

Proposal Summary



Multifamily Restructuring

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during a utility-sponsored stakeholder meeting on February 21, 2023. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com by March 7, 2023.

Measure Description

The multifamily restructuring CASE Report will propose changes to envelope and HVAC requirements that differ under 2022 Title 24, Part 6 between multifamily buildings up to three habitable stories and multifamily buildings four or more habitable stories.

Verification (HERS/ATT) Clean-Up

This measure would extend HERS compliance credits to all applicable multifamily buildings, regardless of number of habitable stories, for:

1. **Low Leakage Air-handling Units:** Verify low leakage air handler and ducts installed and system leakage rate meets or exceeds rate specified on certificate of compliance
2. **Variable Capacity Heat Pump (VCHP) Compliance Option:** Verify system equipment is listed in CEC low-static pressure systems, non-continuous fan operation, refrigerant charge, low leakage ducts in conditioned space, ductless system in conditioned space, airflow to all habitable spaces, wall-mounted thermostats for zones >150 ft², ducted airflow, and air filter pressure drop

The measure would remove verification requirements for buildings with three or fewer habitable stories, so that the compliance options can be claimed without verification for all applicable multifamily buildings, regardless of number of habitable stories, for:

1. **Verified Energy Efficiency Ratio (EER/EER2):** Verify system equipment is listed in approved directory and necessary information is provided



2. **Verified Seasonal Energy Efficiency Ratio (SEER/SEER2):** Verify system equipment is listed in approved directory and necessary information is provided
3. **Verified Heating Seasonal Performance Factor (HSPF/HSPF2):** Verify system equipment is listed in approved directory and necessary information is provided
4. **Rated Heat Pump Capacity Verification:** Verify system equipment is listed in approved directory and heating capacities are greater than or equal to values specified on certificate of compliance

The measure would also remove compliance options that are not applicable or common in multifamily buildings, including:

1. **Evaporatively Cooled Condensers** – Verify low leakage ducts, refrigerant charge, time delay response, listed equipment, and system efficiencies
2. **Whole House Fan:** Verify airflow rate and watt draw. Calculate efficacy (w/cfm). Confirm airflow rate and efficacy meet or exceed requirements of certificate of compliance
3. **Central Fan Ventilation Cooling System:** Verify system airflow and fan efficacy meet or exceed requirements of certificate of compliance

The measure would not modify the process for conducting the verification tests, and would not affect additions or alterations.

The measure would replace mention of “low-rise residential” and “high-rise residential” in the Residential and Nonresidential Appendices with “single-family” and “multifamily” and appropriate mention of multifamily buildings up to three habitable stories and four or more habitable stories.

Data Needs/Stakeholder Information Requests

Data needs include:

Verification Clean-Up

- Technical feasibility of technologies and prevalence of the compliance options in multifamily buildings.
- Barriers to removing and extending compliance options, and removing verification for proposed compliance options.
- Cost and labor time required to perform each verification test per dwelling unit.

Data may be provided anonymously. To participate or provide information, please email Lucy Albin, LAlbin@trccompanies.com directly and cc info@title24stakeholders.com.

Draft Code Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2022 documents are marked with **red underlining** (new language) and **strikethroughs** (deletions). Expected sections or tables of the proposed code (but not specific changes at this time) are highlighted in **yellow**.

Standards

SUBCHAPTER 11 MULTIFAMILY BUILDINGS - PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES

SECTION 170.1 – PERFORMANCE APPROACH

A building complies with the performance approach if the energy budget calculated for the Proposed Design Building under Subsection (b) is no greater than the energy budget calculated for the Standard Design Building under Subsection (a).

- (a) Energy Budget for the Standard Design Building.** The energy budget for the Standard Design Building is expressed in terms of source energy and time-dependent valuation (TDV) energy, and they are determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, photovoltaic (PV) and battery storage system, service water heating, and covered process loads.
- (b) Energy Budget for the Proposed Design Building.** The energy budget for a Proposed Design Building is expressed in terms of source energy and time-dependent valuation (TDV) energy, and they are determined by calculating the source energy and TDV energy for the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the energy for space-conditioning, indoor lighting, mechanical ventilation, photovoltaic (PV) and battery storage system, and service water heating and covered process loads. The Proposed Building shall separately comply with the source energy budget and the TDV energy budget.

EXCEPTION to Section 170.1(b). A community shared solar electric generation system, or other renewable electric generation system, and/or community shared battery storage system, which provides dedicated power, utility energy reduction credits, or payments for energy bill reductions, to the permitted building and is approved by the Energy Commission as specified in Title 24, Part 1, Section 10-115, may offset part or all of the solar electric generation system or battery storage system TDV energy required to comply with the Standards, as calculated according to methods established by the Commission in the Nonresidential ACM Reference Manual.

(c) Calculation of Energy Budget. The TDV energy for both the Standard Design Building and the Proposed Design Buildings shall be computed by Compliance Software certified for this use by the Commission. The processes for Compliance Software approval by the Commission are documented in the ACM Approval Manual.

(d) Compliance Demonstration Requirements for Performance Standards.

1. Certificate of Compliance and Application for a Building Permit. The application for a

building permit shall include documentation pursuant to Sections 10-103(a)1 and 10-103(a)2 which demonstrates, using an approved calculation method, that the building has been designed so that its source energy budget and TDV energy budget do not exceed the Standard Design for the applicable Climate Zone.

2. Field Verification of Individual Dwelling Unit Systems. When performance of installed features, materials, components, manufactured devices or systems above the minimum specified in Section 170.2 is necessary for the building to comply with Section 170.1, or is necessary to achieve a more stringent local ordinance, field verification shall be performed in accordance with the applicable requirements in the following subsections, and the results of the verification(s) shall be documented on applicable Certificates of Installation pursuant to Section 10-103(a)3 and applicable Certificates of Verification pursuant to Section 10-103(a)5.

~~A. EER/SEER/CEER/HSPF/HSPF2 Rating. When performance compliance requires installation of a space conditioning system with a rating that is greater than the minimum rating required by TABLE 170.2-K or specified for the standard design, the installed system shall be field verified in accordance with the procedures specified in the applicable sections of Reference Residential Appendix RA3. RESERVED.~~

~~B. Variable Capacity Heat Pump (VCHP) Compliance Option. When performance compliance requires installation of a heat pump system that meets all the requirements of the VCHP compliance option specified in the ACM Reference Manual, the system shall be field verified in accordance with the procedures in Reference Residential Appendix RA3.4.4.3. RESERVED.~~

C. Low Leakage Air Handler. When performance compliance requires installation of a low leakage air-handling unit, the installed air handling unit shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.1.4.3.9.

D. RESERVED.

E. Heat Pump - Rated Heating Capacity. When performance compliance requires installation of a heat pump system, the heating capacity values at 47 degrees F and 17 degrees F shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.4.4.2.

~~F. Whole House Fan. When performance compliance requires installation of a whole-house fan, the whole house fan ventilation airflow rate and fan efficacy shall be field verified in accordance with the procedures in Reference Residential Appendix RA3.9. RESERVED.~~

~~G. Central Fan Ventilation Cooling System. When performance compliance requires installation of a central fan ventilation cooling system, the installed system shall be field verified in accordance with the procedures in Reference Residential Appendix RA3.3.4. RESERVED.~~

H. Dwelling Unit Enclosure Air Leakage. When performance compliance requires a building enclosure leakage rate that is lower than the standard design, the building enclosure shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.8.

I. Quality Insulation Installation (QII). When performance compliance requires field verification of QII, the building insulation system shall be field verified in accordance with the procedures in Reference Residential Appendix RA3.5.

J. Pre-Cooling. When performance compliance requires field verification of the installation and programming of a Pre-Cooling Thermostat, it shall be field verified in

accordance with the procedures in Reference Residential Appendix RA3.4.5.

Reference Appendices

Appendix RA2 – Residential HERS Verification, Testing, and Documentation Procedures

Table RA2-1 – Summary of Measures Requiring Field Verification and Diagnostic Testing

Measure Title	Description	Procedure(s)
	Duct Measures	
Duct Sealing	Component Packages require that space conditioning ducts be sealed. If sealed and tested ducts are claimed for compliance, field verification and diagnostic testing is required to verify that approved duct system materials are utilized, and that duct leakage meets the specified criteria.	RA3.1.4.3
Duct Location, Surface Area and R-value	Compliance credit can be taken for improved duct location, surface area and R-value. Field verification is required to verify that the duct system was installed according to the design, including location, size and length of ducts, duct insulation R-value and installation of buried ducts. ¹ For buried ducts measures, Duct Sealing and High Quality Insulation Installation (QII) is required.	RA3.1.4.1
Verification of low leakage ducts located entirely in conditioned space	Duct system location shall be verified by visual inspection and diagnostic testing. Compliance credit can be taken for verified duct systems with low air leakage to the outside when measured in accordance with Reference Residential Appendix Section RA3.1.4.3.8. Field Verification for ducts in conditioned space is required. Duct sealing is required.	RA3.1.4.3.8
Low Leakage Air-handling Units	Compliance credit can be taken for installation of a factory sealed air handling unit tested by the manufacturer and certified to the Commission to have met the requirements for a Low Leakage Air-Handling Unit. Field verification of the air handler's model number is required. Duct Sealing is required.	RA3.1.4.3.9
Verification of Return Duct Design	Verification to confirm that the return duct design conform to the applicable criteria given in TABLE 150.0-B, or TABLE 150.0-C, TABLE 160.3-A, or TABLE 160.3-B.	RA3.1.4.4
Verification of Air Filter Device Design	Verification to confirm that the air filter devices conform to the requirements given in applicable Standards Sections 150.0(m)12 or 160.2(b)1.	RA3.1.4.5
Verification of Prescriptive Bypass Duct Requirements	Verification to confirm zonally controlled systems comply with the bypass duct requirements in Section 150.1(c)13 or 170.2(c)3C.	RA3.1.4.6
	Air Conditioning Measures	
Improved Refrigerant Charge	Component Packages require in some climate zones that air-cooled air conditioners and air-source heat pumps be diagnostically tested in the field to verify that the system has the correct refrigerant charge. For the performance method, the Proposed Design is modeled with less efficiency if diagnostic testing and field verification is not performed. The system must also meet the prerequisite minimum System Airflow requirement.	RA3.3 RA3.2 RA1.2
Installation of Fault Indicator Display	Component Packages specify that a Fault Indicator Display can be installed as an alternative to refrigerant charge testing. The existence of a Fault Indicator Display has the same calculated benefit as refrigerant charge testing. Field verification is required.	RA3.4.2
Verified System Airflow	When compliance requires verified system airflow greater than or equal to a specified criterion, field verification and diagnostic testing is required.	RA3.3
Air-handling Unit Fan Efficacy	When compliance requires verified fan efficacy (Watt/cfm) less than or equal to a specified criterion, field verification and diagnostic testing is required.	RA3.3

Verified Energy Efficiency Ratio (EER/EER2)	Compliance credit can be taken for increased EER/EER2 by installation of specific air conditioner or heat pump models. Field verification is required <u>in single-family residential only.</u> ²	RA3.4.3 RA3.4.4.1
Verified Seasonal Energy Efficiency Ratio (SEER/SEER2)	HERS Rater field verification of the SEER/SEER2 rating is required for some systems <u>in single-family residential only.</u>	RA3.4.3 RA3.4.4.1
Rated Heat Pump Capacity Verification	When performance compliance uses a heat pump, the rated capacity of the installed system shall be verified to be greater than or equal to the specified value. <u>Verification is required for single-family residential only.</u>	RA3.4.4.2
Evaporatively Cooled Condensers	Compliance credit can be taken for installation of evaporatively cooled condensers. Field verification of duct leakage is required. Field verification of refrigerant charge is required. Field verification of EER/EER2 is required. <u>This measure is applicable to single-family residential only.</u>	RA3.1.4.3, RA3.2 RA3.4.3. RA3.4.4.1
Variable Capacity Heat Pump (VCHP) Compliance Option	When performance compliance uses the VCHP compliance option, the system shall be field verified to confirm it meets the eligibility requirements.	RA3.4.4.3

	Ventilation Cooling Measures	
Whole House Fan	When performance compliance uses a whole house fan, the installed whole house fan airflow rate (cfm) and fan efficacy (W/cfm) shall be verified to be equal to or better than the specified values. <u>This measure is applicable to single-family residential only.</u>	RA3.9
Central Fan Ventilation Cooling System	When performance compliance uses a central fan ventilation cooling system (CFVCS), the installed CFVCS ventilation airflow rate (cfm) and fan efficacy (W/cfm) shall be verified to be equal to or better than the specified values. <u>This measure is applicable to single-family residential only.</u>	RA3.3.4
	Mechanical Ventilation Measures for Improved Indoor Air Quality	
Continuous Whole-Building Mechanical Ventilation Airflow	Measurement of whole-building mechanical ventilation is mandatory for newly constructed buildings.	RA3.7.4.1
Intermittent Whole-Building Mechanical Ventilation Airflow	Measurement of whole-building mechanical ventilation is mandatory for newly constructed buildings.	RA3.7.4.2
Kitchen Local Mechanical Exhaust Verification	Verification of kitchen local mechanical exhaust is mandatory for newly constructed buildings.	RA3.7.4.3
Heat Recovery Ventilation (HRV) or Energy Recovery Ventilation (ERV) Rated Performance Verification	When performance compliance requires verification of the HRV/ERV fan efficacy (W/cfm) or heat recovery efficiency, then the installed ventilation system shall be verified.	RA3.7.4.4
	Building Envelope Measures	
Building Envelope Air Leakage	Compliance credit can be taken for reduced building envelope air leakage. Field verification and diagnostic testing is required. Multifamily dwelling units are required to have enclosure leakage verified when supply or exhaust ventilation systems are installed.	RA3.8
Quality Insulation Installation (QII)	Compliance Software recognizes standard and improved envelope construction. Quality Insulation Installation is a prescriptive measure in all climate zones for newly constructed buildings and additions greater than 700 square feet, except low-rise multifamily buildings in Climate Zone 7. Field verification is required.	RA3.5
Quality Insulation Installation for Spray Polyurethane Foam (SPF) Insulation	A HERS Rater shall verify the installation of SPF insulation whenever R-values other than the default R-value per inch are used for compliance.	RA3.5.6
	Single Family Domestic Hot Water Measures	
Verified Pipe Insulation Credit (PIC-H)	Inspection to verify that all hot water piping in non-recirculating systems is insulated and that corners and tees are fully insulated. No piping should be visible due to	RA3.6.3.

	insulation voids with the exception of the last segment of piping that penetrate walls and delivers hot water to the sink, appliance, etc.	
Verified Parallel Piping (PP-H)	Inspection that requires that the measured length of piping between the water heater and single central manifold does not exceed five feet	RA3.6.4
Verified Compact Hot Water Distribution System Expanded Credit (CHWDS-H-EX)	Field verification to insure that the eligibility criteria specified in RA 3.6.5 are met.	RA3.6.5
Demand Recirculation: Manual Control (RDRmc-H)	Inspection to verify that all recirculating hot water piping is insulated and that corners and tees are fully insulated. No piping should be visible due to insulation voids	RA3.6.6
Demand Recirculation: Sensor Control(RDRsc-H)	Inspection to verify that all recirculating hot water piping is insulated and that corners and tees are fully insulated. No piping should be visible due to insulation voids.	RA3.6.7
Verified Drain Water Heat Recovery System (DWHR-H)	Inspection to verify that the DWHR unit(s) and installation configuration match the compliance document and the DWHR(s) is certified to the Commission to have met the requirements.	RA3.6.9
	Multi Family Domestic Hot Water Heating Measures	
Multiple Recirculation Loop Design for DHW Systems Serving Multiple Dwelling Units	Inspection that a central DHW system serving a building with more than eight dwelling units has at least two recirculation loops, each serving roughly the same number of dwelling units. These recirculation loops may the same water heating equipment or be connected to independent water heating equipment.	RA3.6.8
Verified Drain Water Heat Recovery System (DWHR-H)	Inspection to verify that the DWHR unit(s) and installation configuration match the compliance document and the DWHR(s) is certified to the Commission to have met the requirements.	RA3.6.9

1. Note: Compliance credit for increased duct insulation R-value (not buried ducts) may be taken without field verification if the R-value is the same throughout the building, and for ducts located in crawlspaces and garages where all registers are either in the floor or within 2 feet of the floor. These two credits may be taken subject only to enforcement agency inspection.

2. Note: The requirement for verification of a high EER/EER2 does not apply to equipment rated only with an EER/EER2.

RA3.1 Field Verification and Diagnostic Testing of Air Distribution Systems

RA3.1.1 Purpose and Scope

RA3.1 contains procedures for measuring the air leakage in forced air distribution systems as well as procedures for verifying duct location, duct surface area, duct R-value, return duct design, return grille design, and air filter installation.

RA3.1 applies to air distribution systems in both new and existing low-rise single-family and multifamily residential buildings.

RA3.3 Field Verification and Diagnostic Testing of Forced Air System Airflow Rate, Fan Watt Draw, and Determination of Fan Efficacy.

RA3.3 contains procedures for:

- (a) Verification of improved system airflow rate (cfm) in ducted split system and packagedspace conditioning systems serving low-rise single-family and multifamily residential buildings.

- (b) Verification of reduced fan power (Watt) draw achieved through improved air distribution system design, including more efficient motors and ducts that have less resistance to airflow.
- (c) Determination of fan efficacy (Watt/cfm) utilizing simultaneous measurement of system Watt draw and airflow rate.

RA3.3.4 Verification of Central Fan Ventilation Cooling Systems (CFVCS)

When field verification and diagnostic testing of a central fan ventilation cooling system is required for compliance credit for the performance standards set forth in Standards Section 150.1(b), the CFVCS shall be verified according to the procedures in this section. Central fan ventilation cooling is not applicable to multifamily buildings.

RA3.4.4.1 Rated Space Conditioning System Equipment Verification Procedure

When installation of specific matched system equipment is necessary for compliance with requirements for higher than minimum values for system HSPF/HSPF2, SEER/SEER2, or EER/EER2, the installed system equipment shall be verified according to the procedure specified in this section. Verification is not required for multifamily buildings. The verification shall utilize certified rating data from the AHRI Directory of Certified Product Performance at <http://www.ahridirectory.org> or another directory of certified product performance ratings approved by the Energy Commission for determining compliance.

RA3.4.4.2 Rated Heat Pump Capacity Verification Procedure

When heat pump systems are installed, and verification of the installed heat pump system capacity is required, the installed heat pump equipment shall be verified according to the procedure specified in this section. Verification is not required for multifamily buildings. The verification shall utilize certified rating data from the AHRI Directory of Certified Product Performance at <http://www.ahridirectory.org> or another directory of certified product performance ratings approved by the Energy Commission for determining compliance (product directory).

RA3.9 Field Verification and Diagnostic Testing of Whole House Fans (WHF)

RA3.9.1 Purpose and Scope

RA3.9 contains procedures for:

- (a) Measurement of WHF airflow rate to confirm compliance with the airflow rate requirements specified in the performance standards set forth in Standards section 150.1(b).
- (b) Measurement of WHF Watt draw.

(c) Calculation of WHF efficacy (w/cfm) utilizing simultaneous measurement of WHF Wattdraw and airflow rate.

(d) Measurement of WHF systems in single-family buildings only.