

EXHIBIT A
RESPONSE TO COMMENTS FROM 2008 STDS COMMITTEE HEARING ON DEC 17, 2007 SUBSEQUENT WRITTEN AND ORAL COMMENTS, AND APRIL 23, 2008 ADOPTION HEARING

Section / Commenter	Summary of Comment	Response and Action
GENERAL COMMENTS		
General comments / Jay Salazar CALBO	<ol style="list-style-type: none"> 1. Building officials need to be equal partners with staff. 2. They need until July to give adequate feedback. 3. The standards must be simplified at inspection 	<ol style="list-style-type: none"> 1. No Change: Staff is actively working with CALBO related to standards implementation. This comment is not related to this rulemaking. 2. Amended: Staff has worked with CALBO to identify specific proposals they suggest for consideration in the 15 day language. Many of their suggestions have been amended in to the 15-day language. 3. No Change: CALBO is plugged into the working group that is overseeing the development of the forms and the compliance manuals. The working group is considering the CALBO comments related to the development of the forms and the compliance manuals.
General Comments / CALBO In written comments on January 31, 2008	Searchable/downloadable/hyperlinked Web version of the manuals (with optional CD version) must be developed to help construction and enforcement personnel find specific energy standard provisions.	No Change: This comment is related to the Compliance manuals which are not part of this rulemaking.
General Comments / CALBO In written comments on January 31, 2008	In general an effort must be made to simplify the standards. Wherever possible contractors, developers, and installers should be provided with a “cookbook” method for energy standard compliance.	No Change: This is general commentary and not related to this rulemaking.

Section / Commenter	Summary of Comment	Response and Action
General Comments / Tom Garcia	<ol style="list-style-type: none"> 1. CEC should collect and maintain the material rather than the BDs. 2. Do away with the acceptance requirements and put the burden on the installing contractors. 3. You need a Readers Digest version of the standards that simplifies things. 4. Don't require mechanical ventilation without telling us how to do this. 62.2 requirements are not clear. 	<ol style="list-style-type: none"> 1. Amended: This proposal has been changed the building departments are no longer required to maintain these records. The HERS provides will retain these records. 2. No Change: We disagree with this comment. Staff believes acceptance requirements are important. We would welcome specific suggestions on how to improve the acceptance requirements, but we do not support getting rid of them. We will work on acceptance requirements and installation certificates as part of the compliance manual updates. 3. No Change: Staff plans to work with the Building Officials to identify information that would be useful to clarify particular part of the standards that are difficult for Building Officials to deal with. 4- No Change: Staff and consultants will make sure that these requirements will be described in detail in the residential compliance manual. This is not part of this rulemaking.
General Comments / Splitt on 4/23/2008	It is not possible to ascertain the cost effectiveness of measures in the Standards because the Compliance Manuals and the Forms are prepared after adoption of the Standards	No Change: The Compliance Manuals only provide clarification and explanation for the Standards requirements; they do not impose new requirements. The core requirements are in the Standards and other related documents adopted with the Standards. Each measure considered for the Standards must demonstrate cost effectiveness which is a part measure template that is prepared by the proponents of the measure. These documents are all part of the "Documents Relied Upon"

Section / Commenter	Summary of Comment	Response and Action
General Standards Comments / Mike Gabel	<p>1- CABEC supports Standards</p> <p>2- Need extreme makeover of the compliance manuals</p> <p>3- Need extreme makeover of the implementation and enforcement of the standards</p> <p>4- there needs to be a long term plan to meet the AB32 goals</p>	<p>1- Thanks</p> <p>2- No Change: CABEC will be plugged into the compliance manuals update process; however, time and resources are limited and probably will not allow for an extreme makeover of the documents</p> <p>3- No Change: Staff intends to be working more intensely with CALBO, CABEC, and others to improve implementation and enforcement.</p> <p>4- No Change: Staff intends to be developing plans for upgrading the standards in the future to meet AB32 goals</p> <p>Note: these comments are not related to this rulemaking.</p>
General Comments / Splitt	<p>1- Acceptance requirements do not save any energy and should be dropped</p> <p>2- Delay the adoption of the standards to correct problems in the standards</p> <p>3- Compliance manuals do not fix the problems with the standards. I do not believe it is possible to accurately design the compliance forms unless the compliance procedures are defined first.</p> <p>4- The procedures defining how to comply with various requirements in the Energy Code do not yet exist. These procedures will supposedly be included in the Compliance Manuals. If one does not yet know what must be done to comply with the Code, the costs of performing these procedures cannot be determined. If we do not now know all the costs, how can the Life-Cycle Cost Analysis be correct?</p>	<p>1- No Change: Reports from other people who are doing acceptance testing are that even though some building departments do not ask for them, people are filling out the forms and doing the testing properly. Staff does not agree it helps ensure that building efficiency measures are installed properly. The purpose of acceptance is because of liability issues that can arise if they fail to do this and the building does not perform as intended or other problems arise. Staff is also focusing on better implementation of the acceptance requirements.</p> <p>2- No Change: Staff is not sure what can be accomplished in another two months. This process has been underway since July of 2005 and we have made numerous changes and improvements to the standards including active consideration of recommendations by Splitt and CABEC. Staff does not agree that a delay is necessary, as there are no major issues to fix with the standards.</p> <p>3&4- No Change: Compliance manuals are just an aid to provide interpretation and guidance for how to comply with the standards and are not the official energy code. Staff is not sure what Splitt means by his statement because the energy code does not become effective until July 1, 2009.. The compliance manuals will be updated after the adoption of the standards and Splitt and CABEC will be plugged into the process. The comment on cost has been addressed in the above response to Splitt on 4/23/2008.</p>

Section / Commenter	Summary of Comment	Response and Action
General Comments / Jeff Chapman	<p>1- The problem is that homes are finalized without the building departments asking for CF-4Rs.</p> <p>2- The building department staff must be trained/certified.</p> <p>3- There is no consequence if building departments are not enforcing.</p>	<p>1- Amended: Staff agrees the standards were amended to highlight the importance of enforcement agencies requiring CF-4Rs and establishing the responsibility of HERS providers maintaining compliance documents for easy checking in the future. Section 10-103 has been changed substantially to address this concern.</p> <p>2- Amended: Staff agrees and intends to place emphasis on building department training. The CEC has no statutory authority to require building department staff certification. Staff will work to build energy standards training and certification into CALBOs voluntary programs. This is not related to this rulemaking.</p> <p>3- Amended: Staff agrees and the CEC recently received resources for the first time to increase attention on enforcement and will be following up on reports about lack of enforcement by specific BOs. This comment is not related to this rulemaking.</p>
General Comments / Randall Gray, Gray's Air Conditioning, Inc., Written comments on 1/28/2008.	Enforcement is a problem. Lack of enforcement gives dishonest companies an advantage. Don't make new regulations if you cannot enforce them	Amended: Staff agrees and the CEC recently received resources for the first time to increase attention on enforcement and will be following up on reports about lack of enforcement by specific building departments. This comment is not related to this rulemaking.

Section / Commenter	Summary of Comment	Response and Action
General Comments / Splitt	<p>1- Why use HERS rater in nonres, use an air balancer instead</p> <p>2- Installer should do the acceptance requirements. There should be a combined acceptance requirement/installation certificate form</p>	<p>1- No Change: Staff does not agree. The only requirements for HERS rating in nonres is for duct sealing and testing and this is very similar to residential requirements and HERS raters are knowledgeable about this. Staff believes this is the best approach, Furthermore, if an air balancer wants to become certified as HERS rater, they can do the test.</p> <p>2- - No Change: Standards do allow the installer to do the acceptance testing, but it also allows others such as third party or the air balancers to do the testing as well.</p> <p>We do not agree that the acceptance forms can be used as installation certificates as there are other equipment in the building that are not subject to acceptance requirements. Instead, the standards have been amended to include a new one page form called the "Installation Certificate" which can be signed by either on person in charge of the whole project or by different individuals responsible for envelope, mechanical, and lighting equipment. The certification will certify that all equipment installed meet the requirements of MECH-1C, ENV-1C. LTG-1C, OLTG-1C and acceptance requirements. These changes will be part of the forms and compliance manual development and are not part of this rulemaking.</p>

Section / Commenter	Summary of Comment	Response and Action
General Comments / Splitt	<p>1- He agrees with moving requirements for how HERS field verification is conducted from the RACM to Reference Appendices (done to add clarity). However, he argues that the adoption of these requirements in the 1998 RACM was procedurally incorrect and so the CEC's authority to adopt these requirements must be justified in the rulemaking document for this proceeding and to correct this problem the rulemaking must start over.</p> <p>2- He complained that he submitted comments about the implementation of the 2005 standards and he intended that we include the letter in the workshop record at the time. He complained that the letter was posted to the February 2007 workshop rather than June 2007 workshop.</p> <p>3- If the CEC wishes to produce an enforceable HERS verification system, they must start over from scratch in the 2008 Adoption Proceedings with a completely new Rulemaking. The CEC has clearly not done this since HERS requirements are not mentioned in the ISR, for instance. The current HERS rules in the ACM Manuals are not proper Regulations and are totally unenforceable. They were first surreptitiously inserted into the ACM Manuals in 1998. The Summary of ACM Changes listed in the Overview of the 1998 Residential ACM Manual did not mention HERS in any way. They were buried in the midst of instructions for program vendors. I believe they were deliberately placed there to avoid public scrutiny.</p> <p>4) The City of Santa Cruz is adopting an ordinance to mandate compliance with quality insulation installation (QII). If quality insulation procedures have been shown to be a cost effective conservation feature, why are they not mandatory for all envelope insulation?</p>	<p>1- - No Change: There was nothing procedurally wrong with the 1998 inclusion of HERS verification procedures in the RACM. Staff has discussed this matter with our attorneys and their opinion is that was nothing wrong with the 1998 RACM. These are comments on events that happened a decade ago and are not related to this rulemaking.</p> <p>2- - No Change: Splitt submitted his comments related to the February workshop; however, his letter contained inflammatory statements and accusations that were not suitable for posting. Staff asked Splitt if he wanted to resubmit the letter with the inflammatory language removed, and after he did so, then we posted the document to the February workshop. Staff did not know that Splitt found this to be unsatisfactory until the 12/17/2007 Committee hearing. Staff will also add this letter to the rulemaking record.</p> <p>3- - No Change: Staff disagrees. There was nothing procedurally wrong with the 1998 inclusion of HERS verification procedures in the RACM. Staff has discussed this matter with our attorneys and their opinion is that was nothing wrong with the 1998 RACM. The ACM manuals are adopted with the Standards and are considered as part of the Standards.</p> <p>These are comments on events that happened a decade ago and are not related to this rulemaking.</p> <p>4 - No Change: QII is a compliance option and have not been shown to be cost effective in all situations. Mandatory measure on the other hands must be cost effective in all climate zones. This has not been demonstrated for QII.</p>
General Comments / Mike Bachand	<p>In response to a comment by Pat Splitt, Mr. Bachand said that the development of the HERS verification to support the standards has been successful and should not be weakened. (This was a response to Splitt's #1 comment above)</p>	<p>Staff agrees with the comment.</p>

Section / Commenter	Summary of Comment	Response and Action
General Comments / Hodgson	<p>1- He thought the 2008 standards was very organized process with a lot of dialogue between staff and all stakeholders. And, he thinks these standards are good for California's future and therefore CBIA would support their adoption.</p> <p>2- The largest concern is the enforcement of the standards. He thinks this is poor for three reasons, complexity, the construction process, and the rapid updates of the building standards. He recommends working with CALBO to create an enforcement team at the Commission and focus on training, and identify ways to make standards simpler.</p> <p>3- He thinks the Commission should be focusing on the retrofit market by finishing the HERS rulemaking and pursuing HERS at time of sale including possible legislation to require improvements at the time of sale.</p>	<p>1- Thanks Mike</p> <p>2- Amended: Staff agrees and will pursue all of the ideas/actions that Hodgson is recommending outside the rulemaking.</p> <p>3- No Change: Staff is working to conduct the HERS proceeding in 2008. The Chairman pointed out that the IEPR recommended legislation to pursue HERS and energy efficiency improvements at time of sale. These are good ideas but are outside this rulemaking.</p>
General Comments / Bob Raymer	<p>1- Green building standards are becoming increasingly important and verification such as we have through HERS will be key.</p> <p>2- He understands that a bill will be introduced to require energy audits at the time of sale.</p>	<p>1- Amended: Staff agrees with the comment; however, this is outside this rulemaking.</p> <p>2 - Amended: Staff agrees with the comment; however, this is outside this rulemaking.</p>
General Comments / Michael Taylor	<p>1- The Commission should have better training and education of public officials</p> <p>2- The Commission should establish a central compliance program (an enforcement unit within the Commission).</p> <p>3- The Commission should regulate demand response and energy consumption at the utility level rather the end use level.</p>	<p>1- No Change: Staff is planning to do this; however, this is outside this rulemaking.</p> <p>2- No Change: Staff is planning to do this; however, this is outside this rulemaking.</p> <p>3- No Change: The state is actively regulating the IOUs to achieve greater DR and energy efficiency. We have to make improvements both at the utility and end use levels; however, this is outside this rulemaking.</p>
General / Splitt written comments from April 2007	<p>There is no compliance statement for the documentation author to sign on any of the residential forms. There is a place on the CF-1R form for the documentation author to sign. However, this signature is meaningless since it does not indicate that the compliance documentation is accurate and complete.</p>	<p>No Change: This comment is related to the compliance manuals and not this rulemaking. Staff recommends adding independent signature block for documentation author to forms as part of the Compliance Manual development.</p>

Section / Commenter	Summary of Comment	Response and Action
General / Splitt written comments from April 2007	The nonresidential requirement that record drawings are to be provided to the building owner seems to be universally ignored. There is no way for the building official to confirm this but, one could require that a note stating this requirement be included on the cover page of the plans.	<p>Amended: Staff agrees and amended the standards to require that a note stating this requirement be included on the cover page of the plans. Additional minor revisions were made to 10-103 to emphasize that the requirement be stated in a note on the plans. revised text:from10-103(a)2B: Plans and specifications for Nonresidential buildings, High-rise Residential buildings and Hotels and Motels shall require[, and indicate with a prominent note on the plans,]that within 90 days after the Enforcement Agency issues a permanent final occupancy permit, record drawings be provided to the building owner. If any characteristic is materially changed before final construction and installation, such that the building may no longer comply with Part 6, the building must be brought back into compliance, and so indicated on amended plans, specifications, and Certificate(s) of Compliance, and the amended documents shall be submitted to the enforcement agency.</p> <p>Staff will also require on the installation certificate a verification that the plans used for installation are consistent with the cert of compliance. This will be included in the RA2 and NA1 language, and 10-103(a)3A requires the installer to make this verification and certify this conformance. Added sentence fragment to emphasize the requirement be stated in a note on the plans and 10-103 requires installer confirmation.</p>
General / Splitt written comments from April 2007	The Installation Certificates (not some mandatory measures checklist) are required to be signed by the builder or installer, not the designer. It is unfortunately, impossible for an installer to comply with these requirements since the residential forms are incomplete (missing mandatory features etc.) and the non-residential forms do not exist!	No Change: Agreed regarding residential. We are going to create a non-residential installation certificate that is not part of this rulemaking. We need to make a form for envelope and have it for mechanical. These are not standards issues and are being dealt with here; however, staff will cooperate with CABEC and CALBO by updating the forms.

Section / Commenter	Summary of Comment	Response and Action
<p>General / Splitt written comments from April 2007</p>	<p>The Business and Professions Code is completely silent with regards to who may or may not sign acceptance documents developed by the California Energy Commission. Since no one is prohibited from signing these documents, anyone is allowed to sign them. It is also not clear who selects the person who performs the acceptance tests. But since the Applicant (does this mean the Permit Applicant?) is the one required to file these forms, it would seem that this Applicant should either do the work or be the one who designates the acceptance person.</p>	<p>No Change: Staff does not agree with this comment. As Stated in NA-7, and Standards Section 10-103 (a)(3)(B): “The installing contractor, engineer of record or owners agent shall be responsible for documenting the results of the acceptance requirement procedures on the acceptance test forms and indicate satisfactory completion by signing the Certificate of Acceptance.”</p> <p>Persons signing for nonresidential buildings have to have a license. We consider acceptance documents to verify installation. “Applicant” equals “Permit Applicant.” The person signing the acceptance certificate shall be the same person doing the acceptance testing or the person responsible for designating the person who is doing the acceptance testing. The person who can sign the acceptance certificates shall have the same qualifications as a person who is allowed to design or install the same kind of equipment.</p> <p>Also the business and professions code comment resolution for certificate of compliance above. The certification statement on the new nonres installation certificate and cert of acceptance now reads: [certificate shall:]Be signed by the individual eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or their authorized representative. This comment is not related to this rulemaking.</p>

Section / Commenter	Summary of Comment	Response and Action
General / Splitt written comments from April 2007	Note that the 3 requirements listed above that are required to be attested to on the Acceptance Forms and verified by the building official prior to issuance of the final occupancy permit, do not exist on the acceptance forms. The only places these statements can be found are in the LTG-1-C and MECH-1-C Certificates of Compliance! How can the designer, when applying for a building permit, know if the Installation Certificates are correct (one could however, state that the Certificates are not incorrect, since they do not exist) or if the builder will give the owner the correct information at building occupancy? Also, which acceptance person confirms that Installation certificates, for items such as envelope mandatory features, are posted?	<p>Amended: Staff agrees and has revised cert of acceptance language in 10-103 to address this comment.</p> <p>Regarding first two sentences, staff added these three statements on the acceptance forms. Installation certificates relevant to the acceptance requirements should be posted. Also change code language in 2008. 10-103.</p> <p>Also, the response to Splitt comment regarding business and professions code and the resolution for certificate of compliance above. The certification statement on the new nonres installation certificate and cert of acceptance now reads: [certificate shall:]Be signed by the individual eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or their authorized representative.</p> <p>The amended certification statement for the certificate of Acceptance requires confirmation that the installation certificates have been posted, and such posting is required for passing the acceptance criteria; new cert language: [these certificates shall:]</p> <p>iii. Include a certification statement indicating that the applicant has demonstrated compliance with the acceptance requirements as indicated in the plans and specifications submitted under section 10-103(a) and in accordance with applicable acceptance requirements and procedures specified in the Reference Nonresidential Appendix NA7, and confirms that Installation Certificate(s) described in section 10-103(a)3A are posted, or made available with the building permit(s) issued for the building.</p>
General / Splitt written comments from April 2007	6- The building official is forbidden from issuing a final occupancy permit until all installation certificates are posted and verified and the CEC has not provided these forms, all Non-Residential final occupancy permits issued so far, under the current Standards, are illegal.	No Change: This complaint is about the 2005 standards and is not part of this rulemaking. The language in 10-103 has been substantially changed for the 2008 standards to deal with these issues. A new installation certificate for nonres has been developed by the working group but is not part of this rulemaking.
General / Splitt written comments from April 2007	7- The Mandatory Measures MF-1 form is is a form that the Residential BUILDER gives to the HOMEOWNER at occupancy. It has absolutely nothing to do with plan check or	7- Amended: We agreed and amended the standards to move the MF-1R to CF-6R; however, CF-6R does not go on the plans and will not be affected. The working group which includes CABEC

Section / Commenter	Summary of Comment	Response and Action
	<p>construction. I believe the original intent was that the MF-1 would indicate to the homeowner which conservation features were incorporated in their home and the manual would describe the benefits and proper use of these features. In order to accomplish this, the MF-1 form needs to be re-written so that a typical homeowner will be able to understand it.</p>	<p>is revising these forms for 2008.</p>
<p>General / Splitt written comments from April 2007</p>	<p>The enforcement agency is required to verify that all manufactured devices are indicated on the Installation Certificates during field inspections, not a Mandatory Measures list in the permit application. Note that it is not possible for them to do this since there are no Non-Residential Installation Certificates, and the Residential forms are incomplete (no indoor & outdoor lighting Installation Certificate, for instance).</p>	<p>No Change: Staff agrees and has created a Nonresidential installation certificate. Will convert form WS-5R to CF-6R as part of the forms development.</p> <p>However, these comments are compliance manual issues and not related to this rulemaking.</p>
<p>General / SMACNA</p>	<p>We further suggest that CEC consider placing requirements that all measurement and verification of HVAC systems in Residential Applications be by a third party who is currently certified with either the Associated Air Balance Council (AABC) www.aabcdirect.com , National Environmental Balancing Bureau (NEBB) www.nebb.org , or the Testing Adjusting and Balancing Bureau (TABB) www.tabbcertified.org . A certified balancing report signed, stamped and should be provided to the building owner, CEC and the appropriate Code authority.</p>	<p>No Change: The standards currently require that this work be carried out by residential HVAC contractors and HERS raters using approaches developed to support the building standards. The request would require significant and potentially expensive changes in the industry and therefore is a substantive issue that must be developed for a future rulemaking.</p> <p>This has cost implications and is coming in too late for the 2008 standards.</p>
<p>General comments / Splitt on 4/23/2008</p>	<p>I have made many comments on the 15-day language and others are also making comments. It seems like the Commission is not going to respond to the comments and is going to adopt anyway. I think some of them are going to have to be addressed. And if the Commission goes ahead I think I will probably have to, probably along with some others, initiate an emergency rulemaking to change these, and get these items fixed.</p>	<p>No Change: The record in this Final Statement of Reasons has fully addressed Mr. Splitt's comments as required by Government Code Section 11346.9 (a) (3), which must be prepared after the Energy Commission adopts the Standards. Mr. Splitt's comments were made before the adoption and before this FSOR were prepared.</p>
<p>General comments / Craig Lease oral comments on 4/23/2008</p>	<p>Concerning the roof coatings of the gentleman whose samples were lost, and the SRI was added solar reflectance index was added. And it is all through the rulings at 64 where the initial reflective -- or after three year age reflectivity is supposed to be 55. At 64 that is the equivalent of 84 on reflectivity, initial reflectivity being 84. One of my products is an 85 reflective. My gravel system that's lasted up to 48 years, is reflective at 81. So in the formula you subtract 15 essentially 20 points. So 85 minus 20 is 65, which would pass. And for my gravel system, being that it's up and down and multiple reflections, it comes in</p>	<p>No Change: Staff does not agree with this comment. The commenter seems to think there is normally a 20 point difference between initial reflectance and aged reflectance, and that you can compare initial reflectance to SRI based on aging by subtracting 20 points from the initial reflectance value. This is not how and cannot be how the SRI calculations work. The SRI is not the same thing as solar reflectance.</p>

Section / Commenter	Summary of Comment	Response and Action
	at 81. 81 minus 20 would be 61. And therefore, that would not be allowed at a SRI of 64.	
STANDARDS BY SECTION		
Section 10-103 / Jay Salazar CALBO	<p>1- The requirement for Building Departments to collect and retain compliance documentation has fiscal implications for the building department and is an unfunded state mandate.</p> <p>2- Building Departments don't want to hold the documentation and these proposed changes will sets up the building departments for failure. This may force the Building Departments to address public comments related to compliance.</p>	<p>2- Amended: Staff agrees and has amended in the "15 Day Language" that the Building Departments are no longer required to retain the documents. The HERS providers will retain this information. Salazar and Garcia have indicated their support for this idea. Staff is working with attorneys to address any potential legal issues.</p> <p>2-. Amended: Staff agrees and has amended in the "15 Day Language" that the building departments are no longer required to maintain these records. The HERS provides will retain these records.</p>
10-103 / CALBO In written comments on January 31, 2008	CALBO and others have provided extended comments on the provisions in the 45-day language related to compliance documentation and electronic reporting requirements.	Amended: Staff has had extensive interaction with members of CLBO, CABEC, CONSOL, and others. The proposed 15-day language amendment represents the consensus of these discussions.
Section 10-103 / Splitt written comments from April 2007	1- Clarify who can sign the Certificate of Compliance. Building Officials are capable of determining who may, or may not, be responsible for the building design. The Business & Professions (B&P) Code makes no reference to who is eligible to sign energy compliance documents. Anyone is allowed by the B&P Code to sign the Certificate of Compliance. Therefore, remove this meaningless reference to the B&P Code and let the building official do his or her job.	<p>1- No Change: Staff disagrees with the commenter. The B&P does dictate who can and cannot practice (qualifications) Architecture, engineering, etc as licensed professionals, and specifies who can and cannot certify construction design documents (stamp/sign). For example this is from Div3 Ch3 Architecture: 5537. (a) This chapter does not prohibit any person from preparing plans, drawings, or specifications for any of the following: Single-family dwellings of wood frame construction not more than two stories and basement in height.</p> <p>The 2005 version of 10-103 was referenced in this comment-> 10-103(a) states that the person responsible for the design should certify the CF-1R. Staff amended the 10-103 certificate of compliance language to clarify that the expectation as follows:</p> <p>1. Certificate of Compliance. The Certificate(s) of Compliance described in Section 10-103 shall be signed, by the person(s) eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design, to certify conformance with Part 6. If more than one person has responsibility for building design, each person shall sign the Certificate of Compliance document(s) applicable to that portion of the design for which the person is responsible. Alternatively,</p>

Section / Commenter	Summary of Comment	Response and Action
		<p>the person with chief responsibility for design shall sign the Certificate of Compliance document(s) for the entire design.</p> <p>The commenter misinterprets the B&P code. The Energy Commission authority to implement, interpret or make specific the statutes under its authority is clearly granted under the Administrative Procedures Act. Under that authority, the Energy Commission can make specific that it requires licensed individuals to take responsibility for compliance with the energy Standards and use the B&P Code to define licensed individuals.</p>
Section 10-103 / Splitt written comments from April 2007	2- Some building designers do not directly specify any energy conservation features on their plans. Their plans reference the Certificate of Compliance for specification of features such as insulation R-value or equipment efficiencies. Their signature on the certificate of Compliance merely signifies that the plans are consistent with the energy compliance features specified in the compliance documentation. If these features are only specified in the Title 24 documentation, this consistency is guaranteed.	2. No Change: The separate signature block will be different. Splitt is saying that some designers do not put the Certificate of compliance on the plans as required..... But they are required to do that according to 10-103. We require the docs to be on the plans because it makes it more likely to be archived with the plans. Stand alone compliance docs are easier to toss.
Section 10-103(a)3B / Pat Splitt	1- Do away with acceptance requirements and call them installation certificates which should be signed only by the installer.	<p>1- No Change: Staff disagrees with this comment. Staff allows licensed installer, responsible engineer, architect, air balancing engineer, or a building commissioning agent to sign the acceptance requirement forms. The Commission has determined that these are all legitimate people to sign. CABEC is heading the effort to create a certificate of installation for nonresidential buildings. These forms will be signed both by the installing contractor and any other person who is responsible for signing the AR forms.</p> <p>The Commission has made a determination that nonresidential Acceptance requirements ensure that equipment, controls and systems operate as required by the Standards. The activities specified in these requirements have three aspects:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Visual inspection of the equipment and installation <input type="checkbox"/> Review of the certification requirements, and <input type="checkbox"/> Functional tests of the systems and controls
Section 10-103(c) / Splitt written comments from April	8- The building official's responsibilities regarding approval of Certificates of Acceptance should be included in this section (10-103(c)1.)	8- Amended: Staff agrees and has amended the inspection requirements language as shown below 10-103(d)2:

Section / Commenter	Summary of Comment	Response and Action
2007		<p>2. Inspection. The enforcement agency shall inspect new construction to determine whether it is consistent with the agency's approved plans and specifications, and complies with Part 6. Final certificate of occupancy shall not be issued until such consistency and compliance is verified. For Occupancy Group R-3, final inspection shall not be complete until such consistency and compliance is verified.</p> <p>Such verification shall include determining that:</p> <p>A. All installed features, materials, components, or manufactured devices, regulated by the Appliance Efficiency Regulations or Part 6, are indicated, when applicable, on the Installation Certificate(s), Certificate(s) of Acceptance, and Certificate(s) of Field Verification and Diagnostic Testing, and are consistent with such features, materials, components, or manufactured devices given in the plans and specifications and the Certificate(s) of Compliance approved by the local enforcement agency.</p> <p>B. All required Installation Certificates are posted, or made available with the building permit issued for the building, and are made available to the enforcement agency for all applicable inspections and that all required Installation Certificates conform to the specifications of section 10-103(a)3A.</p> <p>C. All required Certificates or Acceptance are posted, or made available with the building permit(s) issued for the building, and are made available to the enforcement agency for all applicable inspections, and that all required Certificates of Acceptance conform to the specifications of section 10-103(a)3B.</p> <p>D. All required Certificates or Field Verification and Diagnostic Testing are posted, or made available with the building permit(s) issued for the building, and are made available to the enforcement agency for all applicable inspections, and that all required Certificates of Field Verification and Diagnostic Testing conform to the specifications of section 10-103(a)5.</p>
Section 10-103(d) /	All requirements for local enforcement should be in 10-103,	No Change: Staff disagrees with this comment. This section has

Section / Commenter	Summary of Comment	Response and Action
Pat Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008	rather than scattered throughout especially in RAs.	been substantially re-written. Many of the “enforcement agency” requirements reside in this section along with some cross references to other Standards documents, such as the Reference Appendices. This is a common practice to have cross references to other documents within the standards language. The purpose is to avoid repeating the same language over and over, or to clutter the standards language with long information that are of interest to relatively few people. The enforcement community has access to all these documents.
Section 10-103(d) / Splitt	In Exception to 10-103(d), why should building departments waive plan check and inspection requirements for homes with NSHP?	No Change: The NSHP calls for thorough plan check and field verification necessary to meet program requirement, which is in the NSHP Guidebook. So, it is not necessary for the building official to do this over again. The building official is expected to check the mandatory measures, and finally, the building official may choose whether to waive or not waive the plan checking.
Section 10-105 / DGS – Cathy Hicks	<p>1- No statutory authority to require state and local agencies to report to the CEC.</p> <p>2- Duplicative of the PRC. Section 25402.1(g)(5)</p> <p>3- The proposed language creates new enforcement responsibilities for state and local agencies. This will result in increased costs to state and local agencies involved in permitting and construction.</p> <p>4- The DGS also provided comments on this section in March and April or 2008 about their concerns related to the responsibilities of enforcement agencies that are not local governments.</p>	<p>1- No Change: IPRC allows the CEC to require reporting to implement its statutory authority.</p> <p>2- No Change: Our Proposed language uses the terminology of the statute to ensure clarity to what is to be reported.</p> <p>3- No Change: Staff disagrees with the comment. Statute clearly states that requires this enforcement is required and has done so since 1978 and the proposed regulation makes clear and implements this statutory requirement that they must report the results of their enforcement.</p> <p>4- Amended: In April of 2008, CEC staff and DGS agreed upon a language that is satisfactory to both sides. This language is incorporated as the 15-day language amendments.</p>
Section 10-106(a) / Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008	If a local agency makes no alterations to the State’s Energy Code, they should be allowed to develop their own additional building energy efficiency requirements, without seeking CEC approval.	No Change: This is not an accurate interpretation of state preemption over locally adopted Energy Building Codes. The Commission cannot adopt a regulation to circumvent a state preemptive statute.
Section 10-109 / Splitt in written	If we don’t have public domain programs, how can we ask the vendors to check their software against public domain	No Change: Proposing changes to the Warren-Alquist Act is a legislative action and not part of this rulemaking. These problems

Section / Commenter	Summary of Comment	Response and Action
comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008	programs? The Warren Alquist Act needs to be changed in order to get rid of the responsibility to provide public domain programs,	are related to the existing 2005 standards. Staff is working to make sure that we will have the public domain programs in the 2008 standards. Staff does not agree that public domain programs should be eliminated, but it is true that it takes a change in the statues to make this happen.
Section 10-111 / Splitt in written comments	Section 10-111 “Labeling Requirements – Permanent labels” also indicates that Site-Built fenestration products require an NFRC label certificate. The terms FC-1 and FC-2 are not mentioned anywhere in these sections.	No Change: Staff disagrees with the comment. Permanent label for windows not rated by NFRC is not required in Section 116(a)4B. Section 10-111 is for NFRC permanent label fenestration only - not for default labels.
Section 10-112 / Cardinal Glass	<p>1- The changes to section 10-112 do not make sense.</p> <p>2- The default values in section 116 should be more pessimistic than NFRC values</p> <p>3- Eliminate or reduce to 5,000 sf the 10,000 square feet exception for nonres site built fenestration, if not in this cycle then in the next cycle.</p> <p>4- Lower the U-factors and the SHGC in tables in 143 for skylights</p> <p>5- The U-factors in section 151 tables could be as low as 0.35 and lower SHGCs are possible without causing hardship. .</p>	<p>1- Amended: Staff agrees with the comment and has restored the language back to the 2005 language.</p> <p>2- No Change: Staff disagrees. This new proposal is outside the current rulemaking scope, The defaults in section 116 are more pessimistic than NFRC values and in 2008 we have made them even more pessimistic.</p> <p>3- No Change: Staff believes that NFRC must demonstrate that they have a workable site-built procedure before we can eliminate or change this, which will need to be done in a future rulemaking scope. In a future cycle of standards, staff does intend to modify these requirements once NFRC process is fully functional.</p> <p>4- No Change: This new proposal is outside the current rulemaking scope. These changes require demonstration of cost effectiveness and must be subject to public commenting. This is a good idea for the next round of standards.</p> <p>5- No Change: This new proposal is outside the current rulemaking scope. These changes require demonstration of cost effectiveness and must be subject to public commenting. This is a good idea for the next round of standards.</p>
Section 100(e)(6) / Staff discovery	Old reference to §132 should have been changed to §133	Amended: The 2005Section132 addressed outdoor and sign controls. Sign controls have been removed from §132 and moved to §133. The typos have been corrected.
Section 100(e)(5) / Staff discovery	Missing reference to §133	Amended: Correct reference has been added by staff to the amendments.
Sections 100(h)17 119(m)	Edits to LED language for clarity and consistency.	Amended: Staff agrees and has made LED amendment language consistent with other nationwide efforts.

Section / Commenter	Summary of Comment	Response and Action
130(d)5 150(k)1 and 2 Table 150-C and Reference Joint Appendix JA8 / Informal comments from several stakeholders including OSRAM and CLTC		
Section 101, 119, and 131(c), and / Staff Edits	Jim Benya re-wrote parts of Sections 119 and 131(c), and recommended new definitions for Section 101, without providing reasons or justification. His submittal contained no explanation for the changes.	No Change: Staff worked with all stakeholders and reached consensus for §119 and §131(c), which was that Benya's proposed definitions were not needed.
Section 101, Definitions / Splitt in written comments	section 101 definition of Site-Built Fenestration indicates that all Site-Built Fenestration is to have an NFRC label certificate	Amended: Staff amended dropping the NFRC language from this as follows: SITE-BUILT FENESTRATION is fenestration designed to be field-glazed or field assembled units using specific factory cut or otherwise factory formed framing and glazing units that are manufactured with the intention of being assembled at the construction site and are provided with an NFRC label certificate for site-built fenestration. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.
Section 101, Definitions / Informal Gary Farber comments	Need definition of Internal Cabinet Lighting.	Amended: Staff agrees that proposed language in §150(k)(9) is not clear that Lighting internal to Cabinets applies only to lighting installed on interior of cabinets, and only for the purpose of illuminating the interior of the cabinets. Otherwise, lighting recessed in cabinets, and some reflector lighting might easily be incorrectly classified as cabinet lighting. Staff amended language in §150 to be consistent with new terminology used in definition.
Section 101, Definitions / Mike Gable	Delete proposed new definition: Lighting Floor Area.	Amended: Staff agrees that the new definition proposed by staff creates conflicts when using the performance method. For that reason staff deleted this definition.
Section 101, Definitions / Gary Farber	Edit definition of Financial Transaction, under Nonresidential Function Use	Amended: Staff agrees and used Gary Farber edits that improve clarity which has been incorporated into the 15-day language.
Section 101, Definitions / Gary Farber	Edit definition of Library, Reading Areas, under Nonresidential Function Use	Amended: Staff agrees and used Gary Farber edits that improve clarity which has been incorporated into the 15-day language.

Section / Commenter	Summary of Comment	Response and Action
Section 101, Definitions / CEC Staff	Daylighting definitions do not belong in §101. Rather, they should be moved back to §131(c)	Amended: Staff agrees and moved definitions to Section 131(c)1. This insertion of definitions into the 45-Day language required Section 131(c) to be renumbered. As a result of the renumbering, all references in other sections to Section 131(c) had to be changed.
Section 101, Definitions / CEC Staff	Some definitions for lighting related incorporated references are missing.	Amended: Staff agrees and added definitions for the following lighting related reference: To Section 101: UL 1574; UL 2108 To JA1: ISO/IEC 17011, 17020, and 17025 UL 1574; UL 2108; and UL Data Acceptance Program (DAP)
Section 101, Definitions / CEC Staff	Some lighting related definitions need to be edited for clarity.	Amended: Staff agrees and edited the definitions for Medical and Clinical Care; and Medical Buildings and Clinics, for clarity. Staff added definition for Videoconferencing studio for clarity.
Section 101, Definitions / CABEC written comments 12/17/07	Building is any structure...for which a permit is sought.” Strike “for which a permit is sought” eliminates crucial language clarifying the portion of the building the Standards language applies to. 1992 Standards said, Title 24 compliance and documentation applies only to the portion or components of the building which are covered by a specific permit.	No Change: Staff disagrees with this comment. Section 101 is the definition, Section 100 is the scope section...Section 100(a)2 makes the point about the building permits in more legally accurate terms, Section 100 provides all relevant information about covered buildings and not just the building permits
Section 101, Definitions Same issues at JA-1 Glossary / CABEC written comments 12/17/07	Fenestration Product, Site Built. Two errors: a) NFRC certification is not required; b) “Site-built” fenestration is often not assembled at the project site, but rather at the glazing contractor’s shop.	a) Amended: This has been taken care of, the language has been modified. b) This has been taken care of, the language has been modified. Staff agrees with both comments.
Section 101, Definitions / CABEC written comments 12/17/07	Manufactured Fenestration Product Definition would apply to many “site-built” fenestration assemblies.. Suggest changing 2 nd sentence to “A manufactured fenestration product is typically factory-assembled before deliver to a job site.	Amended: The language has been changed. Staff agrees with the comment.
Section 112(c) / Michael Taylor	The PCT is taking the choice away from the customer by not giving them the choice of when to curtail energy.	Amended: The Efficiency Committee directed staff to remove the PCT from the 2008 standards. The language has reverted back to 2005 standards language with some changes.
Section 112(c) / TURN	PCTs not adequately defined and cost-effectiveness is being double counted.	Amended: PCT language has been removed for consideration from the 2008 Standards.
Section 112(c) / NEMA	1- Questions about security protocol in JA5 (PCTs) 2- Wrong reference in 112(c) related to self certification (PCTs)	Amended: PCT language has been removed for consideration from the 2008 Standards.

Section / Commenter	Summary of Comment	Response and Action
Section 112(c) / Hodgson	Are PCTs available? Are IOU's cool with the requirements?	Amended: PCT language has been removed for consideration from the 2008 Standards.
Section 113(c) / Charles Ehrlich	<p>Section 113—Mandatory Requirements for Service Water-Heating Systems and Equipment for ALL BUILDINGS</p> <p>Sub-section (c) 2 – Pumps for circulating systems. Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required.</p> <p>The above mandatory measure applies to multifamily buildings since it is in Section 113 (all buildings), and since Section 151(f)8(C) also refers to the requirements of Section 113 specifically as it relates to “systems serving multiple dwelling units”.</p> <p>However, in the approved ACM software, “None” is the default and acceptable type of recirculation pump for multifamily central water heating systems (see attached screen capture of EnergyPro). Selecting “None” results in a complying building that just meets the domestic hot water energy budget.</p> <p>This contradiction between the ACM and the Standards should be resolved by correcting the ACM such that the standard design for a central water heating system includes a “control capable of automatically turning off the recirculating pump when hot water is not required.” This should specify the control type with the least energy savings reduction credit. My recommendation would be a “Timer” based control.</p> <p>Alternatively, Section 113(c)2 could be updated to allow different types of controls on the service water heating system that provide equivalent energy savings while keeping the recirculation loop in operation. For example, the “Temp” based controllers, as manufactured by Protemp and others, adjusts the temperature of the water in the storage tank in anticipation of the demand of the building. For multifamily buildings, particularly senior housing, where there is a greater diversity of hot water usage, the temperature-based control is a better option. For multifamily buildings where most of the occupants are working</p>	<p>For computer modulated temperature systems or monitored systems. Staff has created a single credit default that is now in the RACM.</p> <p>The residential ACM is clear that a timer controlled system is the standard design. There is no test in the residential ACM to check this function.</p> <p>Amended: Staff has added a test to the residential ACM to check this function.</p> <p>Amended: Staff has made changes to this section which applies automatic shutoff to all systems. As a mandatory requirement the Section 113©2 now states “Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. The clarification is intended to make a clear separation between a mandatory requirement that all water heating systems with either pumps and or electric trace heating must be provided with a switch that at minimum turn off the system automatically. While a temperature, time, or other recirculation control could meet this requirement, the mandate in Section 113 © 2 is for a separate switching requirement from those that are referred to in the control requirements in the ACM manuals. In the 2005 the standard design system was a time controlled recirculation system. However, while this was true all of the base case assumption where set to neutral as far as credits or penalties. In the 2008 standards all of the base assumptions where changed to “credit”. As a result any variation in distribution type or insulation will result in a difference in the proposed and standards budget. Gas and electric heating are still allowed. One feature that was added to the residential low rise approach was a distribution multiplier for systems like the Protemp or monitored systems. Since Hotels and motels where assigned to meet the requirements for the low rise residential water heating approach virtually all of the occupancies that would benefit from this type of use have be included.</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>adults, hot water use is more similar amongst the units and a timer would provide better energy savings.</p> <p>Suggested Language for Section 113(c)2</p> <p>Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required or shall have a predictive temperature-based control capable of reducing the temperature of the hot water in the storage tank and recirculation loop when hot water demand is at its lowest.</p>	
Section 113(c)2 / Tyco	Concerned on how 113(c)2 defines when hot water is not required. And want an exception for electric tape heating. This would require an exception for the recirculation pump controls.	Amended: Staff agrees and has clarified and made modifications to 113(c)2 that address this concern.
Section 114	Additional comments were made by the pool industry related to the treatment of solar pool heating systems that are independent of the pool system.	Amended: Staff agrees and has added language for pools has been added to this section to include independent circulation system for solar pool heating systems.
Section 114 / John Haley, Sunbather Feb 27, 2008	<p>Consider the following edit:</p> <p>At least 36 inches of pipe shall be installed between the filler and the heater or <u>dedicated suction and returns lines</u> or built-in or built-up connectors to allow for the future addition of solar heating equipment.</p>	Amended: Staff agrees with the comment and has incorporated the comment in the 15-day language.
Section 116 / Splitt in written comments	<p>1- The exception to section 116(a)2 indicates that calculated u-factors can be used for up to 10,000 sq. ft. of site-built fenestration or skylights. This indicates that there is no limit to the allowed area for site-built skylights. However, if I have used calculated u-factors for 5,000 sq. ft. of site-built skylights, can I also use calculated u-factors for an additional 7,000 sq. ft. of site-built vertical fenestration, or am I limited to an additional 4,999 sq. ft.?</p> <p>2- Why calculate an alternate thermal performance anyway? The procedures in appendix NA6 are a waste of time. For prescriptive compliance why not just have an additional table with the required center of glass U-factors and SHGC for site-built glazing <10,000 sq. ft. or skylights, and be done with it! For Performance programs one should still just enter the center of glass numbers and let the software take care of any conversions internally.</p>	<p>1- Amended: Staff agrees and has amended to clarify the skylights are not parts of the 10,000 sf calculations. Skylights are not part of the 10,000 sf of fenestration. Skylights square footage is restricted to either 5% or 10% of the roof, RSR, roof to skylight ratio.</p> <p>EXCEPTION to Section 116(a)2: If the fenestration product is site-built fenestration in a building covered by the nonresidential standards with less than 10,000 square feet of site-built fenestration not including or is a skylight, the default U-factor may be the applicable U-factor calculated as set forth in the Nonresidential ACM Manual Reference Nonresidential ACM Manual Appendix NA6.</p> <p>2- No Change: Staff disagrees at this time. We view the 2008 site-built requirements as interim step until the new NFRC site-built process has had a chance to be established. There is a small chance that the NFRC site-built procedure may not be fully operational by the effective date of the standards; should that</p>

Section / Commenter	Summary of Comment	Response and Action
		happen, we need a plan B and that is NA6. Once the new NFRC process is well established, we can get rid of NA6 and perhaps 116 defaults.
Section 116(a)(2 and 3) / CABEC written comments 12/17/07	10,000 sq ft exemption. Supposed to apply only to “site-built” fenestration, not site-built and skylights. Skylights manufactured, site-built, or field-fabricated.	Amended: The language has been changed. Staff agrees with the comment.
Section 116(a)5 / CABEC written comments 12/17/07	Fenestration Acceptance Requirements. Whoever is taking responsibility for fenestration acceptance must verify installed fenestration consistent with compliance documentation and plans. Will necessitate building enforcement agency confirm compliance documentation is correct, and consistent with plans. Further, compliance forms need to more clearly articulate requirements, and locations, for each fenestration type.	No Change: This is a forms issue and not part of this rulemaking. This will be dealt with when we work on the forms.
Section 118 / Honeywell	Urea Formaldehyde; how is the insulation with Urea Formaldehyde going to be treated in the standards.	No Change: The criteria for Urea Formaldehyde are in section 118 of the Standards.
Section 118 / Honeywell	The Acceptance Criteria for Spray-applied Foam Plastic Insulation has been referred to ICC ES AC 12. The new Acceptance Criteria for Spray-applied Foam Plastic Insulation ICC-ES AC377 goes into effect in March of 2008. What is the position of the CEC regarding this?	This is not part of this rulemaking. ICC’s are standards which California does not abide by. The issue regarding the Standards on product testing for thermal insulation needs to be brought up to the Department of Consumer Affairs Bureau of Home Furnishings.
Section 118 / Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008	If “Quality Insulation Installation” procedures have been shown to be a cost effective conservation feature, why are they not mandatory requirement for all envelope insulation?	No Change: Staff disagrees at this time. This has not been demonstrated to be cost effective in all situations and CZs. It is being used in more areas, but some people are still struggling with this. We could consider these in the next cycle of standards.
Section 118(a) / Splitt in written comments	This is not worded correctly. It now implies that there are no installation requirements for insulation NOT certified by the Department of Home Furnishings. For instance, there are many bubble wrap type insulation products, of dubious effectiveness, that are available in California that are not certified.	Amended: Staff agrees with comment. The language has been edited to clarify. 1/30/08 staff checked language and the last changes made to 118 cover Pat’s issue.
Section 118(c)i / Craig Lease	1- Support inclusion of SRI and can we help him find his lost sample? 2- ASTM Reference D5870 should include the date and its version.	1- Thanks for the support for the SRI and no we cannot help him find his lost samples. 2- No Change: This is already in the definitions in Section 102.
Section 118(e)2 / Splitt in written comments on January 3, 2008, April 21, 2008, and	Only refers to nonresidential buildings. It should apply to all buildings. With the emphasis on Green building products, more residential “attics” are being insulated with spray-on foam insulation that adheres to the bottom of the roof sheathing.	No Change: This new proposal is outside the current rulemaking scope. In nonresidential buildings, the insulation is required to be at the roof all the time. In residential buildings, only a very small fraction of the insulation is at the attic; it is usually at the ceiling. The building department must determine if a residential

Section / Commenter	Summary of Comment	Response and Action
oral comments on April 23, 2008		<p>installation is subject to the building code ventilation requirements.</p> <p>We can consider this for the next round of standards.</p>
Section 118(g) / Splitt on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008	Slab Edge Insulation – Delete the word “or raised floor” and just say “slab-on-grade”. Develop new requirements for raised floors.	No Change: Staff agrees and has deleted the “or raised floor” from the language. However, development of new requirements are outside the current rulemaking scope and must be addressed in a future rulemaking because there are cost implications involved here that requires public input. However, the heated slab floor definition has been edited to include all heating systems and not just hot water pipes.
Section 118(g) / CABEC written comments 12/17/07	Insulation Requirements for Heated Slab Floors. Covers on-grade and raised, but points to Table 118-B which is labeled as for “on-grade”	Amended: Staff agrees with the comments, and the language has been modified.
Section 118(i)1 / Reed Hitchcock-ARMA	The word “asphalt” should not be in section 118, instead we should be using product density as it is done elsewhere in the standards.	No Change: Staff disagrees with the comment. Density does not work since it will pick up metal and other products. Section 118 is intended to include lower reflectance for asphalt shingles because they are lower than dark metal and tile
Section 118(i)3 / Reed Hitchcock-ARMA	The prescriptive standards require an emittance of 0.75 for roofing products; why is that the SRI approach is based on 0.85? It should be based on 0.75 to match prescriptive.	No Change: Staff disagrees with the comment. The 0.75 is a prescriptive requirement. Since most roofing material out there have emittances of 0.85 or higher, to make the performance and SRI approaches equivalent to prescriptive, the emittance must be based on 0.85, otherwise this would result in a free rider credit for most products, resulting in a weakening of the reflectance.
Section 119(f)(1) / NEMA written comment 12/14/07	<p>Requirement for reducing power by 2/3 does not allow all combinations of number of lamps to be step-switched.</p> <p>NEMA suggests using construct similar to Section 131(b) – “one step between 30% to 70%...”</p>	No Change: Staff disagrees. Reducing power by at least 2/3 includes reducing by 100%, and 2/3-1/3 strategies. Staff sees no conflict here.
Section 119(f)6 / Splitt in written comments	As long as the sensor is accurate, it should make no difference whether its’ response is linear, logarithmic or whatever.	<p>No Change: The sensor response (light output over power input) is meant to be a linear response. Staff is not sure why logarithmic is relevant here.</p> <p>This is language from 2005 and has not been proposed for amendments in this rulemaking. Staff has spent a lot of time with vendors and NEMA on this section and no questions were raised about this sentence.</p>
Section 119[(h)&(i)]2 / Splitt in written comments	The requirements for these 2 sections are identical except for the offset requirements. What is meant by offset and why is it specified at all?	No Change: Subsection ‘h’ is for indoor lighting and ‘i’ is for outdoor lighting. These are two different situations. Again, this language has been extensively reviewed by NEMA and vendors

Section / Commenter	Summary of Comment	Response and Action
Section 119(i)(4) / Musco Lighting written comments 010908	Astronomical time switch control requirement to store time parameters in the event of power failure. Musco lighting also states that the language is inverted in that the wrong parameters are required to be stored.	and no amendments were requested. No Change: Staff disagrees and believes the language is actually consistent with what Musco Lighting wants. Also, the NEMA lighting controls committee supports the language as proposed
Section 119(j) / Splitt in written comments	This seems to conflict with/replicate §119(d).	No Change: Subsection ‘d’ describes what an occupant sensor is; subsection ‘j’ defines how manual-on OS must function. Staff disagrees with this comment. There is some duplication here but no conflicts.
Section 121 / ARB	For nonresidential buildings that will be or are expected to be near major sources of outdoor pollutants, the standards should include requirements for high efficiency filters such as those with a MERV 13 rating. A low-efficiency pre-filter is also recommended as a means of reducing filter replacement costs. Additional information on how to identify and mitigate impacts from nearby roadways and other major pollutant sources outdoors is available in the Air Resources Board’s land use guidelines.	No Change: These new proposals are outside the current rulemaking scope and would be required to be part of a future rulemaking. These ideas should be considered for the next round of standards. These suggestions are to a section of standards that has not been changed relative to the 2005 standards.
Section 121 / SMACNA	When buildings are located next to major sources of outdoor pollutants, we suggest a requirement for higher efficiency filtration systems including pre-filters. These systems should be designed by qualified individuals who are competent in such system design. Systems with improper MERV rated filters actually contribute to lower energy efficiency while allowing outdoor pollutants to be circulated throughout the buildings they serve.	No Change: These new proposals are outside the current rulemaking scope and would be required to be part of a future rulemaking. These ideas should be considered for the next round of standards. These suggestions are to a section of standards that has not been changed relative to the 2005 standards.
Section 121 / Danielle Uchio with Worksafe	Expressed concerns about DCV requirements along the lines of Cal-OSHA, such as reliability, Exceptions, etc.	No Change: This comment is outside the scope of the current rulemaking. These proposals must be part of a future rulemaking. Staff has been working with Cal-OSHA and other commenters to resolve these issues.
Section 121(b)1 / Splitt in written comments	This section conflicts with the residential prohibition of using natural ventilation to meet required minimum outdoor air amounts. Since the residential mechanical ventilation requirements will increase electrical consumption, I assume those requirements were enacted in response to some overriding public health & safety concerns.	No Change: Staff disagrees. There is no conflict here. Section 121 is for nonres, high-rise residential buildings and hotels/motels only. Our data indicated that in residential units, window opening is not sufficient to meet adequate indoor air quality (based on research by ARB) and mechanical ventilation should be required. There has been no such field research for natural ventilation in nonres and high-rise residential buildings and hotels/motels.

Section / Commenter	Summary of Comment	Response and Action
Section 121(b)1 / SMACNA	<p>We recommend that natural ventilation systems be engineered to provide sufficient outdoor air ventilation, occupant safety and thermal comfort. Design demonstration should include documentation of system performance by a third party certified with the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or the Testing Adjusting and Balancing Bureau (TABB) utilizing their approved standards. The standards should also require a mechanical system back up for supplemental ventilation when needed.</p> <p>Currently Title 24 does not specify that system performance verification must be done by certified third parties. The certifying bodies listed above all are referenced by the US Corps of Engineers, US General Services Agency, Master Spec, and California OSHPD to verify system performance utilizing accepted engineering methods. Verification of ventilation standards is crucial to establish that a proper balance between energy efficiency and life safety has actually been accomplished.</p>	<p>No Changes: These new proposals are outside the current rulemaking scope and would be required to be part of a future rulemaking. These suggestions are to a section of standards that has not been changed relative to the 2005 standards.</p> <p>There was no change for the natural ventilation requirements 121(b)1 in 2008.</p> <p>The second part of this comment is a new proposal to require certification by agencies for the Acceptance Tests</p>
Section 121(b)1, Natural Ventilation exemption / ARB	<p>We recommend requiring that natural ventilation systems be engineered to provide sufficient outdoor air ventilation and thermal comfort. Design demonstration should include documentation of system performance through accepted engineering methods of calculating air flows and thermal conditions. The standards should also require a low-noise exhaust fan to provide back-up or supplemental ventilation when needed.</p>	<p>No Change: These new proposals are outside the current rulemaking scope and would be required to be part of a future rulemaking. These suggestions are to a section of standards that has not been changed relative to the 2005 standards.</p>
Section 121b.2, Air Filter Design / SMACNA	<p>We support the proposal to require a pressure gage to indicate the air pressure drop across the filter, this will assist building owners and their operating and maintenance staff to make objective decisions to change filters based on current condition, not just based on length of time since last change.</p>	<p>No Change: These new proposals are outside the current rulemaking scope and would need to be part of a future rulemaking. These suggestions are to a section of standards that has not been changed relative to the 2005 standards.</p>
Section 121(b)2, Air filter design / ARB	<p>The standards should require a pressure gauge installed across the air filter, with a mark installed on the gauge to indicate the manufacturer specifications for filter replacement. This would promote proper maintenance, since air filters are often poorly maintained. This measure is considered best practice and is inexpensive. Wording of the regulation should be similar to that in the Cal/OSHA requirements for exhaust systems in workplaces.</p>	<p>No Change: There are no references to air filters in sections 121-125.</p> <p>These new proposals are outside the current rulemaking scope and would need to be part of a future rulemaking. These suggestions are to a section of standards that has not been changed relative to the 2005 standards.</p>
Section 121(c)3C, Exemption 3,	<p>The standards should also exempt nail salons explicitly from DCV requirements. Nail salons produce fumes and often lack</p>	<p>Staff agrees with the comment. This exception has been added to the 15-day language.</p>

Section / Commenter	Summary of Comment	Response and Action
Demand Control Ventilation (DCV) exemptions / ARB	effective exhaust ventilation; DCV would only worsen this situation.	
Section 121(c)4, DCV controls / ARB	The results of a recent pilot study by LBNL researchers suggest that DCV system maintenance and/or accuracy may be inadequate in systems that are as little as two years old. The standards should specify that the DCV controls have a fail-safe mode so that sensor malfunction or failure will not result in extreme under-ventilation. For rooms that have highly variable occupant density, the ventilation rate in failure mode should be at least that for the average occupant density, rather than a minimum ventilation setting. This fail safe feature is apparently a common design feature in DCV systems, and would address major failures of the DCV sensors. In addition, there should be a manual override to adjust ventilation rates properly until the sensor can be replaced or repaired. These requirements should also be included in the Acceptance Requirements.	Amended: Staff agrees and has added amended language which specifies that when sensor failure is detected, the system will provide a signal to maintain minimum ventilation rated required by Section 121(b)2
Section 121(c)4D, DCV outdoor CO2 assumption / ARB	<p>We recommend requiring an outdoor CO2 sensor rather than assuming a certain outdoor level of CO2. If the option of assuming outdoor CO2 levels is retained, we recommend increasing the assumed outdoor CO2 level to 500 ppm, and reducing the allowable increment from 600 ppm to 500 ppm. This would help avoid the under-ventilation of buildings, and provide an incentive for using an outdoor sensor for situations where outdoor CO2 levels may be lower. This measure should also be verified through Acceptance Requirements.</p> <p>This recommendation is based on the outdoor CO2 levels measured at 49 schools across California in the California Portable Classrooms Study. In this study, the outdoor levels were often well above 400 ppm. The median 1-hour average CO2 levels from 8 AM to 2 PM were 410-494 ppm, and 95%ile values were 496-530 ppm. We would expect similar outdoor levels near office buildings and other types of commercial buildings, and even higher levels near nonresidential buildings in highly urbanized areas.</p>	No Change: This section was developed in 2005 with the input from both ARB and Cal-OSHA. It was a consensus proposal from the working group. Nothing has been changed in this section in 2008. These new proposals are outside the current rulemaking scope and would need to be part of a future rulemaking.
Section 121(c)4.DCV outdoor CO2 assumption / SMACNA	We support proper instrumentation and control systems to assure good indoor environmental quality. Assuming or estimating levels of outdoor pollutants in design phase can lead to compromising of the indoor environment. Proper ventilation in buildings is vital to overall building operation and occupant	No Change: This section was developed in 2005 with the input from both ARB and Cal-OSHA. It was a consensus proposal from the working group. Nothing has been changed in this section in 2008. This new proposal is outside the current rulemaking scope and would need to be part of a future

Section / Commenter	Summary of Comment	Response and Action
Section 121.c.4 DCV Controls / SMACNA	<p>health.</p> <p>We support the ARB proposal that DCV controls have a “fail-safe” mode so that sensor malfunction or failure will not result in under ventilation. A manual override should also be required.</p>	<p>rulemaking.</p> <p>Amended: Staff agrees and has added language in this section that requires multiple sensors in large spaces. The new language clarifies that the least compliant sensor will control the outdoor ventilation rates. In the event of a failure, these system will default back to provide the ventilation rates required by Section 121(c).</p> <p>Out pilot study does not contain sufficient data for conclusions about the accuracy of specific CO2 sensor models or even basic designs. Sensors should not be disqualified based on a pilot study that took a snap shop of the performance of just a few sensors, PIER funded work currently being performed by the Iowa Energy Center should identify CO2 sensor characteristics that will weed out poorly performing technologies. The current acceptance tests will ensure that the sensors work as required on new installations.</p>
Section 121(C)4.F / Cal-OSHA Written comments on March 25, 2008 and oral comments on 4/23/2008	<p>Amend this section as follows:</p> <p><i>CO₂ sensors shall be certified by the manufacturer to have an accuracy of no less than 75 ppm at <u>concentrations of 400, 800, and 1000 ppm</u> concentration when measured at sea level and 25 °C, factory calibrated <u>and</u> calibrated at start-up, and certified by the manufacturer to require calibration no more frequently than once every 5 years. <u>CO₂ sensors shall be capable of self-diagnostics that will detect sensor failure. Upon detection of sensor failure, the system shall be reset to supply the minimum quantity of outside air required by section 121(b)(2) to the zone serviced by the sensor at all times that the zone is occupied.</u></i></p>	<p>Amended: Our discussions with manufacturers and other experts reveals that certifying accuracy at there levels of 400, 800, and 1000 ppm is redundant and unnecessary; there will be additional costs associated with this without any demonstrated benefits. Therefore staff has revised the language to certify performance only at two levels, 600 and 1000 ppm.</p> <p>Amended: Our discussions with the sensor manufacturers and the researchers at LBNL and the Iowa Energy Center indicates that currently, there are no cost effective “self diagnostic” capabilities,; however, the control system can detect a sensor failure and revert to a default setting; therefore, staff has edited this section to ensure that when a sensor failure is detected, the system will provide a signal to ensure that the minimum OSA required by Section 121(b)2 is provided to the affected spaces.</p>
Section 121(c)5 / SMACNA	<p>We object to the striking of the requirement for 121.c.5 which removes the requirement for verification of installation of DCV systems prior to certificate of occupancy.. This is the only way to assure the building owners that their systems are in compliance with Title 24, operating safe and efficiently. We suggest that an overall requirement be placed in Section 121.c.5 that all systems be balanced and verified by a third party who is currently certified with either the Associated Air Balance Council (AABC), National Environmental Balancing Bureau</p>	<p>No Change: This section has not been deleted. All mechanical acceptance requirements have been moved to Section 125.</p>

Section / Commenter	Summary of Comment	Response and Action
	(NEBB), or the Testing Adjusting and Balancing Bureau (TABB). That report should be signed, stamped and forwarded to the building owner, CEC and the appropriate Code authority.	
Section 121(e) / Splitt in written comments	This section does seem to require all occupancies, other than low-rise residential, to have a mechanical means of providing outside air if they have a mechanical ventilation or space conditioning system. §121(b) should therefore be deleted to be consistent with this section.	No Change: Staff disagrees. There is no conflict here; section (b)1 describes requirements for spaces that use natural ventilation (this is very rare in nonres buildings). Section (e) describes the type of equipment you have to have when mechanical ventilation is present and the level of outdoor ventilation. Section 121(e) does not require natural ventilation.
Section 121-124 / Robert Nakamura/Cal-OSHA	<p>1- Asked for exceptions for nail salons, social services, public areas of health building, pharmacy areas in healthcare facilities</p> <p>2- Asked for measuring outside air rates at zone level and record the amounts on EMCS. Asked us to justify that this costs too much to do.</p> <p>3- Raised questions about the reliability of CO2 sensors for multizone systems.</p>	<p>1- Amended: Staff agrees and has added these exceptions to the 15-day language</p> <p>2- Amended: Measuring OSA at zone level is expensive and needs to be presented at the staff workshops. This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.</p> <p>3- Amended: We have provided for multiple sensors for spaces larger than 10,000 sf and that the least compliant sensor shall control the OSA. Staff has made numerous improvements to section 121-124 and NA7 to improve the reliability of the CO2 sensors.</p>
Section 121-124 / Len Welsh Cal-OSHA Witten 10/29/2007	<p>1- The current language requires DCV in lobbies and common areas of medical buildings and this is not acceptable.</p> <p>2- Reliability, responsiveness, and long term stability of CO2 sensors have not been addressed</p> <p>3- Considering many reports of sensor failures, it appears ill advised to overly broaden the DCV requirements.</p>	<p>1- Amended: Staff agrees and the 15-day language now exempts the entire medical building.</p> <p>2- Amended: Staff agrees and the acceptance requirements for the CO2 sensors in JA7.5 have been improved to address sensor reliability and performance.</p> <p>3- Amended: Staff agrees and the 15-day language has been carefully crafted to exempt buildings with high occupancies, healthcare buildings, and spaces where chemicals other than CO2 are present. The acceptance requirements have also been improved to enhance the reliability of the sensors.</p>
Section 121-124, EXCEPTION 1 to Section 121(c)3B / Cal-OSHA Written comments on March 25, 2008 and oral comments on 4/23/2008	It is not enough to just exempt DCV in Call centers, healthcare facilities, medical offices, and other similar spaces from T24; rather T24 must forbid installation of DCV in these spaces. At the very least, this Exception should be modified to require minimum OSA at all times in these occupancies.	<p>No Change: Staff disagrees with this comment for several reasons:</p> <ol style="list-style-type: none"> 1. Many of these spaces, such as healthcare facilities are “I” occupancies and are not under the jurisdiction of the CEC and therefore we cannot impose regulations on them. We have provided Exceptions for these spaces and that is the best we can do at this time. 2. There has never been a prohibition against installing DCV in these spaces and there are no evidence that harm is being

Section / Commenter	Summary of Comment	Response and Action
		<p>done.</p> <ol style="list-style-type: none"> 3. Banning DCV altogether will stifle innovations. The industry is constantly responding to challenges imposed by these and other spaces, banning DCV will impede future innovation. 4. Currently, DCV is allowed in all these buildings and staff has no evidence that there exists a problem related to this. 5. This is an issue that we plan to revisit in the next round of standards after PIER sheds more light on the issues.
Section 122(b) 4. and (h) / Nena Silva, Email comment on 4/27/2008	This is absolutely not acceptable. No one has any right to control anything in a privately owned building in a free country, except the owner.	No Change: Staff disagrees. The language in this section provides the capabilities (hardware and software) for future demand response actions by the owner; it does not mandate participation in DR programs. The eventual participation will be decided by the building owner/occupant in cooperation with the local utility.
Section 125 and Reference Nonresidential Appendix NA7 / SMACNA	<p>Section 125.a.1 and Appendix NA 7.5.1, Verification of ventilation rates in occupied spaces - We agree that testing air flows at the supply registers is critical to ascertain proper ventilation and flow to occupied spaces.</p> <p>We suggest that the following language be placed in Section 125 Required Non-Residential Mechanical System Acceptance: All HVAC systems covered by this Section should be balanced and verified by a third party who is currently certified with either the Associated Air Balance Council (AABC) www.aabcdirect.com, National Environmental Balancing Bureau (NEBB) www.nebb.org, or the Testing Adjusting and Balancing Bureau (TABB) www.tabbcertified.org. A certified balancing report signed, stamped and should be provided to the building owner, CEC and the appropriate Code authority.</p>	<p>No Change: This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.</p> <p>The proposed certification of TAB Agencies is also a new proposal and should be presented in the Next Standards cycle.</p>
Section 125 / SMACNA - Erik S Emblem 3E International Incorporated Written comments on 4/1/08	This section includes acceptance requirements for space conditioning equipment that must be performed satisfactorily before a certificate of occupancy can be issued. This proposed edit by the commenter would waive the acceptance requirements if the installation is done by an individual who is certified by any of the following entities; N.E.B.B., A.A.B.C., T.A.B.B.	No Change: Staff disagrees with this comment. Acceptance requirements are there to ensure that all systems perform according to specifications before occupancy begins; there are many reasons why some equipment may not work properly and the acceptance requirements are there to make sure that this does not happen. It does not make sense to waive the acceptance requirements just because the installer is certified by a specific organization; the equipment could still malfunction and must be corrected by performing acceptance testing.
Section 125(a)1, and Appendix NA 7.5.1, Verification of ventilation rates in	The proposed standards would require measurement of total outdoor air flows, presumably at the outdoor air intake. We recommend also requiring testing and balancing of air flows at supply registers, which can have low flows because of improper	This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking. ARB should submit this as a new proposal for the cycle of standards.

Section / Commenter	Summary of Comment	Response and Action
occupied spaces / ARB	installation or design. This requirement is necessary to reduce under-ventilation, improve thermal comfort, and facilitate compliance with Cal OSHA regulations (Title 8, Sec. 5142). This type of testing is already done routinely in most new buildings, and was included under the air balancing requirements in Section 121(f) of the 2001 standards.	
Section 126(d)2 / Ira Richter, Jon McHugh	Section 126(d)2 is currently limited to evaporative condensers but the intent was that it should also apply to condensers served by cooling towers. Change the language to (highlight added): “Condensing temperatures for evaporatively cooled condensers under design conditions shall be less than or equal to:”	No Change: Staff disagrees. The words “evaporatively cooled condensing units” refer to Freus system compliance option. This systems sprays water from a reservoir directly onto the evaporative coils. The compliance option to approve this was done only for residential buildings. Staff and consultants suggest the following edits: “Condensing temperatures under design conditions for systems served by evaporative condensers or cooling towers, shall be less than or equal to...”
Section 130(d)1b / Bernie Bauer	The proposed minimum wattage for recessed incandescent luminaires, based on luminaire aperture size, does not allow models that were used to support 2008 Tailored Method retail lighting models.	Amended: Bernie suggests using mounting height in lieu of using aperture size. Benya counters with a combination of mounting height and aperture. Edit supported by NEMA, Cheryl English, Benya, Bauer, McHugh and Flamm. 15-day language supported using a combination of mounting height and aperture. The 15-day language has been edited to reflect this change.
Section 131(c)1 daylighting definitions / Jon McHugh	McHugh proposed T24 45-Day language definitions for daylighting to the ASHREA 90.1 committee. The 90.1 committee made improvements to the definitions. McHugh suggested making T24 similar.	No Change: Staff agrees and has incorporated the comments as suggested by McHugh. In addition to moving the definitions from Section 101 to Section 131(c)1, staff edited the definitions to be consistent with 90.1
Section 131(c)2A / Splitt	Who is supposed to provide the skylit area on the plans?	No Change: This comment is not a part of this rulemaking. This will be clarified in the forms and the compliance manuals. The regulations state the requirements; the compliance manuals will provide guidance about who should fill out the forms. The commenter is concerned that skylit areas are to be shown on the plans, but T24 doesn't say what plans and who's supposed to actually do this, This is not related to this rulemaking; these can be clarified in the compliance manuals.
Section 131(c)4.A / Splitt in written comments	Adequate illumination is provided by the correct design of the fenestration and lighting fixtures, not the photo sensor	No Change: Staff disagrees; the placement of the photosensor is part of the correct design to provide adequate light.
Section 131(c)4.C / Splitt in written comments	Shouldn't the range be 30% to 70%?	No Change: Jon McHugh points out that 50% can also include zero. This is the correct % for daylighting.

Section / Commenter	Summary of Comment	Response and Action
Section 131(d)(4) / NEMA written comment 12/14/07	<p>Mandatory occupancy sensor in some rooms.</p> <p>NEMA recommends a list of exceptions. However, Wattstopper says they were not consulted by NEMA, and as a NEMA member, do not support the proposal.</p>	<p>No Change: Staff does not agree and has not amended as NEMA requested because:</p> <ol style="list-style-type: none"> 1. They would completely undermine the effect of the proposed requirement, 2. Requirement contradicts measure supported by template that was publically presented. 3. Requirement is an alternate way of addressing one element of PIER study on classroom lighting. 4. Other major control manufacturers do not support this NEMA comment.
Section 131(d)(4) / Wattstopper written comment 2/5/08	<p>Wattstopper disagrees with NEMA's 12/14/07 written comments, recommended changes for Sections 119(f). 131(d)</p>	<p>No Change: Staff agrees with this comment. NEMA's requested exemptions were not added. Wattstopper is disappointed that, as a member of the NEMA Lighting Controls Committee, they were not consulted before NEMA sent their 12/14/07 letter to the Energy Commission. The Wattstopper 2/5/08 letter, and the Sensor Switch 2/6/08 letter both disagree with NEMA's 12/14/07 letter regarding lighting controls. NEMA's recommendations did not represent the major control manufacturers. Major control manufacturers agree with the language as amended.</p>
Section 131(d)(4) / Sensor Switch written comment 2/6/08	<p>Sensor Switch disagrees with NEMA's 12/14/07 written comments, recommended changes for Sections 119(f). 131(d)</p>	<p>No Change: Staff agrees with this comment. NEMA's requested exemptions were not added. Sensor switch supports Wattstopper's position, above.</p>
Section 131(f) / Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008.	<p>Doesn't §131(e) already require this regardless of compliance method?</p>	<p>No Change: There is no conflict here. Subsection (e) deals with all display lighting regardless of the compliance approach and it further says that it cannot exceed 20 amps. Subsection (f), however, deals with tailored lighting only and includes ornamental and general lighting.</p>
Section 143(a) / Hashem Akbari-LBNL	<ol style="list-style-type: none"> 1- Exception for BIPV should only be applied to the part of the roof that is covered by BIPV. 2. The proposed reflectances for low-sloped products are less than Energy Star values. 	<ol style="list-style-type: none"> 1- Amended: We agree with the comment and have changed this language in the 15 day, and get rid of BI solar thermal language 2. No Change: Staff disagrees. Energy Star values are based on 0.25 "initial reflectance" or 0.15 "aged reflectance" value. Staff has proposed an "aged reflectance" value of 0.20, which is more aggressive than Energy Star. The 0.20 aged value requires the whole range of asphalt shingle colors to be upgraded to a new technology for the California market. This is a major accomplishment of the 2008 standards.
Section 143(a)1Aiii / Hashem Akbari-	<p>For climate zones other than 10, 11, 13, 14, 15 make the prescriptive reflectance equal to 0.30</p>	<p>No Change: This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.</p>

Section / Commenter	Summary of Comment	Response and Action
LBNL		
Exception Section 143(a)1Ai4 / Hashem Akbari-LBNL	Eliminate the exception that allows ballasted roof greater than 25#/sf to not meet the cool roof requirement.	No Change: Staff disagrees. The energy analyses by our consultants demonstrated the energy equivalence to a cool roof. Also, note that there is no reliable method to establish reflectance for ballasted roofs.
Exception Section 143(a)1Ai4 / Mike Enis SPRI Also as written comments after the 12/17/07 Hearing	The density for ballasted roofs should be set at 17#/sf and not 25#/sf.	No Change: Staff disagrees. This is inconsistent with the study that our consultants have conducted. If the industry wants to pursue this then they should use the compliance option process.
Exception Section 143(a)1Ai4 / Gillenwater in written comments	The density for ballasted roofs should be set at 15#/sf and not 25#/sf.	No Change: Staff disagrees. This is inconsistent with the study that our consultants have conducted. If the industry wants to pursue this then they should use the compliance option process.
Section 143(c) / Blomberg email dated 12/14/07	Reduce the skylight ceiling height requirement in nonres buildings from 15 to 12 feet. He claims that this change can be cost effective for lower ceilings.	No Change: Staff disagrees. PG&E and HMG have looked at different buildings and ceiling heights and did not find the skylights are cost effective for 12 foot ceilings. They did, however, find the skylights are cost effective in buildings as small as 8,000 sf as opposed to the current 25,000 sf requirement.
Section 143(c) / Splitt in written comments	How are roof monitors and clerestory windows accounted for in the requirements for daylighting?	No Change. This is not part of this rulemaking. These details for handling these systems will be described in the compliance manuals. There are too many details for the standards which will cause confusion for the user to handle in the standards.
Section 144(b)1 / Splitt in written comments	This section states that only load calculation programs approved by the Commission can be used to size equipment. Where can one find a list of these approved programs?	No Change. Load calculations are described in chapter 4, mechanical systems, of the nonresidential compliance manual. This is also covered in Section 150(h) for residential buildings.
Section 144(g) / CABEC written comments 12/17/07	Exception 4 to Section 144(g): Where total capacity of all electric-resistance heating systems serving the building...3 kW. Is the 3kW exception supposed to apply to any tenant improvement? If only apply to entire building, should read: "Where the total capacity of all electric-resistance heating systems serving the entire building, excluding those allowed under Exception 2, is no more than 3 kW.	Amended: Staff agrees with the comment, the language has been modified.
Exception to Section 144(j)1 / Splitt in written comments on January 3, 2008, April 21, 2008, and	1- "Hydronic Variable Flow Systems" does not have an exception for small hydronic (Radiant/Convection) heating systems. "No more than 3 control valves" is not sufficient. How about adding this exception? "Exception: Systems where individual pump horsepower does	1- Amended: Staff agrees that there should be an exemption for total system horsepower but not the individual pumps, because the Standards requirements states that the entire system flow must be variable and not the individual pumps. The following has been adopted:

Section / Commenter	Summary of Comment	Response and Action
<p>oral comments on April 23, 2008.</p>	<p>not exceed 1½ HP.”</p> <p>2- Splitt asks if all pumps over 1-1/2 HP must be variable flow drives under the revised Exception?</p>	<p>“Exception 2 to 144(j)1 Systems having a total pump system power less than or equal to 1-1/2 HP.”</p> <p>The first exception for no more than 3 control valves becomes Exception 1</p> <p>Total pump system horsepower is used in 144(j)5.</p> <p>2- No Change: The answer is no. The system flow as a whole must be variable not individual pumps. Having variable flow drive is one way of doing this, but there are other options such as staging the pumps.</p>
<p>Sections 144(k), 149 (b)1.D, 149 (b)1.E, 152 (b)1.D, 152 (b)1.E, Tables 151 – B, C, &D, Reference Residential Appendix RA2.6, Reference Nonresidential Appendix NA1 / SMACNA - Erik S Emblem 3E International Incorporated</p> <p>Written comments on 4/1/08</p>	<p>These sections include third party HERS verification requirements for space conditioning equipment that must be performed satisfactorily before a certificate of occupancy can be issued. This proposed edits by the commenter would waive the HERS verification requirements if the installation is done by an individual who is certified by any of the following entities; N.E.B.B., A.A.B.C., T.A.B.B.</p>	<p>No Change: Staff disagrees with this comment. HERS verification requirements are there to ensure that the all systems perform according to specifications before occupancy begins; there are many reasons why some equipment may not work properly and the HERS verification requirements are there to make sure that this does not happen. It does not make sense to waive the HERS verification requirements just because the installer is certified by a specific organization; the equipment could still have defects that must be detected and corrected through third party verification.</p>
<p>Section 145 / Steve Taylor</p>	<p>We were made aware of the following revision to DHW requirements in Section 145:</p> <p>This change basically outlaws electric domestic water heaters. Questions/comments.</p> <p>1. We would like to see the life cycle cost analysis that justifies this revision. Mark searched the CEC site and could not find any associated reports.</p>	<p>Amended: Staff has proposed edits to these sections to address the commenter’s issues.</p> <p>Amended: Staff agrees and has returned the nonresidential prescriptive requirements to the 2005 language with the exception that hotel and motel water use in modeled using low rise residential approach.</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>2. Is there an “approved calculation method” and if so where is it defined?</p> <p>3. This outlaws heat pump water heaters (unless they are justified but this possibly undefined “approved calculation method”). Were heat pump water heaters considered in the life cycle cost analysis?</p> <p>4. This outlaws point-of-use electric water heaters, which eliminate recirc systems and associated piping losses. Was this considered in the life cycle cost analysis?</p> <p>5. This even outlaws instantaneous water heaters commonly installed at kitchenette sinks. It is almost impossible to install a fuel-fire heater in such an application given the combustion air, venting, and gas piping requirements. Was this considered in the analysis?</p> <p>6. This would outlaw booster heaters as might be installed at a dishwasher to avoid having to maintain a high temperature in the central water heating system. Was this considered in the analysis?</p> <p>Suggestions: Allow exceptions for small electric resistance heaters below a certain kW so that under-counter instantaneous water heaters and small heaters a tenant may install for a kitchenette are exempt. Limit the requirement to systems with recirculation pumping systems or heat-trace systems, which would allow and even encourage point-of-use water heaters Exempt booster heaters such as those at dishwashers Allow heat pump water heaters to meet the requirement without additional analysis</p>	
Section 146 / CEC Staff	Minor edits needed for clarity and correction	Amended: Gary Flamm has made these edits for clarity: <ol style="list-style-type: none"> 1. Section 146(a)3 C, L, M, and R for clarity. 2. Added new Section 146(a)2F in response to also having added a PAF for demand response lighting controls (see note 6 below). 3. Section 146(b)1 and 2 for clarity 4. Section 146(c)3B i and ii for clarity 5. Table 146-C errors corrected. Mistake was made in copying 2005 PAFs for rows 2 and 4 to the new PAF table, (PAFs for the multi-level occupant sensors for hallways and stacks). The PAF numbers were never proposed to be changed, but were somehow inverted. Gary returned the number back to the correct 2005 numbers. 6. Table 146-C. In response to informal comments, added an

Section / Commenter	Summary of Comment	Response and Action
		additional PAF of 0.5 for demand responsive lighting controls. Also rearranged sequence in table to be more logical. 7. Table 146-C added new Note 1 to bottom of table to clarify PAFs not available for lighting controls required by T24.
Section 146(a)(2) / NEMA written comment 12/14/07	Occupancy Sensors, to qualify for PAF, must have ...multi-level circuitry and switching. NEMA says “multi-level circuitry and switching” needs to be defined here.	No Change: Staff disagrees with NEMA because the definition is imbedded in 146(a)(2)(D). If additional clarification is needed, it can be done in the Nonresidential Compliance Manual, which is not part of this rulemaking.
Section 146(c)3.B.iv / Splitt in written comments	The display cases in religious worship & museum occupancies are not normally used for “merchandise” for sale.	Amended: Staff agrees with the comment. The language has been edited to address this comment.
Section 146(a)(2) / NEMA written comment 12/14/07	Occupancy Sensors, to qualify for PAF, must have ...multi-level circuitry and switching. NEMA says “multi-level circuitry and switching” needs to be defined here.	No Change: Staff disagrees with NEMA because the definition is imbedded in 146(a)(2)(D). If additional clarification is needed, it can be done in the Nonresidential Compliance Manual, which is not part of this rulemaking.
Section 146(2)(3), Exceptions to Section 146./ Musco Lighting written comments 010908	Musco wants to add a new exception for large indoor sports venues for wattage used during sporting events.	No Change: Staff disagrees. Adding this exception would significantly increase energy use and staff believes there is no justification for adding this as an exception
Section 147 / CEC Staff	Minor edits needed for clarity	Amended: Gary edited Section 147(d)1A and B for clarity.
Section 147 / Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008.	1- Outdoor lighting requirements are too complicated, use IES recommendations, have software do the calculations; disallow certain light sources instead of LPDs. 2. ...nowhere require that the outdoor lighting spaces be provided on plans. Whereas in the sections on the indoor skylighting and side-lighting, the Commission actually has required that someone provide these drawings.	1-No Change: Staff disagrees. Jim Benya, the Commission’s consultant expert on lighting, responded to these questions by stating that current CAD software programs can delineate various function areas and can assign luminaires and calculate the LPDs. CEC consultant, Jim Benya also testified that we’ve made significant improvements and simplifications on the outdoor lighting Standards. For example, there will only be one type of hardscape. Jim disagrees with delineating on plans. To suggest that we should simply ban certain light sources and do away with LPDs makes no sense as it will fail to save any energy. The new “Layered Method’ is an attempt to simplify the outdoor lighting. The NCM can provide more explanation. 2- No Change: Staff disagrees. Currently, the OLZ is checked on OLTG-1-C. Staff sees no reason to require this information to be on the plans. Furthermore, it seems better to locate them in a

Section / Commenter	Summary of Comment	Response and Action
		consistent location, as on OLTG-1-C. This is a Nonresidential Compliance Manual issue. Lighting designers have disagreed with this proposal and there is not sufficient time to resolve differences at this late date.
Section 147, Exception 4 / Musco Lighting written comments 010908	Sport, Athletic Field, and Children Playground exempt from Section 147(b). Musco wants lighting controls to not be exempt for these applications.	No Change: Staff disagrees. There is nothing in the Standards that exempts these applications from the Section 132 outdoor lighting control requirements. There is no technical or economic justification for making this change.
Section 149 / CABEC written comments 12/17/07	<p>Could be erroneously construed that additional electric heat may not exceed 150% of existing electric heat.</p> <p>a) Exception 2 unclear. Exception 2 to Section 149(a): When an existing system with electric reheat... may be expanded so that the total capacity does not exceed 150%....</p> <p>b) Exception 1 should be stricken.... CABEC suggested high-rise res & hotel/motel envelope changes be subject to prescriptive envelop, including fenestration area limits, similar to 152(b)1. Advocate small new glazing area exemption from fenestration area limits as 152(b)1. Because proposed envelope compliance not accepted, no reason for Exception 1.</p> <p>c) 1.A i.i Exception 2. Reference should be 149(b)1.A.i.i., not 149(b)A.(i.)</p>	<p>a- Amended: Staff agrees with comment. Exception 2 to Section 149(a) has been edited.</p> <p>b- Amended: Staff has reviewed these comments with CABEC and has edited section 149(b) to resolve these issues.</p> <p>c- Amended: Staff has reviewed these comments with CABEC and has edited section 149(b) to resolve these issues.</p>
Section 149 / Richard Gillenwater, Carlisle Syntec Inc, April 21,2008	<p>1- There seems to be an omission for the use of thermal mass over the roof membrane that is shown in Sections 143 and 151</p> <p>2-The considerable explanation in Section 149 on the exceptions to adding insulation during the installation of a new roof on an existing building. Some of the points are sound, there are several that do not include preferred roofing techniques or miss key parameters</p> <p>3. This section states new insulation is not needed if the existing roof has an R-value of 7 or greater seems out of sorts with the efforts of the addition of insulation to save energy. The 2005 Title 24 had the minimum insulation design at R -11 with a good majority at R – 19. The 2008 requirements have a minimum of an R- 13 with a majority at R – 25.</p>	<p>1- No Change: Staff disagrees that an amendment to the standards is needed. This issue has come up several times and staff has responded by stating that the thermal mass over the roof membrane must be done through a compliance option after the adoption of the standards. The current data available does not support the thermal mass credit that the industry supports. Staff has set the thermal mass at 25 pound per square foot and that we will provide alternative weight per square foot when the compliance option was complete.</p> <p>2. No Change: This is not a part of the rulemaking. Staff will work with the industry on the language for the Compliance Manuals to provide the clarifications that are needed for the Exceptions to Section 149 (b)1Biv.</p> <p>3. In an existing building where there is no existing insulation bellow the roof deck then add the required insulation based of</p>

Section / Commenter	Summary of Comment	Response and Action
Section 149(a)&(b) / Splitt in written comments	How does one differentiate outdoor lighting additions from alterations?	Table 149A. Alterations affect altered components while new additions are places where new lighting is going in. For complex parking lots and geometries, there are some questions and answers in the compliance manuals and there will be more in the 2008 manuals. This level of detail does not belong in the standards and is not part of this rulemaking.
Section 149(b)- Roof Alterations / Phil Dregger	<p>1- Use the language “temporarily disconnecting and lifting of mechanical equipment” in EXCEPTION to 149(b)1Biv2.</p> <p>2- Questioned the costs used to determine the values in Table 149-A for reroofing applications.</p> <p>3- Incorporate not cutting wall coverings.</p>	<p>1- Staff agrees and has had several WebEx and conference call with stakeholders including ARMA on this issue. The 15-day language amendments represent the consensus of the group.</p> <p>2- Staff agrees and has had several WebEx and conference call with stakeholders including ARMA on this issue. The 15-day language amendments represent the consensus of the group.</p> <p>3 Staff agrees and has had several WebEx and conference call with stakeholders including ARMA on this issue. The 15-day language amendments represent the consensus of the group.</p>
Section 149(b)1 / John Briton	In highrise res with electric resistance heating, there are no options for installing a gas equivalent replacement. Another word, if they pull the electric heating out, they have to go to gas heating or heat pump, because they are treated as alterations.	Staff agrees and has proposed the following exception into the 15-day language: EXCEPTION 149(b)1 C Electric resistance heaters which are replaced without increasing the capacity shall be treated as repairs for multi-family rise building dwelling units.
Section 149(b)1B / ARMA Email	<p>1- ARMA has requested the cost effectiveness study for Section 149 to require adding insulation to many roofs as part of reroof projects.</p> <p>2- The exception to 149(b)1Biv requires 4 inch curb between insulation and mechanical equipment. ARMA argues that manufacturers’ recommendation is 6 to 8 inches.</p>	<p>1- The cost effectiveness study has been provided to ARMA. Staff, AEC, and ARMA have reached consensus on the cost effectiveness of cool roof measures.</p> <p>2- Staff agrees and this Exception has been modified to address ARMA’s issues.</p>
Section 149(b)1Biv / Phil Dregger Representing ARMA Written comment	Recommends clarifying requirements for existing roofs with radiant barriers.	Staff disagrees. Radiant barriers are not a requirement for Tile 24 Nonresidential buildings. Also no credit can be taken for installing a radiant barrier in a Nonresidential building. There has been no evidence for having a radiant barrier and a cool roof would be detrimental to the roofing product.
Exception to Section 149(b)1Biv / Gillenwater in	Add the words “during the removal of an existing roof system” to the Exception.	Staff disagrees. This exception is in the alterations section and therefore will only apply to existing roofs.

Section / Commenter	Summary of Comment	Response and Action
written comments		
EXCEPTION to Section 149(b)1Biv2- Roof Alterations / Bill Callahan	The 4 inch curb height requirement between insulation and mechanical equipment in reroofing does not work. They want 8 inches	Amended: Staff agrees with its consultants and have edited this section to address the roofing industry concerns.
Exception 2 to Section 149(b)1Biv / Bill Callahan and Martha Dunham Written comments, 3/12/08 and oral comments on 4/23/2008	Does not agree with the with the way we have worded the exception It reads, "If mechanical equipment is located on the roof and it will not be disconnected and lifted as part of the roof replacement and if the height from the roof membrane surface to the top of the base flashing is equal to or less than 8 inches (203 mm), then additional insulation is not required. They oppose this because of the high cost that is associated with the reconfiguration associated with the work that will be needed to be done. The commenters have disagreed with the cost analysis prepared by our consultants.	No Change: The commenters have argued that the cost analysis by the Commissions consultants does not reflect many "real world" situations. Staff Disagrees. Our consultants have done a benefit cost and found out that If you lift the equipment off of the curb sleepers then extensions can be done to then at an inexpensive cost. So insulation can be added. CEC Staff and its consultants conducted a phone conversation with Mr. Callahan and Ms. Dunham and have agreed to provide more information in the Compliance manuals regarding this mater.
Exception 2 to Section 149(b)1Biv / John A. Goveia - Pacific Building Consultants, Inc, also by Phil Dregger	Disagrees with the wording of the Exception and think the wording is confusing and questions the cost effectiveness the requirements.	Amended: Staff agrees and has had several WebEx and conference calls with stakeholders including ARMA on this issue. The 15-day language represents the consensus of the group.
Section 149(b)1.F.&J / Splitt in written comments	What are the procedures for meeting these requirements for outdoor lighting alterations?	No Change: This comment is not part of this rulemaking. These requirements are described in the 2005 compliance manual and will be expanded in 2008.
Section 149(b)2B / CABEC written comments 12/17/07	Incomplete sentence. What about "the existing plus alteration?"	Amended: Staff agrees with the comment. The language in section 149(b)2B has been modified.
Section 150(e) / Larry W. Anderson, Exponent Failure Analysis Associates	I am wondering why the CA Energy Code Section 150 says to bring combustion air ducts directly into the firebox, when this code says to terminate them outside the firebox. See paragraph 11.5.2 of the enclosed NFPA Standard 211.	Amended: Staff agrees and has worked with the commenter and proposed new edits to address these concerns. The 15-day language amended this.
Section 150(e)	Wood burning masonry fireplaces are not allowed to have outside air supplied to the fire box or combustion chamber based on NFPA.	No Change; Staff disagrees. Staff has reviewed the state fire code. No references to fireplaces in the fire code. We also looked at mechanical code, and the mechanical code refers to NFPA code for the requirements. This includes the language that combustion air cannot be delivered into the fire chamber. Amended: Staff agrees. Modifications were made to Section 150(e) to include the appropriate requirements for masonry

Section / Commenter	Summary of Comment	Response and Action
		fireplaces
150(j)1.A / Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008.	What about storage electric water heaters?	No Change: There are not any exterior insulation requirements for electric water heaters and there never have been. Under the T24, electric water heaters are extremely difficult to install (requires substantial tradeoffs) and therefore this is a minor energy use. This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.
Section 150(j)1.B / Splitt in written comments	Most unfired hot water tanks do not have R-value labels. The CEC should require that unfired tanks with less than R-16 insulation and an attached label can only be sold in California if the seller includes a properly sized R-12 insulation blanket at the time of sale.	No Change: Staff disagrees. Our understanding is that this section already says what Splitt is asking. We do not see the problem here. It appear what Splitt is suggesting is point of sale requirement and does not belong in the building standards.
Section 150(j)4 / Splitt in written comments	Does this mean that only SRCC certified collectors & systems will be able to be installed on residences in California?	Yes.
Section 150(k)(8 and 9) / CABEC written comments 12/17/07	Lighting in Kitchens. Excludes internal cabinet lighting. May allow loophole using glass doors to illuminate kitchen room. Required auto control or allow only when cabinet doors opaque.	Amended: Staff agrees and worked with the commenter to create new definition of internal cabinet lighting to address problem; the language has been modified accordingly.
Section 150(m)9 and 150(j) / Howard Ahern PLUMBEREX	<p>Standard 150(m)9 needs to include the language "no adhesives "or no tape".</p> <p>Reason: Many contractors are using tape i.e., duct, line set tape etc. that defeats the propose of the code.</p> <p>The standard is specific in stating:" protected by aluminum, sheet metal, painted canvas, or plastic cover."</p> <p>Tape is a far cry from the intent of this code; it uses adhesives that break down under moisture and California's warm weather causing the tape to simply unravel thus defeating the purpose of the code to protect the insulation.</p>	<p>No Change: This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.</p> <p>No Change: For the next round of standards, if this person has any evidence that these products are a problem, we can consider changes to the language.</p>
Section 150(m)10 / Splitt oral comment on 4/23/2008	There's section 150(m)(10) doesn't allow porous inner core flexible duct. Well, there's duct work called acoustic duct that's used for sound attenuation. And there are many manufacturers; this is just one, J.P. Lamborne. This is a product that's used a lot. And you've just made it illegal. And I'm sure these people don't know about it, and they're going to be really upset once they figure out that you kind of 24 put them out of business.	No Change: This is not a new change and not part of this rulemaking. This went into effect with the 2005 Standards. The adoption was extensively discussed at the time and no one has raised an issue.
150(o) / CALBO In written comments on January 31, 2008	Mandatory mechanical ventilation requirements for new single family homes should not be included in the 2008 standards because residential HVAC systems that can effectively incorporate outside air are not available. Specific design and	No Change: Staff disagrees with this comment. Indoor air pollution is a problem and needs to be addressed. There are several technologies that can address this problem, including a simple bathroom exhaust fan. Additional information will be

Section / Commenter	Summary of Comment	Response and Action
	installation guidelines must be provided before this requirement is added to the standards.	provided in the Residential Compliance Manual
Section 150(o) / John Crouch – Hearth Association	How would you explain the ventilation requirements of 62.2 in the compliance manual and how would that affect fireplaces?	<p>There are a number of ways to comply with 62.2 including central air handler systems and continuous running bathroom fans. These and other requirements will be presented in the upcoming revisions to the compliance manuals. Standard 62.2 requires that all combustion appliances inside the home, including fireplaces, have combustion air, and be adequately vented as follows:</p> <p>“6.4 Combustion and Solid-Fuel Burning Appliances Combustion and solid-fuel burning appliances must be provided with adequate combustion and ventilation air and vented in accordance with manufacturer’s installation instructions, <i>NFPA 54-2002/ANSI Z223.1-2002, National Fuel Gas Code</i>,³ <i>NFPA 31-2001, Standard for the Installation of Oil-Burning Equipment</i>,⁴ or <i>NFPA 211-2000, Standard for Chimneys, Fireplaces, Vents, and Solid-Fuel Burning Appliances</i>,⁵ or other equivalent code acceptable to the building official.</p> <p>Where atmospherically vented combustion appliances or solid-fuel burning appliances are located inside the pressure boundary, the total net exhaust flow of the two largest exhaust fans (not including a summer cooling fan intended to be operated only when windows or other air inlets are open) shall not exceed 15 cfm/100 ft² (75 Lps/100 m²) of occupiable space when in operation at full capacity. If the designed total net flow exceeds this limit, the net exhaust flow must be reduced by reducing the exhaust flow or providing compensating outdoor airflow.”</p>
Section 150(o). Ventilation for Indoor Air Quality, Reference to ASHRAE 62.2-2007 and Reference Residential Appendix / SMACNA	<p>There seems to be some dialogue that the 2007 ASHRAE 62.2-2007 may have gone to far when it lowered required air change requirements in residential design. The new standard takes into account infiltration for reaching the required outside air requirements however not considering that homes today are tighter than homes used to establish the 2007 standard. We recommend that reference to the 2004 ASHRAE 62 Standard remain until verification of the infiltration claims are substantiated through valid research and study.</p> <p>Appendix RA. Acceptance Requirements for Mechanical Ventilation (MV) - ARB recommends that MV systems be “acceptance” tested to verify adequate air flows, filtration, control system, duct design, accessibility and labeling. We support this recommendation.</p>	<p>No Change: Staff disagrees. SMACNA is saying that there needs to be more ventilation than 62.2; however, 62.2 is the consensus standards and there are no basis for changing the current consensus standards.</p> <p>No Change: The proposed mandatory requirement to meet ASHRAE Standard 62.2-2007 is the first time that mechanical ventilation has been required for new low rise residential construction in California. The Commission believes this will increase ventilation compared to current standards, particularly for homes with low air leakage where occupants do not regularly open windows.</p> <p>No Change: Staff disagrees. There is currently no basis for</p>

Section / Commenter	Summary of Comment	Response and Action
		requiring expensive and elaborate “acceptance” testing for every new dwelling unit. If serious problems are found with ventilation systems installed to meet this requirement, an acceptance testing program will be developed to deal with them.
Section 150(0) / Lennox	While energy efficiency is desirable, it should not be at the cost of Indoor Air Quality. Let’s not forget that this part of the standard is primarily written for better Indoor Air Quality. My recommendation is to allow for all types of mechanical ventilation systems that promote better indoor air quality. Even ASHRAE 62.2 recognizes that and does not limit the use of any specific type of ventilation system.	No Change: Staff disagrees. Central-fan integrated (CFI) mechanical ventilation systems (defined as Air Distribution Systems in the Standards) are allowed as long as they meet the prescriptive requirements for Air Distribution System Watt Draw as shown in note 12 to TABLE 151-D: <i>“Central forced air system fans used in Air Distribution Systems shall demonstrate, in Air Distribution Mode, a watt draw less than 0.58 W/CFM.”</i>
150(o) and negative declaration / Regal, Charles Davis	<p>1- The added ventilation air to satisfy ASHRAE 62.2 increases home’s energy by 15%. This impact must be analyzed for each climate zone.</p> <p>2- Bathroom exhaust fans can actually increase pollution by drawing air from the attic and other unconditioned spaces.</p>	<p>Response from Wilcox: No Change: Staff disagrees with commenter. The energy consumption of indoor air quality ventilation has been included in the Impact Analysis. The analysis presented in <u>Revision to the Residential ACM Calculation for Indoor Air Quality Ventilation</u>. Revised: March 27, 2006 http://www.energy.ca.gov/title24/2008standards/prerulemaking/documents/2006-03-28_workshop/2006-03-28_INDOR_AIR_QUALITY.PDF indicated that the statewide impact of the change in ventilation was on the order of 1% of total TDV energy consumption.</p> <p>2. Response from Wilcox: It is theoretically possible for any ventilation system to bring in pollutants from sources outside the home, we know of no studies that show residential exhaust ventilation systems make indoor air quality worse.</p>
Section 150(o), Ventilation for Indoor Air Quality / ARB	Reference to ASHRAE 62.2-2007. The Standard needs to specify the 2007 version that is incorporated by reference. In addition, the Initial Statement of Reasons indicates that the 2004 version is referenced – this needs to be corrected to the 2007 version.	No Change: The term is defined in section 101 and JA1 with 2007 in it. All references to “2007” have been removed from the standards and RA. The definition on Page 33 of the Standards 45 day language references the 2007 version, which is the correct version.
Section 150(o) / ARB	<p>The following comments refer to sections in ASHRAE 62.2-2007, which is incorporated by reference in the standard. In addition, all of these items should also be verified through the Acceptance Requirements.</p> <p>11. Sec. 4.4, Delivered Air. For exhaust-only MV systems, we recommend requiring that the central air system must cycle</p>	<p>11. No Change: The Commission has referenced Standard 62.2, the ANSI approved consensus standard for residential ventilation. The Standard 62.2 committee has considered this issue and chose to not include this requirement which would increase energy consumption.</p> <p>12. No Change: The Commission has referenced Standard 62.2,</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>periodically to improve air distribution. Ontario Province in Canada requires this feature.</p> <p>12. Sec. 4.3, Control and Operation. ASHRAE does not require kitchen exhaust systems to have a means of ensuring effective operation. We recommend requiring an automatic control of range hood and oven exhausts, such as a burner interlock or heat sensor.</p> <p>13. Sec. 5, Local Exhaust. The standards should include specific design requirements for exhaust duct design such as the number of bends, insulation level, and screen mesh size. For an example, see the State of Washington's Ventilation and IAQ Code and Builders Field Guide.</p> <p>14. Sec. 6.2, Instructions and Labeling. We recommend specifying very clear and visible labeling with user instructions. The ASHRAE 62.2 appendices give some guidance on the labeling of control systems, but this is not part of the official standard. The Washington standards and manual also have useful examples.</p> <p>15. Sec. 6.4, Combustion and Solid-Fuel Burning Appliances.</p> <p>a) We recommend that the standards include measures to reduce pressure imbalances in the home, such as undercuts of room doors, transfer registers above room doors, and additional return ducts in distant parts of the house. This is considered best practice in high-performance, healthy home design. Excessive depressurization can cause IAQ problems by drawing in air pollutants from adjacent areas such as the garage, the crawl space, and the sub-slab area, or by drawing in cold air that causes warm moist air from the home to condense in wall spaces.</p> <p>b) The standards should not allow exhaust-only systems in homes with open hearth fireplaces. This measure would avoid depressurization and backdrafting problems. Such a measure is required by the State of Minnesota building standards. Open hearth fireplaces have become less common in low-elevation regions of California in recent years, but they are still allowed in nearly all parts of California and are found in many remodeling</p>	<p>the ANSI approved consensus standard for residential ventilation. The Standard 62.2 committee has considered this issue and chose to not include this requirement. We do not believe that such a system is widely available in the residential market, proven to be reliable or shown to be cost effective.</p> <p>13. No Change: Section 7.3 of Standard 62.2 requires use of the requirements for duct design in TABLE 7.1 Prescriptive Duct Sizing.</p> <p>14. No Change: Examples will be included in the Compliance Manual for clarification.</p> <p>15a. No Change: This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.</p> <p>15b. No Change: There is no evidence that whole house mechanical ventilation systems will cause problems with open hearth fireplaces and Standard 62.2 does not prohibit them. Standard 62.2 has provisions that limit the unbalanced exhaust of large kitchen range hoods and other fans with air flows much larger than required for whole house ventilation.</p> <p>16a. No Change: Standard 62.2 does not require any filtration for standalone IAQ ventilation systems. This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking.</p> <p>16b. No Change: The vast majority of HVAC system filters in current California homes are in the return grill, usually located in the ceiling. It is not clear how builders could comply with the</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>or addition projects.</p> <p>16. Sec. 6.6, Minimum Filtration.</p> <p>a) Air filtration for the mechanical ventilation system is required to have a MERV rating of at least 6, but air filtration is only required if the duct length is over 10 feet. We recommend filtration for all MV systems in order to reduce transport of outdoor dust and allergens into the interior spaces of buildings.</p> <p>b) We recommend specifying minimum requirements for filter access. For example, filter access should not require a ladder, and space clearance should be sufficient to easily replace a filter.</p>	<p>proposed no ladder requirement without substantial additional first cost which the commenter has not attempted to show would be life cycle cost effective.</p>
<p>Section 150(0) / Building Science Corp.</p> <p>Armin Rudd (2/5/08)</p>	<p>A recent public comment on the residential ventilation requirements, submitted by Newport Ventures on December 20, 2007, stated objection to the central-fan-integrated (CFI) supply ventilation system based on simulation results reported in an LBNL publication¹. That publication was a technical paper condensed from an earlier LBNL publication² which includes more details about the simulation approach used. It would be useful for interested parties to know that the earlier publication shows that the simulation results are applicable to:</p> <p>All of those energy modeling assumptions are weighted against the central-fan-integrated supply ventilation system in ways that:</p> <ol style="list-style-type: none"> Increase the central fan operation time charged to ventilation; Increase the power draw of the central fan; and Increase the air distribution system losses. <p>A more recent simulation study³ addressed some of those deficiencies and includes more complete results for both standard and higher-performance houses. Those results were comparable to a 2001 field monitoring study⁴ conducted by the NAHB Research Center for the U.S. EPA which stated that the operating costs for CFI supply ventilation systems were moderate and competitive. I respectfully recommend that the 45 day language for residential mechanical ventilation remain as it is.</p>	<p>No Change: The proposed standard allows systems incorporating the central air handler and requires them to meet the prescriptive standard for Air Distribution System Watt Draw.</p>
<p>Section 150(p) and 114 / Donald C. Burns, California Spa & Pool Industry, Carvin DiGiovanni,</p>	<p>General concern about sweep elbows including a concern they are not cost effective. He says the sweep elbows and other measures to the swimming pools are not cost effective.</p>	<p>No Change: Consensus was reached with the stakeholders over these measures which include Mr. Burns. We think the measure still make sense and are cost effective. The original analysis was presented at public workshops and was found that the measures where cost effective. Some new language has been added to the</p>

Section / Commenter	Summary of Comment	Response and Action
Senior Director, Technical, Standards APSP, and LASCO fittings inc. Larry Workman		standards to provide added flexibility and clarity to the application of sweep elbows
Section 151 / Hodgson	The new refrigerant charge requirements will not work for maximum cooling capacity compliance option. Decouple the RC from MCC.	Amended: Staff agrees with the comment and has changed the RACM to correct this.
Section 151(e) / Splitt in written comments	Only the Commission, not the Executive Director, should be able to approve calculation assumptions and calculation methods.	Amended: We agree with the comment and have changed the language accordingly.
Section 151(f) / Mike Moore	<p>Consider the following for residential IAQ:</p> <p>If whole building ventilation is provided by a system incorporating the central air handler, that system shall be powered by an electronically commuted motor. If whole-building ventilation is provided by a balanced system that also provides heat recovery, the system shall have a maximum watt draw of 1.2 w/cfm of ventilation air based on manufacturer ratings at design conditions. All other whole-building ventilation systems shall have a maximum watt draw of 0.71 w/cfm of ventilation based on manufacturer ratings at design conditions.</p>	<p>Response from Wilcox:</p> <p>No Change: The proposed standard requires systems incorporating the central air handler to meet the prescriptive standard for Air Distribution System Watt Draw. This comprehensive standard is superior to a requirement for ECM motors because it allows builders to use high efficiency motors or improved duct systems to achieve low W/CFM and includes a post construction test to verify compliance. We do not believe that energy consumption of standalone indoor air quality ventilation systems will generally be significant and prefer to allow maximum flexibility as the industry evolves systems to meet these new requirements. The performance path rules in the ACM limit all stand alone ventilation systems to 1.2 W/CFM. We do not have any life cycle cost analysis that would justify 0.71 W/CFM criteria.</p>
Section 151(f)8E / Splitt in written comments on January 3, 2008, April 21, 2008, and oral comments on April 23, 2008.	There are several flexible insulated piping systems available for buried water lines. It is not possible to remove or replace the enclosed PEX water pipes in these systems. Does the Commission intend that the use of these products in Residential construction will be illegal in California?	No Change: Staff's requirement for installation of piping so that the pipe can be removed is critical to allow for repairs. Staff understands that other systems exist – These systems can be used as part of an installation where the inner pipe and insulation is removable. Not providing for the option to remove the inner pipe would result in having to jack hammered out the piping in the event of a problem.
Section 151(f)11Ai / Hashem Akbari-LBNL	Establish a reflectance requirement of 0.15 for asphalt shingles for CZ other than 10 through 15, parallel to section 151(f)11Aii which is for tile	This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking Our cost effectiveness study would indicate that 0.15 was not cost effective in other CZ. In contrast the 0.15 value for tile is an appropriate nominal standard design value.

Section / Commenter	Summary of Comment	Response and Action
Section 151 (f)11.B / Cool Metal Roofing Coalition	Suggested corrective language to this section. There were problem with how the SRI numbers were presented. Also, the SRI value should be 64 not 65.	Amended: Staff agrees and has corrected the problem.
Section 151(f)12 / Hindus of the Tile Roofing Institute on 4/23/2008	<p>1- The 0.20 reflectance requirements for shingles only is required in climate zones 10-15; however, the 0,15 reflectance requirements for the tiles are required in all climate zones.</p> <p>2- The Standards do not recognize the above sheathing ventilation that results from raised battens.</p>	<p>1- No Change: The 0.15 reflectance requirement is achieved by commonly available and relatively dark tiles, and was established as the nominal value for the tiles. Substantial compliance credit is available for higher performing tiles and the compliance impact due to lower reflectance tiles can be easily achieved by other building measures. Using 0.15 reflectance creates an incentive for tiles to be tested and listed in CRRC Directory to gain compliance credit. However, the 0.20 reflectance requirement for the shingles requires substantial improvement to the product that is not cost effective in all climate zones.</p> <p>2- No Change: Staff and the consultants have not been able to duplicate these results in California homes under real conditions and therefore we cannot recognize this credit. The tile industry has been encouraged to provide more evidence to the Commission that would justify a future approval of a compliance option.</p>
Section 152(a)2B / CABEC written comments 12/17/07	Wording in last sentence mangled. Correct as follows: When determining the standard design, the fenestration area shall be the smaller of the sum of 20 percent of the conditioned floor area or the addition plus glass removed from the existing building as a result of the construction of the addition , or the proposed glass area in the addition as a result of the construction of the addition.	Amended: Staff agrees with the comment. Section 152(a)2B has been changed to address this issue.
Section152(b)1 and RA3 / Michael E. Bachand, President CalCERTS, Inc.	<p>1. Standards Section 152(b)(1)(e)(iii) a 60% reduction in leakage prior to installation and a visual smoke test should require 100% HERS verification on the smoke test, as this is a major area where contractors are circumventing the Standards. See the next comment regarding the Appendices.</p> <p>2. Table RA3.1-2 we strongly urge the language retain the words “with 100% verification” in the 60% reduction of leakage requirement as this is a major area of contractor cheating already, plus, this would allow sampling of this measure, and there is just no evidence to support that fact that the contractors will do this faithfully. We have documents indicating that the 60% reduction is taken, but the final duct test by the C20 does</p>	1 & 2. No Change: While indication of crossed out “with 100% Verification” text is shown in both 45-day language and 15-day language (2008), it is apparently due to a copy paste command done in track changes by two different authors while adding an additional row in the table RA3.1-2. This should NOT be interpreted as language that was deleted. 100% HERS testing for 60% reduction in duct leakage was not present in 2005 standards language.

Section / Commenter	Summary of Comment	Response and Action
	not come anywhere near the number they indicate. If they do incorrect math and pass this through it can get into a sampling pool and have massive leaks.	
Section 152(b)2B / CABEC written comments 12/17/07	Incomplete sentence. What about, “the existing plus alteration.”?	Amended: Staff agrees with the comment. The language in section 152(b)2B has been modified.
TABLES		
Section 116, Table 116A and Table 116B note / CABEC written comments 12/17/07	Translucent or transparent panels shall use glass block values What are “translucent or transparent panels” and what are “glass block values”?	No Change: Staff agrees with the comment. Section has been edited with the changes.
Section 121, Table 121-A / Mark Hydeman and Steve Taylor	<p>It appears that residential ventilation (single family and high rise) has been left out between the changes in the CMC, CBC and Title 24. How do we get this addressed? Clearly there needs to be some emergency addendum to correct the oversight.</p> <p>Standard 62.1 now has ventilation rates for high rise residential. I plan to suggest those as an amendment to the UMC. But of course Cal-OSHA won't like those rates so I agree that for the T-24 ventilation section the best approach is to take out the reference to the CBC in Table 121A and insert instead whatever was in the 2001 CBC. I believe that the 2001 CBC only had the 15 cfm/p requirement for high rise residential, in which case you just delete that row in the table and have no area based component for this occupancy type.</p> <p>So, do you realize how confusing this all is to designers? There are now references to the UMC from the CBC then back to the CBC and to Section 121 which refers to the 2001 CBC. We told you this would happen - it was so reventable! Can I give designers your home phone numbers in case they are confused?</p>	Amended: Staff agrees that we delete the reference to the 2001 CBC in Table 121-A for high rise residential in the 15 day language. The commenters have agreed with the resolution.
Section 123, Table 123-A / Unknown Commenter	Exclude electrical heat tracing tape from the table	No Change: This is not language that can be amended because the table has been adopted from ASHRAE 90.1 and changing it may make it inconsistent with 90.1.
Section, Table 146-C / CABEC written comments 12/17/07	<p>2005 standards provide greater PAF for variable dimming systems than for stepped dimming at vertical glazing daylight areas.</p> <p>Eliminate credit distinction between two different control technologies.</p>	No Change: Staff disagrees with the comment. This change was done on purpose for simplicity. Continuous dimming generally saves more energy than stepped dimming.

Section / Commenter	Summary of Comment	Response and Action
Section 146, Table 146-F / Musco Lighting written comments 010908	<p>Area Category lighting power allowance table. Exercise Center, Gymnasium allows 1.0 W/ft².</p> <p>Musco wants to double allowance to 2.0 W/ft².</p>	<p>No Change: This is pre-existing language which is not part of the 2008 proposed changes.</p> <p>This requirement has not changed for several generations of Standards, even though lighting technology and camera technology has significantly improved. No technical justification for change. No support from other stakeholders.</p>
REFERENCE APPENDICES		
Reference Joint Appendix JA2 / Splitt written comments	Design Day Data should be listed alphabetically by City, not County. If I am working on a project in some other part of the State, I will know the city but often will have no idea what county that city is in.	No Change: These documents are available electronically in several formats and the PDF search function can be used.
Reference Joint Appendix JA.4 / Honeywell	Isopentane foams, and foams made using a mixture of HFC-245fa and isopentane show that although the absolute value of the foams' thermal conductivities are different, their rates of aging are the same in the Joint Appendix. They request that the treatment of pentane blown foams the same any other non-air blowing agent for purposes of this standard and that hydrocarbon foam should not be subject to an aging process.	No Change: This is not under our authority. We told Honeywell that this is an issue which they need to bring up with the Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation. They understood the process and plan to pursue the issue.
Reference Joint Appendix JA4 / Honeywell	<p>1- JA 4.7 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>2- JA 4.11 Second paragraph - Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>3- JA 4.18 Second paragraph - Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation.</p> <p>4-JA 4.22 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation.</p> <p>5-JA 4.24 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>6-JA 4.26 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>7-JA 4.27 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p>	<p>1-7: No Change: The JA4 will only separate out Open-cell polyurethane foam from the rest because with open cell polyurethane you would have to fill the entire cavity. With the close-cell Polyurethane and the other types of insulation described an installer only need to install the amount needed to meet the required insulation R-value which was needed for the Title 24 to pass. If close-cell Polyurethane being used then only a R-value of 5.8 (5.8 is the minimum value listed with the Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation) will be assumed and JA7, the Quality Insulation Installation Procedures for Medium-Density will need to be met.</p> <p>8. No Change: This comment stems from renumbering of some tables in JA4. Staff has pointed out the correct numbers to the commenter.</p> <p>9-13 No Change: The JA4 will only separate out Open-cell polyurethane foam from the rest because with open cell polyurethane one would have to fill the entire cavity. With the close-cell Polyurethane and the other types of insulation described an installer only need to install the amount needed to meet the required insulation R-value which was needed for the</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>8-JA 4.28 R-Value listed is incorrect. Polyisocyanurate is listed as having an R-value of 7, which is incorrect. This section should be revised to reflect an R-value for polyisocyanurate as 6.</p> <p>9-JA 4.30 Second paragraph - Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>10-JA 4.33 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>11-JA 4.45 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>12-JA 4.50 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p> <p>13-JA 4.54 Revise to add closed-cell polyurethane foam, rigid polystyrene or polyisocyanurate foam insulation</p>	<p>Title 24 to pass. If close-cell Polyurethane being used then only a R-value of 5.8 (5.8 is the minimum value listed with the Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation) will be assumed and JA7, the Quality Insulation Installation Procedures for Medium-Density will need to be met.</p>
<p>Reference Joint Appendix JA7 / Honeywell</p>	<p>1-JA7.2 Medium density foam definition needs to be revised to show both 2 lb wall and 3 lb roof application in the definition of closed-cell foam insulation along with their compressive strengths</p> <p>2-JA 7.2 We recommend that the use of vapor barrier under JA 7.3 be removed (see JA 7.3 comments) In the alternative, the language should be amended to add definitions for vapor barriers and vapor retarders to definitions section of JA 7.2 as follows: For purposes of this section: Vapor barriers have a water vapor permeance of 0.1 perms or less Vapor retarders have a permeance of 1.0 perms or less.</p> <p>3-JA 7.3 The reference here should be changed from “Vapor barrier” to “Vapor Retarder” – see comments in JA 7.2 recommending the addition of a definition for vapor barriers and vapor retarders.</p> <p>4-JA 7.3 Vapor barrier/retarder films should not be required for</p>	<p>1. No Change: The value which staff assigned to the Medium density foam is the minimum value certified with the Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation. Since there is no real method for field inspection to make sure the proper insulation is applied (staff also asked for assistance from the industry on how to conduct proper field verification) staff believes that R-value of 5.8 is to be used so that it captures all the Medium density foam insulation to provide an accurate field inspection.</p> <p>2-4 No Change: Vapor barrier is only needed for open cell polyurethane. Since open cell polyurethane has been removed from JA 7 and placed in JA 4 staff will only have a definition for what a Vapor Barrier is which will be consistent with the definition in the Standards. For Medium density foam or closed cell polyurethane insulation Vapor Barrier will not be needed.</p> <p>5. Amended: Staff agrees and this section of the JA4 has been modified and figure 3 are removed.</p> <p>6. No Change: The vented attic and Unvented attic is an issue</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>open-cell foams in most warm and temperate climate zones in California. In these particular climates, vapor retarder films are not technically justified and add unnecessary cost to the consumer.</p> <p>5-JA 7.4.2 Figure 3: Option 3 in Figure 3 should be removed from the document as a method to insulate. While the method is technically correct, it is not practical as a method to insulate since the garage ceiling and attic subfloor must be in place before the foam is applied to the band joist thereby preventing access to the installer to apply the foam. Recommend that Option 1 in Figure 3 be removed.</p> <p>6-JA 7.6.2 In the Note section of this requirement the language regarding unvented attic requirements appears contradictory or at the least, ambiguous. Does the T 24 building code permit both vented and unvented attics?</p> <p>7-JA 7.9 This section should be revised eliminating the fixed, minimum value of R 5.8/in and changing the requirement to “as reported by the manufacturer, measured in a properly aged condition per ICC AC12.” The reason for this requested change is that the R-value for closed-cell SPF can vary from R 5.8/inch to nearly R 6.9/inch.</p> <p>*In the alternative, if the CEC determines that a specific R-Value is necessary for listing in JA 7.9, the fixed value assigned should be a R-value of R6.2/inch of 2 lb closed-cell wall foam and R6.7 per inch for 3 lb closed-cell roofing foam ensuring consistency with the requirements for ASTM C1029.</p>	<p>which we believe is better addressed by allowing the local building officials to decide on how to deal with the issue since they are more familiar with climatic environment.</p> <p>7. No Change: This is not under Commission jurisdiction. The value which staff assigned to the Medium density foam is the minimum value certified with the Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation. Since there is no real method for field inspection to make sure the proper insulation is applied (staff also asked for assistance from the industry on how to conduct proper field verification) staff believes that R-value of 5.8 is to be used so that it captures all the Medium density foam insulation to provide an accurate field inspection.</p>
Reference Joint Appendix JA4 and JA7 / NAIMA	<p>1- As proposed, the table does not contain U-factors for spray applied fiber glass insulation for 2x4 and 2x6 walls. All US manufacturers of fiber glass insulation produce spray applied or blown fiber glass materials that deliver R-15 in 2x4 wall cavities and R-23 in 2x6 wall cavities. Attachments A through E are the manufacturers’ specification and data sheets for those products.</p> <p>The current table 4.3.1 provides U-factors for spray foam and cellulose materials but does not provide U-factors for blown fiber glass insulation.</p> <p>2- Section JA7.3 includes a provision that low-density SPF will</p>	<p>1&2. Amended: Staff agrees. Leave JA4 the way it is in JA4 related to low density foam and drop it from JA7. Staff has cleaned up the language JA7 to incorporate these comments related to medium density. Staff has reviewed and revised language related to the medium density foam industry. Continue to work with the industry on a compliance option for low density.</p> <p>Further, staff and industry can add this to the JA4 at anytime even after the adoption of the standards to refine the insulation values for these products. The industry will have to provide protocols for field testing of the R-values in order to revise the R-values.</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>be assigned the equivalent U-value as an R-13 wall with 2x4 framing. And an equivalent U-value as an R-19 wall when low-density SPF in installed in 2x6 framing.</p> <p>These materials are manufactured in the field by combining 2 separate components. This process is subject to the skill and knowledge of the applicator, as well as the temperature and humidity conditions under which they are installed. All of these factors can have an effect on the final R-value of the product. NAIMA believes the R-13 and 19 values are the highest R-values these materials can achieve and may not be representative of all the materials installed in actual buildings.</p>	
Reference Joint Appendix JA Table 4.5.1 / Hodgson	Allow the use of U-factors for insulated doors from NFRC since they are better than the table provided in the JA.	Amended: Staff agrees. Staff adopted new entries in the table for insulated doors in increments of R-2, The table selections can be based on specific U-factor ranges from NFRC data, or R-values based on manufactures information. If door has less than 50% glass, it will be treated as door and will get compared against a standard design that is based on 0.50 U-factor , only the actual area of the glass area will be accounted towards total building fenestration areas. For the proposed design one can use the NFRC values for U-factor or defaults in JA4.
Reference Joint Appendix JA7 / Icynene and NCFI Polyurethanes	Icynene provided general editorial and clarifying comments on JA7	Amended: Staff agrees. This appendix is being re-written which will address these comments. Staff has removed the open Cell SPF insulation from JA7. In the Reference Appendices JA4, Open cell SPF has been assigned an R-value of 3.6 per inch and the insulation needs to fill the entire cavity. This remains the same as in the 2005 JA IV. Open Cell insulation will not be represented in JA7 for a QII. Staff also contacted Icynene and informed them of this. Icynene was satisfied with our decision.
Reference Joint Appendix JA7 / Lyle Ork	The industry has worked with staff regarding medium density only and was surprised when the chapter tried to capture low density. He believes there are multiple problems related to low density.	Amended: The low-density spray foam has been removed from the JA.7. Low-density spray foam has been represented in the appropriate tables in JA.4 the cavity assembly section.
Reference Joint Appendix JA7 / Hodgson	Concern regarding Medium vs. low spray foam he will send it in writing.	Amended: The low-density spray foam has been removed from the JA.7. Low-density spray foam has been represented in the appropriate tables in JA.4 the cavity assembly section.
Reference Joint Appendix JA7.9 / Jim Francisco NCFI	The R-value for spray foam should not be R-5.8/in. Industry values range from 6.2-7.1.	The values in this JA table are based on certified values to the Bureau of Home Furnishings. There is a process for updating the JA tables whenever industry has reliable new information. This process should be used to address this comment. Staff has

Section / Commenter	Summary of Comment	Response and Action
		<p>reviewed the most up to date directory with the help of staff from the Bureau of Home Furnishing and found Medium Density Spray foam Ranges in R-value from 5.8 to 7.2 per inch. To capture all the Medium Spray foam from the different companies represented in the directory staff will keep the rating for R-value at 5.8/in</p>
<p>Reference Nonresidential Appendix NA6 / Splitt in written comments</p>	<p>1- For fenestration, responsibilities for Compliance are also way too complicated. One of the responsibilities of the Energy Consultant is supposed to be determining that the center of glass values given in the manufacturers' literature has been "determined using methods consistent with NFRC standards.</p> <p>2- There is absolutely no reason to require any manufacturer's documentation at the time a building permit is applied for.</p>	<p>1- Amended: Staff agrees and amended by clarifying that NA6 to include that it is a manufacturer's responsibility according to NFRC standards, not the energy consultant. It is the manufacturer's responsibility to use NFRC's procedure to provide the center of glass for both U-factor and SHGC – not the consultant.</p> <p>2- No Change: Staff agrees with comment. The standards does not require such documentation, nor in NA6 and NA7.</p>
<p>Reference Nonresidential Appendix NA7 / Splitt in written comments</p>	<p>Acceptance Requirements (for fenestration) are also too complex. Here is just one example. The acceptance requirements for site-built glazing require verification that a purchase order or detailed payment receipt matches the delivered product, the energy compliance documentation and the plans! What is that all about?</p>	<p>No Change: The point here is to make sure that the glass, spacer, and frames that are purchased and installed in the building are the same or better than the components that are on the NFRC label certificate. The field inspector cannot know if the right fenestration product is installed in the building unless he can verify the right components are purchased and installed. The purchase order has CDP numbers or other descriptors for glass, spacer, and frame that can be checked against the CPD numbers on the label certificate. Does the commenter have other suggestion for this verification? Also, it is the responsibility of the "responsible party", which can be an architect, engineer, designer in charge, builder or owners agent as indicated in NA7 would be responsible of the installation and there is NO THIRD PARTY!</p> <p>Also there is no third party verification for fenestration.</p>
<p>Reference Nonresidential Appendix NA7 / Splitt</p>	<p>1- Splitt thinks that the acceptance requirements for skylights writing are too technical: "...<i>whoever wrote that probably it all makes sense to him because he's seeing what happens. But it's not in the words.</i>" He recommends dropping the acceptance requirements because the text is too complicated to allow meaningful evaluation of 45-Day language.</p>	<p>No Change: Staff disagrees with comment. Staff has worked extensively with stakeholders on these Acceptance Requirements including the PG&E team, CLTC and Benya Lighting Design to come up with consensus edits for this section to clarify the intent.</p> <p>The acceptance requirements for daylighting in JA7 completely re-written for 2008. Staff disagrees that acceptance requirements should be drooped ; acceptance testing is very important to</p>

Section / Commenter	Summary of Comment	Response and Action
		ensure that all equipment installed works as they were intended to.
Reference Nonresidential Appendix NA7 / Michael Taylor	Acceptance testing is not working, building departments do not require them, and compliance software do not generate them.	<p>No Change: Staff agrees and will be working with the building departments to improve the enforcement of the acceptance requirements.</p> <p>It is not clear how the compliance software would generate and fill out these forms. The testing agents must fill out the forms upon completion of testing.</p> <p>These issues are compliance manual related and not the 15-day language.</p>
Reference Nonresidential Appendix NA7.5.5. / Cal-OSHA Written comments on March 25, 2008	<p><i>Step 2: Simulate a signal at or slightly above the CO₂ concentration <u>predictive setpoint, which must be less than the maximum CO₂ concentration permitted</u> required by Section <u>121(c)4C</u>. Verify and document the following:</i></p> <ul style="list-style-type: none"> • <i>For single zone units, outdoor air damper modulates opens to satisfy the total ventilation air called for in the Certificate of Compliance.</i> • <i>For multiple zone units, either outdoor air damper or zone damper modulate open to satisfy the zone ventilation requirements.</i> <p><i>Step 3: Simulate signal well below the CO₂ <u>predictive setpoint</u> . Verify and document the following:</i></p> <ul style="list-style-type: none"> • <i>For single zone units, outdoor air damper modulates to the design minimum value.</i> • <i>For multiple zone units, either outdoor air damper or zone damper modulate to satisfy the reduced zone ventilation requirements.</i> <p><i>Step 6: Restore economizer controls and remove all system overrides initiated during the test.</i></p> <p><i>Step 7: <u>With all controls restored, apply a test gas signal at the CO₂ predictive set point to the sensor. Verify that the outdoor air damper modulates open to satisfy the total ventilation air called for in the Certificate of Compliance.</u></i></p>	<p>Amended: Staff agrees. The suggested edits to Step 2 are incorporated into VA 7.5.5.1, third bullet without the word “predictive” in it. The comment from our engineering consultants was that this word is vague and not needed.</p> <p>The suggested edits in Step 7 have been accepted with some edits.</p>
Reference Nonresidential	The draft Acceptance Requirements (Nonresidential Appendix, NA7.5.5) adequately cover all the operational modes, but the	No Change: Staff disagrees with the comment. Section 125(a)5 requires all systems to be tested. NA7.5.5 requires all sensors to

Section / Commenter	Summary of Comment	Response and Action
Appendix NA7.5.5 and Section 125, DCV acceptance requirements. / ARB	specific procedure for testing multiple sensors is not clear. The wording should be modified to require testing of each sensor, especially since the current manufacturing quality in the sensors appears to be inconsistent.	be factory calibrated or field calibrated then NA7.5.5.2 provides a procedure to field test each sensor. It appears that these requirements already do what the commenter is seeking.
RACM / Carrier Corporation	Carrier does not oppose the air handler improvement requirements. However, they believe that to achieve compliance with these requirements will require special attention to get contractors trained and understand how to get the static pressure down.	No Change: Not part of this rulemaking. Staff will work with Carrier to make sure that the compliance manuals will include special attention to how duct design and control of static pressure will be critical to meeting the air handler requirements. Staff should work with the utilities and Carrier to develop training for the contractors. These ideas are not 15-day language related.
RACM-Buried Duct Credit / Hodgson-Consol	To qualify for the buried duct credit, the HERS rater must perform a cumbersome supply duct surface area reduction inspection. Also, there are conflicting requirements in various documents related to this credit including CF-4R, RACM, and RA3.	Amended: Staff agrees and amended CF-4R. Staff has determined that a verified duct design needs to be a requirement for the reduced duct surface area, buried ducts, and deeply buried ducts credits, however, a simplified duct inspection protocol will be provided as alternative to the inspection that CBIA objects to =>> the duct design layout still needs to be submitted to plan check along with the certificate of compliance when the measures are used for compliance credit, but the following up inspections can be limited to comparing the design drawing layout to the installed system (prior to blowing in the ceiling insulation) to confirm installed system is consistent with the design layout drawing, and the installed duct locations are consistent with the requirement for duct location for the measures. The cumbersome aspects of the duct inspection are substituted with a simplified yes or no checklist for the main system characteristics such as register/grill location, duct diameter, duct R-value – no detail measurements will be required for the inspection protocol at system install; a follow up inspection will be needed for buried ducts to confirm that the insulation is blown in to cover the ducts, and the insulation needs to meet the quality insulation installation criteria, but there will be no requirement for detailed measurements to be made and filled in on the inspection form;
RACM-Low Infiltration Credit Verification for Installers / Hodgson/Consol	Currently the builder or subcontractor has to perform 100% blower door inspections if the low air infiltration credit is taken. This credit is awkward to achieve and unnecessarily requires 100% testing. First, there is no one installer who is responsible for air infiltration. Very few installers have blower door testing equipment, so HERS inspectors are often hired for the testing	Amended: Staff agrees and amended to clarify the signature requirements for low air infiltration on the compliance forms. No Change: Staff disagrees with the comment. A blower testing is a reliable method for determining leakage and is the preferable method. Staff could consider developing a check list; however,

Section / Commenter	Summary of Comment	Response and Action
	<p>but are not allowed by the Standards to sign the CF-6R. The builder or the installer is currently allowed to sign the CF-6R. If the installer is to sign the CF-6R, which installer should sign? Basically it is unclear who should sign this portion of the CF-6R.</p> <p>An alternative to the 100% blower door testing has been suggested to CEC staff by CBIA. If the builder or installer does not wish to do blower door testing, then CBIA has proposed that they use a checklist, similar to the Quality Insulation Installation checklist</p>	<p>there are many different possible leak areas in the building that would need to be checked and developing a check list for these areas takes considerable time to draft. We could work with the industry to develop a check list as a compliance option.</p> <p>No Change: These new proposals are outside the current rulemaking scope and would need to be part of a future rulemaking.</p>
RACM APP RE / CABEC	Modification of water heating distribution factors	Amended: Staff agrees and added demand recirculation for systems with manual controls and photo sensor controls
RACM and NACM / Joel Neymark	Made various clarifications and edits to the res and nonresidential ACMs, and JA4.	Amended: Staff worked with the commenter to address these issues. The sections have modified.
RACM, Appendix RE / Hodgson	Allow in multifamily or single family attached to break up the central boiler water heating budget by individual units.	Amended: Staff agrees to this. Change is already in RACM on the last page of appendix RE.
RACM-Evaporative Cooling Compliance Option in / Michael Day	Michael suggests that the current credit for the evaporative cooling is too low and should be updated	No Change: Staff is recommending that the industry should pursue a compliance option in the near future to revisit the credit levels. The water agencies are extremely concerned that widespread use of evaporative cooling will result in major increase in water use.
RACM / Jon McHugh/ PG&E	Change the EER default for residential AC from 10 to 11 for compliance credit calculations.	No Change: These new proposals are outside the current rulemaking scope and would need to be part of a future rulemaking.
RACM / Hodgson/Consol	Written comments to oppose PG&E proposal above regarding changing the default EER.	
Reference Residential Appendix RA, Acceptance Requirements for Mechanical Ventilation (MV) Systems. / ARB	<p>In a study of 160 energy-efficient homes in the Pacific Northwest, most of the MV systems did not provide ventilation at the rated capacity due to system design and installation flaws. Because the MV system is an essential health and safety feature in new homes, and because this technology is relatively new to California builders and homeowners, we recommend the following measures</p> <p>a. Appendix RA3 – Residential Field Verification and Diagnostic Test Procedures. We recommend acceptance testing and inspection of MV systems to verify adequate air flows, filter installation, control system performance, duct design, accessibility, and controls labeling.</p>	<p>No Change; Staff disagrees. The major problems with 1980s ventilation systems such as those studied in the referenced report was that they didn't actually move much air and home occupants did not operate them long enough to make an impact. ASHRAE 62.2 has responded to these problems by requiring ventilation systems which are rated to be quiet enough to leave on continuously and deliver sufficient air at static pressures likely to be found in actual installations.</p> <p>a. No Change; Staff disagrees. There is currently no basis for requiring expensive and elaborate "acceptance" testing for every new dwelling unit. If serious problems are found with ventilation systems installed to meet this requirement, an acceptance testing program will be developed to deal with them.</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>b. MV Maintenance. The standards should require that MV systems have a maintenance contract for at least the first few years. This type of approach is used as a Performance Target in DOE's Building America Program.</p> <p>c. Implementation Training. We recommend mandatory training on MV system requirements for designers, builders, and inspectors to quickly get them up to speed, at least for the first few years of standard implementation.</p>	<p>b. No Change. The commission has no authority to require maintenance contracts in all new buildings.</p> <p>c. No Change. The Commission has no authority to require mandatory training, but plans to work with the utilities and building industry to provide extensive education on the 2008 standards.</p>
<p>Reference Residential Appendix RA1 / Splitt on April 21, 2008, and oral comments on April 23, 2008.</p>	<p>The requirements of this appendix conflict with §150(h). For instance, the SMACNA Residential and ACCA Manual J load calculation methods are forbidden by this appendix. Also, appendix RA1 prohibits room by room load calculations, among other things. This entire appendix must be deleted.</p>	<p>No Change There is no conflict here. Section 150(h) is mandatory measures for all buildings; RA1 on the other hand is the procedure for calculating maximum rated total cooling capacity for a compliance credit. Also, the procedures in RA1 are for entire building load calculations; therefore, room by room load calculations are irrelevant.</p>
<p>Reference Residential Appendix RA2 / Hodgson Also in written comments submitted after the 12/17/07 Hearing.</p>	<p>Sampling requirements should allow the houses in a group to be approved when ready for final regardless of when the individual house is sampled. In other words, don't wait until the group is closed to final a house.</p> <p>CBIA proposes that instead of requiring a group to be closed after all of the CF-6Rs have been uploaded to the database, allow the group to remain open until seven CF-6Rs have been provided or the 6-month time limit has been reached. A unit within a sample can be certified at any time as long as the associated CF-6R is uploaded.</p>	<p>No Change The concern here is that the sampled house may become known to the builder and therefore compromise the randomness of the sample. Consol thinks that this does not happen because builders are too busy to keep track of which houses have been sampled.</p> <p>Staff, Consol, and HERS providers have reached agreement on this. A group for sampling normally has 7 homes. If all 7 CF-6Rs are loaded into the registry before the first CF-4R is needed, the sampled home is chosen from the 7 and if it passes, CF-4Rs can be issued for all 7. If a CF-4R is needed before all 7 CF-6Rs are completed, the group is reduced to 5 homes.</p> <p>The compromise sampling procedure agreed upon with CBIA representatives is to allow issuance of a CF-4R for untested homes in groups of 5 dwellings or less provided that first, one of the dwellings in the group has been tested and passed by a HERS rater. Thus, the first home could be tested, and subsequently, the next 4 homes that are completed and entered into the sample</p>

Section / Commenter	Summary of Comment	Response and Action
		<p>group are issued a passing CF-4R without receiving a HERS test. The group would be required to be closed after 6 months following the entry of the first house in the group, so if there are less than 5 dwellings in the group when the 6-month time limit is reached, there can be no additional dwellings added to the group even if the number of dwellings in the group is less than the 5 dwelling maximum.</p> <p>CF-4Rs can be issued only for those 5 homes based on the testing of the sampled house in this situation. This strongly limits the number of potential homes for which contractors can do shoddy work by being aware of which home is tested prior to completion of other homes. If CF-6Rs for six homes have been loaded, the group would be closed with just six homes.</p>
Reference Residential appendix RA2 Eligibility for demand control systems / Larry Acker	Larry has concern that occupancy sensor based controls actually work better than manual controls for demand control water heating systems.	Amended: Staff agrees and has revised the tables for recirculation distribution to include two separate values for demand recirculation. One is for manual control Changes made to RACM, Table RE2.
Reference Residential Appendix RA2.4 / Michael E. Bachand, President CalCERTS, Inc.	<p>1. RA Section 2.4.3 regarding Third Party QC systems: Allowing “specialty” contractors to perform part of the work of constructing a tightly constructed duct system with proper airflow defeats the training and subsequent consequences that has been given to the installer. This promotes the failure of the training that is the stated benefit upon which the entire TPQC program is predicated. The installing technicians will not be properly disposed to construct tight ducts, nor to test their own work and see their results first hand. Allowing this process is irresponsible. Since the “specialty” contractor is going to do the “incorruptible data transmission”</p> <p>Who is going to determine what the nominal flow should be? Who determines if the condenser is a 4 ton, 5 ton, etc.? Where does this verification get logged into the registry? How does the installing C20 warrant his work after it has been modified by another “specialty” contractor? Who warrants performance of this system in terms of energy and comfort?</p> <p>2. RA Section 2.4.3: The language leaves out the important fact that the data required to be kept is in the PROVIDER’S data registry....not a database maintained by the TPQC. The TPQC is</p>	<p>1. No Change: Responsibility for installation is specified in more detail in 2008 RA2.5, and the implication of these requirements will be further detailed in the certification statements on the installation certificates as detailed in the revised specifications for the installation certificates in Standards 10-103 and as will be implemented in the compliance manuals that will contain the revised compliance forms. The installation certificate shall be signed by the person who is responsible for “warranting” the proper system performance to the homeowner. Thus the “specialty” contractor you refer to, which might be a contractor that only performs duct sealing and duct testing services would not be signing the installation certificate to warrant the installation. The “specialty” duct seal/test subcontractor’s performance and the test results reported by the “specialty” subcontractor will remain the responsibility of the installing contractor or builder who would sign the installation certificate. This topic will be reinforced in the compliance manuals.</p> <p>Section RA2.7 fifth paragraph has additional language that specifies training requirements and QA requirements for training of installation persons and also the “specialty” subcontractor</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>not the PROVIDER.</p> <p>3. RA Section 2.4.4: The RA does not specify that the HERS rater MUST do the test when it is 55F, and that the builder is still responsible for that test after the homeowner has moved in.</p>	<p>persons who participate in the TPQCP procedures. There is additional language in RA2.7 to further define prohibition of the third party quality control program from imposing restrictions on HERS rater equipment selections or activities.</p> <p>2 & 3. No Change: RA2.5 and RA2.6 provide procedure detail for registration of installation certificates and registration of certificates of field verification and diagnostic testing that will be subject to Building Official and Commission scrutiny, and will also be subject to public information disclosures. Additionally, HERS providers will be required to meet the specifications for HERS Provider Data Registry functions and data transfer protocols that have been described in RA2 and that will be further defined in requirements engineering working groups during 2008 as preparation for implementation of the registry in 2009. The regulations have always required the TPQCP to be independent of the HERS provider. To the extent that proper oversight and enforcement of those requirements have been neglected in the past, staff hopes and expects to improve the enforcement of the requirements for TPQCP and HERS provider roles and responsibilities going forward.</p>
<p>Reference Residential Appendix RA2.8 (2005 RACM 7.7) / Ann Marie Jones of Enalysis & David Price</p>	<p>These procedures should require the building official provide conditional approval of the final building based on CF-6R if third party quality control program is used.</p>	<p>No Change: Staff does not agree. This should be at the building department's discretion.</p>
<p>Reference Residential Appendix RA2.8 / John Proctor</p>	<p>In written comments, Proctor disagreed with Enalysis and David Price comments above.</p>	<p>Comments were taken into consideration above.</p>
<p>Reference Residential Appendix RA2 and RA3 / Steve G. Mohasci, written comments April 14, 2008</p>	<p>7. Reference Residential Appendix (RRA) RA2: Specify the sampling rate for new construction when the dwelling unit has a combination of HERS measures that qualify for 1 in 7 and 1 in 30 sampling rate. Example being a dwelling unit that uses sealed & tested ducts, high EER and quality insulation installation to meet the performance standards. Sealed & tested ducts qualify for 1 in 30 sampling if the contractor is a certified Third Party Quality Control Program (TPQCP) contractor.</p> <p>8. RRA RA3.1 – Section RA3.1.4.2.2:</p>	<p>7. No Change: Staff disagrees. Reference Residential Appendix RA2: RA2.6 states that if multiple measures requiring field verification and diagnostic testing are installed in dwelling units, sample testing does not have to be completed for all of the measures in the same dwelling unit. This would allow that the dwelling could be included in more than one sample group for HERS verification of those multiple measures, provided that all the dwellings in each respective sample group have the same measures installed in each welling in the respective group(s).</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>The requirement for cooling coil airflow for new construction has been reduced from 400 CFM/Ton to 350 CFM/Ton. If 350 CFM/Ton is now considered sufficient to meet air conditioning standards for new construction, then 350 CFM/Ton should also be the nominal airflow standard for air conditioning for sealed & tested ducts. Although the proposed requirement for cooling coil airflow for alterations is 300 CFM/Ton, it is probably better to use a single standard. So 350 CFM/Ton should be the nominal airflow standard for air conditioning for sealed & tested ducts for both new construction and alterations.</p> <p>9. RRA RA3.1 – Section RA3.1.4.3.8: The following inspection standards are part of the nonresidential visual inspection standards (Reference Nonresidential Appendix NA2 – Section NA2.3.8.4): Visually inspect to verify that portions of the duct system that are excessively damaged have been replaced. Ducts that are considered to be excessively damaged are:</p> <ul style="list-style-type: none"> • Flex ducts with the vapor barrier split or cracked with a total linear split or crack length greater than 12 inches • Crushed ducts where cross-sectional area is reduced by 30% or more • Metal ducts with rust or corrosion resulting in leaks greater than 2 inches in any dimension • Ducts that have been subject to animal infestation resulting in leaks greater than 2 inches in any dimension. <p>These same visual inspection standards are part of the 2005 residential duct test and verification standards. These visual inspection standards have been eliminated from the proposed 2008 duct test and verification standards.</p> <p>10. RRA RA3.4: Include the requirement that the installing HVAC contractor provide the ARI Reference # on the Installation Certificate for high EER compliance.</p> <p>11. RRA RA3.5: Section 3.5.1 indicates that this quality installation insulation compliance credit is limited to wood frame structures and that the insulation type is limited to mineral fiber and cellulose. Reference Joint Appendix JA7 the field verification procedure</p>	<p>8. No Change: Reference Residential Appendix RA3.1 – Section 3.1.4.2.2: The duct leakage criteria would have been tightened up by 12% if the criteria for calculating the leakage criteria were keyed into 350 cfm per ton rather than keeping it at 400 cfm per ton. There was no economic justification for doing that.</p> <p>9. No Change: Reference Residential Appendix RA3.1 – Section 3.1.4.3.8: It was determined that the excessively damaged duct criteria were not practical for residential installations, and that the smoke test would suffice to identify all accessible leaks. A smoke test was not considered appropriate for all nonresidential occupancy situations, so the visual inspection criteria were not modified from 2005 language. This is a duct leakage specification, not a duct installation quality specification. The visual inspection language for residential duct systems has been modified to specify sealing at key locations that relate to duct leakage.</p> <p>10. No Change: Staff agrees and Reference Residential Appendix RA3.1 – Section 3.4 will be addressed in the compliance manual.</p> <p>11. Amended: Reference Residential Appendix RA3.1 – Section 3.5 has been edited. Staff agrees with the comment.</p> <p>12. No Change: staff disagrees. Installation Testing and Verification Standards</p> <ul style="list-style-type: none"> • All ducts in conditioned space requires use of the RA3.1.4.3.4 Duct Leakage to Outside procedure • 12 feet of duct in conditioned space: This characteristic does not require HERS verification, it • Duct Surface area Reduction requires the verified duct design verification in RA3.1 • Maximum Cooling Capacity does not require HERS Field Verification to confirm capacity, however, if a high EER unit is selected to qualify for the electrical input exception specified in RA1, there is a HERS verification for the EER. <p>13. The 60% reduction duct testing standard: We agree that the 60% reduction of leakage based upon an initial test by the installer is a protocol that is easily defeated and</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>for spray polyurethane foam allows for both wood and metal frame structures. Is the quality installation insulation compliance credit for mineral fiber and cellulose insulation going to remain limited to wood frame structures?</p> <p>12. Installation Testing and Verification Standards: Reference Residential Appendix RA2 (Section 2.5) indicates that the installation of measures requiring HERS verification or diagnostic testing must be done utilizing the procedures specified in Reference Residential Appendix RA3. Currently there are 20 measures requiring HERS verification or diagnostic testing. Of those 20 measures only 12 have verification or diagnostic testing procedures in Reference Residential Appendix RA3. Two measures have verification or diagnostic testing procedures in Reference Residential Appendix RA4. One measure has verification or diagnostic testing procedures in Reference Joint Appendix JA7. One measure has verification or diagnostic testing procedures from ASTM. Four measures do not have verification or diagnostic testing procedures, they are as follows:</p> <ul style="list-style-type: none"> • All ducts in conditioned space • Less than 12 lineal feet of ducts in unconditioned space • Supply duct surface area reduction • Maximum cooling capacity <p>13. The 60% reduction duct testing standard: There should be a cap on the allowed leakage rate from the initial duct system test. If the initial duct system test indicates that the duct system leakage rate is in excess of 60% for example, then the duct system must qualify for compliance using the “Seal All Accessible” standard.</p> <p>14. Verification of Charge Indicator Display (CID): As indicated in Reference Residential Appendix RA3.4, the verification of the CID is a visual inspection. The verification protocol limits the HERS rater to only the determination that the CID is installed. This is the same type verification process that created all the problems of improper installation of the TXV.</p> <p>15. Reference Nonresidential Appendix NA2: The following is a suggested change for of the labeling</p>	<p>challenging to properly enforce. Comments on this should have been introduced into the record at least by the 45-day language in order for staff to respond with modifications. The absence of comments on this measure at workshops and stakeholder focus working groups during 2007 have allowed this measure to slip through the standards update process without a modification.</p> <p>14. No Change: Verification of Charge Indicator Display (CID) Yes this is a simple verification to see that a CID is installed. The CID is substituted for TXV as an alternative to performing refrigerant charge verification. It is not valid to blame the HERS TXV verification protocol for the result of research that determined TXV devices were not as reliable for insuring air conditioning efficiency as had been previously assumed. 2008 HERS refrigerant charge verification protocol now has TXV function verification as part of the protocol. Note: The CID checks for proper TXV function and displays a signal indicating service or repair is needed if the TXV fails to meet spec. Confirming proper CID function can be done using instrumentation and procedures for refrigerant charge verification described in RA3.2. As the CID is new technology, and there is little documentation or field experience with the technology, we will need to work with CID manufacturers, installers and homeowners to determine additional inspection requirements if deemed necessary.</p> <p>15. No Change. Reference Nonresidential Appendix NA2: The labeling is unchanged from 2005 language. The labeling could be modified to give additional clarity, however we feel the labeling as specified is satisfactory. This new proposal is outside the current rulemaking scope and would need to be part of a future rulemaking. Note: The 60% reduction does not meet the prescriptive requirements for tight ducts, it was offered as a way that an installer could demonstrate due diligence in attempting to seal all accessible leaks.</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>requirement for nonresidential duct systems (Section NA2.3.8.5): The leakage of the air distribution ducts was tested using the procedures prescribed in Reference Nonresidential Appendix NA2.</p> <p>The current language that is proposed has several problems:</p> <ul style="list-style-type: none"> • First, the language did not include the compliance option of 60% leakage reduction. • Second, new duct systems must pass the less than 6% standard, there is no exception. 	
<p>RACM 3.3 / Mike Moore, New Ventures, Written Comments April 14, 2008</p>	<p>Section 3.3.3 - Within this section, some guidance is provided to calculate the space conditioning load incident to mechanical ventilation. As currently provided, the language appears to over-penalize the space conditioning load caused by introducing outdoor air under operation of a central fan integrated (CFI) system. This penalization for CFI systems is buried within the definition of the variables MECHbal and MECHunbal. These variables are defined in terms of “total supply fan cfm” and “total exhaust fan cfm”.</p> <p>For CFI systems, the total supply fan cfm (which incorporates ventilation air as well as recirculated air) will be much higher than what should be computed here, which is the total ventilation air supply in cfm. For example, a CFI’s blower may have a total supply fan cfm of 1200, but total ventilation air supply cfm of 100 – smaller by an order of magnitude. This difference can have a significant effect on the energy consumption projections for CFI systems.</p>	<p>No Change: The term “total supply fan cfm” refers to the total ventilation airflow of outside air induced/supplied by the ventilation fan. For the case of the Central Fan Integrated (CFI) systems, the term “total supply fan cfm” refers to the portion of the CFI airflow that was ventilation airflow of outside air induced/supplied by the outside air duct connected to the CFI system and subsequently distributed to the home by the CFI system fan. We are will clarify the terms “total supply fan cfm” and “total exhaust fan cfm” in the compliance manual(s).</p>
<p>RACM 3.3 / Mike Moore, New Ventures, Written Comments April 14, 2008</p>	<p>Section 3.13 - Currently, the 15 day language states: “If the Central Fan Integrated Ventilation central air handler fan system is configured to mix the indoor air without introducing outdoor air, the energy to run the central air handler fans must be included. In this case, a standalone IAQ system must also be modeled.” This language is confusing in that it does specify how to model an IAQ system. One example of such a central fan integrated (CFI) system would have an electronically actuated damper on the outdoor air duct and controls that strategically engage this damper when ASHRAE 62.2 ventilation rates are not satisfied. Is this language requiring that the energy use of the CFI system be modeled when outdoor air is being introduced by the CFI system, but that a standalone system is modeled when no outdoor air is being introduced by the CFI system?</p>	<p>No Change: The third paragraph under the heading 3.13 (top of pg 3-65) states: “If the Central Fan Integrated Ventilation system is configured to mix the indoor air without introducing outdoor air, a standalone IAQ system must also be modeled.” This refers to a specific IAQ system configuration that requires the central air conditioning fan to cycle on for a period of time (e.g. 20 minutes) each hour to circulate/mix the air in the dwelling that has had outside air introduced into some location within the dwelling by a standalone ventilation fan/system. Some practitioners believe this IAQ system design strategy provides better IAQ to rooms within the dwelling that are partially isolated from the influence of a standalone IAQ fan due to proximity, or due to closed doors, and other such barriers to air circulation in the dwelling. Since this system does not supply outdoor ventilation air, a separate IAQ ventilation system is required to</p>

Section / Commenter	Summary of Comment	Response and Action
		<p>meet the mandatory ventilation requirement and this system must be modeled as part of the energy calculation. The compliance software will require the IAQ system type to be defined as input. The compliance software vendors will be required to “model” approved IAQ system types/configurations in order to determine compliance with the standards.</p>
<p>RACM 3.3 / Mike Moore, New Ventures, Written Comments April 14, 2008</p>	<p>Section 3.13.1 - Proposed Design</p> <p>A- If a standalone IAQ fan system is installed then the fan system is assumed to be on continuously...” This modeling assumption would not permit some innovative and energy efficient systems to receive credit for their performance in this area. For example, some manufacturers provide Energy Star rated exhaust fans that have a high ventilation rate (e.g. up to 110 cfm), but are equipped with controls and timers to ensure that ASHRAE 62.2 ventilation rates are met and not automatically overrun. Assuming that this type of system runs at 110 cfm at all times would result in modeling over twice as much ventilation as would be delivered under this system for an ASHRAE 62.2 compliant 3 bedroom, 2000 sqft home.</p> <p>B- systems, but no guidance is given for calculating the space conditioning energy consumption of CFI systems. This topic is covered briefly under section 3.3.3, but it is unclear when the space conditioning load must be counted for both standalone systems and CFI systems. Section 3.13.1 would do well to expound more upon these calculations.</p> <p>C- If the central air handler fan is on for more than 20 minutes during an hour to provide heating or cooling, then separate IAQ ventilation is not modeled for that hour.” This 15-day language suggests that the space conditioning load impacts of CFI systems are disregarded when the air handler runs more than 20 minutes during an hour to provide heating or cooling. The space conditioning load of the mechanical ventilation system should be calculated under all conditions, regardless of the type of ventilation system specified.</p>	<p>A. No Change: The compliance software will require ventilation airflow sufficient to meet the ASHRAE 62.2 specification for the dwelling. Ventilation fans/systems that utilize intermittent operation strategies will still be required to meet the ASHRAE standards for ventilation airflow. The method chosen to meet the ventilation requirement will not affect the calculation for the impact on space conditioning load energy due to required ventilation airflow.</p> <p>B. No Change: The bulleted section just following equation R3-67 provides specification for determining the proposed design that software shall model. Energy calculations for a central fan are covered in the section that deals with the calculations for heating and cooling energy in the ACM manual (see Residential ACM sections 3.10 and 3.11).</p> <p>C. No Change: The bulleted section just following equation R3-67 provides specification for determining the proposed design that software shall model. Correct interpretation of this section accounts for fan energy due to space conditioning separately from fan energy due to ventilation. For CIF systems operating to condition the space and also bring in outside air (simultaneously), fan energy due to ventilation airflow is not counted, thus all such fan energy is considered part of the heating or cooling energy. If there is no call for space conditioning, and ventilation is required to meet the standard, the central fan energy is considered ventilation energy.</p>
<p>RACM 3.3 / Mike Moore, New Ventures, Written</p>	<p>Section 3.13.2 Standard Design - This section requires that the standard design for the mechanical ventilation system be the same as the proposed design. By</p>	<p>No Change: We acknowledge that energy consumption for ventilation systems varies significantly with system type. However, the determination to make energy consumption for</p>

Section / Commenter	Summary of Comment	Response and Action
Comments April 14, 2008	requiring the standard design's mechanical ventilation system to be the same as the proposed design, the guidelines limit the recognition and reward of those mechanical ventilation systems that save the most energy. The 15 day language recognizes this by stating in section 3.13, "In many cases, this energy is substantially compliance neutral because the standard design is typically set equal to the proposed design." The standard design should be set as the most energy inefficient system which is still acceptable for use. If this is the case, designers will be more greatly influenced to specify MV systems that are more energy efficient. Otherwise, there is little to no incentive within the design phase for specifying a more energy efficient system.	ventilation systems essentially compliance neutral was deliberate. Methods for determining the various ventilation system energy efficiencies, and the actual distribution effectiveness of various ventilation system configurations are topics still being researched and the results of the research are being debated. The first consideration must be to provide adequate IAQ ventilation, and this consideration should not be compromised in order to save energy. Rather we have proposed that any system selected and installed to meet ASHRAE 62.2 shall be an efficient system, thus a Central Fan Integrated system shall meet the prescriptive furnace fan watt draw requirements in the standards.
RACM 3.3 / Mike Moore, New Ventures, Written Comments April 14, 2008	3.13.3 Reporting Requirements on CF-1R - Within this section, users are required to report the fan power ratio in W/cfm of the mechanical ventilation system specified. This report will be misleading to the reader unless ventilation fan power ratios are reported for the system specified, whether stand-alone system or central air handler system. For example, a reader who specifies a central air handler system may feel that this system is a better performing system than a stand-alone system because the fan power ratio of the central air handler is lower than the fan power ratio of the stand alone system. As it is currently defined, the fan power ratio is not a good indicator of the actual energy consumption of various mechanical ventilation systems. In lieu of the fan power ratio, we recommend calculation and reporting of the ventilation fan power ratio.	No Change: HERS verification of fan Watt draw and CFM require values to be reported that are specific to the equipment installed. The intent of the fan power ratio in the report is to determine if the efficiency of the installed equipment complies with the standards.
RACM, section 3.4.4 / Monier Tile	Recognize the value of above sheathing ventilation for roofing tiles and, as the result, lower the reflectance from 0.15 to 0.10 for tiles.	No Change: Staff disagrees. Testing by our consultants has not verified the benefits that are claimed by the industry. In addition, the proposed 0.15 reflectance for tiles is not an aggressive value; lowering to 0.10 amounts to making no change to the tile requirements.
RACM Ch 3a, Sections5 / CBIA-Consol	CBIA request that doors are modeled using NFRC values	Amended: Staff agrees and has made the modification Standards door is 0.50 U-factor and 0.02 SHGC. Default entry door is 0.50 U-factor and 0.39 SHGC – any door with SHGC 0.40 or higher must be treated as fenestration.
RACM Ch 3a, Sections3.6 / CABEC	CABEC requested that the reference to have inputs for individual fenestrations be removed	Amended: Staff agrees with the comment and made the modification to the language.
RACM Ch 3b RACM, chapter 5 / CABEC	Change to text on water heating distribution systems to match changes in RACM Appendix RE	Amended: Staff added demand recirculation for systems with manual controls and photo sensor controls

Section / Commenter	Summary of Comment	Response and Action
Reference Residential Appendix RA3.5 / Hodgson	The word “Batt” should not be in the title.	Amended: Staff has fixed the problem from both the title and from Table of contents.
RACM 3.11 / Steve G. Mohasci, written comments April 14, 2008	<p>1. Residential ACM (RACM) Section 3.11.4: Section 3.11.4 in the RACM indicates that the maximum cooling capacity credit must be in combination with verified cooling coil airflow and sealed and tested ducts. Table RA2-1 of the Reference Residential Appendix RA2 indicates that the maximum cooling capacity credit must be in combination with verified cooling coil airflow, sealed and tested ducts and high EER. Which requirement is valid?</p> <p>2. RACM Section 3.11.6: The requirement for duct design verification by the HERS rater has been eliminated from section 3.11.6 in the RACM. Section RA3.3.3.2 in the Reference Residential Appendix RA3 requires duct design verification by the HERS rater. Since duct design is a mandatory measure it would seem appropriate to continue the HERS rater verification of the duct design.</p> <p>3. RACM Section 3.11.8: Default EER should be increased to correspond with the current 13.0 SEER standard. An appropriate default would probably be something in the range of 10.5 to 10.8 EER. An average quality 13.0 SEER air conditioner should probably have an EER in the range of the proposed default. If the default is not increased, there is a built-in EER credit for just complying with the current 13.0 SEER standard.</p> <p>4. RACM Section 3.12.1: The requirement for cooling coil airflow verification by the HERS rater has been eliminated from section 3.12.1 in the RACM. There is still a requirement for duct design verification by the HERS rater in this section RACM. The physical verification of the duct design by the HERS rater does not guarantee that the cooling coil airflow will meet the standard. If there is any concern about cooling coil airflow then:</p> <ul style="list-style-type: none"> • Either the group of duct system credits described in this section of the RACM should be in combination with verified cooling 	<p>1. No Change: Residential ACM (RACM) Section 3.11.4: Reference Residential Appendix RA1 section RA1.4 specifies that an Exception to Maximum Rated Total Cooling Capacity when higher EER equipment is specified. If high EER equipment is used to qualify for compliance based on this electrical input exception, the equipment EER shall be verified by a HERS rater. Note: he ACM does not currently flag HERS verification of EER when the RA1.4 electrical input exception is utilized to qualify for increased cooling capacity. So the RACM needs to be modified to require this HERS verification as a requirement on the CF-1R output. Elimination of the refrigerant charge verification requirement for maximum rated cooling capacity credit was done to answer a CBIA concern that 2008 language that eliminates the TXV verification alternative to performing refrigerant charge verification made the criteria for complying with the Maximum Rated Cooling Capacity measure requirements too burdensome.</p> <p>2. Amended: RACM Section 3.11.6 Central System Cooling Coil Airflow Verification. The requirement Verified Duct Design has been deleted from Airflow verification protocols. However, system designers and system installers are free to utilize industry standard duct system design methods in order to attain optimum cooling coil airflow.</p> <p>Amended: The present location of the Verified Duct Design language (RA3.3.3.2) is not correct since it is still a subsection to the RA3.3 airflow measurement procedures. We relocated RA3.3.3.2 Verified Duct Design section to be a subsection of RA3.1.4.1.1. for final adoption.</p> <p>No Change: The requirement Verified Duct Design has NOT been deleted from the Duct Surface Area and R-value measures since the duct system design details are required inputs for compliance calculations for these measures..</p> <p>No Change: Duct design specifications are not mandatory measures in the Standards; rather the Standards incorporate by</p>

Section / Commenter	Summary of Comment	Response and Action
	<p>coil airflow;</p> <ul style="list-style-type: none"> • Or, continue the HERS rater verification that the cooling coil airflow meets the standard. <p>5. RACM Section 3.12.4: Under 2005 Standards, the two buried duct compliance measures must be used in combination with sealed & tested ducts and quality insulation installation. Section 3.12.4 of the RACM does not specifically require sealed and tested ducts as a requirement for buried ducts. This section indicates that duct systems meeting the requirements for High Insulation Quality and the Procedures for Field Verification and Diagnostic Testing of Air Distribution Systems may take credit for increased effective insulation duct insulation.</p> <p>6. RACM Chapter 3 - General: There are numerous citations of references or sections in references that are invalid.</p>	<p>reference the CMC sections that specify duct system requirements. HERS verification of duct system design and installed duct system materials is not mandatory; however verification of duct system materials and installation quality is required in conjunction with other duct verification measures such as duct leakage/sealing measure.</p> <p>3. No Change: RACM Section 3.11.8 Cooling System Calculations This EER topic was debated during previous workshops, and it was determined to not change the default EER for 2008 standards requirements. It is too late in the 2008 proceedings to reconsider this change.</p> <p>4. Amended: RACM Section 3.12.1 We will attempt to correct in errata: the last sentence in paragraph 2 of section 3.12.1, that was deleted should not have been deleted, should be restored and the term “adequate airflow” should be updated to “prescriptive cooling coil airflow”. Also the reference to the airflow measurement section needs to be corrected. So ultimately, this sentence should read: The HERS rater shall also measure and verify prescriptive cooling coil airflow, see section 3.11.6.</p> <p>5. Amended: RACM Section 3.12.4 The ACM language under “Buried Attic Ducts” for 2008 is unchanged from the corresponding 2005 version of this ACM language. Both specify that the duct system shall meet the “procedures for Field Verification and Diagnostic Testing of Air Distribution Systems” and reference the test protocols (2005 ACM RC; 2008 RA4 [reference is wrong should be RA3.1]). These HERS protocols specify duct design verification and duct leakage testing. In Table RA2-1 we probably should have included a specification for duct leakage test, and QII for buried ducts measure. We will include in errata if possible.</p> <p>6. Amended: RACM Chapter 3 – General Agree that there are numerous errors in the references. These will be dealt with in the errata.</p>

Section / Commenter	Summary of Comment	Response and Action
		<p>No Change: The term “total supply fan cfm” refers to the total ventilation airflow of outside air induced/supplied by the ventilation fan. For the case of the Central Fan Integrated (CFI) systems, the term “total supply fan cfm” refers to the portion of the CFI airflow that was ventilation airflow of outside air induced/supplied by the outside air duct connected to the CFI system and subsequently distributed to the home by the CFI system fan. We are attempting to clarify the terms “total supply fan cfm” and “total exhaust fan cfm” for the adopted language, if possible, and the terms will be clarified in the compliance manual(s).</p>
		<p>No Change: The third paragraph under the heading 3.13 (top of pg 3-65) states: “If the Central Fan Integrated Ventilation system is configured to mix the indoor air without introducing outdoor air, a standalone IAQ system must also be modeled.” This refers to a specific IAQ system configuration that requires the central air conditioning fan to cycle on for a period of time (e.g. 20 minutes) each hour to circulate/mix the air in the dwelling that has had outside air introduced into some location within the dwelling by a standalone ventilation fan/system. Some practitioners believe this IAQ system design strategy provides better IAQ to rooms within the dwelling that are partially isolated from the influence of a standalone IAQ fan due to proximity, or due to closed doors, and other such barriers to air circulation in the dwelling. Since this system does not supply outdoor ventilation air, a separate IAQ ventilation system is required to meet the mandatory ventilation requirement and this system must be modeled as part of the energy calculation. The compliance software will require the IAQ system type to be defined as input. The compliance software vendors will be required to “model” approved IAQ system types/configurations in order to determine compliance with the standards.</p>
		<p>A. No Change: Staff disagrees. The compliance software will require ventilation airflow sufficient to meet the ASHRAE 62.2 specification for the dwelling. Ventilation fans/systems that utilize intermittent operation strategies will still be required to meet the ASHRAE standards for ventilation airflow. The method chosen to meet the ventilation requirement will not affect the calculation for the impact on space conditioning load energy due to required ventilation airflow.</p>

Section / Commenter	Summary of Comment	Response and Action
		<p>B. No Change: The bulleted section just following equation R3-67 provides specification for determining the proposed design that software shall model. Energy calculations for a central fan are covered in the section that deals with the calculations for heating and cooling energy in the ACM manual (see Residential ACM sections 3.10 and 3.11).</p> <p>C. No Change: The bulleted section just following equation R3-67 provides specification for determining the proposed design that software shall model. Correct interpretation of this section accounts for fan energy due to space conditioning separately from fan energy due to ventilation. For CIF systems operating to condition the space and also bring in outside air (simultaneously), fan energy due to ventilation airflow is not counted, thus all such fan energy is considered part of the heating or cooling energy. If there is no call for space conditioning, and ventilation is required to meet the standard, the central fan energy is considered ventilation energy.</p>
		<p>No Change: We acknowledging that energy consumption for ventilation systems varies significantly with system type. However, the determination to make energy consumption for ventilation systems essentially compliance neutral was deliberate. Methods for determining the various ventilation system energy efficiencies and the actual distribution effectiveness of various ventilation system configurations are topics still being researched and the results of the research are being debated. The first consideration must be to provide adequate IAQ ventilation, and this consideration should not be compromised in order to save energy. Rather we have proposed that any system selected and installed to meet ASHRAE 62.2 shall be an efficient system, thus a Central Fan Integrated system shall meet the prescriptive furnace fan watt draw requirements in the standards.</p>
		<p>No Change: HERS verification of fan Watt draw and CFM require values to be reported that are specific to the equipment installed. The intent of the fan power ratio in the report is to determine if the efficiency of the installed equipment complies with the standards.</p>
RACM Chapter 4 and 5 Tests	Needed revisions to Chapter 4 and 5 of Residential ACM. Tests to not cover new requirements or features in standards	No Change: Staff agrees, but comments are related to the Compliance Manuals and not to this rulemaking. Tests have been added to these chapters. To allow for verification, a statement was added to allow modification of the test as part of the testing

Section / Commenter	Summary of Comment	Response and Action
RACM, Ch5 / DEG	Make Changes to Evap cooling in Optional Capabilities section of RACM Ch5	process. Amended: Staff agrees with this comment and has amended RACM Chapter 5 by editing the language to clearly state that direct evaporative coolers were not included in the compliance option, including in the diagram in the ACM. Clarifications were also made to the language related to how the compliance option is to be implemented, including in the eligibility criteria.
Reference Residential Appendix RA, Acceptance Requirements for Mechanical Ventilation (MV) Systems. / ARB	<p>In a study of 160 energy-efficient homes in the Pacific Northwest, most of the MV systems did not provide ventilation at the rated capacity due to system design and installation flaws. Because the MV system is an essential health and safety feature in new homes, and because this technology is relatively new to California builders and homeowners, we recommend the following measures</p> <p>d. Appendix RA3 – Residential Field Verification and Diagnostic Test Procedures. We recommend acceptance testing and inspection of MV systems to verify adequate air flows, filter installation, control system performance, duct design, accessibility, and controls labeling.</p> <p>e. MV Maintenance. The standards should require that MV systems have a maintenance contract for at least the first few years. This type of approach is used as a Performance Target in DOE’s Building America Program.</p> <p>f. Implementation Training. We recommend mandatory training on MV system requirements for designers, builders, and inspectors to quickly get them up to speed, at least for the first few years of standard implementation.</p>	<p>The major problems with 1980s ventilation systems such as those studied in the referenced report was that they didn’t actually move much air and home occupants did not operate them long enough to make an impact. ASHRAE 62.2 has responded to these problems by requiring ventilation systems which are rated to be quiet enough to leave on continuously and deliver sufficient air at static pressures likely to be found in actual installations.</p> <p>a. No Change: Staff disagrees. There is currently no basis for requiring expensive and elaborate “acceptance” testing for every new dwelling unit. If serious problems are found with ventilation systems installed to meet this requirement, an acceptance testing program will be developed to deal with them.</p> <p>b. No Change: The commission has no authority to require maintenance contracts in all new buildings.</p> <p>c. No Change: The Commission has no authority to require mandatory training, but plans to work with the utilities and building industry to provide extensive education on the 2008 standards.</p>