2022 CODE BREAKER

Solving the Energy Code Puzzle One Piece at a Time

Nonresidential, Hotel/Motel & Multifamily Envelope

Participant Handout

May 2023

Energy Code Ace™

SDGE™

Southern California Edison®
Energy for What's Ahead®

PG&E Pacific Gas and Electric Company®

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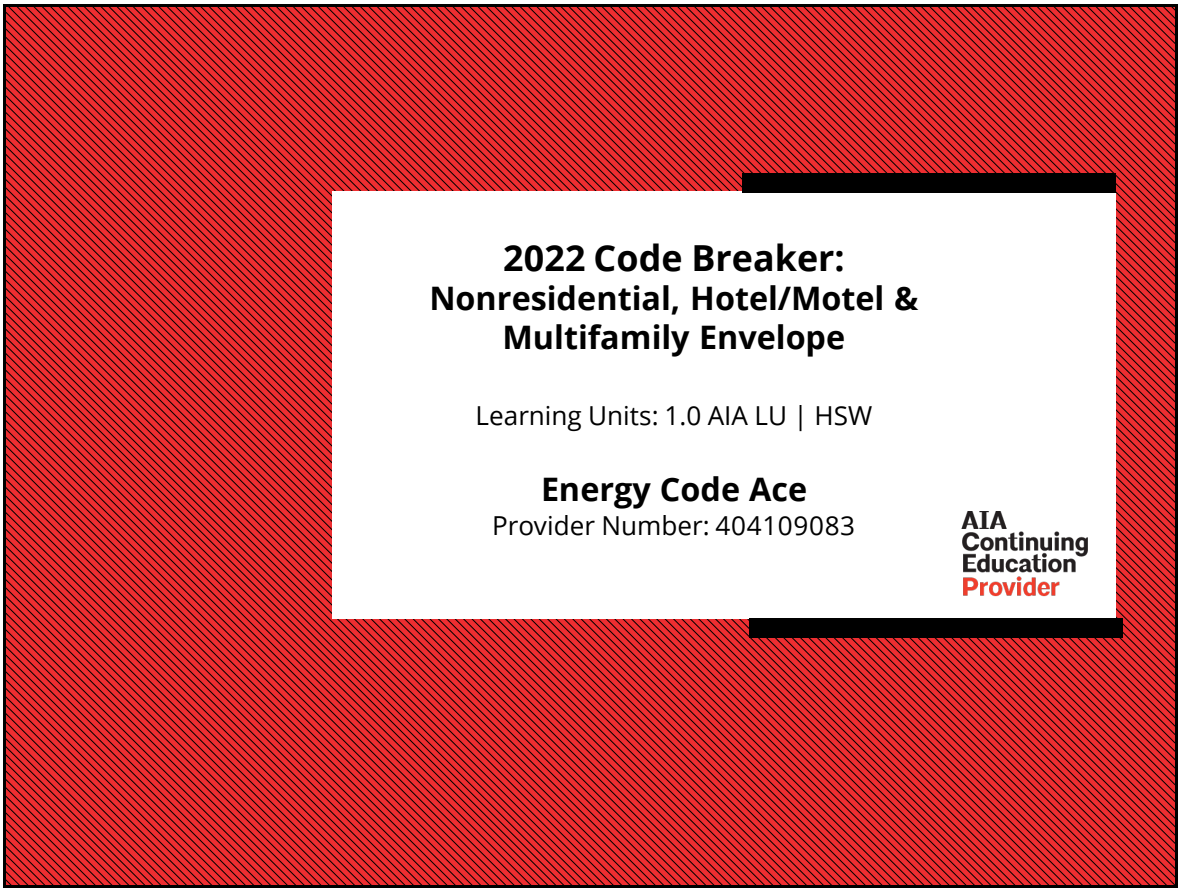
ABOUT THE STATEWIDE CODES AND STANDARDS PROGRAM

The Statewide Codes and Standards Program (C&S Program) is jointly managed by PG&E, SDG&E, and SCE. The C&S Program saves energy on behalf of ratepayers by directly influencing standards and code-setting bodies to strengthen energy efficiency regulations, by improving compliance with existing codes and standards, and working with local governments to develop ordinances that exceed statewide minimum requirements.

This class is one of many free courses, tools, and resources that the C&S Program offers. Please visit http://energycodeace.com/ or contact info@energycodeace.com to find out more about all program offerings.

AIA Information



Course Description

The 2022 Energy Code (Title 24, Part 6) requirements for Nonresidential, Hotel/Motel and Multifamily envelope features, including roofing products and insulation, wall, raised floor, fenestration, and solid door for all scopes of work (new construction, additions and alterations), have been revised. We will review these requirements in addition to how the Energy Code has been reorganized to support Multifamily buildings.

Course Objectives

- Determine which section(s) of the 2022 Energy Code apply to Nonresidential, Hotel/Motel and Multifamily buildings
- Discuss the envelope (roof, walls, floors, fenestration, solid doors) requirements under the 2022 Energy Code for both Nonresidential, Hotel/Motel and Multifamily buildings
- Recognize how the Energy Code requirements for newly built spaces differs from the requirements for altered spaces
- Discover where and how to document compliance with the Certificate of Compliance (NRCC), Certificate of Installation (NRCI) and Certificate of Acceptance (NRCA)

AIA Continuing Education Provider

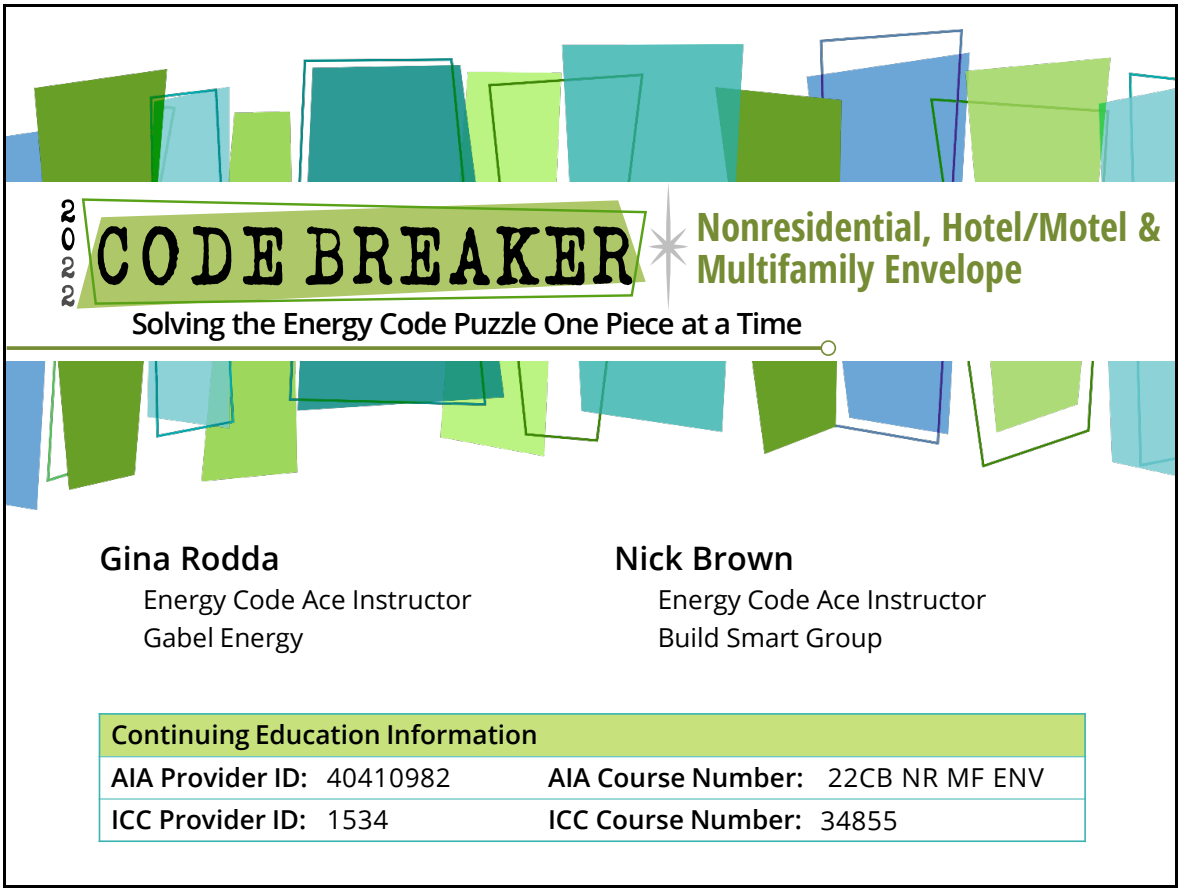
Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

AIA Continuing Education Provider

Welcome


2022
CODE BREAKER
Nonresidential, Hotel/Motel & Multifamily Envelope
Solving the Energy Code Puzzle One Piece at a Time
Gina Rodda
Energy Code Ace Instructor
Gabel Energy
Nick Brown
Energy Code Ace Instructor
Build Smart Group
Continuing Education Information
AIA Provider ID: 40410982
AIA Course Number: 22CB NR MF ENV
ICC Provider ID: 1534
ICC Course Number: 34855

Ace Training™

Learning Objectives

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EnergyCodeAce™ Comply With Me

Ace Training™

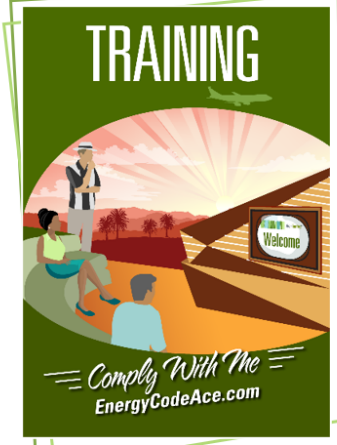
Ace Resources™

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

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™

Ace Training™

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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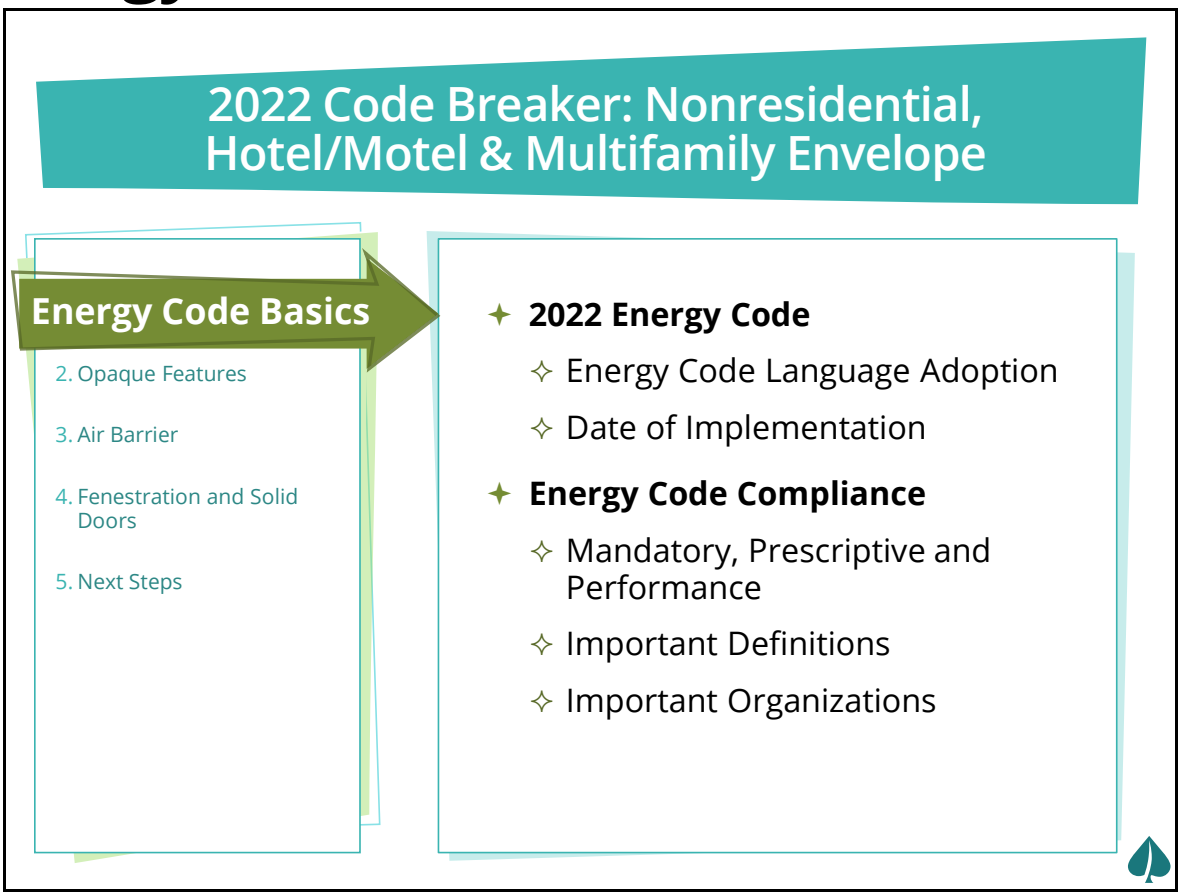
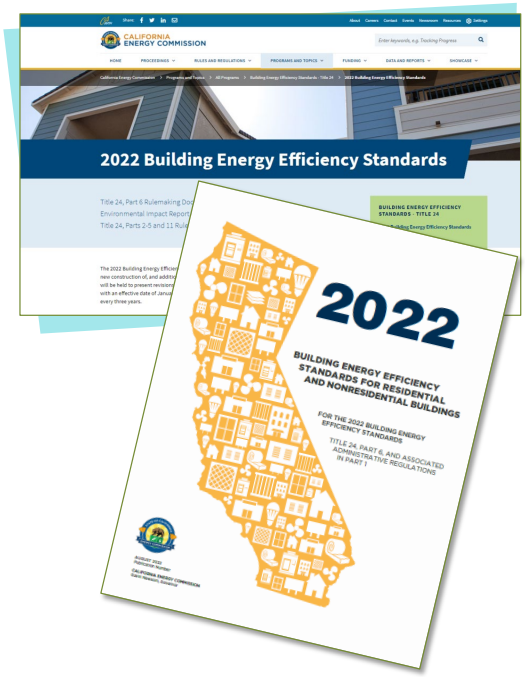
Energy Code Basics



Schedule Update



- **2022 Energy Code Language Adoption**
  - August 2021 Business Meeting
- **Implementation Date**
  - **January 1, 2023**
  - Any projects that apply for a permit on or after this date will be subject to the 2022 Standards
- Information and documents available at:
  - https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency

Course Conventions

Mandatory	Prescriptive	Performance
Always required regardless of compliance approach used	Required when using the Prescriptive compliance approach	Optional feature accounted for when doing Performance-based computer modeling

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

Mandatory Measures

Prescriptive Approach

- **Simple but inflexible** – "all or nothing" approach to compliance
- Offers list of requirements for each building feature
- List of requirements based on climate zone

Performance Approach

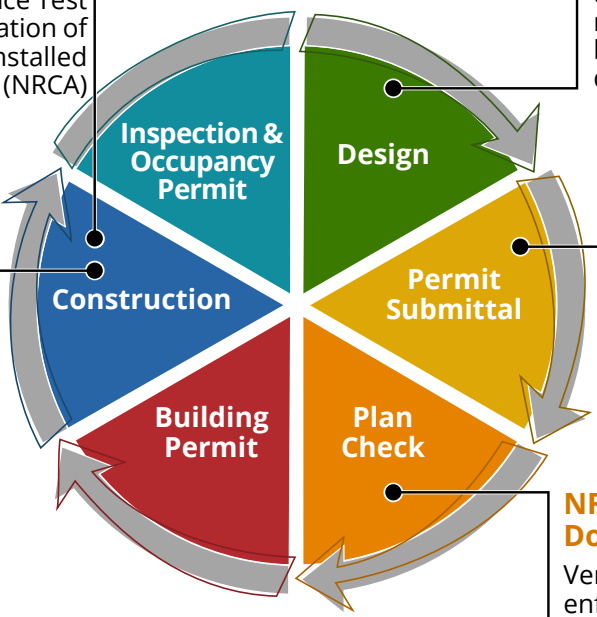
- **Allows flexibility** and building customization
- Approved software verifies whether the "Proposed Design" is as good as, or better than, "Standard Design" (the baseline for Prescriptive)

NRCC-ENC-E or LMCC-ENV-E | NRCC-PRF-E or LMCC-PRF-E Compliance Documentation

Overview of Nonresidential Forms

NRCA Forms
Acceptance Test Technician verification of applicable installed features (NRCA)

NRCI Forms
Contractor builds from approved design (NRCC) documenting installed features (NRCI)

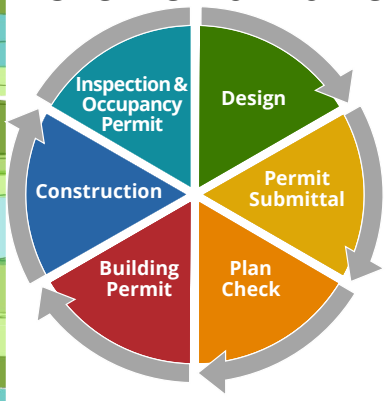


Incorporate and document code requirements within building budget and design wishes

NRCC Forms
Submit design, including code requirements

NRCC Forms & Design Documents
Verification by enforcement agency that design meets and or exceeds code

Overview of Nonresidential Forms



1. **Get a Permit** → **Certificate of Compliance**
   - **NRCC**-???-**E**
2. **Install the Equipment** → **Certificate of Installation**
   - **NRCI**-???-**E**: (measure)
3. **Do Acceptance Tests** → **Certificates of Acceptance**
   - **NRCA**-???-##-**A**: (measure)
4. **Get verification, if required** → **Certificate of Verification**
   - **NRCV**-???-##-**H**: (measure)
5. **Occupy the building** → **Certificate of Occupancy**
   - Review of relevant compliance docs by enforcement agency

Form Titles & What They Show (NR & MF)

Occupancy Type

NR = Nonresidential
LM = Low-rise Multifamily (3 stories or fewer)

High-rise MF (4 stories or more) also uses "NR"

Building Feature or Category

PRF = Performance Approach
CXR = Commissioning
ELC = Electrical
ENV = Envelope
LTI = Indoor Lighting
LTO = Outdoor Lighting
LTS = Sign Lighting
MCH = Mechanical
PLB = Plumbing (DHW)
PRC = Covered Process
SAB = Solar PV & Battery
STH = Solar Thermal

NRCC-ENV-E

Type of Document

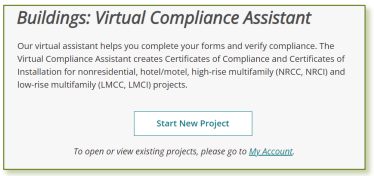
Certificates of…
CC = Compliance
CI = Installation
CA = Acceptance
CV = Verification

Primary User

E = Enforcement Agency
H = HERS Rater
F = Field Technician (Contractor)
A = Acceptance Test Tech

Ace Tools™

The Virtual Compliance Assistant (VCA)
Certificates of Compliance & Certificates of Installation



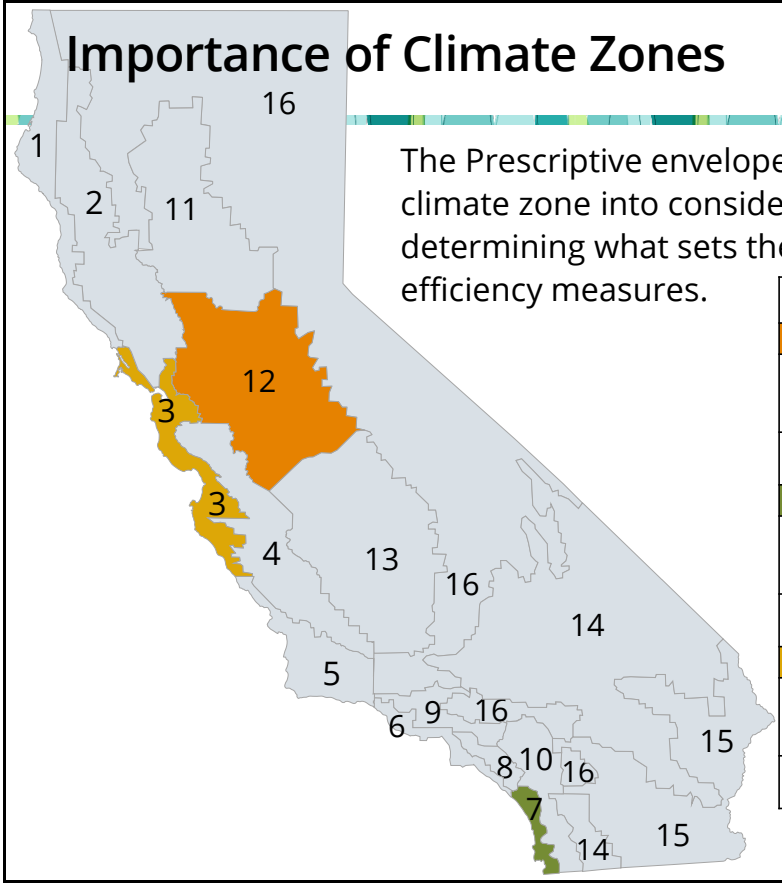
Click HERE to go to VCA

A tool to help you complete the NRCC, LMCC, NRCI and LMCI forms

- Walks you through a series of questions about your project
- Produces the NRCCs, LMCCs, NRCIs and/or LMCIs for that project
- Tells you if the project complies — and, if not, where the problem is
- Saves your projects so you can update if necessary
- Lets you share your project with other team members

Try the Virtual Compliance Assistant here: https://energycodeace.com/content/project-tool

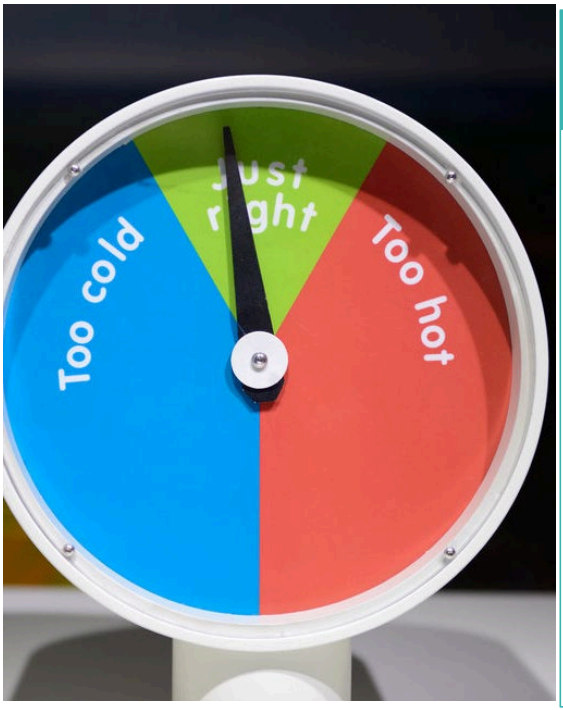
Importance of Climate Zones



The Prescriptive envelope requirements take climate zone into consideration when determining what sets the minimum envelope efficiency measures.

Examples		
Hot (CZ 12)		
Metal Framed Wall U-factor	Cavity	Continuous
0.055	**R-19**	**R-13**
Fixed Window	U-factor	RSHGC
	0.34	**0.22**
Mild (CZ 7)		
Metal Framed Wall U-factor	Cavity	Continuous
0.060	**R-19**	**R-11**
Fixed Window	U-factor	RSHGC
	0.36	**0.25**
Cool (CZ 3)		
Metal Framed Wall U-factor	Cavity	Continuous
0.071	**R-19**	**R-10**
Fixed Window	U-factor	RSHGC
	0.36	**0.25**

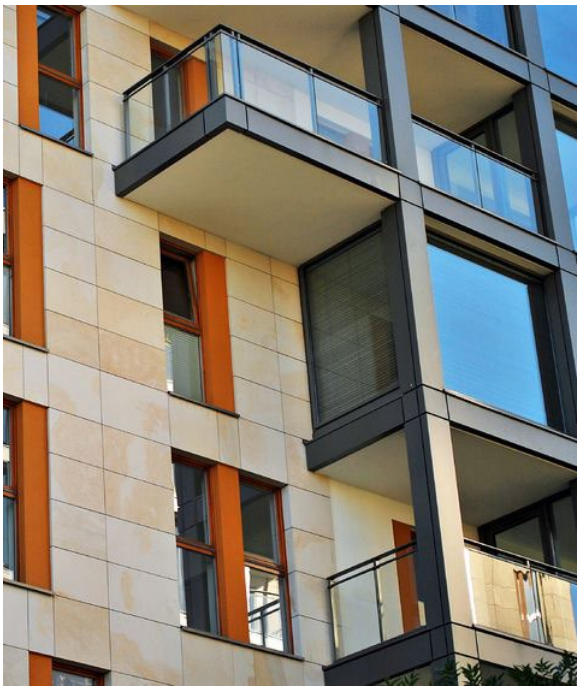
Important Definitions



§100.1

- **CONDITIONED SPACE** is an enclosed space within a building that is directly conditioned or indirectly conditioned.
- **CONDITIONED SPACE, DIRECTLY** is an enclosed space that is provided with wood heating, mechanical heating that has a capacity exceeding 10 Btu/hr-ft², or mechanical cooling that has a capacity exceeding 5 Btu/hr-ft², . Directly conditioned space does not include process space. (See "process space.")
- **CONDITIONED SPACE, INDIRECTLY** is enclosed space that (1) is not directly conditioned space; and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour.
- **NEWLY CONDITIONED SPACE** is any space being converted from unconditioned to directly conditioned or indirectly conditioned space. Newly conditioned space must comply with the requirements for an addition.

Important Definitions



§100.1

- **DEMISING PARTITION** is a wall, fenestration, floor, or ceiling that separates conditioned space from enclosed unconditioned space or a controlled environment horticulture space.
- **EXTERIOR PARTITION** is an opaque, translucent, or transparent solid barrier that separates conditioned space from ambient air or space.

Important Definitions

New Construction Addition & Alteration	Repair
Will require compliance to the Energy Code for applicable envelope features	Will *not require* compliance to the Energy Code

§100.1

- **ADDITION** is any change to a building that increases conditioned floor area and conditioned volume. See also "newly conditioned space." Addition is also any change that increases the floor area and volume of an unconditioned building of an occupancy group or type regulated by Part 6. Addition is also any change that increases the illuminated area of an outdoor lighting application regulated by Part 6.
- **REPAIRS** shall not increase the preexisting energy consumption of the repaired component, system, or equipment.

Important Organizations

Cool Roof Rating Council (CRRC)

- The Cool Roof Rating Council rates the solar reflectance, thermal emittance and solar reflectance index of roofing materials, and publishes the directory of CRRC-rated products on their website https://coolroofs.org/directory/roof

Dept. of Consumer Affairs

- For insulation and radiant barriers to be installed in California, manufacturers must certify product to the California Bureau of Household Goods and Services (BHGS) https://bhgs.dca.ca.gov/

National Fenestration Rating Council (NFRC)

- The National Fenestration Rating Council rates the performance of manufactured and site-built windows, glass doors, opaque doors and skylights, and publishes the directory of NFRC-rated products on their website.
  - Manufactured products: https://search.nfrc.org/search/searchdefault.aspx
  - Site-Built products: https://cmast.nfrc.org/

Check Your Understanding

Check Your Understanding #1

What do you think?

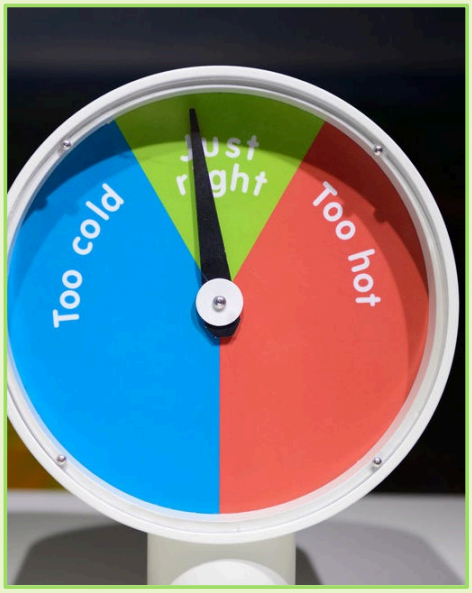
Envelope requirements apply to _____ *(not including daylighting requirements)*

A. All enclosed spaces

B. Conditioned enclosed spaces

C. Unconditioned enclosed space

D. Non enclosed spaces



Check Your Understanding #2

What do you think?

Which scope of work is NOT subject to the Energy Code?

A. New Construction

B. Additions

C. Alterations

D. Repairs

Check Your Understanding #3

What do you think?

Which compliance forms can be used to show compliance for envelope?

A. NRCC-ENV-E (Envelope)

B. NRCC-PRF-01-E (Performance including envelope features)

C. Both of the above

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:	Report Page: Page 1 of 4
Project Address:	Date Prepared:

A. GENERAL INFORMATION

01	Project Location (city)		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.*

Performance

Project Name:	Nonresidential Sample	NRCC-PRF-01-E	Page 1 of 15
Project Address:	1234 Main St. Sacramento 95800	Calculation Date/Time:	08:14, Wed, Oct 13, 2021
Input File Name:	NonRes Sample.cibd19x		

A. GENERAL INFORMATION

1	Project Location (city)	Sacramento	8	Standards Version	Compliance2019
2	CA Zip Code	95800	9	Compliance Software (version)	EnergyPro 8.3
3	Climate Zone	12	10	Weather File	SACRAMENTO-EXECUTIVE_724830_CZ2010.epw
4	Total Conditioned Floor Area in Scope	4,480 ft²	11	Building Orientation (deg)	(N) 0 deg
5	Total Unconditioned Floor Area	1,200 ft²	12	Permitted Scope of Work	NewComplete
6	Total # of Stories (Habitable Above Grade)	2	13	Building Type(s)	Nonresidential
7	Total # of dwelling units	0	14	Gas Type	NaturalGas

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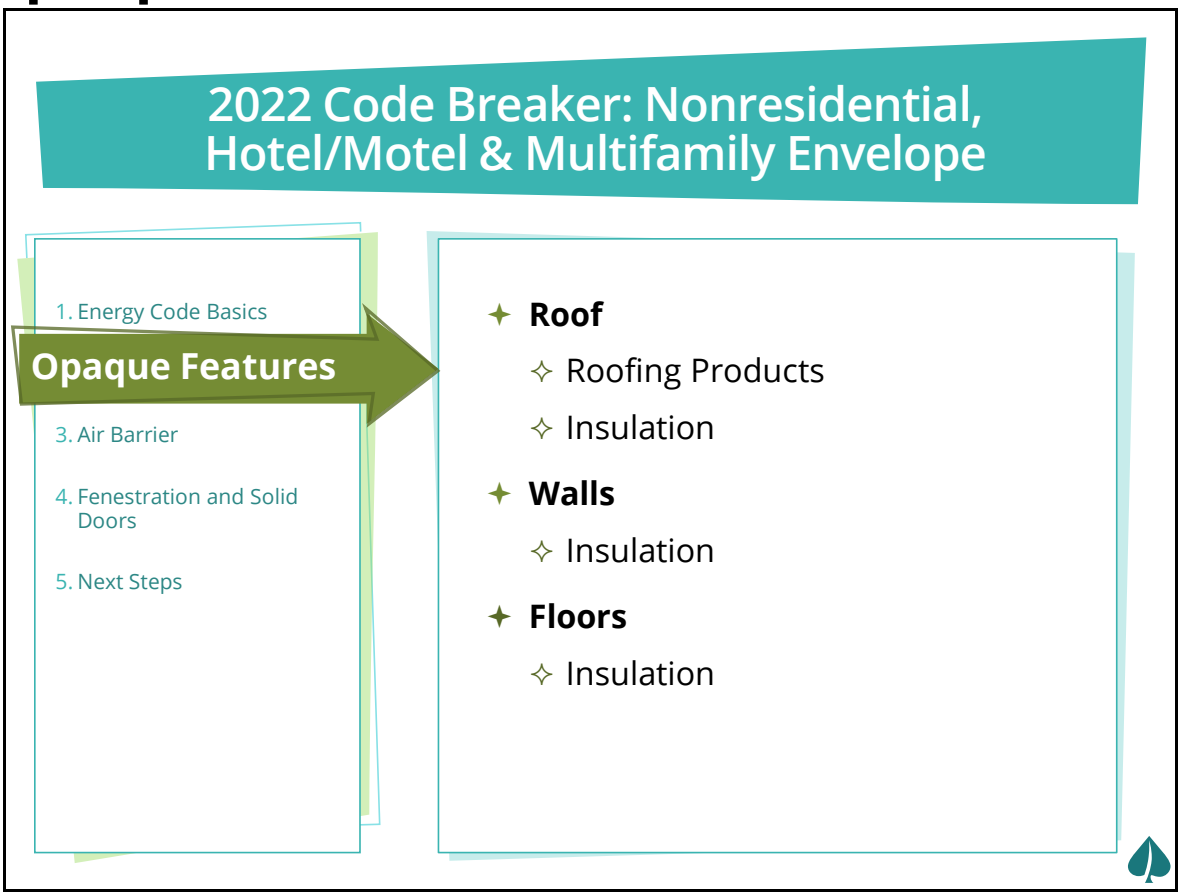
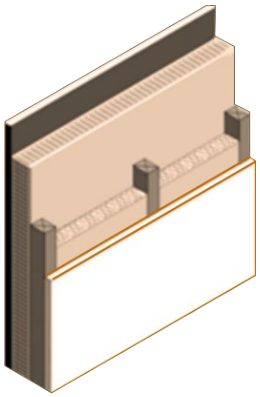
Opaque Features



Important Definitions



- U-factors are determined by either:
  - Joint Appendices Chapter 4 (JA4) or
  - Performance software layers feature
- R-values represent requirements for insulation only

§100.1

- **U-FACTOR** is the overall coefficient of thermal transmittance of a fenestration, wall, floor, or roof/ceiling component, in Btu/(hr × ft² × °F), including air film resistance at both surfaces.
- **R-VALUE** is the measure of the thermal resistance of insulation or any material or building component expressed in ft2-hr-°F/Btu. All insulation shall be **certified by Department of Consumer Affairs, Bureau of Household Goods and Services** that the insulation conductive thermal performance is approved pursuant to the California Code of Regulations, Title 24, Part 12, Chapters 12-13, Article 3, "Standards for Insulating Material."

Prescriptive Requirements Opaque Envelope

§140.3/170.2
§141.0/180.1/180.2

Nonresidential and Hotel/Motel Guest Rooms

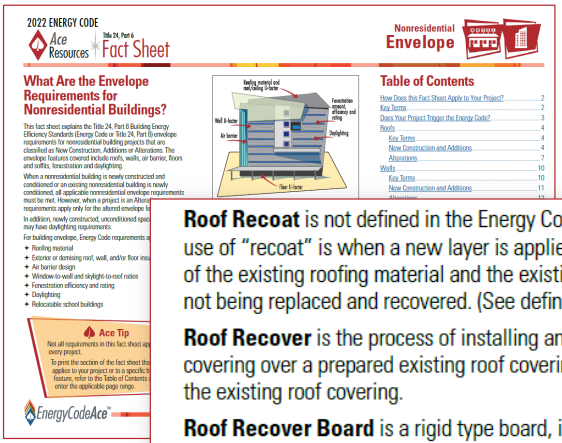
- **New Construction & Additions**: Table 140.3-B
- **Alterations**:
  - Reroof:
    - Low-sloped Solar Reflectance: Table 141.0-B
    - Low-sloped Insulation: Table 141.0-C

Multifamily

- **New Construction**: Table 170.2-A
- **Additions**: See §180.1(a)1
- **Alterations**:
  - Reroof:
    - Low-sloped Solar Reflectance: Table 180.2-A
    - Insulation: See §180.2(b)1Aiii

Roof

2022 Nonresidential Envelope Fact Sheet



Roof Recoat is not defined in the Energy Code, but typical industry use of "recoat" is when a new layer is applied to the outer surface of the existing roofing material and the existing roofing material is not being replaced and recovered. (See definitions below.)

Roof Recover is the process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

Roof Recover Board is a rigid type board, installed directly below a low-sloped roof membrane, with or without above deck thermal insulation, to: (a) improve a roof system's compressive strength, (b) physically separate the roof membrane from the thermal insulation, or (c) physically separate a new roof covering from an underlying roof membrane as part of a roof overlay project.

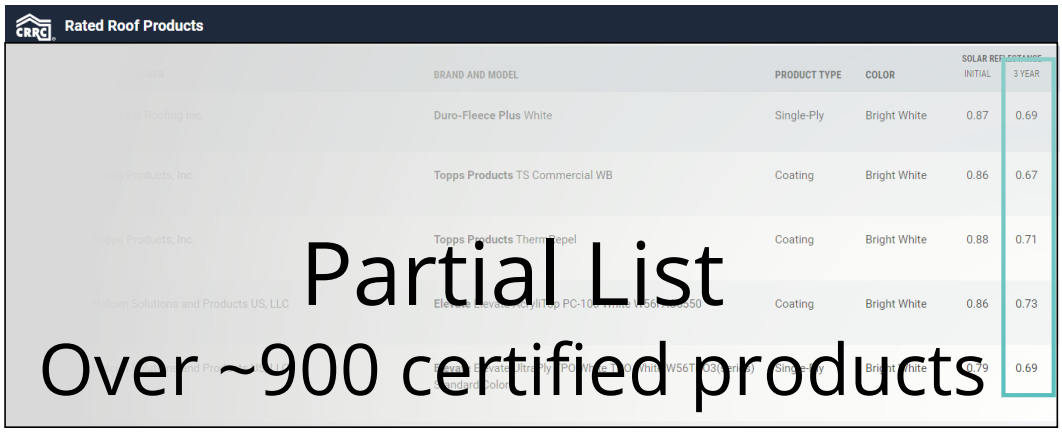
Roof Replacement is the process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

New Construction
Roof: Rated "Cool Roof" Product

§140.3/170.2

Examples of Products that meet Aged Solar Reflectance 0.63

Roof Style	Building Type	Climate Zone	Either 3-year Aged Solar Reflectance	Thermal Emittance	Or SRI
Low-Sloped	Nonresidential*	1-16	0.63	0.75	75
	Guest Rooms of Hotel/Motel**	9,10,11,13,14,15	0.55	0.75	64
Steep-Sloped	Nonresidential and Guest Rooms of Hotel/Motel	1, 3	0.20	0.75	16
		2, 4-16	0.25	0.80	23



Partial List

Over ~900 certified products

New Construction
Nonresidential Roof Exceptions

- **Rated "Cool Roof" Products:**
  - **Steep Sloped:** Roof area covered by integrated PV panels
  - **Low-Sloped:**
    - Wood-framed roofs with U-factor ≤0.034 in Climate Zones 3 and 5
    - Roof constructions with a weight of at least 25 lb/ft² over the roof membrane
    - Roof area covered by integrated PV panels
    - Roof/Ceiling Insulation Tradeoff Table 140.3 for reduced Aged Solar Reflectance

Exceptions

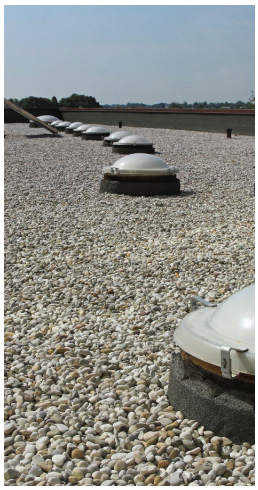
- It is a good practice to review all applicable exceptions before confirming building features required
- The performance approach can provide flexibility of prescriptive measures (all mandatory measures must be met), with any "penalties" are offset by equal or better TDV energy savings considered "credits"

New Construction
Nonresidential Roof: Insulation

§140.3
§141.0

Examples of assemblies that meet the U-factor of 0.034

		Climate Zone															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Roofs/ Ceiling	Metal Building	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
	Wood Framed and Other	0.034	0.034	0.034	0.034	0.034	0.049	0.049	0.049	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034



- Span Deck
  - 4" concrete ~ R-25
    (5" R-5 polystyrene above roof deck)
- Wood Framed Rafter
  - 2 x 12 16" OC: R-38
  - 2 x 10 24" OC: R-30
- Metal Framed Rafter
  - 2 x 14 16" OC: R-38 + R-15
  - 2 x 10 24" OC: R-30 + R-12

Alteration
Nonresidential Low-Sloped Roofing Product

§141.0

Trigger

Recovering, recoating or replacing ≥50% or ≥2,000 ft² of roofing over conditioned space(s)

Same as New Construction

Roof Style	Building Type	Climate Zone	Either: 3-year Aged Solar Reflectance	Either: Thermal Emittance	Or: SRI
Low-Sloped	Nonresidential*	1-16	0.63	0.75	75
	Guest Rooms of Hotel/Motel**	9,10,11,13,14,15	0.55	0.75	64
Steep-Sloped	Nonresidential and Guest Rooms of Hotel/Motel	1, 3	0.20	0.75	16
		2, 4-16	0.25	0.80	23

Exceptions: Rated "Cool Roof"

- Roof constructions with a **weight of at least 25 lb/ft²** over the roof membrane
- Any roof area **covered by building integrated photovoltaic panels** or integrated solar thermal panels is not required to meet the rated "cool roof" requirements.
- Altered Roof/Ceiling Insulation **Tradeoff for Reduced Aged Solar** Reflectance Table 141.0-B

Alteration
Nonresidential Low-Sloped Roof Insulation

§141.0

Trigger

Recovering, ~~recoating~~ or replacing ≥50% or ≥2,000 ft² of roofing over conditioned space(s)

Table 141.0-C: Low-Sloped Roof When Recovering or Replacing Roofing Material		
Climate Zone	Minimum Continuous Insulation R-Value	Maximum U-factor of Roof Assembly with ≥R-10 to be Provided at Roof Deck
1-5 and 9-16	R-23	0.037
6-8	R-17	0.047

Span Deck Insulation Examples for U-factor of 0.037

- **R-10** above roof deck **+ R-38** below roof deck interrupted by metal framing
- **R-10** above roof deck **+ R-19** below roof deck interrupted by wood framing

Exceptions: Insulation

- When **recovering** an existing roof and providing **new ≥R-10 continuous insulation** above the roof deck (this exception does not apply to replaced roofs)
- When **existing mechanical equipment** is not disconnected and lifted, then either **≥R-10 or maximum insulation thickness allowed per manufacturer's instructions, WHICHEVER IS GREATER,** for minimum base flashing heights must be installed. If R-10 cannot be achieved, the equipment must be lifted with new flashing supporting Table 141.0-C requirements.

Wall

New Construction Nonresidential Wall: Insulation

§140.3
§141.0

Examples of assemblies that meet the U-factor of 0.055

		Climate Zone															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walls	Metal Building	0.113	0.061	0.113	0.061	0.061	0.113	0.113	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.057	0.061
	Metal-framed	0.060	0.055	0.07[1]	0.055	0.055	0.060	0.060	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055
	Mass Light[1]	0.196	0.170	0.278	0.227	0.440	0.440	0.440	0.440	0.440	0.170	0.170	0.170	0.170	0.170	0.170	0.170
	Mass Heavy[1]	0.253	0.650	0.650	0.650	0.650	0.690	0.690	0.690	0.690	0.650	0.184	0.253	0.211	0.184	0.184	0.160
	Wood-framed and Other	0.095	0.059	0.110	0.059	0.102	0.110	0.110	0.102	0.059	0.059	0.045	0.059	0.059	0.059	0.042	0.059

- Metal Framed
  - 2 x 4 16" OC: R-11 + R-15
  - 2 x 6 16" OC: R-19 + R-14
  - 2 x 8 16" OC: R-19 + R-12

Note: Z-clips will be considered metal framing if spaced 24" OC or less and will increase the wall U-factor

Alteration
Nonresidential Wall Insulation

§141.0

Trigger

Making an existing wall made **accessible**, or **rebuilding** in the same exact location (and type) as a replaced wall

Wall Type	Altered Walls	
	Minimum Cavity Insulation R-Value	Maximum U-factor
Metal Building	R-13	0.113
Metal Framed	R-13	0.217
Spandrel Panels/Glass Curtain Walls	R-4	0.280
Wood framed and all others not listed*	R-11	0.110
Demising Walls for all Building Types		
Wood Framed	See U-factor	0.099
Metal Framed		0.151

Examples of assemblies that meet the U-factor of 0.151

- Metal Framed
  - 2 x 4 16” OC: R-13 + R-2
  - 2 x 6 16” OC: R-19 + R-2
  - 2 x 6 16” OC: R-19 + 2 layer 5/8” gypboard on BOTH sides of the wall (fire rated wall)

Check Your Understanding

Check Your Understanding #4

What do you think?

The alteration trigger for complying with roofing requirements include:

A. Replacing ≥50% or ≥2,000 ft² of roof over conditioned space

B. Recoating ≥50% or ≥2,000 ft² of roof over conditioned space

C. Recovering ≥50% or ≥2,000 ft² of roof over conditioned space

D. All of the above

Check Your Understanding #5

What do you think?

The alteration trigger for complying with roof insulation requirements include:

A. Replacing ≥50% or ≥2,000 ft² of roof over conditioned space

B. Recoating ≥50% or ≥2,000 ft² of roof over conditioned space

C. Recovering ≥50% or ≥2,000 ft² of roof over conditioned space

D. All of the above

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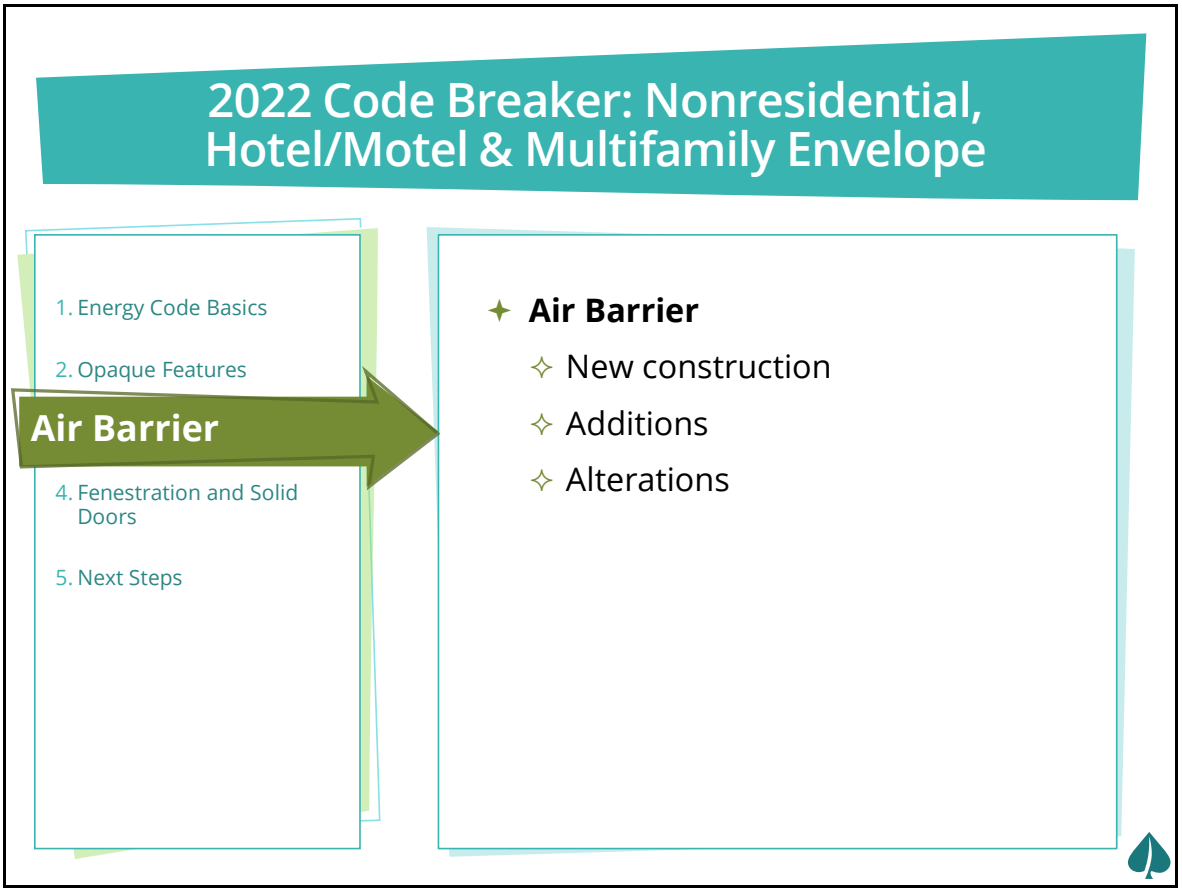
Air Barrier


2022 Code Breaker: Nonresidential, Hotel/Motel & Multifamily Envelope
1. Energy Code Basics
2. Opaque Features
Air Barrier
4. Fenestration and Solid Doors
5. Next Steps
Air Barrier
New construction
Additions
Alterations

New Construction & Additions
Air Barrier

§140.3
§141.0(a)

- Air barrier is now **Prescriptively required** in all climate zones (**except** in CZ 7 for Hotel/Motel guest rooms and any multifamily building)

Design	Acceptable Materials and Assemblies	Verification
Construction documents to include: - Air barrier boundaries - Interconnections and penetrations - Associated square foot calculations for all sides of barrier	**Entire length of air barrier shall be sealed at all joints and composed of:** - **Materials** with an air permeance **≤ 0.004 cfm/ft²**, under a pressure differential of 0.3 inches of water (see **Table 140.3-A** "Materials Deemed to Comply") **OR** - **Assemblies** of materials and components with an average air leakage **≤ 0.04 cfm/ft²**, under a pressure differential of 0.3 inches of water - **Exceptions** and **ASTM testing** procedures apply	**If chosen (NOT a requirement), then use one of the following:** - Tested per new **NA 5** to ensure air leakage is **≤ 0.40 cfm/ft²** - If air leakage is **> 0.40 cfm/ft²**, then visual inspection and diagnostic evaluation per **NA 2.4.7** can be used - Buildings **> 50,000 ft²** CFA can use sampling

Alteration
Nonresidential Air Barrier

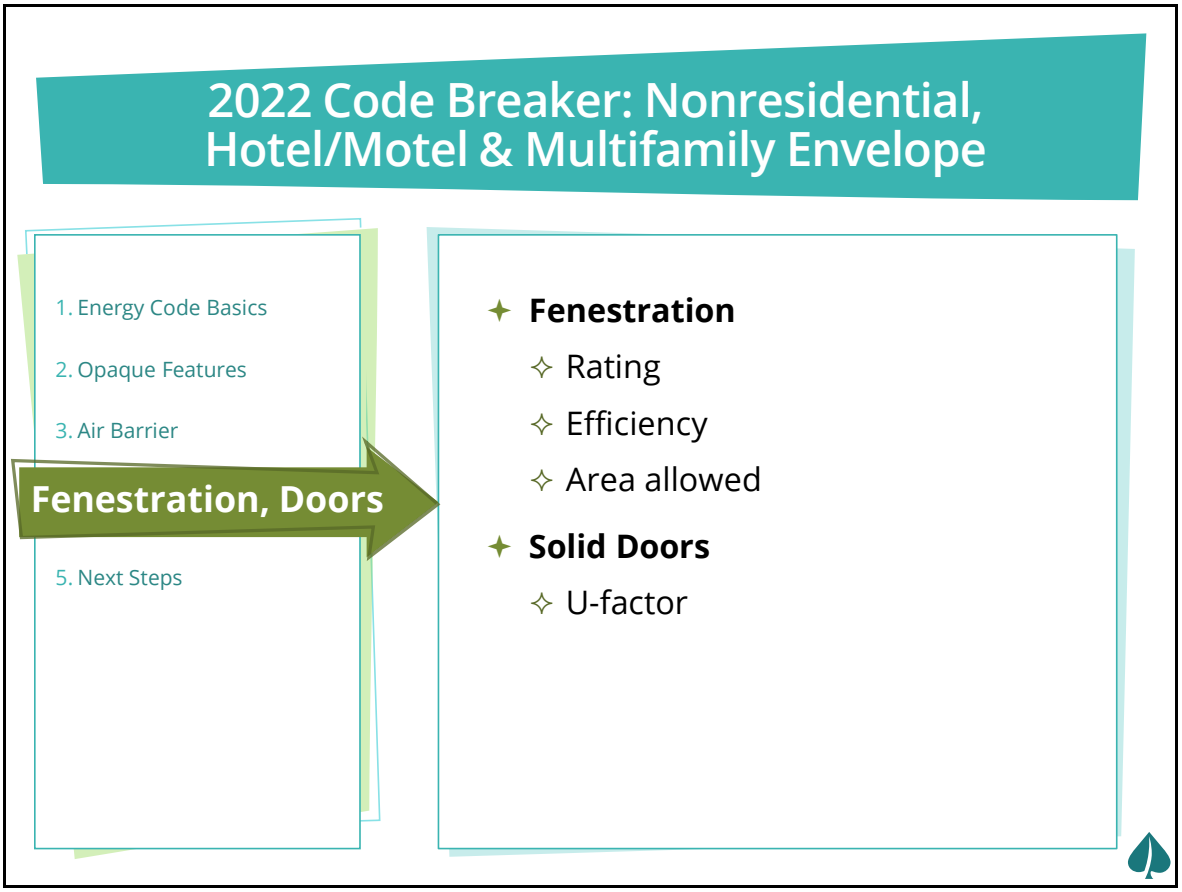
§141.0(b)2Q

Trigger

≥25% of existing exterior wall made **accessible**, or **rebuilding** in the same exact location (and type) as a replaced wall

- Verification Options for Alterations
  - Where the building is tested in accordance with the procedures for whole building air leakage in NA2.4 and the tested leakage rate exceeds 0.4 cfm/ft2 of building shell at 75 pa **OR**
  - A Visual Inspection and Diagnostic Evaluation shall be done in accordance with NA2.4.7 and **all observed leaks shall be sealed where such sealing can be made without destruction of existing building components.**

Fenestration & Doors



Prescriptive Requirements Fenestration

§140.3/170.2
§141.0/180.1/180.2

Nonresidential and Hotel/Motel Guest Rooms

- **New Construction & Additions**: Table 140.3-B
- **Alterations**:
  - Fenestration: Table 141.0-A

Multifamily

- **New Construction**: Table 170.2-A
- **Additions**: See §180.1(a)1
- **Alterations**:
  - Fenestration: Table 180.2-B

Fenestration Types

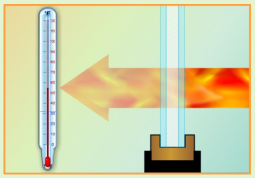
Manufactured Products	Site-built Products	Field-fabricated Products
Includes fenestration products constructed of materials that are factory cut or otherwise factory-formed.	Includes fenestration designed to be field-glazed or field assembled.	Includes fenestration that are fabricated at the building site from elements that are not sold together.
Applicable Methods	**Applicable Methods**	**Applicable Methods**
☒ NFRC-certified Products	☒ NFRC-certified Products	☐ NFRC-certified Products
☐ NFRC Component Modeling Approach (CMA)	☒ NFRC Component Modeling Approach (CMA)	☐ NFRC Component Modeling Approach (CMA)
☒ Tables 110.6-A & 110.6-B	☒ Tables 110.6-A & 110.6-B	☒ Tables 110.6-A & 110.6-B
☐ NA6 Calculation*	☒ NA6 Calculation*	☐ NA6 Calculation*

* Alternative Calculation NA6

- **NR & MF 4 stories or more:** Skylights < 200
- **MF 3 stories or less:** Site-built fenestration ≤ 250 ft² or 5% of CFA

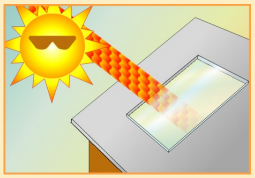
Fenestration Efficiency Measures

U-factor



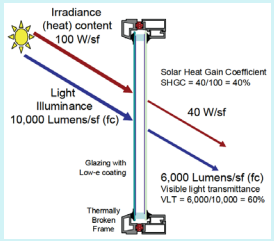
- **U-FACTOR** is the overall coefficient of thermal transmittance of a fenestration, in Btu/(hr × ft² × °F), including air film resistance at both surfaces. Typically affected by:
  - Number of panes
  - Film/coating
  - Frame type
  - Infill

SHGC



- **SOLAR HEAT GAIN COEFFICIENT (SHGC)** is the ratio of the solar heat gain entering the space through the fenestration area to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation, which is then reradiated, conducted, or convected into the space.

VT



- **VISIBLE TRANSMITTANCE (VT)** is the ratio (expressed as a decimal) of visible light that is transmitted through a glazing fenestration. The higher the VT rating, the more light is allowed through a window.

New Construction Nonresidential Fenestration

§140.3

Envelope	Fenestration				Climate Zone 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
					Fixed Window															
		Vertical	Area-weighted Performance Rating	Max U-factor	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.34	0.36	0.34	0.34	0.34	0.34	0.34	0.36
				Max RSHGC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.22	0.25	0.22	0.22	0.22	0.22	0.22	0.25
				Min VT	0.42															
					Curtainwall or Storefront															
				Max U-factor	0.38	0.41	0.41	0.41	0.41	0.41	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
				Max RSHGC	0.25	0.26	0.26	0.26	0.26	0.26	0.25	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
				Min VT	0.46															
					Operable Window															
				Max U-factor	0.46															
				Max RSHGC	0.22															
				Min VT	0.32															
					Glazed Doors															
				Max U-factor	0.45															
				Max RSHGC	0.23															
				Min VT	0.17															
			Max WWR%		40%															
					All Climate Zones															
		Skylights			Glass, Curb Mounted								Glass, Deck Mounted			Plastic, Curb Mounted			Tubular Daylighting Devices (TDDs)	
			Area-Weighted Performance Rating	Max U-factor	0.58								0.46			0.88			0.88	
				Max SHGC	0.25								0.25			NR			NR	
				Min VT (Min VT_{adjust} for TDDs)	0.49								0.49			0.64			0.38	
			Maximum SRR%		5%															

Examples of storefront U-factor=0.41 / RSHGC=0.26 / VT=0.46

- Dual paned thermally broken frame from using glass a product similar to Vitro Solarban 90 clear

Architectural Window (AW)

MF §170.2

- Rated according to North American Fenestration Standard/Specification for windows, doors and skylights (NAFS)
- Commonly used in high-rise and mid-rise buildings to meet increased loading requirements and limits on deflection, and in buildings where frequent and extreme use of the fenestration products is expected

New Construction Multifamily Fenestration

MF §170.2

Excerpt of Table 170.2-A: *Envelope Component Package – Multifamily Standard Building Design*

Multifamily		Climate Zone															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Curtain Wall/ Storefront ** (Product)	Maximum U-factor	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38
	Maximum RSHGC, three or less habitable stories	NR	0.26	NR	0.26	NR	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.26	NR
	Maximum RSHGC, four or more habitable stories	0.35	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.26	0.25
	Minimum VT, four or more habitable stories	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Perform-ance Class AW* (Floors)	Maximum U-factor	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
	Maximum RSHGC, three or less habitable stories	NR	0.24	NR	0.24	NR	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	NR
	Maximum RSHGC, four or more habitable stories	0.35	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
	Minimum VT, four or more habitable stories	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other Fenestra-tion***	Maximum U-factor	0.30	0.30	0.30	0.30	0.30	0.30	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
	Maximum RSHGC, three or less habitable stories	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
	Maximum RSHGC, four or more habitable stories	0.35	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23

*North American Fenestration Standard/Specification for an Architectural Window (AW)

Fenestration Area

NR§140.3
MF§170.2

- **Per Table 140.3 & Table 170.2-A, which outlines Prescriptive Nonresidential & Multifamily requirements respectively by climate zone:**
  - Fenestration area allowance based on both window to floor area and window to wall area ratios
  - Limit is the lower of the two areas

Excerpt of Table 170.2-A: *Envelope Component Package – Multifamily Standard Building Design*

Climate Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Maximum Ratio															
Maximum Window to Floor Ratio	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Maximum Window to Wall Ratio	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%

NR only uses Window to Floor Ratio **Table 140.3**

Alteration
Nonresidential Window

§141.0

Trigger Replacing framing and glazing; adding fenestration

Project Scope		Fenestration U-factor §110.6-8 §141.0(b)2A	Fenestration RSHGC §110.6-8 §141.0(b)2A	Fenestration VT §110.6-8 §141.0(b)2A	Fenestration Area* §110.6-8 §141.0(b)2A
		When associated with conditioned spaces			
Skylights	Altering ≤ 50 ft²	**Yes – Alteration Rules**	No	No	No
	Altering > 50 ft²	**Yes – Alteration Rules**	**Yes – New Construction**	**Yes – New Construction**	No
	Adding ≤ 50 ft²	**Yes – Alteration Rules**	No	No	**Yes – New Construction**
	Adding > 50 ft²	**Yes – New Construction**	**Yes – New Construction**	**Yes – New Construction**	**Yes – New Construction**
Vertical Fenestration	Altering ≤ 150 ft²	**Yes – Alteration Rules**	No	No	No
	Altering > 150 ft²	**Yes – New Construction**	**Yes – New Construction**	**Yes – New Construction**	No
	Adding ≤ 50 ft²	**Yes – Alteration Rules**	No	No	**Yes – New Construction**
	Adding > 50 ft²	**Yes – New Construction**	**Yes – New Construction**	**Yes – New Construction**	**Yes – New Construction**

Alteration Rules	CZ 1, 16	CZ 3, 5	CZ 2, 4, 6-15
U-factor	0.47	0.58	0.47
RSHGC	0.41	0.41	0.31
VT	Use Table 140.3-B or C		

Examples of storefront U-factor=0.58 / RSHGC=0.41 / VT=0.46

- Dual paned metal frame from using glass a product similar to Vitro Solarban 60 clear

Opaque Exterior Doors

NR§140.3
MF§170.2

Excerpt of Table 170.2-A: *Envelope Component Package – Multifamily Standard Building Design*

Climate Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Maximum U-factor															
Dwelling Unit Entry	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Common Use Area Entry Non-swinging	0.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.50
Common Use Area Entry Swinging	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70

Door type

Common use U-factors are the same for **Table 140.3 (NR)**

- Type of door dictates required maximum U-factor
  - For example: entry doors are R-5 insulated with a U-factor of 0.20
  - Solid wood doors: U-factor of 0.50
  - Metal doors: U-factor of 0.70

Check Your Understanding

Check Your Understanding #6

What do you think?

When replacing a site-built window, which efficiency methods can be used?

A. NFRC-certified Products

B. NFRC Component Modeling Approach (CMA)

C. Default Tables 110.6-A & 110.6-B

D. NA6 Calculation

E. All of the above

Check Your Understanding #7

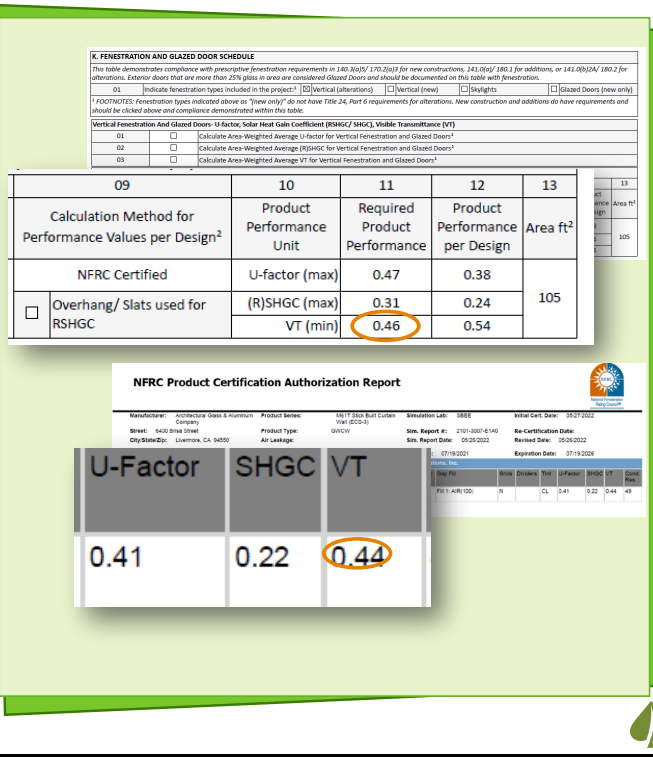
What do you think?

Window replacement NRCC-ENV-E (on right), and NFRC certificate on bottom. Which statement is the most accurate?

A. Proposed product is exactly what was designed

B. Proposed product is equal or better than required

C. Proposed product is not equal or better hence compliance not support



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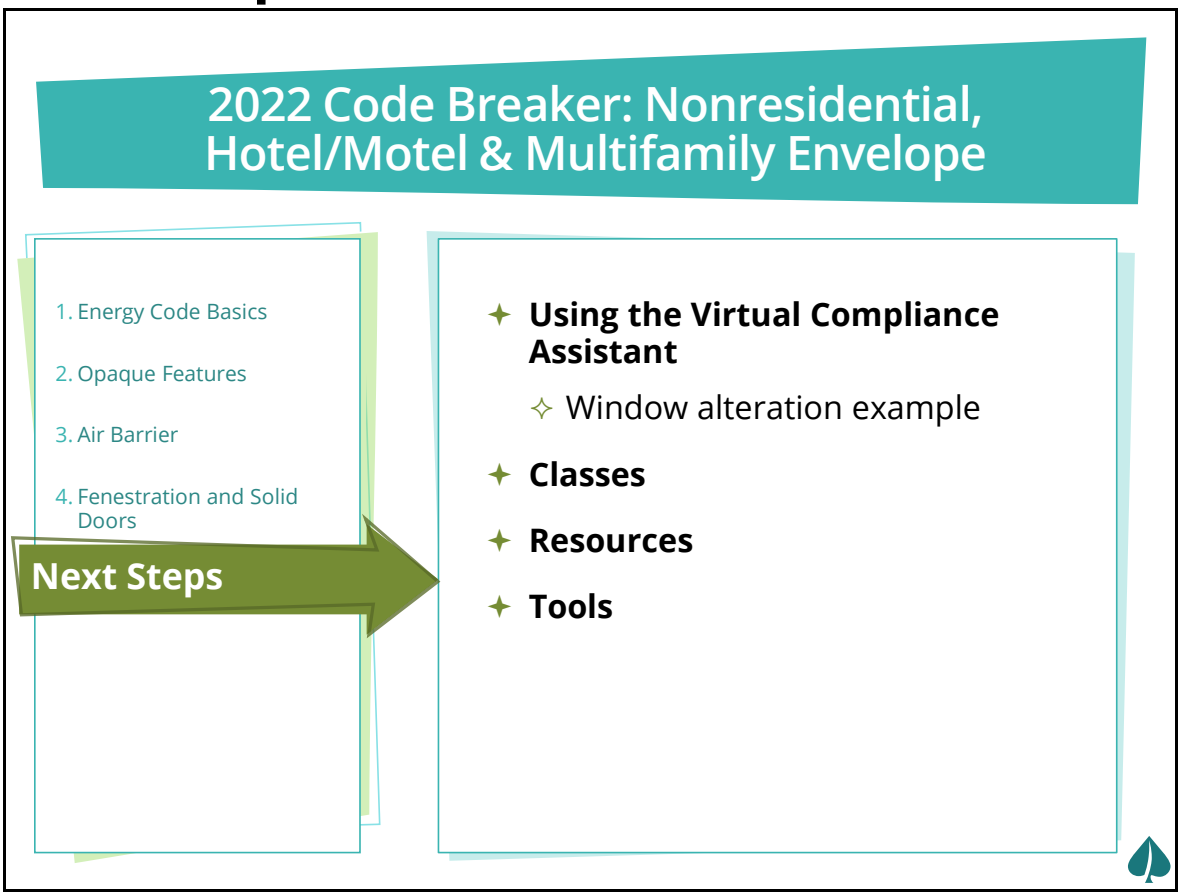
Next Steps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3. Air Barrier
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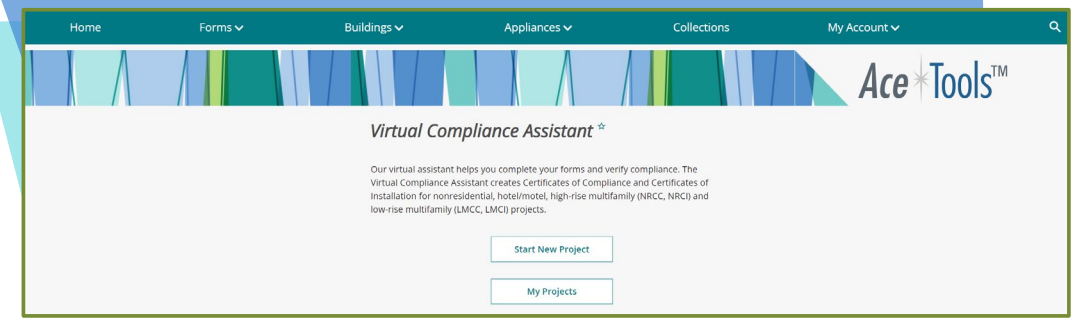
Next Steps
Using the Virtual Compliance Assistant
Window alteration example
Classes
Resources
Tools

VCA and the NRCI/LMCI



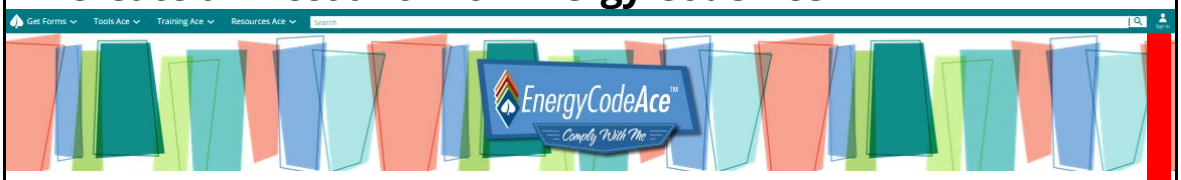
The VCA will automatically populate your Certificates of Installation (NRCI or LMCI) forms for Nonresidential and Multifamily projects using the permitted data collected from the Certificate of Compliance (NRCC or LMCC) forms.

- If you need to make substitutions, the VCA will verify if the substitution complies with Title 24, Part 6
- If the substitution doesn't comply, the VCA will tell you why and provides next steps in showing compliance

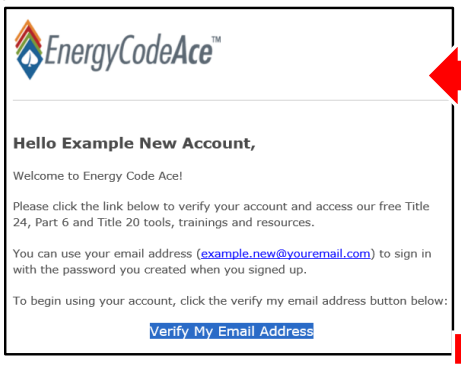
TIP

In order to automatically populate your NRCI and LMCI and verify compliance, the permit applicant must complete the project's Certificate of Compliance (NRCC or LMCC) using the VCA or EnergyPro

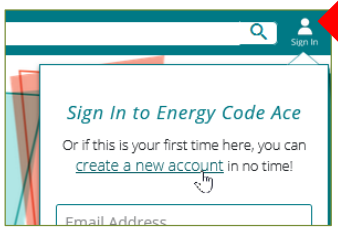
Create an Account with Energy Code Ace

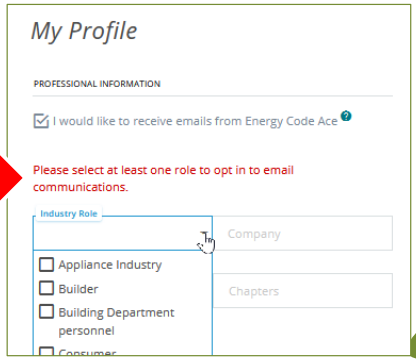


2 Look for email from admin@energycodeace.com to verify your email address



1 Create an account





3 Be sure to select at least one Role under "Professional Information"

Walk-Through Example – Window Alteration

Step 1

Gather the Appropriate Material

Installed material(s):

- Receipts
- Packing slips
- Submittals
- Anything supporting what was installed at that address

NRCC or LMCC submitted for permit

- Included in permitted design documents

Step 2

Sign on to Energy Code Ace's Virtual Compliance Assistant

NRCC or LMCC submitted for permit

- Use the "Compliance ID" to auto populate application NRCI/LMCI

If "Compliance ID" not available

- Auto populate function will not work and user to populate required features

Step 3

Confirm, Print, Sign, Leave On-Site

Confirm

- Compliance supported with installed features

Print & Sign

- Print once complete
- Populate project address, authors information (not populated by VCA)

Leave On-Site

- Make accessible to Building Inspector and provide to Building Owner

NRCI/LMCI to be completed by installing contractor, or General Contractor, and left on-site before final inspection

Walk-Through Example – Window Alteration

Step 1

Gather the Appropriate Material

Installed material(s):

- Receipts
- Packing slips
- Submittals
- Anything supporting what was installed at that address

NRCC or LMCC submitted for permit

- Included in permitted design documents

Replace 105 ft² of existing storefront with new product which will be NFRC certified using U-factor of 0.38, SHGC of 0.24 and VT of 0.54.

NRCA-ENV-02-E will be required to support NFRC certificate requirements.

Walk-Through Example – Window Alteration

Step 1

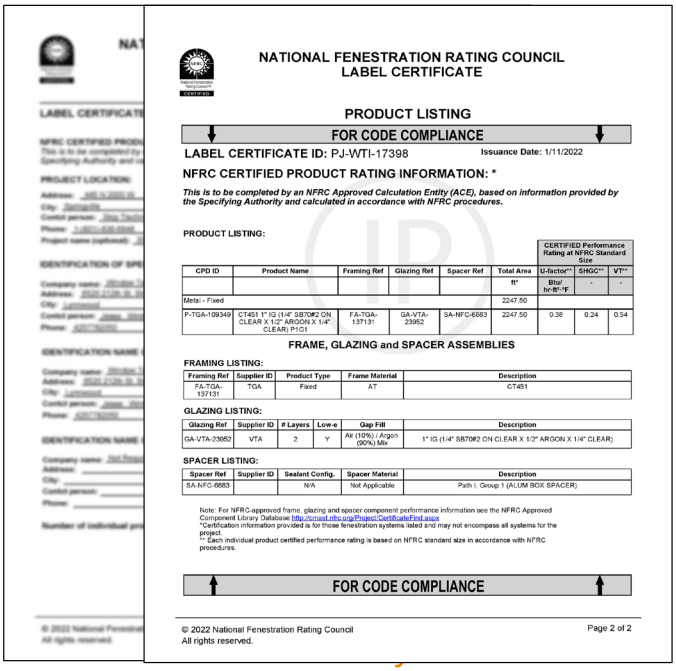
Gather the Appropriate Material

Installed material(s):

- Receipts
- Packing slips
- Submittals
- Anything supporting what was installed at that address

NRCC or LMCC submitted for permit

- Included in permitted design documents



NATIONAL FENESTRATION RATING COUNCIL
LABEL CERTIFICATE

PRODUCT LISTING

FOR CODE COMPLIANCE

LABEL CERTIFICATE ID: PJ-WTI-17398 Issuance Date: 1/11/2022

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 - Fixed					2247.50			
P-TGA-109349	CT451 1" IG (1/4" SB70#2 ON CLEAR X 1/2" ARGON X 1/4" CLEAR) P1G1	FA-TGA-137131	GA-VTA-23952	SA-NFC-6883	2247.50	0.38	0.24	0.54

FRAME, GLAZING and SPACER ASSEMBLIES

FRAMING LISTING:

Framing Ref	Supplier ID	Product Type	Frame Material	Description
FA-TGA-137131	TGA	Fixed	AT	CT451

GLAZING LISTING:

Glazing Ref	Supplier ID	# Layers	Low-e	Gap Fill	Description
GA-VTA-23952	VTA	2	Y	Air (10%) / Argon (90%) Mix	1" IG (1/4" SB70#2 ON CLEAR X 1/2" ARGON X 1/4" CLEAR)

SPACER LISTING:

Spacer Ref	Supplier ID	Sealant Config.	Spacer Material	Description
SA-NFC-6883		N/A	Not Applicable	Path I, Group 1 (ALUM BOX SPACER)

Note: For NFRC-approved frame, glazing and spacer component performance information see the NFRC Approved Component Library Database http://cmast.nfrc.org/Project/CertificateFind.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

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Page 2 of 2

NRCA-ENV-02-E will be required to support NFRC certificate requirements.

Walk-Through Example – Window Alteration

Step 1

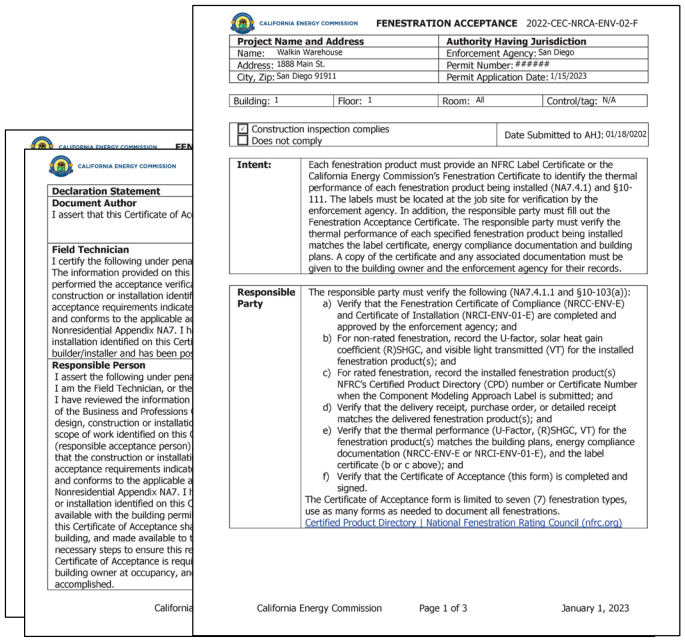
Gather the Appropriate Material

Installed material(s):

- Receipts
- Packing slips
- Submittals
- Anything supporting what was installed at that address

NRCC or LMCC submitted for permit

- Included in permitted design documents



CALIFORNIA ENERGY COMMISSION FENESTRATION ACCEPTANCE 2022-CEC-NRCA-ENV-02-F

Project Name and Address	Authority Having Jurisdiction
Name: Walkin Warehouse	Enforcement Agency: San Diego
Address: 1888 Main St.	Permit Number: ######
City, Zip: San Diego 91911	Permit Application Date: 1/15/2023

Building: 1	Floor: 1	Room: All	Control/tag: N/A

☑ Construction inspection complies
☐ Does not comply

Date Submitted to AHJ: 01/18/0202

Intent: Each fenestration product must provide an NFRC Label Certificate or the California Energy Commission's Fenestration Certificate to identify the thermal performance of each fenestration product being installed (NA7.4.1) and §10-111. The labels must be located at the job site for verification by the enforcement agency. In addition, the responsible party must fill out the Fenestration Acceptance Certificate. The responsible party must verify the thermal performance of each specified fenestration product being installed matches the label certificate, energy compliance documentation and building plans. A copy of the certificate and any associated documentation must be given to the building owner and the enforcement agency for their records.

Responsible Party The responsible party must verify the following (NA7.4.1.1 and §10-103(a)):

a) Verify that the Fenestration Certificate of Compliance (NRCC-ENV-E) and Certificate of Installation (NRCI-ENV-01-E) are completed and approved by the enforcement agency; and
b) For non-rated fenestration, record the U-factor, solar heat gain coefficient (R)SHGC, and visible light transmitted (VT) for the installed fenestration product(s); and
c) For rated fenestration, record the installed fenestration product(s) NFRC's Certified Product Directory (CPD) number or Certificate Number when the Component Modeling Approach Label is submitted; and
d) Verify that the delivery receipt, purchase order, or detailed receipt matches the delivered fenestration product(s); and
e) Verify that the thermal performance (U-Factor, (R)SHGC, VT) for the fenestration product(s) matches the building plans, energy compliance documentation (NRCC-ENV-E or NRCI-ENV-01-E), and the label certificate (b or c above); and
f) Verify that the Certificate of Acceptance (this form) is completed and signed.

The Certificate of Acceptance form is limited to seven (7) fenestration types, use as many forms as needed to document all fenestrations.
Certified Product Directory | National Fenestration Rating Council (nfrc.org)

California Energy Commission Page 1 of 3 January 1, 2023

Walk-Through Example – Window Alteration

Step 1

Gather the Appropriate Material

Installed material(s):

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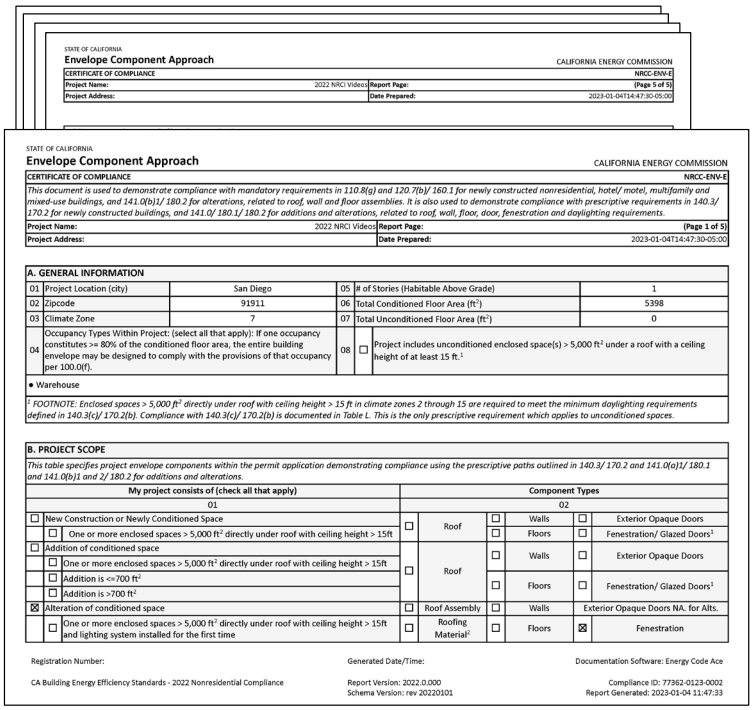
NRCC or LMCC submitted for permit

- Included in permitted design documents



STATE OF CALIFORNIA
Envelope Component Approach — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-ENV-E
Project Name:	2022 NRCI Videos	Report Page:	(Page 1 of 5)
Project Address:		Date Prepared:	2023-01-04T14:47:30-05:00

This document is used to demonstrate compliance with mandatory requirements in 110.8(g) and 120.7(b)/ 160.1 for newly constructed nonresidential, hotel/ motel, multifamily and mixed-use buildings, and 141.0(b)1/ 180.2 for alterations, related to roof, wall and floor assemblies. It is also used to demonstrate compliance with prescriptive requirements in 140.3/ 170.2 for newly constructed buildings, and 141.0/ 180.1/ 180.2 for additions and alterations, related to roof, wall, floor, door, fenestration and daylighting requirements.

A. GENERAL INFORMATION

01	Project Location (city)	San Diego	05	# of Stories (Habitable Above Grade)	1
02	Zipcode	91911	06	Total Conditioned Floor Area (ft²)	5398
03	Climate Zone	7	07	Total Unconditioned Floor Area (ft²)	0
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) > 5,000 ft² under a roof with a ceiling height of at least 15 ft.[1]	

• Warehouse

[1] *FOOTNOTE: Enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15 ft in climate zones 2 through 15 are required to meet the minimum daylighting requirements defined in 140.3(c)/ 170.2(b). Compliance with 140.3(c)/ 170.2(b) is documented in Table L. This is the only prescriptive requirement which applies to unconditioned spaces.*

B. PROJECT SCOPE

This table specifies project envelope components within the permit application demonstrating compliance using the prescriptive paths outlined in 140.3/ 170.2 and 141.0(a)1/ 180.1 and 141.0(b)1 and 2/ 180.2 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 Opaque Doors
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft			☐	Floors	☐	Fenestration/ Glazed Doors[1]
☐ Addition of conditioned space	☐	Roof	☐	Walls	☐	Exterior Opaque Doors
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft						
☐ Addition is <=700 ft²			☐	Floors	☐	Fenestration/ Glazed Doors[1]
☐ Addition is >700 ft²						
☒ Alteration of conditioned space	☐	Roof Assembly	☐	Walls		Exterior Opaque 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[2]	☐	Floors	☒	Fenestration

Registration Number:
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220101
Documentation Software: Energy Code Ace
Compliance ID: 77362-0123-0002
Report Generated: 2023-01-04 11:47:33

Walk-Through Example – Window Alteration

Step 2

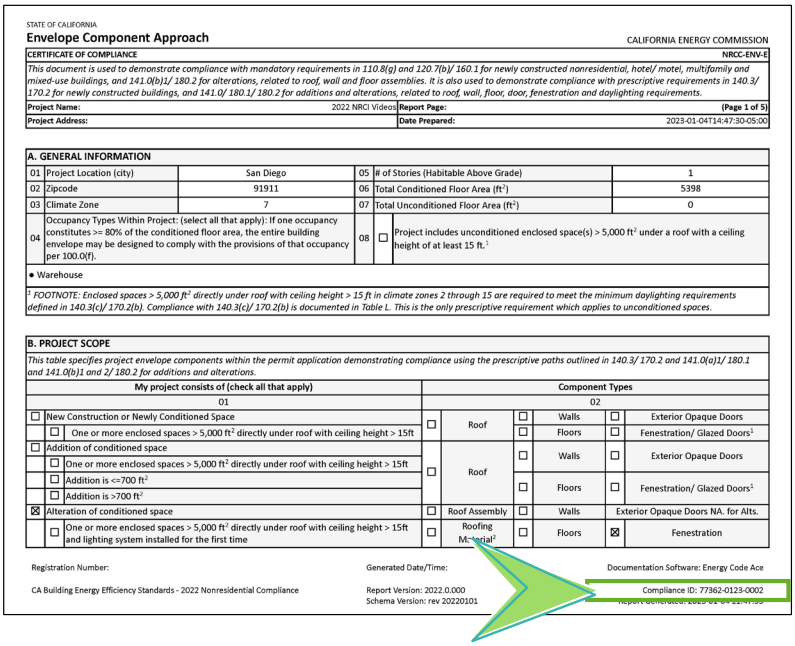
Sign on to Energy Code Ace's Virtual Compliance Assistant

NRCC or LMCC submitted for permit

- Use the "Compliance ID" to auto populate application NRCI/LMCI

If "Compliance ID" not available

- Auto populate function will not work and user to populate required features



STATE OF CALIFORNIA
Envelope Component Approach — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-ENV-E
Project Name:	2022 NRCI Videos	Report Page:	(Page 1 of 5)
Project Address:		Date Prepared:	2023-01-04T14:47:30-05:00

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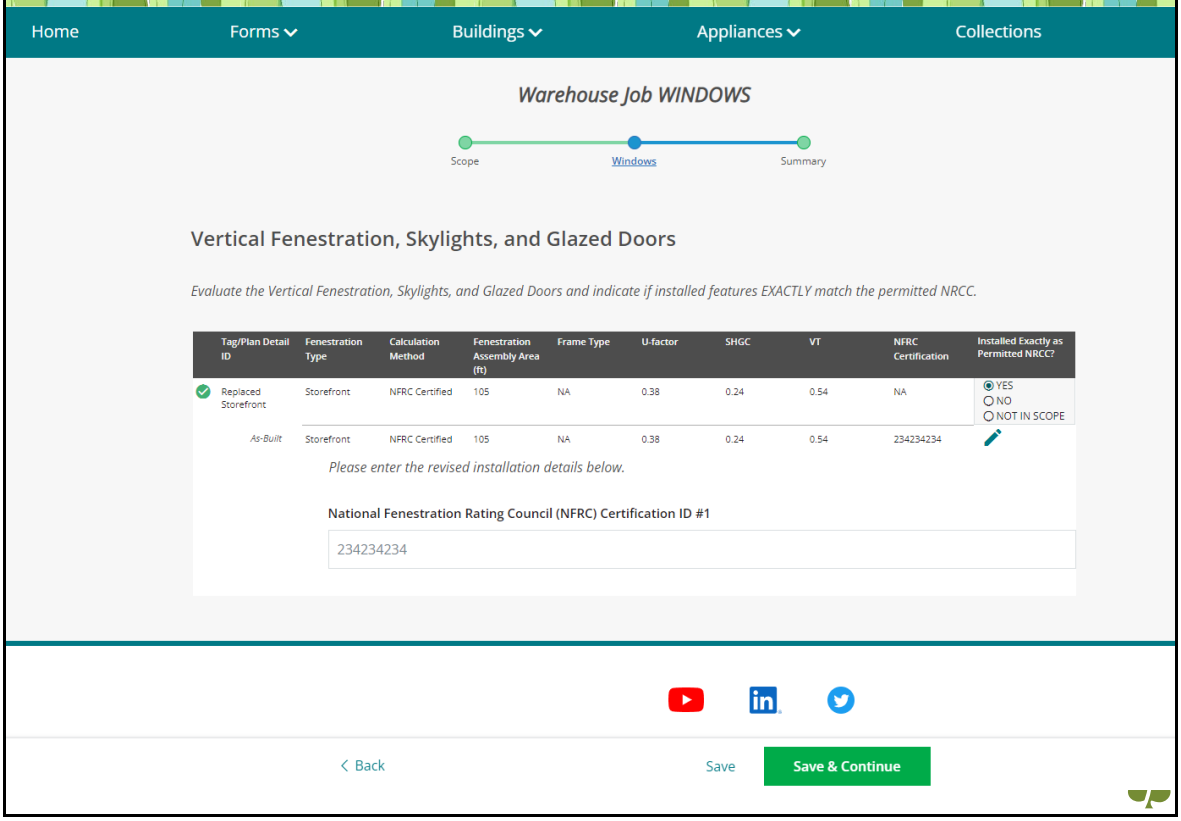
01	02							
☐ New Construction or Newly Conditioned Space	☐	Roof	☐	Walls	☐	Exterior Opaque Doors
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft			☐	Floors	☐	Fenestration/ Glazed Doors[1]
☐ Addition of conditioned space	☐	Roof	☐	Walls	☐	Exterior Opaque Doors
☐ One or more enclosed spaces > 5,000 ft² directly under roof with ceiling height > 15ft						
☐ Addition is <=700 ft²			☐	Floors	☐	Fenestration/ Glazed Doors[1]
☐ Addition is >700 ft²						
☒ Alteration of conditioned space	☐	Roof Assembly	☐	Walls		Exterior Opaque 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[2]	☐	Floors	☒	Fenestration

Registration Number:
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220101
Documentation Software: Energy Code Ace
Compliance ID: 77362-0123-0002

Walk-Through Example – Window Alteration



Walk-Through Example – Window Alteration

Step 3

Confirm, Print, Sign, Leave On-Site

Confirm

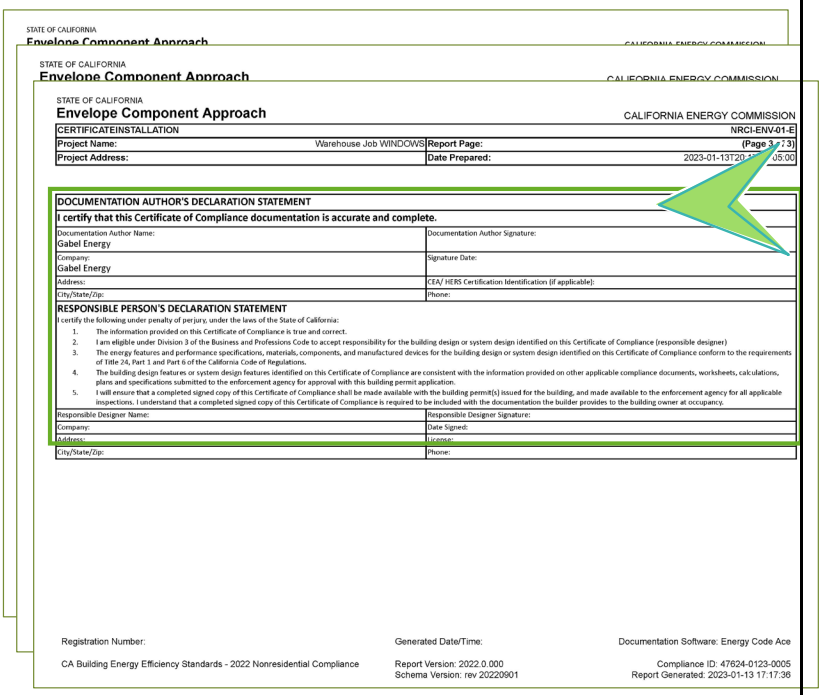
- Compliance supported with installed features

Print & Sign

- Print once complete
- Populate project address, authors information (not populated by VCA)

Leave On-Site

- Make accessible to Building Inspector and provide to Building Owner


STATE OF CALIFORNIA
Envelope Component Approach
CALIFORNIA ENERGY COMMISSION

CERTIFICATEINSTALLATION			NRCI-ENV-01-E
Project Name:	Warehouse Job WINDOWS	Report Page:	(Page 3 of 3)
Project Address:		Date Prepared:	2023-01-13T20:[illegible]:05:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name:	Documentation Author Signature:
Gabel Energy	
Company: Gabel Energy	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be 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 completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

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

Registration Number:
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance

Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220901

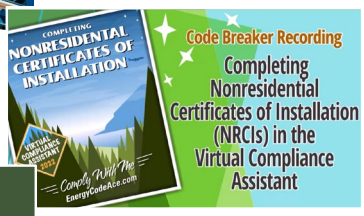
Documentation Software: Energy Code Ace
Compliance ID: 47624-0123-0005
Report Generated: 2023-01-13 17:17:36

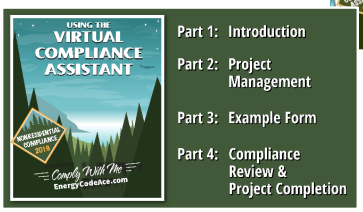
Courses

What's New in 2022 Residential Energy Code
Online Live Event

What's New in 2022 Nonres Energy Code
Online Live Event

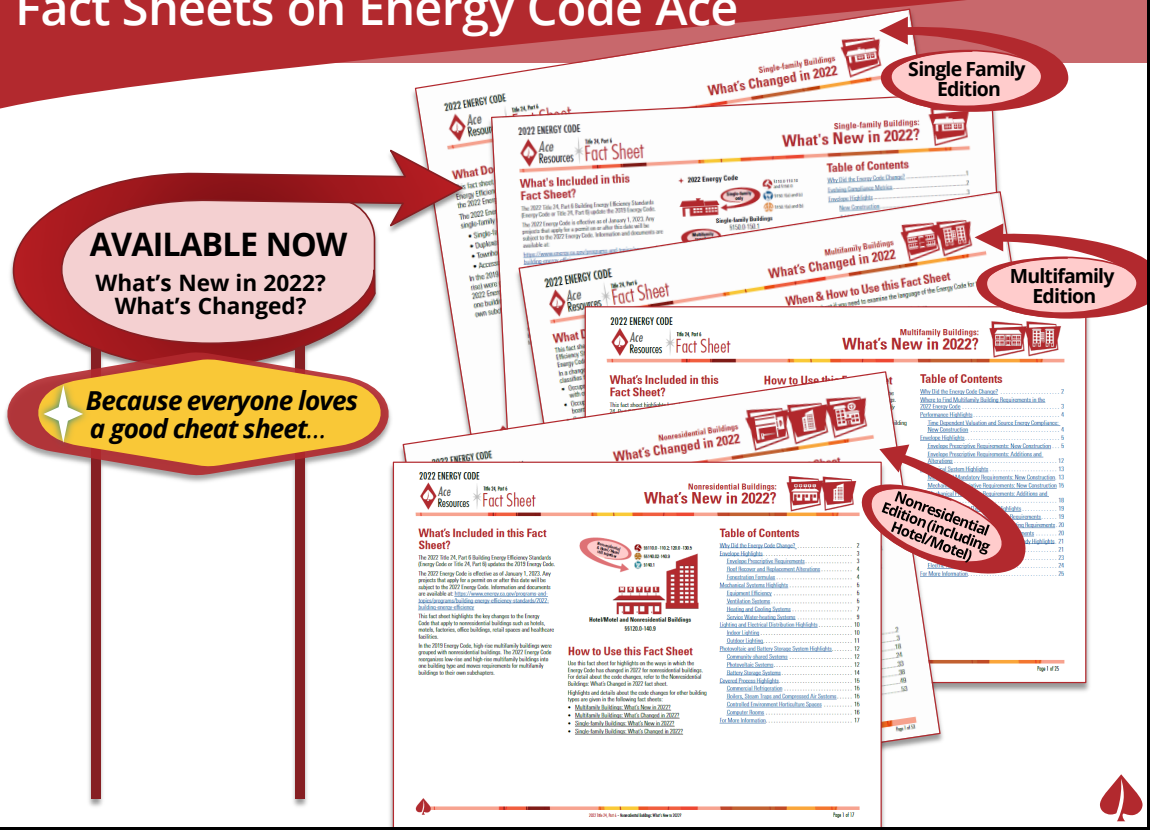
2022 Code Breaker: Completing NRCIs in the VCA
You Tube Video





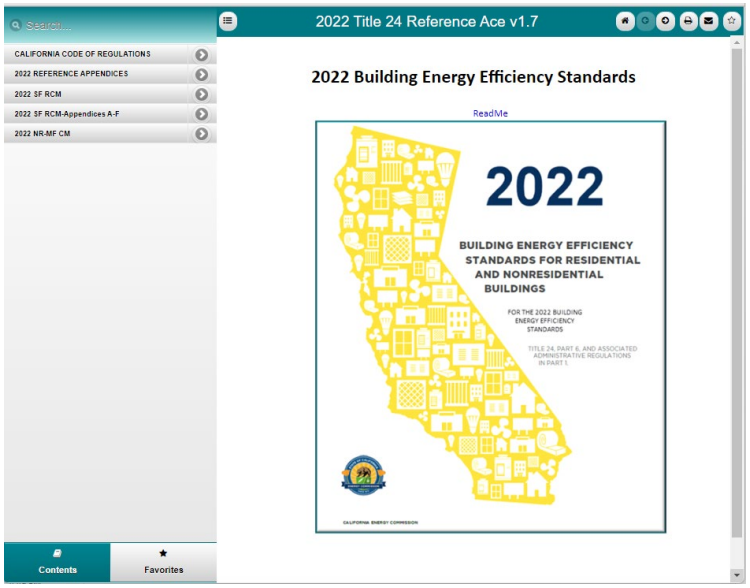
2019 Nonresidential Compliance: Using the Virtual Compliance Assistant
You Tube Video Series

Fact Sheets on Energy Code Ace

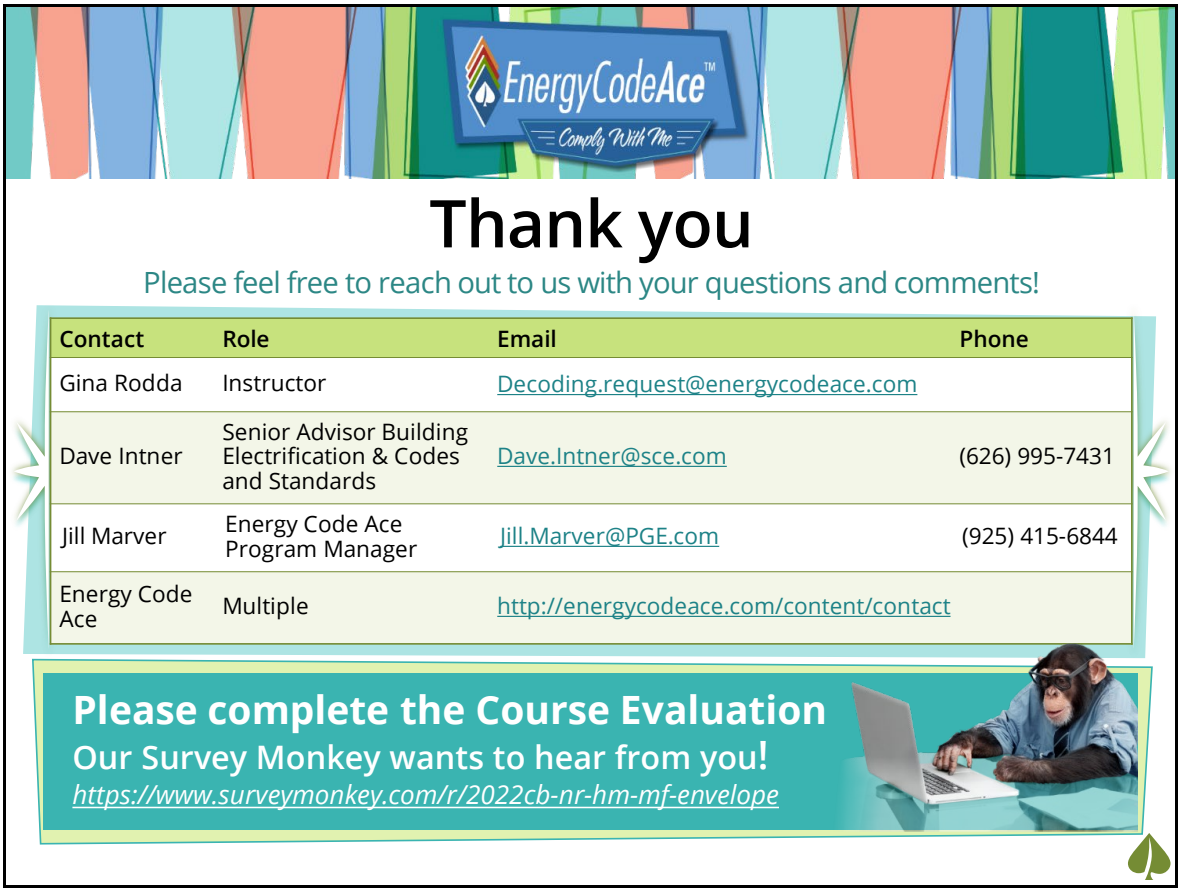


Reference Ace

- 2022 Reference Ace



Contact Information & Evaluation



Please complete our course evaluation: https://www.surveymonkey.com/r/2022cb-nr-hm-mf-envelope

This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company (SCE) under the auspices of the California Public Utilities Commission.

This concludes the American Institute of Architects Continuing Education Systems Course

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