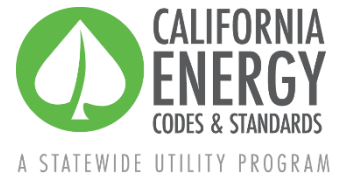


Proposal Summary



2022 California Energy Code (Title 24, Part 6)

Multifamily High Performance Thermal Envelope – Quality Insulation Installation (QII) Verification

Updated: Monday, March 23, 2020

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during Round 2 of the utility-sponsored stakeholder meeting on March 25th, 2020. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com.

Measure Description

This report proposes updates to QII verification of multifamily buildings. The measure primarily aligns low-rise and high-rise multifamily building QII requirements and secondarily increases energy efficiency level overall.

This measure extends the prescriptive requirements of QII to include high-rise multifamily buildings. QII is currently a prescriptive requirement for multifamily buildings with three or fewer habitable stories in all climate zones except Climate Zone 7. Under the proposed code change, buildings with less than 40,000 ft² of conditioned floor area would follow the current QII protocol. Buildings equal to or greater than 40,000 ft² would use a new protocol that is more appropriate and cost effective for large buildings that are built and insulated in stages.

The new protocol would allow for a randomized field verification of a portion of thermal envelope's insulation installation quality at a specific snapshot in time and would leverage the verification results as representative of the overall quality. This inspection would occur at approximately 30 percent construction completion stage when portions of the building will have both insulation conditions: (1) framed and sealed but with no insulation, (2) insulated but exposed and unfinished. The snapshot protocol includes a minimum of 20 percent total wall area threshold at each complete stage to be covered during field verification(s).

The proposed protocol includes inspecting for air sealing and insulation installation quality in walls, ceilings/attics, and floors over unconditioned spaces. Curtain wall and spandrel wall construction types common in metal buildings are excluded from the inspection protocol and QII requirements because the high variability of insulating methods and materials, panel-connections, and air-sealing requirements inherent across curtain wall products makes a consistent verification process prohibitively difficult to develop and enforce objectively.



In the performance approach, the proposed measure uses the same three derating mechanisms as in the 2019 standards for buildings that do not fulfill the prescriptive standard, and a 50 percent partial credit-back formula for each derating mechanism reflective of the partial nature of the proposed snapshot QII protocol. Larger buildings could opt to take extra performance credit for full-inspection QII, and smaller buildings could use the performance approach to trade off against snapshot QII in lieu of the prescriptively mandated full-inspection. The measure applies to new construction buildings and maintains the same trigger conditions for additions and alternation at 700 ft2. The proposed code change needs compliance software updates to account for appropriate baseline and proposed/improved conditions.

Draft Code Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2019 documents are marked with red underlining (new language) and ~~strikethroughs~~ (deletions).

Standards

SECTION 150.1 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR LOW-RISE RESIDENTIAL BUILDINGS

Section 150.1(c)1E.

E. All buildings shall comply with the Quality Insulation Installation (QII) requirements shown in TABLE 150.1-A or B. When QII is required, insulation installation shall meet the criteria specified in Reference Appendix RA3.5. Multifamily buildings with smaller than 40,000 CFA shall comply with full QII requirements, and multifamily buildings of 40,000 CFA or larger shall comply with Snapshot QII requirements.

TABLE 150.1-B COMPONENT PACKAGE – Multifamily Standard Building Design

Floors	Slab Perimeter	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	U 0.58 R 7.0
	Raised	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19
	Concrete Raised	U 0.092 R 8.0	U 0.092 R 8.0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.138 R 4.0	U 0.092 R 8.0	U 0.092 R 8.0	U 0.138 R 4.0	U 0.092 R 8.0
Quality Insulation Installation (QII)	Yes	Yes	Yes	Yes	Yes	Yes	NR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

SECTION 140.3 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES

Section 140.3(a) Envelope Component Requirements.

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Reference Appendices

RESIDENTIAL APPENDICES

RA3 RESIDENTIAL FIELD VERIFICATION AND DIAGNOSTIC TEST PROTOCOLS

Section 3.5 Quality Insulation Installation Procedures

RA3.5.1 Purpose and Scope

RA3.5 is a procedure for verifying the quality of insulation installation and air leakage control used in low-rise residential buildings. This procedure is to be followed by the insulation installer and a qualified Home Energy Rating System (HERS) rater must verify its conformance for meeting the requirements of Sections 150.1(c), and 110.7 of the Standards.

The procedure applies to wood and metal construction of framed and non-framed envelope assemblies. Framed assemblies include wall stud cavities, roof/ceiling assemblies, and floors typically insulated with: (1) batts of mineral fiber and mineral wool; (2) loose-fill materials of mineral fiber, mineral wool, and cellulose; (3) spray polyurethane foam; and, (4) rigid board sheathing materials. Non-framed assemblies include wall, roof/ceiling, and floors constructed of structural insulated panels and insulated concrete forms.

Note 1: For newly constructed buildings, this procedure applies to the entire thermal envelope of the building. In many instances, residential homes will use several types of insulation material, even in the same framed assembly. Each insulation material and the integrity of air leakage control for the building's entire thermal envelope must be verified by the HERS rater for the home to comply with the Standards.

Note 2: Structural bracing, tie-downs, and framing of steel or specialized framing used to meet structural requirements of the California Building Code (CBC) are allowed. These areas shall be called out on the building plans with diagrams and/or specific design drawings indicating the R-value amount and fastening method to be used. All structural framing areas shall be insulated in a manner that resists thermal bridging from the outside to the inside of the assembly separating conditioned from unconditioned space. The insulation and air barrier integrity shall be verified by the HERS rater.

Note 3: For multifamily buildings, dwelling unit-based sampling methods are not allowed for QII compliance. Multifamily building with less than 40,000 ft2 of conditioned floor area, must follow the same full QII protocols and methods as single-family buildings with direct verification of each insulating layer of the entire thermal envelope. Multifamily buildings with equal to or larger than 40,000 ft2 of conditioned floor area, may follow the Snapshot QII or the full QII verification procedure.

RA3.5.x Snapshot QII Procedures for Select Multifamily Buildings

Multifamily buildings with 40,000 or more CFA use the Snapshot QII verification procedure. Snapshot QII requires verification of all insulating materials of the thermal envelope, but only those aspects of quality insulation installation that can be verified at the snapshot in time of the verification date(s). Buildings using panelized curtain wall construction methods, rather than cavity framed methods are exempted from prescriptive snapshot-QII requirements without verification.

During each verification visit, the HERS Rater shall verify all thermal envelope air sealing and insulating materials visually available during the visit. The HERS Rater must directly observe at minimum 20 percent of the building's total gross wall area to verify framing cavity air sealing quality, and 20 percent of the building's total gross wall area to verify insulation installation quality. If these 20 percent minimums at both construction stages cannot be met in a single day's visit, the verifier shall return at subsequent dates until the minimum requirements are achieved.

Requirements detailed in RA3.5.1 through 3.5.8 apply with the following variations:

- Verification of external insulation, regardless of the building heights, may be done by observation from the ground level at a distance.
- Insulated header verification is omitted from the Snapshot QII protocol.