

**FINAL STATEMENT OF REASONS
FOR
PROPOSED BUILDING STANDARDS
OF THE
CALIFORNIA BUILDING STANDARDS COMMISSION (CBSC)**

REGARDING ADOPTION OF AMENDMENTS TO THE 2010 CALIFORNIA BUILDING STANDARDS CODE, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR), PARTS 2, 3, 4, 5 and 6 in TITLE 24, CCR, PART 11, CALIFORNIA GREEN BUILDING STANDARDS CODE

The Administrative Procedure Act requires that every agency shall maintain a file of each rulemaking that shall be deemed to be the record for that rulemaking proceeding. The rulemaking file shall include a final statement of reasons. The Final Statement of Reasons shall be available to the public upon request when rulemaking action is being undertaken. The following are the reasons for proposing this particular rulemaking action:

UPDATES TO THE INITIAL STATEMENT OF REASONS

CBSC finds that revisions have been made which warrant changes to the initial statement of reasons for the following sections as proposed for public comment based on comments received:

- **Section 5.106.4.3 Changing rooms** has been moved from the mandatory chapter to the appendix as **Section A5.106.4.3**.
- In the cost/benefit rationale for **Section 5.408.3 Construction waste**, CBSC is clarifying that the numbers 5 million and 50-75 million refer to dollars of construction cost.
- The purpose and rationale for **Section 5.410.2 Commissioning** is being updated to reflect new data collected by Lawrence Berkeley National Laboratory since the 2004 report cited in the initial statement of reasons. An abstract of the 2009 report follows:

"This report provides the world's largest database of commissioning case studies for new and existing buildings. It represents a major update and expansion of a study initially published in 2004, with roughly three-times as many projects. We gathered and analyzed data on 643 buildings, representing 99 million square feet of floor space from 26 states. The database incorporates the work of 37 commissioning providers.

"Commissioning maximizes the quality and persistence of energy, cost, and emissions reductions. The process ensures that building owners get what they pay for when constructing or retrofitting buildings, provides risk-management and 'insurance' for policymakers and program managers enabling their initiatives to actually meet targets, and detects and corrects problems that would eventually surface as far more costly maintenance or safety issues.

"This report responds to a widely held concern that end-users do not have confidence in the nature and level of energy savings that can be achieved through the commissioning process. It addresses this issue by assembling diverse case studies and previously unpublished data, and developing performance benchmarks using standardized assumptions. The results demonstrate that commissioning is arguably the single-most cost-effective strategy for reducing energy, costs, and greenhouse-gas emissions in buildings today.

Key findings:

- Median commissioning costs: \$0.30 and \$1.16 per square foot for existing buildings and new construction, respectively (and 0.4% of total construction costs for new buildings)
- Median whole-building energy savings: 16% and 13%
- Median payback times: 1.1 and 4.2 years
- Median benefit-cost ratios: 4.5 and 1.1
- Cash-on-cash returns: 91% and 23%
- Very considerable reductions in greenhouse-gas emissions were achieved, at a negative cost of -\$110 and -\$25/tonne CO₂-equivalent.
- High-tech buildings are particularly cost-effective, and saved large amounts of energy and emissions due to their energy-intensiveness.
- Projects employing a comprehensive approach to commissioning attained nearly twice the overall median level of savings, and five-times the savings of projects with a constrained approach.
- Non-energy benefits are extensive and often offset part or all of the commissioning cost.

- Limited multi-year post-commissioning data indicate that savings often persistent for a period of at least five years.
- Uniformly applying our median whole-building energy-savings value to the stock of U.S. non-residential buildings yields an energy-savings potential of \$30 billion by the year 2030, and annual greenhouse gas emissions reductions of about 340 megatons of CO₂ each year. An industry equipped to deliver these benefits would have a sales volume of \$4 billion per year and support approximately 24,000 jobs.

“Commissioning America’ in a decade is an ambitious goal, but achievable and consistent with this country’s aspirations to simultaneously address energy and environmental issues while creating jobs and stimulating sustainable economic activity.”

⁶ Mills, Evan. 2009. "Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse-gas Emissions" (Lawrence Berkeley National Laboratory)

- **Section 5.410.3 Testing, adjusting and balancing** has been changed to **5.410.3 Testing and adjusting**.
- **Section 5.504.2 Indoor Air Quality (IAQ) post-construction** has been moved from the mandatory chapter to the appendix as **Section A5.504.2**. A new **Section A5.504.2.1 Testing** was added for 15-day comment to provide an alternative to building flush-out.
- **Verification of compliance** language has been added to the finish materials sections in **Divisions 5.5 and A5.5** to strengthen verification mechanisms, particularly for those required in the voluntary tiers.
- Placeholders in Chapter 7 have been replaced with **Sections 702.2 Special inspection** and **703.1 Documentation** based on verification mechanisms cited in other parts of Title 24 instead of third-party inspection requirements. These have green building treated for application and enforcement like other building standards that code users and enforcers already know to use.
- **Section A5.304.3 Potable water reduction** has been modified from allowable potable water for irrigation expressed as percentages of the water budget to percentages of reference evapotranspiration.

MANDATE ON LOCAL AGENCIES OR SCHOOL DISTRICTS

Because this version of the green building standards proposed contains mandatory measures, CBSC has determined that the proposed regulatory action could impose a mandate on local agencies or school districts. However, the mandate does not require reimbursement pursuant to Part 7 (commencing with section 17500) of Division 4, Government Code.

OBJECTIONS OR RECOMMENDATIONS MADE REGARDING THE PROPOSED REGULATION(S).

GENERAL COMMENTS.

COMMENTERS: Anthony C. Fejarang-Herrera, Rainforth Grau Architects, and Laura Knauss, Lionakis (architects) and the Coalition for Adequate School Housing (CASH), **no section number:**

The commenters claim that the green building standards proposed were not developed with input from all stakeholders; do not meet 9-point criteria 1, 3, 4 and 6; they are overly broad; and the cost impacts are significant, particularly for school districts, their primary clients.

RESPONSE: CBSC is deferring response to the Division of the State Architect, who may have received related comments from CASH or other school stakeholders.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), **no section number:**

Ms. Nichols wrote in general support of the 2010 CGBSC, which would strengthen the 2008 voluntary code and advance the State’s goals for greenhouse gas (GHG) emissions reduction and promote healthful air quality in and around buildings. Green building is a critical component of the [AB 32] Scoping Plan that outlines how the State will meet the Governor’s 2020 and 2050 targets for GHG emissions reduction.

RESPONSE: CBSC thanks Ms. Nichols for ARB’s supportive comments and recognition of the contribution of the 2010 CGBSC, development of which the Governor requested of CBSC and other state agencies at the close of the 2007 legislative session. CBSC also commends the tireless ARB staff that assisted CBSC with the development of the 2010 CGBSC, despite their own program demands. Especially appreciated as well are staff from the California Energy Commission and the Department of Water Resources, who were particularly helpful with technical provisions of the code. CBSC looks forward to working with these agencies in further development of the CGBSC.

COMMENTERS: Dan Zarraonandia, President, California Precast Concrete Association; Tom Tietz, Executive Director, California Nevada Cement Association; Charles Rea, Director of Communications and Policy, California Construction and Industrial Materials Association; and Bruce Carter, Regional Director, Lehigh Hanson West Region, on **Industry ‘Sustainability’ Proposal** (for cement and concrete):

Support CBSC's examining this draft proposal for an alternate approach to greener cement and concrete and request that the agency consider it in the next code adoption cycle.

RESPONSE: CBSC acknowledges the support and agrees to convene interested parties and stakeholders to revisit this proposal in the next cycle. The proposal may be approved as a standard at that time, or may be included in the International Code Council's 2012 green building code.

COMMENTER: Douglas Mooradian, Executive Director, Precast/Prestressed Concrete Manufacturers Association of California, on the "**Draft Code**":

Requests CBSC to further study for the next cycle the provisions of the CGBSC to create a green and sustainable code that takes a holistic approach. The emphasis on supplementary cementitious materials in the cement and concrete provisions is too narrow.

RESPONSE: CBSC declines to accept the change at this time, but it will reconvene the parties interested in cement and concrete in the next code adoption cycle for further development of these standards.

COMMENTER: William Schock, California Building Officials (CALBO), on the **Preface** and **Effective Use of this Code**:

Coordinate the language in these boilerplate sections with Sections 101.7 and 101.11 in Chapter 1. Delete the word "local" in describing environmental conditions for which cities and counties may adopt more restrictive ordinances than regulations in Title 24.

RESPONSE: CBSC concurs with the first comment, and proposed changes in a 15-day comment period. No further comments were received. CBSC does not accept the second comment, however, because the local requirement is in statute, and indeed, through AB 210 (Hayashi) recently signed by the Governor, green building standards are specifically included among those subject to local amendment filing.

COMMENTERS: Victoria Rome, Natural Resources Defense Council, and Lauren Navarro, Environmental Defense Fund, **no section number**:

The commenters state that the CGBSC is moving in the right direction, including strengthening the voluntary tier structure. They disagree with the use of "CALGREEN" to describe the tiers, agreeing on this matter with the United States Green Building Council (USGBC-NCC). They claim the debate over CALGREEN detracted from discussion of substantive measures during code development.

RESPONSE: CBSC appreciates the comment in support, but intends to maintain the use of CALGREEN for the tiers to distinguish them from other green building programs that may be adopted by cities and counties. See response to USGBC-CC for additional information on "CALGREEN" and verification concerns.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC-CC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; Tina Andolina, Planning and Conservation League, on **Division A5.6**, "CALGREEN" tiers:

Recognize the progress that CBSC and HCD have made, working with agencies like the Air Resources Board and the Energy Commission, to strengthen the tier structure and improve verification of compliance. Recommend that CBSC delete the term CALGREEN, like HCD, to describe the tiers, since the term increases the level of market confusion and undermines choices for cities and counties to promote truly green building.

RESPONSE: CBSC is appreciative of the support expressed. CBSC does not accept the recommendation, however, because many other interested parties have expressed support for the tiers. The tiers are intended as reach standards for adoption by cities and counties, moving the State toward its goals for net zero energy and GHG emission reduction. The term "CALGREEN", furthermore, also has received support from other parties and serves to distinguish this code from other green building guidelines, assisting market choices by code users and local governments. CBSC previously removed numerous references to CALGREEN that were in other parts of the code in response to concerns expressed by these same commenters. The CALGREEN reference to the voluntary tiers provides clarity to the users of the code so it will not be confused with any other tier system that may be used elsewhere.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC-CC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; Tina Andolina, Planning and Conservation League, on **Division A5.6**, verification:

Opine that the tiers still lack adequate verification mechanisms and suggest that CBSC either strengthen the verification mechanisms or remove the tiers for further study in the next code adoption cycle. The commenters further recommend that the code require verification similar to that of the leading point rated systems designed to certify buildings. Third party verification by the leading point rated systems is typically performed by independent parties who do not visit the site, reviewing documentation provided by the contractor or owner. This third party verifier is outside the control of the enforcing agency and is under contract with the point rated organization.

RESPONSE: The CGBSC establishes the minimum level of standards for all buildings and does not certify buildings. Verification for code compliance is typically performed by inspection during construction by the local enforcement personnel or by special inspection under the control of the local enforcement agency.

CBSC has proposed in Chapter 7 special inspection and documentation language like other parts of Title 24; and it has proposed in a 15-day comment period additional verification of compliance language for the voluntary standards included in the tiers.

COMMENTER: Judi Schweitzer, S+A, on **Voluntary Tiers:**

Finds the CBSC format confusing, and recommends following the table format proposed by HCD. Also, it should be made clear how each individual measure within a tier may be counted, such as towards energy reduction and/or another voluntary measure within the tier.

RESPONSE: CBSC has received a conflicting comment on the format from ARB, and declines to make any changes for this code cycle. However, it proposed for 15-day comment a clarification on credit for the cool roof provision, which may also apply to other measures that may be used to reduce energy and for another purpose. No further comment was received.

COMMENTS ON MANDATORY MEASURES.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 101.3:**

Supports the scoping of the CGBSC for new construction only.

RESPONSE: CBSC acknowledges the comment, having agreed with Department of Housing and Community Development (HCD) to propose the partially-mandatory code currently for newly constructed buildings.

COMMENTER: William Schock, California Building Officials (CALBO), on **Section 101.4:**

Correct an error in strikethrough inadvertently shown through the word "city".

RESPONSE: CBSC concurs with the comment, and proposed changes in a 15-day comment period. No further comments were received.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; Tina Andolina, Planning and Conservation League; and William Schock, (CALBO), on **Section 101.7.1:**

The environmental groups support the inclusion of environmental conditions for the purpose of local amendments. However, all ask CBSC to delete the word "local" in describing environmental conditions for which cities and counties may adopt more restrictive ordinances than regulations in Title 24.

RESPONSE: CBSC is appreciative of the support expressed. CBSC does not accept the second comment, however, because the local requirement is in statute, and indeed, through AB 210 (Hayashi) recently signed by the Governor, green building standards are specifically included among those subject to local amendment filing.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 303.1:**

With regard to the CGBSC's application to tenant improvements, define the word "initial".

RESPONSE: CBSC does not accept the comment, because the codes generally defer to dictionary definitions of non-technical words.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.102 Definitions:**

Correct the number 100 lamp lumens to 1000 lamp lumens for the calculation of allowable candela for Cutoff Luminaires.

RESPONSE: CBSC concurs with the comment, and proposed changes in a 15-day comment period. No further comments were received.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.106.1:**

Recommends scoping the section on storm water pollution prevention during construction for new projects only, and requiring it only for larger projects disturbing greenfield sites.

RESPONSE: CBSC concurs with the first comment, and proposed changes in a 15-day comment period. No further comments were received. CBSC does not accept the second comment, however, because this proposal is widely applied in green building programs and draft standards as a prerequisite for projects of all sizes and types of sites. Further, it is modeled after State Water Resources Control Board regulations.

COMMENTER: William Schock, California Building Officials (CALBO), on **Section 5.106.4:**

Delete the reference to the University of California Policy on Sustainable Practices for bicycle parking.

RESPONSE: CBSC declines to accept the change, because it was added at the request of the university, and CBSC adopts Title 24 for all occupancies in the State.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.106.4.1:**

Recommend increasing the distance from bicycle visitor parking amenities from 100 feet to 100 yards, and graduating the requirements depending on the size of the building.

RESPONSE: 300 feet, the length of a football field, seem too far to encourage visitors on bicycle, but CBSC agrees to increase the distance to 200 yards. CBSC proposed the change in a 15-day comment period, and no further comments were received. The requirement, at 5% of visitor parking capacity, is modest; the cost is insignificant; and the standards encourage less use of cars, contributors to GHG emissions. CBSC did not propose to make further changes.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.106.4.2:**

Add a clarification that long-term bicycle parking is for the tenant-occupants of a building, and graduate the requirements depending on the size of the building. They also recommended moving this to a voluntary standard in the Appendix.

RESPONSE: CBSC concurs with the first comment, and proposed changes in a 15-day comment period. No further comments were received. For the second comment, CBSC posits that, at 5% of visitor parking capacity, is modest; the cost is minimal; and the standards encourage less use of cars, contributors to GHG emissions. CBSC did not propose to make further changes.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA); Robert Raymer, California Building Industry Association (CBIA); and Judi Schweitzer, S+A, on **Section 5.106.4.3:**

This mandatory requirement for changing rooms and showers generated considerable negative comment from the building industry. Ms. Schweitzer questioned the safety and security of shower users, and potential liability for the building owner. They recommended moving this to a voluntary standard in the Appendix.

RESPONSE: CBSC proposed moving this section to the Appendix as Section A5.106.4.3 in a 15-day comment period, and received no further comment.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section 5.106.5.2:**

ARB suggests that the values in the table for designated parking for clean cars be consistent with those in the Appendix, but reflect an average 8% of parking capacity requirement.

RESPONSE: CBSC accepts the comment and has modified value ranges as recommended. CBSC submitted the change in a 15-day comment period and received no comments on the revision.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.106.8:**

Commenters support the inclusion of an exception for nighttime security and emergency lighting when considering a mandate for exterior light pollution reduction. However, they note that all lighting is not likely to be preventing from escaping a site. LEED, in a guideline like this standard, allows a small percentage to escape 15 feet beyond the site boundary.

RESPONSE: CBSC acknowledges the support. CBSC also concurs with the comment, and proposed changes in a 15-day comment period. No further comments were received.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.301.1:**

Support the triggers for water meter requirements at 100 and 1000 gallons of water consumption per day, respectively.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League; on **Section 5.303.1:**

Support the requirements for separate water meters for high water-use occupancies.

RESPONSE: CBSC acknowledges the support.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League, on **Section 5.303.2:**

Support the requirement for a 20% reduction in indoor water use.

RESPONSE: CBSC acknowledges the support, and notes that the Governor has made this a statewide goal for water reduction.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.304.3 – 5.304.3.1:**

Expressed general concern for cost of “smart” irrigation controllers, especially for associated energy management systems.

RESPONSE: CBSC has found that water- and soil-moisture controllers do cost more than conventional ones, but they save cost in water savings for irrigation. Also, CBSC is not mandating connection to a building’s energy management system at this time, having learned that the technology is still in development.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Sections 5.408.2.1** and **5.408.2.2:**

Support the flexibility of making documentation of construction waste management plans and diversion records accessible to the enforcement agency, but not requiring a specific location; and supports defining language submitted in the 45-day comment period for an exception for isolated jobsites.

RESPONSE: CBSC acknowledges and appreciates the support.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.408.4:**

Would like to see the recycling requirement for soil and land clearing debris moved to the voluntary appendix.

RESPONSE: CBSC, deferring to its expert staff at the California Integrated Waste Management Board (CIWMB), demurs. CIWMB has stated that requiring this provision will drive the market and keep considerable waste from going to the landfill.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.410.1:**

Suggest that the words “entire building” be changed to “building occupants” in consideration of accessibility to recycling areas.

RESPONSE: CBSC does not propose to accommodate the comment, because CIWMB has stated that the language in this provision is statutory.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.410.2:**

Suggest that language be added to clarify an Owner’s Project Requirements (OPR) for commissioning a building for buildings of differing stages, such as shell buildings not completely built-out. They suggest that language for training for systems operation move from the listed requirements to a more general statement to assure the building operates efficiently over time.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League, on **Section 5.410.2:**

Suggest that commissioning should be moved to another location in the code; removal of the requirement for national recognition for certification of commissioning agents; removal of “post-construction” from documentation and training; and include a section for systems programming and expected usage of the building. They included suggested language in their comment.

COMMENTER: William Schock, California Building Officials (CALBO), on **Section 5.410.2:**

Initially, CALBO requested that CBSC delete all but part of the first sentence to give maximum flexibility to building owners and enforcement authorities for commissioning. CALBO later returned with specific comments on language throughout the section, to wit: Narrowing the scope to only certain occupancies 50,000 square feet and over; removing the reference to national recognition for certification of commissioning agents; removing, wherever it appears, the phrase “at a minimum”; deleting “Owner” from Owner’s Project Requirements (OPR); removing the section on training of building staff for commissioning; removing commissioning provisions during the design phase of the project; stipulating that a commissioning plan is to be prepared prior to permit issuance; allowing documentation and reporting to be delivered to an owner’s representative or an owner; and removing some detail and specificity.

COMMENTER: Phil Welker, California Commissioning Collaborative (CCC), on **Section 5.410.2:** Mr.

Welker was by and large supportive, but had suggestions for general strengthening of provisions related to design review, minimum standards for commissioning provider certification, and training and outreach to support compliance and enforcement.

RESPONSE: CBSC submitted the comments of USGBC-CC, et al, CCC, and CALBO to the ARB and the California Energy Commission (CEC). Basically the agencies agreed with the USGBC comments, and recognizing that CALBO is reviewing the section from a building official viewpoint, advised which comments could be accommodated and which should not, in the interest of advancing this important provision forward. In two subsequent 15-day comment periods, CBSC presented a revised section by:

- Adding phasing language for buildings of differing completion stages;
- Adding training language suggested by USGBC which meets the spirit also of the comment from BOMA, and removing any references to commissioning activities occurring post certificate of occupancy;

- Using USGBC language for qualification of commissioning agents which eliminates the requirement for certification by a nationally recognized organization;
- Removing the phrase “at a minimum” throughout;
- Including an Owner’s Representative as an alternate with authority for project requirements and receipt of documentation and reports;
- Stipulating that a commissioning plan is to be prepared prior to permit issuance;
- Removing suggested minor detail and specificity to give flexibility to user and enforcer; and
- At the request of ARB, adding a reference to other related regulatory requirements for systems.

During the final 15-day comment period, CBSC received additional comment from William Schock, CALBO, who reiterated the recommendations that CBSC declined to make as noted above. CBSC will continue to work with all interested parties in the next code adoption to refine provisions and reach additional consensus. It should be noted that all other comment received on building commissioning was supportive or constructive, and most was accommodated by the agency; CBSC will also consider the general comments of the CCC in working with other agencies in the next cycle.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League, on **Section 5.410.3:**

Suggest that the section referred to as Testing, Adjusting and Balancing be amended to Testing and Adjusting, reserving the requirements for balancing for HVAC systems only.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section 5.410.3:**

Suggests changing the word “should” to “shall” for following recommended procedures for HVAC balancing, and suggests adding a reference to other related regulatory requirements for systems.

RESPONSE: CBSC is accepting the comments and has submitted the changes in subsequent 15-day comment periods. CBSC received no comments on the revisions.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA); Robert Raymer, California Building Industry Association (CBIA), and William Schock, California Building Officials (CALBO), on **Section 5.504.2:**

More than bicycle changing rooms and showers, this section requiring flushing out a building with fresh air prior to occupancy reportedly received the most negative comment from the building industry, despite modifications made for public comment that allowed the building to be occupied early. They claim technical, enforcement and potential liability problems and recommend that CBSC withdraw the section for further study in the next code adoption cycle.

COMMENTERS: Anton Paley, the American Commission Group, LLC, and Simon Turner, Healthy Buildings International, on **Section 5.504.2:**

Suggest that building flush out has the problems noted by the building industry representatives, and propose a testing alternative modeled after LEED.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section 5.504.2:**

Suggests adding specificity to calculations for outdoor air volume, but no other changes to the section. During code development, ARB did not recommend a testing alternative due to lack of a widely accepted protocol and the expense of testing, which may not actually test for all volatile organic compounds (VOC) emitted by newly-installed finishes.

RESPONSE: CBSC, upon the recommendation of ARB, has not agreed to withdraw this important section, but noting industry comments, has moved the section to the voluntary Appendix as Section A5.504.2. Further, coordinating with ARB, CBSC has proposed a testing alternative in new Section At.504.2.1. These changes were submitted in a 15-day comment period and received no further comment.

COMMENTERS: Stephany Mason, Air Quality Sciences, Inc and Josh Jacobs, Greenguard Environmental Institute, on **Sections 5.504.4.4 and 5.504.4.6:**

Require that, in addition to referring to Collaborative for High Performance Schools (CHPS) for acceptable carpet and resilient flooring, products are certified to meet Greenguard Children and Schools standard. Ms. Mason commented again during a 15-day comment period, where these sections were not proposed for additional change.

RESPONSE: CBSC consulted with ARB and was advised against requiring Greenguard certification at this time. First, this is a third-party certifier that may involve expense to the code user, and second, their standards are specific to children and schools, which may be more rigorous than what is needed for nonresidential buildings. CBSC and ARB will consider this comment for the next code adoption cycle.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section 5.504.4.6:**

ARB suggests adding a non-regulatory note for clarity to the user with a link to the FloorScore website for information on products recognized by the Resilient Floor Covering Institute.

RESPONSE: Despite the non-regulatory nature of the change, CBSC submitted the change in a 15-day comment period and received no comments on the revision.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League, on **Section 5.504.4.5:**

Support the mandatory provisions for reduction of formaldehyde in composite wood products.

RESPONSE: CBSC, which included this provision from the 2008 code in collaboration with ARB, is appreciative of the support expressed.

COMMENTER: William Schock, California Building Officials (CALBO), on **Section 5.504.7:**

Delete the reference to Community College, California State University, and University of California polices for control of tobacco smoke.

RESPONSE: CBSC declines to accept the change, because it adopts Title 24 for all occupancies in the State. CALBO may have no authority for enforcement of public school and university building regulations and is regarding the proposal from its point of view.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section 5.507.4.2:**

Support CBSC's proposal for a Sound Transmission Class (STC) rating of 40 for interior walls, which they requested be reduced to from the 50 proposed initially.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League, on **Section 5.507.4.2:**

Note that CBSC should correct the word "Coefficient" to "Class" to describe STC, and prefer the 50 rating originally proposed, claiming that STC 40 is very low for party walls.

RESPONSE: CBSC acknowledges the support of the building industry. It will make the editorial change to the word "Class", but declines to change STC back to 50. Residential buildings and school classrooms require 50, but their needs for quiet are likely greater than most commercial occupancies. Also, many walls between tenants are fire-rated, and fire-rated assemblies often achieve 50 STC.

COMMENTS ON VOLUNTARY MEASURES.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section A5.102, Definitions:**

Update the designations for vehicles qualifying as Low-emitting and Fuel-efficient Vehicles, and correct an acronym, to coordinate with current ARB regulations.

RESPONSE: CBSC is accepting the comment and modifying the designations. CBSC submitted the change in a 15-day comment period and received no comments on the revision. It will correct the acronym editorially for publication.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section A5.103.1:**

Land use for development of private property, including this section for site selection criteria, is considered by the building industry to be under the authority of local governments, and CBSC should withdraw this section.

RESPONSE: CBSC declines to accommodate this comment. This section is voluntary, but may be adopted at the local level at the discretion of cities and counties. In addition, CBSC has included the qualifying phrase "where feasible" to communicate to the code user that compliance with this section may not be possible for any given project.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section A5.103.4 and A5103.4.1:**

Delete or revise to add additional clarity to level of remediation required for different land uses on brownfields. Their may be legal risk if not carried out pursuant to EPA regulations.

RESPONSE: CBSC declines to accommodate this comment. This section is voluntary, and CBSC has required remediation and has referred code users to the EPA website for additional information on brownfield development.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section A5.106.7:**

This section is unclear as to shading coverage required for a building exterior, and should be moved to the voluntary Appendix.

RESPONSE: CBSC already moved this standard to the voluntary Appendix for the 45-day comment period. CBSC added clarifying language to indicate that shading would be required only for walls with windows, and the Solar Reflectance Index (SRI) of 25 for opaque walls is a minimum requirement. The changes were submitted in a 15-day comment period, and no further comments were received.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section A5.106.8:**

Suggest amendments for the exceptions to this section for shading of air conditioning condenser units.

RESPONSE: CBSC responds that it already withdrew this section from the code for the 45-day comment period for lack of clarity. The section number has been reassigned. CBSC will consider further developing this provision for the next code adoption cycle.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section A5.106.11:**

Correct the climate zone numbers for roof slopes greater than 2 in 12 in the cool roof Table A5.106.11.2.1, and add verification of compliance language to this section like others required for compliance with voluntary tiers.

RESPONSE: CBSC is accepting the comment, correcting the number and adding a Section A5.106.11.3 and submitting it in a 15-day comment period. CBSC received no comments on the revisions.

COMMENTER: James Mattesich, Greenberg Traurig, on behalf of the Asphalt Roofing Manufacturers Association (ARMA) on **A4.1.6.5** and **A4.1.6.5.1** (HCD proposal with corresponding sections in CBSC proposal):

Mr. Mattesich claims that steep slope asphalt roofing products, primarily used in residential construction, are unable to meet the aged thermal emittance and SRI values in these provisions, and he recommended further study. After HCD submitted modifications in a second 15-day comment period, Mr. Mattesich responded that the changes should be resubmitted in a full 45-day comment period, and he recommended disapprove.

RESPONSE: HCD, who worked with ARMA and the CEC to reach a consensus on acceptable values, believes that the changes made subsequent to the 45-day comment period were sufficiently related and adequately noticed. Since there may be steep slope asphalt shingle roofing applications in new nonresidential buildings, CBSC is proposing to co-adopt the HCD provisions to avoid conflicts in the code. Refer to HCD's Final Statement of Reasons for a summary of Mr. Mattesich's specific comments and HCD's responses to each.

COMMENTER: Judi Schweitzer, S+A, on **Table A5.106.11.2.2:**

As presented in the 45-day comment period, some values in the cool roof table were TBD, which is unenforceable; further study this provision until more information is available.

RESPONSE: CBSC acknowledges problem, but since has coordinated the values with ARB. The completed table was proposed in a 15-day comment period, and no further comment was received.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section A5.204.3.1** and **A5.204.3.2:**

Suggest that demand response strategies are overly limited and should allow additional strategies.

They also suggest that the savings from combined heat and power applications be including in energy savings for voluntary tiers for 15% and 30% above current energy code requirements.

RESPONSE: CBSC finding the comment concerning strategies beyond the scope of this rulemaking, has deferred these comments to CEC. CBSC and CEC will look at these comments for the next code adoption cycle.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Section A5.302.2.2:**

ARB suggests omitting the appellation "Tier 3" for voluntary 40% indoor water use reduction as inconsistent with the format of other sections of the code.

RESPONSE: CBSC is accepting the comment and omitting "Tier 3". CBSC submitted the change in a 15-day comment period and received no comments on the revision.

COMMENTERS: Dennis Murphy, Andrea Traber, and Elizabeth Echols, (USGBC); Catherine Merschel, Build It Green; Wendy Sommer, Stop Waste.Org; Jim Metropulos, Sierra Club; and Tina Andolina, Planning and Conservation League, : on **Section A5.303.3.3:**

Recommend following Energy Star guidelines for water use for commercial dishwashers in lieu of standards cited.

RESPONSE: CBSC finds that this comment is beyond the scope of this rulemaking. It will work with the Department of Water Resources (DWR) and consider this comment in the next code adoption cycle.

COMMENTER: Larry Rohlfs, Assistant Executive Director, California Landscape Contractors Association, on **Sections A5.304.4, A5.304.4.1** and **A5.304.4.2:**

Using the water budget as a benchmark for outdoor use of potable water for landscape irrigation produces standards that will not be achievable and acceptable to the code user.

RESPONSE: CBSC, working with DWR, is accepting the comment, along with HCD for residential applications, as an important consideration since these sections are required in the voluntary tiers. CBSC and HCD changed the benchmark to Reference Evapotranspiration and modified the percentages of

reduction, somewhat stricter for nonresidential than residential. The agencies submitted the changes in a 15-day comment period and received no comments on the revisions.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **Sections A5.304.4.1** and **A5.304.4.2:**

Add verification of compliance language to this section like others required for compliance with voluntary tiers.

RESPONSE: CBSC is accepting the comment, adding a Section A5.304.4.3.3 and submitting it in a 15-day comment period. CBSC received no comments on the revision.

COMMENTER: Kenneth Nigro, Business Development Manager, Central Concrete Supply Co., a division of US Concrete, on **Sections A5.405.5** through **A5.405.5.3.2.3:**

Supports CBSC voluntary measures for cement and concrete that “will positively effect the state-wide effort to reduce energy consumption, lower CO2 emission and increase the use of recycled materials in concrete production.”

RESPONSE: CBSC acknowledges the comment and appreciates the support of Central Concrete staff.

COMMENTER: Tom Tietz, Executive Director, California Nevada Cement Association, on **Section A5.405.5. 1:**

Change title of standard ASTM C 595 to include the word “Blended” before the words “Hydraulic Cement”.

RESPONSE: CBSC agrees to make this editorial change.

COMMENTERS: Dan Zarraonandia, President, California Precast Concrete Association; Tom Tietz, Executive Director, California Nevada Cement Association; Charles Rea, Director of Communications and Policy, California Construction and Industrial Materials Association; and Bruce Carter, Regional Director, Lehigh Hanson West Region, on **Section A5.405.5.2.1:**

Support CBSC’s removal of a general reference to the CalTrans specification for supplementary cementitious materials (SCM) that replace cement in the manufacture of cement or concrete. However, they suggest removing the specific reference to the CalTrans specification for Ultra-fine fly ash and metakaolin, or requiring either ASTM or CalTrans standards.

RESPONSE: CBSC acknowledges the support, but declines to remove the CalTrans reference for these specific SCM. According to CalTrans engineers, these are “premium” SCM used primarily in blended cement and must have additional physical and chemical properties.

COMMENTERS: Dan Zarraonandia, President, California Precast Concrete Association; Tom Tietz, Executive Director, California Nevada Cement Association; Charles Rea, Director of Communications and Policy, California Construction and Industrial Materials Association; and Bruce Carter, Regional Director, Lehigh Hanson West Region, on **Section A5.405.5.2.1.1:**

In addition to the exception to the mix design equation containing SCM for early high-strength concrete, emphasize the discretion of the engineer for special considerations of architecture or design.

RESPONSE: CBSC declines to make the change, because, at the very beginning of the SCM section, it states that the engineer may direct otherwise for the mix design (for any reason implied).

COMMENTERS: Stephany Mason, Air Quality Sciences, Inc and Josh Jacobs, Greenguard Environmental Institute, on **Sections A5.504.4.8** and **A5.504.4.9:**

Require that, in addition to referring to Collaborative for High Performance Schools (CHPS) for thermal insulation and acoustical wall and ceiling finishes, products are certified to meet Greenguard Children and Schools standard. Ms. Mason commented again during a 15-day comment period, where these sections were not proposed for additional change.

RESPONSE: CBSC consulted with ARB and was advised against requiring Greenguard certification at this time. First, this is a third-party certifier that may involve expense to the code user, and second, their standards are specific to children and schools, which may be more rigorous than what is needed for nonresidential buildings. CBSC and ARB will reconsider this comment in the next code adoption cycle.

COMMENTERS: Matthew Hargrove, Building Owners and Managers Association of California (BOMA) and Robert Raymer, California Building Industry Association (CBIA), on **Section A5.508.1.3:**

Suggest that this section for voluntary prohibition of Hydrochlorofluorocarbons (HCFC) should be deleted due to their being phased out soon for new equipment and their relatively low impact as a (GHG).

RESPONSE: CBSC declines to make this change at this time. This voluntary provision was developed in concert with the State Fire Marshal (SFM), and CBSC will work with SFM in the next code cycle to consider the merit of this option.

COMMENTER: Judi Schweitzer, S+A, on **Section A5.601.2.4** and **A5.601.3.4:**

Has questions on how the percentage of designated parking spaces for clean air vehicles is to be calculated, and how it may affect FAR, by which CBSC thinks she means "floor area ratio".

RESPONSE: CBSC acknowledges the question, but does not consider answering a question that does not suggest an action by the agency appropriate for this document.

COMMENTER: Mary Nichols, Chairman, Air Resources Board (ARB), on **BSC Application Checklist:**

Fully coordinate changes proposed during 45-day and 15-day comment periods with the items in the checklist, with several noted.

RESPONSE: CBSC is accepting the comment, and proposed some updates for 15-day comment. CBSC notes that the checklists are non-regulatory in nature, serving as guidelines for code users. Further coordination of the checklists can be made editorial or at the time of codification.

DETERMINATION OF ALTERNATIVES CONSIDERED AND EFFECT ON PRIVATE PERSONS

As a code partially mandatory and partially voluntary for green building standards, it could have an effect. However, the mandatory measures proposed are generally of modest cost, and the benefits derived in terms of pollution reduction and the well-being of building users outweigh the costs. The only alternative considered was changing two mandatory measures to voluntary in response to public comment, which could lessen any effect, and this alternative was chosen.

REJECTED PROPOSED ALTERNATIVE THAT WOULD LESSEN THE ADVERSE ECONOMIC IMPACT ON SMALL BUSINESSES

CBSC has determined that the proposed regulations could have adverse economic impact on small businesses, but the benefits derived in terms of pollution reduction and the well-being of building users outweigh the costs. No alternatives were considered, however, because the partially mandatory green building code was developed in response to the Governor's direction for the 2010 edition to assist the State in meeting its net zero energy and GHG emission targets.