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Staff Supplement to California Statewide Codes and Standards Enhancement (CASE) Team Measure Proposal Buried Ducts and Cathedral Ceilings

Date: **March 28, 2024**

Pages: **2**

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Description of Proposed Regulatory Changes

The measure change proposal submitted by California Statewide Codes and Standards Enhancement (CASE) team and titled “Buried Ducts and Roofs with Cathedral Ceilings” proposes to make the following changes to the 2025 Standards:

1. Replaces the prescriptive Option B, Section 150.1, Title 24, Chapter 6 for Climate Zones 1 through 3, 5 through 7, and 16 to require that ducts are fully buried within attic insulation.

    - Staff does not agree with the proposed changes for buried ducts and have not included the proposed changes to the express terms. Staff's evaluation is that, despite the cost-effectiveness and energy-saving benefits of the buried ducts measure, various factors such as installation complexities, low adoption rates, inspection challenges, and compliance issues currently hinder its suitability for immediate implementation as part of the building energy efficiency standard. Staff intends to conduct a reevaluation to assess the feasibility of incorporating this measure into future code cycles.

2. Changes mandatory requirements of Section 150.0(a)1, eliminating the roof deck insulation requirement for Climate Zone 16 and adding a third exception that allows a buried ducts as an alternative to the required roof deck insulation U-factor of 0.184 for Climate Zones 4 and 8 through 15.

    - Staff does not agree with the proposed changes for eliminating roof deck insulation requirement and have not included the proposed changes to the express terms.

3. Revises effective R-values listed in Tables 15 through 20 of the Single Family Residential Alternative Calculation Method Reference Manual (ACM Manual) and eliminates partially buried ducts as an option to

simplify verification. Empirical equations would be developed for use in compliance models to account for the impact of attic temperature on effective R-value. (Sizing, Equipment Selection, and Ducts/ Diffusers)

- Staff does not agree with the proposed changes for eliminating partially buried ducts as an option and have not included the proposed changes to the express terms.

4. Provides prescriptive compliance pathway for constructing cathedral ceilings – otherwise known as vaulted ceilings, cathedral roofs, or rafter roofs – in single-family new construction and additions. This proposal would add a new prescriptive option to Table 150.1-A. Cathedral ceilings would be required to have a maximum U-factor of 0.02-0.032 (or a minimum R-value of 30 to 49, respectively) depending on climate zone. R-30 is proposed in Climate Zones 11, 14 and 16, R-38 in Climate Zones 1, 2, 4, 8 through 10, 12, 13, and 15, and R-49 in Climate Zones 3 and 5 through 7. In addition to these insulation requirements space conditioning equipment and ducts would be required to meet Section 150.1(c)9B which requires that the Verified Low Leakage Ducts in Conditioned Space conditions be met per Reference Residential Appendix Section RA3.1.4.3.8.

    - Staff agrees with requirements for and have incorporated substantively similar changes into 150.1(c)1A of the proposed Express Terms.

<u>Staff Analysis and Conclusion</u>

Staff has analyzed the submitted proposal and reached the following conclusions for the measures included in the Express Terms:

- Based on the evidence presented in the proposal, the prescriptive compliance path for constructing cathedral ceilings measure, as proposed, are cost effective and the author have appropriately followed the Energy Commission's Life Cycle Cost methodology.
- The cathedral ceiling measure costs premiums presented in the proposal reasonable and appropriate for the measure proposed.
- The cathedral ceiling measure energy savings presented in the proposal have been appropriately modeled and appear credible.
- The cathedral ceiling measure environmental impacts presented in the proposal are reasonable and appropriate for the measure proposed.