2019 Energy Code
Accessory Dwelling Units

California Energy Commission
Amie Brousseau
REACO
November 2, 2021

Agenda

- Review Energy Code basics
- ADUs - Definitions and clarifications
- ADUs - Additions
- ADUs - New construction
- Modeling tips
- Plan check and inspection
- Resources

2019 Energy Code Basics

2019 Energy Code

Effective January 1, 2020

- Building permit applications submitted on or after effective date
- Must use 2019 software and forms

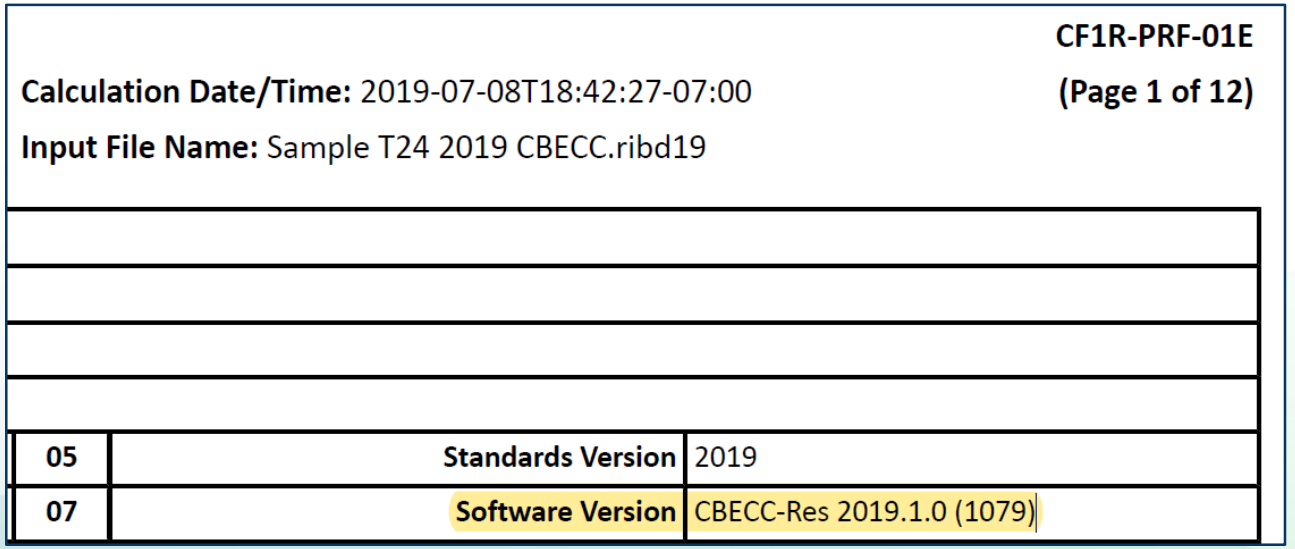
2019 Documents Online

- Energy Code
- Reference Appendices
- Compliance Manuals
- Forms
  - Fillable dynamic
  - Energy Code Ace

2019 Compliance Software

Performance approach compliance use most recently approved versions

- Residential
  - CBECC-Res 2019 2.0
    - Permit applications on or after 1/1/22 must use CBECC-Res 2019.2.0
  - EnergyPro 8.2 Residential
  - Right-Energy 2019.1.1



CF1R-PRF-01E

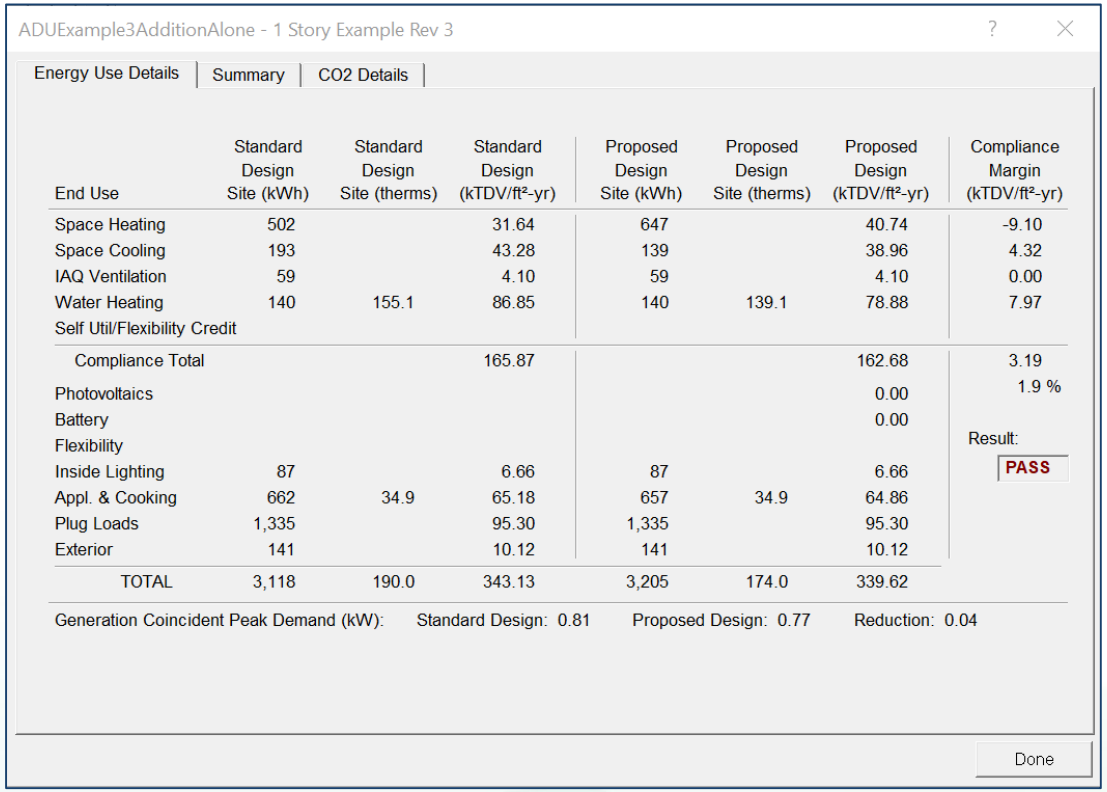
Calculation Date/Time: 2019-07-08T18:42:27-07:00 **(Page 1 of 12)**

Input File Name: Sample T24 2019 CBECC.ribd19

05	**Standards Version**	2019
07	**Software Version**	CBECC-Res 2019.1.0 (1079)

Performance Approach

- Software updated to model ADUs
- Mandatory measures must still be met
  - IAQ fan HERS verified
  - Mandatory insulation requirements
  - Duct insulation
- Trade-offs of prescriptive requirements are allowed



ADUExample3AdditionAlone - 1 Story Example Rev 3

Energy Use Details | Summary | CO2 Details

End Use	Standard Design Site (kWh)	Standard Design Site (therms)	Standard Design (kTDV/ft²-yr)	Proposed Design Site (kWh)	Proposed Design Site (therms)	Proposed Design (kTDV/ft²-yr)	Compliance Margin (kTDV/ft²-yr)
Space Heating	502		31.64	647		40.74	-9.10
Space Cooling	193		43.28	139		38.96	4.32
IAQ Ventilation	59		4.10	59		4.10	0.00
Water Heating	140	155.1	86.85	140	139.1	78.88	7.97
Self Util/Flexibility Credit							
Compliance Total			165.87			162.68	3.19
Photovoltaics						0.00	1.9 %
Battery						0.00	
Flexibility							Result:
Inside Lighting	87		6.66	87		6.66	PASS
Appl. & Cooking	662	34.9	65.18	657	34.9	64.86	
Plug Loads	1,335		95.30	1,335		95.30	
Exterior	141		10.12	141		10.12	
TOTAL	3,118	190.0	343.13	3,205	174.0	339.62	

Generation Coincident Peak Demand (kW): Standard Design: 0.81 Proposed Design: 0.77 Reduction: 0.04

Done

2019 Energy Code

ADU - Definitions and Clarifications

Low-Rise Residential Buildings

- Single family and duplexes
  - Any number of stories
- Multifamily and townhouses
  - No more than three habitable stories

Accessory Dwelling Unit (ADU)

Accessory dwelling unit

- Secondary dwelling unit on residential lot
- Residential “R” occupancy
- Attached, detached, converted
- Independent living space

ADUs have many names

- Carriage house
- Garage apartment
- Garden cottage
- Granny flat
- In-law unit
- Junior ADU
- Secondary suite
- Tiny house

Energy Code Compliance

Must meet Energy Code

- ADUs, Junior ADUs
- Efficiency units
- *Factory-built homes*

Meet HUD and HCD requirements

- Manufactured housing
- Mobile home
- *Factory-built homes*

Meet ANSI and NFPA standards

- RVs
- Park trailers

Energy Code Definitions

Newly constructed building

- Building that has never been used or occupied for any purpose

Addition

- Any change to existing building that increases conditioned floor area (CFA) and conditioned volume
- **Newly conditioned space**
  - Any space being converted from unconditioned space to directly or indirectly conditioned space

Alteration

- Any change to building components with requirements in the Energy Code

ADU Scenarios

Attached ADU

- Connected to the existing dwelling
  - Common wall, ceiling, floor
- Addition - newly constructed or newly conditioned space
- Alteration - previously conditioned space
- Never considered newly constructed building

Detached ADU

- Separate from the existing dwelling
  - No shared walls, ceilings, floors
- Newly constructed - built from the ground up
- Addition - newly conditioned space

ADU Scenarios Addition

1. **A new ADU is built sharing a common wall with an existing home**
   - Addition
   - Shares common wall
   - Increases CFA and volume

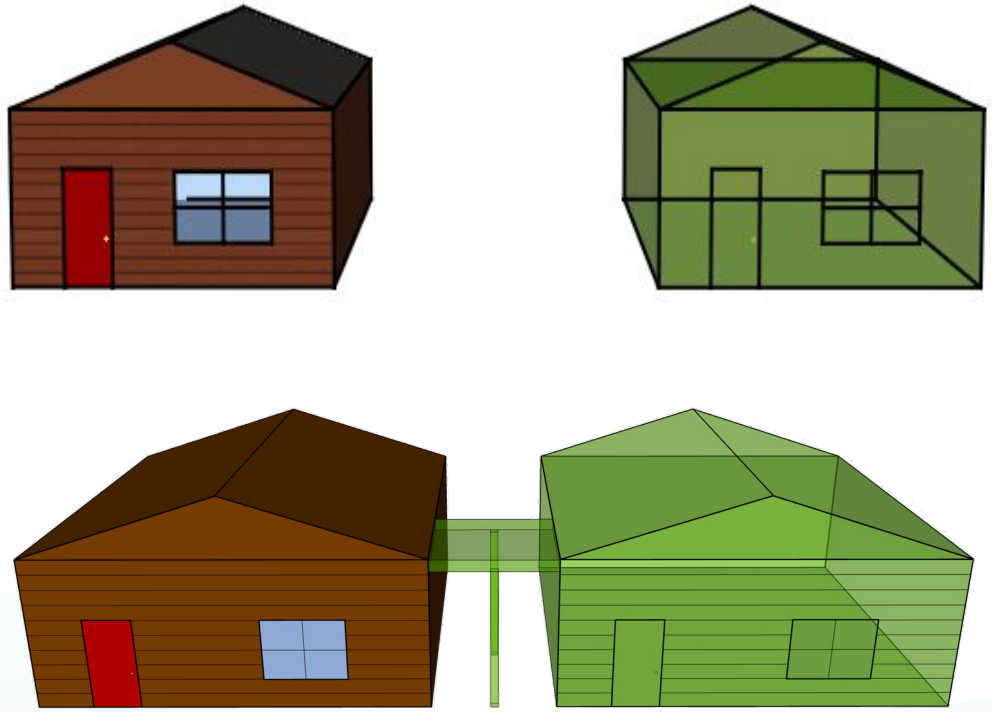
2. **Converting an existing attached unconditioned garage to an ADU**
   - Addition
   - Shares common wall
   - Increases CFA and volume in existing garage

ADU Scenarios Addition

3. **Converting existing detached unconditioned structure to ADU**
   - Addition
   - Increases CFA and volume in existing garage
4. **Building ADU on top of detached garage**
   - Addition
   - Shares common ceiling/floor
   - Increases CFA and volume in existing garage

ADU Scenarios
New Construction

1. **ADU built new, detached from the existing home**
   - Newly constructed building
2. **ADU built new, attached to existing home by breezeway or covered walkway**
   - Newly constructed building
   - No shared common wall or adjacent ceiling/floor



ADU Scenario Alteration

1. **Converting existing conditioned space, like conditioned basement, into ADU or junior ADU**
   - Alteration
   - May trigger additional requirements if altering components
     - Water heater, HVAC system, lighting, envelope, etc.

ASHRAE 62.2

Note: Alterations to components that previously met any requirements of ASHRAE 62.2 must continue to meet requirements upon completion of the alterations

2019 Energy Code ADUs - Additions

§150.2(a)

Envelope Fenestration Prescriptive Requirements

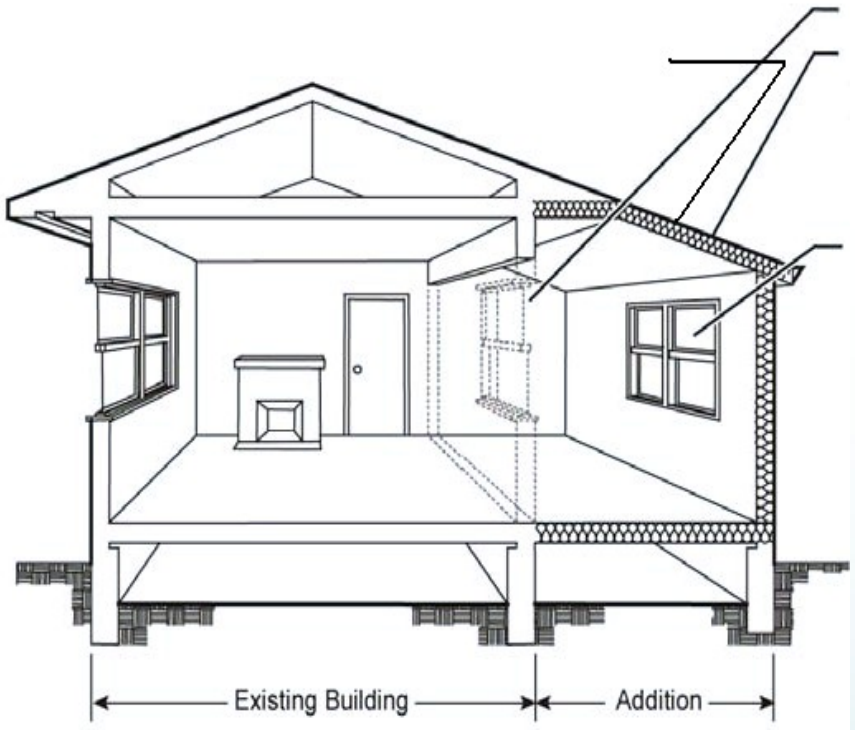
§150.2(a)1

New windows, skylights, and glazed doors meet § 150.1(c) with modifications

Addition Square Feet	Max Total Fenestration Area	Max West-Facing Area Climate Zones 2, 4, 6-15
Over 700	The larger of 175 ft^2 or 20% CFA	70
401 to 700	The larger of 120 ft^2 or 25% CFA	60
400 or less	The larger of 75 ft^2 or 30% CFA	60

Envelope Insulation Prescriptive Requirements

§150.2(a)1



All additions

- Wall extensions, and existing walls where existing siding is unaltered
  - R-21 in 2x6 wood-framed, no continuous
  - R-15 in 2x4 wood-framed, no continuous
  - QII exceptions
    - No insulated headers for existing doors and windows
    - No air sealing if existing air barrier not altered

Additions ≤ 700 square feet

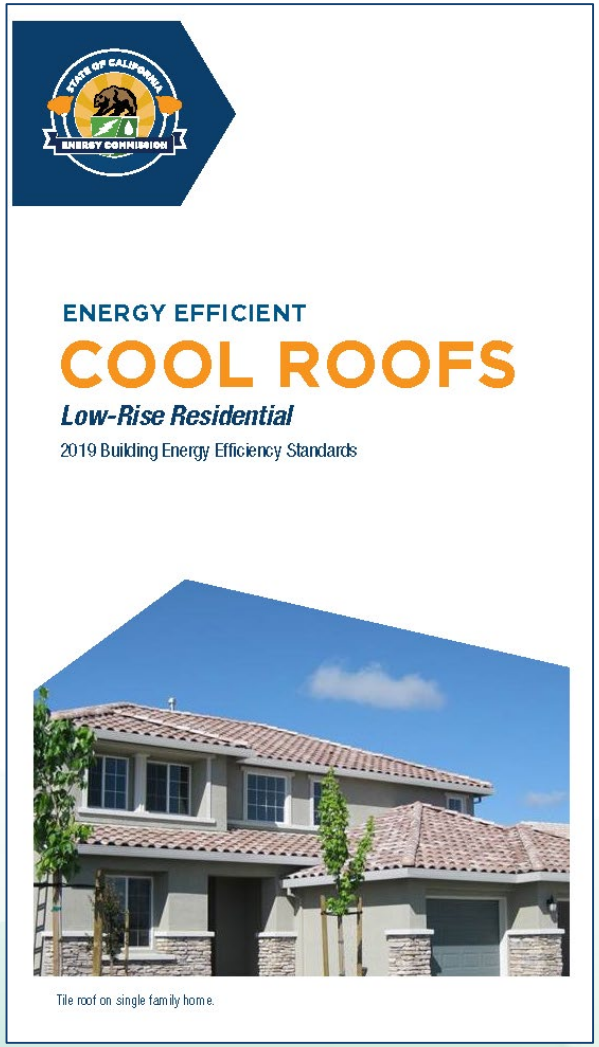
- Ceiling insulation
  - R-38 in climate zones 1,11-16
  - R-30 in climate zones 2-10
  - Radiant barrier in climate zones 2-15
  - Exception: R-22 allowed in rafter roofs
- QII not required

Envelope Roofing Prescriptive Requirements

§ § 150.2(a)1, 150.1(c)11

Additions more than 300 square feet

- New portion of roof must meet aged solar reflectance (SR) and thermal emittance (TE)
- Low-sloped roofs climate zones 13, 15
  - Minimum aged SR 0.63
  - Minimum TE 0.75
- Steep-sloped roofs in climate zones 10-15
  - Minimum aged SR 0.20
  - Minimum TE 0.75
- Multiple exceptions



Space Conditioning Mandatory Requirements

§ § 150.2(a)1, 150.0(m)

Completely new space conditioning systems (ducting and equipment)

- Duct insulation
- HERS testing
  - Leakage testing
  - Airflow and fan efficacy
  - Refrigerant charge in climate zones 2, 8-15
- Air filtration
  - **Mandatory** MERV 13 filters

Ventilation Mandatory Requirements

§ § 150.2(a)1, 150.0(o)

Mechanical ventilation for indoor air quality

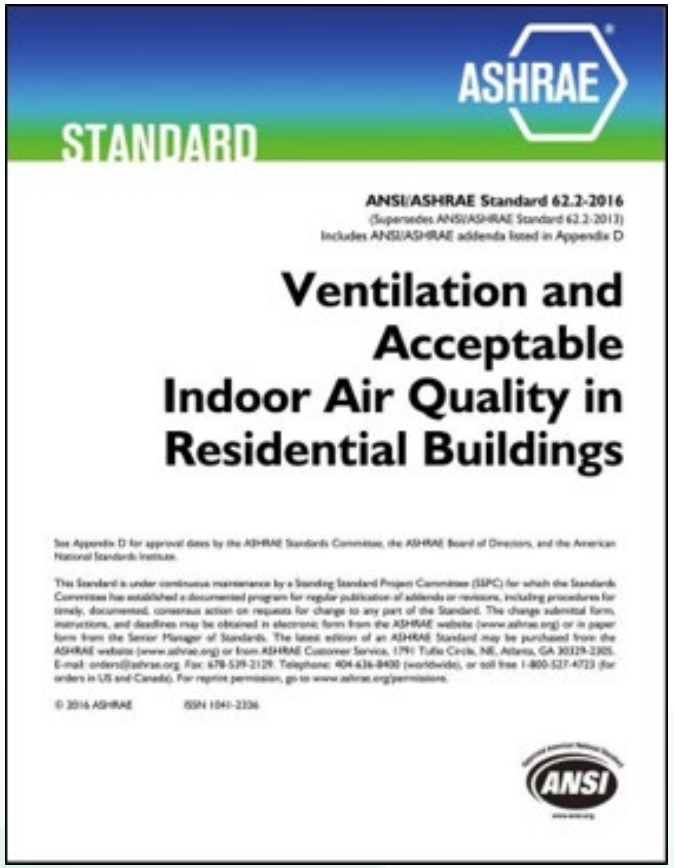
- **Additions which add a new dwelling unit** to existing building must meet **mandatory** ventilation requirements
  - 150.0(o)1C for single family detached
  - 150.0(o)1E for multifamily with individual dwelling unit ventilation systems
  - 150.0(o)1F for multifamily with central ventilation systems

Ventilation Mandatory Requirements

§ § 150.2(a)1C, 150.0(o)

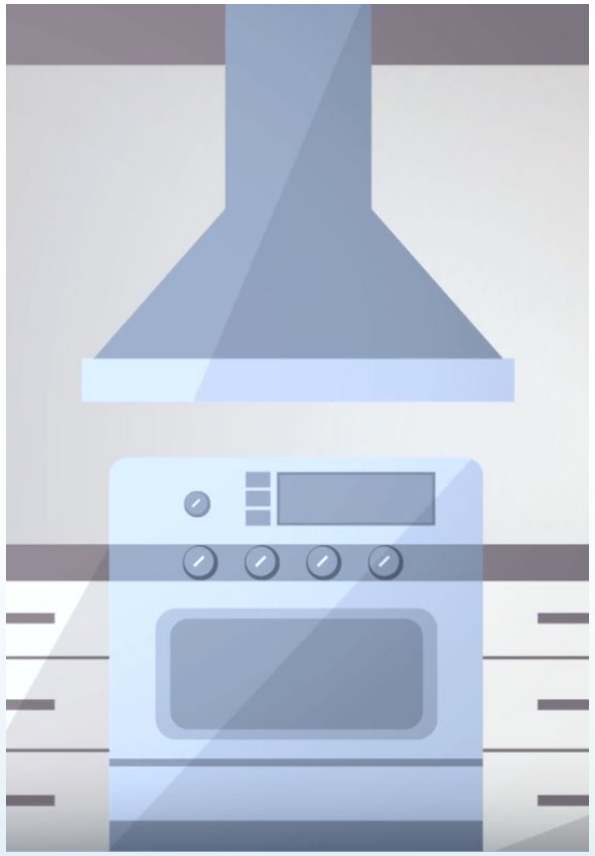
All new dwelling units must meet ASHRAE 62.2

- 2019 Equation 150.0-B
  - Q_{tot} = **0.03** x A_{floor} + 7.5 x (Nbr + 1)
    - Q_{tot} = total required ventilation rate, cfm
    - A_{floor} = dwelling-unit floor area, ft^2
    - Nbr = number of bedrooms (not less than 1)
- Bathroom local exhaust requirements
  - 50 CFM intermittent fan in bathrooms
    - Manually controlled



Ventilation Mandatory Requirements

Residential § 150.0(o)1G, 2B



Kitchen vented range hoods

- HERS verification of airflow and sound ratings
  - HVI or AHAM
- Minimum airflow of 100 CFM
- Maximum sone rating of 3.0
  - Fans over 400 CFM exempt

Other kitchen exhaust fans

- Includes downdraft
- Minimum airflow of 300 CFM
- Enclosed kitchens – option 300 CFM or 5 ACH

ASHRAE 62.2

Enclosed kitchen:
kitchen whose permanent openings to interior adjacent spaces do not exceed 60 square feet in total

Water Heating Prescriptive Requirements

§ § 150.2(a)1, 150.1(c)8

Gas or propane

- Instantaneous water heater, no storage
- Storage water heater allowed
  - Additional efficiency measures
- Heat pump ready measures

Electric

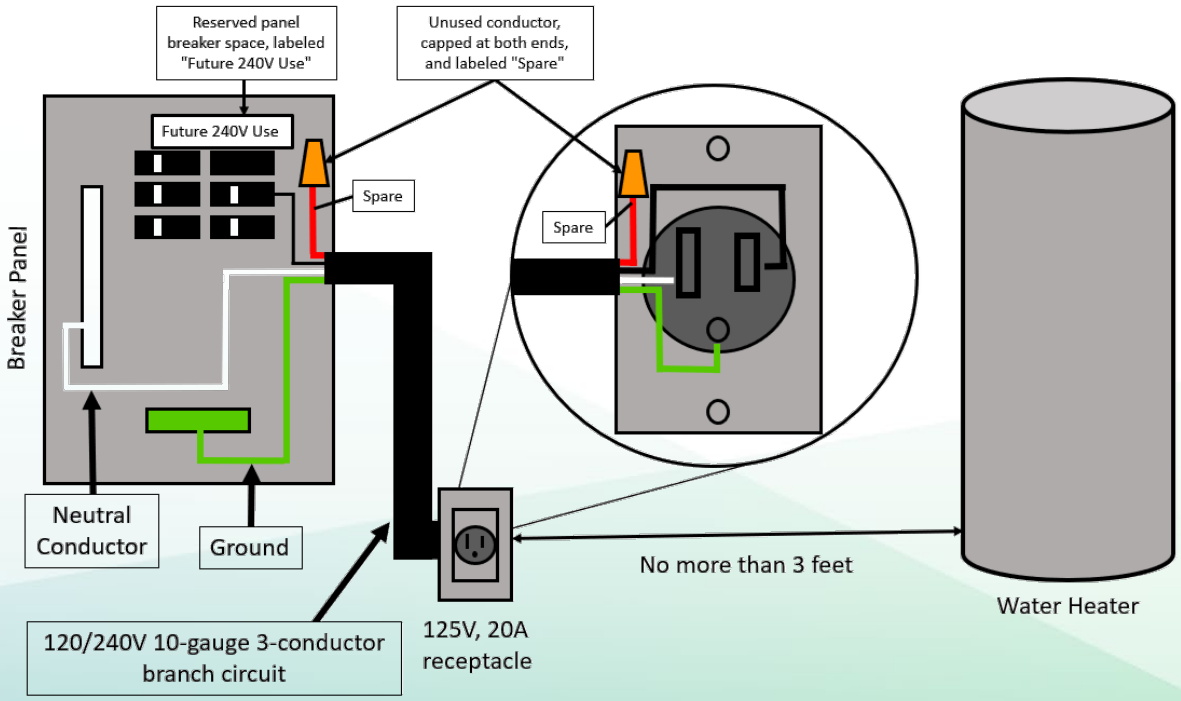
- Heat pump water heaters allowed
- High efficiency or additional measures
- Must be located indoors

Water Heating Mandatory Requirements

Residential § 150.0(n)

High efficiency water heater ready requirements

- Allows for simple and cost-effective installation of heat pump water heaters as a replacement
- Dwellings with gas or propane water heaters
  - Dedicated 125 volt, 20 amp receptacle
  - 3 conductor, 10 AWG copper branch circuit
  - Within 3 feet of water heater
  - Labeled “Future 240V Use”



Lighting Mandatory Requirements

§ § 150.2(a)1, 150.0(k)

- Newly installed and replaced hardwired lighting, indoor and outdoor, must be high efficacy
  - Table 150.0-A or JA8-2019
- JA8-2019-E required
  - Recessed downlights, no screw base
  - Enclosed luminaires
- JA8 light sources must have a dimmer or vacancy sensor
- JA8-2016 still acceptable
- All indoor general lighting LEDs must be JA8 certified

2019 Energy Code
ADUs – New Construction

Quality Insulation Installation Prescriptive Requirements

§150.1(c)1E

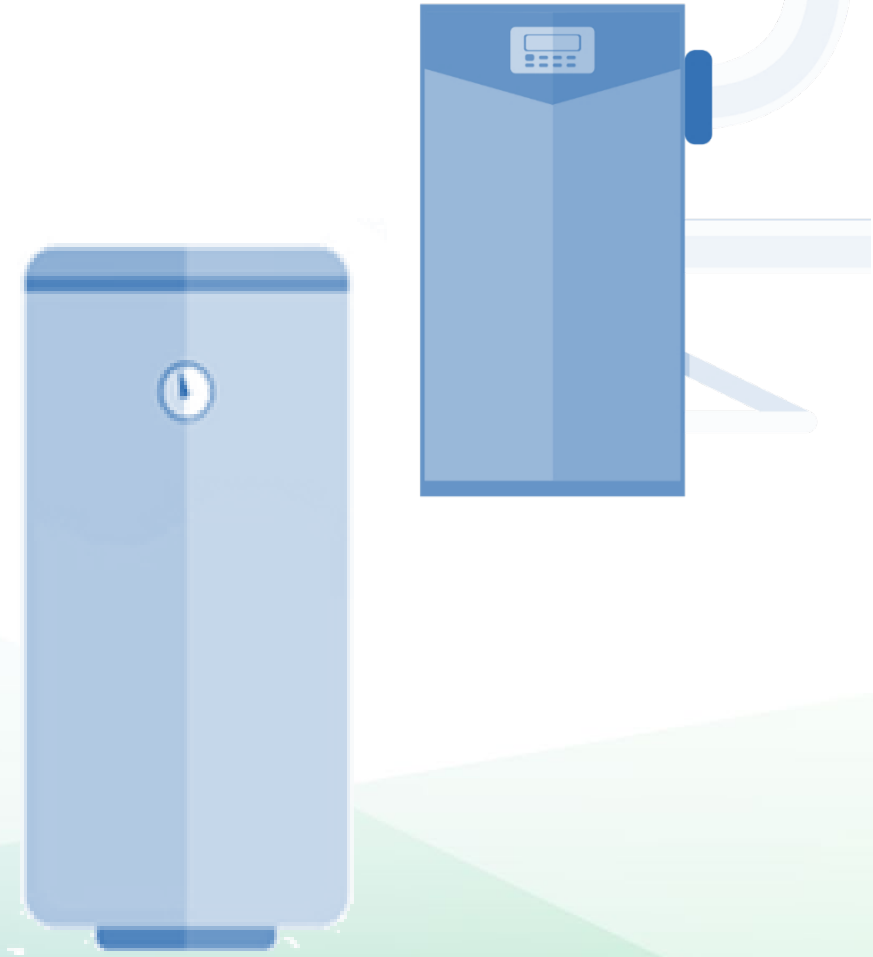
Quality insulation installation (QII)

- Requires HERS verification of installed insulation and exterior air barrier
- Meet criteria in Reference Residential Appendix RA3.5
- Not mandatory, but difficult to offset
- Modeling without can have 7-11% penalty

2019 Prescriptive Paths

Two parallel prescriptive paths for compliance

1. Mixed fuel homes
   - Gas water heater and furnace
2. All-electric homes
   - Heat pump space conditioners meet prescriptive compliance requirements
   - NEEA Tier 3 heat pump water heater models meet or exceed water heater baseline efficiencies

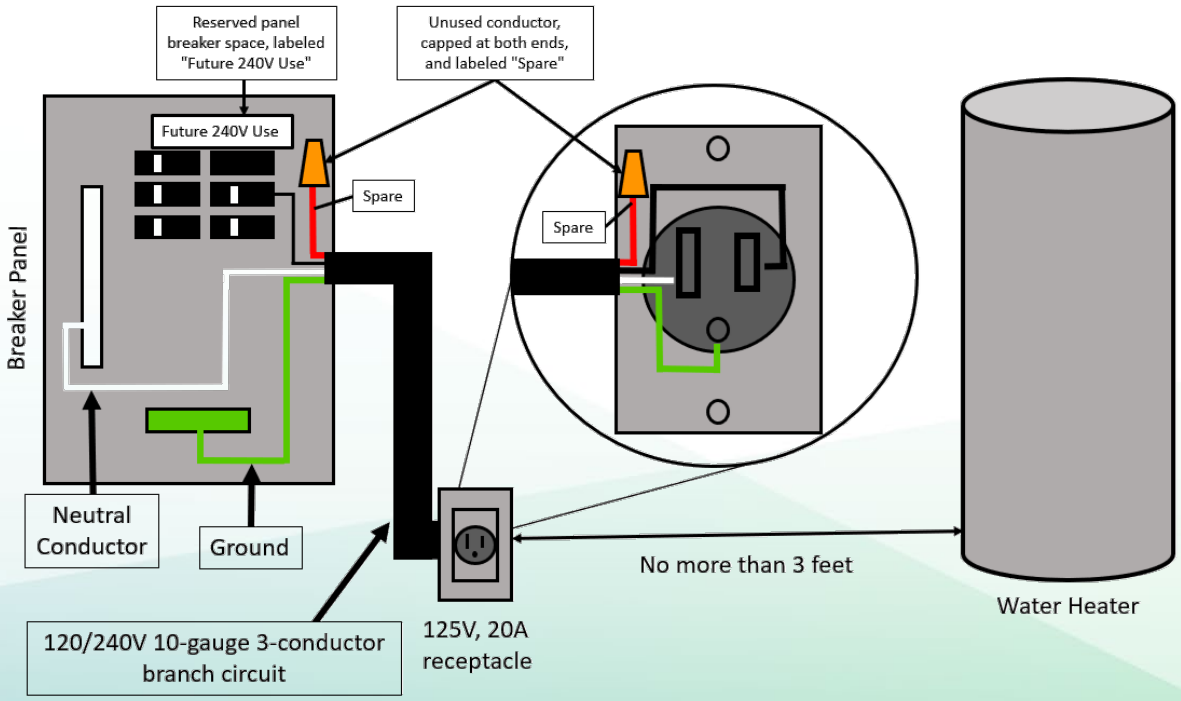


Water Heating Mandatory Requirements

Residential § 150.0(n)

High efficiency water heater ready requirements

- Allows for simple and cost-effective installation of heat pump water heaters as a replacement
- Dwellings with gas or propane water heaters
  - Dedicated 125 volt, 20 amp receptacle
  - 3 conductor, 10 AWG copper branch circuit
  - Within 3 feet of water heater
  - Labeled “Future 240V Use”



Water Heating Prescriptive Requirements

§150.1(c)8A

Options for gas or propane serving individual dwelling units

- Instantaneous water heater, no storage
- Storage water heater ≤ 75,000 Btu per hour and volume ≤ 55 gallons
  - Installed fenestration products must have maximum weighted average U-factor 0.24 and field verified compact distribution system or drain water heat recovery system
- Storage water heater ≤ 75,000 Btu per hour and volume > 55 gallons
  - US DOE has higher efficiency requirements over 55 gallons

Water Heating Prescriptive Requirements

Residential § 150.1(c)8A

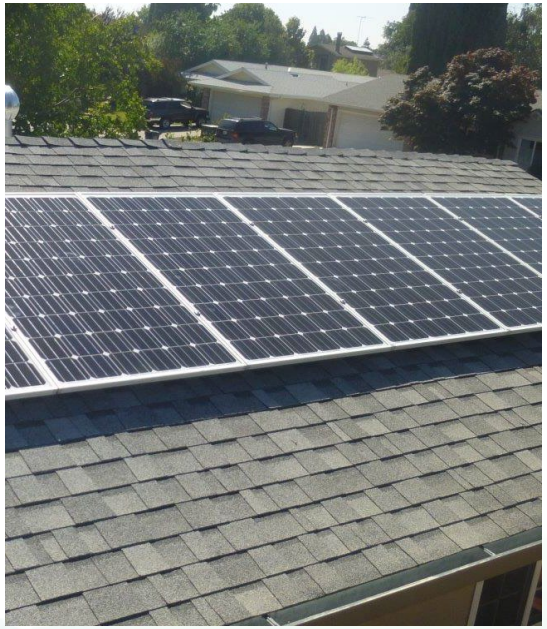
Heat pump systems serving individual dwelling units

- Added as prescriptive compliance option
- Located in garage or conditioned space
- Must comply with **one**
  1. NEEA Advanced Water Heater Specification Tier 3 or higher
     - Plus in climate zones 1, 16: increase PV system by 0.3 kWdc or compact hot water distribution
  2. Compact hot water distribution and drain water heat recovery
  3. Climate zones 2-15: increase PV system by 0.3 kWdc
  4. Climate zones 1, 16: increase PV system by 1.1 kWdc

Photovoltaic Prescriptive Requirements

Residential § 150.1(c)14

- PV systems sized to offset annual kWhs of mixed-fuel home
- Meet requirements in Reference Joint Appendix JA11
  - Verification of number of panels, panel type, size, orientation, tilt, and shading
  - Use available solar access tools
  - Remote monitoring capability required, with mobile app
- Heavily shaded buildings exempt
- Disaster area rebuilds under AB 178 exempt (2019)



Photovoltaic Prescriptive Requirements

§150.1(c)14

- Exceptions for shading and limited roof solar access areas
- Installation location options:
  - On ADU
  - On existing primary dwelling or other structures on site
  - Ground mounted
  - No limitation
- Energy Code does not require new meter, though utility company may
- Existing panels cannot be used to meet new ADU's PV system requirement
  - Panels can be added to an existing system
  - Panels must be new to meet requirements
- Community solar option approved for SMUD territories
  - Sacramento area

Modeling Tips for ADUs

CBECC-Res Modeling

User Manual

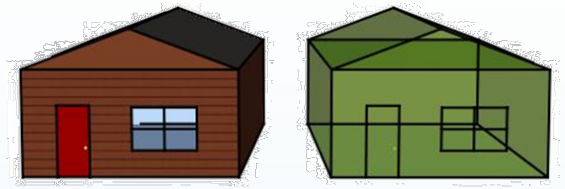
- Chapter 4 - Project
  - Section 4.10 - ADUs
  - Section 4.11 - Indoor air quality
- Chapter 10 - Additions and alterations
  - Section 10.2 - ADUs
  - Section 10.7 - Existing wall exceptions

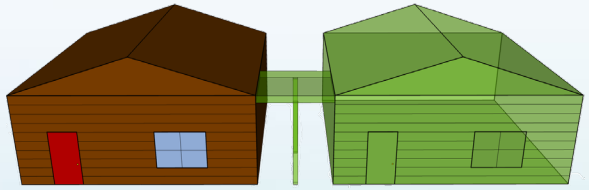
CBECC-Res Modeling

Determine if ADU is a newly constructed building, addition, or alteration

New Construction

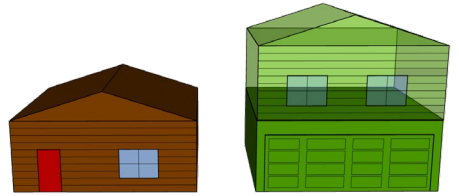
Detached New Building





Additions

Attached

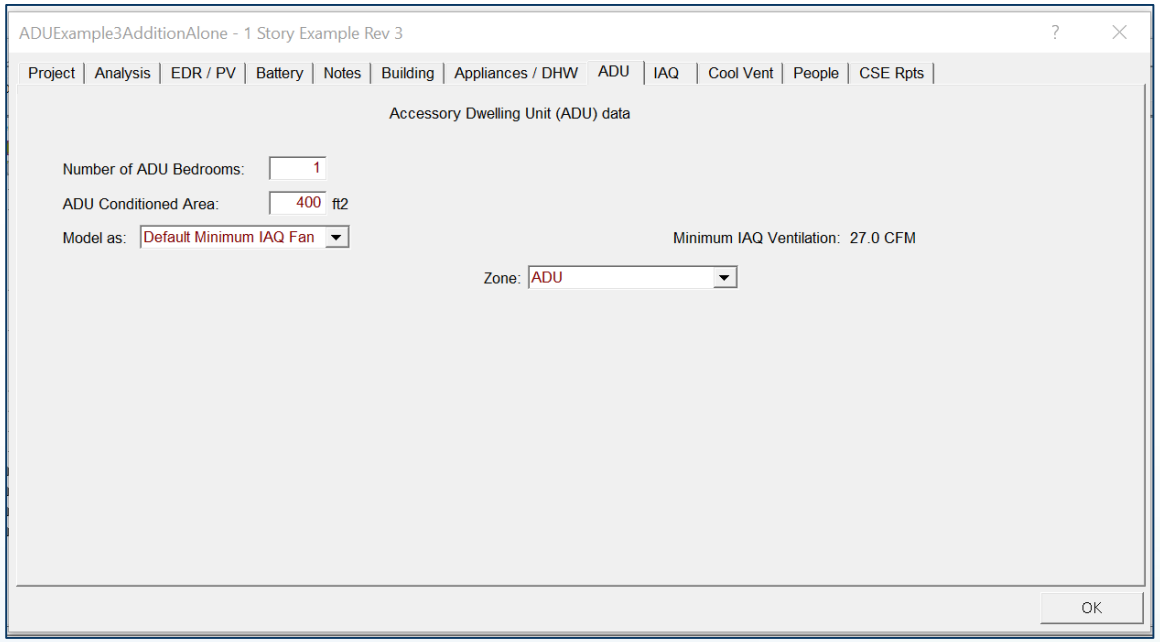


Attached Conversion

Detached Conversion

CBECC-Res Modeling

Addition or Alteration



ADU is modeled as addition

- ADU attached to home
  - Identify ADU as addition alone (AA) or existing plus addition (EAA)
  - Input existing building details
  - Use ADU tab for ADU details
- ADU is converted space - attached or detached
  - Identify ADU as AA or EAA
  - Input existing building details
  - Use ADU tab for ADU details

CBECC-Res Modeling

New Construction

ADU is modeled as new construction

- ADU is detached and newly built
  - Do not use ADU tab options
  - Does not calculate IAQ correctly
  - CBECC-Res 1.2 or later will give error message
- Constructing a new home plus new ADU at same time
  - Input primary dwelling details
  - Use ADU tab for ADU details
    - NOTE: This is the only new construction option that will allow ADU tab when using CBECC-Res 1.2 or later

Compliance Software Support

2019 CBECC-Res Software Manual

https://www.energy.ca.gov/sites/default/files/2020-04/CBECC-Res_User-Manual_ada.pdf

CBECC-Res

cbecc.res@gmail.com

EnergyPro

support@energysoft.com

Wrightsoft Right-Energy Title 24

support@wrightsoft.com

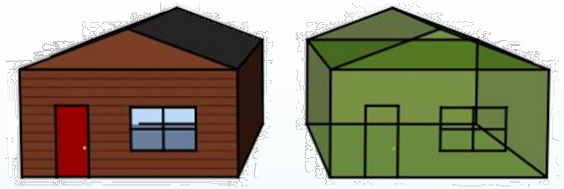
Plan Check and Inspection

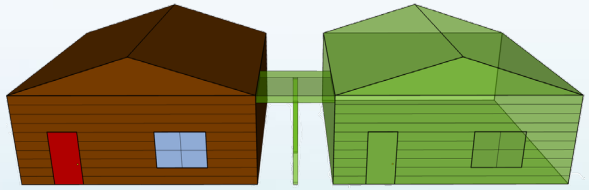
Plan Check

Determine if building is a newly constructed building, addition, or alteration

New Construction

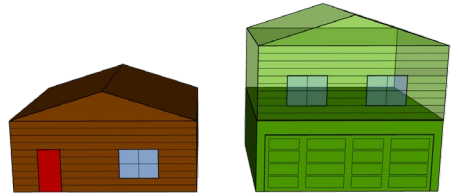
Detached New Building





Additions

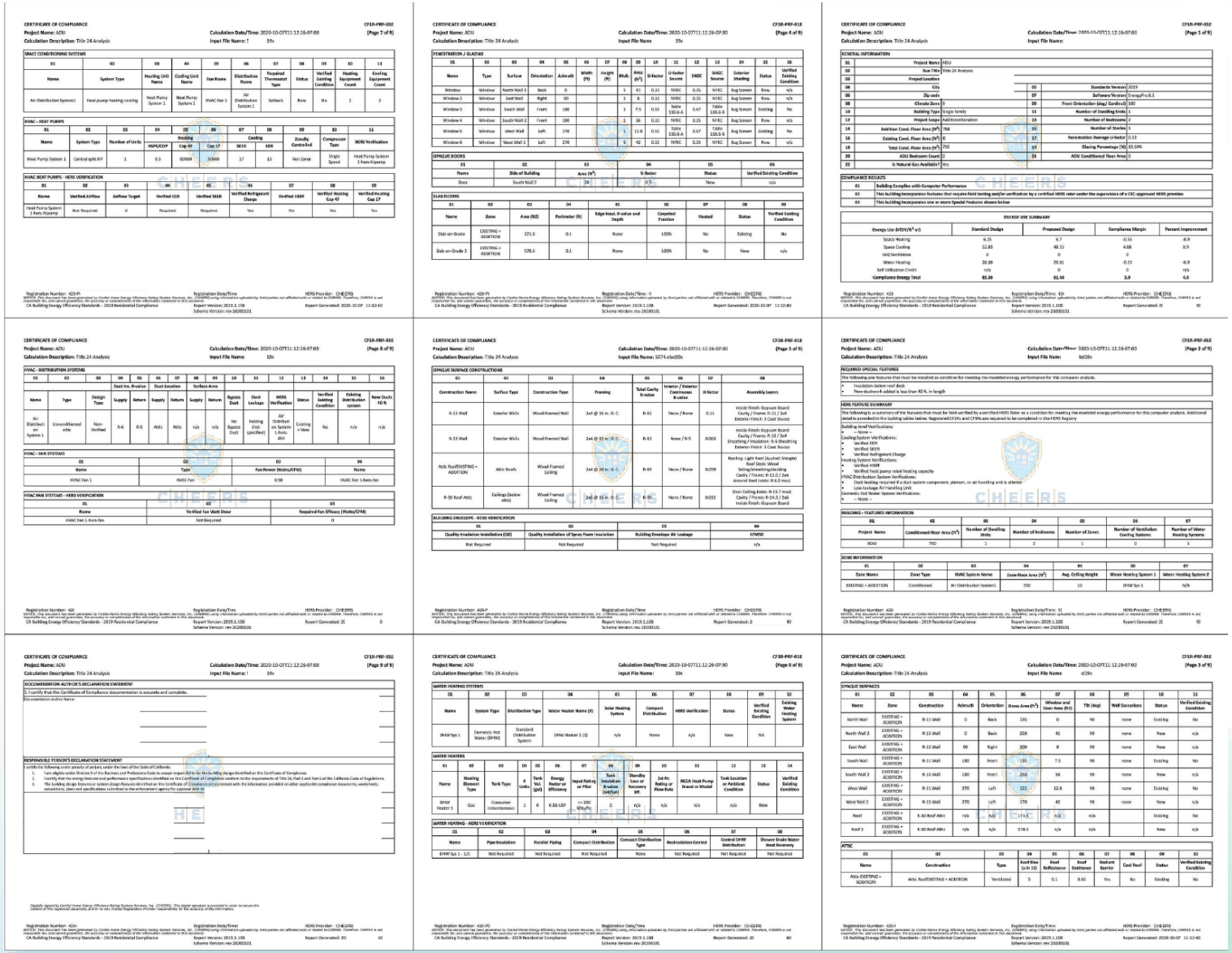
Attached



Attached Conversion

Detached Conversion

Plan Check



CERTIFICATE OF COMPLIANCE | CF1R-PRF-01E
Project Name: ADU | Calculation Date/Time: 2020-10-07T11:12:26-07:00 | (Page 1 of 9)
Calculation Description: Title 24 Analysis | Input File Name:

This is just a title

GENERAL INFORMATION						
01	Project Name	ADU				
02	Run Title	Title 24 Analysis				
03	Project Location					
04	City				Standards Version	2019
06	Zip code				Software Version	EnergyPro 8.1
08	Climate Zone	9			Front Orientation (deg/ Cardinal)	180
10	Building Type	Single family		11	Number of Dwelling Units	1
12	Project Scope	AdditionAlteration		13	Number of Bedrooms	2
14	Addition Cond. Floor Area (ft²)	750		15	Number of Stories	1
16	Existing Cond. Floor Area (ft²)	0		17	Fenestration Average U-factor	0.32
18	Total Cond. Floor Area (ft²)	750		19	Glazing Percentage (%)	19.64%
20	ADU Bedroom Count	0		21	ADU Conditioned Floor Area	0
22	Is Natural Gas Available?	Yes				

When "AdditionAlteration" selected, existing CFA cannot be 0.

When "AdditionAlteration" ADU bedroom & CFA CANNOT be zero

COMPLIANCE RESULTS	
01	Building Complies with Computer Performanc...
02	This building incorporates features that requi... a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	This building incorporates one or more Special Features shown below

ENERGY USE SUMMARY				
Energy Use (kTDV/ft²-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	6.15	6.7	-0.55	-8.9
Space Cooling	52.83	48.15	4.68	8.9
IAQ Ventilation	0	0	0	
Water Heating	26.38	26.61	-0.23	-0.9
Self Utilization Credit	n/a	0	0	n/a
Compliance Energy Total	**85.36**	**81.46**	**3.9**	**4.6**

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- Insulation below roof deck
- New ductwork added is less than 40 ft. in length

HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the buildng tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- -- None --

Cooling System Verifications:
- Verified EER
- Verified SEER
- Verified Refrigerant Charge

Heating System Verifications:
- Verified HSPF
- Verified heat pump rated heating capacity

HVAC Distribution System Verifications:
- Duct Sealing required if a duct system component, plenum, or air handling unit is altered
- Low-leakage Air Handling Unit

Domestic Hot Water System Verifications:
- -- None --

What mandatory HERS measure is missing?

- IAQ ventilation
- Required 100% of the time for ADUs

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft^2)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
ADU	750	1	2	1	0	1

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft^2)	Avg. Ceiling Height	Water Heating System 1	Water Heating System 2
EXISTING + ADDITION	Conditioned	Air Distribution System1	750	10	DHW Sys 1	N/A

GENERAL INFORMATION					
01	Project Name	Example ADU			
02	Run Title	1 Story Example Rev 3			
03	Project Location	1516 Ninth St			
04	City	Sacramento, CA	05	Standards Version	2019
06	Zip code	95814	07	Software Version	CBECC-Res 2019.1.3
08	Climate Zone	12	09	Front Orientation (deg/ Cardinal)	0
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	AdditionOnly	13	Number of Bedrooms	4
14	Addition Cond. Floor Area (ft^2)	400	15	Number of Stories	1
16	Existing Cond. Floor Area (ft^2)	2100	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft^2)	2500	19	Glazing Percentage (%)	26.09%
20	ADU Bedroom Count	1	21	ADU Conditioned Floor Area	400
22	Is Natural Gas Available?	Yes			

"AdditionAlone" selected, existing CFA is entered

"AdditionAlone" ADU bedroom & CFA entered on ADU tab

Addition Alone Project Analysis Parameters					
01	02	03	04	05	06
Existing Area (excl. new addition) (ft2)	Addition Area (excl. existing) (ft2)	Total Area (ft2)	Existing Bedrooms	Addition Bedrooms	Total Bedrooms
2100	400	2500	3	1	4

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

ENERGY USE SUMMARY				
Energy Use (kTDV/ft^2-yr)	**Standard Design**	**Proposed Design**	**Compliance Margin**	**Percent Improvement**
Space Heating	31.64	40.74	-9.1	-28.8
Space Cooling	43.28	38.96	4.32	10
IAQ Ventilation	4.1	4.1	0	0
Water Heating	86.85	78.88	7.97	9.2
Self Utilization/Flexibility Credit	n/a	0	0	n/a
Compliance Energy Total	**165.87**	**162.68**	**3.19**	**1.9**

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- Cool roof
- Insulation below roof deck
- Window overhangs and/or fins

HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the buildng tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- Indoor air quality ventilation
- Kitchen range hood

Cooling System Verifications:
- -- None --

Heating System Verifications:
- -- None --

HVAC Distribution System Verifications:
- -- None --

Domestic Hot Water System Verifications:
- -- None --

IAQ ventilation
Kitchen range hood

Field Inspection

For Newly Constructed Buildings

- ADUs are no different than primary dwelling units
- Verify HERS inspections complete
- Verify all forms are registered
- Ask for Project Status Report

For Additions

- Require HERS verification 100% of the time
- Verify all forms are registered
- Ask for Project Status Report
- Ensure IAQ fan is installed,
  - Listed and complete on Project Status Report
- If gas water heater, ensure heat pump ready measures

CHEERS

CalCERTS, Inc.
HERS PROVIDER

Project Status Report

PROJECT STATUS REPORT — CalCERTS, Inc
Effective 09/23/2021 11:06 — (Page 1 of 3)

GENERAL INFORMATION

Energy Standards Code Year:	2019
Project Name:	Smith Residence SFR
Project Type:	New Construction SFR
Address:	1111 Unicorn Lane
City/State/Zip:	CalCERTSville / CA / 00000
Enforcement Agency:	City of CalCERTSville
Permit Number:	Permit 888
OVERALL STATUS	NOT COMPLETE
HERS VERIFIABLE MEASURES:	COMPLETE

Easy to Verify @ calcerts.com

CF1R INFORMATION - Certificate of Compliance (Document Lists Required Energy Features) ✓

Certificate Type	Compliance
Registered Form	CF1R-PRF-01
Registered Date	2021-09-23 10:40:39
Registration Number	221-P010199851A-000-000-0000000-0000

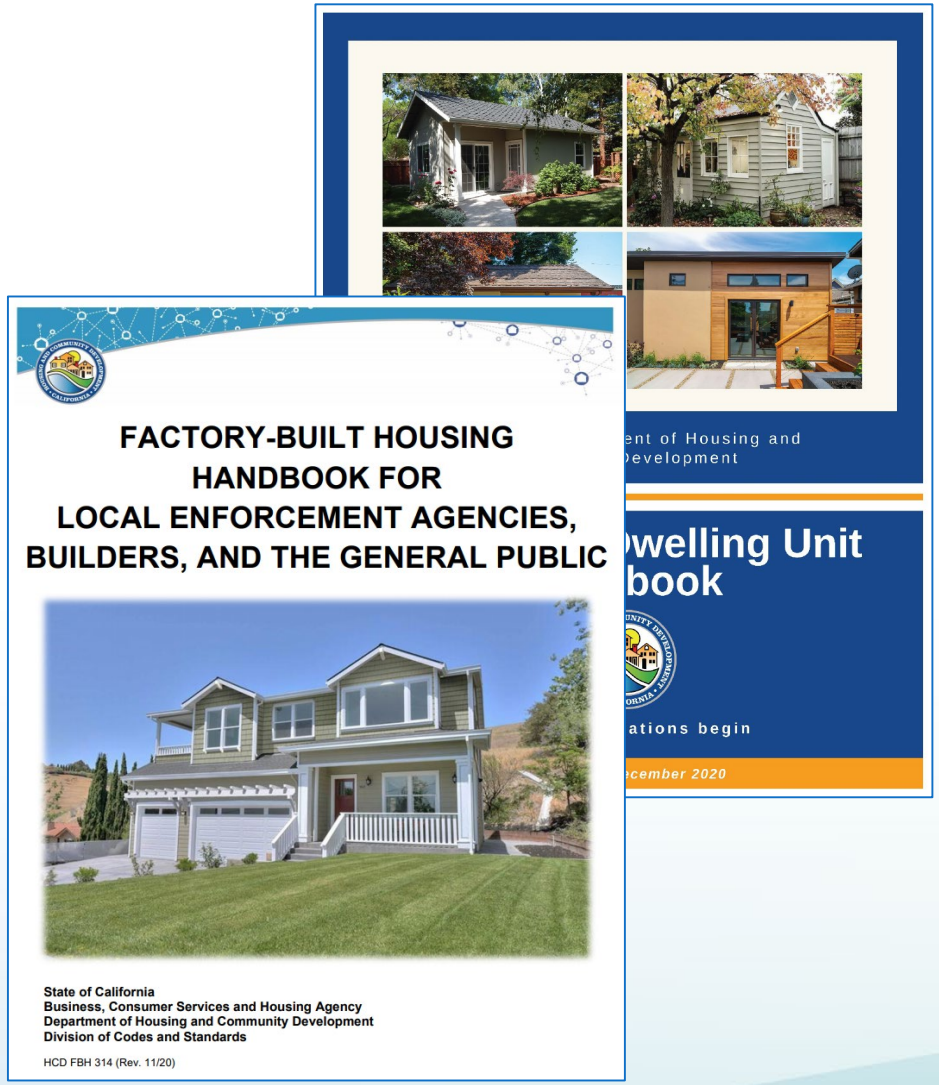
CF2R INFORMATION - Certificate of Installation (Documents the proper installation of required energy features)

System	Form	Registered Date	Registration Number	
	CF2R-ENV-01-E Fenestration Installation	2021-09-23 10:57:46	221-P010199851A-000-001-E01001A-0000 Johnny Installer (DEV INSTALLERS &)	✓
	CF2R-ENV-03-E Insulation Installation	2021-09-23 10:57:46	221-P010199851A-000-001-E03001A-0000 Johnny Installer (DEV INSTALLERS &)	✓
	CF2R-ENV-21-H QII-Framing Stage	2021-09-23 10:57:46	221-P010199851A-000-001-E21001A-0000 Johnny Installer (DEV INSTALLERS &)	✓
	CF2R-ENV-22-H QII-Insulation Installation	2021-09-23 10:57:46	221-P010199851A-000-001-E22001A-0000 Johnny Installer (DEV INSTALLERS &)	✓
	CF2R-LTG-01-E Lighting	2021-09-23 10:57:47	221-P010199851A-000-001-L01001A-0000 Johnny Installer (DEV INSTALLERS &)	✓

- Summarizes status of all required forms
- Available for all projects registered with HERS provider
- Online access to registry
- Request hard copy at final inspection to verify compliance
- HERS and overall status marked **Complete** to pass inspection

Resources

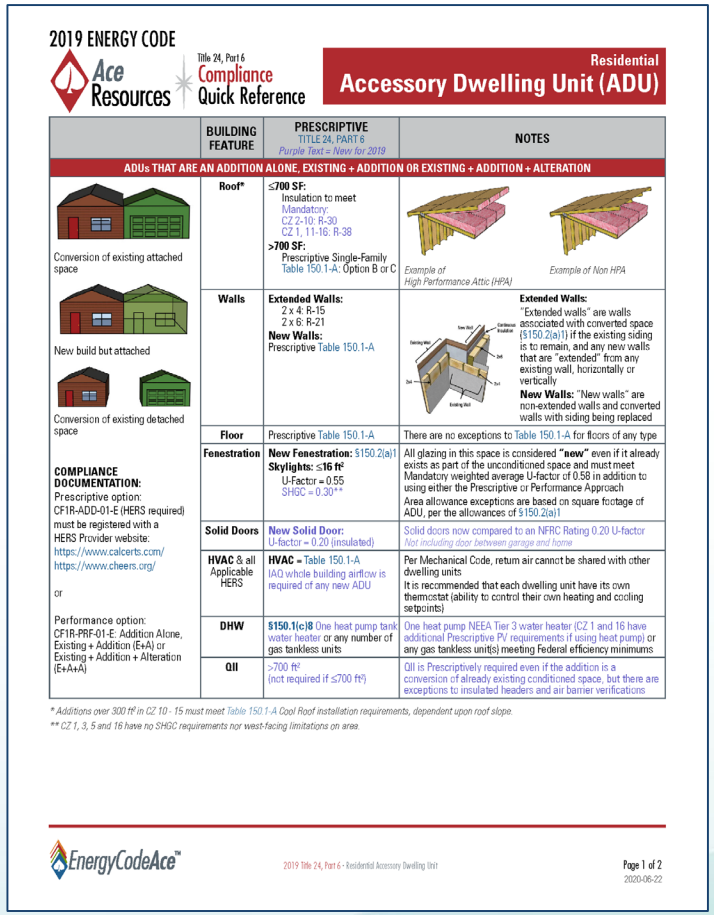
ADU Resources



- [HCD Accessory Dwelling Unit Handbook]
- [2016 HCD Tiny Homes Info Bulletin]
- [HCD Factory Built Housing Handbook]

ADU Resources

- Quick Reference Sheet: Residential Accessory Dwelling Units 2019



2019 ENERGY CODE

Ace Resources | Title 24, Part 6 Compliance Quick Reference

Residential

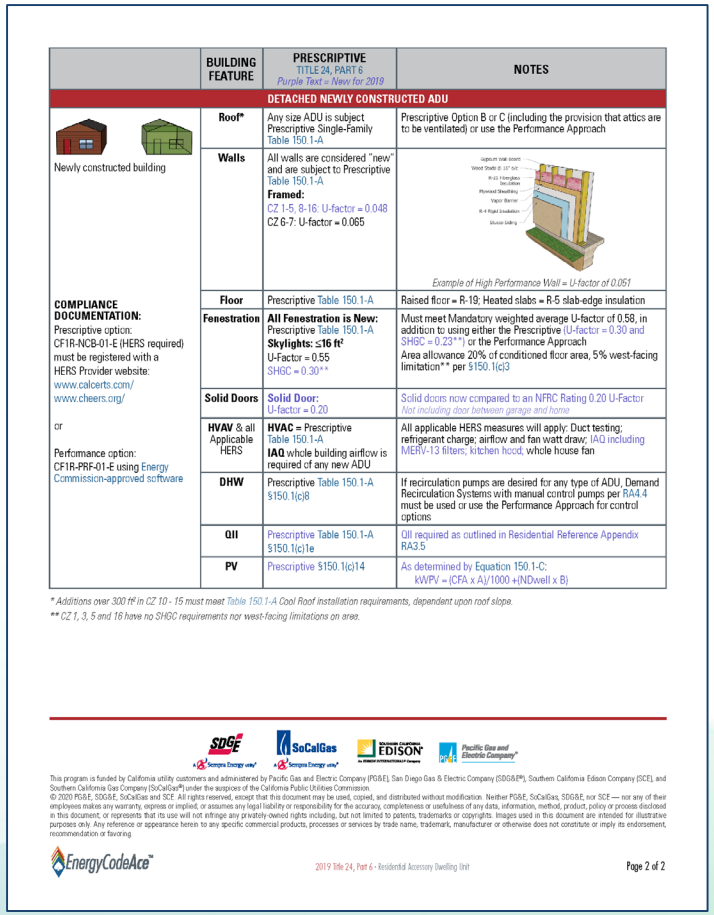
Accessory Dwelling Unit (ADU)

	BUILDING FEATURE	PRESCRIPTIVE TITLE 24, PART 6 *Purple Text = New for 2019*	NOTES
ADUs THAT ARE AN ADDITION ALONE, EXISTING + ADDITION OR EXISTING + ADDITION + ALTERATION			
Conversion of existing attached space New build but attached Conversion of existing detached space **COMPLIANCE DOCUMENTATION:** Prescriptive option: CF1R-ADD-01-E (HERS required) must be registered with a HERS Provider website: https://www.calcerts.com/ https://www.cheers.org/ or Performance option: CF1R-PRF-01-E: Addition Alone, Existing + Addition (E+A) or Existing + Addition + Alteration (E+A+A)	**Roof***	**≤700 SF:** Insulation to meet Mandatory: CZ 2-10: R-30 CZ 1, 11-16: R-38 **>700 SF:** Prescriptive Single-Family Table 150.1-A: Option B or C	*Example of High Performance Attic (HPA)* *Example of Non HPA*
	Walls	**Extended Walls:** 2 x 4: R-15 2 x 6: R-21 **New Walls:** Prescriptive Table 150.1-A	**Extended Walls:** "Extended walls" are walls associated with converted space (§150.2(a)1) if the existing siding is to remain, and any new walls that are "extended" from any existing wall, horizontally or vertically **New Walls:** "New walls" are non-extended walls and converted walls with siding being replaced
	Floor	Prescriptive Table 150.1-A	There are no exceptions to Table 150.1-A for floors of any type
	Fenestration	**New Fenestration:** §150.2(a)1 **Skylights: ≤16 ft²** U-Factor = 0.55 SHGC = 0.30**	All glazing in this space is considered **"new"** even if it already exists as part of the unconditioned space and must meet Mandatory weighted average U-factor of 0.58 in addition to using either the Prescriptive or Performance Approach Area allowance exceptions are based on square footage of ADU, per the allowances of §150.2(a)1
	Solid Doors	**New Solid Door:** U-factor = 0.20 (insulated)	Solid doors now compared to an NFRC Rating 0.20 U-factor *Not including door between garage and home*
	HVAC & all Applicable HERS	**HVAC** = Table 150.1-A IAQ whole building airflow is required of any new ADU	Per Mechanical Code, return air cannot be shared with other dwelling units It is recommended that each dwelling unit have its own thermostat (ability to control their own heating and cooling setpoints)
	DHW	**§150.1(c)8** One heat pump tank water heater or any number of gas tankless units	One heat pump NEEA Tier 3 water heater (CZ 1 and 16 have additional Prescriptive PV requirements if using heat pump) or any gas tankless unit(s) meeting Federal efficiency minimums
	QII	>700 ft² (not required if ≤700 ft²)	QII is Prescriptively required even if the addition is a conversion of already existing conditioned space, but there are exceptions to insulated headers and air barrier verifications

** Additions over 300 ft² in CZ 10 - 15 must meet Table 150.1-A Cool Roof installation requirements, dependent upon roof slope.*

*** CZ 1, 3, 5 and 16 have no SHGC requirements nor west-facing limitations on area.*

EnergyCodeAce™ 2019 Title 24, Part 6 - Residential Accessory Dwelling Unit Page 1 of 2 2020-06-22



	BUILDING FEATURE	PRESCRIPTIVE TITLE 24, PART 6 *Purple Text = New for 2019*	NOTES
DETACHED NEWLY CONSTRUCTED ADU			
Newly constructed building **COMPLIANCE DOCUMENTATION:** Prescriptive option: CF1R-NCB-01-E (HERS required) must be registered with a HERS Provider website: www.calcerts.com/ www.cheers.org/ or Performance option: CF1R-PRF-01-E using Energy Commission-approved software	**Roof***	Any size ADU is subject Prescriptive Single-Family Table 150.1-A	Prescriptive Option B or C (including the provision that attics are to be ventilated) or use the Performance Approach
	Walls	All walls are considered "new" and are subject to Prescriptive Table 150.1-A **Framed:** CZ 1-5, 8-16: U-factor = 0.048 CZ 6-7: U-factor = 0.065	*Example of High Performance Wall = U-factor of 0.051*
	Floor	Prescriptive Table 150.1-A	Raised floor = R-19; Heated slabs = R-5 slab-edge insulation
	Fenestration	**All Fenestration is New:** Prescriptive Table 150.1-A **Skylights: ≤16 ft²** U-Factor = 0.55 SHGC = 0.30**	Must meet Mandatory weighted average U-factor of 0.58, in addition to using either the Prescriptive (U-factor = 0.30 and SHGC = 0.23**) or the Performance Approach Area allowance 20% of conditioned floor area, 5% west-facing limitation** per §150.1(c)3
	Solid Doors	**Solid Door:** U-factor = 0.20	Solid doors now compared to an NFRC Rating 0.20 U-Factor *Not including door between garage and home*
	HVAV & all Applicable HERS	**HVAC** = Prescriptive Table 150.1-A **IAQ** whole building airflow is required of any new ADU	All applicable HERS measures will apply: Duct testing; refrigerant charge; airflow and fan watt draw; IAQ including MERV-13 filters; kitchen hood; whole house fan
	DHW	Prescriptive Table 150.1-A §150.1(c)8	If recirculation pumps are desired for any type of ADU, Demand Recirculation Systems with manual control pumps per RA4.4 must be used or use the Performance Approach for control options
	QII	Prescriptive Table 150.1-A §150.1(c)1e	QII required as outlined in Residential Reference Appendix RA3.5
	PV	Prescriptive §150.1(c)14	As determined by Equation 150.1-C: kWPV = (CFA x A)/1000 +(NDwell x B)

** Additions over 300 ft² in CZ 10 - 15 must meet Table 150.1-A Cool Roof installation requirements, dependent upon roof slope.*

*** CZ 1, 3, 5 and 16 have no SHGC requirements nor west-facing limitations on area.*

SDGE SoCalGas Southern California EDISON Pacific Gas and Electric Company

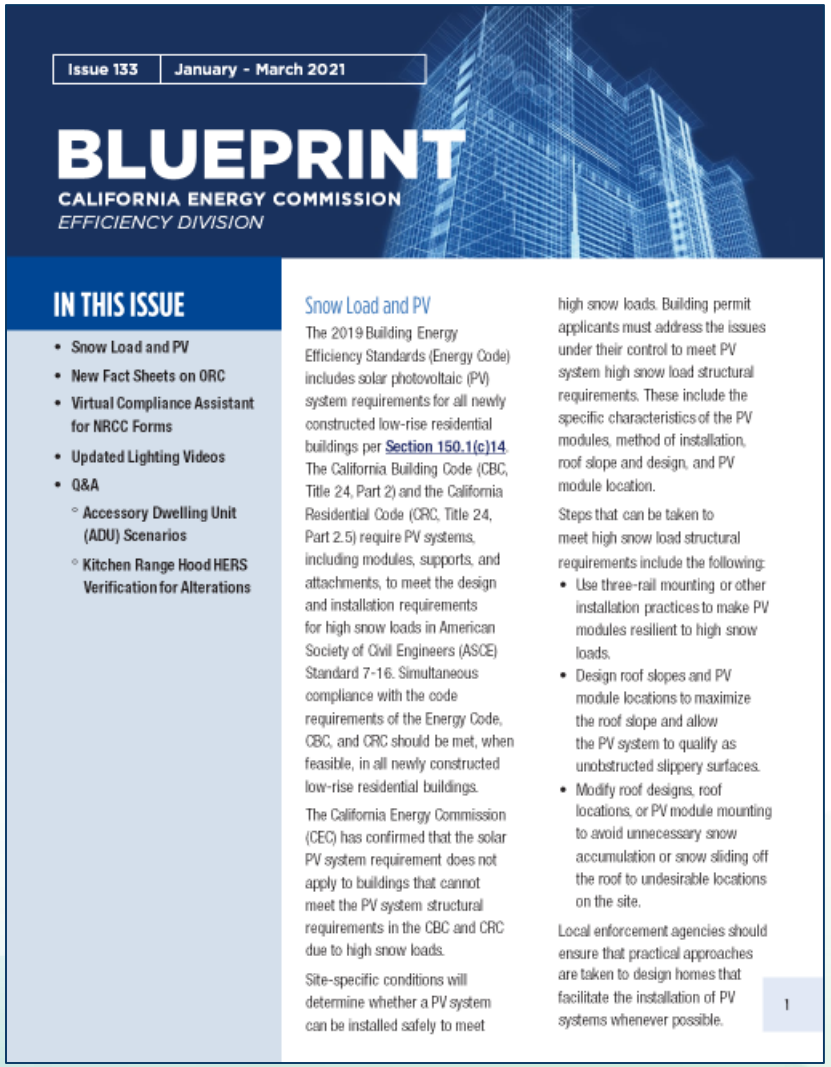
This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E®), Southern California Edison Company (SCE), and Southern California Gas Company (SoCalGas®) under the auspices of the California Public Utilities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

EnergyCodeAce™ 2019 Title 24, Part 6 - Residential Accessory Dwelling Unit Page 2 of 2

Blueprint Newsletter

Energy Code Newsletter

- Published quarterly
- Updates
- Clarifications
- Frequently asked questions
- ADU resources
  - BP #122
  - BP #123
  - BP #124
  - BP #127
  - BP #129
  - BP #130
  - BP #131
  - BP #132
  - BP #133
  - BP #134
  - BP #135



Issue 133 | January - March 2021

BLUEPRINT

CALIFORNIA ENERGY COMMISSION

EFFICIENCY DIVISION

IN THIS ISSUE

- Snow Load and PV
- New Fact Sheets on ORC
- Virtual Compliance Assistant for NRCC Forms
- Updated Lighting Videos
- Q&A
  - Accessory Dwelling Unit (ADU) Scenarios
  - Kitchen Range Hood HERS Verification for Alterations

Snow Load and PV

The 2019 Building Energy Efficiency Standards (Energy Code) includes solar photovoltaic (PV) system requirements for all newly constructed low-rise residential buildings per Section 150.1(c)14. The California Building Code (CBC, Title 24, Part 2) and the California Residential Code (CRC, Title 24, Part 2.5) require PV systems, including modules, supports, and attachments, to meet the design and installation requirements for high snow loads in American Society of Civil Engineers (ASCE) Standard 7-16. Simultaneous compliance with the code requirements of the Energy Code, CBC, and CRC should be met, when feasible, in all newly constructed low-rise residential buildings.

The California Energy Commission (CEC) has confirmed that the solar PV system requirement does not apply to buildings that cannot meet the PV system structural requirements in the CBC and CRC due to high snow loads.

Site-specific conditions will determine whether a PV system can be installed safely to meet high snow loads. Building permit applicants must address the issues under their control to meet PV system high snow load structural requirements. These include the specific characteristics of the PV modules, method of installation, roof slope and design, and PV module location.

Steps that can be taken to meet high snow load structural requirements include the following:

- Use three-rail mounting or other installation practices to make PV modules resilient to high snow loads.
- Design roof slopes and PV module locations to maximize the roof slope and allow the PV system to qualify as unobstructed slippery surfaces.
- Modify roof designs, roof locations, or PV module mounting to avoid unnecessary snow accumulation or snow sliding off the roof to undesirable locations on the site.

Local enforcement agencies should ensure that practical approaches are taken to design homes that facilitate the installation of PV systems whenever possible.

1

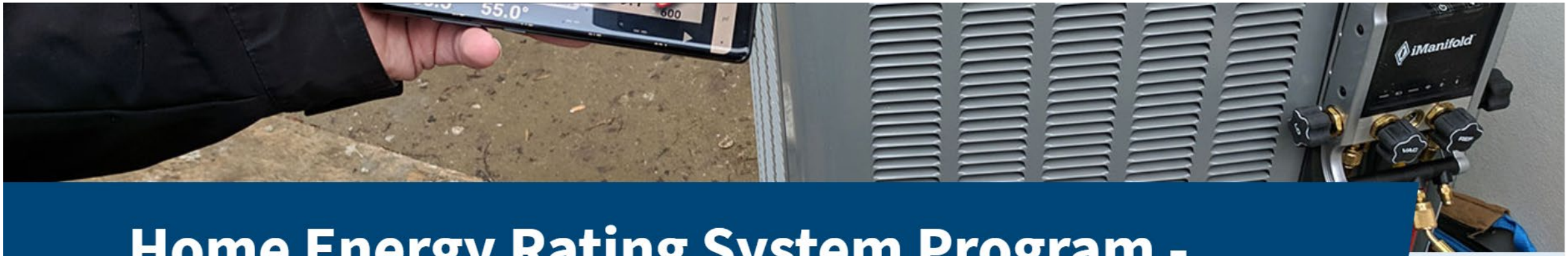
Online Resource Center

Online Resource Center

Educational documents and training information for building communities and enforcement agencies to assist with building energy standards compliance.

LEARN MORE >

2019 HERS Providers



Home Energy Rating System Program - HERS

The Home Energy Rating System (HERS) Program tests and rates the energy performance of a home. The California Energy Commission's HERS Program addresses construction defects and poor equipment installation, including HVAC systems and insulation. The Energy Commission has a list of approved HERS providers who train and certify raters.

SUBSCRIBE

Building Energy Efficiency Standards

First Name *

First Name

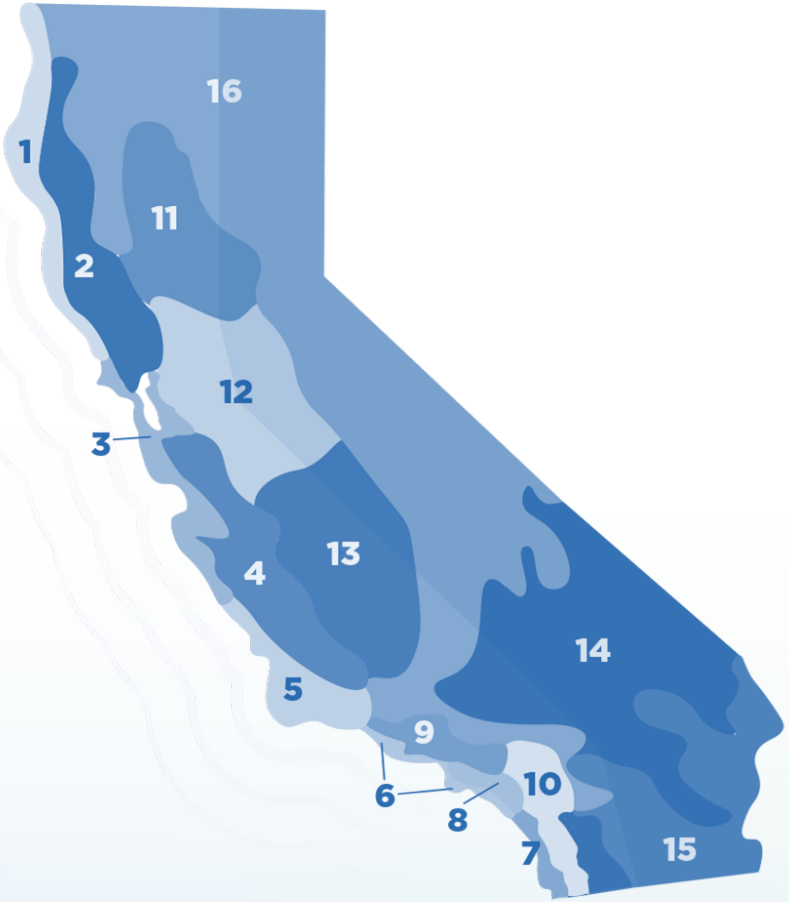
Stay Connected

Receive Energy Code updates

- Subscribe to Efficiency Division emails
  - Appliances
  - Blueprint
  - Building Standards
- Respond to confirmation email

Follow the California Energy Commission

Energy Code Hotline



Monday through Friday

8:00 a.m. to 12:00 p.m.

1:00 p.m. to 4:30 p.m.

Call

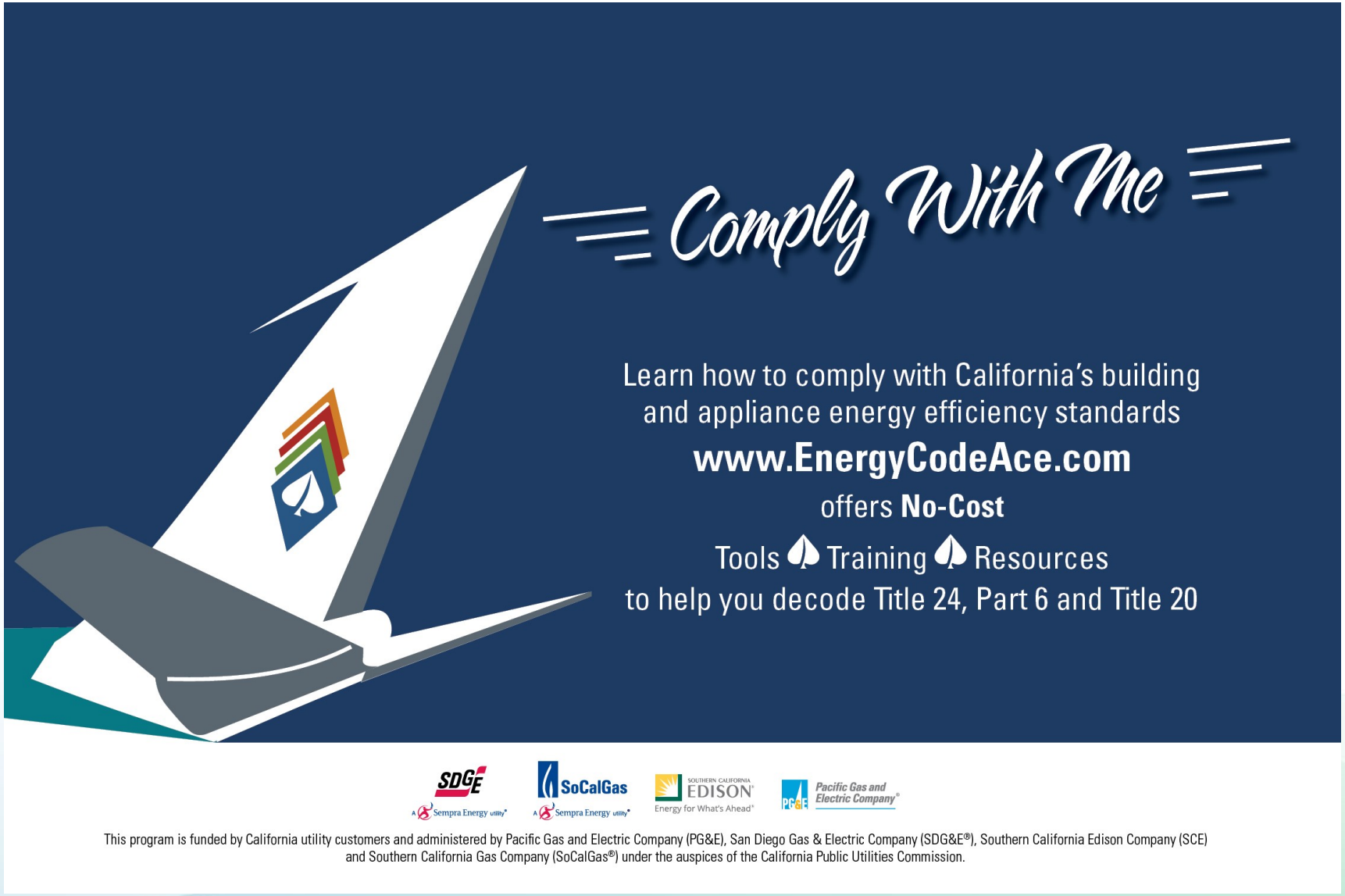
800-772-3300 in CA

916-654-5106 outside CA

Email

Title24@energy.ca.gov

Energy Code Ace



Thank you