STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

2013 Title 24 Building Energy Efficiency Standards Rulemaking Proceeding California Code of Regulations, Title 24, Parts 1, 6, and 11	)	**Docket No. 12-BSTD-1** **Order No. 12-0531-5**

ORDER ADOPTING PROPOSED REGULATIONS AND NEGATIVE DECLARATION

I. INTRODUCTION

The California Energy Commission hereby adopts additions and amendments to its energy and water efficiency standards for buildings. These standards apply to residential, nonresidential, high-rise residential, and hotel and motel buildings. The standards are in Part 6 (also known as the California Energy Code) and associated administrative regulations in Part 1 of Title 24 of the California Code of Regulations ("CCR"). The standards are called the "2013 Building Energy Efficiency Standards" (or 2013 Standards), as proposed on May 15, 2012, for a 15-day review period and as revised pursuant to our decisions at the May 31, 2012, public hearing, as reflected in Appendix A. The 2013 Standards will go into effect on January 1, 2014, following approval of the California Building Standards Commission.

Pursuant to the California Environmental Quality Act (CEQA),[1] the Energy Commission also approves the Initial Study, as supplemented, analyzing the environmental impacts of the 2013 Standards. Based on this analysis, the Energy Commission finds that:

(1) there is no substantial evidence, in light of the whole record, that adopting the 2013 Building Energy Efficiency Standards, in Parts 1 and 6 of Title 24 of the California Code of Regulations, will have a significant effect on the environment and

(2) the Negative Declaration reflects the Energy Commission's independent judgment and analysis.

And the Energy Commission adopts the Negative Declaration.

The Energy Commission takes this action under the authority given by Public Resources

[1]Public Resources Code § 21000 et seq.

Code sections 25218, subd. (e), 25402, 25402.1, 25402.4, 25402.5, 25402.5.4, 25402.8 and 25910, to implement, interpret and make specific Sections 25402, subd. (a)-(c), 25402.1, 25402.4, 25402.5, 25402.5.4, 25402.8 and 25910.

II. HISTORY OF THE PROCEEDING

To develop the 2013 Standards, the Energy Commission conducted an open, transparent, and extensive public process. Between November 2010 and today, the Commission has held over 15 workshops and other public events. We began with a presentation of the overall plan and schedule for this rule-making, and the fundamental building blocks that would be used in the Standards. Subsequent workshops addressed various aspects of the 2013 Standards in detail. During this process, more than 45 stakeholder groups assessed, analyzed, discussed, and helped to improve numerous versions of the proposed Standards, and the Commission staff responded to more than 1,000 public comments.

On February 7, 2012, the formal rule-making phase was initiated when the Commission (1) filed with the California Building Standards Commission ("CBSC") and the Office of Administrative Law ("OAL"), and (2) published, the following:

- A Notice of Proposed Action ("NOPA"), which described the proceeding, summarized the proposed Standards, and explained how interested persons could participate;
- Economic and Fiscal Analysis (Form 399);
- An Initial Statement of Reasons ("ISOR"), which presented the rationales for the Standards; and
- Proposed Express Terms ("45-day language") of the 2013 Standards.

OAL published the NOPA in the California Regulatory Notice Register on February 24, 2012.[2]

The Commission also provided the NOPA to:

- every contact on the Energy Commission's mailing lists for: *The Blueprint* (a Title 24 newsletter), appliance efficiency standards, nonresidential and residential building energy efficiency standards, city and county building officials, and county clerks,
- the Commission's *Efficiency* and *Building Standards* electronic mail list-servers, and
- every person who had requested notice of such matters.

As stated in the NOPA, p. 3, the Commission welcomed comments on any of the proposed provisions – and, as we have noted above, many were received. Accordingly, the

[2]California Regulatory Notice Register, Feb. 24, 2012, vol. no. 8-Z, p. 228.

Commission on May 15, 2012, published proposed changes to the 45-day language (and identified additional documents beyond those identified in the NOPA upon which it is relying in adopting the2013 Standards). These changes are called "15-day language" because they are sufficiently related to the 45-day language and thus only subject to an abbreviated15-day notice requirement. The 15-day language was made available for public comment for 15 days, through May 30, 2012.[3]

The NOPA, the ISOR, and the 45-day and 15-day language were also timely posted on the Energy Commission's website.[4]

On May 31, 2012, the Energy Commission held a public hearing, pursuant to Government Code section 11346.8 and Public Resources Code section 25402, to accept both oral and written final comments on the 2013 Standards, and to consider their adoption.

Also, as discussed in detail below, the Commission considered at this hearing adopting the Negative Declaration prepared pursuant to CEQA.

III. FINDINGS AND CONCLUSIONS

Several different statutory schemes govern the Commission's adoption of building standards: the Warren-Alquist State Energy Resources Conservation and Development Act,[5] the Administrative Procedure Act,[6] and the Building Standards Law.[7] Pursuant to these statutes, the Commission has reviewed the entire record of this proceeding, including public comments, reports and other documents, transcripts of public events, and all other materials that have been filed in this proceeding (Docket No. 12-BSTD-1). Based on that record, the Commission makes the following findings and conclusions.

A. The Warren-Alquist Act

1. Public Resources Code Sections 25402, subd. (a)-(b)

The Standards we adopt today satisfy the requirements of Public Resources Code section 25402, subdivisions (a) and (b). Those provisions require the Commission to adopt building design and construction standards that increase the efficiency in the use of energy and water for new residential and new nonresidential buildings, and energy and water conservation design standards. By law, these standards must be "cost effective when taken in their entirety, and when amortized over the economic life of the structure when compared with historic practice."

[3] Gov. Code § 11346.8; Cal. Code Regs., tit. 1, § 42.
[4] See http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/.
[5] Pub. Resources Code § 25000 et seq.
[6] Gov. Code § 111340 et seq.
[7] Health & Safety Code § 18901 et seq.

The 2013 Standards fulfill these directives. They increase the efficiency of and conserve the use of energy and water. Moreover, they are cost-effective.

Building constructed pursuant to the 2013 Standards are projected to:

- save $1.60 billion in energy over a 30-year life;
- save 200 million gallons of water per year, and;
- avoid more than 155 thousand metric tons of greenhouse gas emissions per year.

To further illustrate the anticipated savings, in the residential context, the 25 percent efficiency improvement in the 2013 Standards will provide a 2½:1 return on a typical homeowner's investment. If factored into a 30-year mortgage, the standards will add approximately $11 per month to the cost of the average home, but will save approximately $27 on monthly heating, cooling, and lighting bills. On average, the 2013 Standards will increase the cost of constructing a new residential building by $2,290 but will return more than $6,200 in energy savings over 30 years.

For complete details of the Energy Commission's fiscal and economic analysis of the 2013 Standards, see the Economic and Fiscal Analysis (Form 399), previously published with the NOPA.

Therefore, we find and conclude that the 2013 Standards are cost effective.

5. Public Resources Code Section 25402.8.

Section 25402.8 of the Warren-Alquist Act directs the Commission, when adopting new building energy conservation standards to "include in its deliberations the impact that those standards would have on indoor air pollution problems."

The Commission must take into account both the indoor air quality concerns embodied in Section 25402.8 and the mandate to achieve cost-effective energy conservation in Sections 25402(a) and (b). This alone requires a delicate balancing of issues and concerns because, among other reasons, by improving indoor air quality through increased ventilation, energy use will increase, which means that the adverse health impacts of outdoor air pollution may also increase.

In developing the 2013 Standards, the Energy Commission coordinated with other agencies with expertise in indoor air quality, including the California Air Resources Board, California Department of Industrial Relations, Division of Occupational Safety and Health (better known as Cal/OSHA), and the California Department of Health Care Services.

The 2013 Standards:

- Ensure adequate outdoor air ventilation;
- require that the minimum outdoor air quantities be provided during regular and pre-occupancy periods; and
- require documentation showing that ventilation systems provide the minimum outdoor air quantities.

We find and conclude that such provisions are reasonably necessary to carry out the mandate of Section 25402.8, and that they strike an appropriate balance between the requirements of this Section and the energy-savings and cost-effectiveness mandates of Sections 25402, subd.(a)-(b).

B. **The Administrative Procedure Act**

The California Administrative Procedure Act ("APA") requires all state agencies to take certain steps and assess several matters when adopting regulations. Many of these matters, analyses and findings are required to be addressed in the ISOR prepared as part of the NOPA, or in the Final Statement of Reasons that is required to be prepared after the regulations are adopted. In support of those documents, the Commission makes the following findings and determinations here in adopting the 2013 Standards.

1. Government Code section 11346.3

In addition to the economic analysis required by Section 11346.3 of the APA, discussed further below, subdivision (c) of this statute mandates that agencies that require the preparation of reports by businesses find that such reports are necessary to protect the health, safety or welfare of the people of California.

The 2013 Standards require completion of certain reports, called compliance documentation, regarding the efficiency measures incorporated into buildings. The reports collect the information necessary for local building officials, building owners and occupants, and contractors to ensure that the measures are properly installed and operating correctly, so that the anticipated energy, environmental and cost benefits will actually be achieved. Accordingly, we find and conclude that it is necessary that these reporting requirements apply to businesses, in order to protect the health, safety and welfare of the people of California, as required by Government Code section 11346.3, subdivision (c).

2. Government Code section 11346.45

State agencies must "involve parties who would be subject to the proposed regulations in public discussions regarding those proposed regulations, when the proposed regulations involve complex proposals or a large number of proposals that cannot easily be reviewed during the comment period." As described above, the Energy Commission conducted extensive outreach with industry and other stakeholders, over the course of the past 18 months on the structure and contents of the regulations. We therefore find and conclude that the Energy Commission has complied with Government Code section 11346.45.

3. Government Code sections 11346.3, 11346.5 and 11346.9

Sections 11346.3, 11346.5, and 11346.9 of the APA require State agencies to assess various potential economic and fiscal impacts of proposed regulations potential alternatives. Briefly stated, the Commission finds that the 2013 Standards:

a) Will not result in a significant statewide adverse impact directly affecting business (including small businesses), including the ability of California businesses to compete with businesses in other states, and job creation;
b) Will not have significant impacts on housing costs;
c) Do not have alternatives that would be more effective in carrying out the purposes of the Warren-Alquist Act without increasing burdens, or that would be as effective and less burdensome to affected private persons in carrying out the purposes; and
d) Will not impose any direct costs or direct or indirect requirements on state agencies, local agencies, or school districts, including but not limited to costs that are required to be reimbursed under Part 7 (commencing with Section 17500) of the Government Code.

These matters are discussed below.

a. No Significant Economic Impact on Businesses and Job Creation

The Energy Commission has determined that adopting the 2013 Standards will not have a significant statewide adverse economic impact on businesses, including the ability of California businesses to compete with business in other states.

The Standards will require energy efficiency measures for all new nonresidential and residential construction, and for certain additions and alterations to existing buildings as well. However, those measures are cost-effective, so businesses will experience a positive economic impact. In addition, the Standards will indirectly require changes in practice, and the retraining of employees, in businesses that are involved in the design and construction of buildings, in compliance analysis and documentation, and in field verification. Any costs attributable to such changes and retraining would be short-term in nature, since the incremental cost increases for new technologies will not persist once these technologies become mainstream, and building practice changes

requiring retraining will not result in ongoing cost increases. In any case, these incremental construction cost increases would ultimately be borne by the beneficiaries of the Standards: the people and businesses benefitting from reduced energy bills.

In addition, new jobs may be created as a result of the new compliance procedures, or to provide compliance-related services and energy-efficiency products. The Energy Commission estimates that the 2013 Standards may create up to 3,500 new jobs in the building industry. Also, because the Standards will save hundreds of millions of dollars in energy costs, there will be more money in the economy that can be used for job creation.

For the same reasons, the Commission finds that the 2013 Standards will not have any significant adverse impact on small or other businesses or other affected persons. By making compliance with the standards easier, the proposed regulations will help building designers, architects, contractors, and similar professionals. Most importantly, by causing overall reductions in the costs of owning and operating residences and buildings, the 2013 Standards will reduce costs for all businesses and persons throughout the state.

b. Impact on Housing Costs

The 2013 Standards will affect housing costs. By requiring the installation of energy efficiency measures that would otherwise not be included in buildings, the 2013 Standards will result in small increases in the initial cost of housing. The Energy Commission estimates that an average of $3,300 in additional costs for single family residential buildings will result from the 2013 Standards, and an incremental construction increase of $45,000 for a 15,000 square foot building (such as a multi-family residential building), less than 2% of typical construction costs for this building size. As described above, these increases will be recouped by the reduced energy costs to operate the buildings. Further, this estimate is likely more than what will be realized, since it does not account for volume pricing or reductions in technology costs once these technologies are provided to a mass market. Therefore, we find and conclude that there will be no significant increase in housing costs.

c. Consideration of Alternative Proposals; Necessity

The 2013 Standards are the result of a process that lasted eighteen months, involved more than a dozen publicly-noticed hearings and workshops, relied upon input from numerous representatives of all aspects of the building industry and from building officials, and produced detailed and sophisticated technical analyses. Moreover, the resultant 2013 Standards carefully harmonize the statutory requirements of energy conservation, cost-effectiveness, and other aspects of the public health and welfare.

Many alternatives suggested to the Commission have been included in the Standards; those that are not either (1) were more expensive than the proposed Standards, (2) were infeasible, or (3) would save less energy than the proposed Standards. Discussions of all the specific alternatives considered are in the public comments and reports in the record of this rulemaking proceeding, and will be discussed in more detail in the FSOR prepared after adoption.

Therefore, the Energy Commission has determined that (1) no reasonable alternative considered by it or that has otherwise been identified and brought to its attention (a) would be more effective in carrying out the purposes of the Warren-Alquist Act, (b) would be as effective and less burdensome to affected private persons than the adopted regulations, or (c) would be more cost-effective to affected private persons and equally effective in implementing the Warren-Alquist Act; and (2) the 2013 Standards are necessary to carry out the purposes for which they are proposed– cost-effective energy savings and environmental improvements – because without the Standards, those purposes will not be achieved.

d. Mandates and Costs on State or Local Agencies and School Districts

By requiring new or improved energy efficiency measures to be installed, the 2013 Standards will result in small increases in the cost of new construction. However, those construction costs will be more than offset by reductions in energy costs, so that over the life of a building, total costs will be reduced. Therefore, although the 2013 Standards will result in direct costs (for construction) and savings (in energy bills) for local and state agencies and school districts (to the extent that those agencies and districts construct buildings or pay energy bills), the Commission finds that they will not impose a mandate on local agencies or school districts or impose increased or new costs that are reimbursable by the state under Part 7 (beginning with section 17500) of Division 4 of the Government Code. In addition, because the 2013 Standards will make enforcement easier, local and state agencies responsible for enforcing the building 2013 Standards are likely to enjoy savings.

As required by Government Code section 11346.9, subd. (a)(2), the Commission finds and concludes that there will be no costs or savings to local or state agencies or school districts. Finally, we find and conclude that there will be no costs or savings to federal agencies, and no costs or savings in federal funding to the State.

For complete details of the Energy Commission's fiscal and economic analysis of the 2013 Standards, see the Economic and Fiscal Analysis (Form 399), previously published with the NOPA.

C. The State Building Standards Law (Health & Safety Code Section 18930).

The Building Standards Law requires that state agencies adopting building standards submit to the California Building Standards Commission both their adopted building standards and a justification of how the standards meet the criteria in Section 18930 of the Health and Safety Code. For the reasons described below, we find, determine, and conclude that the 2013 Standards comply with each one of the applicable criteria. Additional supporting analysis will accompany the 2013 Standards when they are submitted for approval to the Building Standards Commission.

1. The building standards do not conflict with, overlap, or duplicate other building standards

There is no overlap or duplication with other regulations because the Energy Commission is the only agency authorized to set efficiency standards for buildings, and for the same reason there should be no conflict with other building standards (i.e., no situation in which it is impossible to comply with both an Energy Commission standard and another building standard).

2. The building standards are within the parameters established by enabling legislation and are not expressly within the exclusive jurisdiction of another agency

The "enabling legislation" for the 2013 Standards is the Warren-Alquist Act; compliance with its "parameters" is discussed above. The Warren-Alquist Act gives to the Energy Commission, and not to any other agency, the exclusive jurisdiction to set energy standards for buildings.

3. The public interest requires the adoption of the building standards

The Warren-Alquist Act requires the Commission to adopt and "periodically update" its building standards, which indicates that the Legislature itself deems adoption of cost-effective building standards to be in the public interest.[8]Moreover, as we have discussed at length above, the extensive public record of this proceeding demonstrates that the 2013 Standards will save substantial amounts of energy and money, and will reduce adverse environmental impacts, all of which are in the public interest.

4. The building standards are not unreasonable, arbitrary, unfair, or capricious, in whole or in part

Not only the content of the 2013 Standards, but also the process through which they were adopted (including the voluminous comments both supporting and suggesting

[8]Pub. Resources Code, § 25402, subd. (a)(1).

edits which were incorporated into the 2013 Standards)show that this criterion was met.

5. The cost to the public is reasonable based on the overall benefit to be derived from the building standards

As described herein, the 2013 Standards are cost-effective. The costs which are imposed are reasonable based on the economic, environmental and other benefits to be derived.

6. The building standards are not unnecessarily ambiguous or vague, in whole or in part

Throughout the one-and-a-half-year rulemaking process, the Commission made many changes to draft proposals to ensure their clarity. There were no comments on the 15-Day Language regarding unnecessary ambiguity or vagueness.

7. The applicable national specifications, published standards, and model codes have been incorporated in the standards as provided in the State Building Standards Law, where appropriate

There are no federal laws applicable to nonfederal buildings in their entirety, so nothing in this realm could have been incorporated into the 2013 Standards. However, the adopted Standards do incorporate (as previous editions of the Standards have for decades incorporated) federal energy standards for particular appliances that may be installed in buildings.

There are several different types of national and model standards that could be applicable to the Energy Commission's building standards. The Commission included model and national codes and specifications wherever appropriate. For example, heating and cooling system design loads shall be determined in accordance with the procedures described in the ASHRAE Handbook, Fundamentals Volume, or as specified in a method approved by the Commission.[9]

8. The format of the building standards is consistent with that adopted by the California Building Standards Commission

The 2013 Standards continue to use the format of the other building standards in the State Building Code.

9. The proposed building standards, if they promote fire and panic safety as de-

[9] 2013 Standards, Title 24, Part 6, § 140.4(b)2.

termined by the State Fire Marshal, have the written approval of the State Fire Marshal

The 2013 Standards are not intended to promote fire and panic safety. Nevertheless, the Energy Commission has coordinated with the State Fire Marshal to ensure any necessary approvals are obtained. We understand that following adoption, the Fire Marshal will file with the Commission written approval of the 2013 Standards.

D. The California Environmental Quality Act (Public Resources Code Section 21000 et seq.)

The California Environmental Quality Act ("CEQA") requires that state agencies consider the environmental impact of their discretionary decisions, including the adoption of regulations. The Energy Commission began its compliance with CEQA's mandate by preparing an "Initial Study". (See Cal. Code Regs., tit. 14, §§ 15060 - 15065.) The Initial Study, addressed matters such as air emissions, water use , indoor air pollution, and the use of materials such as wood, glass, aluminum, copper, fiberglass, mercury, lead, steel, plastic silicon, gold, and titanium.

As CEQA requires, the Commission then published a Notice of Intent to adopt a Negative Declaration.[10]. The Notice, Initial Study and the Proposed Negative Declaration were made available through the Statewide Clearinghouse at the Office of Planning and Research to the following responsible agencies:[11]

- The California Air Resources Board,
- The Department of Housing & Community Development,
- The Office of School Construction,
- The California Public Utilities Commission,
- The California Resource Agency,
- The California Department of Resources Recycling and Recovery,
- The California Department of Toxic Substance Control
- The California Department of Water Resources, and
- The California State Fire Marshal.

The Notice of Intent was also sent to all 58 county clerks in California as well as to over 10,000 people and entities that had previously requested such notice.[12] Finally, a

[10]See Public Resources Code sections 21091, 21092 and 21092.3, and 14 CCR section 15072(g).
[11] 14 CCR Section 15073(d).
[12]14 CCR Section 15072(a).

legal notice was published on or near March 28, 2012, in:[13]

- The San Diego Union Tribune
- The San Jose Mercury News
- The San Francisco Chronicle
- The Los Angeles Times

The Energy Commission provided a comment period on the Initial Study and Proposed Negative Declaration beginning on March 26, 2012 and ending May 15, 2012 (a total of 48 days).[14]

Moreover, when the 15-Day language was published, the Energy Commission undertook a further review to determine if any of the changes from the 45-Day Language required recirculation of the Proposed Negative Declaration. The Commission found that the changes did not result in any new, significant, avoidable environmental effects, and therefore issued a Supplement to the Initial Study and Proposed Negative Declaration that so indicated.[15]

There were no comments received on the Initial Study or Proposed Negative Declaration, either in their original form or as supplemented, whether from any state agencies or the public.

Accordingly, the Energy Commission finds[16] that:

(1) In light of the whole record, there is no substantial evidence that the 2013 Building Energy Efficiency Standards in Parts 1 and 6 of Title 24 of the California Code of Regulations, will have a significant effect on the environment and

(2) the Proposed Negative Declaration reflects the Energy Commission's independent judgment and analysis.

IV. ADOPTION OF AMENDMENTS TO REGULATIONS, AND OF NEGATIVE DECLARATION; DELEGATION TO EXECUTIVE DIRECTOR

The California Energy Commission adopts the amendments in the 15-day language dated May 15, 2012, in Title 24, Parts 1 and 6, of the California Code of Regulations, as revised by the document titled "Modifications to 15-day Language", May 15, 2012, and as further revised at the May 31, 2012, public hearing (the latter revisions are set forth in

[13] 14 CCR Section 15072(b)(1).
[14] 14 CCR Section 15073(a).
[15] 14 CCR Section 15073.5.
[16] Public Resources Code section 21082.1.

Appendix A).

The California Energy Commission adopts the Negative Declaration dated March 26, 2012.

The California Energy Commission directs the Executive Director to take, on behalf of the Commission, all actions reasonably necessary to have the adopted regulations approved by the California Building Standards Commission and go into effect, including but not limited to preparing and filing all appropriate documents and correcting typographical and other non-substantive errors, such as the Final Statement of Reasons and the Notice of Determination of a Negative Declaration.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on May 31, 2012.

AYE: Weisenmiller, Douglas, Peterman, McAllister
NAY:
ABSENT:
ABSTAIN:

Harriet Kallemeyn,
Secretariat

APPENDIX A

NONSUBSTANTIVE ERRATA TO THE
2013 BUILDING ENERGY EFFICIENCY STANDARDS 15-DAY LANGUAGE

Revised May 31, 2012

Staff proposes the following changes to the 15-Day Language to correct typographical and transcription errors, inadvertent inconsistencies, improve phrasing, and make other improvements that clarify without materially altering the requirements, rights, responsibilities, conditions, or prescriptions contained in the 15-Day Language.

Changes from the 15-Day Language are shown in double-underline for additions and double strike-through for deletions, and in gray highlight to distinguish from the 15-Day Language.

1. **Part 1, Sections 10-109(h) and (i), p. 23**

For Section 10-109(h), the 15-Day Language change was intended to delete only "Executive Director" and insert "Commission"; however, the entirety of 10-109(h) was inadvertently deleted. The 45-Day Language for Section 10-109(h) is restored and the intended 15-Day Language change of deleting "Executive Director" and inserting "Commission" is made. Also, the next section is marked as Section 10-109(i) due to the restoration of Section 10-109(h).

~~(h) In addition to the procedures and protocols identified in the Alternative Calculation Method Approval Manuals and the Reference Appendices, the Executive Director may authorize alternative procedures or protocols that demonstrate compliance with Part 6.~~

(h) In addition to the procedures and protocols identified in the Alternative Calculation Method Approval Manuals and the Reference Appendices, the ~~Executive Director~~ Commission may authorize alternative procedures or protocols that demonstrate compliance with Part 6.

(~~h~~ i) **D~~d~~ata R~~r~~egistries A~~a~~nd R~~r~~elated D~~d~~ata -I~~i~~nput S~~s~~oftware, A~~a~~nd E~~e~~lectronic D~~d~~ocument R~~r~~epositories.**

2. **Part 6, Section 100.0(e)2Dii, p. 33**

Delete a reference to Section 120.7 for low-rise residential buildings, because Section 120.7 is a requirement for Nonresidential and high-rise residential and Hotel/motels.

D. **Low-rise residential buildings.**

i. Sections applicable. Sections 150.0 through 150.1 apply to newly constructed low-rise residential buildings.

ii. Compliance approaches. To comply with ~~Title 24 Part 6~~ Part 6 newly constructed low-rise residential buildings must meet the requirements of:

a) Mandatory measures: The applicable provisions of Sections 110.0 through 110.10~~9~~, ~~120.7~~, and 150.0; and ….

3. **Part 6, Section 100.1, p.40**

ASTM C1167 is the American Society for Testing and Materials document entitled "Standard Specification for Clay Roof Tiles," ~~1996~~ 2011 (ASTM C1167-~~96~~11).

4. **Part 6, Section 100.1, p.41**

Staff inadvertently did not add the following definition. This document was used in the development of the Building Energy Efficiency Standards and is referred to in the documents relied upon.
ASTM C1492, the American Society for Testing and Materials document entitled "Standard Specification for Concrete Roof Tile," 2009 (ASTM C1492-03(2009)).

5. **Part 6, Section 100.1- DEFINITIONS, p. 43**

The inserted text adds clarity to the definition that was requested by commenters on the 45-Day Language, and makes this definition consistent with that of PROCESS BOILER which also states a value for Btu/h. (see pg. 68).

COMMERCIAL BOILER is a type of boiler with a capacity (rated maximum input) of 300,000 Btus per hour (Btu/h) or more and serving a space heating or water heating load in a commercial building.

6. **Part 6, Section 110.2(k), p. 104**

Align with the current federal standards in 10-CFR-430 and 10-CFR-431 incorporating the changes to the Final Rule as codified/notified by Federal Register Vol. 73, No. 145, dated July 28, 2008 for applicable small boilers as specified in Table 110.2-K and electronic version of the CFR 431.87 at eCFR.goaccess.gov.

TABLE 110.2-K Gas- and Oil-Fired Boilers, Minimum Efficiency requirements

Equipment Type	Sub Category	Size Category (Input)	Minimum Efficiency [b,c]	Test Procedure [a]
Boiler, hot water	Gas-Fired	< 300,000 Btu/h	~~80%~~ 82% AFUE	DOE 10 CFR Part 430
		≥ 300,000 Btu/h and ~~<~~≤ 2,500,000 Btu/h [d]	80% E_t	DOE 10 CFR Part 431
		~~≥~~> 2,500,000 Btu/h [e]	82% ~~E_t~~ E_c	
	Oil-Fired	< 300,000 Btu/h	~~80%~~ 84% AFUE	DOE 10 CFR Part 430
		≥ 300,000 Btu/h and ~~<~~≤ 2,500,000 Btu/h [d]	~~80%~~ 82% E_t	DOE 10 CFR Part 431
		~~≥~~> 2,500,000 Btu/h [e]	84% ~~E_t~~ E_c	
Boiler, steam	Gas-Fired	< 300,000 Btu/h	~~75~~ 80% AFUE	DOE 10 CFR Part 430
	Gas-Fired – all, except natural draft	≥ 300,000 Btu/h and ~~<~~≤ 2,500,000 Btu/h [d]	79% E_t	DOE 10 CFR Part 431
		~~≥~~> 2,500,000 Btu/h [e]	79% E_t	DOE 10 CFR Part 431
	Gas-Fired, natural draft	≥ 300,000 Btu/h and ~~<~~≤ 2,500,000 Btu/h [d]	77% E_t	DOE 10 CFR Part 431
		~~≥~~> 2,500,000 Btu/h [e]	77% E_t	DOE 10 CFR Part 431
	Oil-Fired	< 300,000 Btu/h	~~80~~ 82% AFUE	DOE 10 CFR Part 430
		≥ 300,000 Btu/h and ~~<~~≤ 2,500,000 Btu/h [d]	81% E_t	DOE 10 CFR Part 431
		~~≥~~> 2,500,000 Btu/h [e]	81% E_t	DOE 10 CFR Part 431

7. **Part 6, Section 110.3(c)7, p. 111**

This subsection is withdrawn from consideration in its entirety.

~~**7. Showers Heads.**~~

~~A. At least one single shower head must be attached to each shower valveinstalled directly on each pipe that terminates at a shower.. Shower valvesheads must be placed no closer than four feet from each other, as measured directly from one shower headvalve to the next. Shower heads shall conform to applicable requirements in ASME A112.18.1/CSA B125.1 2011 and must have a rated flow rate of no more than 2.0 gallons per minute at 80 psi. When a shower valve supplies more than one shower head, the shower shall be fitted with a valve or diverter that~~

~~limits the maximum flow rate of the shower to 2.0 gallons per minute.Each mixing valve must supply only one shower head. The piping connecting the shower head to the heater or recirculation loop must be no greaterwider than 1/2 inch at any point.~~

~~**EXCEPTION 2 to Section 110.3(c)7A**: Showers that recirculate hot water from the drain to the shower head.~~

8. **Part 6, Section 110.10(a)1, p. 128**

Edit the sentence to use language consistent with the Building Energy Efficiency Standards by inserting "enforcement agency" and deleting "authority having jurisdiction".

(a) ~~**Buildings listed below shall provide for the future installation of a solar electric or solar thermal system**~~**Covered Occupancies.**

1. **Single Family Residences.** Single family residences located in subdivisions with ten or more single family residences and where the application for a tentative subdivision map for the residences has been deemed complete, by the ~~authority having jurisdiction~~enforcement agency, on or after January 1, 2014, shall comply with the requirements of Section 110.10(b) through 110.10(e).

9. **Part 6, Section 110.10(c), p. 131**

Edit the sentences for clarity by deleting "or alternate reserved space". The provision for an alternate reserved space was removed in the 15-Day Language.

(c) **Interconnection Pathways.**

1. The construction documents shall indicate a location for inverters and metering equipment and a pathway for routing of conduit from the solar zone ~~or alternate reserved space~~ to the ~~main~~ point of interconnection with the electrical service ~~panel of the building~~. For single family residences the point of interconnection will be the main service panel.
2. The construction documents shall indicate a pathway for routing of plumbing from the solar zone ~~or alternate reserved space~~ to the ~~building's~~ water-heating system.

10. **Part 6, Section 120.1(c)5, p. 135**

Edits are made to clarify the conditions when a zone damper or a supply fan shall be shut off, making these requirements easier to understand and implement. An exception is added to clarify that occupant sensor ventilation control is not required when demand control ventilation is required, because doing so is redundant.

5.- Occupant Sensor Ventilation Control Devices. When occupancy sensor ventilation devices are required by Section 120.2(e)3 or when meeting EXCEPTION 5 to Section 120.1(c)3, occupant sensors shall be used to reduce the rate of outdoor air flow when occupants are not present in accordance with the following:

A.- Occupant sensors shall meet the requirements in Section 110.9(b)4 and shall have suitable coverage and placement to detect occupants in the entire space ventilated. Occupant sensors controlling lighting may be used for ventilation as long as the ventilation signal is independent of daylighting, manual lighting overrides or manual control of lighting. When a single zone damper or a single zone system serves multiple rooms, there shall be an occupancy sensor in each room and the zone is not considered vacant until all rooms in the zone are vacant.

B.- One hour prior to normal scheduled occupancy, the occupancy sensor ventilation control shall allow pre-occupancy purge as described in Section 120.1(c)2.

C.- Within 30 minutes after being vacant~~ following vacancy in~~for all rooms served by a zone damper on a multiple zone system, and ~~the occupant does not require cooling or heating~~ the space temperature is between the heating and cooling setpoints, then no outside air is required and supply air shall be zero.

D.- Within 30 minutes after being vacant for~~following vacancy in~~ all rooms served by a single zone system, the single zone system shall cycle off the supply fan when the ~~occupant does not require cooling or heating~~ the space temperature is between the heating and cooling setpoints.

E. In spaces equipped with an occupant sensor, when vacant during hours of expected occupancy and the occupied ventilation rate required by Section 120.1(b)2 is not provided, then the system or zone controls shall cycle or Operate to maintain the average outdoor air rate over an averaging period of 120 minutes equal to the following:

i. For spaces with a design occupant density, or a maximum occupant load factor for egress purposes in the CBC, greater than or equal to 25 people per 1000 ft² (40 square foot or less per person); 25~~%~~percent of the rate listed in TABLE 120.1-A.

ii. For spaces with a design occupant density, or a maximum occupant load factor for egress purposes in the CBC, less than 25 people per 1000 ft² (more than 40 square foot per person); 50~~%~~ percent of the rate listed in TABLE 120.1-A.

Exception to 120.1(c)5. If Demand Control Ventilation is implemented as required by Section 120.1(4).

11. **Part 6, Section 120.2(e)3, p. 138**

The square footage specification for multipurpose rooms is correcting an obvious typographical error from 100 ft^2 to 1000 ft^2.

3. Multipurpose room less than ~~100~~ 1000ft^2, c~~C~~lassrooms greater than 750 ft^2 and conference, convention, auditorium and meeting center rooms greater than 750 ft^2 that do not have processes or operations that generate dusts, fumes, vapors or gasses shall be equipped with occupant sensor(s) to accomplish the following during unoccupied periods:

   A. Automatically setup the operating cooling temperature set point by 2°F or more and setback the operating heating temperature set point by 2°F or more; and
   B. Automatically reset the minimum required ventilation rate with an occupant sensor ventilation control device according to Section 120.1(c)5.

12. **Part 6, Section 120.2(i)5, p. 139-140**

For the 15-Day Language, these requirements were moved from NA9 to Section 120.2. The language was incorrectly copied during the transfer of the text.

5. The controller shall provide system status by indicating the following conditions:

~~A. Air temperature sensor failure/fault~~
~~B. Not economizing when it should~~
~~C. Economizing when it should not~~
~~D. Damper not modulating~~
~~E. Excess outdoor air~~

A. Free cooling available
B. Economizer enabled
C. Compressor enabled
D. Heating enabled
E. Mixed air low limit cycle active

13. **Part 6, Section 120.6(c)5, p. 152**

The deletion of "is scheduled to be" is a mistake. This edit was made under the assumption that it adds clarity and is being withdrawn. This requirement is deliberately written to mean that there is a minimum ventilation requirement in enclosed parking garages during each period of time that the garage is expected to be occupied. The restored language is:

5. The ventilation rate shall be at least 0.15 cfm/ft² when the garage is ~~scheduled to be~~ scheduled to be occupied.

14. **Part 6, Section 120.6(e), p. 153-154**

This section of 15-Day Language has been formatted incorrectly so that the requirements proposed in 45-Day Language have been misplaced. The result of this mis-formatting is that it creates an unintended mandatory requirement for variable speed compressors that was never intended in the 45-Day Language. The criterion for one or more variable speed compressors is one of two options available under the trim compressor and storage subsection of Section 120.6(e).

There are also two mistakes in the 15-Day Language in subsection 1, where (1) some of the requirements of 120.6(e)1B were also included in 120.6(e)1A, and (2) the extraneous words "total capacity" make the requirement to satisfy the first Exception to Section 120.6(e)1 unintelligible.

All new compressed air systems, and all additions or alterations of compressed air systems where the total combined online horsepower (hp) of the compressor(s) is 25 horsepower or more, shall meet the requirements of Subsections 1 through 3. These requirements apply to the compressors and related controls that provide compressed air and do not apply to any equipment or controls that use or process the compressed air.

EXCEPTION to Section 120.6(e): Alterations of existing compressed air systems that include one or more centrifugal compressors.

1. Trim Compressor and Storage. The compressed air system shall be equipped with an appropriately sized trim compressor and primary storage to provide acceptable performance across the range of the system and to avoid control gaps. The compressed air system shall comply with subsection A. or B below

~~The compressed air system shall include one or more variable speed drive (VSD) compressors. For systems with more than one compressor, the total combined capacity of the VSD compressor(s) acting as trim compressors must be at least 1.25 times the largest net capacity increment between combinations of compressors. The compressed air system shall include primary storage of at least one gallon per actual cubic feet per minute (acfm) of the largest trim compressor; or, i. The compressed air system shall be equipped with an appropriate sized trim compresser and primary storage to provide acceptable performance across the range of the system and to avoid control gaps.~~

A. ~~ii.~~ The compressed air system shall include one or more variable speed drive (VSD) compressors. For systems with more than one compressor, the total

combined capacity of the VSD compressor(s) acting as trim compressors must be at least 1.25 times the largest net capacity increment between combinations of compressors. The compressed air system shall include primary storage of at least one gallon per actual cubic feet per minute (acfm) of the largest trim compressor; or, ~~Compressed air systems with more than one compressor online shall include a compressor or set of compressors with total effective trim capacity at least the size of the largest net capacity increment between combinations of compressors.~~

~~A.~~B. The compressed air system shall include a compressor or set of compressors with total effective trim capacity at least the size of the largest net capacity increment between combinations of compressors, or the size of the smallest compressor, whichever is larger. The total effective trim capacity of single compressor systems shall cover at least the range from 70 percent to 100 percent of rated capacity. The effective trim capacity of a compressor is the size of the continuous operational range where the specific power of the compressor (kW/100 acfm) is within 15 percent of the specific power at its most efficient operating point. The total effective trim capacity of the system is the sum of the effective trim capacity of the trim compressors. The system shall include primary storage of at least 2 gallons per acfm of the largest trim compressor.

EXCEPTION 1 to Section 120.6(~~c~~e)1: Compressed air systems in existing facilities that are ~~a~~adding~~ltering~~ or replacing less than 50~~%~~ percent of the ~~total capacity~~ online capacity of the system.

15. **Part 6, Section 120.7(b), p.155**

The U-factor in TABLE 140.3-C is inconsistent with the narrative in Section 120.7(b)2.

2. **Metal Framed-** The weighted average U-factor of the wall assembly shall not exceed ~~0.098.~~ 0.105.

16. **Part 6, Section 120.7(b)6, p.155**

To make the language consistent with the Table 4.3.8 in Reference Joint Appendix JA-4

6. ~~Glass~~ **Spandrel Panels and Glass Curtain Wall**- The weighted average U-factor of the Glass spandrel panels and glass curtain wall assembly shall not exceed 0.280.~~.~~

17. **Part 6, Section 120.9, p. 158**

The inserted text adds clarity to the definition that was requested by commenters on the 45- Day Language, and makes this definition consistent with that of PROCESS BOILER (see pg. 68).

(a) Combustion air positive shut-off shall be provided on all newly installed boilers as follows:

1. All boilers with an input capacity of 2.5 MMBtu/h (2,500,000 Btu/h) and above, in which the boiler is designed to operate with a non-positive vent static pressure ~~for negative or zero pressure operation~~.

(c) Newly installed boilers with an input capacity of 5 MMBtu/h (5,000,000 Btu/h) and greater shall maintain excess (stack-gas) oxygen concentrations at less than or equal to 5.0~~%~~ percent by volume on a dry basis over firing rates of 20 percent to 100 percent ~~the entire firing range~~. Combustion air volume shall be controlled with respect to firing rate or flue gas oxygen concentration. Use of a common gas and combustion air control linkage or jack shaft is prohibited.

18. **Part 6, Section 140.3(a)5B, p.193**

Automatic controls was moved from Item (IV) "original language" to Item (I) under the same exception to improve language flow and eliminate confusion.

B. Have an area-weighted average ~~a~~ U-factor no greater than the applicable value in TABLE 140.3--B, C, or D.~~, or~~

EXCEPTION to Section 140.3(a)5B: For vertical fenestration containing chromogenic type glazing:

(I) the lower-rate labeled U-factor shall be used ~~to~~ with automatic controls to modulate the amount of U-factor heat flow into the space in multiple steps in response to solar intensity to demonstrate compliance with this section;
(II) ~~C~~chromogenic glazing shall be considered separately from other fenestration; and
(III) area-weighted averaging with other fenestration that is not chromogenic shall not be permitted.
~~(IV) Cchromogenic glazing shall be automatically controlled to modulate the amount of U-factor into the space in multiple steps in response to daylight levels or solar intensity.~~

C. Have an area-weighted average -Relative Solar Heat Gain ~~,~~Coefficient, RSHGC, excluding the effects of interior shading, no greater than the applicable value in Table 140.3 B, C or D.

19. **Part 6, Section 140.3(a)5C, p.193**

Automatic controls was moved from Item (IV) "original language" to Item (I) under the same exception to improve language flow and eliminate confusion.

EXCEPTION 2 to Section 140.3(a)5C: For vertical fenestration containing chromogenic type glazing:

(I) the lower-rate labeled RSHGC shall be used ~~to~~ with automatic controls to modulate the amount of heat flow into the space in multiple steps in response to solar intensity to demonstrate compliance with this section;
(II) Chromogenic glazing shall be considered separately from other fenestration; and
(III) area-weighted averaging with other fenestration that is not chromogenic shall not be permitted.
~~(IV) chromogenic glazing shall be automatically controlled to modulate the amount of solar heat gain into the space in multiple steps in response to solar intensity.~~

~~For Fenestration containing dynamic glazing, the lowest-rated labeled SGHC shall be used to demonstrate compliance with this section. Dynamic glazing shall be considered separately from other fenestration and area-weighted averaging with other fenestration that is not dynamic shall not be permitted.~~

20. **Part 6, Section 140.3(a)5D, p.194**

Automatic controls was moved from Item (IV) "original language" to Item (I) under the same exception to improve language flow and eliminate confusion.

EXCEPTION 3 to Section 140.3(a)5D: ~~When the~~ For vertical fenestration containing chromogenic type glazing:

(I) the higher-rate labeled VT shall be used ~~to~~with automatic controls to modulate the amount of light transmitted into the space in multiple steps in response to solar intensity to demonstrate compliance with this section;
(II) ~~C~~chromogenic glazing shall be considered separately from other fenestration; and
(III) area-weighted averaging with other fenestration that is not chromogenic shall not be permitted.
~~(IV) Cchromogenic glazing shall be automatically controlled to modulate the amount of light transmitted into the space in multiple steps in response to daylight levels or solar intensity.~~

~~For fenestration containing dynamic glazing, the highest-rated labeled VT listed on the fenestration's label (pursuant to Section __) VT shall be used to demonstrateassess compliance with this section . Dynamic glazing shall be considered separately from~~

~~other fenestration and area-weighted averaging with other fenestration that is not dynamic shall not be permitted.~~

21. **Part 6 Section 140.3(a)6C, p. 195**

The words higher for SHGC and lower for VT were unintentionally reversed. Correcting the words makes the language consistent with the chromogenic type glazing in Sections 140.3(a)5B, 140.3(a)5C, and 140.3(a)5D.

EXCEPTION to Section 140.3(a)6C: For skylights containing chromogenic type glazing: (I) the ~~higher-~~lower-rated labeled SHGC shall be used to demonstrate compliance with this section; (II) chromogenic glazing shall be considered separately from other skylights; and (III) area-weighted averaging with other skylights that is not chromogenic shall not be permitted.

22. **Part 6 Section 140.3(a)6D, p. 196**

The words higher for SHGC and lower for VT were unintentionally reversed. Correcting the words makes the language consistent with the chromogenic type glazing in Sections 140.3(a)5B, 140.3(a)5C, and 140.3(a)5D.

EXCEPTION to Section 140.3(a)6D: For skylights containing chromogenic type glazing: (I) the ~~lower~~ higher-rated labeled VT shall be used to demonstrate compliance with this section; (II) chromogenic glazing shall be considered separately from other skylights; and (III) area-weighted averaging with other skylights that are ~~is~~ not chromogenic shall not be permitted.

23. **Part 6, Section 140.3(a)8 Table 140.3-D , p. 207**

Reformatted table for clarity. Consolidated the RSHG to 0.26 rows for all Window Wall Ratios to one row and remove the % values WWR. The RSHGC of 0.26 is the same for all WWR percentages and therefore redundant.

~~Windows~~ Windows of all buildings ~~Relative Ssolar H heat gGain~~	
U-factor	Maximum U-factor 0.47
RSHGC	Maximum RSHGC 0.26
~~0-10% WWR~~	~~Maximum RSHGC Relative Solar Heat gain 0.2636~~
~~11-20% WWR~~	~~Maximum RSHGC Relative Solar Heat gain 0.2631~~
~~21-30% WWR~~	~~Maximum RSHGC Relative Solar Heat gain 0.26~~
~~31-40% WWR~~	~~Maximum RSHGC 0.26~~

24. **Part 6, Section 140.4(e)4D, p. 217**

The correct specification for a "fixed enthalpy + fixed dry-bulb" high-limit economizer control device was incorrectly described as a "fixed enthalpy" control device. Fixed enthalpy control devices are no longer allowed as an acceptable high-limit control device. This correction to the 15-Day Language will make Section 140.4(e)4D consistent with Table 140.4B:

~~E~~D. **Adjustable setpoint**. If the high-limit control is fixed dry-bulb~~,~~ or fixed enthalpy + fixed dry-bulb ~~it~~ then the control shall have an adjustable setpoint.

25. **Part 6, Section 141.0, TABLE 141.0-B, p. 266**

Edits made to Table 141.0-B, Roof/Ceiling Insulation Tradeoff for Aged Solar Reflectance, to clarify and simplify its use. Specifications provided in Table 141.0-B are now consistent with the specifications of roof and ceiling insulation in Table 141.0-C, which sets requirements based on climate zones and not building frame types. These modifications do not change the stringency of the Standards.

The energy benefits associated with cool roofs are specified in provisions for the aged solar reflectance of roofing products in the Building Energy Efficiency Standards (Standards). The aged solar reflectance values for low-sloped roofs in new nonresidential buildings are specified in Section 140.3 and are specified for alterations made to existing nonresidential buildings in Section 141.0. To help the roofing industry with flexible ways of meeting these requirements Energy Commission staff included an insulation tradeoff tables (i.e., Table 140.3 and Table 141.0-B) in the proposed 45-Day Language. Each table allows increasing R-values of above deck insulation to be used in lieu of lower aged solar reflectance values.

Modifications were made to these tables for the 15-Day Language that responded to further recommendations by the roofing industry allowing tradeoffs for insulation installed below the roof deck as opposed to solely insulation above the roof deck with lower aged solar reflectances. This tradeoff was accomplished by revising Table 141.0-B in the 15-Day Language to specify roof assembly U-factors as opposed to R-value of above deck insulation. U-factor represents thermal resistance of the entire assembly while R-value only applies to the insulation material within an assembly. The energy equivalent U-factor replaced the prior energy measure expressed as an R-value.

As an example, the 45-Day Language specified an R-value and the location of where the insulation would be placed. However, specifying a U-factor in 15-Day Language allows insulation material to be installed anywhere within the assembly provided the required U-factor is not exceeded. The substantive obligation to meet the specified energy requirement did not change from 45-Day Language to 15-Day Language, rather the manner in which this energy requirement was expressed for building design purposes.

This provides greater flexibility for the roofing industry to comply with the Standards. Table 141.0-B in the15-Day Language includes columns based on two different frame types: metal and wood. U-factor specifications in each column differ by climate zone. U-factor specifications for climate zones 2 and 10-16 for metal and wood frame are identical; whereas the U-factor specifications for climate zones 1 and 3-9 for metal and wood frame have minor differences that result in insignificant overall energy use for the building. The inconsequential differences by frame types allows the removal of the frame type distinction while maintaining a single set of roof/ceiling U-factor tradeoff requirements for lower specified aged solar reflectances. This helps to increase clarity and facilitate use of Table 141.0-B, and does not alter the energy impact of the proposed requirement.

The energy savings resulting from the proposed requirements of this table did not change between those originally prescribed in proposed revisions for the 45-Day Language and the 15-Day Language. The 15-Day Language proposed revisions based on U-factor and the proposed nonsubstantive errata capture the same energy savings as the proposed 45-Day Language. The 15-Day Language proposed revisions for this table result in greater flexibility for the roofing installer to meet the intent of the aged solar reflectance requirement—insulation can be installed above, below or any given combination of above and below roof deck so long as the required maximum specified U-factor is met for the specified solar reflectance.

Staff is proposing further clarification to Table 141.0-B to simplify its use without compromising the estimated energy savings that would accrue for these requirements. Specifications provided in Table 141.0-B are based on a complementary table for specifications of roof and ceiling insulation in Table 141.0-C. To improve consistency between the formats of each table staff is proposing as a non-substantive errata to eliminate building frame type as a category in Table 141.0-B. No wording in the body of the proposed language of Section 141.0 would be changed and the proposed nonsubstantive errata would not result in any change to the intent or stringency of measures required between the proposed requirements of the 45-Day and 15-Day Language.

Table 141.0-B Roof/Ceiling Insulation Tradeoff for Aged Solar Reflectance

Nonresidential				
Aged Solar Reflectance	~~Metal Building~~ Climate Zone 1, 3-9 U-factor	~~Metal Building~~ Climate Zone 2, 10-16 U-factor	~~Wood Framed and Other Climate Zone 1, 3-9 U-factor~~	~~Wood Framed and Other Climate Zone 2, 10-16 U-factor~~
0.62- 0.60	0.075	0.052	~~0.069~~	~~0.052~~
0.59-0.55	0.066	0.048	~~0.062~~	~~0.048~~
0.54-0.50	0.060	0.044	~~0.056~~	~~0.044~~
0.49-0.45	0.055	0.041	~~0.051~~	~~0.041~~
0.44-0.40	0.051	0.039	~~0.048~~	~~0.039~~
0.39-0.35	0.047	0.037	~~0.044~~	~~0.037~~
0.34-0.30	0.044	0.035	~~0.042~~	~~0.035~~
0.29-0.25	0.042	0.034	~~0.039~~	~~0.034~~

26. **Part 6, Section 141(b)2B iii, Table 141.0-C and Table 4.2.2, p. 268**

The U-factor value in Table 141.0-C has been changed to be consistent with the U-factor value in Reference Joint Appendix Table 4.2.2

TABLE 141.0-C~~B~~ INSULATION REQUIREMENTS FOR ROOF ALTERATIONS

	Nonresidential		High-R~~r~~ise Residential and Guest Rooms of Hotel/Motel Buildings	
Climate Zone	Continuous Insulation R-value	U-factor	Continuous Insulation R-value	U-factor
1	R-8	~~0.081~~ 0.082	R-14	0.055
2	R-14	0.055	R-14	0.055
3-9	R-8	~~0.081~~ 0.082	R-14	0.055
10-16	R-14	0.055	R-14	0.055

27. **Part 6, Section 141.0(b)3B, p. 277**

Added "the" to match the language in 150.2(b)2B:

> B. ~~When the altered components do not meet the requirements specified in the sections that are stated in subsections i through viii, the standard energy budget (energy budget) shall be based on the requirements stated in those sections as follows:~~ The standard design for an altered component shall be the higher efficiency of existing conditions or the requirements stated in ~~Table~~ TABLE 141.0-~~C~~D. For components not being altered, the standard design shall be based on the existing conditions. When the third party verification option is specified, all components proposed for alteration must be verified. The Executive Director shall determine the qualifications required by the third party inspector.

28. **Part 6, Section 150.0(j)4, p. 287**

This subsection is withdrawn in its entirety.

~~54. The maximum length per dwelling unit of 1 inch (25 mm) diameter piping in a non-recirculating system providing domestic hot waterdomestic hot water distribution system shall be limited to a total length of 15 feet (4.5 m).~~
~~**EXCEPTION 1 to Section 150150.0(j)54:** A dedicated 1 inch (25 mm) diameter line feeding a high flow tub fixture (or tub fixtures) can be installed provided all other fixtures meet the requirement of 150150.0(j)54.~~

29. **Part 6, Section 150.1(b)1, p. 303**

Edit corrects an error in that lighting is a mandatory measure and has never been included in the energy budget calculation.

> 1. **Energy Budget for the *Standard Design Building***. The energy budget for a Standard Design Building is determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, ~~lighting,~~ mechanical ventilation and water heating.

30. **Part 6, Section 150.1(c)3A, p. 307**

Automatic controls was moved from Item (IV) "original language" to Item (I) under the same exception to improve language flow and eliminate confusion. Corrected SHGC acronym.

EXCEPTION 3 to Section 150.1(c)3A~~:~~ For fenestration containing chromogenic type glazing:

(I) the lower-rated labeled U-factor and SHGC~~SGHC~~ shall be used ~~to~~with automatic controls to modulate the amount of heat flow into the space in multiple steps in response to solar intensity to demonstrate compliance with this section;

(II) Chromogenic glazing shall be considered separately from other fenestration; and

(II) area-weighted averaging with other fenestration that is not chromatic shall not be permitted and shall be determined in accordance with Section 110.6(a).

~~(IV) Chromogenic glazing shall be automatically controlled to modulate the amount of solar gain and light transmitted into the space in multiple steps in response to daylight levels or solar intensity.~~

~~For Fenestration containing dynamic glazing, the lowest-rated labeled U-factor and SGHC~~
~~shall be used to demonstrate compliance with this section. Dynamic glazing shall be considered separately from other fenestration and area-weighted averaging with other fenestration that is not dynamic shall not be permitted and shall be determined in accordance with Section 110.6(a).~~

31. **Part 6, EXCEPTION to Section 150.2(b), p. 330**

This exception is deleted due to the withdrawal of Section 110.3(c)7.

~~**EXCEPTION to Section 150.2(b):** Showers do not need to meet Section 110.3(c)7.~~

32. **Part 6, Section 150.2(b)1B, p. 331**
Removed "in the same orientation and tilt" because it is redundant with "existing wall or roof". The existing language "existing wall or roof" covers all orientations and tilts.

C. **Replacement Fenestration~~:~~.** Replacement of fenestration, where existing fenestration area in an existing wall or roof is replaced with a new manufactured fenestration product ~~in the same orientation, tilt~~ and up to the total fenestration area removed in the existing wall or roof, the replaced fenestration shall meet the U-factor and Solar Heat Gain Coefficient requirements of Sections 150.1(c)3A, 150.1(c)4, and TABLE 150.1-A.

33. **Part 6, EXCEPTION to Section 150.2(b)1, p. 336**

This exception is deleted due to the withdrawal of Section 110.3(c)7.

~~**EXCEPTION to Section 150.2(b)1 Shower Heads:** Alterations in which the hot water supply piping between the water heater (or recirculation loop) and the bathroom is not moved or replaced.~~

34. **Part 6, EXCEPTION to Section 150.2(b)2A, p. 336**

This exception is deleted due to the withdrawal of Section 110.3(c)7.

~~**EXCEPTION to Section 150.2(b)2A Shower Heads:** Alterations in which the hot water supply piping between the water heater (or recirculation loop) and the bathroom is not moved or replaced.~~

35. **Part 6, Joint Appendix, JA1, p. 1-7**

ASTM C1167 is the American Society for Testing and Materials document entitled "Standard Specification for Clay Roof Tiles," ~~1996~~ 2011 (ASTM C1167-~~96~~11).

36. **Part 6, Joint Appendix, JA1, p. 1-7**

Missing reference added

ASTM C1492 is the American Society for Testing and Materials document entitled "Standard Specification for Concrete Roof Tile," 2009 (ASTM C1492-03(2009))

37. **Part 6, Residential Appendix, RA3.5.6, p. 3-49**

Change a typographical error in the thickness for closed cell spray foam to 2 inches from 1.5 inches to be consistent with the Joint Appendix JA-4 and the body of this document.

-- Closed cell spray polyurethane foam with a minimum density of 2.0 pcf and a minimum thickness of ~~1½ inches~~ 2 inches.

38. **Part 6, Residential Appendix, RA3.5.6, p. 3-71 to 3-78**

Section titles were inadvertently struck out for the following Section Numbers (Pages RA3-71 through RA3-78):

Page 3-71 RA3.5.6.1.1 oc SPF
Page 3-75 RA3.5.6.2.1 Narrow Framed Cavities

Page 3-75 RA3.5.6.2.3 Special Situations--Obstructions
Page 3-76 RA3.5.6.2.4 Special Situations--Rim Joists
Page 3-77 RA3.5.6.2.7 Special Situations--Double Walls and Framed Bump-Outs
Page 3-77 RA3.5.6.2.8 Special Situations--Structural Bracing, Tie Downs, Steel Structural Framing
Page 3-78 RA3.5.6.3.1 Special Situations--Enclosed Rafter Ceilings
Page 3-78 RA3.5.6.3.2 Special Situations--Attics and Cathedral Ceilings
Page 3-78 RA3.5.6.3.3 Special Situations--HVAC Platform
Page 3-78 RA3.5.6.3.4 Special Situations--Attic Access

39. **Part 6, Residential Appendix, RA3.5.6.1.3, p. 3-74**

Remove item 16 as it is a duplicate and renumber 17 to 16

~~16. All recessed light fixtures that penetrate the ceiling shall be listed for zero clearance insulation contact (IC), have a label that certifies it as airtight with leakage less than 2.0 cfm @ 75 Pa when tested to ASTM E283, and shall be sealed with a gasket or caulk between the light's housing and the ceiling.~~
~~17~~16……

40. **Part 6, Residential Appendix, RA4.4.21, p. 4-23**

Edited to be consistent with the Building Energy Efficiency Standards by inserting "shall" and deleting "must".

1. The collectors ~~must~~shall face within 35 degrees of south and be tilted at a slope of at least 3:12. ~~The system shall be SRCC certified.~~

41. **Part 6, Nonresidential Appendices NA6, p. 6-2**

The following sentence was deleted because it is redundant.

~~The default U-factor shall be determined using the following equation.~~

42. **Part 11 Energy Efficiency Divisions of the Voluntary Measure Appendices A4.2 and A5.2**

The Energy Efficiency Divisions of the Voluntary Measure Appendices A4.2 and A5.2 are withdrawn in their entirety.