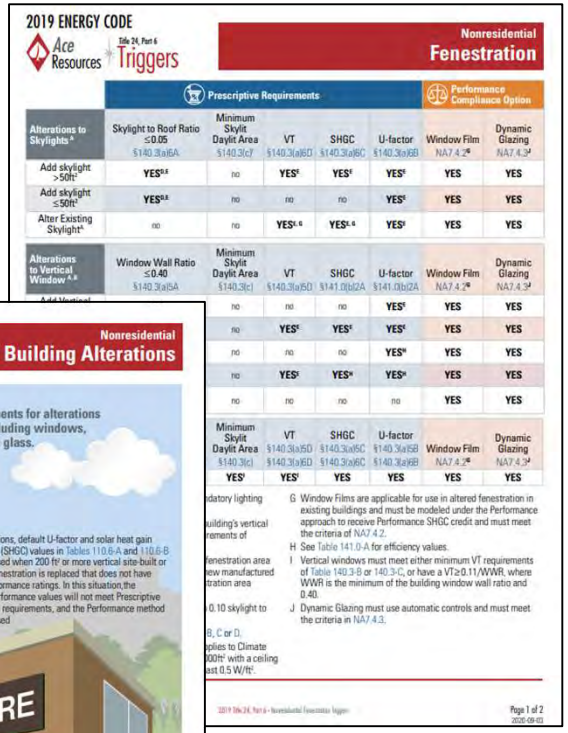
2019 Energy Code: Fenestration

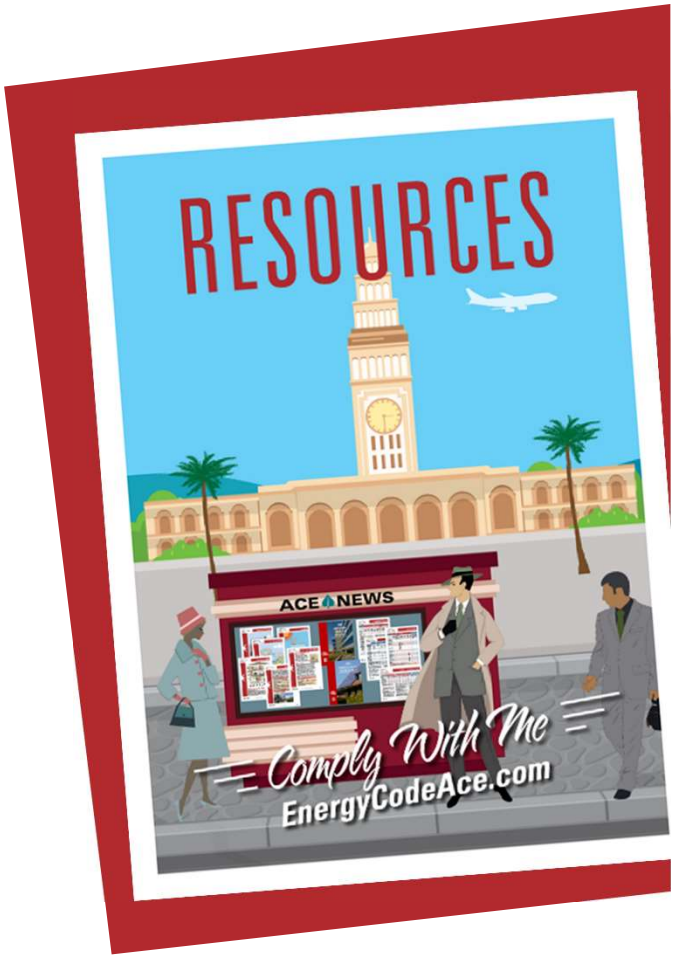
1. Energy Code Basics
2. Fenestration Basics
3. Residential Requirements
4. Nonresidential Requirements
5. Next Steps

- **Next Steps**
  - Check out more on the Energy Code Ace website

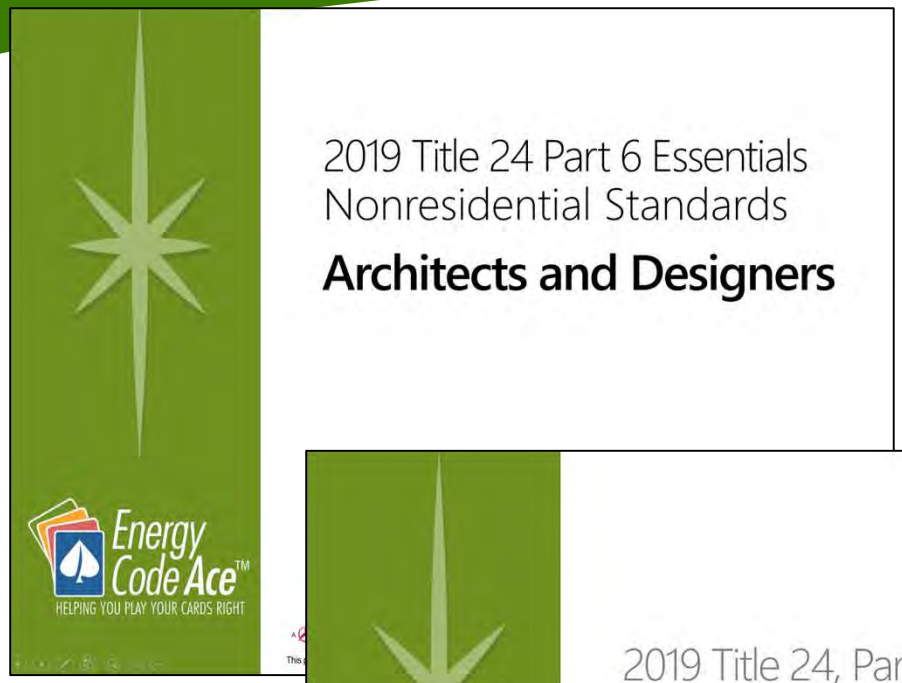
Fenestration Resources







Virtual Classes



Thank you

Please feel free to reach out to us with your questions and comments!

Contact	Role	Email	Phone
Gina Rodda	Instructor	Decoding.request@energycodeace.com	(510) 428-0803
Jill Marver	Energy Code Ace Program Manager	Jill.Marver@PGE.com	(925) 415-6844
Energy Code Ace	Multiple	http://energycodeace.com/content/contact	