

CALIFORNIA ENERGY COMMISSION

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FINAL STATEMENT OF REASONS FOR PROPOSED BUILDING STANDARDS OF THE CALIFORNIA ENERGY COMMISSION

**REGARDING THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1, CHAPTER 10,
and PART 6 (CALIFORNIA ENERGY CODE)**

**2019 BUILDING ENERGY EFFICIENCY STANDARDS
DOCKET NUMBER 17-BSTD-02**

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I. INTRODUCTION

Pursuant to California Government Code Section 11346.9(a), this Final Statement of Reasons (FSOR) contains updates to the Initial Statement of Reasons ("ISOR") and its descriptions of the purposes, rationales, and necessity of the California Energy Commission's proposed amendments to its energy efficiency standards for buildings, to account for further amendments made to the originally proposed Draft Express Terms as a result of public comments received during the rulemaking proceeding. This document accompanies a set of Final Express Terms that will go into effect on January 1, 2020, following its adoption by the Energy Commission and approval by the California Building Standards Commission.¹ These standards are in the California Code of Regulations, Title 24, Part 1, Chapter 10, and Part 6 (and are also known as the California Energy Code). This FSOR fulfills the requirements of California's Administrative Procedure Act (see Government Code Section 11340 et seq.).

The FSOR also includes the Commission's Final Response to Comments. Due to its size, this response is included as an Appendix to the FSOR.

A. A Brief History of the Energy Commission's Building Standards

The description of the history of the Building Energy Efficiency Standards (Standards) found in the ISOR remains accurate in describing the changes proposed in the Final Express Terms. No updates are necessary.

B. How the Standards Work

The description of the general organization and operation of the Standards found in the ISOR remains accurate in describing the changes proposed in the Final Express Terms. No updates are necessary.

C. Updates to the Summary of the Changes Proposed in This Rulemaking Proceeding

The changes included in the Final Express Terms build upon and ultimately refine the Draft Express Terms based on consideration of the public comments received on the proposed changes to the regulations. These changes therefore remain within the summaries specified in the ISOR, improving upon but not fundamentally altering the proposed changes to regulation.

Residential

The summaries of proposed changes to the residential sections of the Standards found in the ISOR remain accurate in describing the changes proposed in the Final Express Terms. No updates are necessary.

Nonresidential

The summaries of proposed changes to the residential sections of the Standards found in the ISOR remain accurate in describing the changes proposed in the Final Express Terms. No updates are necessary.

Standards cleanup

The Final Express Terms includes additional changes throughout the regulations to further clarify, simplify, and streamline the existing language and requirements consistent with the ISOR. The majority of these changes have no material effect, such as changes to correct spelling or improve grammar.

¹ The ISOR refers to the proposed standards in various ways, e.g., "2019 Building Energy Efficiency Standards," "proposed standards," and "2019 Standards"; in addition, it uses "amendments" or "proposed regulations" as a shorthand reference for new provisions, revisions to existing provisions, and deletions of existing provisions, in the Parts 1 and 6 of Title 24 of the California Code of Regulations.

II. FSOR ANALYSES REQUIRED BY THE ADMINISTRATIVE PROCEDURE ACT

A. Update of the Information Contained in the Initial Statement of Reasons (Government Code Section 11346.9(a)(1))

Pursuant to Government Code Section 11349(a), this part of the FSOR provides an update to the information contained in the ISOR.

1. Purpose of Proposed Regulations

a. The general purpose, rationale, and necessity of the proposed amendments

The general purpose and rationale stated in the ISOR remains accurate in describing the changes proposed in the Final Express Terms. No updates are necessary.

b. The specific purpose of each regulation, the problem it addresses, and why it is reasonably necessary

Where the language in the Final Express Terms differs from the Draft Express Terms that accompanied the ISOR, this section of the FSOR contains an updated statement of the specific purpose of each adoption, amendment, or repeal, the problem the agency intends to address, and the rationale for the determination by the agency that each adoption, amendment, or repeal is reasonably necessary to carry out the purpose and address the problem for which it is proposed.

ALL CHAPTERS

Updates to the purpose and necessity statements have been made to all sections within the Express Terms, including those in the Reference Appendices and the Alternate Calculation Method Approval Manual. The purpose of these changes is to ensure that references to Statutes providing authority and reference are both complete and accurate; these changes are necessary to provide transparency regarding the legal context of the adopted provisions, the statutory authority under which they are proposed, and the statutory direction they are following.

UPDATES TO TITLE 24, PART 1, CHAPTER 10

Section 10-102 – The purpose of the changes to the definitions are to replace the word “called” with the phrase “referred to as” where it occurs, and to remove a doubled word (“ATTs”) that occurs back-to-back in a few places. The changes clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-102 – The purpose of the change to the definition for “Compliance Approach” is to add a missing space. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-102 – The purpose of the change to the definition for “Record Drawing” is to add the word “drawings” in one place for consistency with the defined term. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-103(a) – The purpose of the change to this section is to align its requirements with those in Chapter 7, consistent with the addition of Healthcare Facilities to the Scope of Part 6. This change is necessary to prevent overlapping documentation requirements from applying to these facilities, which would unnecessarily increase compliance costs.

Section 103.1(c)3B, F and G – The changes to these sections correct punctuation relating to section numbering; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 103.1(f) – The changes to these sections correct punctuation relating to section numbering; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-103.2(b)1B – The changes to these sections correct punctuation relating to section numbering; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 103.2(c)3B, F and G – The changes to these sections correct punctuation relating to section numbering; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 103.2(f) – The changes to these sections correct punctuation relating to section numbering; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-109 – The change to the Title of this section replaces the phrase "Exceptions to" with the word "Determinations" to preclude conflating the use of the term "Exception" here with how it is used in section language. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-111 – The purpose of the changes made to this section are to include exterior doors within the labeling requirements, and clarify that windows and doors shall comply with the labeling requirements of NFRC 700 or NFRC 705. These changes are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 10-115(a) – The purpose of the change to this section is to correct a section reference: solar photovoltaic systems are proposed to be required on newly constructed residential buildings, and the section applicable to newly constructed buildings is Section 150.1(b)1, not (b)2. This change is necessary to prevent an erroneous reference from making the contents of Section 10-115(a) nonsensical.

Section 10-115(a)3 – The purpose of the change to this section is to more clearly describe each of the scenarios that staff find to be potential avenues for community-scale renewable generation or storage comporting with Part 6, and in so doing add specificity to the requirement that community-scale systems provide building owners or tenants with the same benefit that would occur with per-building installation of solar photovoltaic or battery storage systems. This change is necessary to provide adequate direction to projects seeking a community-scale approach to renewable energy or energy storage systems, such that it is clear when a proposed project would comply and when it would fall short of compliance.

Section 10-115(a)4 – The purpose of the change to this section is to simplify its requirement and align it with industry norms; the intent of this Section is guarantee that equivalent benefit is provided in cases of community systems, and staff finds that common industry practice is to provide a 20-year or greater warranty to rooftop solar photovoltaic systems. For this reason, staff finds that it is appropriate and sufficient to specify a period “no less than 20 years” rather than the more complex “equal to or greater than the inside [...] system” language previously proposed. This change is necessary to ensure that the requirements of this Section are not more complex than needed for its purpose.

UPDATES TO TITLE 24, PART 6, SUBCHAPTER 1

All Occupancies—General Provisions

100.0(h) – The purpose of the change to this section is to add an informative note to clarify the relationship between Title 20 and Title 24. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is not a substantive change.

Table 100.0-A – The purpose of the changes to this table are to ensure its accuracy in specifying all of the sections applicable to each listed Application. As the purpose of the table is informative and the sections applicable irrespective of their reference here, this change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

The following definitions in Section 100.1 have been updated:

AAMA/WDMA/CSA 101/ I.S.2/A440-11 – The purpose of adding this definition is to specify the complete title and version of the test procedure. This change is necessary to support its incorporation by reference into section language.

AHRI 680 – The purpose of this change is to update the reference to the most current version of the test standard. This change is necessary to stay current with respect to this document and in so doing maintain alignment with industry standards.

ASTM C836 – The purpose of this change is to update the reference to the most current version of the test standard. This change is necessary to stay current with respect to this document and in so doing maintain alignment with industry standards.

ASTM E1175 – The purpose of the change to this definition is to correct an error by inserting a space; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

ASTM E1918 – The purpose of the change to this definition is to remove an unnecessary space; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

CENTRAL FAN-INTEGRATED VENTILATION SYSTEM - The purpose of moving the location of the central fan-integrated ventilation system definition is to include this ventilation system definition in the same location in this section as the other ventilation system definitions. Moving the definition is necessary to improve Part

6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

CLERESTORY – The purpose of the change to this definition is to change from defining “clerestory glazing” to instead define “clerestory” broadly, and allow “clerestory glazing” to more naturally use the associated definitions of both words. In so doing, clerestory is now defined based on its location above the roofline. This change is necessary to avoid conflicts between defined terms, and to ensure consistent use of defined terminology.

DRIVER – The purpose of the change to this definition is to ensure use of terms common to the lighting industry (e.g., “semiconductors” in place of “circuitry”). This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

FENESTRATION PRODUCT – The purpose of the change made to this definition is for consistent use of defined terminology “glazed door”. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

HABITABLE SPACE – The purpose of the change to this definition is to simplify phrasing and more closely align to the definition occurring in Title 24, Part 2. As the removed phrasing was explanatory of the list of excluded spaces and that list is retained, this change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

HVI 915 - The purpose of this change is to define the test method referenced in the Standards. This test method has been referenced for several code cycles by ASHRAE Standard 62.2 which Part 6 has adopted by reference without the definition being defined in this section. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

HVI 916 - The purpose of this change is to define the test method referenced in the Standards. This test method has been referenced for several code cycles by ASHRAE Standard 62.2 which Part 6 has adopted by reference without the definition being defined in this section. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

HVI 920 - The purpose of this change is to define the test method referenced in the Standards. This test method has been referenced for several code cycles by ASHRAE Standard 62.2 which Part 6 has adopted by reference without the definition being defined in this section. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

IES LM-79-08 – The purpose of the change to this definition is to add the parenthetical version year for consistency with similar definitions. As the version year is already incorporated into the document number, this change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

IES TM-15-11 – The purpose of the change to this definition is to add the parenthetical version year for consistency with similar definitions. As the version year is already incorporated into the document number, this change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

OCCUPIABLE SPACE – The purpose of the change to this definition is to simplify phrasing and retain alignment with the definition of "Habitable Space", which is also updated. As the removed phrasing was explanatory of the list of excluded spaces and that list is retained, this change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

OVERHANG PROJECTION – The purpose of adding this definition is to include a key term consistent with the clarification of automatic daylighting control requirement for the areas adjacent to vertical glazing below an overhang. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

OVERHANG RISE - The purpose of adding this definition is to include a key term consistent with the clarification of automatic daylighting control requirement for the areas adjacent to vertical glazing below an overhang. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

RESNET 380 - The purpose of this change is to define the test method referenced in the Standards and to update the title and version of the standard. This test method has been referenced in previous code cycles without being defined in this section, and this change corrects this oversight. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

ROOF, LOW-SLOPED/STEEP-SLOPED – The purpose of the change to this definition is to align with the definition of the term in the California Building Code. The current definition for a low-sloped roof is a ratio of rise to run of 2:12 *or less*, and a steep-sloped roof is a ratio of rise to run of *greater than* 2:12. The California Building Code defines a low-sloped roof as being *less than* 2:12, and steep-sloped roofs as greater than *or equal to* 2:12. The change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

SMACNA RESIDENTIAL COMFORT SYSTEM INSTALLATION STANDARDS – The purpose of the change to this section is to correct the name and numeric edition of the document to the 2016-dated version, consistent with the update proposed in the 45-Day Language. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

UL STANDARD 181, 181A, 181B, 723, 1077, 2108, 8750 – The purpose of adding these definitions is to provide the complete name and version of each standard. The addition of UL test procedures referenced in later sections that were not previously defined is necessary to support their incorporation by reference into the Standards.

UL STANDARD 731 – The purpose of the change to this definition is to correct the associated date to the version currently referenced in federal law. This change is necessary to ensure consistency between state and federal requirements relating to oil-fired unit heaters.

VENTILATION SYSTEM, BALANCED - The purpose of this change is to define the balanced ventilation system type referenced in the Standards. This ventilation system type has been referenced for several code cycles by ASHRAE Standard 62.2 which Part 6 has adopted by reference without the definition being defined in this section. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

VENTILATION SYSTEM, CENTRAL FAN INTEGRATED, or CFI - The purpose of moving the location of the central fan-integrated ventilation system definition is to include this ventilation system definition in the same location in this section as the other ventilation system definitions. Moving the definition is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

VENTILATION SYSTEM, ENERGY RECOVERY, or ERV - The purpose of this change is to define the energy recovery ventilation system type referenced in the Standards. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

VENTILATION SYSTEM, EXHAUST - The purpose of this change is to define the exhaust ventilation system type referenced in the Standards. This ventilation system type has been referenced for several code cycles by ASHRAE Standard 62.2 which Part 6 has adopted by reference without the definition being defined in this section. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

VENTILATION SYSTEM, HEAT RECOVERY, or HRV - The purpose of this change is to define the heat recovery ventilation system type referenced in the Standards. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

VENTILATION SYSTEM, SUPPLY - The purpose of this change is to define the supply ventilation system type referenced in the Standards. This ventilation system type has been referenced for several code cycles by ASHRAE Standard 62.2 which Part 6 has adopted by reference without the definition being defined in this section. This change clarifies the amendments to ASHRAE 62.2 given in Section 150.0(o) without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This is a non-substantive change.

In addition to the above, ending periods were added to any definitions where they were found to be missing. These additions clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

UPDATES TO PART 6, SUBCHAPTER 2

All Occupancies—Mandatory Requirements for the Manufacture, Construction and Installation of Systems, Equipment and Building Components

Exception 2 to 110.2(a) – The purpose of the change to this section is to improve phrasing: “air- and water-cooled” is amended to “air-cooled and water-cooled”. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 110.2-D, E, F, G – The purpose of the changes to these tables are to correct punctuation; they clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 110.3(c) – The purpose of removing this section (and the necessary renumbering of is to eliminate overlap with the Plumbing Code. As the Plumbing Code already specifies the minimum output temperature for public lavatories and this section merely duplicates the requirement, this change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 110.6(a) – The purpose of the changes made to this section are to expressly state in the applicable subsections that the labeling requirements of §110.6 apply to exterior doors; this is stated at the beginning of this section but not restated later. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 110.6-B – The purpose of the changes to this table is to correct punctuation; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 110.8(a) – The purpose of the changes to this section are to update the name of a referenced outside organization and to improve grammar. This section currently refers to the “Bureau of Home Furnishings and Thermal Insulation”. Recently the California Bureau of Electronic and Appliance Repair and the Bureau of Home Furnishings and Thermal Insulation were merged together as the “Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation”. The changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 110.8(i) – The purpose of the change made to this section is to remove an unnecessary reference to Section 140.1. This change is necessary to ensure correct referencing and does not materially alter the requirements in the 45-Day Language, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 110.9(b)2 – The purpose of the change to daylighting controls is to expressly state that the specifications are applicable to indoor automatic daylighting controls. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and

11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 110.12(a) – The purpose of the change to this section is to add the phrase “demand responsive control” to characterize the requirements of its subsections, and for consistency with references to this section. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 110.12(a)1 – The purpose of the change to this section is to allow use of a cloud-based Virtual End Node (VEN) for compliance with Part 6. This change is necessary to allow use of a common solution for demand response communications, and in so doing ensure a minimal cost of compliance with demand responsive requirements.

Section 110.12(a)2 – The purpose of the change to this section is to simplify phrasing; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 110.2(a)3 – The purpose of adding this section is to expressly state that the requirements of Section 110.12(a) are minimum requirements, and do not limit the additional features (including communications protocols) that may be possessed by the device. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 110.12(b) – The purpose of the changes to this section are to use the more common terms “increase” and “decrease” in place of “setup” and “setdown”. The changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 110.12(c) – The purpose of the change to this section is to clarify that the requirement for lowering lighting by 15 percent is a minimum necessary to demonstrate correct installation and ability to function, and does not otherwise restrict the types of demand responsive functions or behaviors that the device can provide. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

UPDATES TO PART 6, SUBCHAPTER 3

Nonresidential, High-Rise Residential, and Hotel/Motel Buildings-Mandatory Requirements

Section 120.1(a) – The purpose of the change to this section is to remove the phrase “as amended by OSHPD” as unnecessary; the California amendments in the California Mechanical Code are noted without reference to adopting agency. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.1(b) – The purpose of the extensive changes to these sections are to include more current and more detailed requirements relating to Indoor Air Quality (IAQ), including filtration, updating the incorporation-by-reference of ASHRAE 62.1. The specific changes proposed for this section include:

Section 120.1(b)1Aiii – The purpose of the change to this section is to expressly specify that “heat recovery ventilation systems and energy recovery ventilation systems that provide outside air to an occupiable space” are considered part of the “supply side of mechanical balanced ventilation systems”. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

EXCEPTION to Section 120.1(b)1Bi – The purpose of adding this Exception is to allow for design flexibility where equipment is still adequately protected and filtration consistent with this section is still ultimately accomplished. This change is necessary to avoid being unnecessarily prescriptive regarding the design of HVAC systems.

Section 120.1(b)1Bii – The purpose of the changes to this section are to add specificity by including the term “nominal” and including an equation for filter sizing. This change is necessary to establish minimum filter size requirements that are clear and consistent, ensure that this section is not relying on an implicit reference to another document, and to make the requirements fully transparent.

Section 120.1(b)1Biv – The purpose of the change to this section is to improve clarity by removing redundant phrasing, consistent with the edits to Section 120.1(b)1Bii. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.1(b)1D – The purpose of the change to this section is to add a provision specific to supply-only and balanced ventilation systems, and to add mention of airflow rate consistent with that section’s requirements. This change is necessary to ensure that system design constraints are recognized and addressed in this section’s provisions.

Section 120.1(b)2Ai – The purpose of the change to this section is to simplify phrasing by replacing a key term with a more common term and replacing a reference to an outside document with a reference to the relative sections internal to Part 6. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.1(b)2Aiii – The purpose of the change to this section is to add a provision pointing back to the equation for filter sizing added to Section 120.1(b)1. This change is necessary for consistency with the proposed updates to Section 120.1(b)1.

Section 120.1(b)2Aiv and v – The purpose of the change to this section is to renumber these sections for clarity, remove use of the phrase “horizontally attached single-family dwelling units” in favor of the simpler phrase “multifamily attached dwelling units”, and to directly state an equation rather than relying on reference to an external document. These changes clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.1(b)2Avi – The purpose of the change to this section is to incorporate residential kitchen range hood requirements for consistency with Section 150.0(o)1G. This change is necessary to prevent an appearance of conflict between this Section and applicable provisions of Section 150.0, and to ensure its application where residential ventilation requirements apply.

Section 120.1(b)2Avii – The purpose of adding this section is to specify that compliance with ASHRAE 62.2 Section 6.5.2 (Space Conditioning System Ducts) shall not be required. The change was needed in order to eliminate a conflict between the ASHRAE 62.2 duct leakage requirements and existing duct leakage requirements in Part 6.

Section 120.1(b)2Aviii – The purpose of adding this section is to add explicit specification for the text for the label for the required mechanical ventilation fan control required by ASHRAE 62.2 section 4.4. The change is necessary in order to address builder stakeholder concerns that IAQ ventilation fan control labeling has not been well enforced, and IAQ ventilation fans are often turned off by dwelling occupants who do not understand that the fans must be operated in order to protect the quality of the indoor air.

Section 120.1(b)2B – The purpose of the changes to this section are to replace references to an external document with references to internal sections, consistent with the revisions to Sections 120.1(b)2Aiv and v. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.1(c)1 – The purpose of the changes to this section are to add and update section headings and to provide a second option for air filter sizing. The changes are necessary to include performance-based criteria for air filter sizing alongside the "prescriptive" option of a two inch depth, consistent with the updates to Section 120.1(b).

Section 120.1(c)3 – The purpose of the changes to this section are to update equation numbering consistent with including additional equations in Section 120.1, and to add an Exception to create consistency with Section 120.1(g) regarding use of transfer air. These changes are necessary to ensure consistency between sections and to allow appropriate use of transfer air.

Section 120.1(d)4 and 5 – The purpose of the changes to these sections are to correct punctuation and grammar; they clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.1(g)2 and 3 – The purpose of adding exceptions to these sections is to permit a small amount of transfer air to facilitate heat recovery. This change is necessary to avoid inadvertently restricting heat recovery devices or systems (and their associated energy efficiency benefits).

Table 120.1-A – The purpose of the proposed changes to this table are to correct table headings where the table extends to multiple pages, to correct and improve the language in the table's footnotes, and to remove note F from barbershops consistent with received public commentary. The removal of note F has the substantive effect of preventing barbershops from having zero air movement during occupied standby mode, as this lack of ventilation could have unintended consequences in enclosed spaces with airborne particulates and aerosols that commonly accompany provision of this service. Thus, this change is necessary to avoid a risk of unintended harm to indoor air quality. The remaining changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.2(j) – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.3(a) – The purpose of the changes to this section are to improve phrasing: the word “lines” is removed for being redundant, and Section 120.2(j)3C is merged into 3B (and the subsequent section renumbered). These changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.3(b) – The purpose of the changes to this section are to simplify phrasing, and include relocating a provision relating to adhesive tapes. These changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.4 – The purpose of the change to this section is to remove the phrase “as amended by OSHPD” as unnecessary; the California amendments in the California Mechanical Code are noted without reference to adopting agency. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 120.6(a) – The purpose of the change to this section is to simplify phrasing by merging the first and third paragraphs; this change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 120.6(a)7 – The purpose of the change to this section is to add, and therefore include, adiabatic condensers, consistent with their addition to other sections. This change is necessary to appropriately account for use of adiabatic systems in commercial refrigeration.

Section 120.6(e)1 – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 120.7(b)6 – The purpose of the change made to this section is to remove the word “opaque” as unnecessary, consistent with the proposed change to JA4: as curtain walls are defined as walls, which are distinct from fenestration, it is not necessary to specify “opaque” to exclude fenestration products from this provision. Additionally, this avoids questions relating to semi-translucent materials and at what point a material is considered “opaque.” This change has the substantive effect of applying the opaque curtain wall U-factor requirement to translucent materials that are walls and are not fenestration. This change is necessary to ensure energy efficiency in buildings using curtain walls and avoid unnecessary use of terminology.

Section 120.8 – The purpose of the change to this section is to add a provision that directs healthcare facilities to the applicable commissioning requirements of Part 1, Chapter 7. Healthcare facilities are already subject to commissioning requirements, making the requirements of this section potentially duplicative. This change is therefore necessary to eliminate a risk of this section’s requirements being applied separately from Part 1 Chapter 7 and requiring healthcare facilities to complete two parallel, duplicative commissioning processes.

UPDATES TO PART 6, SUBCHAPTER 4

Nonresidential, High-Rise Residential, and Motel/Motel Occupancies—Mandatory Requirements for Lighting Systems and Equipment, and Electrical Power Distribution Systems

Section 130.0(c)1 – The purpose of the change to this section is to clarify the luminaire wattage label requirement for various lighting technologies. The change clarifies that the luminaire wattage can be either the maximum rated wattage or the relamping rated wattage of a luminaire, as new lighting technology of solid state lighting does not require relamping and incumbent lighting technologies requires regular relamping. The change clarifies without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 130.0(c)4 – The purpose of the change is to clarify the maximum rated wattage of inseparable SSL luminaires: the requirement is applicable to inseparable SSL luminaires whether the driver of the luminaire is mounted within the luminaire or mounted remotely from the luminaire. The change clarifies without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 130.0(c)5 – The purpose of the change is to clarify the maximum rated wattage of LED tape lighting and LED linear lighting with LED tape lighting components. Where the prior language was phrased generically (e.g., "LED linear lighting that does not require a housing"), public commentary requested that the section be more direct in identifying LED tape light as the lighting it is intended to apply to, and use associated terminology in defining the requirement. For this reason, this change specifies that the maximum rated wattage for lighting with LED tapes can also be determined based on the rated linear power rating of the LED tape lighting, or based on the maximum rated input wattage of the driver or power supply of the lighting system. The change is necessary ensure that this section correctly applies to the types of lighting products for which it is intended, and to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. This clarification is a non-substantive change.

Section 130.0(c)6 – The purpose of the change is to replace the word "served" with the phrase "with power supplied" to more clearly express that this section applies broadly to modular lighting systems that use power supplied by a driver, power supply or other electrical transformer. The phrase "with power supplied" more accurately characterizes the interaction these components and the light sources they provide power to. The change clarifies without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception to Section 130.0(c)6 – The purpose of adding this exception for Power over Ethernet (PoE) lighting systems (a type of modular lighting system) is to allow the wattage of any non-lighting devices to be excluded from the wattage of a PoE lighting system, consistent with the purpose of this section to quantify power available for lighting. This change is necessary to prevent the calculation from over-valuing PoE lighting systems and making it unnecessarily more difficult to achieve compliance using these systems.

Exception 1 to Section 130.1(a)2 – The purpose of the change to re-ordering "psychiatric and secure areas in healthcare facilities" is to improve the readability of the sentence, reduce grammatical ambiguity and prevent alternate and unintended readings. In addition, the phrase "and other areas where placement of a manual area control poses a health and safety hazard" is added to ensure that the application of the exception is not based on an exact match of the terms used in the exception with those stated on blueprints or other plans. The change clarifies without materially altering the requirements in the Express Terms, and

is necessary to improve the code's compliance with clarity and consistency criteria of California's Government Code Section 11349 and 11349.1 and California Code of Regulations, Title 1 and Section 16.

Section 130.1(b) – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception to Section 130.1(c) – The purpose of the change is to correct the sentence's formatting and relocate it to improve visibility. The change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.1(c)1 – The purpose of the change is to expressly permit automatic time-switch controls to operate in manual-on mode. While the section is clear in requiring that controls include an automatic OFF function, public comments indicated a concern that this section could be understood to be requiring fully automatic controls. The change is therefore necessary to prevent an unintended reading that this section prohibits controls from operating in manual-on mode as appropriate for the operation of the building space; manual-on behavior can produce energy savings when the light is not automatically turned ON until it is manually activated, and it is not the intent of the Energy Commission to prevent or restrict such behavior.

Section 130.1(c)3 – The purpose of the change is to clarify an override to an automatic time-switch control must be a manual override, and may not be an automatic override. As this section already specified that the control comply with Section 130.1(a), which is a manual control provision, this change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.1(d) – The purpose of the change to this section is to correct a numbering error in Section 130.1(d)3A relating to multilevel controls. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception 2 to Section 130.1(d) – The purpose of the change to this exception is to clarify the type of overhangs that reduce significant amount of daylight to the daylight area. The change is necessary to ensure that the exception is only available when the associated overhang actually prevents daylight from entering the space.

Exception 5 to Section 130.1(d) – The purpose of this change is to replace the term "transition" with the word "adaptation" to better align with industry terms; public commenters noted that "daylight adaptation zone" was more commonly used to refer to these areas. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.1(f) – The purpose of the changes to this section is to improve phrasing and readability. The changes clarify without materially altering the requirements in the Express Terms, and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 130.1-A – The purpose of the change to the table is to more clearly state that the two exceptions to the table are specific to Minimum Required Control Steps specified in the table's middle column, and to correct grammar by adding the word "of" in one location. The change clarifies without materially altering the

requirements in the Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.2(b) – The purpose of the change to the outdoor luminaire exemption threshold is to raise the lumen threshold from 5,500 to 6,200, and to use the phrase “initial luminaire lumens” to be more consistent with industry terminology. The increase in lumen threshold is necessary to account for the anticipated decrease in lumen output as the luminaire ages; a public commenter had suggested an increased value, and staff investigated and confirmed that a higher value was appropriate. The change in phrasing clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception 7 to Section 130.2(b) – The purpose of adding Exception 7 to the section is to clarify that outdoor lighting attached to a high-rise residential or hotel/motel building falls under the residential lighting requirement as specified in Section 130.0(b); this exception directly restates the existing language in Section 130.0(b)2. To the extent that the outdoor control provisions could have been understood to apply despite the language in 130.0(b)2, this change has the material effect of exempting this residential lighting and is necessary to prevent nonresidential controls from being inappropriately installed for this residential lighting. Otherwise, this change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.2(c) – The purpose of the changes to this section and its subsections and exceptions is to improve the readability of the requirements by organizing the requirements in an itemized format and by organizing the outdoor lighting control requirement so that Subsection 1 is about daylight availability, Subsection 2 is automatic time-switch controls and Subsection 3 is about motion sensing controls. For each Subsection, the following changes were made:

Section 130.2(c)1 – The purpose of the change to this section is to remove express mention of Automatic Scheduling Controls in order to prevent confusion with subsequent sections. While these controls may be capable of providing the function required by this section, the phrase “or other control capable of automatically shutting OFF the outdoor lighting when daylight is available” already provides for this without creating confusion with the immediately following “Automatic Scheduling Controls” section. This change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.2(c)2 – The purpose of the change to this section is to clarify and simplify the section's layout and phrasing, to provide language that expressly states that the controls may be installed in combination with other lighting controls, to clearly state that the ability to turn the light down and the ability to turn it off are separate and distinct requirements, and to change the override provision proposed in the 45-Day Language to be optional rather than mandatory. The change to the override requirement is necessary to address stakeholder concern that including the feature would add cost. The other changes clarify without materially altering the requirements in the Express Terms, and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 130.2(c)3 – The purpose of the change to this section is to clarify and simplify the section's layout and phrasing, to provide language that expressly states that the controls may be installed in combination with other lighting controls, and to restore a 1,500 watt limit on the amount of co-controlled lighting present in the 2016 Standards. The change to restore the 1,500 watt limit rephrases the requirement to clarify that it is not requiring complete duplication of control equipment; this change is

necessary to prevent unnecessary cost associated with an ambiguity in the 2016 requirement while retaining the benefit of scaling the activated lighting. The other changes clarify without materially altering the requirements in the Express Terms, and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception 1 to Section 130.2(c)3 – The purpose of the change to this exception is to more clearly state its purpose and application. The change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception 2 to Section 130.2(c)3 – The purpose of the change to this exception is to more clearly state its purpose and application, using language consistent with the language added to Exception 1. The change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception 3 to Section 130.2(c)3 – The purpose of the change to this exception is to remove the exception relating to obstructions and add an exception consistent with Exception 3 to Section 130.2(b) and with similar exceptions for Demand Responsive controls. The prior Exception 3 created ambiguities related to enforceability, in particular relating to intentionally designing a system to become obstructed and therefore qualify; removing it is necessary to avoid creating a significant potential loophole within the Standards. Adding the replacement exception is necessary to ensure consistency in addressing circumstances where health or life safety statutes, ordinances, or regulations apply to lighting.

The remaining changes to parent Section 130.2(c) clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Part 16.

UPDATES TO PART 6, SUBCHAPTER 5

Nonresidential, High-Rise Residential, and Hotel/Motel Occupancies—Performance and Prescriptive Compliance Approaches for Achieving Energy Efficiency

Section 140.3(a)1B – The purpose of the changes made to this section are to include a reference to Section 120.7(a)3 to clarify the requirements for insulation placement, and to reference the entirety of Section 110.8. This change is necessary to ensure correct referencing; it does not materially alter the requirements in the 45-Day Language and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.3(a)5 – The purpose of the change to this section is to correct capitalization; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.3(a)8 – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.3(a)9 – The purpose of the change to this section is to correct punctuation and abbreviation; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to

improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.3(c) – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.4 – The purpose of the change to this section is to correct the section reference to reference the final subsection of Section 140.4; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.4(b) – The purpose of the change to this section is to remove the phrase “as amended by OSHPD” as unnecessary, and to add specificity to the reference to the California Mechanical Code by expressly stating the applicable section. As the California amendments in the California Mechanical Code are noted without reference to adopting agency, removing this phrase has no effect; therefore, the changes clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 140.4-B – The purpose of the change to this table is to remove reference to credit for higher MERV filters, consistent with the proposed minimum MERV rating of 13. This change is necessary to prevent a conflict in the code, as well as to award additional credit for meeting minimum design requirements.

Section 140.4(e)2C – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.4(e)2D – The purpose of the change to this section is to correct abbreviation of measurement units; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.4(l) – The purpose of the change to this section is to remove the phrase “as amended by OSHPD” as unnecessary. As the California amendments in the California Mechanical Code are noted without reference to adopting agency, removing this phrase has no effect; therefore, the changes clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

EXCEPTION 1 to Section 140.4(m) – The purpose of the change to this exception is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

EXCEPTION 1 to Section 140.4(o) – The purpose of the change to this exception is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

EXCEPTION 3 to Section 140.4(o) – The purpose of the change to this section is to specify that it applies where a positive pressure differential is required; given that the section and this exception relate to the maximum amount of air delivered to a space, the purpose of the Exception is to account for “over delivery”

necessary to create positive pressure. For this reason, adding this specificity clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.6(d) – The purpose of the change is to remove an outdated reference to daylight zone definitions as the relevant definitions are now in Section 100.1, definitions, and to correct a second reference to daylighting requirements to reflect that section's renumbering. The change it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 140.6-A – The purpose of the change to this table is to correct numbering; it clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 140.6-B – The purpose of the change to this table is to replace the term “hospital building” with the term “healthcare facility” consistent with the addition of healthcare facilities to the Scope of Part 6 and the update to associated definitions and other sections of Part 6. This change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 140.7-B – The purpose of the change to this table is to correct grammar by removing the word “for”; it clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.8(b) – The purpose of the change to this section is to update the reference to ANSI C82.6 to its most current version and to update the terminology used in the section for consistency with the updated ANSI standard. This change is necessary to keep pace with updates to industry standards, where such standards are incorporated by reference into Part 6.

Exception 5 to Section 140.9(a)1 – The purpose of the change to this section is to remove the new Exception proposed in the 45-Day Language, consistent with public commentary received during the public comment period. This change is necessary to provide additional time to conduct analysis and address stakeholder concerns; staff anticipate revisiting consideration of this exception in the next (2022) triennial code cycle.

Section 140.9(c) – The purpose of the proposed change is to improve grammar and phrasing by presenting each immediate subsection as a separate statement or sentence, and not as part of a single run-on sentence. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.9(c)3 – The purpose of the proposed change is to increase the clarity of the requirements of this section. The proposed change is to move the language requiring acceptance testing from 140.9(c)3E to within subsections 140.9(c)3C and 140.9(c)3D. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.9(c)3B – The purpose of the proposed changes is to add compliance pathways for systems where it's technically infeasible to comply with the single, 0.65 watts per cfm, limit proposed in 45-Day

Language. The proposed changes are to add a second exhaust system power limit of 0.85 watts per CFM for systems with air treatment devices and to add an exception to 140.9(c)3B for systems with code-required air treatment systems developing more than one (1) inch water of static pressure drop. These changes are necessary to ensure that Part 6 is in compliance with the feasible and attainable efficiency requirements of California Public Resources Code Section 25402(c)1.

Section 140.9(c)3B – The purpose of the proposed change is to remove the word demand from “power demand” which was unnecessary and confusing wording in the 45-Day Language. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.9(c)3Ci – The purpose of the proposed change is to increase the required anemometers from one to two. Requiring two anemometers increases the effectiveness of wind-based exhaust flow control systems by adding fault tolerance and increasing the accuracy of wind data provided to the exhaust flow control system. This change is necessary to ensure the beneficial performance of the required system and in so doing to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy consistent with Public Resources Code §25402 et seq.

Section 140.9(c)3Cii – The purpose of the proposed change is to add a source, 2018 American Conference of Governmental Industrial Hygienist Threshold Limit Values and Biological Exposure Indices, for the health and odor limits proposed in the 45-Day Language. Stakeholder feedback indicated that the previous language was vague and that a source for the health and odor limits needed to be defined for cases where there are no applicable local, state, or federal limits. This change is necessary to ensure enforceability and prevent the requirement from being unclear due to being vague.

Section 140.9(c)3Civ – The purpose of the proposed change is to add requirements for system fault detection thresholds and requirements for the system to report sensor faults to an Energy Management Control System or other fault management system. These changes were necessary to ensure that sensor faults are detected, repaired, and the system runs as effectively as possible. For safety, sensor faults cause the system to run at maximum design rates; without a fault management notice these systems could be left in this high energy use state indefinitely. This change is therefore necessary to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy consistent with Public Resources Code §25402 et seq.

Section 140.9(c)3Cv – The purpose of the proposed change is to move language from Section 140.9(c)3E to Section 140.9(c)3Cv, in order to improve the readability and flow of Section 140.9(c)’s requirements. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.9(c)3Di – The purpose of the proposed change is to add a source, 2018 American Conference of Governmental Industrial Hygienist Threshold Limit Values and Biological Exposure Indices, for the health and odor limits proposed in the 45-Day Language. Stakeholder feedback indicated that the previous language was vague and that a source for the health and odor limits needed to be defined for cases where there are no applicable local, state, or federal limits. This change is necessary to ensure enforceability and prevent the requirement from being unclear due to being vague.

Section 140.9(c)3Dii – The purpose of the proposed change is to increase the required contaminant concentration sensors from one to two. Requiring two sensors increases the effectiveness of concentration-based exhaust flow control systems by adding fault tolerance and increasing the accuracy of contaminant concentration data provided to the exhaust flow control system. This change is necessary to ensure the beneficial performance of the required system and in so doing to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy consistent with Public Resources Code §25402 et seq.

Section 140.9(c)3Diii – The purpose of the proposed change is to add requirements for system fault detection thresholds and requirements for the system to report sensor faults to an Energy Management Control System or other fault management system. These changes were necessary to ensure that sensor faults are detected, repaired, and the system runs as effectively as possible. For safety, sensor faults cause the system to run at maximum design rates; without a fault management notice these systems could be left in this high energy use state indefinitely. This change is therefore necessary to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy consistent with Public Resources Code §25402 et seq.

Section 140.9(c)4 – The purpose of this change is to re-word the section to improve its readability; stakeholder feedback indicated the original language of the section was confusing. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 140.9(c)4Aiv – The purpose of the proposed change is to require a manual open mode on fume hood automatic sash closures. When in manual open mode an automatic sash will not automatically open when presence is detected in the detection zone. Feedback from stakeholders indicated that automatic open mode could be hazardous and use more energy when sashes unintentionally open. Requiring that sashes have the option to be configured in a manual open mode is necessary to ensure that the measure doesn't lead to increased safety risk, and allows the measure to have its intended benefit in all other cases.

UPDATES TO PART 6, SUBCHAPTER 6

Nonresidential, High-Rise Residential, and Hotel/Motel Occupancies—Additions, Alterations, and Repairs

Section 141.0(b)4 – The purpose of the change made to this section is to remove the word “opaque” as unnecessary, consistent with the proposed change to JA4: as curtain walls are defined as walls, which are distinct from fenestration, it is not necessary to specify “opaque” to exclude fenestration products from this provision. Additionally, this avoids questions relating to semi-translucent materials and at what point a material is considered “opaque”. This change has the substantive effect of applying the opaque curtain wall U-factor requirement to translucent materials that are walls and are not fenestration. This change is necessary to ensure energy efficiency in buildings using curtain walls and avoid unnecessary use of terminology.

Section 141.0(b)2Biii – The purpose of the change made to this section is to correct a formatting mistake that made the fourth bullet (d.) a sub-bullet of c. This change is necessary to correct the formatting mistake and does not materially alter the requirements in the 45-Day Language, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 141.0(b)2C – The purpose of the change to this section is to provide credit for inclusion of higher MERV filters in nonresidential alterations. This change is necessary to ensure consistency of evaluation of MERV ratings between newly constructed buildings, where it is required, and existing buildings where it is optional.

Section 141.0(b)2D and E – The purpose of the changes to these sections are to correct spelling; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 141.0(b)2I – The purpose of the change to this section is to update a table reference, consistent with changes made to Tables 141.0-E and F. This change clarifies without materially altering the requirements in the Draft Express Terms and is necessary to improve Part 6's compliance with the clarity

and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 141.0(b)3A – The purpose of the change made to this section is to update the table reference. This change does not materially alter the requirements in the 45-Day Language and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 141.0-E and F – The purpose of the changes to these tables are to update their numbering; they clarify without materially altering the requirements in the Draft Express Terms and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

UPDATES TO PART 6, SUBCHAPTER 7

Low-Rise Residential Buildings– Mandatory Features and Devices

Section 150.0(c) – The purpose of the changes made to this section are to separate the R-value and U-factor requirements into separate line items. These changes do not materially alter the requirements in the 45-Day Language, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(c)5 – The purpose of the addition of this section is to specify mandatory minimum insulation levels for masonry walls consistent with expected prescriptive insulation levels. This change is necessary to prevent masonry walls from being uninsulated, which is otherwise possible using the performance approach to compliance.

Section 150.0(d) – The purpose of the changes made to this section are to clarify that the requirement is based on a U-factor, but can be met by installing insulation with an R-value of R-19 or greater in a wood framed assembly. These changes do not materially alter the requirements in the 45-Day Language, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(e) – The purpose of the change to this section is to reduce redundancy with other Sections by referencing each section rather than restating its requirements. As Section 110.5 contains a prohibition on continuously burning pilot lights (making the one struck from this section redundant), and Section 4.503 of Part 11 applies irrespective of its mention here, this change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(i) – The purpose of the change to this section is to simplify phrasing by removing the word "unitary". This change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(j)2 – The purpose of the change to this section is to more closely align the 2019 language with the 2016 language while maintaining alignment with the Plumbing Code, and to provide the R-value expected for pipe insulation in order to accommodate compliance based on thermal performance. As hot water piping buried below grade or leading to or between hot water storage tanks is still "hot water piping" as the term is used, restoring express mention of these situations does not have a substantive effect. Similarly, as Section 120.3 already provided for thermal performance-based compliance with pipe insulation requirements, specifying the target R-value relating to one inch of thickness does not have a substantive effect. For this reason, these changes clarify without materially altering the requirements in the Express

Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(k)1C – The purpose of the change to this table is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(k)1E – The purpose of the change to this section is to also remove Table 150.0-A requirements from applying to navigational lighting consistent with this section. This change is necessary for consistency with the 2016 requirements: the 45-day edits were phrased in such a way that made the table inadvertently applicable to this lighting, and the proposed 15-day edits correct this by expressly stating that the table does not apply to lighting meeting the criteria of this section.

Section 150.0(k)1L – The purpose of adding this section is to move a specification proposed for Table 150.0-A to instead occur in section language, to use the phrase "linen closet" in place of the phrase "closet other than walk-in closet", and to apply a wattage limit consistent with the limit applicable to Section 150.0(k)1E to preclude abuse of this section's provisions. This change is necessary to provide a more appropriately stated and tailored provision relating to small non-occupiable spaces.

Section 150.0(k)6 – The purpose of the change to this section is to replace an indirect reference to Table 150.0-A (via the term "high efficacy lighting") with a direct reference to the table. The change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(m)11C – The purpose of the change to this table is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(m)12 and 13 – The purpose of the extensive changes to these sections are to include more current and more detailed requirements relating to Indoor Air Quality (IAQ), including filtration, updating the incorporation-by-reference of ASHRAE 62.2. The specific changes proposed for this section include:

Section 150.0(m)12A – The purpose of the change to this section is to expressly specify that "heat recovery ventilation systems and energy recovery ventilation systems that provide outside air to an occupiable space" are considered part of the "supply side of mechanical balanced ventilation systems." This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exception to Section 150.0(m)12Bi – The purpose of adding this exception is to allow for design flexibility where equipment is still adequately protected and filtration consistent with this section is still ultimately accomplished. This change is necessary to avoid being unnecessarily prescriptive regarding the design of HVAC systems.

Section 150.0(m)12Bii – The purpose of the changes to this section are to add specificity by including the term "nominal" and including an equation for filter sizing. This change is necessary to establish minimum filter size requirements that are clear and consistent, ensure that this section is not relying on an implicit reference to another document, and to make the requirements fully transparent.

Section 150.0(m)12Biv – The purpose of the change to this section is to remove an unnecessary reference to Section 150.0(m)12D; this change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(m)12D – The purpose of the change to this section is to add a provision specific to supply-only and balanced ventilation systems, and to add mention of airflow rate consistent with that Section's requirements. This change is necessary to ensure that system design constraints are recognized and addressed in this section's provisions.

Section 150.0(m)13 – The purpose of the change to this section is to specify a section title that is more closely aligned with the amended language of its subsections. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(m)13B – The purpose of the change to this section is to move language occurring after its subsections to instead occur before, and to make reference to the subsections more explicit. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(m)13C – The purpose of the change to this section is to move language occurring after its subsections to instead occur before, and to make reference to the subsections more explicit. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Exceptions 1 and 2 to Section 150.0(m)13B and D – The purpose of the changes to these exceptions are to extend their application to Section Section 150.0(m)13D. This change is necessary to recognize that the same situations and concerns addressed by the exception can occur in systems using Small Duct High Velocity (SDHV) equipment.

Exception 3 to Section 150.0(m)13B – The purpose of adding this exception is to address the effective date of an applicable federal law, which is based on the date of manufacture of the equipment (and not based on the date that a building permit is issued. This change is necessary to prevent this section from unintentionally creating stranded inventory.

Section 150.0(m)13 – The purpose of the change is to add exceptions to the new 0.45 w/cfm requirement for gas furnaces for single zone and zonally controlled systems to allow that for furnaces manufactured prior to July 3, 2019, the compliance criterion for fan efficacy shall remain at 0.58 w/cfm. This was necessary in order to avoid stranded manufacturer inventory. In addition, non-substantive changes were made to the section heading text which was revised in order to better describe the subject matter of this section, and paragraphs in subsections B and C were relocated in order to improve clarity. The non-substantive changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(n)1A – The purpose of the change to this section is to provide clearer and more explicit direction regarding the installation of a spare, available electrical path that would minimize the cost of installing electric equipment. This change is necessary to ensure that suitable circuitry is safely installed and appropriately labeled.

Section 150.0(o) – Several changes were made throughout this section, as follows:

Section 150.0(o)1A – The purpose of the change is to make a correction to the dwelling unit terminology and to specify requirements are located in the amendment sections C, E, or F instead of referencing that information from section 4 of ASHRAE 62.2. The change is necessary in order to avoid confusion. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(o)1C – The purpose of the change is to eliminate an undefined term horizontally attached, and substitute defining language for these attached dwelling unit types. Also, subsections i, ii, iii were added in order to include the calculations published in ASHRAE 62.2. The changes were necessary in order to address stakeholder comments requesting that all of the details of the calculations be included in 150.0(o) for clarity. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(o)1D – The purpose of the change is to state explicitly that compliance with ASHRAE 62.2 Sections 6.7 (Minimum Filtration) and 6.7.1 (Filter Pressure Drop) shall not be required. This was needed in order to clarify that the air filter the requirements required for Part 6 are given in 150.0(m)12. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(o)1E – The purpose of the change is to delete a reference to ASHRAE 62.2 Section 4.1.1 and to instead reference an equivalent equation 150.0-B in the new Subsection i to Section 150.0(o)1C. A credit for the equation source in ASHRAE 62.2 was added [ASHRAE 62.2:4.1.1]. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(o)1F – The purpose of the change is to delete a reference to ASHRAE 62.2 Section 4.1.1 and to instead reference an equivalent equation 150.0-B in the new Subsection i to Section 150.0(o)1C. A credit for the equation source in ASHRAE 62.2 was added [ASHRAE 62.2:4.1.1]. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. Additionally, the tolerance for the balancing compliance criterion was increased from no more than 10 percent to no more than 20 percent in response to stakeholder comments and concerns that 10 percent was too restrictive.

Section 150.0(o)1G – The purpose of the change is to add subsection G to emphasize that compliance with sound rating specification in ASHRAE 62.2 Section 7.2 is required, and to add a new exception to allow kitchen range hoods to be rated for sound at a static pressure determined at working speed as specified in HVI 916 section 7.2. This change was needed in order to address manufacturer concerns that most of the existing kitchen range hoods would have to be retested at considerable cost if compliance at 0.1 inch wc as required by ASHRAE 62.2 section 7.2 was the only compliance option. The change allows about 50 percent of the kitchen range hood models currently listed in the HVI directory to comply without having to undergo further ratings tests.

Section 150.0(o)1H - The purpose of the change is to add subsection H to specify that compliance with ASHRAE 62.2 Section 6.5.2 (Space Conditioning System Ducts) shall not be required. The change

was needed in order to eliminate a conflict between the ASHRAE 62.2 duct leakage requirements and existing duct leakage requirements in Section 150.0(m)11 and 150.2(b)1D and E.

Section 150.0(o)1I – The purpose of the change is to add explicit specification for the text for the label for the required mechanical ventilation fan control required by ASHRAE 62.2 section 4.4. The change is necessary in order to address builder stakeholder concerns that IAQ ventilation fan control labeling has not been well enforced, and IAQ ventilation fans are often turned off by dwelling occupants who do not understand that the fans must be operated in order to protect the quality of the indoor air.

Section 150.0(o)2A – The purpose of the change is to delete a reference to dwelling unit mechanical ventilation in Section 4 of ASHRAE 62.2 and to instead reference the new equivalent equations now given in Sections 150.0(o)1C, 150.0(o)1E, and 150.0(o)1F. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.0(o)2B – The purpose of the change is to delete a reference to ASHRAE 62.2 Section 7.2.2 kitchen range hood sound ratings requirements, and to substitute a reference to the new location for the kitchen range hood sound ratings requirements in Section 150.0(o)1G. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 150.0-A – The purpose of the changes to this table are to improve consistency of phrasing, update numbering, and to remove the requirements now proposed to be located in Section 150.0(k)1L. The changes clarify without materially altering the requirements in the Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 150.0-B and C – The purpose of the changes to these tables is to edit the column headers for grammar, and to clarify that the values are nominal values. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 150.0-D – The purpose of the change to add Table 150.0-D is to provide the weather shielding factors from ASHRAE 62.2 Table B1. The change is necessary in order to include the necessary information needed to complete the calculations in Section 150.0(o)1C subsections i, ii, iii that were added in order to include the calculations published in ASHRAE 62.2. As ASHRAE 62.2 is already incorporated by reference, the change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

UPDATES TO PART 6, SUBCHAPTER 8

Low-Rise Residential Buildings—Performance and Prescriptive Compliance Approaches for Newly Constructed Buildings

Section 150.1(a)3 – The purpose of the change to the Note for this section is to correct grammar; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.1(b)3B – The purpose of the change is to clarify that field verification procedures specified in this section are required when performance of installed features, materials, components, manufactured devices or systems above the minimum specified in Section 150.1(c) is necessary for the building to comply with Section 150.1(b), or is necessary to achieve a more stringent local ordinance. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.1(c)1A – The purpose of the changes made to this section is to clarify that high performance attic Option A is no longer part of the prescriptive package. These changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.1(c)1B – The purpose of the changes made to this section are to provide consistency in phrasing. These changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.1(c)3 and 4 – The purpose of the changes made to this section are to provide consistency in phrasing. These changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.1(c)8 – The purpose of the changes to this section is to restructure it for simplicity and to be consistent in incorporation of an electric prescriptive option. In addition, Subsection C is added for consistency with a similar provision in Section 150.2(a)1Diii. These changes are necessary to ensure the availability of electric prescriptive options for newly constructed buildings.

Section 150.1(c)10 – The purpose of the change is to add an exception to Section 151.0(c)10A to allow gas furnace air-handling units manufactured prior to July 3, 2019, to comply with a fan efficacy value less than or equal to 0.58 w/cfm instead of 0.45 W/cfm. The change is necessary in order to avoid the possibility that manufacturer inventory would be stranded and unable to comply with the new 0.45 W.cfm requirement. Some text in this section was moved in order to improve clarity without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.1(c)12 – The change is to delete the reference to Table 150.1-B because WHFs have been deleted from Table 150.1-B. Also, an exception to Section 150.1(c)12B has been added to eliminate the requirement for free vent area at 1 square foot for every 750 cfm of rated whole house fan flow when the Whole House Fan is vented directly to the outside. This change is necessary because when WHFs are vented directly to the outside, additional free ventilation area is not needed.

Section 150.1(c)14 – The purpose of the change to this Section is to replace the phrase "Solar Heat Gain Coefficient" with the abbreviation "SHGC," consistent with its definition and use throughout the Standards. This change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 150.1-A – The purpose of the changes to Table 150.1-A are to make the following amendments and updates:

- Table 150.1-A – The purpose of the changes made to this section are to align the U-factors stated for mass walls to the requirement to install R-13 insulation, extending them to an extra digit of

precision. These changes are necessary to ensure the two values shown (R-value and U-factor) are in alignment with one another.

- Footnote #2, to Table 150.1-A – The purpose of the changes made to this section are to clarify that alternatives to high performance attics shall comply using the performance approach: by definition, projects must either directly implement the adopted prescriptive measures or must comply based on performance, therefore a project implementing alternative measures will necessarily follow the performance compliance path. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.
- Footnote #4, to Table 150.1-A – The purpose of the changes made to this Section are to clarify that insulation must be less than or equal to the requirement listed in Table 150.1-A to comply. These changes do not materially alter the requirements in the 45-Day Language, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 150.1-B – The purpose of the changes to Table 150.1-A are to make the following amendments and updates:

- Table 150.1-B – The purpose of the changes made to this section are to correct the requirements for mass walls with R-13 installed on the interior and the requirements for below grade walls. These changes do not materially alter the requirements in the 45-Day Language, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.
- Footnote #2, to Table 150.1-B – The purpose of the changes made to this section are to clarify that alternatives to high performance attics shall comply with the performance standard. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.
- Footnote #3, to Table 150.1-B – The purpose of the changes made to this section are to clarify that insulation must be less than or equal to the requirement listed in Table 150.1-A to comply. 150.1(c)1B – These changes are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

UPDATES TO PART 6, SUBCHAPTER 9

Low-Rise Residential Buildings—Additions and Alterations in Existing Low-Rise Residential Buildings

Exceptions to Section 150.2(a) – The purpose of the change to this exception is to delete a reference to ASHRAE 62.2 section 4 and substitute a reference to equivalent equations now located in Sections 150.0(o)1C, 150.0(o)1E, or 150.0(o)1F. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.2(a)1A – The purpose of the added language in this section is to clarify that additions that consist of the conversion of existing spaces from unconditioned to conditioned space shall not be required to meet the window and door header requirements, and that air sealing shall not be required when the existing air barrier is not being removed. These changes are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section 150.2(a)1C – The purpose of this change is to clarify the difference between an addition to an existing dwelling, and an addition of an entirely new dwelling unit to an existing building. The change is necessary in order to ensure that additions to existing dwelling units receive IAQ mechanical ventilation based on the total conditioned floor area of the entire dwelling unit comprised of the existing dwelling unit conditioned floor area plus the addition conditioned floor area, and to ensure that entirely new dwelling units added to existing buildings receive IAQ mechanical ventilation regardless of the size of the conditioned floor area. Without this change, entirely new dwelling unit additions to existing buildings would not receive the IAQ mechanical ventilation necessary to ensure health and safety of the occupants.

150.2(a)1D – The purpose of the change to this section is to remove provisions that related to natural gas availability. This change is necessary to accommodate electrification of existing buildings and for consistency with proposed options for newly constructed buildings.

Section 150.2(a)2C – The purpose of this change is to clarify the difference between an addition to an existing dwelling, and an addition of an entirely new dwelling unit to an existing building. The change is necessary in order to ensure that additions to existing dwelling units receive IAQ mechanical ventilation based on the total conditioned floor area of the entire dwelling unit comprised of the existing dwelling unit conditioned floor area plus the addition conditioned floor area, and to ensure that entirely new dwelling units added to existing buildings receive IAQ mechanical ventilation regardless of the size of the conditioned floor area. Without this change, entirely new dwelling unit additions to existing buildings would not receive the IAQ mechanical ventilation necessary to ensure health and safety of the occupants.

Section 150.2(b)1D – The purpose of this change is to clarify the requirements for duct leakage for alterations to existing space conditioning systems that have ducts or air handlers located in a garage space. The change is necessary in order to eliminate an unintended requirement for the entire existing duct system to meet a 6 percent or less leakage criterion when altered ducts are located in a garage space, and instead require compliance with the requirement in section 150.2(b)1Diic which tests for only the leaks in the ducts or the air handler located in the garage space.

Section 150.2(b)1Dii – The purpose of this change is to add a clarified procedure for sealing leaks when an alteration to an HVAC system includes new or replacement ducts, air-handling units, cooling or heating coils, or plenums located in a garage space. The clarified protocol provides an alternative compliance path using the Residential Appendix RA3.1.4.3.5 smoke test of the portion of the duct system located in the garage space when the system cannot meet a 6 percent or less leakage rate compliance criterion.

Section 150.2(b)1E – The purpose of this change is to clarify the requirements for duct leakage for alterations to existing space conditioning systems that have ducts or air handlers located in a garage space. The change is necessary in order to eliminate an unintended requirement for the entire existing duct system to meet a 6 percent or less leakage criterion when altered ducts are located in a garage space, and instead require compliance with the requirement in Section 150.2(b)1Diic which tests for only the leaks in the ducts or the air handler located in the garage space.

150.2(b)1H – The purpose of the change to this section is to simplify the phrasing of the provisions and to amend an existing option for installation of a heat pump water heater to reduce associated costs. This change is necessary to incorporate an identified lower-cost alternative to the prior provision, and to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Notes to Section 150.2(b)2 – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

UPDATES TO APPENDIX 1-A DOCUMENTS INCORPORATED BY REFERENCE

The purpose of changing the title of this Appendix is to directly state the phrase “documents incorporated by reference” to more clearly and directly indicate that the purpose of Appendix 1-A is to list all documents incorporated by reference in the Standards or Reference Appendices by title and date. This change is necessary to ensure that all documents intended to be incorporated by reference in the Standards or Reference Appendices are adequately incorporated by reference, and to provide clarity to the public about what the purpose of Appendix 1-A is.

The purpose of the changes within the Appendix is to accurately identify all of the documents incorporated by reference in Part 6, where these references are proposed to be updated in 2019 or where a reference was missing from Appendix 1-A in previous versions of the Standards and Reference Appendices, and to delete documents that are either not referenced in Part 6 or the Reference Appendices or that were not intended to be incorporated by reference. These changes are necessary to ensure that all documents intended to be incorporated by reference into the Standards and Reference Appendices are adequately incorporated by reference and to provide clarity to the public about the full title, date, and location of the documents incorporated by reference into the Standards or Reference Appendices.

APPENDICES TO THE REGULATIONS

The Alternate Calculation Approval Manual (ACM Manual) and all of the Reference Appendices are adopted along with and are a part of the standards. Due to their volume and complexity, they are not codified. They are incorporated by reference. The purposes, rationales, necessity and benefits of the changes to these documents are described below.

UPDATES TO THE JOINT APPENDICES

JA1 – Definitions

Section JA1 – The purpose of the change made to this section is to include a definition for ‘Visual Quality Standard for Applied Window Film’. This change is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

JA2 - Reference Weather/Climate Data

Section JA2.2 – The purpose of the change to this section is to correct the spelling of an abbreviation: “Mean Coincident Wet Bulb” is abbreviated “MCWB”, not “MWVB”. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

JA3 - Time Dependent Valuation (TDV) Data

Tables 3-1, 3-2 and 3-3 - The purpose of the changes made to this section is to update the tables with the 2019 TDV values. This change is necessary to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

JA4 - U-factor, C-factor, and Thermal Mass Data

Section JA4.1.7, Tables 4.3.1, 4.3.3, and 4.3.4 – The purpose of the changes made to these tables are to add a row for R-20 insulation, and to add columns for R-8, R-10, R-12, and R-15 continuous insulation.

This change is necessary to provide pre-calculated values for these assemblies consistent with the changes proposed for Part 6, thereby ensuring the tables are comprehensive with regard to wall assemblies.

Section JA4.1.7, Table 4.3.8 and assumptions – The purpose of the changes made to this table are to align with NFRC assumptions and to remove unnecessary curtain wall specificity (i.e., glass vs. opaque). These changes are necessary to ensure and maintain the accuracy of the values specified in the tables within JA4, ensure comprehensive coverage of potential wall assemblies, and to align with current industry standards and practices.

Section JA4.1.7, Tables 4.3.11 and assumptions – The purpose of the changes made to this table are to correct the heat capacity values, and to correct the assumption that this table is based on a softwood density. These changes are necessary to ensure and maintain the accuracy of the values specified in the Tables within JA4.

Section JA4.1.7, Table 4.3.12 assumptions – The purpose of the change made to this table is to correct the assumed dimensions of straw bales. This change is necessary to ensure and maintain the accuracy of the values specified in the tables within JA4, and to align with current building practices.

JA5 – Technical Specifications for Occupant Controlled Smart Thermostats

(No additional changes to this section.)

JA6 – HVAC Fault Detection and Diagnostic Technology

(No changes to this Section.)

JA7 – Data Registry Requirements

Section JA7.2 - The purpose of the change to this section is to add a definition for Personal Computing Device. The change is necessary in order to clarify the scope of technologies that are allowed to be used. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section JA7.7.1 - The purpose of the change is to clarify the Keyed-in Data Entry in JA7.7.1.1 by deleting use of the term users computer system keyboard entry devices and substituting the use of the term personal computing device. This was necessary because technology has evolved to use devices such as mobile phones and touch screen tablets that do not use keyboard entry devices, and it is not the intent of this Section to unnecessarily restrict the use of these devices.

Section JA7.8.5 - The purpose of the change to this section is to clarify the user manual may be made available to users as electronic tutorials. The change is necessary in order to ensure that use of electronic tutorials is equivalent to use of user help screens, and not be more prescriptive than is intended or necessary.

JA8 – Qualification Requirements for High Efficacy Light Sources

Section JA8.3.3 – The purpose of the change is to update the reference to the ENERGY STAR test procedure for start time from a memo published on September 25 to a more formal document including the same requirements published in October. As the requirements within the two documents are the same, this change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section JA8.3.5 – The purpose of the change is to harmonize the Maintenance and Rated Life Test to Section 10 of the ENERGY STAR Program Requirements for Lamps and Luminaires, and to update which test is used for lighting out of scope of the tests based on public comments received from lighting stakeholders. Harmonizing with these requirements is necessary to avoid imposing redundant testing requirements that do not generate novel information or additional benefit, and to ensure the test prescribed for lighting falling outside of the ordinary scope of the tests is tested using the most appropriate and most applicable test.

Section JA8.4.5 – The purpose of the change is to clarify the applicability of the survival rate requirement by using the phrase “for the duration” and by restoring the exception, as well as by removing references to specific durations (which may not be accurate for all of the options permitted by the ENERGY STAR test procedure). This change is necessary to prevent conflict between this provision and the referenced ENERGY STAR tests, as well as to improve Part 6’s compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section JA8.4.6 – The purpose of the change is to delete the term “Type 1 or Type 2” for the forward phase cut dimmer requirement, consistent with NEMA’s deprecation of the use of these terms. This is necessary for consistency with the referenced NEMA standard as the latest NEMA SSL-7A document no longer uses the term.

Section JA8.5 – The purpose of the change is to allow products that have passed the rated life test as specified in the ENERGY STAR Program Requirements for Luminaires to be marked with “JA-2016-E”. This change is necessary to prevent confusion regarding where products passing the Luminaires test (as opposed to the Lamp test) may be installed.

JA9 – Qualification Requirements for Low Leakage Air Handling Units:

(No changes to this section.)

JA10 – Test Method for Measuring Flicker of Lighting Systems and Reporting Requirements

(No changes to this section.)

JA11 – Qualification Requirements for Photovoltaic Systems

Section JA11.2 – The purpose of the changes to this section are to simplify verbiage and to provide the option to allow installation of panels outside of the specified azimuth range if using the performance approach. This change is necessary to provide maximum flexibility, given that the performance modeling can account for the anticipated output of panels installed at any orientation.

Section JA11.3 – The purpose of the change to this section is to correct the word “must” to “shall” for consistency with the rest of the Reference Appendices, and to add a missing space to a section heading. The changes clarify without materially altering the requirements in the Draft Express Terms, and are necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section JA11.4 – The purpose of the changes to this section are to provide a more robust and detailed description of use of the solar assessment tool, to allow the assessment to occur prior to panel installation, and to provide an ability to consider alternatives that accomplish the same verification of solar access. This change is necessary to ensure that panels are installed in locations with appropriate levels of solar access, that Exceptions based on solar access are used appropriately, and that the process of verifying solar access can, when needed, be tailored to project operational needs.

Section JA11.8 – The purpose of the change to this section is to remove the requirement for physical inspection of installed systems by the local enforcement agency, focusing instead on review of documentation for completeness and correctness consistent with overall review of submitted project documentation. This change is necessary to align the requested enforcement review with the general process of review undertaken by local enforcement agencies and thereby avoid imposing new process requirements on local agencies.

JA12 – Qualification Requirements for Battery Storage Systems

Section JA12.2 – The purpose of the changes to this section are to eliminate ambiguity relating to provisions (b) and (c). To the extent these provisions could have been read to specify or allow minimum requirements alternate to the proposed language, this change has the substantive effect of requiring a specific type of efficiency and of requiring warranty irrespective of whether the device is rated in terms of time or cycles, and the change is necessary to prevent alternate and unintended readings of these requirements that could lead to installation of equipment that is less likely to perform as expected. Otherwise, the changes clarify without materially altering the requirements in the Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section JA12.2.2 – The purpose of the change to this section is to add specificity and prevent alternate readings of the proposed requirement. The changes clarify without materially altering the requirements in the Express Terms, and are necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section JA12.2.3 – The purpose of the changes to this section and its subsections are to revise and clarify the control requirements and to add flexibility, including adding a provision allowing executive director approval of alternative control strategies that demonstrate equal or greater benefits to JA12 control strategies. These changes are necessary to provide flexibility for an evolving market, including evolving interactions between on-site storage and electric utility providers, and to avoid inadvertently impeding innovative efficiency programs.

Section JA12.3 – The purpose of the change to this section is to refer broadly to Net Energy Metering rules that are adopted by the California Public Utilities Commission (CPUC), rather than narrowly referencing Rule 21. This change is necessary to ensure that rules adopted by the CPUC are accounted for regardless of specific name or location.

Section JA12.4 – The purpose of the change to this section is to correct terminology and account for added Section JA12.2.2.4. The change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

UPDATES TO THE RESIDENTIAL APPENDICES

RA1 – Alternative Residential Field Verification and Diagnostic Test Protocols

(No additional changes to this section.)

RA2 – Residential HERS Verification, Testing and Documentation Procedures

Section RA2.3.1.1 – The purpose of the change is to revert “Dwelling Unit” to “Building” for consistency with the section title and topic, and to expressly describe the credit as a credit for reduced outdoor air infiltration to improve transparency to the reader and prevent confusion with other purposes for which a blower door test may be performed. The change clarifies without materially altering the requirements in the Draft

Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA2.4.1, 2.5, 2.5.1, 2.6.1, 2.6.3.3, 2.6.3.5, 2.7.7, 2.8 – The purpose of the changes to these sections are to correct punctuation and spacing; they clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

RA3 – Residential Field Verification and Diagnostic Test Protocols

Section RA3.1.4.2.3 – The purpose of the change is to correct the reference to RA3.3.3. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.3 – The purpose of the change is to make corrections to the description of the information in Table RA3.1-2 which has eliminated the leakage target requirement information. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.3.1 (c) – The purpose of the change is to add direction that floor registers on carpeted floors may be removed and the opening sealed to the floor under the carpet. If allowed by the equipment manufacturer, the air-handling unit blower compartment access panel may be sealed with an approved tape - do not use mastic or other permanent sealing material. The changes are necessary in order to clarify the procedure for these special circumstances.

Section RA3.1.4.3.1 (h) – the purpose of the change is to correct the reference to the compliance criterion which is given in the standards and not in Table RA3.1-2. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Sections RA3.1.4.3.2.1 and 2 – The purpose of the change is to correct the reference to the compliance criterion which is given in the standards and not in Table RA3.1-2. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.3.3 – The purpose of the change is to clarify the interior wall finish may be dry wall or other finishing material. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.3.4 (d) – The purpose of the change is to clarify that for the blower door protocol, if the door between the dwelling and the garage is used, the garage car-bay doors must be open. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.3.4 (i) and (j) - The purpose of the change is to correct the reference to the compliance criterion which is given in the standards and not in Table RA3.1-2. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance

with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.3.7 – The purpose of the change is to eliminate unnecessary text, and to add clarifying text. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.1.4.6 – The purpose of the changes to this section are to correct capitalization; they clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.2.1.2 – The purpose of the changes to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.2.2 – The purpose of the change is to clarify that the standard charge verification procedure is not required to be used for all compliance procedures, as there are alternatives to the standard charge verification procedure available for demonstrating compliance. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Sections RA3.2.2.2.1, 2, and 3 – The purpose of the change is to make corrections to punctuation and spelling. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.2.2.6.2 – The purpose of the change is to make corrections to punctuation. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.3.2.2.1 – The purpose of the change is to make corrections to punctuation. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.3.3.1.5 – The purpose of the change is to clarify the description of the protocol, and to correct references to other sections of the procedures. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.3.4.2 and 3 – The purpose of the changes to these sections are to correct punctuation; they clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.3.4.5 – The purpose of the change is to clarify that both subsections are to be met. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.4.4.2 – The purpose of the change is to clarify and improve the readability of the descriptions of the protocol steps. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16. The change also clarifies the compliance criteria, including an allowance that the capacity ratings at 17F are optional. The change is necessary to avoid possible preemption of federal regulation since capacity at 17F is not a mandatory reporting value for the rating.

Exception to RA3.5.3.2(e) – The purpose of the changes made to this exception is to add specificity; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.5.3.2.3 – The purpose of the change to this section is to correct spacing; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.5.3.2.5 – The purpose of the change made to this section is to clarify that air permeable insulation exposed to the unconditioned attic space shall be covered with a continuous air barrier. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA 3.5.3.2.10 – The purpose of the changes made to this section is to clarify the requirements of gable ends in unvented attics. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Sections RA3.5.3.3.1, 2, and 6 –The purpose of the changes to these sections is to correct numbering, in part by adding the word "RESERVED" to preserve overall section numbering; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.3.4.2 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.4.2.5 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.4.2.10 – The purpose of the changes made to this section is to clarify the requirements of gable ends in unvented attics. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Sections RA3.5.4.3.1 and 2 – The purpose of the changes to these sections is to correct numbering, in part by adding the word "RESERVED" to preserve overall section numbering; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.4.4.2 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.4.4.3 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.5.2.5 – The purpose of the change made to this section is to clarify that air permeable insulation exposed to the unconditioned attic space shall be covered with a continuous air barrier. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.5.2.10 – The purpose of the changes made to this section is to clarify the requirements of gable ends in unvented attics. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.5.3.2 – The purpose of the changes to these sections is to correct numbering by adding the word "RESERVED" to preserve overall section numbering; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.5.4.2 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.6.1.3 – The purpose of the change to this section is to correct numbering; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.6.2.5 – The purpose of the change made to this section is to clarify that air permeable insulation exposed to the unconditioned attic space shall be covered with a continuous air barrier. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.6.2.10 – The purpose of the changes made to this section is to clarify the requirements of gable ends in unvented attics. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.6.4.2 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.6.4.3 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the

effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.7.2.3 – The purpose of the change made to this section is to clarify that air permeable insulation exposed to the unconditioned attic space shall be covered with a continuous air barrier. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.7.2.4 – The purpose of the change to this section is to correct numbering; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.7.2.8 – The purpose of the changes made to this section is to clarify the requirements of gable ends in unvented attics. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.7.4.2 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.5.8.2.3 – The purpose of the change made to this section is to clarify that air permeable insulation exposed to the unconditioned attic space shall be covered with a continuous air barrier. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.8.2.8 – The purpose of the changes made to this section is to clarify the requirements of gable ends in unvented attics. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.5.8.4.2 – The purpose of the change to this section is to specify the requirement in terms of necessary effect (creation of an air barrier) rather than in terms of specific assemblies that accomplish the effect. This change is necessary to ensure that requirements are not unnecessarily prescriptive, and to allow flexibility where appropriate.

Section RA3.6.2 – The purpose of the changes to these sections are to correct punctuation and spacing; they clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.6.3 – The purpose of the change to this section is to remove reference to a Pipe Insulation Credit, consistent with its removal from Part 6. This change is necessary to prevent "double counting" of pipe insulation used to meeting plumbing code requirements.

Section RA3.6.4 – The purpose of the change to this section is to correct spacing; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.6.6 – The purpose of the changes to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's

compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.6.9 – The purpose of the change to this section is to allow use of an equivalent IAPMO test procedure, and to better accommodate sloped DWHR systems. This change is necessary to allow a larger variety of DWHR products to be used for compliance with Part 6.

Section RA3.7.1 – The purpose of the change is to correct the scope of the protocol to delete "low rise". The change is necessary as the scope of ASHRAE 62.2 was expanded to include all residential dwelling units (rather than only low-rise units).

Section RA3.7.3 – The purpose of the change is to clarify the measurements are made at system inlets or outlets, using flowmeters designed for measurement of residential ventilation airflows, and to correct grammar changing will to shall. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.7.4.1 – The purpose of the change is to clarify the procedures for measurement of supply, exhaust and balanced ventilation systems; to clarify that when multiple fans are specified to operate simultaneously to provide the required airflow, they shall be tested operating simultaneously; to make a correction to state the source for the airflow rates required for compliance are given in the Standards or the certificate of Compliance instead of in ASHRAE 62.2; to provide direction for measurement of balanced ventilation systems consistent with the updated airflow requirements for balanced systems given in ASHRAE 62.2 which requires measurement of both exhaust and supply airflows; to make a correction delete language that required approval of the executive director that is applicable to the intermittent operation in Section RA3.7.4.2. The changes were necessary in order to update the protocols to be consistent with the updated ventilation system descriptions and airflow requirements in Section 150.0. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.7.4.2. - The purpose of the change is to eliminate the term "whole-building" which is not used in the version of ASHRAE 62.2 proposed to be adopted in Section 150.0(o), and to clarify the source for the airflow rates required for compliance are given in the Standards. The changes are necessary in order to update protocols and terminology consistent with the updated ventilation system descriptions and airflow requirements proposed for Section 150.0 in the Draft Express Terms. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.7.4.3. - The purpose of the change is to edit the descriptions of the verification and compliance requirements to improve phrasing and readability. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.9.1 – The purpose of the change is to delete an unneeded reference to 150.1(c)12. The change is necessary because field verification of the prescriptive requirements for whole house fans is not required, making this reference unnecessary and a source of potential confusion.

Section RA3.9.3.2 and 3 – The purpose of the change is to correct references to Section RA3.9.2 and to correct descriptions of the WHF inlet. The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency

criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA3.9.4 – The purpose of the change is to incorporate corrections to the pressure matching procedures identified in the field study performed by Chitwood and King in September 2017 that was docketed as a document relied upon. The changes are necessary to clarify the method for setting up the house for a pressure matching procedure (WHF-OP), and to make a needed correction to the protocol such that envelope leakage is accounted for correctly for both parts of the pressure matching measurements. Staff stated at the 45-day hearing this correction to the procedure would be included with the 15-Day Language. Redundant language was removed from Section RA3.9.4.3, and the compliance criteria in RA3.9.4.4 was edited to improve clarity. The changes are necessary in order to give direction for accurate measurements of whole house fan airflow and fan efficacy for determining compliance with the performance standards.

RA4 – Eligibility Criteria for Energy Efficiency Measures

Section RA4.1 – The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.2.1.1 – The purpose of the change to this section is to update and correct the title of the referenced certifying body. The California Bureau of Electronic and Appliance Repair and the Bureau of Home Furnishings and Thermal Insulation have merged together as the “Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation”, and the change to this section incorporates this change to the Bureau's name. This change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.2.2.1 – The change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.2.2.2.1 – The purpose of the changes made to this section are to provide clarity on what documentation is expected at occupancy for window films. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.2.2.4 – The purpose of the changes made to this section are to provide clarity on what documentation is expected at occupancy for fenestration. This change is necessary to improve Part 6's compliance with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.3.1.2 – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.4.6 – The purpose of the changes to this section are to improve phrasing and correct punctuation; they clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Table 4.4.6-2 – The purpose of the change to this section is to correct an error; the error to the amended number originated as a typographical error in an associated Document Relied Upon. Although the original number was erroneous, this change has the substantive effect of altering a coefficient used in determining system compliance and therefore adjusting, by a small amount, the threshold for compliance. This change is necessary to ensure the coefficients in this Table are accurate to their purpose, and that the resulting calculations are therefore sound.

Section RA4.4.17 – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.4.20 – The purpose of the change to this section is to correct punctuation and spacing; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section RA4.4.21 – The purpose of the change to this section is to allow use of an equivalent IAPMO test procedure, and to better accommodate sloped DWHR systems. This change is necessary to allow a larger variety of DWHR products to be used for compliance with Part 6.

UPDATES TO THE NONRESIDENTIAL APPENDICES

NA1 – Nonresidential HERS Required Verification, Testing and Documentation Procedures

Sections NA1.2.2, 1.3.1, 1.3.3, 1.6.1, 1.7.7, and 1.8 – The changes to these sections correct punctuation; they clarify without materially altering the requirements in the Express Terms and are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA1.9 – The purpose of the changes to this section are to create a structure for qualified ATTs to provide HERS-based testing for nonresidential buildings that are subject to residential HVAC design requirements. This change is necessary to address the small number of nonresidential buildings that are built according to residential designs, and allow flexibility that accounts for the overlap in design.

NA2 – Nonresidential Field Verification and Diagnostic Test Procedures

Section NA2.2.1 – The purpose of the change to this section is to correct an occurrence of the term “buildings” to “dwelling units” for consistency with the rest of NA2.2. This change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA2.2.3 – The purpose of the changes to this section and its subsections is to use more direct and explicit language (e.g., “inlet or outlet terminals, grilles or registers” in place of simply “grilles or registers”) and to correct one occurrence of the word “shall” to “may” consistent with allowance in Part 6 for alternate methods of demonstrating compliance. While staff do not believe these changes to have any substantive effect, to the extent the existing language could have been read more narrowly these changes have the effect of incorporating terminals as well as registers or grilles, and of allowing rather than prohibiting alternatives to use of a flowmeter. Otherwise, these changes are necessary to improve the code's compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA2.2.4 – The purpose of the changes to this section are to redraft and update the procedures relating to mechanical system ventilation airflow both for clarity and to ensure consistency with the proposed changes to Part 6 requirements in Section 120.1. This change is necessary to ensure that performance of the test verifies compliance with updated Part 6 requirements, and to remove reference to HERS verification that is unneeded following the proposed change to Section NA1.9.

Section NA2.3 – The purpose of the change to this section is to add the phrase “Field Verification and Diagnostic Testing of” to its title, for consistency with the other sections of the Nonresidential Appendices. This change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

NA3 - Fan Motor Efficiencies

(No change to this section.)

NA4 - Compliance Procedures for Relocatable Public School Buildings:

(No change to this section.)

NA5 - RESERVED

(No change to this section.)

NA6 – Alternate Default Fenestration Procedure to Calculate Thermal Performance:

Section NA6.1 – The purpose of the changes made to this section and its subsections are to update the compliance document references. These changes are necessary as the documents referenced are from 2008 and are no longer available.

Section NA6.4 – The purpose of the change to this section is to correct punctuation; it clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA6.5.1 – The purpose of the change to this section is to correct capitalization and spelling; the change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA6.5.3.1 – The purpose of the change to this section is to correct capitalization; the change clarifies without materially altering the requirements in the Draft Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

NA7 – Installation and Acceptance Requirements for Nonresidential Buildings and Covered Processes

Section NA7 – Staff conducted a complete pass through NA7 to identify and correct minor punctuation errors, the most common being missing periods at the end of list items. These changes occur throughout NA7 and are non-substantive except where identified below. These changes clarify without materially altering the requirements in the Express Terms and are necessary to improve the code’s compliance with

clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA7.4.1 – The purpose of the changes made to this section are to update the compliance document references. These changes are necessary as the documents referenced are from 2008 and are no longer available.

Section NA7.4.2.4 – The purpose of the changes made to this section is to increase the warranty requirement to 15 years; commenters had expressed that current market practice in California is to provide a 15-year warranty, and requested alignment. This change is necessary to align with, and maintain consistency with, current industry norms and practices.

Section NA7.4.5 – The purpose of the change is to correct typographical errata by replacing the word “vertical” with “horizontal” in subsection NA7.4.5.2(b), and by replacing the phrase “light shelf and overhang” with “horizontal slats” in subsection NA7.4.5.3(d), to add a conjunction word “and” to subsection NA7.4.5.2(f) and to delete a conjunction word “and” from subsection NA7.4.5.3(a). The change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA7.5.5.2 – The purpose of the change to this section is to improve phrasing of test requirements; it clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA7.5.17.2 – The purpose of the change to this section is to improve readability and, by doing so, reduce the total number of steps. This change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA7.6.2.5 – The purpose of the change is to add a testing procedures for automatic time-switch controls configured with manual ON mode operation. This change is necessary to support the changes in Section 130.1(c)1E for allowing an automatic time-switch control other than the default mode of automatic ON.

Section 7.7.3 and 4 – The purpose of the change to these sections is to add the word “RESERVED” in order to preserve overall section numbering. This change clarifies without materially altering the requirements in the Express Terms and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

Section NA7.10.3.3 – The purpose of the changes to this section and its subsections are to redraft the test procedure using clearer, more standard terms and phrases, to reorder steps for a better logical flow, and to accommodate the updates relating to adiabatic condensers made to Part 6. This change is necessary to ensure the applicability of the test to revised requirements, to improve the clarity and consistency of the language, and to ensure the procedure accounts for as many situations as possible.

Section NA7.17.2 – The purpose of the proposed changes is to increase the clarity of this section and to increase the effectiveness this sections acceptance testing procedures. The proposed changes include rewording of 45-Day Language to add clarity, simplify the functional testing steps, and ensure that the instructions are applicable to all fume hood configurations that may be complying with this section. Stakeholder feedback indicated that some language wasn’t appropriate for all fume hood configurations and the proposed language addresses this while still retaining the intent of the original language. Additionally, language was added to explicitly test the sash downward force limit and confirm manual open

control operation. Adding this language was done to ensure that equipment complies with the requirements of section 140.9(c)4ii and 140.9(c)4iv. These changes are necessary to address concerns raised by commenters, ensure the applicability of the test to the equipment it is intended to cover, and remove unnecessary complexity consistent with the clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

NA8 - Luminaire Power

(No change to this section.)

UPDATES TO THE ALTERNATIVE CALCULATION METHOD (ACM) APPROVAL MANUAL

1.1.5 – The purpose of the change to this section is to add specificity by expressly stating that the Energy Commission ruleset, rules processor, and report generator must be directly integrated into the software. This change is necessary to ensure that vendor software behaves identically to Energy Commission developed software with regards to determining compliance or noncompliance.

1.3 – The purpose of the change to this section is to shorten “Building Energy Efficiency Standards” to “Standards” consistent with its use in the rest of the document. This change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

3 – The purpose of the change to this section is to shorten “Building Energy Efficiency Standards” to “Standards” consistent with its use in the rest of the document. This change clarifies without materially altering the requirements in the Express Terms, and is necessary to improve the code’s compliance with clarity and consistency criteria of California Government Code Sections 11349 and 11349.1, and California Code of Regulations, Title 1, Section 16.

(No change to Appendix A or B to the ACM.)

2. Update to the Economic Impact Assessment

The Economic Impact Assessment identified in the ISOR remains accurate in describing the changes proposed in the Final Express Terms. No updates are necessary.

3. Additional Technical, Theoretical, and Empirical Studies, Reports, and Similar Documents Relied Upon

Pursuant to the requirements of Government Code section 11346.2(b)(3), this section of the FSOR contains “[a]n identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the adoption, amendment, or repeal of a regulation” that was identified after the publication of the ISOR. All of these documents have been filed and formally noticed in this proceeding, and are available to the public unless subject to copyright or other restrictions on free dissemination. They are docketed under docket number 17-BSTD-02 and are available at <http://www.energy.ca.gov/title24/2019standards/rulemaking/documents/>.

Table 1: Documents Relied Upon

Required Filings	
Document Number	Report Title
399	Economic and Fiscal Impact Statement
(none; supplement)	Attachments to Form 399 (explanatory document and spreadsheet file)
(none; supplement)	2019 TDV Methodology Report (February 15, 2017)

Nonresidential Code Change Proposals	
Document Number	Report Title
2019-NR-LIGHT1-F	2019-NR-LIGHT4-F Indoor Lighting Power Densities
2019-NR-LIGHT2-F	Indoor Lighting Power Densities
2019-NR-LIGHT3-F	Nonresidential Outdoor Lighting Controls
2019-NR-LIGHT4-F	Nonresidential Indoor Lighting Controls
2019-NR-LIGHT5-F	Nonresidential Advanced Daylighting Design
2019-NR-LIGHT6-F	Nonresidential Indoor Lighting Alterations

2019-NR-ASHRAE62.1-F	Nonresidential Ventilation & Indoor Air Quality (IAQ)
2019-NR-ASHRAE90.1-F	Proposals Based on ASHRAE 90.1
2019-NR-MECH1-F	Prescriptive Efficiency Requirements for Cooling Towers
2019-NR-MECH2-F	Economizer Fault Detection and Diagnostics (FDD) for Built-Up Air Handlers
2019-NR-MECH3-F	Variable Exhaust Flow Control
2019-NR-MECH4-F	High Efficiency Fume Hoods in Laboratory Spaces
(none; proposal submitted by California Energy Alliance (CEA), April, 2017 (revised June, 2017))	Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2019 Update to the Building Energy Efficiency Standards Nonresidential Lighting Alterations

Residential Code Change Proposals	
Document Number	Report Title
2019-RES-ENV1-F	High Performance Walls
2019-RES-ENV2-F	High Performance Attic (HPA)
2019-RES-ENV3-F	Residential High Performance Windows and Doors
2019-RES-ENV4-F	Quality Insulation Installation (QII)
2019-RES-IAQ-F	Residential Indoor Air Quality
2019-RES-HVAC1-F	Residential Quality HVAC
2019-RES-DHW1-F	Compact Hot Water Distribution
2019-RES-DHW2-F	Drain Water Heat Recovery

All Other Documents Relied Upon	
Document Source	Title
Noresco; December 7, 2017	Cooling Tower Efficiency LCC Addendum
E2e Working Paper 031; June 1, 2017	Residential Building Codes Do Save Energy: Evidence From Hourly Smart-Meter Data
NAIMA; October 19, 2017	North American Insulation Manufacturers Association Comments on Draft 2019 Standards
Proctor Engineering Group; November 2017	Residential Furnace Blower Performance Testing
Translational Psychiatry; January 2017 (doi:10.1038/tp.2016.262)	Timing of light exposure affects mood and brain circuits
Air Resources Board; July, 2005	Indoor Air Pollution in California
California Energy Commission; December 1994	California's Energy Efficiency Standards and Indoor Air Quality
Illuminating Engineering Society (website article by Cori Jackson)	Commercial Lighting's Role in Automated Demand Response Programs
Lawrence Berkeley National Laboratory; 04-21-2014 (http://escholarship.org/uc/item/2nj5z1xm)	System Effects of High Efficiency Filters in Homes
Lawrence Berkeley National Laboratory; October 2012	Energy Implications of In-Line Filtration in California
Los Angeles Times; July 9, 2017(http://www.latimes.com/local/lanow/lame-in-freeway-pollution-filters-20170709-story.html)	L.A. requires air filters to protect residents near freeways. Are they doing the job?

All Other Documents Relied Upon	
Environmental Health Perspectives, volume 120, number 12; December 2012	Is CO2 an Indoor Pollutant? Direct Effects of Low-to-Moderate CO2 Concentrations on Human Decision-Making Performance
Indoor Air; 2000;10; 212-221	Risk of Sick Leave Associated With Outdoor Air Supply Rate, Humidification, and Occupant Complaints
International Journal of Environmental Research and Public Health; November 2015 (doi:10.3390/ijerph121114709)	Economic, Environmental and Health Implications of Enhanced Ventilation in Office Buildings
Indoor Air; 2015; doi:10.1111/ina.12254	The effects of bedroom air quality on sleep and next-day performance
RDH Building Engineering Ltd.; April 2, 2013	Air Leakage Control in Multi-Unit Residential Buildings - Development of Testing and Measurement Strategies to Quantify Air Leakage in MURBS
U.S. Department of Energy; March 2015	Field Testing of Compartmentalization Methods for Multifamily Construction
California Energy Commission; March 2014 (CEC-500-2015-045)	Unique Multifamily Buildings Proposed Energy Code Measures
Ernest Orlando Lawrence Berkeley National Laboratory; February 2016 (LBNL-1004365)	Development of a Tracer Gas Capture Efficiency Test Method for Residential Kitchen Ventilation
Ernest Orlando Lawrence Berkeley National Laboratory; March, 2017 (LBNL2001009)	Development of a Standard Test Method for Reducing the Uncertainties in Measuring the Capture Efficiency of Range Hoods
American Chemical Society; 2012 (dx.doi.org/10.1021/es3001079 Environ. Sci. Technol. 2012, 46, 6167–6173)	Performance Assessment of U.S. Residential Cooking Exhaust Hoods
Ernest Orlando Lawrence Berkeley National Laboratory; November 2011 (LBNL-5265E-r1(3))	Performance of Installed Cooking Exhaust Devices
U.S. Department of Commerce; June 6, 2012 (Volume 432; 350-356)	Reduction of exposure to ultrafine particles by kitchen exhaust hoods: The effects of exhaust flow rates, particle size, and burner position

All Other Documents Relied Upon	
California Energy Commission, March 2011 (CEC-500- 2012- 062)	Efficiency Characteristics and Opportunities for New California Homes (ECO)
California Air Resources Board; May 21, 2016	Reducing In-Home Exposure to Air Pollution
14th Canadian Conference on Building Science and Technology - Toronto, Ontario 2014	A Field Study of Airflow in Mid to High-Rise MultiUnit Residential Buildings
ASHRAE; 2007	Measured Change in Multifamily Unit Air Leakage and Airflow Due to Air Sealing and Ventilation
U.S. Department of Energy; February 2016	Evaluation of Passive Vents in New Construction Multifamily Buildings
U.S. Department of Energy; July 2014	Evaluation of Ventilation Strategies in New Construction Multifamily Buildings
U.S. Department of Energy; January 2017	Measure Guideline: Ventilation Guidance for Residential High-Performance New Construction – Multifamily
RDH Building Engineering Ltd.; August 2015 (TB-009)	Air Quality in Multi-Unit Residential Buildings
Center for Energy and Environment; November 2004	Reduction of Environmental Tobacco Smoke Transfer in Minnesota Multifamily Buildings Using Air Sealing and Ventilation Treatments
California Energy Commission; November 2009 (CEC-500-2009-085)	Ventilation and Indoor Air Quality In New Homes
Atmospheric Environment; March 2004 (doi:10.1016/j.atmosenv.2004.03.027)	Contribution from indoor sources to particle number and mass concentrations in residential houses
University of Birmingham; January 2013 (10.1016/j.atmosenv.2013.01.061)	Emissions and indoor concentrations of particulate matter and its specific chemical components from cooking
California Air Resources Board; November 30, 2001	Indoor Air Quality: Residential Cooking Exposures
Atmospheric Environment; August 2009 (doi:10.1016/j.atmosenv.2009.08.043)	Indoor acrolein emission and decay rates resulting from domestic cooking

All Other Documents Relied Upon	
	events
International Journal of Environmental Research and Public Health; April 2010 (doi:10.3390/ijerph7041744)	Measurement of Ultrafine Particles and Other Air Pollutants Emitted by Cooking Activities
Environmental Health Perspectives; July 2003	Particle Concentrations in Inner-City Homes of Children with Asthma: The Effect of Smoking, Cooking, and Outdoor Pollution
Atmospheric Environment; June 2009	Particle emission factors during cooking activities
Environmental Health Perspectives; January 2014	Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California
Environmental Science & Technology; March 2004 (doi:10.1021/es0306260)	Source Strengths of Ultrafine and Fine Particles Due to Cooking with a Gas Stove
Indoor Air; September 2014 (doi:10.1111/ina.12163)	Ultrafine particles from electric appliances and cooking pans: experiments suggesting desorption/nucleation of sorbed organics as the primary source

4. The Reasons Why Mandating the Use of Specific Technologies or Equipment is Required

The Standards mandate the use of specific technologies and equipment to assure that buildings always meet minimum, cost-effective efficiency requirements whether the prescriptive method (pursuant to Sections 140.0 and 150.1(c)) or the performance method (pursuant to Sections 140.1 and 150.1(b)) of compliance is used. If these proven, simple, highly cost-effective, long-lasting energy saving technologies and equipment were not mandatory, they could be “traded off” against measures that have not been documented to save energy as persistently, simply, or cost-effectively. (Note also that although some measures and equipment appear in the “prescriptive” compliance method, none of those are mandatory. That is because the prescriptive compliance method is a voluntary alternative to the performance compliance method. Moreover, there are several different “packages” of measures and equipment in the prescriptive compliance method, which further demonstrates the voluntary nature of the prescriptive compliance method.)

5. Consideration of reasonable Alternatives, including those that Would Lessen Any Adverse Impact on Small Business (Government Code Section 11346.9(a)(4) & (5))

Pursuant to the requirements of Government Code Section 11346.9(a)(4), this section of the FSOR contains “[a] determination with supporting information that no alternative considered by the agency would

be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the adopted regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.” Per Government Code Section 11346.9(a)(5), this section must also contain “[a]n explanation setting forth the reasons for rejecting any proposed alternatives that would lessen the adverse economic impact on small businesses.” In doing so, the Commission is “not required to artificially construct alternatives or describe unreasonable alternatives.” (Gov. Code, § 11346.2(b)(4)(C).)

As stated in the ISOR, any alternatives that lessen any adverse economic impacts, but likewise do not achieve the energy savings of the proposed regulations, would not be a reasonable fulfillment of the Energy Commission’s statutory obligations. The Commission therefore does not consider the “do nothing” alternative of abandoning, in part or in full, the updates proposed by the Draft Express Terms, or any alternative that would completely eliminate feasible and cost effective efficiency requirements either currently in effect or proposed by the Draft Express Terms, to be a reasonable alternative. The Commission considered proposed alternatives to specific provisions of the Standards received among the public comments submitted for the Draft Express Terms, and substantively incorporated those alternatives where staff found that the proposed alternative would be effective in carrying out the purpose for which the regulation is proposed, or would be as effective and less burdensome to affected private persons than the adopted regulation. The reasons for accepting or rejecting any alternative proposed as part of a public comment are stated in the response to the comment within the Final Response to Comments at the end of this FSOR.

6. Facts, Evidence, Documents, Testimony, or other Evidence of No Significant Adverse Economic Impact on Business

The estimation of impacts on business stated in the ISOR remains accurate in describing the changes proposed in the Final Express Terms.

7. Duplication or Conflicts with Federal Regulations

The final revisions to the Standards do not duplicate or conflict with any federal regulations. (See Gov. Code, 11346.2, subd. (b)(6)). There are no federal regulations that prescribe building standards for non-federal buildings.

B. Determination as to Whether Adoption, Amendment, or Repeal of the Regulation Imposes a Mandate on Local Agencies or School Districts (Government Code Section 11346.9(a)(2))

The proposed modifications to the standards will not impose new mandates on local agencies. Existing law already obligates local authorities having jurisdiction (primarily building departments) to serve as enforcement agencies for the Standards.² Existing law also already requires compliance with the Standards as they apply to buildings owned by local agencies (including but not limited to school buildings).³ While the proposed Standards add requirements for building types owned by local agencies, those requirements are the same as those applicable to all nonresidential buildings regardless of owner. Moreover, the proposed Standards recognize the unique characteristics of relocatable public school buildings, and they establish procedures to facilitate compliance by relocatables. Finally, the Standards for schools, and for all other buildings, are cost effective, and they will thereby reduce the total costs of building and operating school buildings.

C. Objections and Recommendations, and the Energy Commission’s Responses (Government Code Section 11346.9(a)(3))

² Pub. Resources Code §§ 25402, subd. (a)-(b), 25402.1.

³ California Code of Regulations, Title 24, Part I, Administrative Regulations of Department of School Administration.

This discussion is presented in the spreadsheets labeled Response to Comments.

D. Consideration of Reasonable Alternatives, including those that Would Lessen Any Adverse Impact on Small Business

(Government Code Section 11346.9(a)(4) & (5))

This consideration appears in Section II.A.6. (beginning on page 49 above).

E. Documents Referenced in the Proposed Building Energy Efficiency Standards

All of these documents, which are incorporated by reference in the Parts 1 and 6 Standards, are in the record of the Energy Commission's rulemaking proceeding. In addition, they were made available to the public upon request directly from the Energy Commission, or were reasonably available to the affected public from a commonly known or specified source. (See OAL Regulations, California Code of Regulations, Title 1, Section 20(c)(2).). They were listed in the Initial Statement of Reasons, and no additional documents were referenced in the 15-Day Language.

Each one of the documents incorporated by reference is of such length, or is subject to copyright restrictions, that it would be cumbersome, unduly expensive, or otherwise impractical to expressly publish it as part of the Standards. (See OAL Regulations, California Code of Regulations, Title 1, Section 20(c)(2).)