

2019 Energy Code

Accessory Dwelling Units



California Energy Commission
Efficiency Division
June 2021



Agenda

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



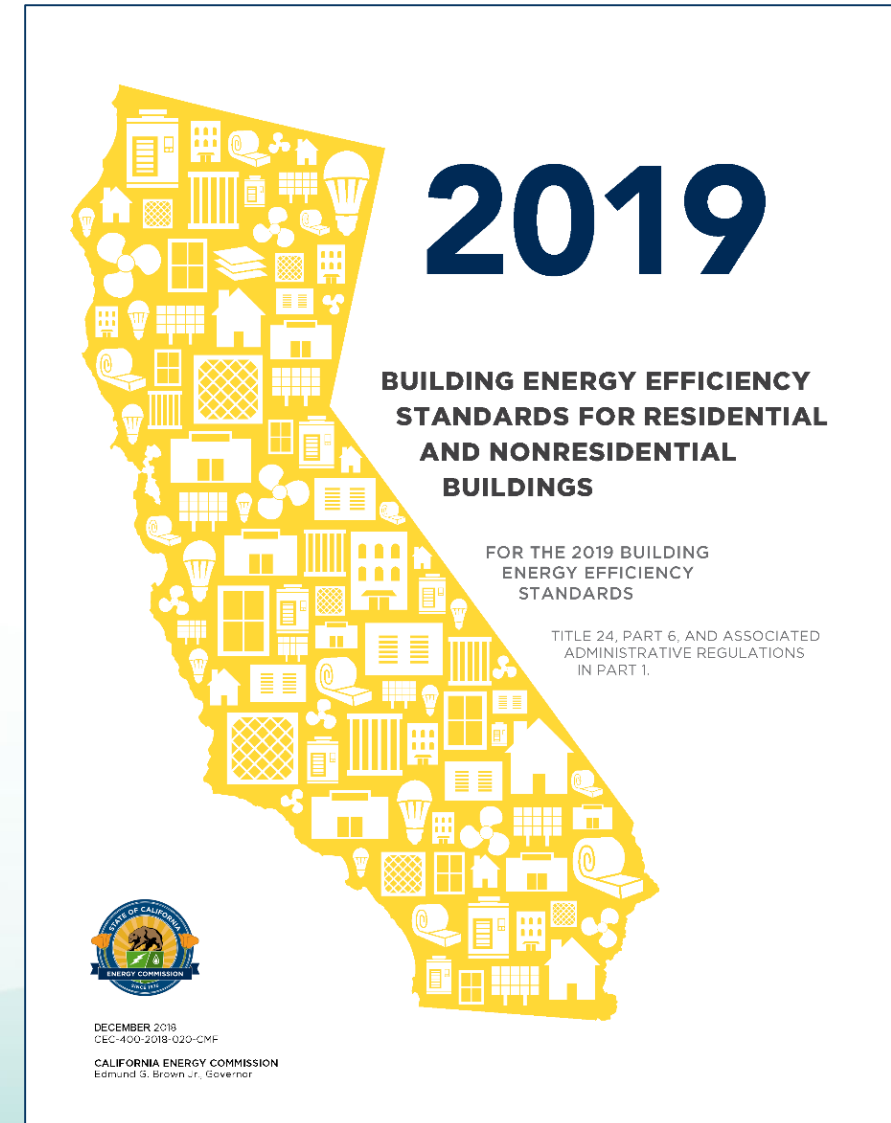
2019 Energy Code Basics



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

The screenshot shows the California Energy Commission website. The header includes the CA.GOV logo, social media icons, and navigation links: About, Careers, Contact, Events, Newsroom, Resources, and Settings. The main navigation bar features: HOME, PROCEEDINGS, RULES AND REGULATIONS, PROGRAMS AND TOPICS (selected), FUNDING, DATA AND REPORTS, and SHOWCASE. A search bar is present with the placeholder text "Enter keywords, e.g. Tracking Progress". The breadcrumb trail reads: Home > Programs and Topics > All Programs > Building Energy Efficiency Standards - Title 24 > 2019 Building Energy Efficiency Standards. The main content area has a large heading "2019 Building Energy Efficiency Standards" and a paragraph: "The 2019 Building Energy Efficiency Standards improve upon the 2016 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. Buildings permitted on or after January 1, 2020, must comply with the 2019 Standards. The California Energy Commission updates the standards every three years." Below this is an "Expand All" link. A sidebar on the right lists: BUILDING ENERGY EFFICIENCY STANDARDS - TITLE 24, 2022 Building Energy Efficiency Standards, 2019 Building Energy Efficiency Standards (highlighted), 2016 Building Energy Efficiency Standards, Online Resource Center, and Past Building Energy Efficiency Standards. At the bottom, there is a "CONTACT" section with the link "Building Energy Efficiency Standards - Title 24" and phone numbers: Toll-free in California: 800-772-3300, Outside California: 916-654-5106. A bottom navigation bar contains two items: "2019 Building Energy Efficiency Standards and Compliance Manuals" and "2019 Compliance Forms", both with expand icons.

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



Demonstrating Compliance

Compliance forms confirm Energy Code is met

- Completed by designers, consultants, builders, contractors, technicians, HERS raters, etc.
- Submitted to enforcement agencies for verification

Type of form	Residential
Certificate of compliance	CF1R
Certificate of installation	CF2R
Certificate of verification	CF3R



Energy Code Requirements

Mandatory measures

- Minimum efficiency requirements must always be met
- Can never trade-off

Prescriptive measures

- Predefined efficiency requirements
- May supersede mandatory measures
- Different requirements for newly constructed buildings, additions, and alterations



Compliance Approaches

Prescriptive Approach

- Simple approach, no trade-offs
- Match the standard building baseline
- More common for alterations

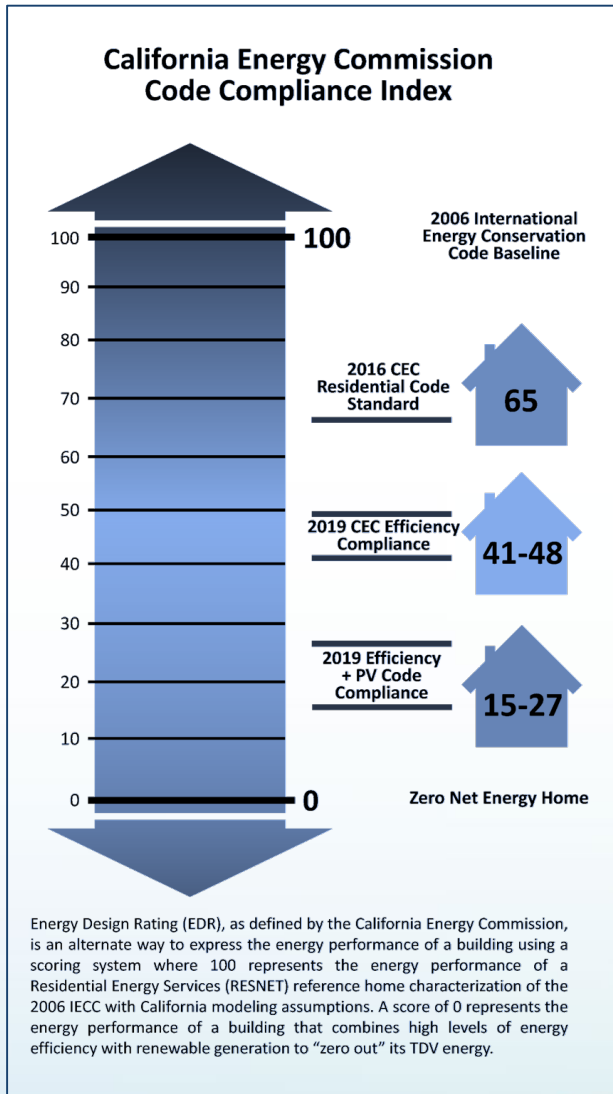
Performance Approach

- Most flexible approach, allows for trade-offs
- Must meet all mandatory requirements
- Requires the use of CEC approved software
- Residential new construction:
 - Proposed efficiency EDR \leq Standard building design
 - Total EDR (includes PV) \leq Standard building design
- Additions and alterations:
 - Proposed TDV \leq Standard building design





Energy Design Rating (EDR)



Low-rise residential EDR score for newly constructed buildings based on total estimated energy use

- 100 represents a home built to 2006 IECC
- 0 represents a zero net energy home
- Two types of EDR must be met independently
 - **Efficiency EDR:** Includes energy savings for space heating, space cooling, ventilation, and water heating measures
 - **Total EDR:** Includes efficiency EDR minus compliance credit for PV, battery, and other demand flexibility measures



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 (kTDOV/ft ² -yr)	Proposed Design Site (kWh)	Proposed Design Site (therms)	Proposed Design (kTDOV/ft ² -yr)	Compliance Margin (kTDOV/ft ² -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 Compliance Software

Performance approach compliance use most recently approved versions

- Residential
 - CBECC-Res 2019.1.3
 - 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)



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



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



Test Your Knowledge





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

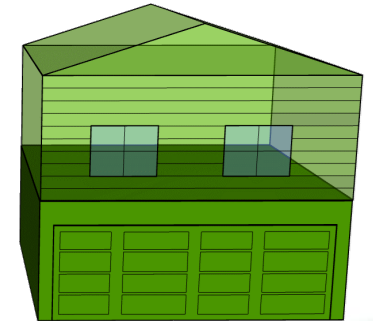
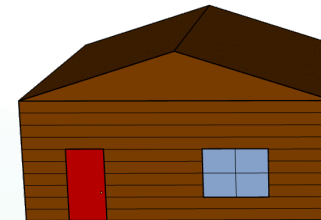
3. Converting existing detached unconditioned structure to ADU

- 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

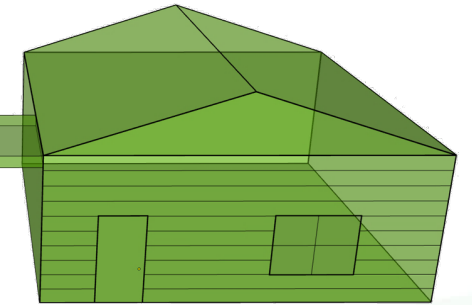
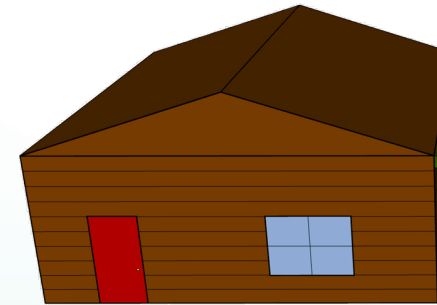
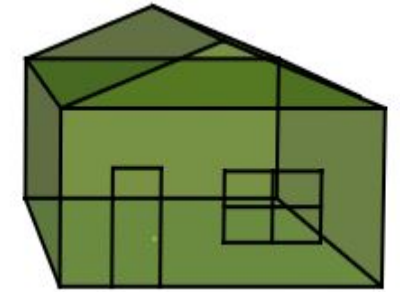




ADU Scenarios

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

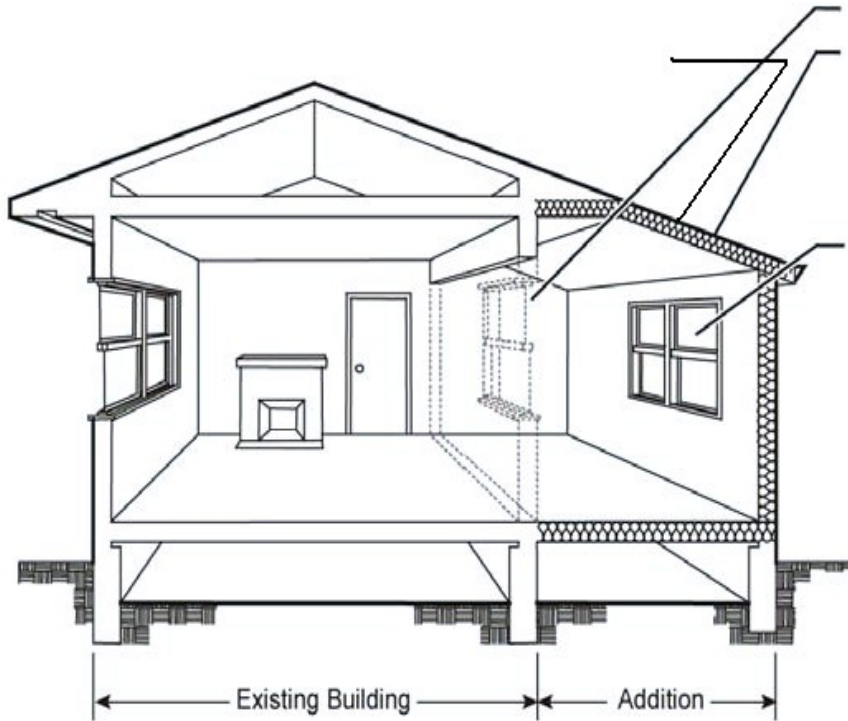
New windows, skylights, and glazed doors meet § 150.1(c) with modifications

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

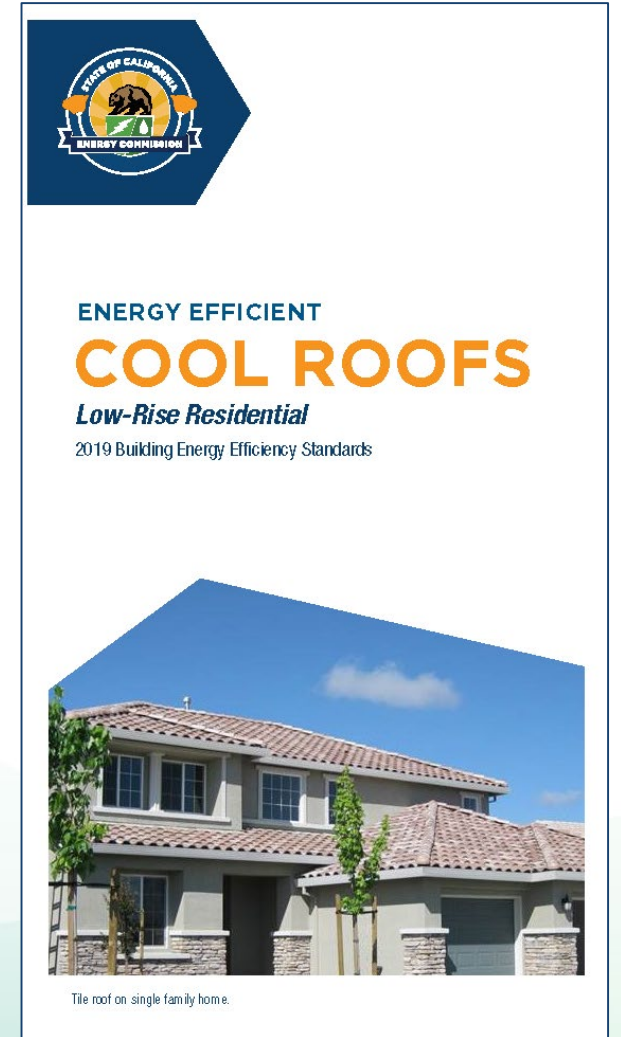


Envelope Roofing Prescriptive Requirements

§ § 150.2(a)1, 150.1(c)11

Additions more than 300 ft²

- 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



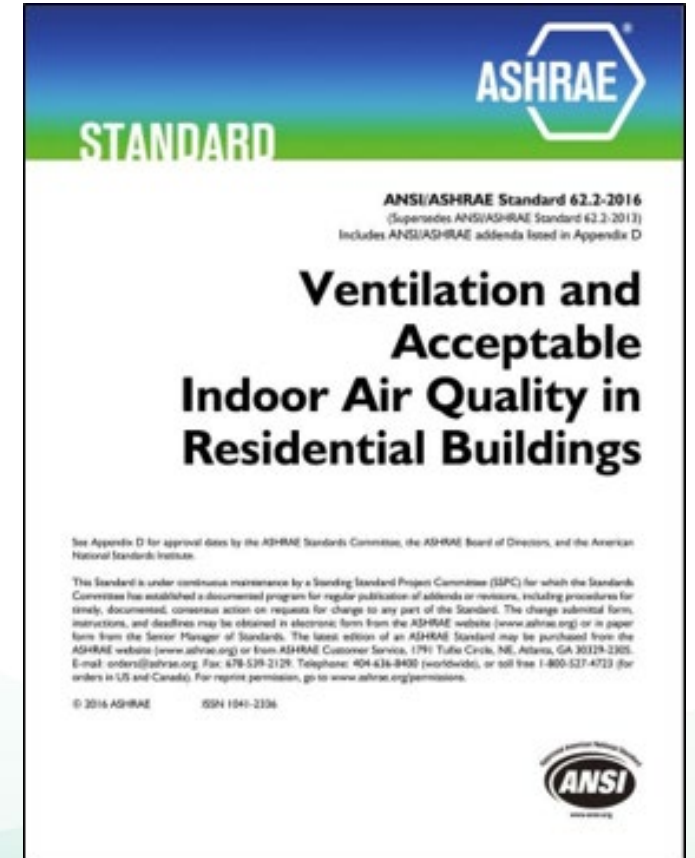


Ventilation Mandatory Requirements

§ § 150.2(a)1C, 150.0(o)

All new dwelling units must meet ASHRAE 62.2

- 2019 Equation 150.0-B
 - $Q_{\text{tot}} = 0.03 \times A_{\text{floor}} + 7.5 \times (\text{Nbr} + 1)$
 - Q_{tot} = total required ventilation rate, cfm
 - A_{floor} = dwelling-unit floor area, ft²
 - 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 a total of 60 ft²





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



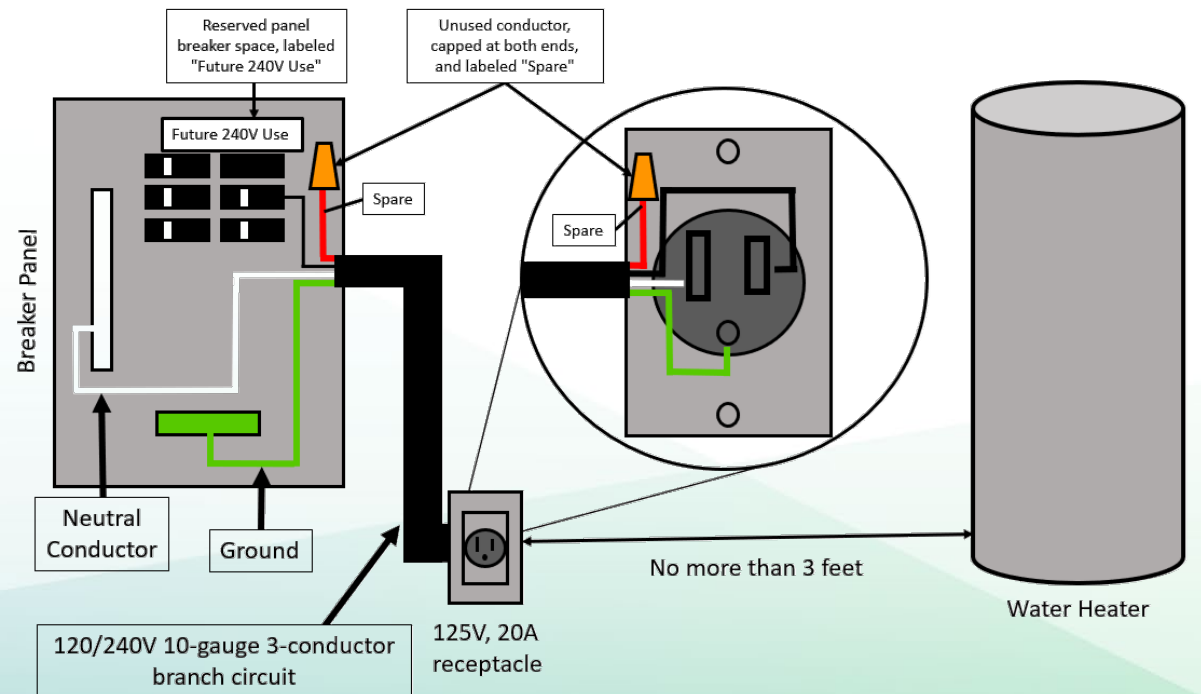


Water Heating Mandatory Requirements

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



Test Your Knowledge

Do ADUs that are additions and alterations need to meet all Energy Code requirements for low-rise residential buildings?

- Yes. ADUs will need to comply with all low-rise residential Energy Code requirements, with some exceptions





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

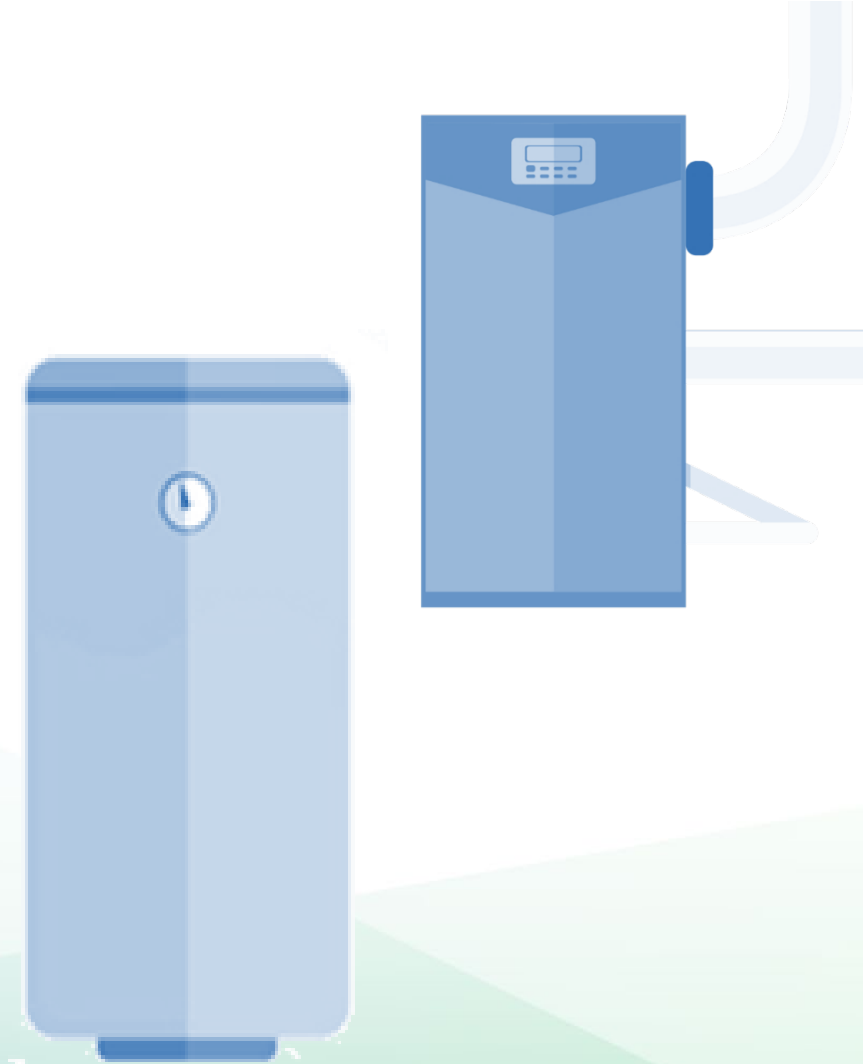




2019 Prescriptive Paths

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



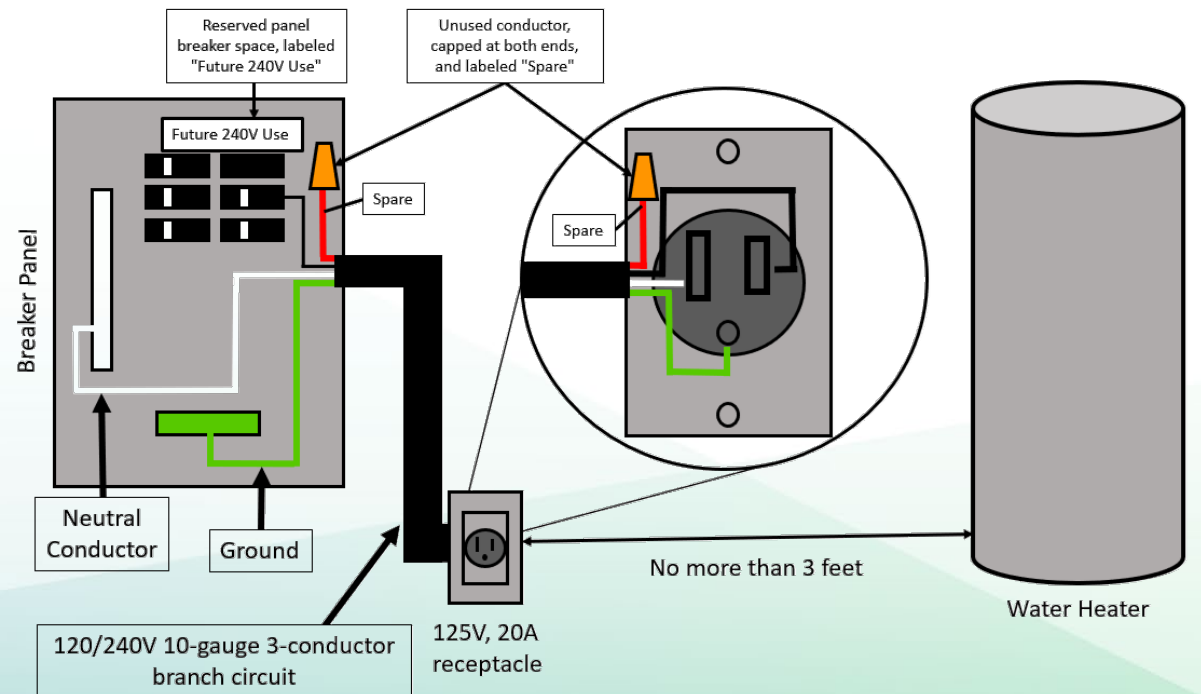


Water Heating Mandatory Requirements

Residential § 150.0(n)

High efficiency water heater ready requirements

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- 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 $\leq 75,000$ 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 $\leq 75,000$ 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



Test Your Knowledge

Do newly constructed ADUs need to meet all Energy Code requirements for low-rise residential buildings?

- Yes. In addition to the QII, water heating, and solar PV requirements, newly constructed ADUs will need to comply with all low-rise residential Energy Code requirements





Modeling Tips for ADUs



CBEEC-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

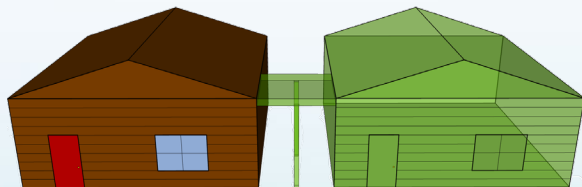


CBEECC-Res Modeling

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

New Construction

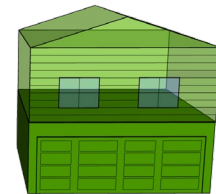
Detached New Building



Additions



Attached



Attached Conversion



Detached Conversion





CBEEC-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

A screenshot of a software window titled "ADUExample3AdditionAlone - 1 Story Example Rev 3". The window has a menu bar with options: Project, Analysis, EDR / PV, Battery, Notes, Building, Appliances / DHW, ADU, IAQ, Cool Vent, People, CSE Rpts. The main area is titled "Accessory Dwelling Unit (ADU) data" and contains several input fields: "Number of ADU Bedrooms:" with a value of 1, "ADU Conditioned Area:" with a value of 400 ft2, "Model as:" with a dropdown menu set to "Default Minimum IAQ Fan", and "Minimum IAQ Ventilation: 27.0 CFM". At the bottom, there is a "Zone:" dropdown menu set to "ADU" and an "OK" button.



CBEECC-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
 - CBEECC-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 CBEECC-Res 1.2 or later



Test Your Knowledge

Do ADUs smaller than 1,000 square feet need to model IAQ?

- Yes. All ADUs must meet IAQ requirements regardless of size
 - No exceptions
 - Important to model bedroom counts correctly





Plan Check and Inspection

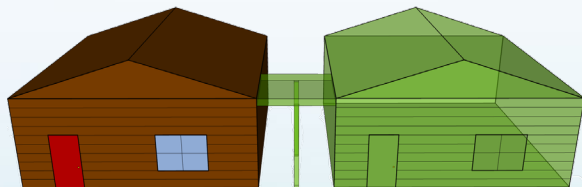
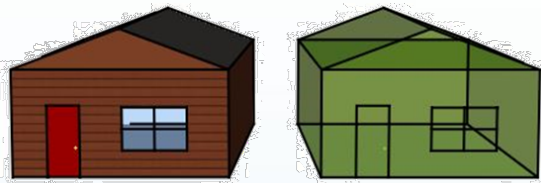


Plan Check

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

New Construction

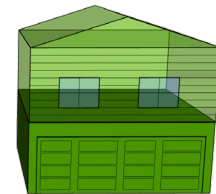
Detached New Building



Additions



Attached



Attached Conversion



Detached Conversion





Plan Check

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 7 of 9)

MECH CONDENSING SYSTEMS

ID	01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Heating Unit Name	Chilling Unit Name	Ion Name	Distribution Name	System Type	Status	Verified Setting Condition	Heating Equipment	Chilling Equipment	Control
Heat Pump System 1	Heat Pump System 1	Heat Pump System 1	Heat Pump System 1	Heat Pump System 1	Heat Pump System 1	Heat Pump System 1	None	None	None	None	None

AIR-HEAT PUMPS

ID	01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Number of Units	Heating Capacity (kW)	Model	Efficiency	Manufacturer	Control Type	Commissioning Year	MEQ Verification	MEQ Verification Date	MEQ Verification Status
Heat Pump System 1	Heat Pump System 1	1	10.5	10000	10000	17	None	None	None	None	None

AIR-HEAT PUMPS - MEQ VERIFICATION

ID	01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Verified Input	Verified Load	Verified SEER	Verified Refrigerant Charge	Verified Oil Level	Verified Heating Capacity	Verified Cooling Capacity	Verified MEQ Status
Heat Pump System 1	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 8 of 9)

DESTRUCTION / GLAZING

ID	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Surface Orientation	Area (sq ft)	Material	U-Value (BTU/hr-ft ² -in)	R-Value (ft ² -in/BTU/hr)	Glazing Fraction	Shading Coefficient	SHGC	Visible Transmittance	Status	Verified Setting Condition	Heating Equipment	Chilling Equipment	Control	
Window 1	Window	North Wall	10.0	IGLO	0.31	3.21	0.18	0.65	0.25	0.65	None	None	None	None	None	None

DOOR DOORS

ID	01	02	03	04	05	06	07	08	09
Name	Area (sq ft)	U-Value	Shading Coefficient	Status	Verified Setting Condition	Heating Equipment	Chilling Equipment	Control	
Door 1	10.0	0.31	0.65	None	None	None	None	None	

GLAZINGS

ID	01	02	03	04	05	06	07	08	09	10	11
Name	Zone	Area (sq ft)	Material	U-Value	Shading Coefficient	Status	Verified Setting Condition	Heating Equipment	Chilling Equipment	Control	
Zone 1	Living Room	100.0	IGLO	0.31	0.65	None	None	None	None	None	

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 1 of 9)

GENERAL INFORMATION

ID	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Project Location	City	County	Standard Version	Software Version	Report Date	Report Version	Report Generated	Report Generated	Report Generated	Report Generated	Report Generated	Report Generated	Report Generated	Report Generated	Report Generated
ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU	ADU

COMPLIANCE RESULTS

ID	01	02	03
Name	Compliance Status	Compliance Reason	Compliance Action
01	Compliant	None	None

ENERGY USE SUMMARY

Energy Use (kBtu/yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	6.15	6.7	-0.55	-8.9
Space Cooling	52.81	48.15	4.66	8.8
A/C Ventilation	0	0	0	0
Water Heating	26.38	26.41	-0.03	-0.9
Soft Climate Control	0	0	0	0
Compliance Energy Total	85.36	81.36	4.00	4.6

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 8 of 9)

MECH VENTILATION SYSTEMS

ID	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return	Supply Return
MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1	MEV Fan 1

MECHANS SYSTEMS - MEQ VERIFICATION

ID	01	02	03
Name	Verified for MEQ Status	Required for MEQ (Y/N/NA)	MEQ Status
MEV Fan 1	Not Required	Not Required	None

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 2 of 9)

MECH CONDENSING CONSTRUCTION

ID	01	02	03	04	05	06	07	08
Name	Surface Type	Construction Type	Insulation	Total Ceiling Depth	Insulation / Membrane Construction	U-Value	Assembly Layers	Notes
9.11 Wall	Exterior Wall	Wood Framed Wall	2 in @ 16 in C.	0.01	None / None	0.11	None / None / None / None / None / None	None

MEQ VERIFICATION

ID	01	02	03
Name	Quality of Installation	Required for MEQ (Y/N/NA)	MEQ Status
9.11 Wall	Not Required	Not Required	None

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 2 of 9)

REQUIRED SPECIAL FEATURES

ID	01	02	03	04	05	06	07
Name	Conditioned Floor Area (sq ft)	Number of Dwelling Units	Number of Bedrooms	Number of Bathrooms	Number of Kitchens	Number of Water Heaters	Number of Water Heaters
ADU	750	1	2	1	1	1	1

MEQ VERIFICATION

ID	01	02	03	04	05	06	07
Name	Conditioned Floor Area (sq ft)	Number of Dwelling Units	Number of Bedrooms	Number of Bathrooms	Number of Kitchens	Number of Water Heaters	Number of Water Heaters
ADU	750	1	2	1	1	1	1

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 9 of 9)

MECH CONDENSING CONSTRUCTION

ID	01	02	03	04	05	06	07	08
Name	Surface Type	Construction Type	Insulation	Total Ceiling Depth	Insulation / Membrane Construction	U-Value	Assembly Layers	Notes
9.11 Wall	Exterior Wall	Wood Framed Wall	2 in @ 16 in C.	0.01	None / None	0.11	None / None / None / None / None / None	None

MEQ VERIFICATION

ID	01	02	03
Name	Quality of Installation	Required for MEQ (Y/N/NA)	MEQ Status
9.11 Wall	Not Required	Not Required	None

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
(Page 3 of 9)

MECH CONDENSING CONSTRUCTION

ID	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	System Type	Distribution Type	Water Meter Name (s)	Water Heating System	Connect Distribution	MEQ Verification	Status	Verified Setting Condition	Heating Equipment	Chilling Equipment	Control					
Water Heater 1	Water Heater (WH)	Water Heater (WH)	Water Heater (WH)	Water Heater (WH)	Water Heater (WH)	Water Heater (WH)	None	None	None	None	None					

MEQ VERIFICATION

ID	01	02	03
Name	Verified for MEQ Status	Required for MEQ (Y/N/NA)	MEQ Status
Water Heater 1	Not Required	Not Required	None

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201

CERTIFICATE OF COMPLIANCE
Project Name: ADU
Calculation Date/Time: 2020-10-07T11:12:26-07:00
Input File Name: 1 31a
CFIR-PH-016
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MECH CONDENSING CONSTRUCTION

ID	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Zone	Area (sq ft)	Material	U-Value	Shading Coefficient	Status	Verified Setting Condition	Heating Equipment	Chilling Equipment	Control						
Zone 1	Living Room	100.0	IGLO	0.31	0.65	None	None	None	None	None						

MEQ VERIFICATION

ID	01	02	03
Name	Quality of Installation	Required for MEQ (Y/N/NA)	MEQ Status
Zone 1	Not Required	Not Required	None

Registration Number: 4251
Report Generated: 2020-10-07 11:12:26
Scheme Version: 191.20200201



CERTIFICATE OF COMPLIANCE

Project Name: ADU

This is just a title

Calculation Date/Time: 2020-10-07T11:12:26-07:00

CF1R-PRF-01E

(Page 1 of 9)

Calculation Description: Title 24 Analysis

Input File Name:

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

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

When "AdditionAlteration" ADU bedroom & CFA CANNOT be zero

COMPLIANCE RESULTS	
01	Building Complies with Computer Performance
02	This building incorporates features that require 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	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

Registration Number

Registration Date/Time:

HERS Provider: CHEERS

NOTICE: This document has been generated by ConSol Home Energy Efficiency Rating System Services, Inc. (CHEERS) using information uploaded by third parties not affiliated with or related to CHEERS. Therefore, CHEERS is not responsible for, and cannot guarantee, the accuracy or completeness of the information contained in this document.

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Report Version: 2019.1.108

Report Generated: 2020-10-07 11:12:40

Schema Version: rev 20200101



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 building 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 --



CHEERS

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



CERTIFICATE OF COMPLIANCE

Project Name: Example ADU

Calculation Description: 1 Story Example Rev 3

Calculation Date/Time: 2021-04-23 15:45:06-07:00

Input File Name: ADUExample3AdditionAlone.ridb19

CF1R-PRF-01E

(Page 1 of 8)

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
	Climate Zone	12	09	Front Orientation (deg/ Cardinal)	0
	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) (ft ²)	Addition Area (excl. existing) (ft ²)	Total Area (ft ²)	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

Registration Number:

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Registration Date/Time:

Report Version: 2019.1.300
Schema Version: rev 20200901

HERS Provider:

Report Generated: 2021-04-23 15:46:06



CERTIFICATE OF COMPLIANCE

Project Name: Example ADU

Calculation Description: 1 Story Example Rev 3

Calculation Date/Time: 2021-04-23T15:45:06-07:00

Input File Name: ADUExample3AdditionAlone.ribd19

CF1R-PRF-01E

(Page 2 of 8)

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.
<ul style="list-style-type: none"> • 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 building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Building-level Verifications:</p> <ul style="list-style-type: none"> • Indoor air quality ventilation • Kitchen range hood <p>Cooling System Verifications:</p> <ul style="list-style-type: none"> • -- None -- <p>Heating System Verifications:</p> <ul style="list-style-type: none"> • -- None -- <p>HVAC Distribution System Verifications:</p> <ul style="list-style-type: none"> • -- None -- <p>Domestic Hot Water System Verifications:</p> <ul style="list-style-type: none"> • -- None -- </div> <div style="width: 60%; text-align: center;"> <h2 style="color: #0056b3;">IAQ ventilation</h2> <h2 style="color: #0056b3;">Kitchen range hood</h2> </div> </div>

Registration Number:

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Registration Date/Time:

Report Version: 2019.1.300
 Schema Version: rev 20200901

HERS Provider:

Report Generated: 2021-04-23 15:46:06



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



Project Status Report

Project Status Report		CalCERTS, Inc	
		1 of 2	
GENERAL INFORMATION			
Code Year Standards:	2013		
Project Name:	Shewmaker Performance Demo		
Project Type:	New Construction SFR		
Address:	1516 9th Street		
City / State / Zip:	Sacramento / CA / 95814		
Enforcement Agency:	City of Sacramento		
Permit Number:	123456789	Easy to Verify @ calcerts.com	
HERS VERIFIABLE MEASURES:	NOT COMPLETE		
OVERALL STATUS:	NOT COMPLETE		
CF1R INFORMATION - Certificate of Compliance ✓			
Certificate Type:	Compliance		
Registered Form:	CF1R-PRF-01-E		
Registered Date:	04/05/2016 08:30		
Registration Number:	216-N0125429A-000000000-0000		
ADDITIONAL CF1Rs			
System	Form	Registered Date	Registration Number
	CF1R-SRA-01		216-N0125443A-000000000-0000
CF2R INFORMATION - Certificate of Installation			
System	Form	Registered Date	Registration Number
	CF2R-ENV-01 (Penetration Installation)		216-N0125429A-E0100001A-0000
	CF2R-ENV-02 (Envelope Air Sealing)		216-N0125429A-E0200001A-0000
	CF2R-ENV-03 (Insulation Installation)		216-N0125429A-E0300001A-0000
	CF2R-ENV-04 (Roofing-Radiant Barrier)		216-N0125429A-E0400001A-0000
	CF2R-MCH-01 (Space Conditioning Systems, Ducts and Fans)	04/05/2016 09:40	216-N0125429A-M0100001A-0000
System 1	CF2R-MCH-20 (Duct Leakage)	04/05/2016 09:40	216-N0125429A-M2000002A-0000
System 1	CF2R-MCH-23 (Airflow)	04/05/2016 09:40	216-N0125429A-M2300002A-0000
System 1	CF2R-MCH-22 (Fan Efficacy)	04/05/2016 09:40	216-N0125429A-M2200002A-0000
System 1	CF2R-MCH-25 (Refrigerant Charge)	04/05/2016 09:40	216-N0125429A-M2500002A-0000
	CF2R-MCH-27 (IAQ and MV)	04/05/2016 09:40	216-N0125429A-M2700001A-0000
	CF2R-PLB-02 (SD HWS Distribution)	04/05/2016 09:40	216-N0125429A-P0200003A-0000
CF3R INFORMATION - Certificate of Verification			
System	Form	Registered Date	Registration Number
	CF3R-MCH-27 (IAQ and MV)		216-N0125429A-M2700001A-M27A
System 1	CF3R-MCH-20 (Duct Leakage)	04/11/2016 12:52	216-N0125429A-M2000002A-M20A

CA Building Energy Efficiency Standards 2013 Residential Compliance HERS Provider: CalCERTS, Inc. Dec 2015

- 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



Test Your Knowledge

Do new ADUs that are additions or newly constructed buildings require HERS testing?

- Yes. HERS verification is required
 - IAQ fan required 100% of the time
 - New kitchen range hood installed
 - QII, HVAC, duct testing - when required
 - All forms must be registered with HERS registry
 - CalCERTS or CHEERS
 - Forms must have registration number and watermark



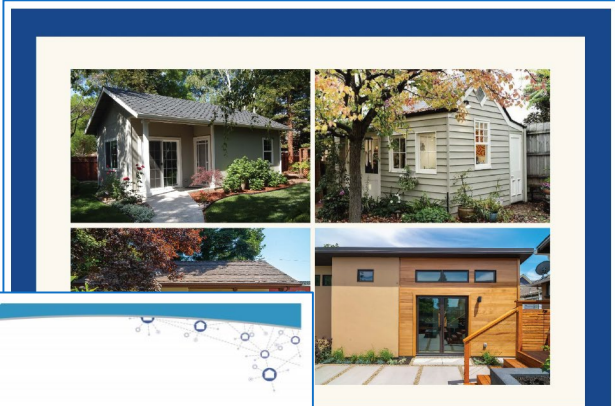


Resources





ADU Resources



**FACTORY-BUILT HOUSING
HANDBOOK FOR
LOCAL ENFORCEMENT AGENCIES,
BUILDERS, AND THE GENERAL PUBLIC**

State of California
Business, Consumer Services and Housing Agency
Department of Housing and Community Development
Division of Codes and Standards

HCD FBH 314 (Rev. 11/20)

ent of Housing and
evelopment

**Accessory Dwelling Unit
Handbook**

ations begin

ember 2020

- [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 | **Table 24, Part 6 Compliance Quick Reference** | **Residential Accessory Dwelling Unit (ADU)**

BUILDING FEATURE	PRESCRIPTIVE TITLE 24, PART 6	NOTES
ADUs THAT ARE AN ADDITION ALONE, EXISTING + ADDITION OR EXISTING + ADDITION + ALTERATION		
Conversion of existing attached space	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
New build but attached	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)) 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
Conversion of existing detached space	Floor Prescriptive Table 150.1-A	There are no exceptions to Table 150.1-A for floors of any type
COMPLIANCE DOCUMENTATION: Prescriptive option: CFIR-ADD-01-E (HERS required) must be registered with a HERS Provider website: https://www.calcerts.com/ https://www.cheers.org/ or Performance option: CFIR-PRF-01-E, Addition Alone, Existing + Addition (ExA) or Existing + Addition + Alteration (ExAA)	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. <i>Not including door between garage and home.</i>
	HVAC & all Applicable HERS	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
	OII >700 ft² (not required if ≤700 ft²)	OII 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 | 2020-08-22

BUILDING FEATURE	PRESCRIPTIVE TITLE 24, PART 6	NOTES
DETACHED NEWLY CONSTRUCTED ADU		
Newly constructed building	Roof* Any size ADU is subject Prescriptive Single-Family Table 150.1-A. Framed: CZ 1-5, 8-16: U-factor = 0.048 CZ 6-7: U-factor = 0.065	Prescriptive Option B or C (including the provision that attics are to be ventilated) or use the Performance Approach Example of High Performance Wall = U-factor of 0.051
	Floor Prescriptive Table 150.1-A	Raised floor = R-19. Heated slab = R-5 slab-edge insulation
COMPLIANCE DOCUMENTATION: Prescriptive option: CFIR-NCB-01-E (HERS required) must be registered with a HERS Provider website: www.calcerts.com/ www.cheers.org/ or Performance option: CFIR-PRF-01-E using Energy Commission-approved software	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. <i>Not including door between garage and home.</i>
	HVAC & all Applicable HERS	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
	OII Prescriptive Table 150.1-A §150.1(c)1e	OII required as outlined in Residential Reference Appendix RA3.5
	PV Prescriptive §150.1(c)14	As determined by Equation 150.1-C: kW/PV = (CFA x AJ)/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.

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



Online Resource Center

Online Resource Center

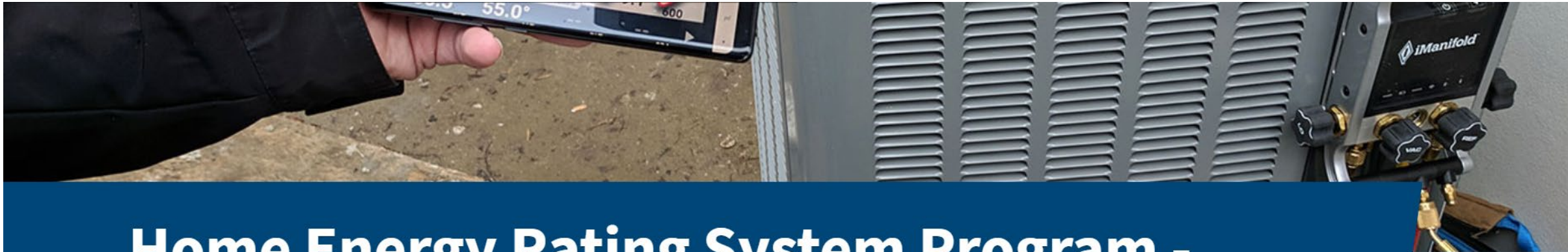
Educational documents and training information for building communities and enforcement agencies to assist with building energy standards compliance.

[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 *



Blueprint Newsletter

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- 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

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



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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



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Thank you