Proposal Summary

2022 California Energy Code (Title 24, Part 6)

Reduced Infiltration – Air Leakage Testing

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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 November 5, 2019. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com by November 19, 2019.

Measure Description

This submeasure is proposing a prescriptive requirement for whole building air leakage testing of nonresidential buildings other than high-rise residential. Air leakage rates will be required to not exceed 0.30 cubic feet per minute per square foot of the building thermal envelope area at a pressure differential of 75 Pascals. Construction documents will be required to include all air barrier details. The CASE Team is considering a performance credit for buildings that achieve a leakage below a more stringent threshold.

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). Expected sections or tables of the proposed code (but not specific changes at this time) are highlighted in yellow.

Standards

Air Barrier. To meet the requirement of TABLE 140.3-B, all buildings shall have a continuous air barrier that is designed and constructed to control air leakage into, and out of, the building's conditioned space. The air barrier shall be sealed at all joints for its entire length and shall be composed of:

A. Nonresidential buildings and hotels and motels:

i. Materials that have an air permeance not exceeding 0.004 cfm/ft^2, under a pressure differential of 0.3 in. of water (1.57 psf) (0.02 L/(sec-m^2) at 75 pa), when tested in accordance with ASTM E2178; or

EXCEPTION to Section 140.3(a)9A: Materials in TABLE 140.3-A shall be deemed to comply with Section 140.3(a)9A provided if all joints are sealed and all of the materials are installed as air barriers in accordance with the manufacturer's instructions.

TABLE 140.3-A MATERIALS DEEMED TO COMPLY WITH SECTION 140.3(a)9A

	MATERIALS AND THICKNESS		MATERIALS AND THICKNESS
1	Plywood – min. 3/8 inches thickness	9	Built up roofing membrane
2	Oriented strand board – min. 3/8 inches thickness	10	Modified bituminous roof membrane
3	Extruded polystyrene insulation board – min. ½ inches thickness	11	Fully adhered single-ply roof membrane
4	Foil-back polyisocyanurate insulation board – min. ½ inches thickness	12	A Portland cement or Portland sand parge, or a gypsum plaster, each with min. 5/8 inches thickness
5	Closed cell spray foam with a minimum density of 2.0 pcf and a min. 2.0 inches thickness	13	Cast-in-place concrete, or precast concrete
6	Open cell spray foam with a density no less than 0.4 pcf and no greater than 1.5 pcf, and a min. 5½ inches thickness	14	Fully grouted concrete block masonry
7	Exterior or interior gypsum board min. 1/2 inches thickness	15	Sheet steel or sheet aluminum
8	Cement board – min. 1/2 inches thickness	---	----------

ii. Assemblies of materials and components that have an average air leakage not exceeding 0.04 cfm/ft^2, under a pressure differential of 0.3 in. of water (1.57 psf) (0.2 L/m^2 at 75 pa), when tested in accordance with ASTM E2357, ASTM E1677, ASTM E1680, or ASTM E283; ~~or~~ and

EXCEPTION to Section 140.3(a)9B: The following materials shall be deemed to comply with Section 140.3(a)9B if all joints are sealed and all of the materials are installed as air barriers in accordance with the manufacturer's instructions:

a) Concrete masonry walls that have at least two coatings of paint or at least two coatings of sealer coating.

b) Concrete masonry walls with integral rigid board insulation.

c) Structurally Insulated Panels.

d) Portland cement or Portland sand parge, or stucco, or a gypsum plaster, each with min. 1/2 inches thickness

iii. The entire building has an air leakage rate not exceeding ~~0.40~~0.30 cfm/ft^2 at a pressure differential of 0.3 in of water (1.57 psf) (2.0 L/ m^2 at 75 pa), when the entire building is tested, after completion of construction, in accordance with ASTM ~~E779~~ E3158 by Blower Door Fan Assembly (Architectural Only), multi-point regression testing or another test method approved by the Commission. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and building owner. If the tested rate exceeds 0.3 cfm/ft2 but does not exceed 0.60 cfm/ft2, a diagnostic evaluation, such as a smoke tracer or infrared imaging shall be conducted while the building is

pressurized, and any leaks noted shall be sealed if such sealing can be made without destruction of existing building components. In addition, a visual inspection of the air barrier shall be conducted, and any leaks noted shall be sealed if such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal air leaks shall be submitted to the building owner and the Code Official and any further requirement to meet the leakage air rate will be waived.

i. **EXCEPTION to Section 140.3(a)9:** Relocatable Public School Buildings.

High-rise multifamily will not have a prescriptive requirement for whole building testing, it will remain an option

B. High-rise residential buildings

i. Materials that have an air permeance not exceeding 0.004 cfm/ft^2, under a pressure differential of 0.3 in. of water (1.57 psf) (0.02 L/(sec-m^2) at 75 pa), when tested in accordance with ASTM E2178; or

EXCEPTION to Section 140.3(a)9A: Materials in TABLE 140.3-A shall be deemed to comply with Section 140.3(a)9A provided if all joints are sealed and all of the materials are installed as air barriers in accordance with the manufacturer's instructions.

ii. Assemblies of materials and components that have an average air leakage not exceeding 0.04 cfm/ft^2, under a pressure differential of 0.3 in. of water (1.57 psf) (0.2 L/m^2 at 75 pa), when tested in accordance with ASTM E2357, ASTM E1677, ASTM E1680, or ASTM E283; or

EXCEPTION to Section 140.3(a)9B: The following materials shall be deemed to comply with Section 140.3(a)9B if all joints are sealed and all of the materials are installed as air barriers in accordance with the manufacturer's instructions:

a) Concrete masonry walls that have at least two coatings of paint or at least two coatings of sealer coating.

b) Concrete masonry walls with integral rigid board insulation.

c) Structurally Insulated Panels.

d) Portland cement or Portland sand parge, or stucco, or a gypsum plaster, each with min. 1/2 inches thickness

iii. The entire building has an air leakage rate not exceeding 0.30 cfm/ft^2 at a pressure differential of 0.3 in of water (1.57 psf) (2.0 L/ m^2 at 75 pa), when the entire building is tested, after completion of construction, in accordance with ASTM 3158 by Blower Door Fan Assembly (Architectural Only), multi-point regression testing or another test method approved by the Commission. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and building owner.

iv. **EXCEPTION to Section 140.3(a)9:** Relocatable Public School Buildings.

There will be a requirement to show the air barrier on construction documents:

Construction documents include all air barrier details, including air barrier boundaries and associated square foot calculations on all sides of the air barrier as applicable.

Performance credit for achieving an air leakage rate below a more stringent threshold is being considered.