

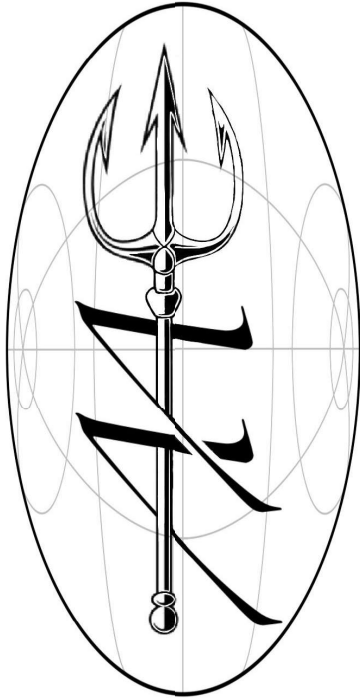
2022

CODE BREAKER

Accessory Dwelling Units
(ADUs)

Solving the Energy Code Puzzle One Piece at a Time

Bruce Cheney
Anchors Aweigh Energy LLC
Energy Code Ace Instructor



Continuing Education Information

AIA Provider ID: 40410982

AIA Course Number: 22 CB ADU

ICC Provider ID: 1534

ICC Course Number: 35313

Learning Objectives

- ★ Establish if an ADU design is considered an alteration, addition, or a new residential building per the Energy Code.
- ★ Discuss the envelope (roof, walls, floors, fenestration) requirements associated with the ADU type (alteration, addition, new construction) under the 2022 Energy Code.
- ★ Recognize the renewable energy requirements of ADU type including photovoltaics (PV), battery storage, and battery ready.
- ★ Determine mechanical equipment requirements, including any HERS verification measure options that provide ADU design flexibility, and how utility source energy metric may impact those choices.



Course Conventions

Mandatory



- ★ Always required regardless of compliance approach used

Prescriptive



- ★ Required when using the Prescriptive compliance approach

Performance

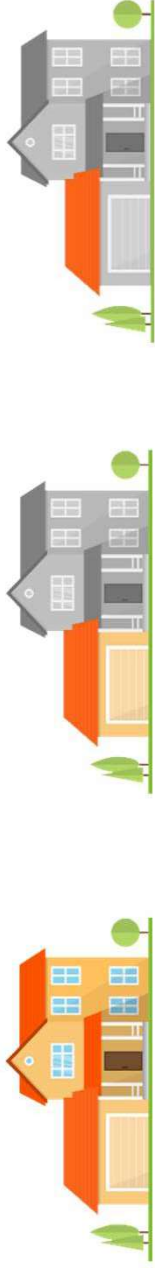


- ★ Optional feature accounted for when doing Performance-based computer modeling

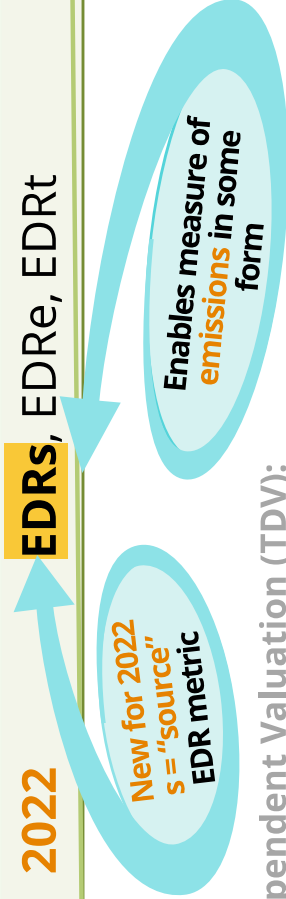


Evolving Building Energy Efficiency Ratings

For Residential Construction



Energy Code	New Construction	Additions	Alterations
2016	TDV	TDV	TDV
2019	EDRe, EDRT	TDV	TDV
2022	EDRs, EDRe, EDRT	TDV	TDV



Time Dependent Valuation (TDV):

“TDV Energy” is the time varying energy used by the building to provide space conditioning, water heating and specified building lighting. It accounts for the energy used at the building site and consumed in producing and delivering energy to a site, including, but not limited to, power generation, transmission and distribution losses.

Energy Design Rating (EDR):

An alternate way to express the energy performance of a home using a scoring system where 100 represents the energy performance of a reference design building meeting the envelope requirements of the 2006 International Energy Conservation Code (IECC). A score of 0 represents the energy consumption of a building that has zero net energy consumption. The lower the score, the better.

Source Energy Design Rating (EDRs) (new!):

A separate EDR metric based on “hourly source energy,” which establishes a “carbon-proxy” analysis of the building in kBtu/sf-yr units to support decarbonization and electrification policy goals.



EDR for “New” ADUs



Source EDR

a score representing building energy expressed in hourly source-based

- Includes energy
- ★ Envelope
- ★ IAQ
- ★ HVAC
- ★ DHW
- ★ Unregulated

Efficiency EDR

Total EDR

Compliance Summary		CO2 Emissions	Energy Design Rating		Energy Use Details		CO2 Details	
		Energy Design Ratings:			Compliance Margins:			
		Source (EDR1)	Efficiency ¹ (EDR2)	Total ² (EDR2)	Source (EDR1)	Efficiency ¹ (EDR2)	Total ² (EDR2)	
Standard Design		53.2	53.4	36.2	4.3	1.6	2.5	
Proposed Design		48.9	51.8	33.7				

Result*: **COMPLIES**
(not current)

All three ratings show better (lower) rating for Proposed than Standard

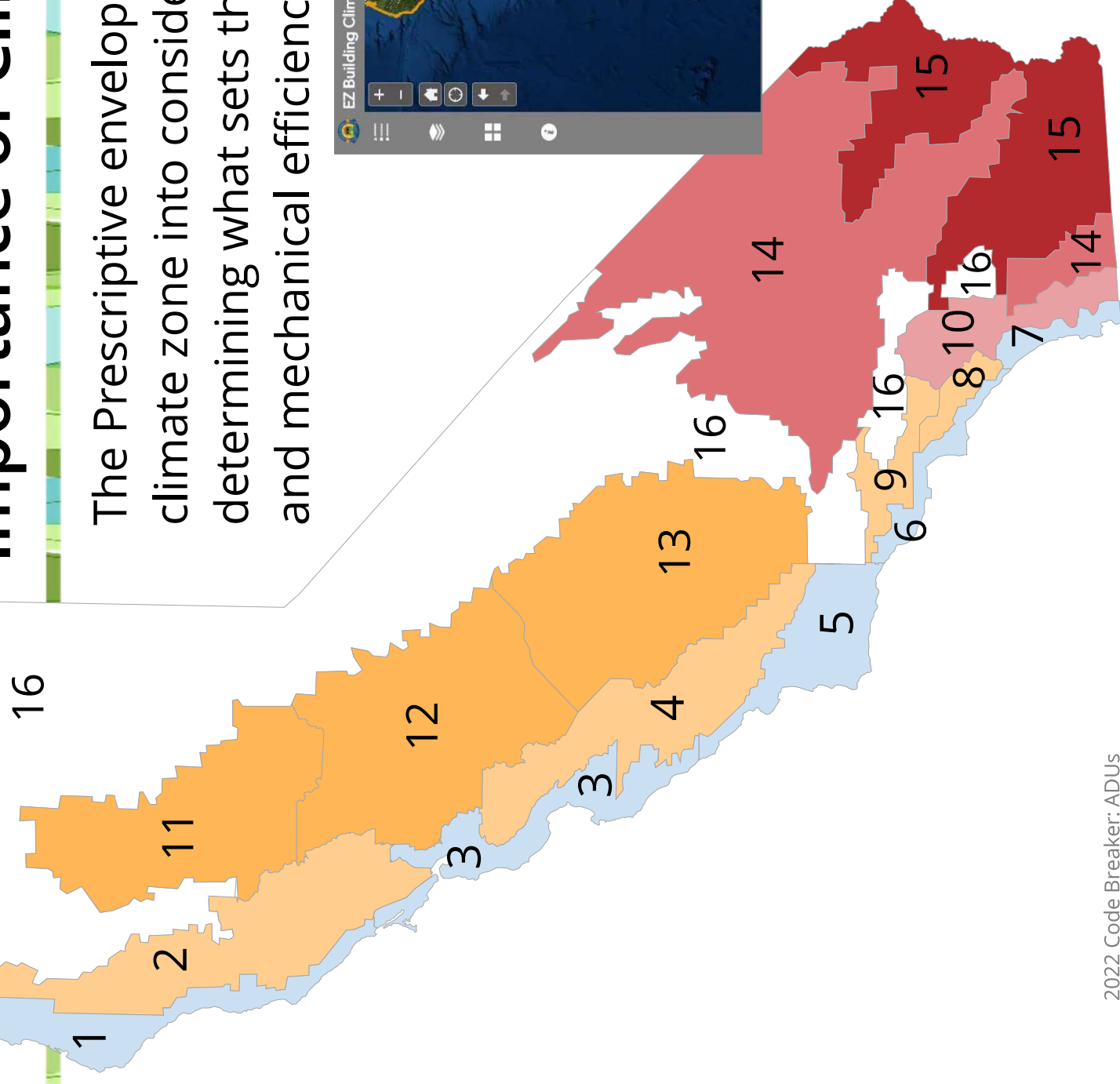
All three compliance margins (deltas) show zero or positive values

¹ Efficiency measures include improvements like a better building envelope and more efficient equipment
² Total EDR includes efficiency, photovoltaics and batteries
³ Building complies when all source, efficiency and total margins are greater than or equal to zero
Standard Design PV Capacity: 2.70 kWdc

A building complies ONLY if **all three** compliance scores are met (each Proposed Design score is **lower or equal** to Standard Design score)

Importance of Climate Zones

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



2022 ADU Factsheet

2022 ENERGY CODE



Title 24, Part 6

Single-family Buildings: Accessory Dwelling Units



What Are the Residential Accessory Dwelling Unit (ADU) Requirements?

The 2022 California Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) includes requirements for single family and multifamily accessory dwellings units (ADUs).

An ADU is accessory to a primary residence and has complete independent living facilities for one or more persons. It is supported in the Energy Code as a "single-family" project when the ADU is associated with a single-family occupancy, and multifamily when associated with a multifamily occupancy. This fact sheet will concentrate on single-family ADU types.

Single Family: A residential building of Occupancy Group R-3 with two or less dwelling units; a building of Occupancy Group R-3 other than a multifamily building or hotel/motel building; a townhouse; a building of Occupancy Group R-3.1; or a building of Occupancy Group U when located on a residential site.

How Does this Fact Sheet Apply to Your Project?

ADU Energy Code requirements differ depending upon the ADU type. Use this fact sheet to determine your ADU type and the Energy Code compliance options and requirements applicable to that ADU type. This includes requirements for envelope, mechanical, renewables and electric readiness.

Importance of Compliance

California continues to encourage and support ADUs through the legislative process via Assembly and Senate bills, in addition to recent changes in the Government Code §65852.150. Complying with the building codes assures health, safety and cost-effective energy efficiency measures, many of which aim to reduce California's greenhouse gas emissions.

It is important to confirm the ADU development and design standards of the local jurisdiction because each jurisdiction determines how compliance to California legislation supporting ADU construction impacts the local concerns such as parking, height and setback.

California Department of Housing and Community Development

To learn more about ADU laws and requirements, see the California Department of Housing and Community Development (HCD) website. The HCD maintains the Accessory Dwelling Unit Handbook and other useful information on the HCD website at <https://www.hcd.ca.gov/policy-and-research/accessory-dwelling-units>

Table of Contents

System Components and Key Terms	2
Compliance Requirements	3
Alteration ADU Type	4
Addition ADU Type	8
New Construction ADU Type	12
For More Information	18



2022 Title 24, Part 6 Single-family Buildings: Accessory Dwelling Units

Page 1 of 18
2022-01-20



Code Breaker: Accessory Dwelling Units (ADU)

1. ADU Challenges

2. ADU Types

3. Envelope

4. Renewables

5. Mechanical

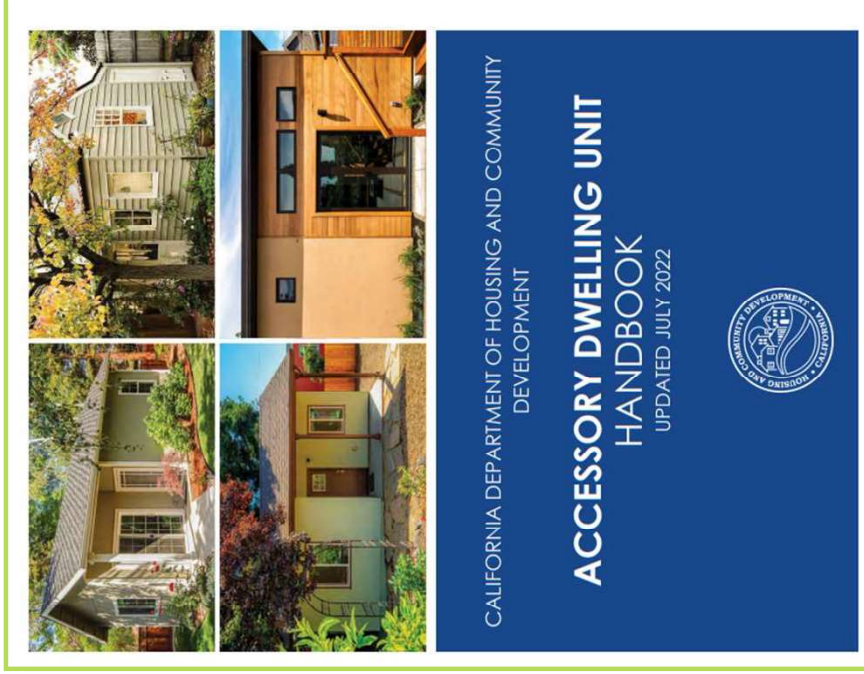
6. Next Steps

◆ **ADU Challenges**

- ◆ What is an ADU?
- ◆ Design and logistic concerns



What is an ADU?



- ✦ Often called in-law apartments or garage flats, an accessory dwelling unit (ADU) is a separate and complete dwelling unit (e.g., kitchen, sleeping area and bathrooms) that is either attached or detached from the primary residential unit on a single-family lot.

- ✦ California has changed state law to help eliminate barriers to ADU construction, and each local government can adopt these state bills (or not).

<https://www.hcd.ca.gov/policy-and-research/accessory-dwelling-units>

- ✦ CAL FIRE has provided new guidance for fire sprinkler requirements of ADUs.

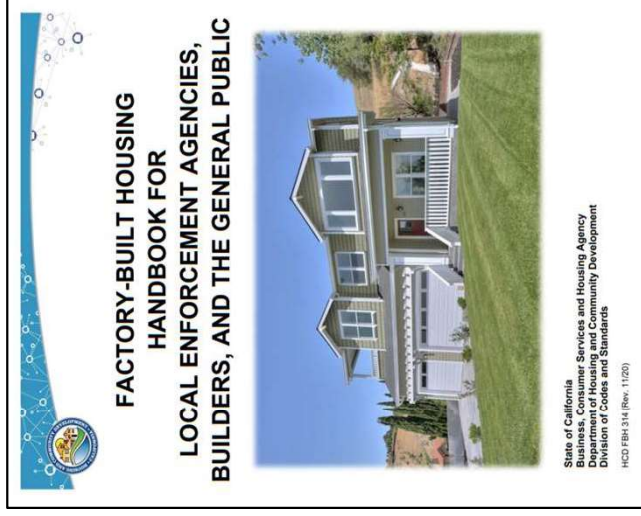
<https://osfm.fire.ca.gov/media/q1xg3mu/d/ib-accessory-dwelling-units-final.pdf>



Factory Built ADUs

Typically considered a New Construction ADU type, these are factory-constructed versions of site built ADUs that are manufactured and then transported to their permanent installation locations.

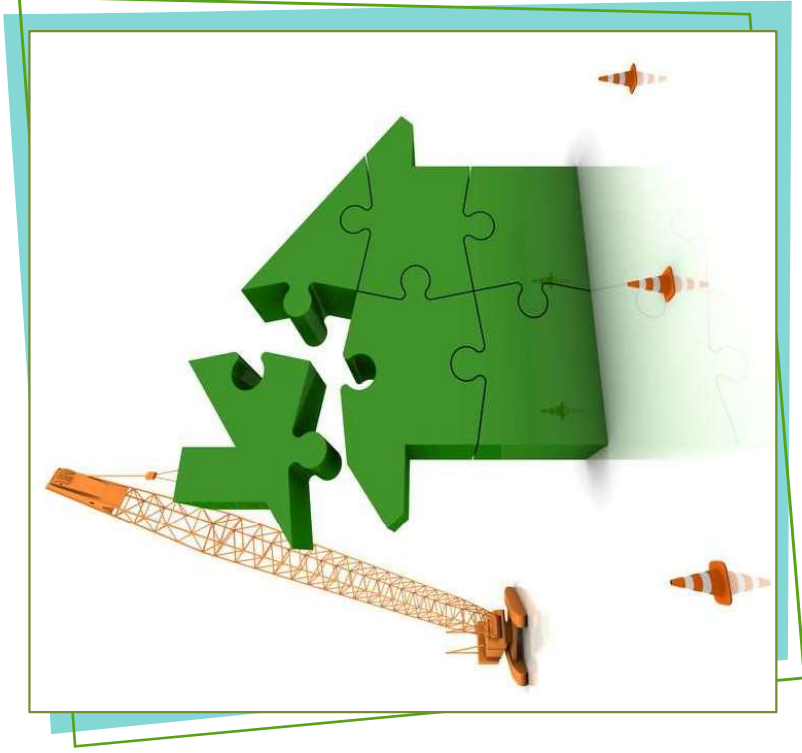
- ★ These are **regulated by the California Department of Housing and Community Development (HCD) under Title 25, which incorporates Title 24** as the applicable building code for design and construction.
- ★ These ADUs are **reviewed and approved through HCD Factory-built Housing (FBH) requirements** with the on-site installation and assembly under the jurisdiction of the local authority (typically the local building department).
- ★ As these are constructed off-site, **many of the Home Energy Rating System (HERS) are to be performed at the factory.**



California Department of Housing and Community Development

- ★ To learn more about ADU laws and requirements, see the California Department of Housing and Community Development (HCD) website.
- ★ The HCD maintains the Accessory Dwelling Unit Handbook and other useful information on the HCD website at <https://www.hcd.ca.gov/policy-and-research/accessory-dwelling-units>

ADU Buildings Can Have Some Challenges



★ Site Issues:

- ✧ Property line limits:
 - ◆ CalFire 4 feet set back
 - ◆ City setbacks
 - ◆ Utility setbacks
- ✧ Property height restrictions
- ✧ Local zoning requirements (e.g., covered parking)
- ✧ Limitations based what already may be built
- ✧ Available utilities (natural gas versus all-electric)

★ Getting everyone involved at the right time:

- ✧ Utilities:
 - ◆ Setback approvals
 - ◆ Natural gas connections

Code Breaker: Accessory Dwelling Units (ADU)

1. ADU Challenges

2. ADU Types

3. Envelope

4. Photovoltaics (PV)

5. Mechanical

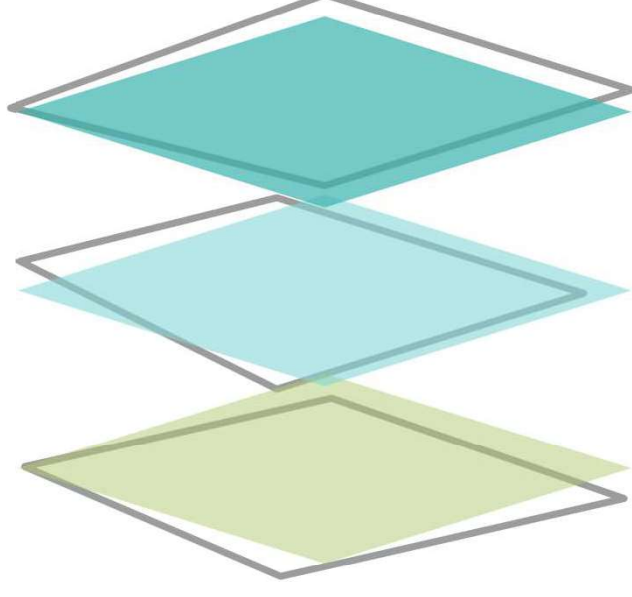
6. Next Steps

✦ ADU Types

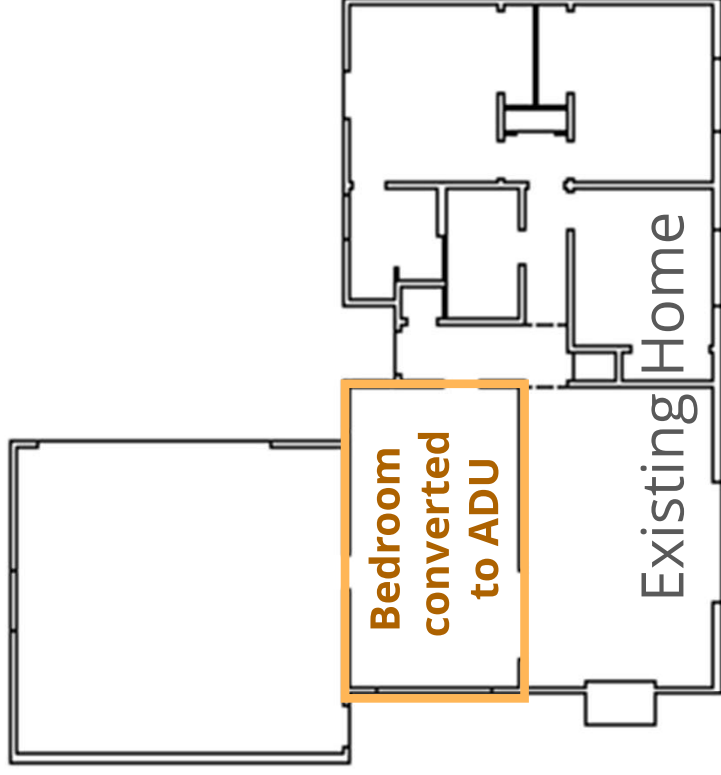
- ✦ **Alteration:** Only altered features required to meet Title 24, Part 6 requirements
- ✦ **Addition:** Allowed to meet the requirements associated with additions rather than those for new residential buildings
- ✦ **New Residential Building:** Must meet all the requirements applicable to new buildings



Classifying ADU Types



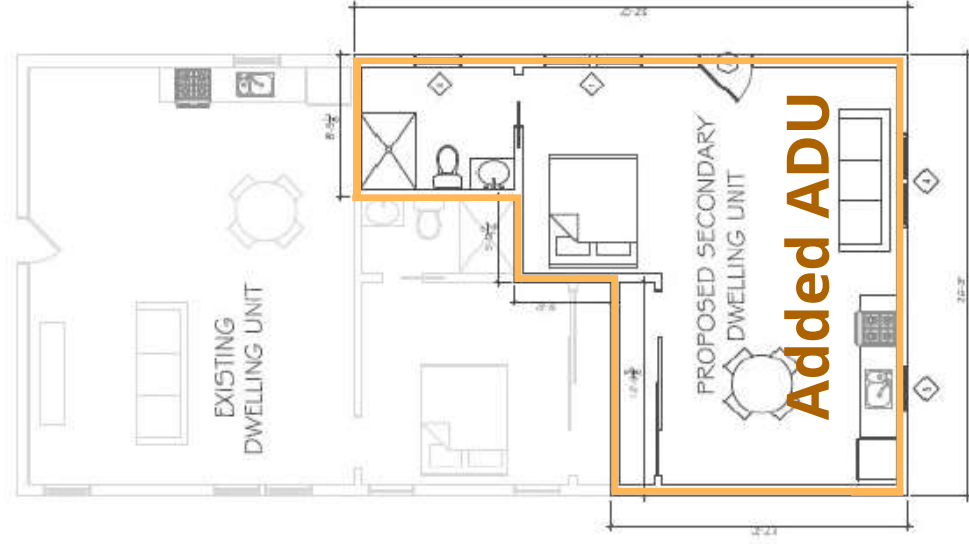
ADU Type Example



Alteration

- ◆ Existing conditioned space that is altered to become an ADU
 - ◆ Examples:
 - ◆ Converting a living room into an ADU

ADU Type Example

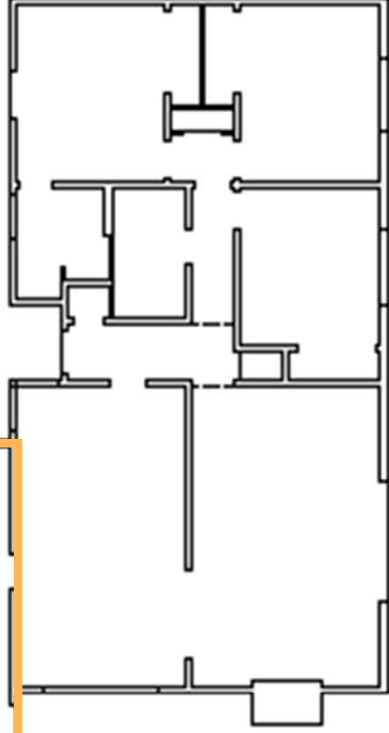


Addition: Attached

- ◆ Attached to an existing building on the property
 - ◆ Examples:
 - ◆ Converting unconditioned space to a new ADU

ADU Type Example

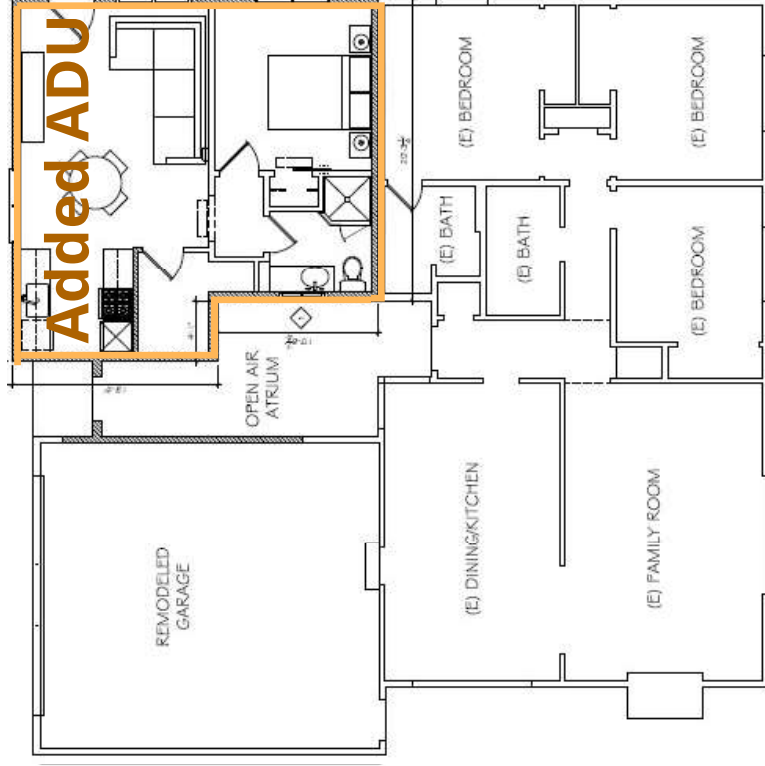
**Converted
Garage
to ADU**



Addition: Attached

- ◆ Attached to an existing building on the property
 - ◆ Examples:
 - ◆ Converting unconditioned space to a new ADU
 - ◆ Converting an existing attached garage to an ADU

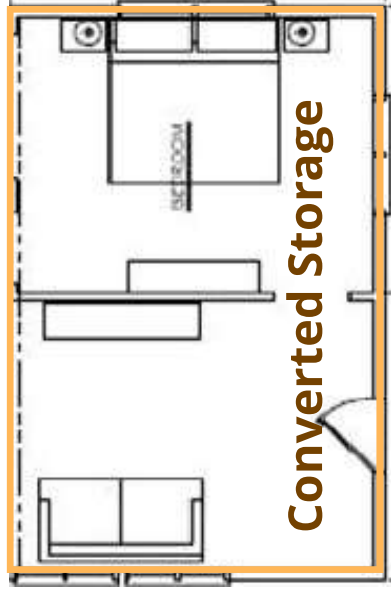
ADU Type Example



Addition: Attached

- Attached to an existing building on the property
- Examples:
 - Converting unconditioned space to a new ADU
 - Converting an existing attached garage to an ADU

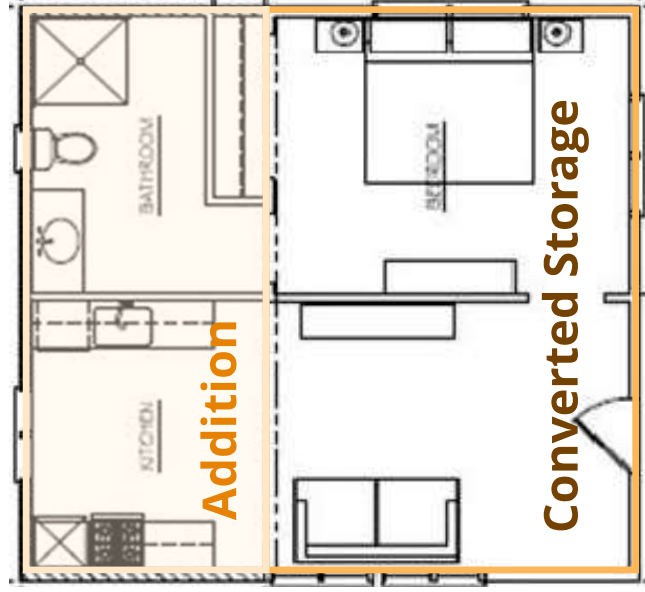
ADU Type Example



Addition: Detached

- ★ Converted from an existing building on the property
 - ✧ Examples:
 - ◆ Converting an unconditioned storage building to a new ADU

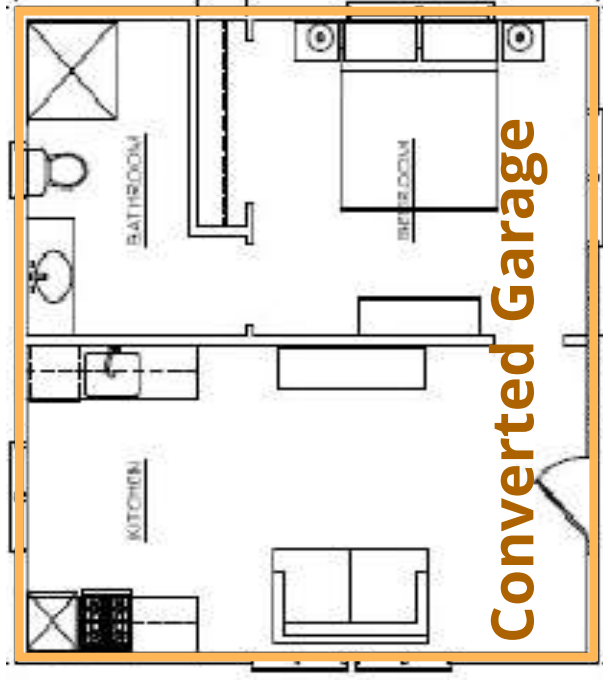
ADU Type Example



Addition: Detached

- ★ Converted from an existing building on the property
 - ✧ Examples:
 - ◆ Converting an unconditioned storage building to a new ADU
 - ◆ Converting unconditioned storage and adding onto it for a new ADU

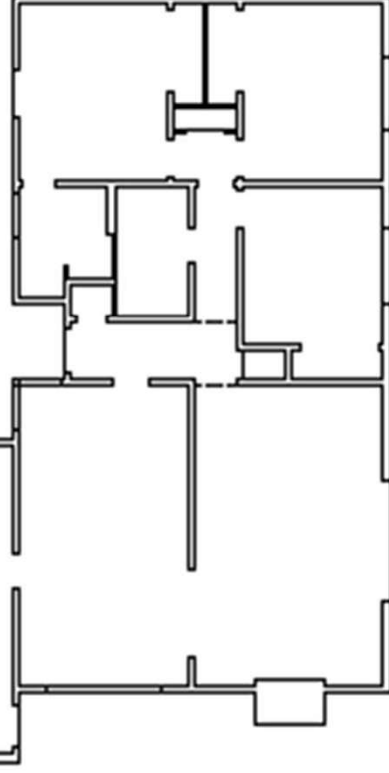
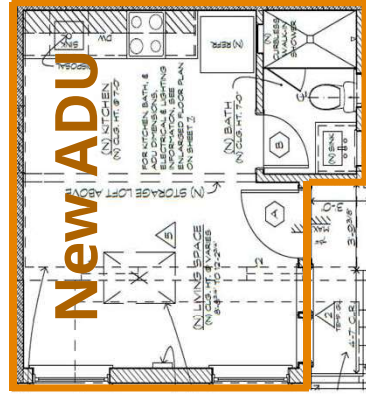
ADU Type Example



Addition: Detached

- ★ Converted from an existing building on the property
 - ✧ Examples:
 - ◆ Converting an unconditioned storage building to a new ADU
 - ◆ Converting unconditioned storage and adding onto it for a new ADU
 - ◆ Converting an existing detached garage to an ADU

ADU Type Example



New Residential Building

- ◆ A detached brand-new building
- ◆ Example:
 - ◆ A new building not attached to any existing building on the property



Check Your Understanding #1

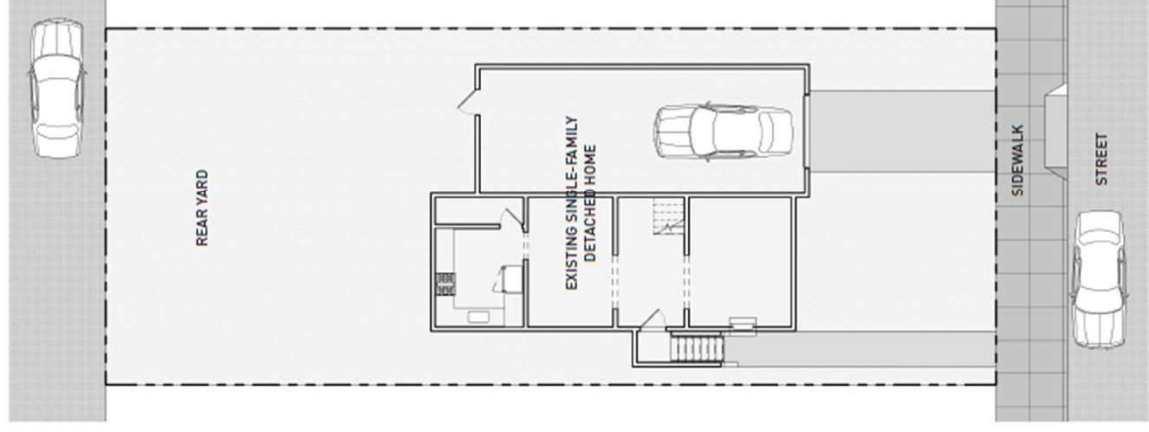
What do you think?

A. Alteration

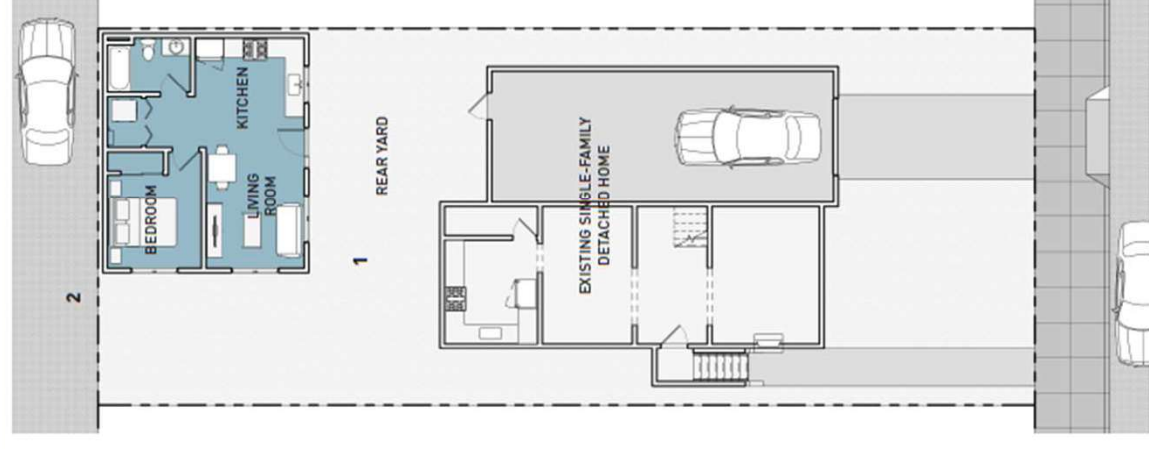
B. Addition

C. New Residential Building

Images used for "Check your Understandings" are courtesy of San Francisco Planning and Open Scope Studios. THANK YOU!



Existing Ground Floor Plan



Ground Floor Plan





Check Your Understanding #2

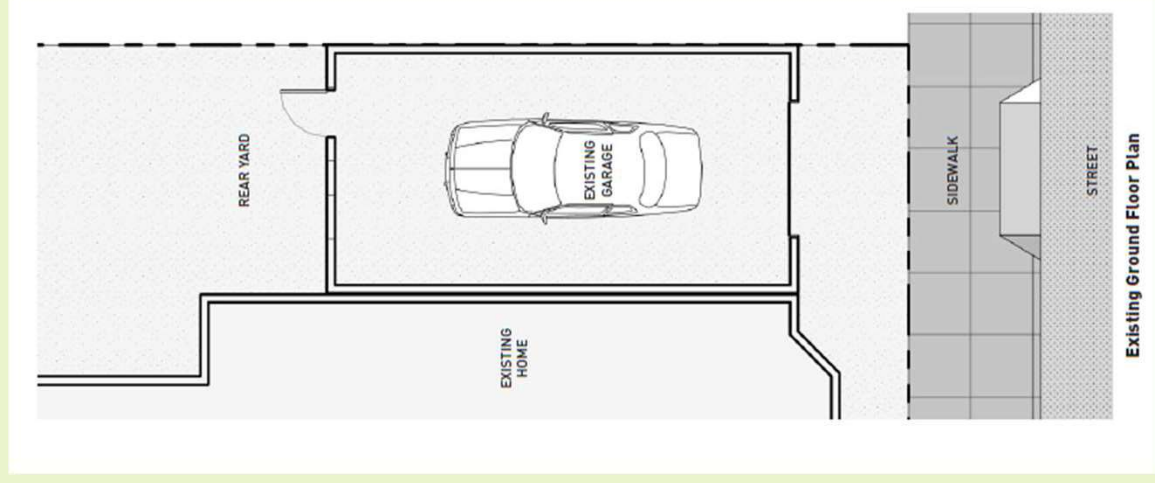
What do you think?

A. Alteration

B. Addition

C. New Residential Building

Images used for "Check your Understandings" are courtesy of San Francisco Planning and Open Scope Studios. THANK YOU!





Check Your Understanding #3

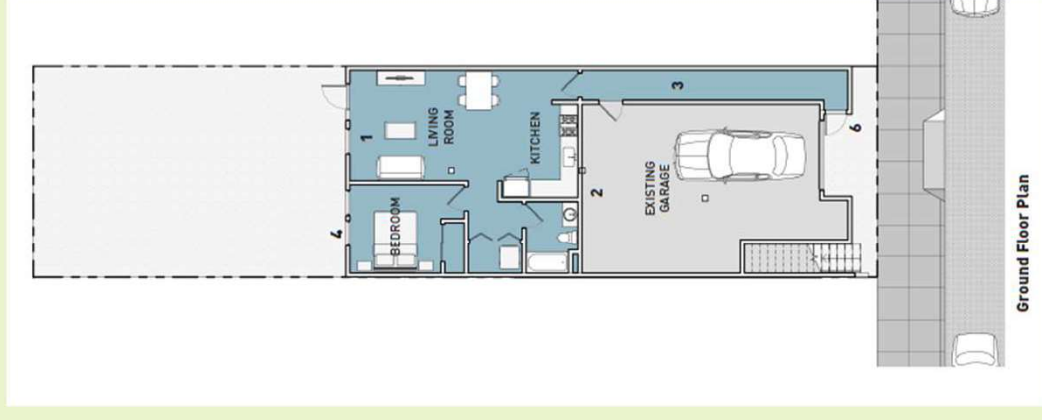
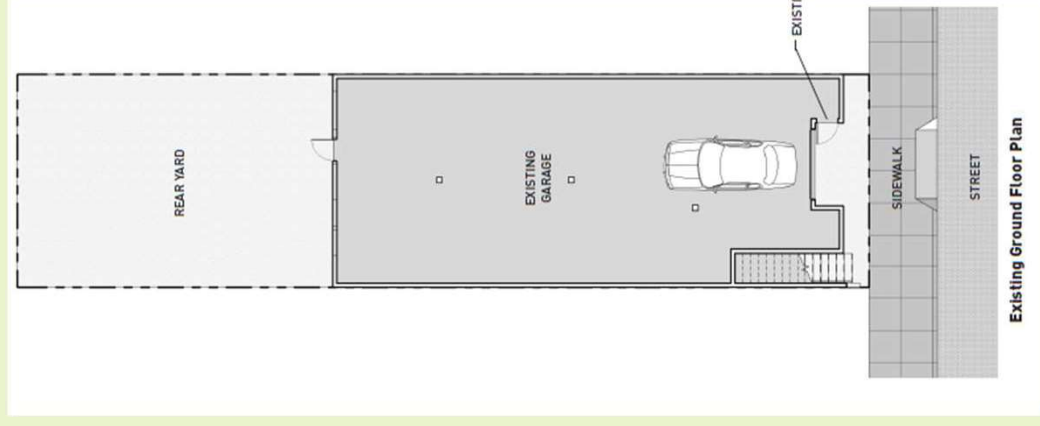
What do you think?

A. Alteration

B. Addition

C. New Residential Building

Images used for "Check your Understandings" are courtesy of San Francisco Planning and Open Scope Studios. THANK YOU!



Code Breaker: Accessory Dwelling Units (ADU)

1. ADU Challenges

2. ADU Types

3. Envelope

4. Photovoltaics (PV)

5. Mechanical

6. Next Steps

◆ Envelope Requirements

✧ **Roof**

◆ Alterations

◆ Additions

◆ New Residential Buildings

✧ **Walls**

◆ Converted or Extended

◆ New

✧ **Fenestration**

◆ Efficiency Requirements



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

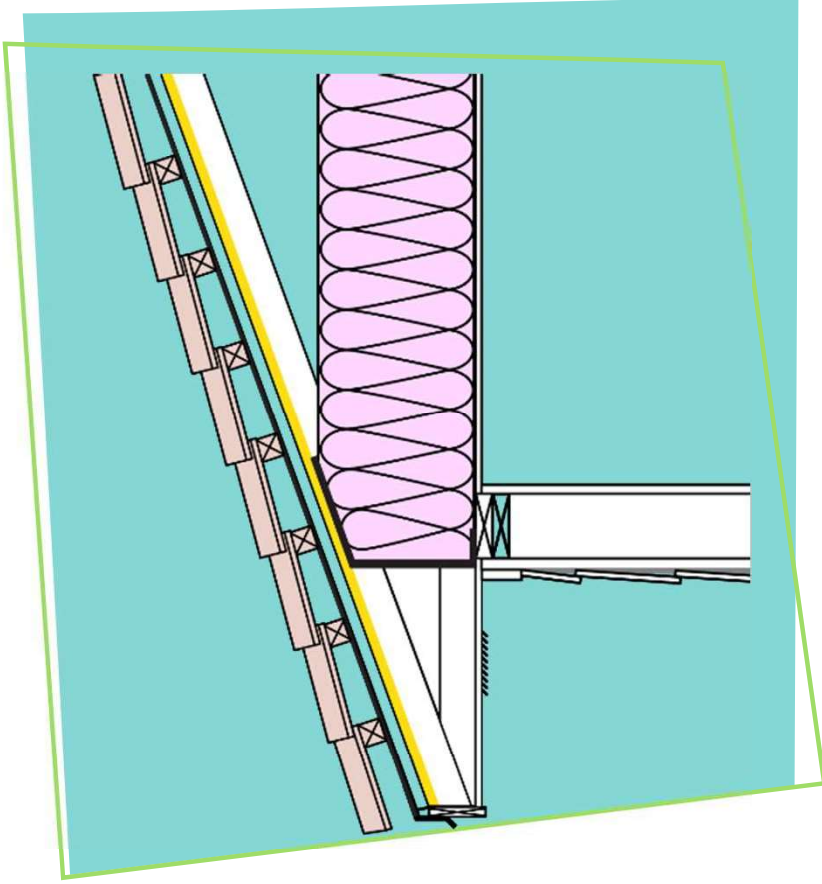


Roof – Vented Attic



Alteration ADU Type

These are ADUs that are converting existing permitted conditioned space, such as a family room, to an ADU.



Alteration ADU

Alteration ADU of any size

✦ Insulation (new!):

- ✧ CZ 1-4, 6, 8-16: $\geq R-49$ (exceptions may apply)
- ✧ CZ 1,3,5,7: Existing $\geq R-19$ allowed to remain

✦ Air sealing when insulation altered (new!):

- ✧ CZ 2,4,8-16

✦ Rated Cool Roof:

- ✧ CZ 4, 6-15

✦ Airspace Below Roofing:

- ✧ N/A

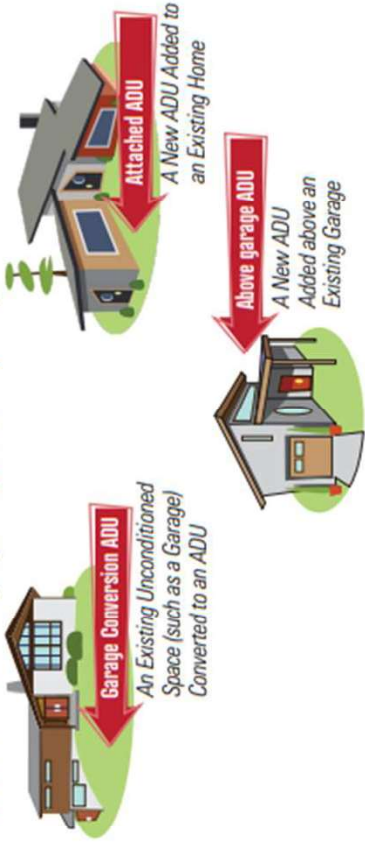


Roof – Vented Attic



Addition ADU Type

These are ADUs that are converting an existing space or building that was not habitable space and is considered "newly conditioned space" in the Energy Code or that are adding new conditioned floor area and volume to an existing single-family or multifamily building.



Addition ADU

Addition ADU $\leq 700 \text{ ft}^2$

★ Insulation (new!):

- ✧ CZ 1-2,4,8-16: $\geq R-38$ with radiant barrier
- ✧ CZ 3,5-7: $\geq R-30$ with radiant barrier

★ Air sealing of attic ceiling:

- ✧ N/A

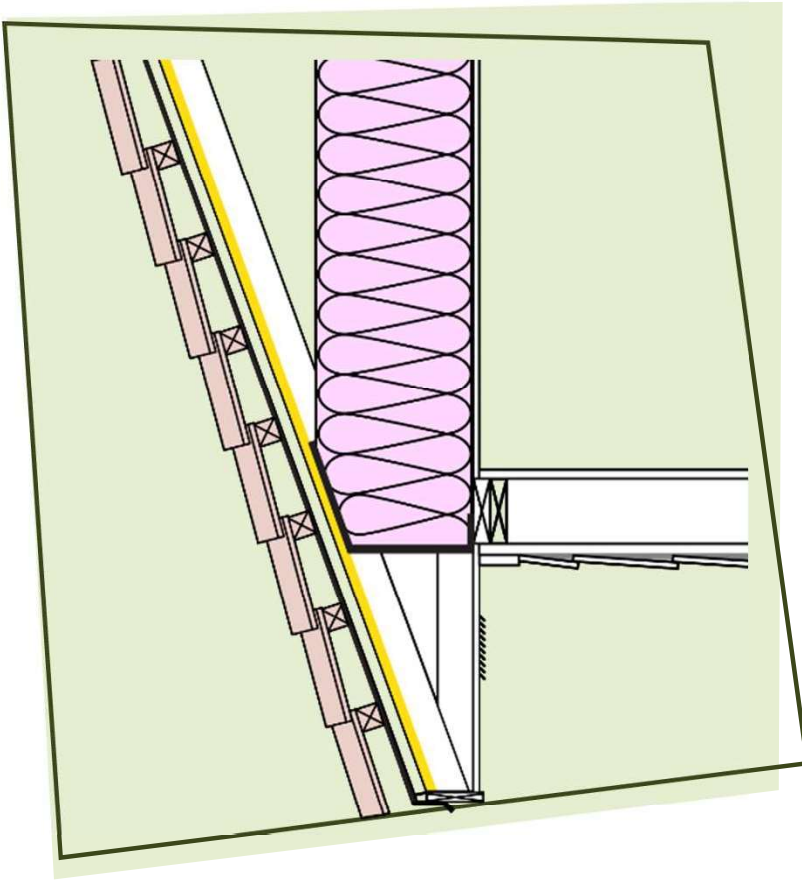
★ Rated Cool Roof:

- ✧ When addition $> 300 \text{ ft}^2$ in CZ 10-15

★ Airspace Below Roofing:

- ✧ Required

Addition ADU $> 700 \text{ ft}^2$: See "New"



Roof – Vented Attic



New Construction ADU Type

These are ADUs that are not being attached to any other structure on the property and are all New Construction.



“New” ADU & Addition ADUs >700 ft²

★ Insulation (Option B):

- ✧ CZ 4, 8-16: Ceiling: $\geq R-30$ / Roof $\geq R-19$ (**new!**)
Mandatory U-factor ≤ 0.184)
- ✧ CZ 1-3, 5-7: Ceiling $\geq R-38$ with radiant barrier / Roof N/A

★ Air sealing of attic ceiling:

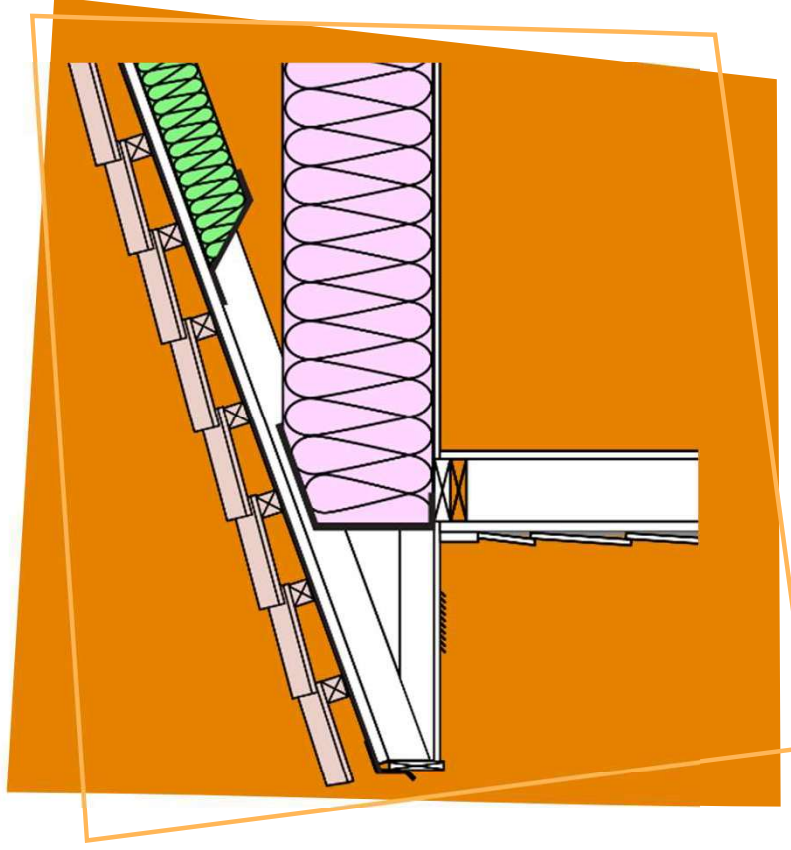
- ✧ Required as part of QII

★ Rated Cool Roof:

- ✧ In CZ 10-15

★ Airspace Below Roofing:

- ✧ Required

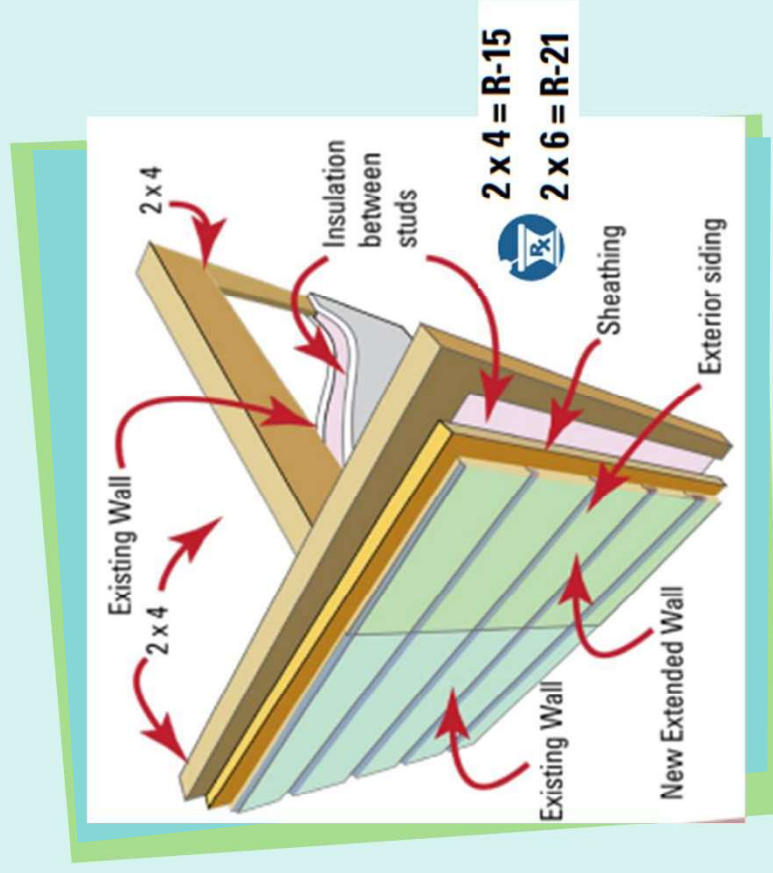


Wall



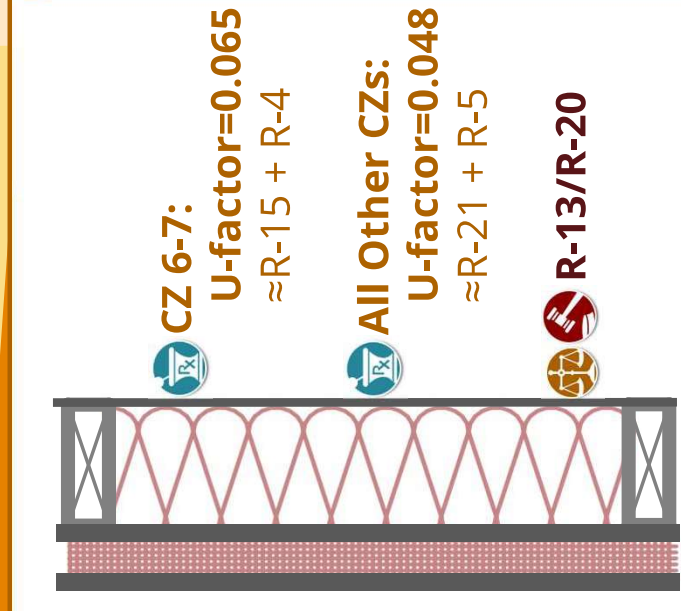
Addition ADU Only: Extended or Converted Wall

- Existing wall with existing siding not removed or replaced or
- New wall extended from existing wall

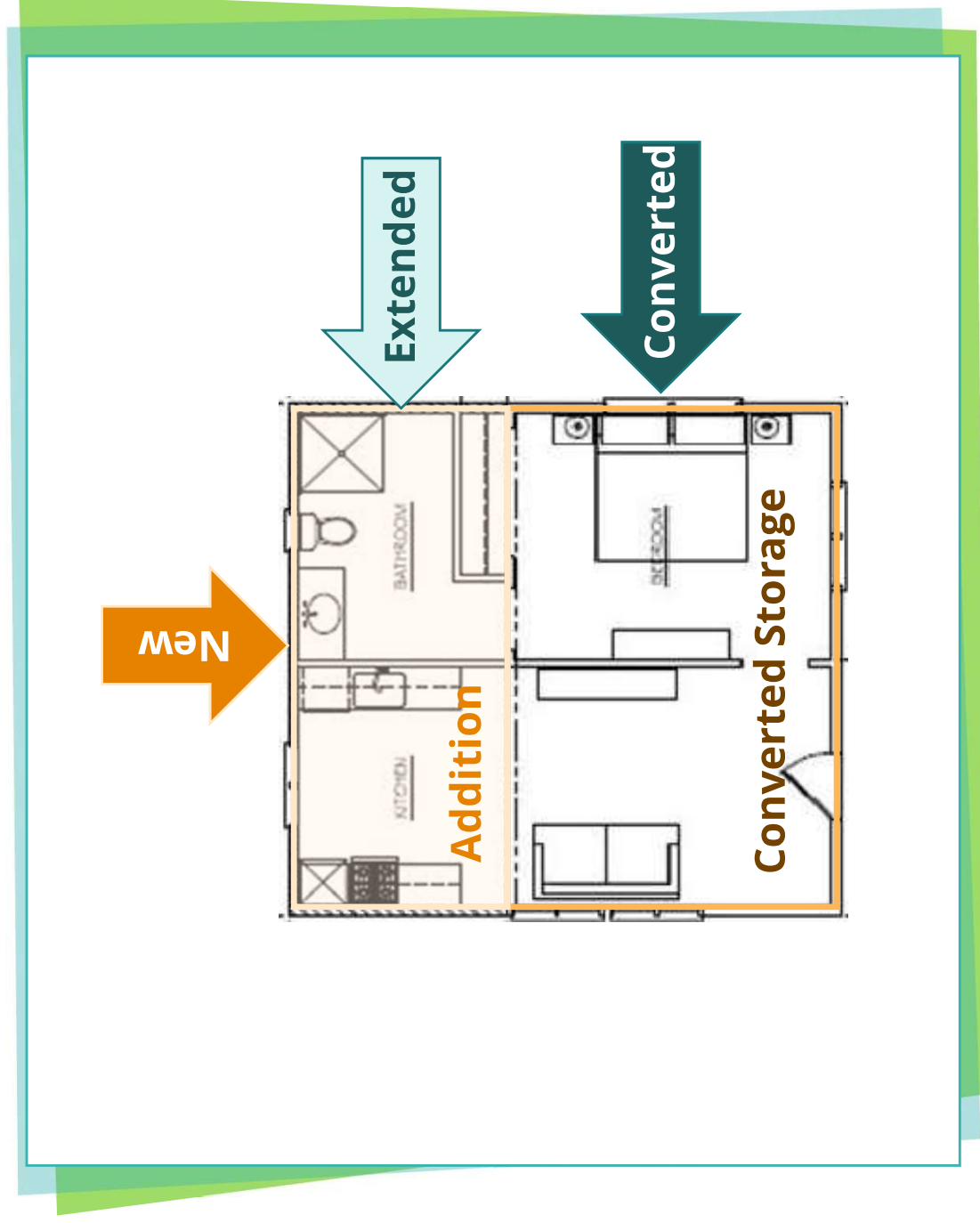


"New" Wall

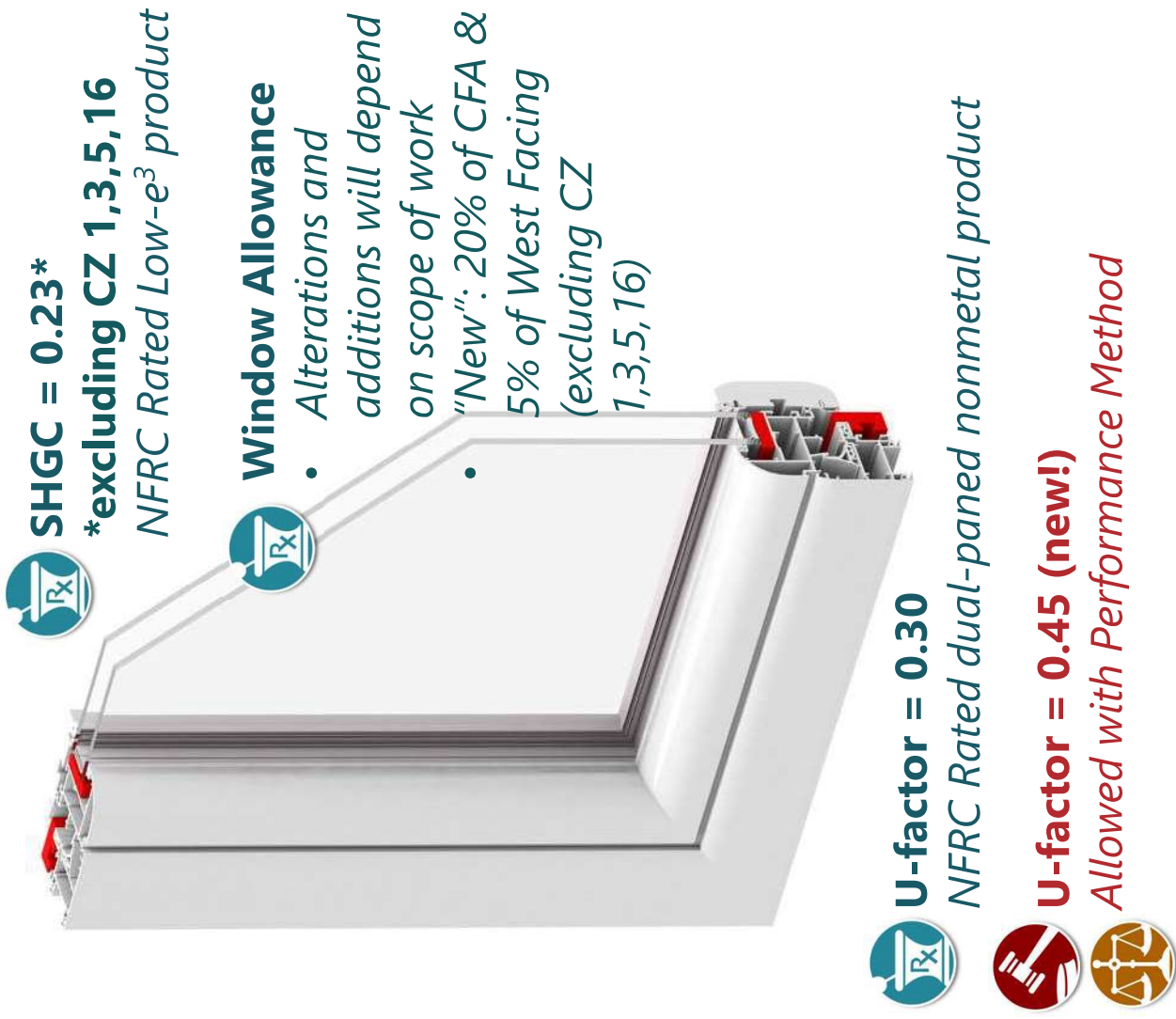
- New wall **not** extended from existing wall for Addition ADUs
- All exterior walls for "New" ADUs



Wall



Fenestration



SHGC = 0.23*
*excluding CZ 1,3,5,16
NFR Rated Low-e³ product

Window Allowance

- Alterations and additions will depend on scope of work
- "New": 20% of CFA & 5% of West Facing (excluding CZ 1,3,5,16)

U-factor = 0.30
NFR Rated dual-paned nonmetal product

U-factor = 0.45 (new!)
Allowed with Performance Method



Converting unconditioned space **does not allow** the fenestration associated with the space to be considered "existing"

Code Breaker: Accessory Dwelling Units (ADU)

1. ADU Challenges

2. ADU Types

3. Envelope

4. Renewables

5. Mechanical

6. Next Steps

◆ Photovoltaics

✧ **Not Required**

◆ Additions and Alterations

✧ **Required**

◆ New Residential Buildings

◆ SARA

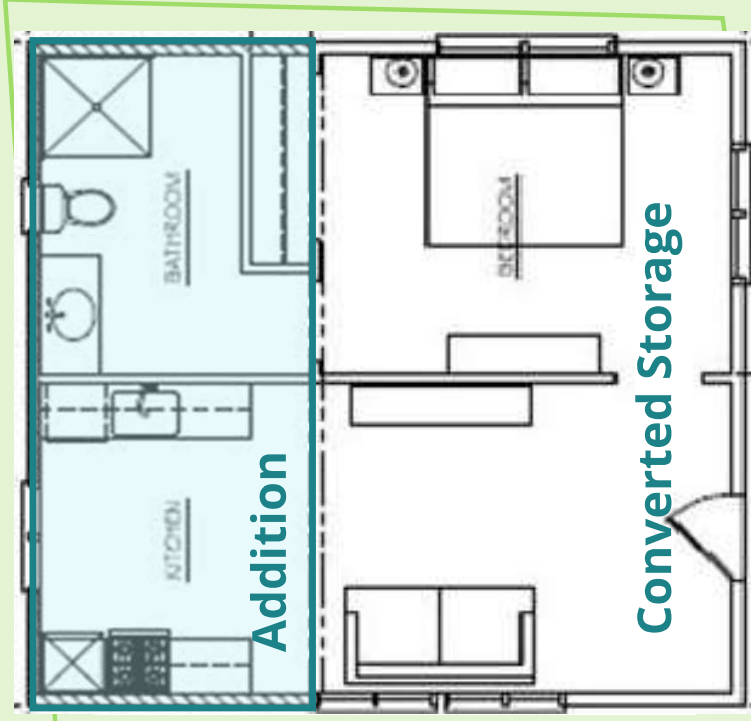
◆ Battery Ready



Photovoltaics (PV)

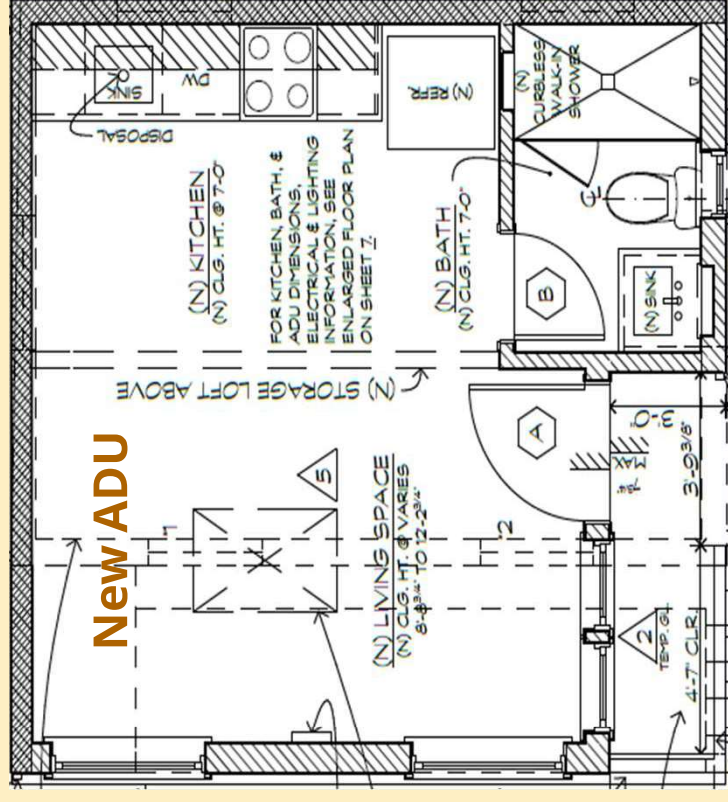
Not Required

- ✦ Alteration ADU of any size
- ✦ Addition ADU of any size



Required

- ✦ "New" ADU Residential Buildings



Solar Access Roof Area (SARA)



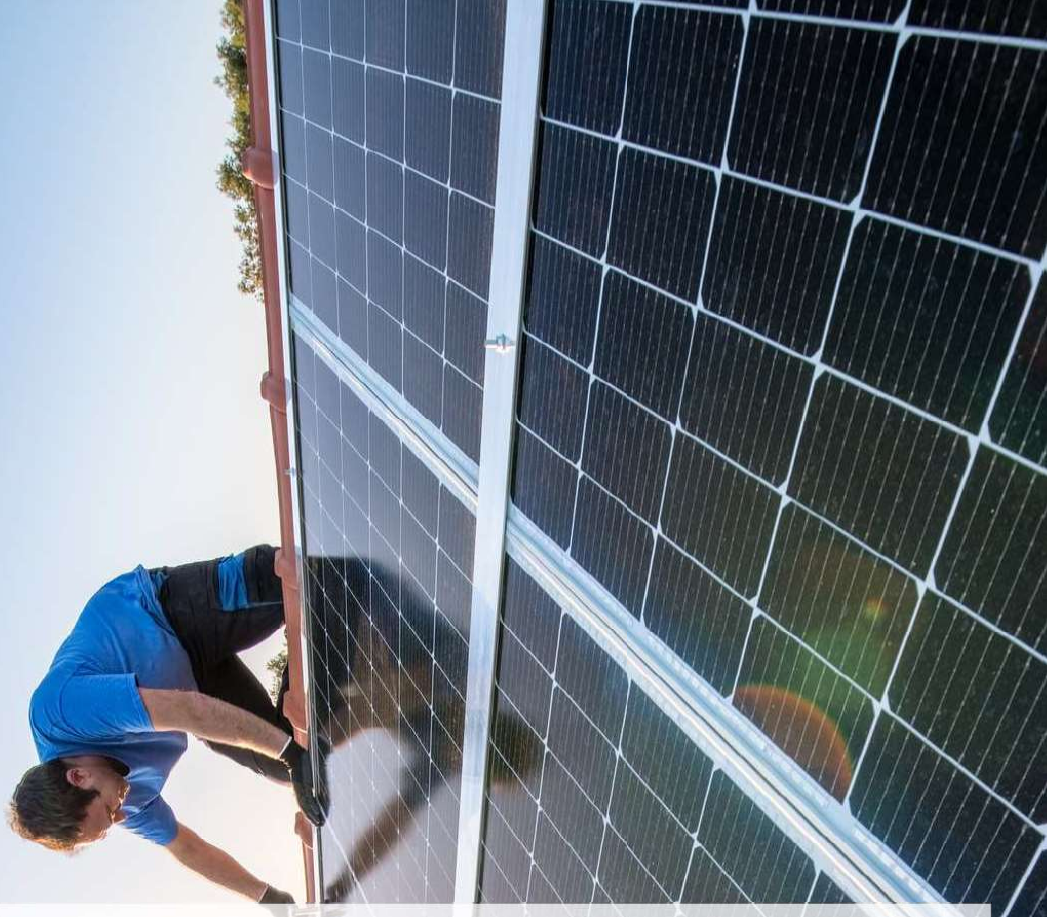
§150.1

★ New! SARA includes:

- ✧ The **area of a building's roof space** capable of structurally supporting a PV system **AND**
- ✧ The area of **all roof space on covered parking areas, carports** and **all other newly constructed structures** on the site that are compatible with supporting a PV system per CA Building Code **§1511.2**

★ Exceptions:

- ✧ Any roof area that has < 70% annual solar access using CEC approved solar access tool
- ✧ Occupied roof areas as specified by CA Building Code **§503.1.4**
- ✧ Roof area that is otherwise not available due to compliance with other building code requirements if confirmed by the Executive Director



PV Exceptions

§150.1(c)14



No PV system is required if:

- ★ The **SARA** is < 80 contiguous square feet
- ✧ For steep-slope roofs, SARA shall not consider roof areas with a northerly azimuth that lies between 300 degrees and 90 degrees from true north

- ★ **New!** The minimum PV system size specified by §150.0(c)14 is < **1.8 kWdc**

- ★ The building has an enforcement-authority-approved roof design, and the enforcement authority determines it is **not possible** for the PV system to meet **ASCE 7-16, Chapter 7, Snow Loads**

- ✧ “PV System” includes panels, modules, components, supports and attachments to the roof structure

- ★ The building is approved by the local planning department **prior to January 1, 2020** with mandatory conditions for approval

Required minimum PV system **may be reduced by 25%** if:

- ★ Installed in conjunction with a **battery storage system**
- ✧ Battery storage system shall meet Joint Appendix JA12 qualification requirements and have a minimum **usable capacity of 7.5 kWh**

The **Performance Approach** allows for a 25% minimum PV reduction via installation of both PV and Battery Storage



Photovoltaics: Design Options



PV Options

- ✦ **Can** be added to existing PV, but **cannot** use PV kW already installed
- ✦ **Can** be located anywhere on the property
- ✦ **Can** be part of Energy Commission-approved Community Shared Solar System



Configuring for Battery Ready (new!)



§150.0(s)

Mandatory Requirements

★ Basic Vision of Energy Code

- ✧ All new homes to be **wired to allow** the easy installation of a future whole-house battery supply system
- ✧ 2022 Energy Code calls this **"Energy Storage Systems (ESS) Ready"**

★ Main Panel Configuration

1. Interconnection equipment with a minimum backed up capacity of 60 amps supplying at least **four circuits**
 2. A dedicated raceway (1" minimum) from the main service to a subpanel supplying at least **four circuits**
- ◆ Subpanel to be labeled:
"Subpanel shall include all backed-up load circuits"

Choose either of
two methods



Configuring for Battery Ready (cont.)



§150.0(s)

Mandatory Requirements

- ★ The **four branch circuits** shall feed as a minimum:
 - ✧ Refrigerator
 - ✧ One lighting circuit near the front door
 - ✧ A sleeping room receptacle outlet
 - ✧ Other
- ★ Main panel must be **minimum 225 amps** busbar rating
- ★ Sufficient space shall be reserved to allow future installation of a system isolation equipment or transfer switch **within 3 feet** of the main panelboard
- ★ **Raceways** shall be installed between the panelboard and the system isolation equipment or transfer switch location to allow the connection of backup power source





Check Your Understanding #5

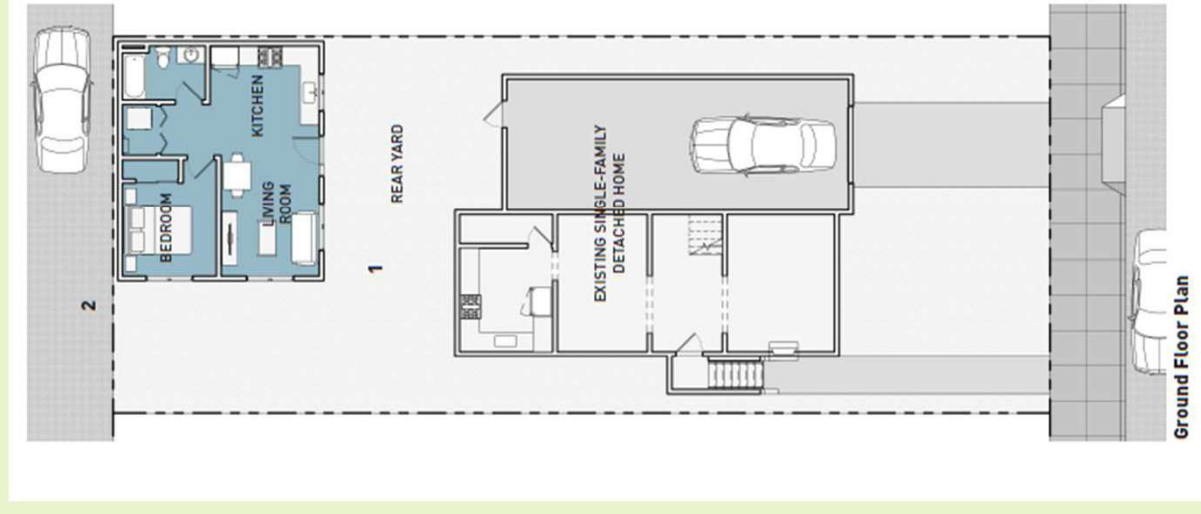
What do you think?

Will PV be required for this ADU?

A. Yes (exception may apply)

B. No

Images used for "Check your Understandings" are courtesy of San Francisco Planning and Open Scope Studios. THANK YOU!





Check Your Understanding #6

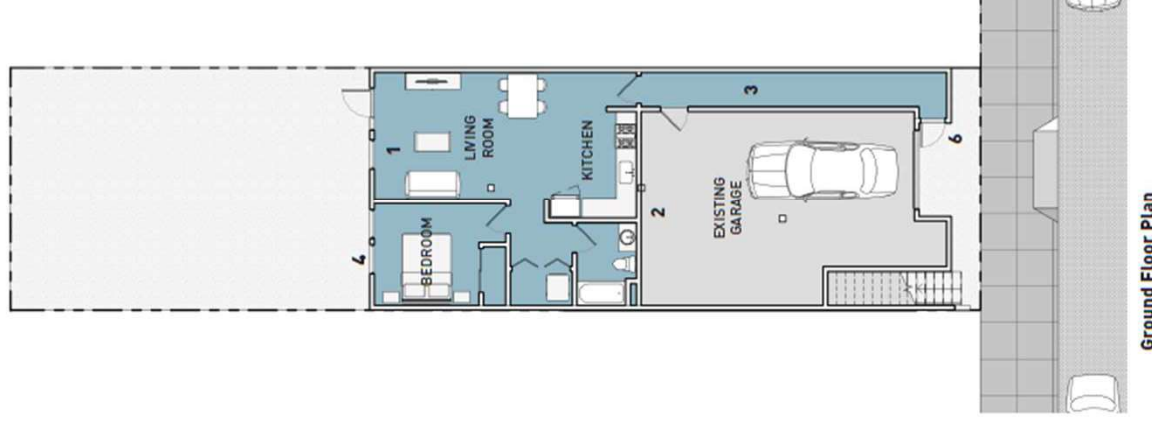
What do you think?

Will PV be required for this ADU?

A. Yes (exception may apply)

B. No

Images used for "Check your Understandings" are courtesy of San Francisco Planning and Open Scope Studios. THANK YOU!





Check Your Understanding #7

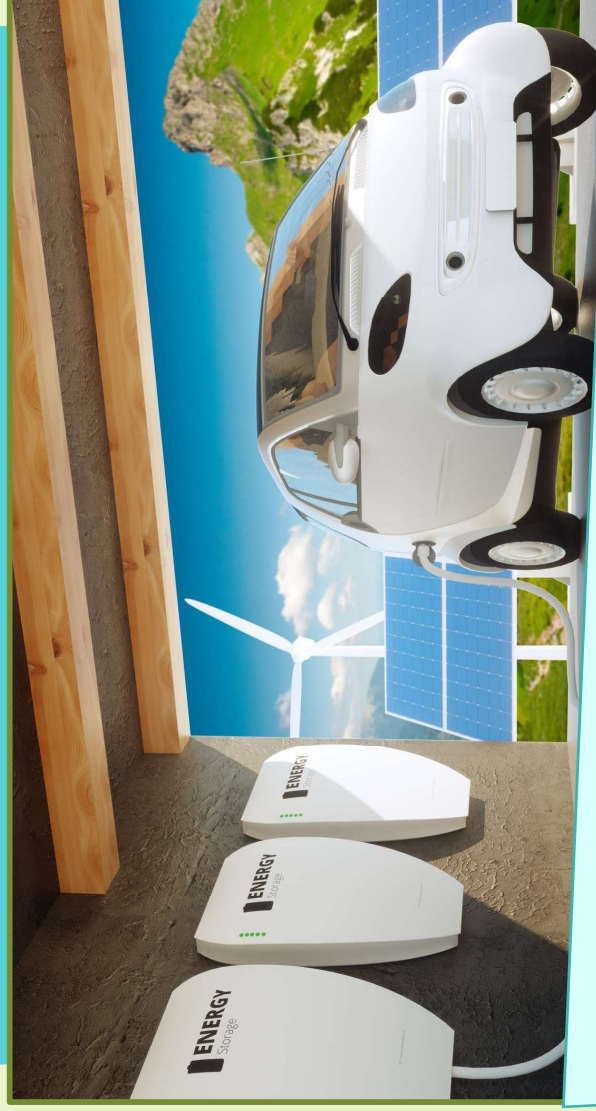
What do you think?

1. When does the 2022 Energy Code mandate the installation of battery systems?

❖ Never

❖ Starting January 1, 2023

❖ Only if the main panel is 225 amps or greater



Battery Storage installation is NOT required in 2022 Energy Code. The only code requirements are that Residential occupancies be "Energy Storage Systems Ready." This largely involves main panel configuration.



Code Breaker: Accessory Dwelling Units (ADU)

1. ADU Challenges

2. ADU Types

3. Envelope

4. Photovoltaics (PV)

5. Mechanical

6. Next Steps

◆ Mechanical

✧ **Ventilation**

◆ Kitchen Hood

✧ **Utility Source**

◆ EDR

◆ Space Heating, Cooling, Water Heating

◆ Electric Ready



Kitchen Hood (new!)



§160.2(b)

- ◆ **New Kitchen Hood Table 160.2-G**, which is based on:
 - ✧ Home size
 - ✧ Fuel type
- ◆ **Capture Efficiency (CE)** comes from ASTM testing

Dwelling Unit Floor Area (ft ²)	Hood Over Electric Range	Hood Over Natural Gas Range
> 1500	50% CE or 110 cfm	70% CE or 180 cfm
> 1000 – 1500	50% CE or 110 cfm	80% CE or 250 cfm
750 – 1000	55% CE or 130 cfm	85% CE or 280 cfm
< 750	65% CE or 160 cfm	85% CE or 280 cfm

Table 160.2-G: Kitchen Range Hood Airflow Rates (cfm) and ASTM E3087 Capture Efficiency (CE) Ratings According to Dwelling Unit Floor Area and Kitchen Range Fuel Type





What's New: Mandatory Measures

§150.0(o)1G

★ Ventilation System Duct Sizing (Table 150.0-H):

- ✧ Based on cfm
- ✧ Provides for minimum duct diameter
- ✧ Covers both rigid and flex duct

Table 150.0-H: Prescriptive Ventilation System Duct Sizing [ASHRAE 62.2: Table 5-3]

Fan Airflow Rating, cfm at minimum static pressure ^f 0.25 in. water (L/s at minimum 62.5 Pa)	≤ 50 (25)	≤ 80 (40)	≤ 100 (50)	≤ 125 (60)	≤ 150 (70)	≤ 175 (85)	≤ 200 (95)	≤ 250 (120)	≤ 350 (165)	≤ 400 (190)	≤ 450 (210)	≤ 700 (330)	≤ 800 (380)
Minimum Duct Diameter, in. (mm) ^{a,b} for Rigid duct	4 ^e (100)	5 (125)	5 (125)	6 (150)	6 (150)	7 (180)	7 (180)	8 (205)	9 (230)	10 (255)	10 (255)	12 (305)	12 ^d (305)
Minimum Duct Diameter, in. (mm) ^{a,b} for Flex duct ^c	4 (100)	5 (125)	6 (150)	6 (150)	7 (180)	7 (180)	8 (205)	8 (205)	9 (230)	10 (255)	NP	NP	NP

Rigid duct

Flex duct

"New" ADU Prescriptive Requirements for Heat Pumps

★ Heat Pump Water Heater (new!)

Per 150.1(c)8: Heat pump water heater Prescriptively required in all Climate Zones

OR

New dwelling units ≤ 500 ft² CFA with point of use distribution may have instantaneous electric water heater

New dwellings with ≤ 1 bedroom may use 120 volt HPWH
Climate Zones 3, 4, 13 & 14: Gas tankless water heaters Prescriptively allowed if the space heating system is a heat pump

Electric resistance with solar system (solar fraction $\geq 70\%$)

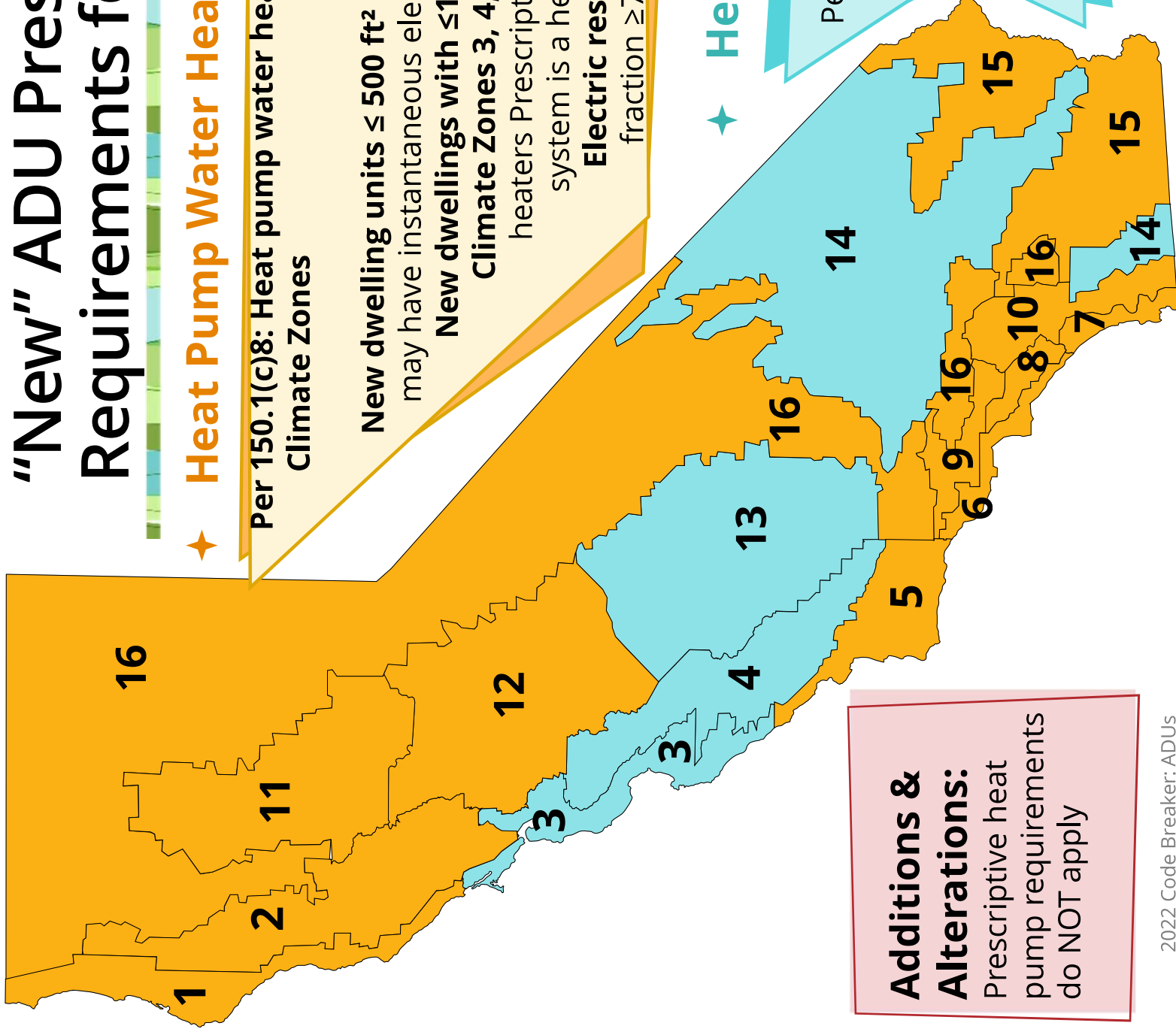
★ Heat Pump HVAC (new!)

Per 150.1(c)6: Heat pump space heating Prescriptively required in Climate Zones 3, 4, 13 & 14

All other Climate Zones:
Either gas or heat pump space heating is allowed Prescriptively

Additions & Alterations:

Prescriptive heat pump requirements do NOT apply





New! Minimum Heating & Cooling Efficiencies

Single-phase Air Source Heat Pumps (Cooling Capacity < 65,000 Btuh)

Configuration	Manufactured BEFORE 1/1/2023		Manufactured AFTER 1/1/2023*	
	HSPF	SEER	HSPF2	SEER2
Packaged	8.0	14.0	6.7	13.4
Split (incl. ductless)	8.2	14.0	7.5	14.3
Space Constrained	7.4	12.0	6.3	11.9
Small Duct High Velocity	7.2	12.0	6.1	12.0

Note:

HSPF/HSPF2 = Heating Season Performance Factor

SEER/SEER2 = Seasonal Energy Efficiency Ratio

* Systems **manufactured** after 1/1/2023 must meet the newer HSPF2/SEER2 requirements.
Cannot use HSPF or SEER.

Adapted from the Code of Federal Regulations, per 10 CFR 430.32(c)





New! Minimum Heating & Cooling Efficiencies

Central Air Conditioners (not Heat Pumps) < 65,000 Btuh

Configuration	Rated Cooling Capacity (Btuh)	Installed BEFORE 1/1/2023		Installed AFTER 1/1/2023*	
		SEER	EER	SEER2	EER2
Split System	< 45,000	14.0	12.2	14.3	11.7/9.8**
	≥ 45,000	14.0	11.7	13.8	11.2/9.8**
Single Package	< 65,000	14.0	11.0	13.4	10.6
Space Constrained	< 30,000	12.0***	No min.	11.7***	No min.

Note:

SEER/SEER2 = Seasonal Energy Efficiency Ratio
EER/EER2 = Energy Efficiency Ratio

- * Systems **installed** after 1/1/2023 must meet the newer SEER2/EER2 requirements, **regardless of date of manufacture**. Cannot use SEER or EER.
- ** For systems with 15.2 SEER2 or greater, the minimum EER2 requirement is 9.8
- *** Use manufactured date, not install date for space-constrained units

Adapted from the Code of Federal Regulations, per 10 CFR 430.32(c)

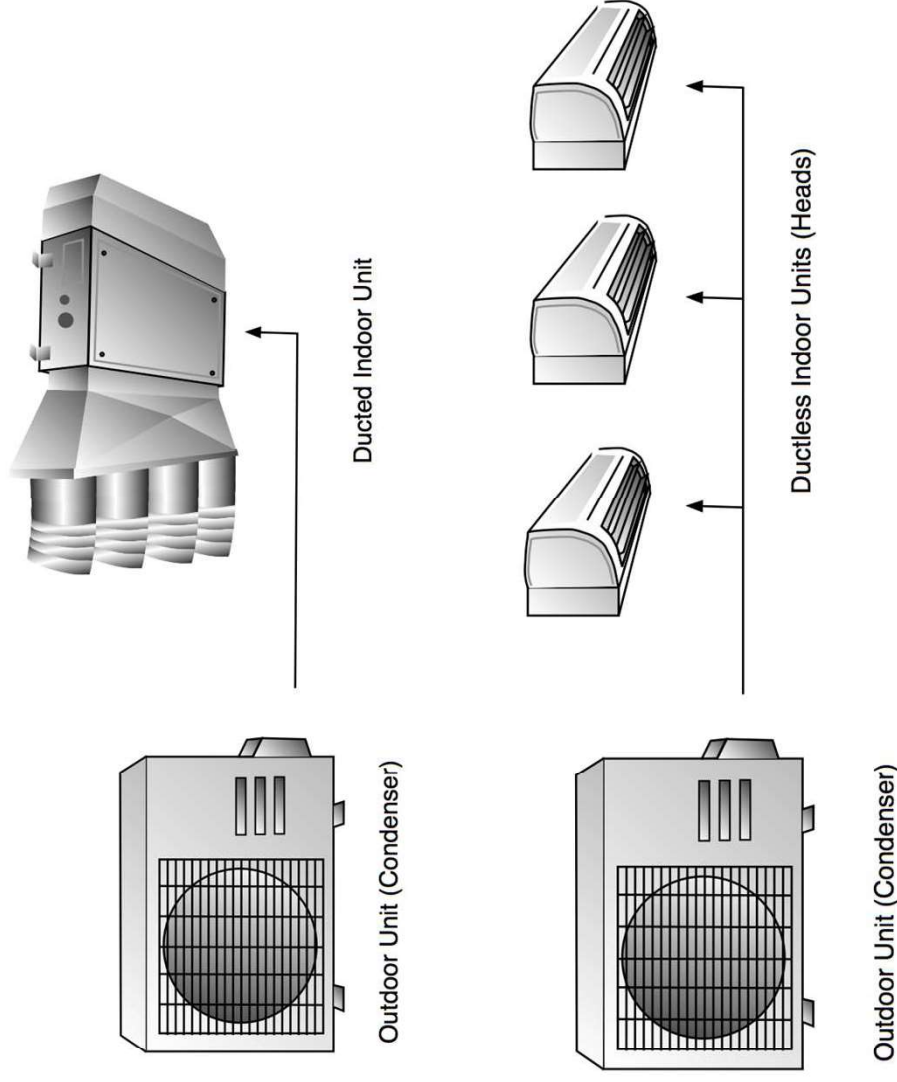


Variable Capacity Heat Pump (VCHP) HERS

Space Heating



Heat Pump: Mini-Ductless or Ducted Variable Capacity Heat Pump (VCHP)



Design Considerations

- ✦ **Location** of the indoor units (heads) and ducts to be *entirely within conditioned space* (thermal envelope)
- ✦ **Airflow to all habitable spaces** either by use of a ductless indoor unit located in the room, or by use of ducts connected directly to the supply air outlet of a ducted indoor unit
- ✦ **Zones >150 ft²** to have a wall-mounted thermostat



Electric Ready (new!)



§150.0

150.0(n) Water Heaters

Gas or propane water heaters must be installed in or adjacent to a space large enough to accommodate a Heat Pump Water Heater (2.5' x 2.5' x 7')

- ✧ Within 3 ft of water heater with dedicated 125 volt / 20 amp outlet with 120/240 volt 3 conductor branch circuit
- ✧ More than 3 ft 240 volt / 30 amp electrical feed

150.0(t) Furnaces

Provide a 240 volt / 30 amp minimum electrical feed to the furnace for future heat pump

150.0(u) Cooktops

Include 240 volt / 50 amp minimum feed for future cooktop

150.0(v) Dryers

Include 240 volt / 30 amp minimum feed for dryer if the unit has a gas line for a dryer

Each Electric Ready item requires breaker space and labeling in panel

"New" and
Addition ADUs

"New" ADUs only





Check Your Understanding #8

What do you think?
Which **upgrade options** would you use to get the project into compliance?

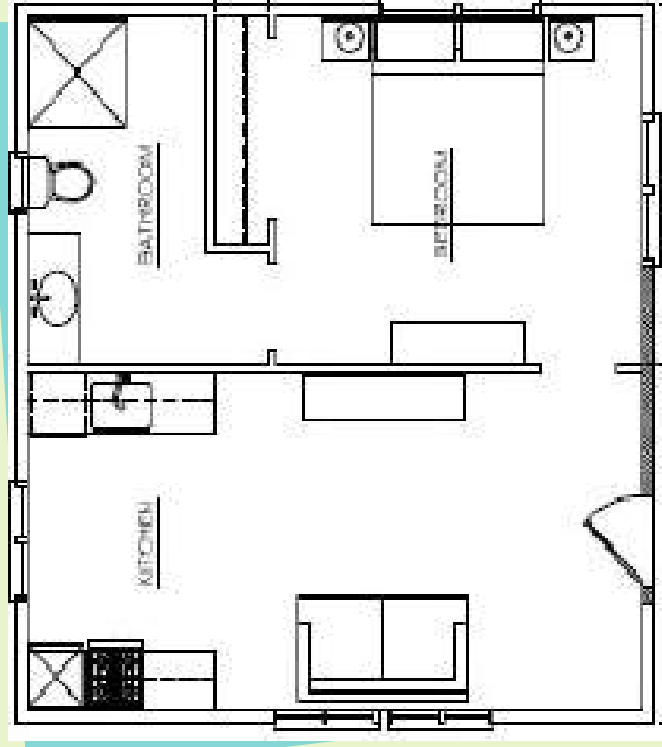
Feature Upgrade Options	Compliance Benefit TDV
A. HVAC: Ductless minisplit + VCHP HERS verification	+29.0
B. HVAC: Heat recovery ventilator	+9.0
C. DHW: Gas tankless condensing water heater	+5.5
D. DHW: Heat pump water heater 50 gal, NEEA Tier III	+11.5

ADU converted from existing garage in Sacramento (CZ 12):

Standard kTDV/ft²-yr: 184.00

Proposed kTDV/ft²-yr: 196.00

Compliance Margin: -12.00



Code Breaker: Accessory Dwelling Units (ADU)

1. ADU Challenges

2. ADU Types

3. Envelope

4. Photovoltaics (PV)

5. Mechanical

6. Next Steps

◆ Next Steps

✧ Take the **Residential Architect** Class!

◆ Other Training

◆ Resources

◆ Tools

✧ Local Incentives/Rebates



Virtual Classes

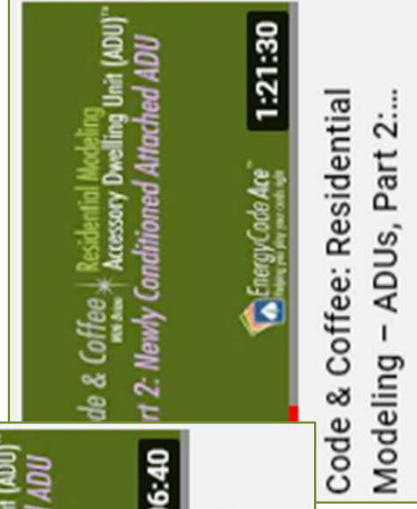
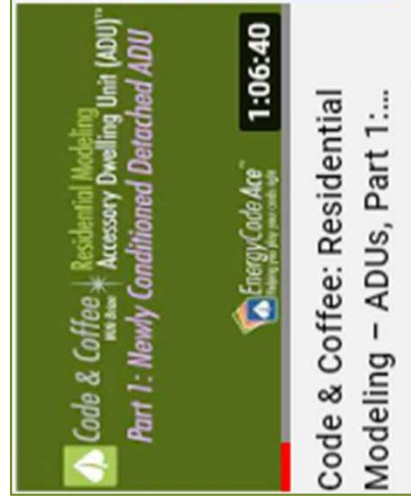
What's New in 2022
Residential Energy Code
Online Live Event



Single-family Standards
for Architects & Designers
Online Live Event



Code & Coffee
On-Demand
YouTube Series



Q & Ace



[Get Forms](#) >
 [Tools Ace](#) >
 [Training Ace](#) >
 [Resources Ace](#) >
 Search

|

Ace Tools™

Q&A

Quickly find the answers to all your questions in our online knowledge base. Check out the Top Topics below or use the filters on the right to find more.

| 🔍

Explore the Top 6 Topics

- ★ Where can I find forms?
- ★ Residential Indoor Lighting
- ★ Residential HVAC
- ★ Nonresidential HVAC
- ★ Nonresidential Indoor Lighting
- ★ Nonresidential Electrical Power Distribution System

Still have questions?

Just ask us. Submit your question and we'll respond to you via email within 3 business days.

Filters

Energy Code & Regs
>

Building Occupancy Types
>

Topics
>

Source
>

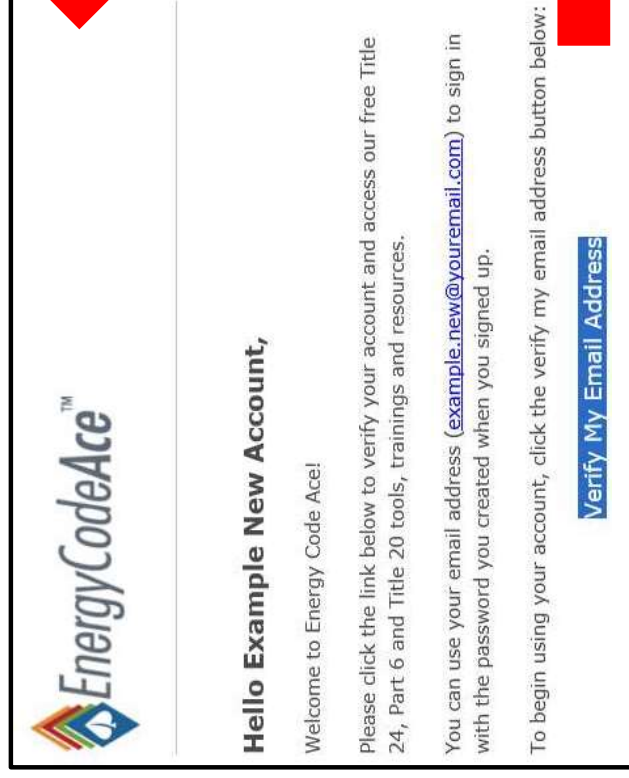
CEC Blueprint Newsletter: Q&A taken from the California Energy Commission's Blueprint Newsletter

CEC Title 24 Compliance Manual: Q&A taken from the California Energy Commission's Title 24, Part 6 Compliance Manual

Didn't Find What You Need?



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

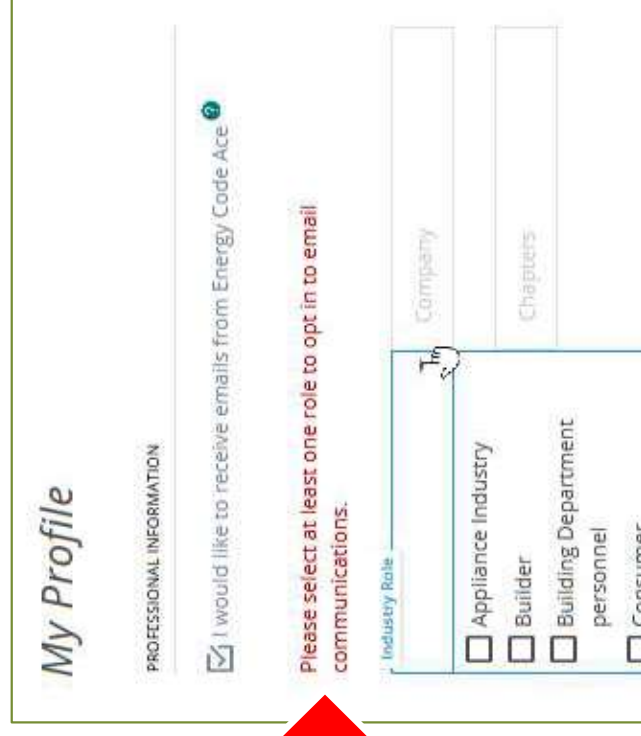


- 1** Create an account



Register with Energy Code Ace to stay-up-to-date with new offerings <https://energycodeace.com>

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

A screenshot of the "My Profile" page. The page has a white background with a blue and yellow logo at the top left. The text reads: "My Profile PROFESSIONAL INFORMATION I would like to receive emails from Energy Code Ace Please select at least one role to opt in to email communications. Industry Role: ☐ Appliance Industry ☐ Builder ☐ Building Department personnel ☐ Consumer Company: Chapters:". A red arrow points from the "Please select at least one role to opt in to email communications" text to the next step.



Thank you

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

Contact	Role	Email	Phone
Bruce Cheney	Instructor	bcheney@aae-hers.org	619-251-3026
Dave Intner	Senior Advisor Building Electrification & Codes and Standards	Dave.Intner@sce.com	(626) 995-7431
Jill Marver	Energy Code Ace Program Manager	Jill.Marver@PGE.com	(925) 415-6844
Energy Code Ace	Multiple	http://energycodeace.com/content/contact	

