

**INITIAL STATEMENT OF REASONS
FOR
PROPOSED BUILDING STANDARDS
OF THE
DIVISION OF THE STATE ARCHITECT –STRUCTURAL SAFETY (DSA-SS)**

**REGARDING ADOPTION OF THE 2008 CALIFORNIA GREEN BUILDING STANDARDS CODE,
FOR USE IN THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 11**

The Administrative Procedure Act requires that an Initial Statement of Reasons be available to the public upon request when rulemaking action is being undertaken. The following information required by the California Administrative Procedures Act (APA) pertains to this particular rulemaking action.

STATEMENT OF SPECIFIC PURPOSE AND RATIONALE FOR PROPOSED CHANGES

DSA proposes to adopt portions of the mandatory and voluntary measures of the 2008 edition of the California Green Building Standards Code for codification and effectiveness as the 2010 California Green Building Standards Code. DSA proposes this action in order to comply with state law requiring state agencies to propose adoption of the latest edition model codes within one year of the publication date.

California Green Building standards proposed by DSA-SS for adoption would be applicable for public elementary and secondary schools, and community colleges.

New amendments to existing 2008 edition of the California Green Building Standards Code are being proposed for adoption into the 2010 edition of the California Green Building Standards Code by DSA-SS or DSA-SS/CC (Division of the State Architect – Structural Safety/Community Colleges).

DSA proposes the codification of grid neutral educational facilities which is defined as a site that produces at least as much renewable electricity as it uses in a year.

Additional information can be found in the guidebook titled: “Grid Neutral: *Electrical Independence for California Schools and Community Colleges*”. This can be found online at: <http://www.dsa.dgs.ca.gov/OtherProg/gridneutral.htm>

CHAPTER 1 - ADMINISTRATION

DSA-SS is proposing these green building standards administrative sections:

AMEND -101.2, 101.3, 101.3.1, 101.5.1, 101.6.1, 101.7, 101.7.1, 101.8, 101.9, 101.10, 101.11, 102.1, 102.2;

ADOPT - Adopt new Section: 101.6.4 and

CARRY FORWARD UN-AMENDED - 101.1, 101.2, 101.4, 101.5, 101.5.2, 101.5.3, 101.5.4, 101.5.5, 101.5.6, 101.6, 101.6.2, 101.6.3, 101.11.

Administrative Chapter 1 was developed for the California Green Building Standards Code with sections specific to the needs of California and each state agency. This chapter is amended to further clarify that this chapter promotes uniform enforcement throughout the state and ensure local enforcement agencies are provided accurate statutory information regarding the enforcement of building standards in the State of California. The proposed amendments to California Chapter 1 are consistent with the standards and format used in other parts of the California Building Standards Codes.

CHAPTER 1 - ADMINISTRATION

DSA-SS is proposing to amend of this chapter as follows:

101-GENERAL

101.2 Purpose: In Item 5, delete the word “air” to match the title of the “Environmental Quality” chapters for residential and nonresidential buildings.

101.3 Scope: Add a paragraph describing voluntary tiers for achieving at least a 15% increase in energy efficiency, which is state policy agreed upon in 2008 among the Governor, Agency secretaries, and the Chair of the California Energy Commission.

101.3.1 State-regulated buildings, structures and applications: Correct a reference to state law, an editorial correction.

101.5.1 Building: Add a cross reference to include California Residential Code, as applicable.

101.6.1 Differences: Amend by adding a sentence to clarify that the texts of amendment would govern in the event a local amendment reused in a difference between the CGBC and local amendments.

101.6.4 Explanatory notes. Adopt new section clarifying that Notes are informational only and are not enforceable requirements of the CGBC.

101.7 City, county, or city and county amendments, additions or deletions: Clarify the intent of the 2010 version of the code to establish minimum mandatory green building standards as directed by the Governor at the close of the 2007-2008 legislative sessions.

101.7.1 Findings and filings: In Item 1, add a sentence clarifying that, when amending the building codes for green building standards, local jurisdictions may consider specific local environmental conditions as climatic findings; and, in Item 4, spell out "Public Resources Code" for clarification.

101.8 Alternate materials, designs and methods of construction: Amend to allow that on a case-by-case basis an alternate, found to be satisfactory and that is at least equivalent to what is prescribed in code in planning and design, energy, water, material, resource efficiency and conservation, environmental air quality, performance, safety, and the protection of life and health may be approved as alternate materials, designs and methods of construction. For clarity in item 1 cross references are corrected and reference to the Division of the State Architect is removed. For clarity, in item 2, cross references are corrected and acronym for CBC is spelled out as 'California Building Code'.

101.9 Effective date of this code: For clarity the word matrix is changed to checklist.

101.10 Mandatory requirements: For clarity sentence structure is proposed by moving the words 'and mandatory' in front of the word voluntary to read 'mandatory and voluntary'. For clarity, after the word contained, remove 'Chapter 11', to read 'contained in this code'.

101.11 Items 1--6: Update the effective use of the code to recognize the minimum mandatory standards and voluntary measures, including voluntary tiers, as well as how to use the state agency checklists.

102 – CONSTRUCTION DOCUMENTS AND INSTALLATION VERIFICATION

102.1 Submittal documents: Incorporate a recommendation by a stakeholder to allow separate submittal of additional construction documents which may be requested by the enforcing agency.

103 – BUILDING STANDARDS COMMISSION

103.1 Specific scope of application ...: Adopt scope of application of the agencies responsible for enforcement, the enforcement agencies, and specific authority to adopt and enforce building standards.

105 – DIVISION OF THE STATE ARCHITECT

105.1.1 Application: For clarity DSA-SS Application is amended to include new construction, unless otherwise indicated in the CGBC for public elementary and secondary schools, and community colleges. All other DSA-SS application provision in 105.1.1 is repealed.

105.1.2 Applicable administrative standards, Items 2.1 and 2.2: For consistency cross references to Sections are updated. The last paragraph regarding Green building standards not adopt, has been repealed with this adoption of the CGBC.

The proposed new language in Chapter 1 is consistent with the standards and format used in other parts of the California Building Standards Code.

CHAPTER 2 – DEFINITIONS

201 - GENERAL

201.1. Scope, 201.2 Interchangeability, 201.3 Terms defined in other documents, and 201.4 Terms not defined
DSA-SS is proposing the adoption of these new California sections to provide clarity to the code user regarding the use of definitions in this Code. The code user needs guidance on how to interpret words used in plural, past or present tense and other variations. The code user also needs guidance to correlate this code with other codes contained in Title 24 of the California Code of Regulations. Through adoption of these sections, DSA-SS is providing the code user with clarity on proper use of terms that are both defined in the proposed adoption and on terms or words that are not included in the CGBC.

202 - DEFINITIONS

DSA-SS proposes to adopt definitions for the terms in this new California section into Title 24, Part 11, CGBC. A uniform definition will provide clarity for the code user and consistency in the code application. The proposed terms contained in this section are used within the text of the CGBC and need to have the meanings assigned to them for proper interpretation and understanding. These definitions are: AUTOMATIC, BUILDING ENVELOPE, CALIFORNIA BUILDING CODE, CALIFORNIA ELECTRICAL CODE, CALIFORNIA ENERGY CODE, CALIFORNIA MECHANICAL CODE, CALIFORNIA PLUMBING CODE, CONDITIONED SPACE, COOLING EQUIPMENT, ENERGY COMMISSION, ENFORCING AGENCY, GREEN BUILDING, INFILTRATION, KITCHEN, LOW-RISE RESIDENTIAL BUILDING, OUTDOOR AIR (Outside air), RESIDENTIAL BUILDING, RESILIENT FLOORING, and VAPOR BARRIER.

CHAPTER 3 - GREEN BUILDING

301 - GENERAL

301.1 Scope

DSA-SS is proposing the adoption of this new California green building standard to provide clarity to the code user regarding the measures contained in the CGBC. It provides guidance and general understanding of the different measures proposed and directs code users to Chapter 11 state agency application checklists and worksheets.

302 – MIXED OCCUPANCY BUILDINGS

302.1 Mixed occupancy buildings

DSA-SS is proposing the adoption of this new California green building standard to provide clarity to the code user regarding mixed occupancy buildings. The CGBC covers several types of occupancies which do not share common concerns. This section clarifies that different types of occupancies shall comply only with features that are appropriate and intended to apply to the specific occupancy.

303 - PHASED PROJECTS

303.1 Phased projects.

DSA-SS is proposing the adoption of this new California green building standard to provide clarity to the code user regarding the phased project for shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction would apply.

303.1.1 Tenant improvements. DSA-SS is proposing the adoption of this new California green building standard to provide clarity to the code user regarding that provisions of the CGBSC would apply only to the initial tenant improvements to a project.

SECTION 304 - VOLUNTARY TIERS

304.1 Purpose DSA-SS is proposing the adoption of this new California green building standard to provide clarity to the code user regarding voluntary tiers are intended to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building's impact on the environment, promote a more sustainable design.

304.1.1 Tiers. DSA-SS is proposing the adoption of this new California green building standard to provide clarity to the code user regarding the provisions of Appendix A5 outline means of achieving enhanced construction levels by incorporating additional measures. Buildings complying with tiers specified for each occupancy contain additional required and voluntary green building measures necessary to meet the threshold of each level.

Note that where Tier 1 and Tier 2 are referenced in this document, these are voluntary measures adopted by the DSA-SS that are over and above the prerequisites required to meet the CALGREEN reach standards indicated in A5.601.

CHAPTER 5 – NONRESIDENTIAL REQUIRED MEASURES

DIVISION 5.1 – PLANNING AND DESIGN

5.101 – GENERAL

5.101.1 Purpose

DSA-SS is proposing the adoption of this new California green building standard section to provide clarity to the code user regarding the measures contained in the CGBC. This section provides the code user with necessary general knowledge regarding the intent of this chapter.

5.102 – DEFINITIONS

5.102.1 Definitions

DSA-SS is proposing the adoption of this new California green building standard section to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the CGBC. These definitions are: CUTOFF LUMINARIES, LOW-EMITTING AND FUEL EFFICIENT VEHICLES, NEIGHBORHOOD ELECTRIC VEHICLE (NEV), PZEV, TENANT-OCCUPANTS, VANPOOL VEHICLE, and ZEV.

5.106 – SITE DEVELOPMENT

5.106.4 Bicycle parking and changing rooms, 5.106.4.1 Short-term bicycle parking, 5.106.4.2 Long-term bicycle parking, 5.106.4.3 Changing rooms, and Table 5.106.4.3

The regulation would make it mandatory for all for non-residential buildings with over 10 tenant-occupants to provide short- and long-term bicycle parking and shower and locker facilities (or document arrangements with nearby changing/shower facilities), meet a local ordinance, or a university campus policy, whichever is stricter.

Although there is cost associated with implementing the bicycle parking regulations, the impact is minimal when compared to the overall construction cost. Vehicle parking is determined at the local level, typically based on building square

footage, visitor traffic, or seats in assembly occupancies. Short term parking is to be required for transient users (occasional visitors, retail customers, etc.). Long-term bicycle parking and changing rooms are restricted to tenant-occupants, as distinguished from visitors. For a typical 10,000 square foot office building in the suburbs of Sacramento, about 30 parking spaces would be required, 5% of which is 2. This might be divided between visitors and tenant-occupants, but calculating long-term parking based on the full 5% yields a small number. A visitor rack, 2 long-term bicycle spaces, 1 shower and 3 lockers would add up to about \$5500. If the building costs 1.5 million dollars to build, bicycle parking and changing facilities would account for less than .5% of the construction cost. As projects get larger, the percentage declines further.

The benefits of implementing a bicycle parking regulation would promote bicycle ridership, for campus staff, rather than the students since it is standard practice to provide for student bicycle parking. The resulting benefits for staff are:

- Reducing the number of vehicles from the roadways and therefore reducing green house gas emissions.
- Also, such a regulation would promote some indirect benefits such as biking, running, walking and other forms of aerobic exercising during breaks or during the lunch hour which would promote health and wellness.
- The health benefits both mental and physical of riding a bicycle and other forms of exercise are well documented and could reduce health-related costs borne by business districts.

These, along with increased employee productivity, clearly out weigh the insignificant cost associated with implementing such a regulation.

5.106.5.2 Designated parking & Table 5.106.5.2

DSA-SS is proposing to adopt these green building standards to require that a graduated number of parking stalls be reserved and marked for any combination low-emission, alternative fuel, and carpool vehicles. The measure provides direction to the designers and builders to the stenciled words to be applied in each designated stall. Separate signage is not required, but could be installed at the owner's discretion.

The purpose of this measure is to reward carpool users and drivers of either low-emission or alternate fuel vehicles for reducing greenhouse gas emissions by assuring that parking is available to them. It can be accomplished for a very low cost of approximately \$30 per stall, including labor, DSA-SS has learned in consultation with designers familiar with this concept. Optional signage would add another \$125 per stall. The cost of stall painting only for a project with 70 parking spaces, for example, would be estimated to be under \$200. For a large project with 500 spaces, it should be under \$1500. The benefits of this provision include the fuel saved and pollution reduced by the building end users for deciding to raise their own environmental consciousness by driving low-emitting and fuel efficient vehicles.

5.106.8 Light pollution reduction

DSA-SS is proposing to adopt these green building standards to provide a reference to the energy code for light pollution control. While the energy code's provisions emphasize the energy efficiency of outdoor lighting, they also mandate cutoff luminaries and provide performance standards that are tailored for the various lighting zones specified in Chapter 10 of the CAC. Thus they have some traction in the arena of reducing light pollution.

The strategies listed from the IESNA guidelines give designers additional tools to meet the provisions of the energy code and further to mitigate light escaping a project site at night, while balancing costs and benefits.

- Cutoff luminaries are commonly selected from distributors' commodity product lines, whereas often more expensive, designer luminaries do not comply with the light distribution parameters of cutoff luminaries. Thus, cutoff luminaries are typically readily available at an economic price. Cost of installation of such fixtures should be comparable to other outdoor lighting fixtures.
- Confining indoor light trespass within buildings and outdoor light trespass within the site through conscious design and controls should reduce light pollution. This may well enhance enjoyment of night skies and provide educational opportunities about heavenly bodies. It may also promote occupants' and neighbors' well-being through the experience of natural circadian rhythms of hormones, often suppressed by modern-day light levels and habits, which regulate sleep and wakefulness.
- The cost of controls to dim or turn off unnecessary indoor or outdoor lighting is in addition to the fixtures, but should be paid back in energy savings and longevity of luminaries. The exceptions to this standard are a pointer to existing regulations in the CBC mandated by law for safety on campus parking lots and walkways through adequate lighting, and an exception for nighttime safety and security recommended in a public comment.

5.106.10 Grading and Paving

DSA-SS is proposing to adopt these green building standards to mandate that sites are graded such that surface water is moved away from buildings to prevent mold and structural damage in the building. Grading and paving plans, typically required by enforcing agencies, will show how this is to be accomplished. Providing such information on plans should not add to the cost of the project, and since most, if not all, projects require some grading, the actual grading should not as well. Benefits may be realized in terms of building longevity and occupant well-being.

DIVISION 5.2 ENERGY EFFICIENCY

5.201 - GENERAL

5.201.1 Scope

DSA-SS is proposing to adopt these green building standards to encourage buildings' to achieve exemplary performance in the area of energy efficiency. A green building should achieve at least a 15% reduction in energy usage when compared to the State's mandatory energy efficiency standards.

DIVISION 5.3 - WATER EFFICIENCY AND CONSERVATION

DSA-SS is proposing to adopt these green building standards which were developed in discussion with staff from the Department of Water Resources (DWR) and are designed to provide greater water savings consistent with the statements in specific purpose and rationale of this document. DWR has since proposed changes to its Model Efficient Landscape Water Ordinance (MO) for approval by the Office of Administrative Law, intended to go into effect on January 1, 2010, some of which are reflected in DSA-SS proposed provisions. Comments from the California Energy Commission, California Urban Water Conservation Council, California Landscape Contractors Association, and the Plumbing Manufacturers Institute were also taken under consideration.

5.301 - GENERAL

5.301.1 Scope

DSA-SS is proposing to adopt these green building standards to provide the code user with necessary general knowledge regarding the goals and items covered by this chapter.

5.302 – DEFINITIONS

5.302.1 Definitions

DSA-SS is proposing adoption of these green building standards definitions applicable to water efficiency and conservation and as used elsewhere in the CGBC for the following definitions GRAYWAER, MODEL WATER EFFICIENT LANDSCAPE ORDINANCE, POTABLE WATER, RECYCLED WATER, SUBMETER, AND WATER BUDGET. These definitions provide guidance to the user on the meaning of words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the code.

5.303 - INDOOR WATER USE

5.303.1.2 Excess consumption

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding recording building energy use to track excessive consumption and increase energy efficiency.

5.303.2 20% Savings, Table 5.303.1 – Indoor Water Use Baseline, Table 5.303.2 – Fixture Flow Rates

DSA-SS is proposing adoption of these green building standards and table to provide clarity to the code user regarding indoor water use conservation. Currently the California Energy Commission (CEC) adopts regulations to establish the minimum water flow rates for specified fixtures and fixture fittings in Title 20 of the California Code of Regulations. The CEC includes shower heads, faucets and other plumbing fixtures and fittings in its definition of appliance and flow rates adopted by the CEC mirror those set by the U.S. Department of Energy. In addition, the US Environmental Protection Agency (EPA) has drafted specifications for high-efficiency residential fixtures under its WaterSense program.

In February of this year the Governor issued a proclamation declaring emergency drought conditions and requesting that "All urban water users immediately increase their water conservation activities in an effort to reduce their individual water use by 20 percent". DSA-SS is proposing to require reduction of indoor water use by 20% to meet the Governor's goals. These sections specify two methods to meet the 20% reduction: 1) a prescriptive 20% reduction in the flow rate of each fixture from what is currently allowed and; 2) a method to calculate base line water compared to the proposed water use.

5.303.4 Wastewater reduction

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding achieving reduction in overall indoor potable water use and impact on municipal water supply and wastewater treatment. The amendment requires that a 20% reduction be realized, aligning with the indoor water use provisions of Section 5.303.2.

5.303.6 Plumbing fixtures and fittings, Table 5.303.6 – Standards for Plumbing Fixtures and Fixture Fittings

DSA-SS is proposing adoption of these green building standards to propose specifications, including WaterSense, for those instances in nonresidential buildings where residential-type fixtures may be installed, for example, in a staff toilet or employee lounge, as well as those for commercial fixtures. This has been put into table format, more like the plumbing code referenced standards.

Received earlier by the Governor were comments from the Kohler Company expressing concern that manufacturers would not be able to meet the regulations' effective date of July 1, 2011 for high efficiency toilets (HET), because manufacturers were prepared for meeting the provisions of AB 715 (Stats. 2007, c. 499, Laird). That law addresses the percentage of product models that a manufacturer must offer for sale during specified years. The law does not address the volume or type of HET models that are to be offered for sale. And, HET are only one type of fixture among other fixtures throughout a project that could be installed to meet the 20% reduction.

Kohler's concern is directed more to the residential market, as is the law, and even after building activity resumes robust levels in the wake of current recession, the demand for residential HET in nonresidential construction will lag behind residential. HCD has committed to proposing a modification to the California Plumbing Code for residential applications to

allow local governments to modify the requirement for HET toilets, on a case by case basis, between July 1, 2011 and January 1, 2014, when the law requires all toilets sold in California to be HET.

DIVISION 5.4 - MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

Division 5.4 provisions address buildings' water resistance and moisture management, intended to extend building life, and recycling of construction and demolition (C & D) waste. It was recommended that recycling at least 50% of C & D waste is doable and could be mandated. Research by DSA-SS staff confirmed this claim and found that contractors that recycle C & D waste typically achieve a higher percentage than 50%. The provisions in the division also include a pointer to an existing law, requiring recycling areas be provided and identified for building occupants.

5.401 – GENERAL

5.401.1 Scope

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the application of the measures contained in the chapter. This section provides the code user with necessary general knowledge regarding the goals and items covered by this chapter.

5.402 – DEFINITIONS

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of key words used within this chapter. These definitions include: ADJUST, BALANCE, BUILDING COMMISSIONING and TEST.

5.407 – WATER RESISTANCE AND MOISTURE MANAGEMENT

5.407.1 Weather protection

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding weather protection, preventing damage to the structure and mold contamination. The section refers to regulations already in place.

5.407.2 Moisture control (5.407.2.1 Sprinklers & 5.407.2.2 Entries and openings)

DSA-SS is proposing adoption of these green building standards as a method to employ moisture control measures for sprinklers (design and maintain landscape irrigation systems) to prevent spray on structures and entries and openings (Design exterior entries and/or openings subject to foot traffic or wind-driven rain) to prevent water intrusion into buildings.

This section provides clarity to the code user regarding moisture control as it applies to structures, preventing mold contamination and damage to the structure and interior finishes.

5.408 – CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 Construction waste diversion

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding moisture control as it applies to structures, preventing mold contamination and damage to the structure and interior finishes. The requirements are minimal and can be addressed through proper design and installation of landscape irrigation systems and components and building elements. No costs are anticipated for special materials, and it would seem that compliance with the requirements can demonstrated in construction plans and specifications and verified during construction.

5.408.2 Construction waste management plan

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the diversion of (C & D) waste. The section recognizes local ordinances for diversion that may be more stringent and supplant the need for individual project waste management plans.

5.408.2.1 Documentation

DSA-SS is proposing adoption of these green building standards to ensure the enforcing agency is provided documentation demonstrating compliance with the construction waste management plan that 1) identifies the materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sales; 2) determines if materials will be sorted on-site or mixed; 3) identifies diversion facilities where material collected will be taken; and 4) specifies that the amount of materials diverted shall be calculated by weight or volume, but not by both.

5.408.2.2 Isolated jobsites

DSA-SS is proposing adoption of these green building standards to allow exceptions by the enforcing agency when jobsites are located in areas beyond the haul boundaries of the diversion facility for construction waste management plan.

5.408.3 Construction waste reduction of at least 50%

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the diversion of at least 50% of the construction waste generated from a landfill. Landfills produce significant amounts of methane gas, a direct greenhouse gas.

Implementation of the WMP and diversion includes at a minimum

- The establishment of dedicated bins for waste to be recycled (mixed or sorted depending on the type of diversion facility available) and materials to be reused or salvaged otherwise;

- Monitoring to ensure the waste is uncontaminated, not otherwise discarded, and the bins are kept clean;
- Contracting with a hauler to weigh and haul the waste to the diversion facilities; and
- Maintenance of records of money collected for recyclables, discounted haul rates and/or tipping fees in lieu of direct payment, weight tickets, and signatures and other forms of validation that reflect the kind and amounts of materials that have been recycled.

The costs of implementing the WMP and diverting at least 50% of C & D waste basically depend on the size of the building project and the level of detail in the plan. There is a cost associated with the time it will take a laborer to manage and oversee the daily waste diversion activity. Based on the data collected from various sources and studies, it appears that:

- The cost to develop and implement a basic level WMP for a small non-residential project in the range of less than 5 million is approximately \$4,000. A more detailed high level WMP implementation cost is approximately twice the cost of a basic WMP.
- The cost to develop and implement a basic level WMP for a large non-residential project in the range of 50-75 million is approximately \$20,000. A detailed WMP implementation cost approximately twice the cost of a basic WMP.

Regardless of the scale of the project, however, the cost is negligible and typically amounts to less than 1 percent of the total construction cost. And this cost is partially offset by the recycling cost savings as diverted waste typically saves costs in money collected for recyclables, discounted haul rates, and reduced tipping fees.

According to a training document from Department of General Services (DGS) for state building projects, the direct benefits of recycling are that it:

- Increases longevity of existing landfills
- Prevents costly process of siting new landfills
- Prevents emissions of air/water pollutants
- Conserves energy
- Preserves resources
- Creates jobs
- Decreases green house emissions
- Stimulates development of greener technologies
- Cost savings from lower disposal fees, avoided labor and implementation expenses.

DGS also notes benefits to the community. There are also subtle economic returns from recycling:

- Avoided are the costs of collecting and burying “trash”.
- The burden of future environmental cleanup and associated public health liabilities is reduced.
- Recycling also provides new jobs and affiliated industries.

Furthermore, communities that are viewed as being environmentally responsible are more likely to attract progressive industries and the workforce to run them. It is important to look at the whole chain of economic benefits from construction waste management and diversion. What may appear to be a break-even venture, or incur a slight cost increase of a project, in fact has more return for a community than is initially apparent.

5.410 – BUILDING MAINTENANCE AND OPERATION

5.410.1 Recycling by occupants & 5.410.1.1 Sample ordinance

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the establishment of recycling areas for occupants. In Section 5.410.1.1, DSA-SS is proposing to provide direction to the code user regarding Space allocation for recycling areas. This section references the regulations developed by CIWMB. It also references the statutory authority which is known as the California Solid Waste Reuse and Recycling Access Act of 1991.

DIVISION 5.5 – ENVIRONMENTAL QUALITY

The emphasis of this chapter addresses indoor air quality (IAQ), which is important to human health because individuals spend a large fraction of their time indoors at their residences, schools and workplaces.

The California Air Resources Board (ARB) and the California Department of Public Health (CDPH), during the last code adoption cycle and in this current cycle, assisted DSA-SS and the other proposing agencies with IAQ standards. Many of the standards refer to ARB VOC regulations or guidelines currently in place, and to other sources identified by ARB and CDPH.

5.501 – GENERAL

5.501.1 Scope

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the measures contained in the CGBC. This section provides the code user with necessary general knowledge regarding the goals and items covered by this chapter.

5.502 – DEFINITIONS

5.502.1 Definitions

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of key words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the CGBC which includes the following definitions: COMPOSITE WOOD PRODUCTS, MERV, MAXIMUM INCREMENTAL REACTIVITY (MIR), PRODUCT-WEIGHTED MIR (PWMIR), REACTIVE ORGANIC COMPOUND (ROC), and VOC.

5.503 – FIREPLACES

5.503.1 General & 5.503.1.1 Woodstoves

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of gas and wood burning appliances listed in this section. For those limited commercial applications such as multi-use rooms in churches, ski-lodges, and lounge areas of cafeterias when a fireplace is desired, DSA-SS proposes to restrict the types of fireplaces that can be installed. The regulations are consistent with the requirements currently in Title 24, Part 6.

For gas appliances, the only ones allowed would be direct-vent, sealed combustion for the following reasons:

- Unvented gas fireplaces are not permitted for installation in California.
- Direct-vent are widely available and recommended by fireplace dealers, who stated in interviews that, while B-vent types are also available and cheaper, B-vents are usually only installed where direct-vent types cannot be.
- Since B-vents need to be ducted through the roof, they may also be more expensive to install, especially in a multi-story building.
- Direct-vent efficiency ratings run from 65% to 93%. Thus, the direct cost of the direct-vent gas fireplaces may be cheaper in terms of installation and will be offset over time compared to B-vents, which are typically not rated for efficiency.

Wood-burning fireplaces and stoves are regulated under the EPA's clean air act provisions, which are recognized in California by the Air Resources Board.

- Open wood-burning fireplaces are not allowed in new construction in California, and
- Some air districts, like the south coasts, prohibit all wood-burning appliances in new developments.

Regulating the types of fireplaces meets Health and Safety Code §18930(a) because, as amenities in new nonresidential construction, they are not required for heat but are typically installed for effect. The cost of direct-vent gas appliances may be offset with energy efficiency and cheaper installation. Wood-burning appliances are already regulated at state and local levels, and these provisions do not conflict with those regulations. The provisions ensure that woodstoves must comply with US EPA Phase II emission limits.

5.504 – POLLUTANT CONTROL

5.504.1 IAQ Post-construction

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding flush out of a building by supplying continuous ventilation and fans for at least 14-days, at their maximum capacities.

5.504.3 Covering of duct openings and protection of mechanical equipment during construction

DSA-SS is proposing adoption of these green building standards to eliminate uncertainty and provide clarity to the code user regarding the covering of duct systems and equipment during construction. Unprotected ducts for heating and air conditioning equipment can accumulate dust, debris and other airborne contaminants during the construction process and contribute to poor indoor air quality. This proposal will require ducts and equipment to be covered or sealed to prevent the contamination during construction.

5.504.4 Finish material pollutant control, 5.504.4.1 Adhesives, sealants, and caulks, Table 5.504.4.1-Adhesive and Sealant VOC Limit, Table 5.504.4.2-Sealant VOC Limit, and 5.504.4.3.2 Verification

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding indoor air quality. Most indoor air pollution comes from sources inside the building. Paints, stains, adhesives, carpeting, upholstery, manufactured wood products, pesticides, and cleaning agents may emit volatile organic compounds (VOCs), including formaldehyde. Research shows that some VOCs can cause chronic and acute health effects at high concentrations, and some are known carcinogens. Low to moderate levels of multiple VOCs may also produce acute reactions. DSA-SS is proposing adoption of VOC limits developed by the South Coast Air Quality Management District (SCAQMD) and is including tables to assist the code user in identification of the VOC limits for adhesives, sealants, paints and other coatings. DSA-SS is proposing adoption for architectural paints and coatings which must comply with VOC limits. DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding verification of compliance must be provided and documentation may include 1) manufacturers product specification and 2) field verification of on-site product containers.

5.504.4.4 Carpet systems, 5.504.4.4.1 Carpet cushion and 5.504.4.4.2 Carpet adhesive

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding indoor air quality. Most indoor air pollution comes from sources inside the building. Paints, stains, adhesives, carpeting, upholstery, manufactured wood products, pesticides, and cleaning agents may emit volatile organic compounds (VOCs), including formaldehyde. Research shows that some VOCs can cause chronic and acute health effects at high concentrations, and some are known carcinogens. Low to moderate levels of multiple VOCs may also produce acute reactions. DSA-SS is

proposing carpet systems be labeled or documented to meet the Carpet and Rug Institute's (CRI) Green Label Plus program. Green Label Plus carpeting is currently widely available.

5.504.4.5 Composite wood, 5.504.4.5.2 Documentation, and Table 5.504.4.5-Formaldehyde Limits

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of formaldehyde in interior finish materials. In buildings, the most significant sources of formaldehyde are likely to be pressed wood products made using adhesives that contain urea-formaldehyde (UF) resins. Formaldehyde exposure at elevated levels (above 0.1 parts per million) may cause a wide range of health related issues. Pressed wood products made for indoor use include: particleboard (used as sub-flooring and shelving and in cabinetry and furniture); hardwood plywood paneling (used for decorative wall covering and used in cabinets and furniture); and medium density fiberboard (used for drawer fronts, cabinets, and furniture tops). Medium density fiberboard contains a higher resin-to-wood ratio than other UF pressed wood product and is generally recognized as being the highest formaldehyde-emitting pressed wood product. DSA-SS is proposing adoption to ensure the enforcing agency is provided documentation verification of compliance of composite wood products. Documentation must include 1) product certifications and specifications.

5.504.4.6 Resilient flooring systems

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding VOC emissions of interior resilient flooring systems. Emission limits are based on the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or the FloorScore certification standards developed by the Resilient Floor Covering Institute (RFCI). The availability of product lines on the CHPS list and/or certified as FloorScore compliant is quite robust, and DSA-SS staff contacted several listed manufacturers, including Armstrong, Mannington, Stainmaster, and Roppe. All of these manufacturers' products are certified by RFCI in conjunction with Scientific Certification Systems (SCS). These manufacturers also stated that they no longer offer products that do not comply. Therefore, for the long list of manufacturers and products on the CHPS list, there is no cost comparison to non-complying products and there is an adequate supply of product.

5.504.5.3 Filters

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding outdoor air contaminants that enter the building. DSA-SS is proposing as mandatory the installation of HVAC filters with at least a Minimum Efficiency Reporting Value (MERV) of 8. This filter features 100% synthetic electrolytic ally charged filtration media, which actively attracts and holds airborne contaminants.

The direct cost of such filters is minimal compared to MERV 5 filters. A 2002 report in the *Indoor Air* journal on filter efficiency authored in part by personnel from the Lawrence Berkeley National Laboratory, T.J. Fisk and D. Faulkner, indicates cost of filtration in a typical office building, relative to no filtration. "With a supply airflow rate per occupant typical of US office buildings the corresponding filtration cost range is \$0.70 to \$1.80 per person per month, which is insignificant relative to the salaries, rent, or health insurance costs." More efficient filters reside at the higher end of the range.

Direct costs are less of a challenge than possible peripheral costs which might result from choosing an HVAC system with higher MERV filtration.

- Upsizing mechanical units or increasing fan motor amperage and
- More frequent replacement of higher MERV filters, which will collect more particulate matter and will clog easier than MERV 5.

Manufacturers representatives from Carrier and mechanical engineers consulted opined that

- "Going to a MERV 8 should not increase the size of the HVAC system other than the smallest size offerings of light commercial equipment, and most likely only if the filter module would be external to the unit versus integrated within the enclosure".
- The fan motors, which apparently operate within a range, would most likely not be affected (except maybe light commercial). "Fan motor amperage draw would increase if the filter media area was not increased by increasing the depth of the filter from the normal 1-inch for a MERV 5 'construction' filter, to 2 inches for a pleated MERV 8, like a Farr 30/30 or an AAF Perfect Pleat Ultra. The HVAC equipment manufacturers should be able to accommodate the code change by offering 2-inch filter tracks on all affected equipment, either as a standard or as a low-cost accessory."
- Some see the need to implement a more stringent filter change program to ensure that the MERV 8 filters are being routinely replaced.

Benefits of MERV 8 filters include:

- Reducing intake of outside air pollutants and promoting a healthier indoor air quality (IAQ) for occupants, producing a healthier working environment and reducing objectionable outside odors and air contaminants in buildings.
- Also, upgrading the standard from MERV 5 to MERV 8 not only improves the IAQ for the occupants, it better protects the heat transfer equipment in the airstream, improving the kW/ton performance of the refrigeration cycle.

5.504.7 Environmental tobacco smoke (ETS) control

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the elimination of environmental tobacco smoke and its impact on indoor and outdoor air quality. This provision imposes some design restrictions for locating building openings such as doors, operable windows and air intakes, but only if an outdoor smoking area is provided. There are no additional costs associated with incorporating this into a design, and minimal ones for posting signage to inform building inhabitants and visitors of restricted areas. The benefits are the health and well-being of building occupants not exposed to second-hand smoke.

5.505 – INDOOR MOISTURE CONTROL

5.505.1 Indoor moisture control

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding moisture control. DSA-SS is proposing to include references to direct the code user to the California Building Code for general ventilation and moisture control requirements. DSA-SS is including these requirements to address moisture and mold issues that can affect indoor air quality.

5.506 – INDOOR AIR QUALITY

5.506.1 Outside air delivery

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the mechanical or natural delivery of outdoor air to buildings. DSA-SS is proposing to include references to direct the code user to the California Energy Code, Title 24, Part 6 and Title 8, Chapter 4 for requirements.

5.507 - ENVIRONMENTAL COMFORT

Indoor air quality (IAQ) is important to human health because individuals spend a large fraction of their time indoors at their residences, schools and workplaces. DSA-SS is proposing the adoption of these sections to provide clarity to the code user regarding the use of individual environmental comforts.

5.507.4 Acoustical control, 5.507.4.1 Exterior noise transmission, 5.507.4.2 Interior sound

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding environmental acoustics that would provide a positive health and psychological impact on persons utilizing the provisions of these sections. The provisions potentially save employers, the state, and health insurer's money through healthy work attendance and increased productivity.

5.508 – OUTDOOR AIR QUALITY

5.508.1 Ozone depletion and greenhouse gas reductions, 5.508.1.1 Chlorofluorocarbons (CFCs)

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the elimination of systems that use chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs) and halons. The provisions of these sections will eliminate, with one exception, the use of the listed chemicals. The reduction of GHG emission from structures is one of the primary goals of the CGBC and will have a significant positive impact climate change and the environment as a whole.

6 – REFERENCED ORGANIZATIONS AND STANDARDS

601 – GENERAL

601.1

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the standards referenced in the CGBC for Air conditioning Contractors of America, American National Standards Institute, American Society of Heating, Refrigerating and Air-conditioning engineers, Inc., American Society of Mechanical engineers, ASTM International, Canadian Standards Association and International Association of Plumbing and Mechanical Officials.

8 – COMPLIANCE FORMS AND WORKSHEETS

DSA-SS is proposing adoption of these green building standards forms and worksheets regarding Baseline Water Use Worksheet , 20%Reduction Water Use Calculation Table Worksheet, 30% Reduction Water Use Calculation Table Worksheet, Construction Waste Management Plan, Construction Waste Management Worksheet and, Construction Waste Management Acknowledgment.

APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES

The contributions to greenhouse gas emissions in California which are mitigated by site planning and design measures in Appendix A are several.

(1) The Air Resources Board reports that fossil fuels contribute to 98% of carbon dioxide emissions, more than one-half of which are transportation related. Provisions in this chapter will:

- Promote biking, walking, carpooling, and fuel efficient vehicles to reduce significantly smog, inhalable particulates, and carbon monoxide.

(2) Greenhouse gas and particulate pollution is generated by the manufacture and transportation of building materials and by diesel-powered earth movers during construction. Provisions in Appendix A5 promote demolition practices that will:

- Encourage the reuse of existing building structural and non-structural elements in new buildings;

- Stimulate the salvage and circulation of reusable building items, encouraging a local market for recyclable goods.

(3) Construction preparation of previously undisturbed sites (Greenfields) results in loss of soil through erosion, contributing to air and watershed pollution. In Appendix A5, standards will:

- Provide for storm water pollution prevention terms of the Clean Water Act as implemented by the State Water Resources Control Board to be applied to all building projects, including those under one acre which are currently outside the scope of the SWRCB;
- Guide the site designer with strategies to maintain pre-project quality of storm water runoff and restrict sedimentation from reaching storm water drainage systems and receiving streams or rivers.

DIVISION A5.1 – SITE PLANNING AND DESIGN

A5.101 - GENERAL

A5.101.1 General

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the measures contained in the CGBC. This section provides the code user with necessary general knowledge regarding the intent of this chapter. DSA-SS also proposes to recognize the authority of local jurisdictions over land use policies and encourage those entities to coordinate land use and planning with this code.

A5.102 – DEFINITIONS

A5.102.1 Definitions

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the CGBC. These definitions are: ALBEDO, BIORETENTION, BROWNFIELD SITE, DEVELOPMENT FOOTPRINT, GREENFIELDS, GREYFIELD SITE, FLOOR AREA RATION, INFILL SITE, LOW IMPACT DEVELOPMENT (LID), AND LOW-EMITTING, FUEL EFFICIENT VEHICLES, NEIGHBORHOOD ELECTRIC VEHICLE (NEV), PZEV, VANPOOL VEHICLE and ZEV.

A5.106 – SITE DEVELOPMENT

A5.106.5.1 Designated parking for fuel efficient vehicles, Table A5.106.5.1.1-Tier 1–10% of Total Spaces, Table A5.106.5.1.2-Tier 2–12% of total Spaces

DSA-SS is proposing adoption of these green building standards by proposing two “tier” sections to provide clarity to the code user regarding reduction of single occupant automobile use and its impacts on development and pollution. The tiers allow code users to provide designated parking at more restrictive levels of 10% and 12% for this cost-effective standard than the 8% in the mandatory section of the code, 5.106.5.

A5.106.5.1.3 Parking stall marking

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user TO PAINT (IN THE PAINT USED FOR STALL STRIPING) characters so that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle: These characters are: CLEAN AIR VEHICLE

A5.106.5.1.4 Vehicle designations

DSA-SS is proposing adoption of these green building standards to provide that a building manager could consult with TMA for methods of designating qualifying vehicles. DSA-SS is adopting)1) Information on qualifying vehicles, car labeling regulations and DMV SOV stickers could be obtained from a) CA DriveClean, b) CA Air Resources Board, c) US EPA fuel efficiency standards and d) Janet Okino DMV Registration Operations, and John Swanton ARB Public Information and 2) Purchasing policy and refueling sites for low emitting vehicles.

A5.106.5.2 Electric vehicle charging

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding measures to encourage the use of plug-in electric vehicles as low-emission alternatives to gasoline-powered vehicles.

A5.106.5.2.1 Electric vehicle supply wiring and Table A5.106.5.2.1

DSA-SS is proposing adoption of these green building standards to require that for the number of parking spaces required one 120 VAC 20 amp and one 208/240 V 40 amp grounded AC outlets or panel capacity and conduit installed for future outlets would be provided.

A5.106.6 Parking capacity

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding reduction of on-site parking, as approved locally, to encourage building occupants to use public transit or other means of transportation. It could also result in a reduction of paved area that produces storm water runoff, heat island effects, and loss of open space.

A5.106.6.1 Reduce parking capacity

DSA-SS is proposing adoption of these green building standards to provide clarity to the user that with approval of the enforcement authority, to make use of strategies to reduce on-site parking area by 1) use of on street parking or compact

spaces (illustrated on the site plan) or 2) implementation and documentation of programs to encourage occupants to carpool, ride share or use alternate transportation.

A5.106.9 Building orientation

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding, when site conditions permit, orienting the building for passive heating and cooling, intended to save energy used by mechanical systems.

A5.106.9.1 Building orientation and shading

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding energy-saving design strategies for passive heating and cooling of a building. Also proposed is an alternate methods of shading using solar shade structures which support the implementation of grid neutral at educational facilities.

A5.106.11 Heat island effect, A5.106.11.1 Hardscape alternatives, A5.106.11.2, Table A5.106.11.2.1-Tier 1, and Table A5.106.11.2.2-Tier 2

DSA-SS is proposing this voluntary section as a recognized method for reducing global warming. Both ARB and CEC recommend standards for non-roof (site and paving) and roof reduction of heat island effect, because, aside from saving energy for cooling buildings, they reduce greenhouse gases such as CO₂ and ozone that energy generation and urban heat create. The roof standards have two levels of achievement, the first tier meeting the cool roofs requirements for energy in Part 6, but intended here for mitigation of heat. The second level is a more stringent

APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES

DIVISION A5.2 – ENERGY EFFICIENCY

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the energy efficiency standards in this Appendix. This Appendix is intended to encourage buildings to achieve exemplary performance in the area of energy efficiency. In particularly a green building should attain at least a 15% decline in energy usage when compared to the States mandatory energy efficiency standards.

A5.201 - GENERAL

A5.201.1 Scope

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding voluntary means of achieving enhanced building energy efficiency in this division.

A5.202 – DEFINITIONS

A5.201.1 Definitions

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the CGBSC. These definitions are: ENERGY STAR, DEMAND RESPONSE AUTOMATION INTERNET SOFTWARE CLIENT, GEOTHERMAL, GRID NEUTRAL, OVER CURRENT PROTECTION DEVICE RATING, PROCESS, and TIME DEPENDENT VALUATION (TDV) ENERGY.

A5.203 – PERFORMANCE APPROACH

A5.203.1 Energy performance, A5.203.1.1 CALGREEN merit, A5.203.2 CALGREEN excellence, A5.203.1.3 CALGREEN grid neutral

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding reduction of energy use and GHG emissions in three tiers of efficiency above the requirements in the California Energy Code. CALGREEN merit exceed California Energy Code requirements by 15%, CALGREEN excellence exceed California Energy Code requirements by 30% and CALGREEN grid neutral exceed California Energy Code requirements by 35%.

A5.204 – PRESCRIPTIVE APPROACH

A5.204.1 ENERGY STAR equipment and appliances

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding a prescriptive measure to save energy with builder-installed units.

A5.204.2 Energy monitoring, A5.204.2.1 Data storage, A5.204.2.2 Data access

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding recording building energy use to track consumption and increase energy efficiency. DSA-SS is proposing to adopt to provide clarity to the code user regarding recording building energy use to record energy use data for energy system in the building, including chillers, heat pumps, packaged AC systems, fans, pumps, cooling Towers, boilers and other heating systems, lighting systems and process loads. Energy use data is to be stored within a data management system. The data management system is to be capable of electronically storing energy data and creating reports showing energy consumption. Data access must be accessible through a central data management system.

A5.204.5 Heat island effect, A5.204.5.1 Hardscape alternatives, A5.204.5.2 Roof area alternatives

DSA-SS is proposing adoption of these green building standards including alternate methods of shading using solar shade structures which support the implementation of grid neutral at educational facilities. These provisions are intended to reduce non-roof heat islands per hardscape alternatives in A5.204.5.1 and reduce roof heat islands per roof area alternatives in A5.204.5.2.

A5.211 – RENEWABLE ENERGY

A5.211.1 On-site renewable energy

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding means of providing clean energy from sources other than power plants, either on- or off the grid. This voluntary section provides clarity to the code user regarding encouraging utility customers to participate in local utilities' renewable energy programs, if offered.

A5.211.1.1 Documentation.

DSA-SS is proposing adoption of these green building standards to calculate renewable on-site energy cost savings of estimated local utility rebates for conventional fuel types. Factor in net-metering when offered by local utility, on an annual basis.

A5.211.1.2 Grid neutral, A5.211.2.1 35% Grid neutral, A5.211.2.2 75% Grid neutral, and A5.211.2.3 Grid neutral

DSA-SS is proposing adoption of these green building standards to provide a method of calculating grid neutral sites for public school and community college buildings is being proposed as an addition to the Renewable Section A5.211. Calculations for both new construction and modernization for existing buildings is addressed as a voluntary measure. Additionally, subsections are added to allow for three tiers for Grid Neutral: 35% Grid Neutral, 75% Grid Neutral and Grid Neutral. These levels tie into the *CALGREEN* Tiers defined in Section A5.601.

A5.211.3 Green power

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding encouraging utility customers to participate in local utilities' renewable energy programs, if offered.

A5.211.4 Pre-wiring for future solar, A5.211.4.1 Off grid pre-wiring for future solar

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding prewiring for future roof-mounted solar installations, both on- and off-grid. DSA-SS is proposing to address installation of conduit from the roof or eave to within the building identified as suitable for future installation of a change controller (regulator) and inverter. The provisions for off grid pre-wiring for future solar if battery storage is anticipated conduit could run to a place with the building that is stable, weather-proof, insulated against hot and cold weather, and isolated from occupied spaces.

A5.212 - ELEVATORS, ESCALATORS AND OTHER EQUIPMENT

A5.212 .1 Elevators and escalators, A5.212.1.1 Controls

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding controls to reduce the electrical demand of these systems during non-peak usage. DSA-SS is also including that In public school and community college buildings, stairs are to be located conveniently to encourage their use in lieu of elevators or escalators. DSA-SS is adopting controls that reduce energy demand to be required provisions of CCR Title 8 and must not interrupt emergency operations for elevators per CCR Title 24, CBC. This provision provides clarity to the code user regarding controls to reduce the electrical demand of these systems during non-peak usage. Revisions are proposed for this Section to account for opportunities for saving electricity and use of elevators by making stairways easily available as an alternate method to elevators/escalators at public school or community college facilities.

A5.213 – ENERGY EFFICIENT STEEL FRAMING

A5.213.1 Steel framing

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding avoiding thermal bridging in steel framing. DSA-SS is proposing to address avoiding thermal bridging in steel framing in the envelope to include: 1) Punching large holes in stud web without affecting its structural integrity, 2) Spacing the studs while maintaining the structural integrity of the structure, 3) Detailed design of intersections of wall openings and building intersections of floors, wall, and roofs.

DIVISION A5.3 - WATER EFFICIENCY AND CONSERVATION

WATER EFFICIENCY AND CONSERVATION

The provisions of A5.3 were developed in discussion with staff from the Department of Water Resources and are designed to provide greater water savings consistent with the statements in specific purpose and rationale of this document.

The California economy, and indeed the well-being of all of California's citizens, depends on an adequate, safe, and environmentally-sound supply of water. The dwindling supply of water in the United States has created increasing concern at all levels of government. Since 1950, the United States population increased nearly 90 percent. In that same period, public demand for water increased 209 percent. Americans now use an average of 100 gallons of water per person each day. This increased demand has put additional stress on water supplies and distribution systems, threatening both human health and the environment. Furthermore, many scientists' predict hotter temperatures the Earth's climate, which will only

increase the demand on water supplies for cooling, irrigation and other uses. Meanwhile, climate change will adversely impact water supplies in some areas of California, especially those that rely heavily on melted snow runoff for their freshwater supply. And according to the U.S. Government Accountability Office (GAO) (www.gao.gov), California, which is already stretching available water supplies, expects to see a population increase that tops 50 percent by 2025 from 1995 levels.

The drought gripping the West is considered by some experts to be the worst in 500 years, with effects in the Colorado River basin that have been considerably more damaging than during the Dust Bowl years, according to scientists at the U.S. Geological Survey. Compounding the problem, the Colorado River had its highest flow of the 20th century from 1905 to 1922, the years used as the basis for allocating the River's water between the Upper and Lower Colorado Basin states under the Colorado River Compact.

The Intergovernmental Panel on Climate Change's (IPCC) 2007 assessment states that water stored in glaciers and snow cover is projected to decline, reducing water availability to one-sixth of the world's population that relies upon melt water from major mountain ranges including California. The IPCC also predicts droughts will become more severe and longer lasting in a number of regions.

We are facing a potential water crisis in California that could risk endangering the future of our way of life, our economy, and our unique environment. In addition, there are natural calamities that can strike at any time in California, and local water officials are working hard to find enough water to meet the needs of their communities now and in the future.

Taken together, all of this combines to create a strong case for the immediate need for water conservation standards and efficiency measures. Water conservation is the most cost-effective and environmentally sound way to reduce our demand for water. Water efficiency is the planned management of water to prevent waste, overuse, and exploitation of the resource. Effective water efficiency planning seeks to "do more with less" without sacrificing comfort or performance. And although some water efficiency strategies require an initial capital investment, in the long run, conserving water provides significant cost savings for water and wastewater systems. Water efficiency and re-use programs help systems avoid or delay expensive infrastructure projects, by developing new water supplies. Utilizing water conservation standards will help protect the future of California's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices. A wide range of technologies and measures can be employed to meet the proposed standards within each of these strategies to save water and associated energy consumption. These include:

- Water-efficient plumbing fixtures (ultra low-flow toilets and urinals, waterless urinals, low-flow and censored sinks, low-flow showerheads, and water-efficient dishwashers and washing machines)
- Irrigation and landscaping measures (water-efficient irrigation systems, irrigation control systems, low-flow sprinkler heads, water-efficient scheduling practices, and Xeriscape)
- Water recycling or reuse measures, and
- Methods to reduce water use in HVAC systems.

Saving water also saves energy. It is estimated that 6.5% of the energy used in the state of California is for pumping and treating water. For energy bills, using less hot water saves on water heating. On the flip side, saving energy and using alternative energy saves water--electricity production from fossil fuels and nuclear energy is responsible for 39% of all freshwater withdrawals in the nation.

US Environmental Protection Agency (www.epa.gov/watersense/) has determined that if a bathroom is given a high-efficiency upgrade by installing a WaterSense labeled high-efficiency toilet (HET) and faucet or faucet accessories, the change can save more than 11,000 gallons annually. With reduced water bills, the upgrade could pay for itself in a few short years and continue to save water and money for years to come.

The building standards proposed in this chapter attempt to address a number of the health, safety, and environmental concerns through efficiency and conservation measures. The measures utilized in the proposed standards are consistent with statute and regulations and are generally excepted measures that focus on several key areas to improve the water efficiency of new buildings. Furthermore, the proposed standards are measures that can apply to all occupancies under the authority of the DSA-SS.

A5.301 – GENERAL

A5.301.1 Scope

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding voluntary means of achieving enhanced water efficiency indoors and outdoors in this division. DSA-SS proposes to provide clarity to the code user regarding the application of the measures contained in the chapter. This section provides the code user with necessary general knowledge regarding the goals and items covered by this chapter.

A5.302 - DEFINITIONS

A5.302.1 Definitions

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the CGBC. These definitions include: HYDRA OZONE, MODEL WATER EFFICIENT LANDSCAPE ORDINANCE, PLANTS, POTABLE WATER, RECYCLED WATER and SUBMETER.

A5.303 – INDOOR WATER USE

A5.303.2.1 30% Savings, Table A5.303.2.1, Table A5.303.2.2-Fixture Flow Rate

DSA-SS is proposing adoption of these green building standards and table to provide clarity to the code user regarding indoor water use conservation. This provision exceeds the mandatory indoor water use requirement by 10% and is considered reachable. Currently the California Energy Commission (CEC) adopts regulations to establish the minimum water flow rates for specified fixtures and fixture fittings in Title 20 of the California Code of Regulations. The CEC includes shower heads, faucets and other plumbing fixtures and fittings in its definition of appliance and flow rates adopted by the CEC mirror those set by the U.S. Department of Energy. DSA-SS is proposing to reduce the indoor water use by 30% to meet the goals of the CGBC. These sections specify two methods to meet the 30% reduction: 1) a prescriptive 30% reduction in the flow rate of each fixture from what is currently allowed and; 2) a method to calculate base line water use compared to the proposed water use.

A5.303.3 Appliances, Table A5.303.3-Commercial Dishwasher Water Use

DSA-SS is proposing adoption of these green building standards and table to provide clarity to the code user regarding indoor water use conservation of appliances. Currently the California Energy Commission (CEC) adopts regulations to establish the minimum water factor rates for specified appliances in Title 20 of the California Code of Regulations. Dishwasher water factor utilized is a specification

A5.304 – OUTDOOR WATER USE

A5.304.1 Water budget

DSA-SS is proposing the adoption of these green building standards to provide clarity to the code user regarding potable water use conservation in irrigation systems. This section is consistent with DWR's statutory authority to develop a model ordinance regarding water use. The MO or local ordinance is already mandated by the state for adoption by local jurisdictions. It now makes reference to the MO for prescriptive measures which can be used to meet the water budget.

A5.304.3 Potable water reduction, A5.304.4.1 Tier 1, and A5.304.4.1.1 Tier 2

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding potable water reduction by providing water efficient landscape irrigation design that reduces the use of potable water beyond the initial requirements for plant installation and establishment in accordance with A5.304.3.1 or A5.304.3.2. Calculations for the reduction are to be based on the water budget developed pursuant to A5.304.1. Methods used to accomplish the requirements the potable water reduction provisions must be designed to the requirements of the California Building Standards Code and shall include, but not be limited to, the following: 1) Plant coefficient, 2) Irrigation efficiency and distribution uniformity, 3) Use of captured rainwater, 4) Use of recycled water, and 5) Water treated for irrigation purposes and conveyed by a water district or public entity. DSA-SS also adopts provisions for Tier 1, that reduces the use of potable water by 50% and provisions for Tier 2 that reduces the use of potable water by 60%.

A5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

The California Integrated Waste Management Board of the California Environmental Protection Agency cites research by D. M. Roodman and N. Lessen indicating that building and construction activities worldwide consume three billion tons of raw materials annually, which is 40% of total global use. In the United States, these activities culminate in dumping 28% of total waste in over-stressed landfills. Manufacturing processes and transportation of virgin construction materials to local dealers and jobsites consume energy and contribute to GHG. Other societal costs associated with production, such as toxics in the workplace affecting worker health and productivity, may represent embodied energy in the final product. These features of conventional construction will prove to be unsustainable over time and will be aggravated by the adoption of the Western life style in developing countries throughout the world.

A5.4 provisions offer means of mitigating these effects by recommending the employment of green building methods, materials, products that are sustainable over time as noted below. With one of the ten largest economies in the world with significant foreign markets, California is also in a position to influence the world economy towards GHG reduction, sustainable resources, habitat protection, and workplace health and safety.

A5.401 – GENERAL

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the application of the measures contained in A5.4. This section provides the code user with necessary general knowledge regarding the goals and items covered by A5.4.

A5.402 – DEFINITIONS

A5.401.1 Definitions

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of definitions. These definitions provide guidance to the user on the meaning of key words used within this chapter. Through adoption of these sections DSA-SS is providing the code user with clarity on proper use of terms that are used in the CGBC. These definitions include: EMBODIED ENERGY, LIFE CYCLE ASSESSMENT (LCA), OVE, POSTCONSUMER CONTENT, PRECONSUMER (or POS-INDUSTRIAL) CONTENT, RECYCLED CONTENT and RECYCLED CONTENT VALUE (RCV).

A5.404 – EFFICIENT FRAMING TECHNIQUES

A5.404.1 Wood framing, A5.404.1.1 Structural or fire-resistance integrity, A5.401.1.2 Framing specifications

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding conservation of materials and labor in wood construction. DSA-SS is proposing adoption to provide clarity to the code user to maintain the safety of the structure while utilizing the advanced framing methods of conservation of wood in construction. The OVE will not conflict with structural framing methods or fire-related assemblies consistent with the CBC. DSA-SS is proposing adoption to provide clarity to the code user regarding the location of resources. The language lists techniques recognized as advanced framing. These standards also indicate a usable web site reference.

A5.405 – MATERIAL SOURCES

A5.405.4 Recycled content-Tier 1, A5.405.4.1 Recycled content - Tier 2

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding using materials equivalent in performance to virgin materials, with post-consumer or pre-consumer recycled value RCV for a minimum of 10% of total value, based on estimated cost of materials and to provide documentation on respective values. For Tier 2, same as Tier 1 except RCV at a minimum of 15% of the total value based on estimated cost of materials.

A5.405.4.2 Determination of recycled content value (RCV)

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding recycled content of material assembly to be determined by weight and the fractional value of the weight is then multiplied by the total estimated cost of material assembly.

A5.406 – ENHANCED DURABILITY AND REDUCED MAINTENANCE

A5.406.1 Choice of materials

DSA-SS is proposing to adopt these green building standards to provide clarity to the code user regarding selective use of materials utilizing specific criteria, thus saving cost, indoor air quality, and raw materials.

A5.406.1.1 Service life, A5.406.1.3 Recyclability

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding selective use of materials utilizing specific criteria, saving cost, indoor air quality, and raw materials. Use materials based on estimated cost of materials on a project and provide documentation of the values. Select materials that can be reused or recycled at end of service life.

A5.408 – CONSTRUCTION WASTE REDUCTION DISPOSAL, AND RECYCLING

At.408.3.1 Enhanced construction waste reduction

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding diverting to recycle or salvage of non-hazardous construction and demolition debris generated by one of the criteria listed in Tier 1 (65%) or Tier 2 (80%). Exceptions are included for excavated soil and land-clearing debris and alternate waste reduction methods.

A5.409 – LIFE CYCLE ASSESSMENT

A5.409.1 Materials and system assemblies

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding life cycle analysis. They provide references to software and information about life cycle assessment of materials to select those with the lowest embodied energy and GHG potentials.

A5.410 – BUILDING MAINTENANCE AND OPERATION

A.410.2 Commissioning

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding guidance for design and construction processes in new buildings 10,000 sq ft and over, to verify the systems and components meet an owner's project requirements. Commissioning must be performed harmony with A5.410 by personnel trained and certified in commissioning by a nationally recognized organization. As a minimum commissioning requirements must include 1) owner's project requirements, 2) basis of design, 3) commissioning measures, 4) commissioning plan, 5) functional performance testing, 6) post construction documentation and training, and 7)commissioning report. Commissioning requirements must include, in the scope, all building systems and components covered by CCR, Title 24, Part 6, process equipment and controls, and renewable energy systems.

A5.410.2 Commissioning

DSA-SS is proposing to adopt these green building standards as mandatory for new buildings over 5000 square feet, however, DSA-SS is proposing to adopt Commissioning as voluntary for public schools and community colleges. Commissioning is effective in improving the efficiency of building systems and pays for itself over a short period of time. DSA-SS cites a 2004 study done by Lawrence Berkeley National Laboratory⁶.

A summary of the report by the authors indicates the following: "We analyze results from 224 buildings across 21 states, representing 30.4 million square feet of commissioned floor area (73 percent in existing buildings and 27 percent in new construction). These projects collectively represent \$17 million (\$2003) of commissioning investment. The new-construction cohort represents \$1.5 billion of total construction costs.

“We develop a detailed and uniform methodology for characterizing, analyzing, and synthesizing the results. For existing buildings, we found median commissioning costs of \$0.27/ft², whole-building energy savings of 15 percent, and payback times of 0.7 years. For new construction, median commissioning costs were \$1.00/ft² (0.6 percent of total construction costs), yielding a median payback time of 4.8 years (excluding quantified non-energy impacts).”

The summary goes on to describe additional savings realized through commissioning: “These results are conservative insofar as the scope of commissioning rarely spans all fuels and building systems in which savings may be found, not all recommendations are implemented, and significant first-cost and ongoing non-energy benefits are rarely quantified. Examples of the latter include reduced change-orders thanks to early detection of problems during design and construction, rather than after the fact, or correcting causes of premature equipment breakdown. Median one-time non-energy benefits were -\$0.18/ft²-year for existing buildings (10 cases) and -\$1.24/ft²-year for new construction (22 cases)—comparable to the entire cost of commissioning. . . .

“New-construction commissioning is more strongly driven by non-energy objectives such as overall building performance, thermal comfort, and indoor air quality, whereas existing-building commissioning is more strongly driven by energy savings objectives. The need for commissioning in new construction is indicated by our observation that the number of deficiencies identified in new-construction exceeds that for existing buildings by a factor of three.”

A5.410.2.1 Owner’s Project Requirements (OPR)

DSA-SS is proposing adoption of these green building standards to clarify for the code user that before the design phase of the project begins the expectations and requirements of the building shall be documented. Documentation must include: 1) Environmental and sustainability goals, 2) energy efficiency goals, 3) indoor environmental quality requirements, 4) equipment and systems expectations, and 5) building occupant and O & M personnel expectations.

A5.410.2.2 Basis of Design (BOD)

DSA-SS is proposing adoption of these green building standards to clarify for the code user that at the design phase a written explanation of how the design systems meet the Owner’s Project Requirements must be completed and updated. The basis of design document must cover: 1) HVAC systems and controls, 2) indoor lighting system and controls, 3) water heating system, and 4) renewable energy systems.

A5.410.2.3 Commissioning plan

DSA-SS is proposing adoption of these green building standards to clarify for the code user that during the design phase a commissioning plan must be completed to document the approach to how the project will be commissioned. The commissioning plan must include: 1) general project information, 2) commissioning goals, 3) systems to be conditioned, 4) commissioning team information, and 5) commissioning process activities, schedules and responsibilities.

A5.410.2.4 Functional performance testing

DSA-SS is proposing adoption of these green building standards to clarify for the code user that functional performance testing reports must contain information addressing each of the building components tested, the testing methods utilized and include any readings and adjustments made. The functional performance tests must demonstrate the correct installation and operation of each component, system, and system-to-system interface in agreement with the approved plans and specifications.

A5.410.2.5 Post construction documentation and training, A5.410.2.5.1 Systems manual, A5.410.2.5.2 Systems operations training

DSA-SS is proposing adoption of these green building standards to clarify for the code user that a systems manual and systems operations training are required, documentation of the operational aspects of the building must be completed and the manual must include a minimum: 1) site information, 2) site contract information, 3) basic operations & maintenance, 4) major systems, 5) site equipment inventory and maintenance notes, and 6) other resources and documentation. Training of maintenance staff must at least include: 1) system/equipment overview, 2) review of the information in the systems manual, and 3) review of the record drawings on the system/equipment.

A5.410.2.6 Commissioning report

DSA-SS is proposing adoption of these green building standards to clarify for the code user that a completed report of commissioning activities through the design, construction and post-construction phases must be completed and provided to the owner.

A5.410.3 Testing, adjusting and balancing, A5.410.3.2 Systems, A5.410.3.3 Procedures, A5.410.3.3.1 HVAC balancing, A5.410.3.4, A5.410.3.5 Operation and maintenance manual, and A5.410.3.5.1 compliance with tiers

DSA-SS is proposing adoption of these green building standards to clarify for the code user that for buildings less than 10,000 feet testing, adjusting and balancing of systems is required. Systems are to include testing, adjusting and balancing and include: 1) HVAC systems and controls, 2) indoor and outdoor lighting and controls, 3) water heating systems, and 4) renewable energy systems. On each system perform testing, adjusting and blanking in accordance with best practices and national standards. The system should be balanced before a new space-conditioning system is operated per the Testing Adjusting and Balancing Bureau National Standards, the National Environmental Balancing Bureau Procedural Standards or Associated Air Balance Council National Standards. Provide a final report of testing, adjusting and balancing signed by person performing these services. Prior to final inspection provide building owner with

operating and maintenance instructions and copies of guaranties/warranties for easy system. DSA-SS is also adopting provisions where if pertinent include certification of fulfillment with measures for tiers.

A5.5 – ENVIRONMENTAL QUALITY

Indoor air quality (IAQ) is important to human health because individuals spend a large fraction of their time indoors at their residences, schools and workplaces.

The California Air Resources Board (ARB) conducted a statewide survey of activity patterns of individuals over 11 years of age. The results showed that Californians spent, on average, 87% of their time indoors. The U.S. EPA conducted the probability-based National Human Activity Pattern Survey (NHAPS). Telephone interviews were conducted with over 9,000 respondents across the ten EPA regions in 48 states. The national results were generally consistent with the California study. Again, the mean percentage of time spent indoors was 87%.

A growing body of scientific evidence indicates that the air within homes and other buildings can be more seriously polluted than outdoor air. There are numerous sources of airborne toxic pollutants in these indoor environments where outdoor air ventilation provides the only primary means to dilute pollutant concentrations. Thus, for many people, the risks to health may be greater due to exposure to air pollution indoors than outdoors.

There are many potential indoor sources of exposure to airborne VOCs. These sources include many classes of consumer products used for building maintenance and office work. Many of the materials that are used to finish interiors of buildings emit VOCs to air when they are new. These include all of the common materials such as carpets and carpet cushions, composite wood products used in cabinetry, resilient flooring, and architectural finishes for walls, ceilings, and woodwork. Attached garages in houses and other buildings are a potential source of fuel and vehicle related emissions. Environmental tobacco smoke (ETS), which contains numerous vapor-phase organic compounds, may be present various environments.

Since there are so many potential indoor sources of VOCs, people are routinely exposed via the inhalation pathway to complex mixtures of compounds. Individually, many of the compounds comprising these mixtures are considered to be harmful to human health and comfort at some level. People who may be exposed to volatile organic compounds (VOCs) and other indoor air pollutants for the longest periods of time are often those most susceptible to the effects of indoor air pollution. Such groups include the young, the elderly, and the chronically ill, especially those suffering from respiratory or cardiovascular disease.

Many of the carcinogens and reproductive toxins (as well as other chemicals) may have acute and chronic systemic effects. Guideline concentrations have been developed for industrial chemicals to protect workers from acute and chronic toxicity. The potential of many of these chemicals to produce sensory irritancy (i.e., irritation of the eyes and upper respiratory tract) serves as the basis for more than one-half of the workplace guideline concentrations. In California, many jurisdictions adopt the regulations of the South Coast Air Quality Management District. Rules #1113 for paints and coatings and #1168 for adhesives limit the allowable amount of VOCs emitted from those materials.

In addition to IAQ, the physical comfort is critical to work effectiveness, satisfaction, and physical and psychological well-being (www.wbdg.org/resources/) Uncomfortable conditions in the workplace—too hot, too cold, too noisy, too dark, too light, too much glare—restrict the ability of workers to function to full capacity and can lead to lowered job satisfaction and increases in illness symptoms. Objectionable odors generated by certain airborne chemicals adversely affect people's satisfaction with indoor air quality and frequently lead to complaints.

Allowing workers control, within the limits of energy efficiency regulated by the California Energy Commission, over their immediate environment's thermal comfort and lighting and providing them connectivity with the outdoors through daylight and views, can decrease absenteeism by as much as 33% and increase productivity by 4%. A 4% increase in productivity equates to paying for the entire building within one year.

A5.501 GENERAL, A5.501.1 Scope

DSA-SS is proposing adoption of these green building standards to clarify the means of reducing the quality of air contaminants which are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants, and neighbors.

A5.502 – DEFINITIONS

A5.502.1 Definitions

DSA-SS is proposing adoption of these green building standards to clarify for the code user that DSA-SS is proposing the adoption of this new California green building standard section to provide clarity to the code user regarding the use of definitions. These words or terms are: INTERIOR, BUILDING; MERV; MULTI-OCCUPANT SPACES; NO ADDED FORMALDEHYDE (NAF) RESIN; SINGLE OCCUPANT SPACES, and ULTRA-LOW EMITTING FORMALDEHYDE (ULEF) RESINS.

A5.504 POLLUTANT CONTROL

A5.504.1 Indoor air quality (IAQ) during construction, A5.504.1.1 Temporary ventilation, A5.504.1.2 Additional IAQ measures, and A5.504.4.5.1 Early compliance with formaldehyde limits.

DSA-SS is proposing adoption of these green building standards to clarify for the code user that provide clarity to the code user regarding indoor air quality. IAQ is to be maintained as provided in temporary ventilation and additional IAQ measures. Temporary ventilation is to be provided during construction per CCR, Title 24 and Title 8. Additional IAQ measures are to be used as follows: 1) when using generators to generate temporary power, 2) protect on-site absorbent materials from moisture, 3) store odorous and high VOC-emitting materials off-site, and 4) clean oil and dust from ducts prior to use. A5.504.4.5.1 DSA-SS is proposing adoption to provide clarity to the code user regarding early compliance with formaldehyde limits established in ARB's phased regulations. DSA-SS proposes an amendment to for a Tier 1 reach standard for no-added formaldehyde resins and a Tier 2 for ultra-low emitting formaldehyde resins at the recommendation of the ARB.

A5.504.4.7 Resilient flooring system, Tier 1, A5.504.4.7.1 Resilient flooring systems-Tier 2

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user that for (Tier 1) 80% or (Tier 2) 100% of floor area scheduled to receive resilient flooring, install resilient flooring which complies with the VOC-emission limits per CHPS low-emitting Materials List or certified under the FloorScore program of the Resilient Floor Covering Institute.

A5.504.8 Thermal insulation- Tier 1, A5.504.4.8.1 Thermal insulation - Tier 2

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding VOC emissions in thermal insulation. Most indoor air pollution comes from sources inside the building including thermal insulation products that may emit volatile organic compounds (VOCs), including formaldehyde. Emission limits are based on the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List and on standards for compliance located in Chapter 12-13 in Title 24, Part 12, the California Referenced Standards Code. For Tier 2 install no-added formaldehyde thermal insulation in addition to meeting the CHPS Low-Emitting Materials List.

A5.504.4.9 Acoustical ceilings and wall panels

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding VOC emissions of interior acoustical ceiling and wall panels. Most indoor air pollution comes from sources inside the building including manufactured wood products that may emit volatile organic compounds (VOCs), including formaldehyde. Emission limits are based on the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List.

A5.504.5 Hazardous particulates and chemical pollutants

DSA-SS is proposing to adopt these green building standards to provide clarity to the code user regarding minimizing and controlling pollutant entry into buildings and cross-contamination of regularly occupied areas.

A5.504.5.1 Entryway systems, A5.504.5.2 Isolation of pollutant sources, A5.504.5.3.1 Filters

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding outdoor air contaminants that enter the building and the containment of contaminants produced on site.

A5.507 – ENVIRONMENTAL COMFORT

A5.507.1 Lighting and thermal comfort controls, A5.507.1.1 Single-occupant spaces, A5.507.1.1.1 Lighting, A5.507.1.1.2 Thermal comfort, A5.507.1.2 Multi-occupant spaces

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding the use of individual environmental controls, within the parameters of the California Energy Code that would provide a positive health and psychological impact on persons utilizing the provisions of these sections. The provisions potentially save employers, the state, and health insurer's money through healthy work attendance and increased productivity. DSA-SS further clarified that these provisions are appropriate to the workplace and that individual lighting control is for task lighting or day lighting.

A5.507.2 Daylight, A5.507.3 Views, A5.507.3.1 Interior office spaces, and A5.507.3.2 Multi-occupant spaces, and A5.507.5 Enhanced acoustical control

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding connectivity to the outdoor environment that, within the parameters of the California Energy Code, would provide a positive health and psychological impact on persons utilizing the provisions of these sections. The provisions potentially save employers, the state, and health insurer's money through healthy work attendance and increased productivity. DSA-SS is proposing to address the requirements of a maximum and minimum requirement for acoustics in classrooms. Student learning suffers in acoustically poor environments. Excess noise from exterior sources, HVAC systems, or adjacent rooms can impede communications between students and teachers.

A5.6 – VOLUNTARY REACH STANDARD

A5.601 - CALGREEN TIERS

A5.601.1 Scope

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding scope of CALGREEN Tiers for public schools and community colleges. The provisions in Appendix 5, Division A5.6 Section A5.601 are not mandatory unless adopted by a local government. These provisions outline means of achieving enhanced construction or reach levels by incorporating additional green building measures. Designers, builders, or property owners are required to incorporate additional green building measures as set prerequisites necessary to meet the threshold of each tier.

A5.601.1.2 CALGREEN merit, A5.601.2 Prerequisites, A5.601.2.2 Energy performance, A5.601.2.3.1 Additional voluntary measures for CALGREEN merit, A5.601.2.3.2 35% Grid neutral

DSA-SS is proposing adoption of these green building standards to provide clarity to the code user regarding that a project must meet all of the mandatory measures in Chapter 5 (Non-residential Mandatory Measures) and in addition meet the provisions Division A5.6 (Voluntary Reach Standard) to achieve *CALGREEN* Tier 1 or Tier 2 status. For the purposes of energy efficiency standards in this code, the CA Energy Commission will continue to adopt mandatory building standards. When using an alternative calculation method, calculate each nonresidential building's TDV energy and CO₂ emissions and compare it to the standard or budget building. Exceed CA Energy Code requirements by 15%. Field verifies and document measures and calculations use to reach the desired level of efficiency following the requirements specified in Title 24 for Nonresidential alternative Calculation Method Manual. Employ at least the voluntary measures from Appendix 5 listed in A5.601.2.3.1 to meet the prerequisites for this tier. In addition to the requirements for *CALGREEN* Merit, a site's annual electrical production and consumption ration must be equal to or greater than 0.35 as described in A5.211.2.3 and employ energy Monitoring as described in A5.204.5.

A5.601.3 CALGREEN excellence, A5.601.3.1 Prerequisites, A5.601.3.2 Energy performance, A5.601.3.3 Additional voluntary measures for CALGREEN Excellence, A5.601.4 75% Grid neutral

DSA-SS is proposing adoption of these green building standards to provide clarity that a project must meet all of the mandatory measures in Chapter 5 and meet the provisions of sections A5.601.3.2 and A5.601.34 to achieve *CALGREEN* Excellence status. The CA Energy Commission will continue to adopt mandatory building standards. Calculate each nonresidential building's TDV energy and CO₂ emissions, and compare it to the standard or budget building when using an Alternative Calculation Method. Exceed CA Energy Code requirements by 30%, Field verify and document the measures and calculations used following the requirements specified in Title 24 for Nonresidential Alternative Calculation Method Manual. Employ at least the voluntary measures from Appendix 5 listed in A5.601.2.3.1 to meet the prerequisites for this tier. In addition to requirements for *CALGREEN* Excellence, a site's annual electrical production and consumption ratio must be equal to or greater than 0.75 per A5.211.2.3 and employ Energy Monitoring as described in A5.204.5.

A5.601.4 CALGREEN grid neutral, A5.601.4.1 Prerequisites, A5.601.4.2 Energy performance, A5.4.3 Additional voluntary measures for CALGREEN grid neutral, and A5.601.4.4 Grid neutral

DSA-SS is proposing adoption of these green building standards to provide clarity that to achieve *CALGREEN* grid neutral status a project shall meet all mandatory measures in Ch 5 and provisions of A5.601.4.2 through A5.601.4.4. The CA Energy Commission shall continue to adopt mandatory building standards for the purposes of energy efficiency standards in this code. Calculate each nonresidential building's TDV energy and CO₂ emissions, and compare it to the standard or budget building when using an Alternative Calculation Method. Exceed CA Energy Code requirements by 35%, field verify and document the measures and calculations used following the requirements specified in Title 24 for Nonresidential Alternative Calculation Method Manual. Employ at least the voluntary measures from Appendix 5 listed in A5.601.4.3 to meet the prerequisites of this tier. In addition to the requirements in A5.601.4.3 a site's annual electrical production and consumption ration must be equal to or greater than 1 as described in A5.211.2.3 and employee energy Monitoring as described in A5.204.5.

TECHNICAL, THEORETICAL, AND EMPIRICAL STUDY, REPORT, OR SIMILAR DOCUMENTS

¹ California Energy Demand 2008-1018 Staff Revised Forecast, California Energy Commission, November 2007, CEC-200-2007-015-sf2

² California Construction Review, August 27, 2007; reports almost \$21 billion in private nonresidential construction (does not include public sector).

³ Third-year report of progress of California's Sustainable Building Task Force in response to Governor Gray Davis' Executive Order D-16-00.

⁴ S. Abbaszadeh, L. Zagreus, D. Lehrer, and C. Huizenga (Center for the Built Environment, U.C. Berkeley), Occupant Satisfaction with Indoor Environmental Quality in Green Buildings, 2006

⁵ Including LEED NC 2.2, Green Globes, the Collaborative for High Performance Schools, Global Green, draft ASHRAE 189P, NAHB/ICC.

⁶ Mills, E., H. Friedman, T. Powell, N. Bourassa, D. Claridge, T. Haasl, and M.A. Piette. 2004, "The Cost-Effectiveness of Commercial Buildings Commissioning: A Meta-Analysis of Existing Buildings and New Construction in the United States." (Lawrence Berkeley National Laboratory Report No. 56637.)

Section 18928 of the Health & Safety Code mandates this proposed action.

CONSIDERATION OF REASONABLE ALTERNATIVES

DSA-SS considered alternative measures to be brought forward as mandatory into the 2010 CGBSC. Following the Governor's veto messages during the 2007-2008 legislative sessions, some mandatory measures are needed to move the state forward in implementation of AB 32, among other things. The measures selected were vetted with a focus group of state agency representatives, industry representatives, and environmental advocates, and the ones presented are those that are cost effective and achievable. Voluntary measures are retained in an appendix for code users and local jurisdictions to apply as they determine appropriate. Keeping a mix of mandatory and voluntary measures will allow designers, builders, and building inspectors and officials a learning period and flexibility of application. The Division of the State Architect has not considered any reasonable alternatives to the proposed action.

REASONABLE ALTERNATIVES THE AGENCY HAS IDENTIFIED THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS

No alternatives were identified to lessen the adverse impact on small businesses, because the mandatory measures were analyzed as to cost-benefit and were seen to be beneficial to builders.

FACTS, EVIDENCE, DOCUMENTS, TESTIMONY, OR OTHER EVIDENCE OF NO SIGNIFICANT ADVERSE ECONOMIC IMPACT ON BUSINESS.

- The third-year report of progress of California's Sustainable Building Task Force in response to Governor Gray Davis' Executive Order D-16-00 indicates that an increase in upfront construction costs for green features, especially in the energy sector, will be paid back during the life of a building.
- DSA-SS has done reviews of the cost impacts weighed against the benefits on the individual measures, which are cited above.

DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS

Federal regulations may be adopted for use in California by those state and local agencies with authority for clean air, clean water, water conservation, energy conservation, and waste management. Those regulations may be cited in the proposed guidelines as they are applied in California. The regulations proposed for mandatory or voluntary adoptions do not duplicate or conflict with federal regulations.