## Title 24, Part 6 - Residential Accessory Dwelling Unit

### Compliance Quick Reference

<table>
<thead>
<tr>
<th>BUILDING FEATURE</th>
<th>PRESCRIPTIVE TITLE 24, PART 6 Purple Text = New for 2019</th>
<th>NOTES</th>
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</thead>
<tbody>
<tr>
<td><strong>ADUs that are an Addition Alone, Existing + Addition or Existing + Addition + Alteration</strong></td>
<td></td>
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</tr>
</tbody>
</table>

#### Roof*

- **≤700 SF:** Insulation to meet
  - Mandatory:
    - CZ 2-10: R-30
    - CZ 1, 11-16: R-38
  - Prescriptive Single-Family Table 150.1-A: Option B or C

#### Walls

- **Extended Walls:**
  - 2 x 4: R-15
  - 2 x 6: R-21
- **New Walls:**
  - Prescriptive Table 150.1-A

#### Floor

- Prescriptive Table 150.1-A

#### Fenestration

- **New Fenestration:** $≤150.2(a)1$
  - Skylights: $≤16$ ft²
    - U-Factor = 0.55
    - SHGC = 0.30**

#### Solid Doors

- **New Solid Door:**
  - U-factor = 0.20 (insulated)

#### HVAC & all applicable HERS

- **HVAC** = Table 150.1-A
- IAQ whole building airflow is required of any new ADU

#### 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

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**Notes:**

* 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.
### Detached Newly Constructed ADU

**BUILDING FEATURE** | **PRESCRIPTIVE TITLE 24, PART 6**<br>Purple Text = New for 2019 | **NOTES**
--- | --- | ---
**Roof** | Any size ADU is subject to 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**<br>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**<br>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:

\[ k_{WPV} = (C_{FA} \times A)/1000 + (NDwell \times B) \]

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*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.
This program is funded by California utility customers under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.
Comply With Me

Learn how to comply with California's building and appliance energy efficiency standards

www.EnergyCodeAce.com

offers No-Cost Tools ♠ Training ♠ Resources to help you decode Title 24, Part 6 and Title 20

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™
Helping you play your cards right
ADUs: Challenges & the 2019 Code

- Be aware of the different ADU types as defined by the Energy Code
- Understand how ADU scope of work dictates Energy Code requirements
- Identify documentation requirements for compliance (permit submittal, construction and final)
- Locate additional relevant resources available from Energy Code Ace and the California Energy Commission
What is an ADU?

- Compliance Forms
- Converted ADU’s
- New Construction ADU’s
- Reach Codes
- Wrap Up
What’s an ADU?

- Often called an “in-law apartment” or “garage flat”, accessory dwelling units are 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 law has changed to help eliminate barriers to ADU construction that are adopted by EACH local government (or not):
  - SB 1069
  - SB 13
  - AB 2299
  - AB 2406
  - AB 68
  - AB 881
  - AB 670 & 671

https://www.hcd.ca.gov/policy-research/AccessoryDwellingUnits.shtml#booklet
Mandatory Measures

- Cannot be traded via the Performance Approach
- Not typically documented within Certificate of Compliance (CF1R)

Two Ways to Comply with the Standards

Prescriptive Approach
Single Family: Table 150.1-A
Multifamily: Table 150.1-B

Performance Approach
Baseline TDV
Proposed TDV
Proposed TDV equal or better than baseline TDV

Compliance Documentation
ADU Challenges

✧ Site Issues:
  ✧ Property line limits:
    ▪ City setbacks
    ▪ Utility setbacks
  ✧ Property height restrictions
  ✧ Limitations based what may be already built
  ✧ Available utilities (natural gas versus all-electric)

✧ Getting everyone involved at the right time:
  ✧ Utilities
    ▪ Setback approvals
    ▪ Natural gas connections
  ✧ Specialty contractor(s) and inspectors
    ▪ PV
    ▪ HERS raters
Classifying ADUs as Additions or New Construction

ADU = “Accessory Dwelling Unit”

- Treated either as **New Construction** or an **Addition** based on whether it’s attached or detached, and whether it’s a conversion from existing space.

Is it a conversion from existing space?

- Then it’s an **Addition**, regardless of whether:
  - Detached
  - Attached

Is it new?

- Depends on whether detached or attached:
  - Detached: **New Construction**
  - Attached: **Addition**

*Photo Courtesy of: Dr. Karen Chapple, UC Berkeley*
How to classify the 4 types of ADUs

Addition
- Attached:
  - Converted
  - Added
- Detached:
  - Converted

New Building
- Detached
- New
Title 24 Part 6: ADU

- What is an ADU?

- **Compliance Forms**
  - Converted ADU’s
  - New Construction ADU’s
  - Reach Codes
  - Wrap Up
Applying for Permit

Certificate of Compliance

- **CF1R: Low-Rise**
  - Provided with plans or equipment schedule; submitted to building department for permit
  - Reviewed by counter tech or plans examiner
Certificate of Installation

CF2R: Low-Rise

- Provided by installing contractor or General Contractor during construction and posted on site.
- Reviewed by Building Inspector.
- Belong to the Building Owner.
CF3R: Low-Rise

- Provided by Acceptance Test Technician.
- Made available BEFORE building inspector arrives for final.
- Belong to the Building Owner
Who is the HERS Rater and why are they in charge?

- Special Inspectors to the AHJ (building departments)
- Trained and maintained by their HERS provider
  - Cal Energy (www.calenergy.org)
  - CalCERTS (www.calcerts.com)
- Hired by the building owner or contractor
  - MUST be 3rd party (not under the employment of the contractor or related to them)
- Verification procedures determined by Energy Commission per Reference Appendices
Title 24 Part 6: ADU

- What is an ADU?
- Compliance Forms

**Converted ADU’s**

A. Attached conversion of unconditioned space to ADU
B. Attached new construction of ADU
C. Detached conversion of unconditioned space to ADU

- New Construction ADU’s
- Reach Codes
- Wrap Up
**What IS that? Type A**

**Attached Converted ADU**

- Existing unconditioned space associated with single family home, such as:
  - Garage
  - Basement

**Allowances:**

**Building Features**

- Walls are considered “extended” not “new”.
- Prescriptive glazing allowance based on size.
- Possible QII exemption based on size (under 700 ft²)
Converting unconditioned space does not allow the fenestration associated with the space to be considered “existing”.

They must be considered “new” and be shown to meet the mandatory and prescriptive requirements of the Energy Code.
What IS that? Type B

Attached Newly Constructed ADU

- New conditioned space added to an existing home with walls attached for the new dwelling unit, such as:
  - Adding to the back of a home;
  - Adding a 2nd floor to a home.

Allowances:

- Walls are considered “extended” not “new”.
- Prescriptive glazing allowance based on size.
- Possible QII exemption based on size (under 700 ft²).
“Extended” walls apply to 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 consist of non-extended walls and converted walls with siding being replaced.

When existing siding of a wood-framed wall is not being removed or replaced, cavity insulation of R-15 in a 2x4 framing and R-21 in a 2x6 framing shall be installed and continuous insulation is not required.

“Extended” walls:
- 2x4 = R-15
- 2x6 = R-21

New walls: Package A
- CZ 1-5; 8-16 U-factor = 0.048
- CZ 6-7 U-factor = 0.065
EXTENDED walls:

- **2 x 4 = R-15**
- **2 x 6 = R-21**

New “extended” wall

Existing Wall

2x4

2x4
New (not extended) Framed Wall

Mandatory Minimum

- 2 x 4 = U-factor of 0.102 (R-13)
- 2 x 6 = U-factor of 0.071 (R-20) (was R-19)

Prescriptive: CZ 6-7

- U-factor: 0.065 (2 x 4 with R-15 + R-4)
- No change

Prescriptive: All Other CZ’s

- U-factor: 0.048 (was 0.051)
  - 2 x 6 with R-21 (was R-19) + R-5 (1”) or
  - 2 x 6 with R-19 + R-7 (1-1/2”) (was 1”) or
  - 2 x 4 with R-15 (was R-13) + R-10 (2”) or
  - ??
Detached Converted Unconditioned Space to ADU

- Existing unconditioned space not connected to existing single family home, such as:
  - Detached Garage;
  - Illegal Unit.

Converted walls:
- 2 x 4 = R-15
- 2 x 6 = R-21
Building Features: QII 2019

Quality Insulation Installation required prescriptively
- Addition >700 ft²
- New residential building of any size

Things to consider when doing QII

- Coordination is key
- Bring on a HERS Rater early
- Make sure the contractor is willing to do it
- Incorporate more details into the plans
Range hoods (single family and low-rise multifamily) must be HERS inspected in the field to verify HVI certified for:

- Minimum ventilation airflow rate per ASHRAE 62.2 (100 cfm for typical kitchen layouts)
- Maximum sound ratings per ASHRAE 62.2 (3.0 sones)

Other airflow options are provided in ASHRAE 62.2 for continuous ventilation.
Utility Choices

- **DHW**
  - Tankless Gas DHW
  - Tank Heat Pump DHW

- **Space Heating**
  - Gas furnace (ducted or ductless)
  - Heat Pump

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**But..I don’t want/get gas easily**

- High Efficiency heat pump water heater now allowed without a penalty for the tank if NEEA 3 (additional requirements apply in CZ 1 and 16)

- Mini-Split Heat Pump system *can be* modeled with better than minimum efficiency and take credit for ductless configurations (HERS verified)
Each habitable room must be directly served by ducted air handler or ductless head – Transfer fans do not meet this requirement

- HABITABLE SPACE is space in a building for living, sleeping, eating or cooking, excluding bathrooms, toilets, hallways, storage areas, closets, utility rooms and similar areas.

All ducts and indoor units (ducted or ductless) must be located entirely in conditioned space

- Compliance credit for ducts in conditioned space

Wall mount thermostat required in each zone > 150 ft²

Verified by HERS rater
Title 24 Part 6: ADU

- What is an ADU?
- Compliance Forms
- Converted ADU's

▶ New Construction ADU’s
  - Detached new construction of ADU

- Reach Codes
- Wrap Up
Detached Newly Constructed ADU

- Building a new building detached from the existing home for an ADU.
- This is treated like a new single family home by the Energy Code.

Allowances:

- Building Features
  - Must meet requirements of a newly constructed home.
  - No exceptions to prescriptive requirements (must use performance approach for flexibility)
  - PV required
## Performance: Building Energy Efficiency Ratings

For Low-rise Residential Construction

<table>
<thead>
<tr>
<th>Energy Code</th>
<th>New Construction</th>
<th>Additions</th>
<th>Alterations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>TDV</td>
<td>TDV</td>
<td>TDV</td>
</tr>
<tr>
<td>2019</td>
<td><strong>EDR</strong>&lt;sup&gt;NEW&lt;/sup&gt;</td>
<td>TDV</td>
<td>TDV</td>
</tr>
</tbody>
</table>

The Proposed Design’s overall TDV energy usage (called “Total EDR”) is found along this range. The lower the EDR index score, the better.

**really inefficient building**

Your score **100**

**Neutral home**

Your score **0**

The Proposed Design’s overall TDV energy usage (called “Total EDR”) is found along this range. The lower the EDR index score, the better.
The building’s energy use is measured via two EDR scores:

- **Building Efficiency**
  - Envelope +
  - IAQ +
  - HVAC +
  - DHW +
  - unregulated loads (lighting, appliances, plug loads)

- **PV + Flexibility**
  - PV +
  - Battery

The building complies when 2 conditions are met:

1. Proposed EDR ≤ Standard EDR for **Building Efficiency**

2. **Building Efficiency EDR** - **PV + Flexibility EDR** = **Total EDR**

   “**Total EDR**” represents the overall TDV energy usage as a score.
2019 Prescriptive PV Example

Table 150.1-C

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>A - CFA</th>
<th>B - Dwelling Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>16</td>
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<td>1.22</td>
</tr>
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</table>

§150.1(c)14

- ADU Example:

What is the minimum size (kW) PV system for a 300 ft² ADU in climate zone 4?

\[
kWPV = \frac{CFA \times A}{1000} + (NDwell \times B)
\]

\[
kWPV = kWdc \text{ size of the PV system}
\]

\[
CFA = \text{Conditioned floor area}
\]

\[
NDwell = \text{Number of dwelling units}
\]

\[
A = \text{Adjustment factor from Table 150.1-C}
\]

\[
B = \text{Dwelling adjustment factor from Table 150.1-C}
\]

Solution:

\[
(300 \times 0.586)/1000 + (1 \times 1.21) = 1.39 \text{ kW}
\]

Exceeding prescriptive sizing must be confirmed as meeting NEM rules (with your local utility).
1: <80 ft\(^2\) of contiguous area with effective annual solar access >70%

**Solar Access** = Solar Insolation Including Shading
Solar Insolation without Shading

Solar access must be verified:
- Installer to demonstrate shading condition compliance of installed PV via CF2R using either:
  - Solar Assessment Tool approved by the Energy Commission (and used per the manufacturer’s instructions)

### Approved Solar Assessment Tools

The following solar assessment tool has been approved by CEC for use as specified in JA11.4(a)

- Aurora Solar Inc.
- Scanify
- Solmetric Suneye

Note: For CF2R verification purposes the satellite, drone or other digital image of the obstructions that cast shadows on the PV array must be created and dated after the installation of the photovoltaic system.
Can the PV system be leased?

- The Energy Code does not dictate if the PV is leased or owned, only that it be installed on the property by final inspection.

Can investment in an “green energy program” be used?

- No, Green Energy programs are not an alternative to meeting these PV requirements.

Can the existing PV on existing home be used to satisfy new ADU PV requirements?

- No, but they can add the kW required for the ADU to the existing PV system.

Does PV apply to an addition?

- No, only new residential construction.
Title 24 Part 6: ADU

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- New Construction ADU’s

► Reach Codes

- Wrap Up
<table>
<thead>
<tr>
<th>REQUIREMENT</th>
<th>PROS</th>
<th>CONS</th>
<th>ADOPTER CITY</th>
</tr>
</thead>
</table>
| Photovoltaic (PV) System on major high-rise multifamily or nonresidential projects: Small minimum system capacity | • Stand-alone or combine with energy efficiency measures for greater savings  
• Small minimum system size allows flexibility to size appropriately for project  
• PV is cost-effective under most major project scenarios  
• Tax Credit | • Requires external documents and/or calculations  
• If install minimum only, offsets small percentage of total usage | Berkeley, Brisbane, Hayward, Menlo Park, Milpitas, Pacifica, Richmond, San Luis Obispo, San Mateo |
| Photovoltaic (PV) System on major high-rise multifamily or nonresidential projects: Large minimum system capacity | • Stand-alone or combine with energy efficiency measures for greater savings  
• PV is cost-effective under most major project scenarios  
• Tax credit | • Can be a considerable incremental cost  
• Highly variable investment requirements  
• Physical constraints on rooftop  
• Sizing may not be optimal for occupancies with different load profiles | Carlsbad, Mountain View, Santa Monica |
| One energy performance requirement for mixed-fuel only (no requirement for all-electric designs) | • Encourages all electric designs  
• No external documents or calculations  
• Retains builder flexibility and choice | • Uncertain impacts  
• May be challenging to communicate | Berkeley, Davis, Marin County, Mill Valley, Milpitas, Palo Alto, San Francisco, San Jose, San Luis Obispo, San Mateo, Santa Monica |
Title 24 Part 6: ADU

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▶ Wrap Up
Ace Tools™
A variety of tools to help you identify the forms, installation techniques, and standards relevant to building projects in California.

Ace Training™
Targeted classroom and online training on Title 24, Part 6 and Title 20 addressing a variety of stakeholders and measures.

Ace Resources™
Application Guides, Facts Sheets, Trigger Sheets and Checklists to help you understand how and when to comply with California's building and appliance energy efficiency standards.
Coffee & Code with Brian — Residential Modeling: Accessory Dwelling Units (ADU), Part 1: Newly Conditioned Detached ADU

Join host Brian Selby for our next Code & Coffee event — a one-hour live stream YouTube show designed to present "how-tos" for industry professionals working with California's building and appliance energy efficiency standards. The setting is informal, the platform interactive, and the java strong! In this episode of Code & Coffee, Brian will focus on residential building performance modeling for compliance with California's Title 24, Part 6 Building Energy Efficiency Standards. Brian will demonstrate how to model a newly conditioned detached ADU based on converting an existing detached garage to an ADU. This demonstration includes performing plan take-offs, modeling the project in EnergyPro, making recommendations for compliance, and reviewing the CF1R for accuracy.

There are currently no classes scheduled for this topic. But you can click on the link below to view a recording of a previous session.

View Recording

View Recording

EnergyCodeAce.com/training
### Contacts

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<tr>
<th>Contact</th>
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<th>Email</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gina Rodda</td>
<td>Instructor</td>
<td><a href="mailto:gina@gabelenergy.com">gina@gabelenergy.com</a></td>
<td>510-428-0803</td>
</tr>
<tr>
<td>Jill Marver</td>
<td>PG&amp;E</td>
<td><a href="mailto:jkz1@pge.com">jkz1@pge.com</a></td>
<td>925-415-6844</td>
</tr>
<tr>
<td>Ruby Yepez</td>
<td>SCE</td>
<td><a href="mailto:Ruby.R.Yepez@sce.com">Ruby.R.Yepez@sce.com</a></td>
<td>626-302-0699</td>
</tr>
<tr>
<td>Jeremy Reefe</td>
<td>Sempra</td>
<td><a href="mailto:JMReefe@semprautilities.com">JMReefe@semprautilities.com</a></td>
<td>858-636-5533</td>
</tr>
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