

**REVISION RECORD  
FOR THE STATE OF CALIFORNIA  
SUPPLEMENT**

**July 1, 2015**

**2013 Title 24, Part 11, California Green Building Code**

**PLEASE NOTE: The date of this supplement is for identification purposes only.  
See the History Note Appendix for the adoption and effective dates of the provisions.**

It is suggested that the section number, as well as the page number be checked when inserting this material and removing the superseded material. In case of doubt, rely on the section numbers rather than the page numbers because the section numbers must run consecutively.

It is further suggested that the superseded material be retained with this revision record sheet so that the prior wording of any section can be easily ascertained.

Please keep the removed pages with this revision page for future reference.

**Note**

**Due to the fact that the application date for a building permit establishes the California Building Standards Code provisions that are effective at the local level, which apply to the plans, specifications, and construction for that permit, it is strongly recommended that the removed pages be retained for historical reference.**

**Part 11**

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## HOW TO DETERMINE WHERE CHANGES HAVE BEEN MADE

Symbols in the margins indicate where changes have been made or language has been deleted.

|| This symbol indicates that a change has been made.

> This symbol indicates deletion of language.



2. The city, county, or city and county shall file the amendments, additions or deletions expressly marked and identified as to the applicable findings. Cities, counties, cities and counties, and fire departments shall file the amendments, additions or deletions and the findings with the California Building Standards Commission at 2525 Natomas Park Drive, Suite 130, Sacramento, CA 95833.
3. Findings prepared by fire protection districts shall be ratified by the local city, county, or city and county and filed with the California Department of Housing and Community Development at 1800 3<sup>rd</sup> Street, Room 260, Sacramento, CA 95811.
4. The city, county, or city and county shall obtain California Energy Commission approval for any energy-related ordinances consistent with *Public Resources Code* Section 25402.1(h)(2) and Title 24, Part 1, Section 10-106. Local governmental agencies may adopt and enforce energy standards for newly constructed buildings, additions, alterations and repairs, provided the California Energy Commission finds that the standards will require buildings to be designed to consume no more energy than permitted by Part 6. Such local standards include, but are not limited to, adopting the requirements of Part 6 before their effective date, requiring additional energy conservation measures, or setting more stringent energy budgets.

**101.8 Alternate materials, designs and methods of construction.** The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternate shall be approved on a case-by-case basis where the enforcing agency finds that the proposed alternate is satisfactory and complies with the intent of the provisions of this code and is at least the equivalent of that prescribed in this code in planning and design, energy, water, material conservation and resource efficiency, environmental air quality, performance, safety and the protection of life and health. Consideration and compliance provisions for occupancies regulated by adopting state agencies are found in the sections listed below.

1. Section 1.2.2 in the *California Building Code* (CBC) for the California Building Standards Commission.
2. Section 104.11 of Chapter 1, Division II for the Division of the State Architect.
3. Section 1.8.7, Chapter 1, Administration, Division 1, of the 2013 *California Building Code* and Section 1.2.6, Chapter 1, Administration, Division 1, of the 2013 *California Residential Code* for the Department of Housing and Community Development.
4. Section 7-104, 2013 *California Administrative Code* for the Office of the Statewide Health Planning and Development.

**101.9 Effective date of this code.** Only those standards approved by the California Building Standards Commission that are effective at the time an application for a building permit

is submitted shall apply to the plans and specifications for, and to the construction performed under, that permit. For the effective dates of the provisions contained in this code, see the appropriate application checklist and the History Note page of this code.

**101.10 Mandatory requirements.** This code contains both mandatory and voluntary green building measures. Mandatory and voluntary measures are identified in the appropriate application checklist contained in this code.

**101.11 Effective use of this code.** The following steps shall be used to establish which provisions of this code are applicable to a specific occupancy:

1. Establish the type of occupancy.
2. Verify which state agency has authority for the established occupancy by reviewing the authorities list in Sections 103 through 106.
3. Once the appropriate agency has been identified, find the chapter which covers the established occupancy.
4. The Matrix Adoption Tables at the beginning of Chapters 4 and 5 identify the mandatory green building measures necessary to meet the minimum requirements of this code for the established occupancy.
5. Voluntary tier measures are contained in Appendix Chapters A4 and A5. A checklist containing each green building measure, both required and voluntary, is provided at the end of each appendix chapter. Each measure listed in the application checklist has a section number which correlates to a section where more information about the specific measure is available.
6. The application checklist identifies which measures are required by this code and allows users to check off which voluntary items have been selected to meet voluntary tier levels if desired or mandated by a city, county, or city and county.

## SECTION 102 CONSTRUCTION DOCUMENTS AND INSTALLATION VERIFICATION

**102.1 Submittal documents.** Construction documents and other data shall be submitted in one or more sets with each application for a permit. Where special conditions exist, the enforcing agency is authorized to require additional construction documents to be prepared by a licensed design professional and may be submitted separately.

**Exception:** The enforcing agency is authorized to waive the submission of construction documents and other data not required to be prepared by a licensed design professional.

**102.2 Information on construction documents.** Construction documents shall be of sufficient clarity to indicate the location, nature and scope of the proposed green building feature and show that it will conform to the provisions of this code, the *California Building Standards Code* and other relevant laws, ordinances, rules and regulations as determined by the enforcing agency.

**102.3 Verification.** Documentation of conformance for applicable green building measures shall be provided to the enforcing agency. Alternate methods of documentation shall be acceptable when the enforcing agency finds that the proposed alternate documentation is satisfactory to demonstrate substantial conformance with the intent of the proposed green building measure.

**SECTION 103  
BUILDING STANDARDS COMMISSION**

**103.1** Specific scope of application of the agency responsible for enforcement, the enforcement agency, and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

1. **Application**—New construction, unless otherwise indicated in this code, of State buildings (all occupancies), including buildings constructed by the Trustees of the California State University and the Regents of the University of California.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—*Health and Safety Code* Section 18934.5.

**Reference**—*Health and Safety Code*, Division 13, Part 2.5, commencing with Section 18901.

2. **Application**—All occupancies where no state agency has the authority to adopt green building standards applicable to those occupancies.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—*Health and Safety Code* Sections 18930.5 and 18938(b).

**Reference**—*Health and Safety Code*, Division 13, Part 2.5, commencing with Section 18901.

3. **University of California, California State Universities and California Community Colleges.**

**Application**—Standards for lighting for parking lots and primary campus walkways at the University of California, California State Universities and California Community Colleges.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—*Government Code* Section 14617.

**Reference**—*Government Code* Section 14617.

4. **Existing state-owned buildings, including those owned by the University of California and by the California State University.**

**Application**—Building seismic retrofit standards including abating falling hazards of structural and

nonstructural components and strengthening of building structures. See also Division of the State Architect.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—*Health and Safety Code* Section 16600.

**Reference**—*Health and Safety Code* Sections 16600 through 16604.

5. **Unreinforced masonry bearing wall buildings.**

**Application**—Minimum seismic strengthening standards for buildings specified in Appendix Chapter 1 of the *California Existing Building Code*, except for buildings subject to building standards adopted pursuant to *Health and Safety Code* (commencing) with Section 17910.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—*Health and Safety Code* Section 18934.6.

**Reference**—*Health and Safety Code* Sections 18901 through 18949.

**SECTION 104  
DEPARTMENT OF HOUSING  
AND COMMUNITY DEVELOPMENT**

**104.1 Scope.** Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated. ||

1. **Housing construction.**

**Application**—Hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities including accessory buildings, facilities and uses thereto. <

**Enforcing agency**—Local building department or the Department of Housing and Community Development.

**Authority cited**—*Health and Safety Code* Sections 17921, 17922 and 19990.

**Reference**—*Health and Safety Code* Sections 17000 through 17060, 17910 through 17990, and 19960 through 19997.

**SECTION 105  
DIVISION OF THE STATE ARCHITECT**

**105.1** Specific scope of application of the agency responsible for enforcement, the enforcement agency, and the specific

authority to adopt and enforce such provisions of this code, unless otherwise stated.

**105.1.1 Application—Public elementary and secondary schools and community colleges.** New building construction and related site work on a new or existing site.

**Enforcing agency—**The Division of the State Architect-Structural Safety (DSA-SS) has been delegated the responsibility and authority by the Department of General Services to review and approve the design and observe the construction of public elementary and secondary schools, and community colleges.

**Authority cited—***Education Code* Sections 17310 and 81142.

**Reference—***Education Code* Sections 17280 through 17317, and 81130 through 81147.

#### 105.1.2 Applicable administrative standards.

1. **Title 24, Part 1, *California Code of Regulations*:** Sections 4-301 through 4-355, Group 1, Chapter 4, for public elementary and secondary schools, and community colleges.
2. **Title 24, Part 2, *California Code of Regulations*:**
  - 2.1. Sections 1.1 and 1.9.2 of Chapter 1, Division I.
  - 2.2. Sections 102.1, 102.2, 102.3, 102.4, 102.5, 104.9, 104.10 and 104.11 of Chapter 1, Division II.

**105.1.3 Applicable building standards.** *California Building Standards Code*, Title 24, Parts 2, 3, 4, 5, 6, 9, 11 and 12, *California Code of Regulations*, for school buildings and community colleges.

## SECTION 106 OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

**106.1 OSHPD 1.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application—**General acute care hospitals and acute psychiatric hospitals, excluding distinct part units or distinct part freestanding buildings providing skilled nursing or intermediate care services. For structural regulations: Skilled nursing facilities and/or intermediate care facilities except those skilled nursing facilities and intermediate care facilities of single-story, Type V, wood or light steel-frame construction.

**Enforcing agency—**Office of Statewide Health Planning and Development (OSHPD). The office shall enforce the Division of the State Architect—Access Compliance regulations and the regulations of the Office of the State Fire Marshal for the above-stated facility types.

#### 106.1.1 Applicable administrative standards.

1. Title 24, Part 1, *California Code of Regulations*: Chapters 6 and 7.
2. Title 24, Part 2, *California Code of Regulations*: Sections 1.1 and 1.10 of Chapter 1, Division I and Chapter 1, Division II.

**106.1.2 Applicable building standards.** *California Building Standards Code*, Title 24, Parts 2, 3, 4, 5, 9, 11 and 12.

**106.1.3 Identification of amendments.** For applications listed in Section 106.1, amendments appear in this code preceded with the acronym [OSHPD 1].

**Authority—***Health and Safety Code* Sections 127010, 127015, 1275 and 129850.

**Reference—***Health and Safety Code* Sections 19958, 127010, 127015, 129680, 1275 and 129675 through 130070.

**106.2 OSHPD 2.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application—**Skilled nursing facilities and intermediate care facilities, including distinct part skilled nursing and intermediate care services on a general acute care or acute psychiatric hospital license, provided either are in a separate unit or a free-standing building. For structural regulations: Single-story, Type V skilled nursing facility and/or intermediate care facilities utilizing wood or light steel-frame construction.

**Enforcing agency—**Office of Statewide Health Planning and Development (OSHPD). The office shall also enforce the Division of the State Architect—Access Compliance regulations and the regulations of the Office of the State Fire Marshal for the above-stated facility type.

#### 106.2.1 Applicable administrative standards.

1. Title 24, Part 1, *California Code of Regulations*: Chapter 7.
2. Title 24, Part 2, *California Code of Regulations*: Sections 1.1 and 1.10 of Chapter 1, Division I and Chapter 1, Division II.

**106.2.2 Applicable building standards.** *California Building Standards Code*, Title 24, Parts 2, 3, 4, 5, 9, 11 and 12.

**106.2.3 Identification of amendments.** For applications listed in Section 106.2, amendments appear in this code preceded with the acronym [OSHPD 2].

**Authority—***Health and Safety Code* Sections 127010, 127015, 1275 and 129850.

**Reference—***Health and Safety Code* Sections 127010, 127015, 1275 and 129680.

**106.3 OSHPD 4.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application**—Correctional treatment centers.

**Enforcing agency**—Office of Statewide Health Planning and Development (OSHPD). The office shall also enforce the Division of the State Architect—Access Compliance regulations and the regulations of the Office of the State Fire Marshal for the above-stated facility types.

**106.3.1 Applicable administrative standards.**

1. Title 24, Part 1, *California Code of Regulations*: Chapter 7.
2. Title 24, Part 2, *California Code of Regulations*: Sections 1.1 and 1.10 of Chapter 1, Division I and Chapter 1, Division II.

**106.3.2 Applicable building standards.** *California Building Standards Code*, Title 24, Parts 2, 3, 4, 5, 9, 11 and 12.

**106.3.3 Identification of amendments.** For applications listed in Section 106.3, amendments appear in this code preceded with the acronym [OSHPD 4], unless the entire chapter is applicable.

**Authority**—*Health and Safety Code* Sections 127010, 127010, 127015 and 129790.

**References**—*Health and Safety Code* Sections 127010, 127015, 1275, and 129675 through 130070.



## CHAPTER 2

# DEFINITIONS

### SECTION 201 GENERAL

**201.1 Scope.** Unless otherwise stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

**201.2 Interchangeability.** Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

**201.3 Terms defined in other documents.** Where terms are not defined in this code and are defined in the *California Building Standards Code* or other referenced documents, such terms shall have the meanings ascribed to them as in those publications.

**201.4 Terms not defined.** Where terms are not defined as specified in this section, such terms shall have ordinarily accepted meanings such as the context implies.

### SECTION 202 DEFINITIONS

**ADDITION.** An extension or increase in floor area of an existing building or structure.

**ADJUST.** To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

**AGRIFIBER PRODUCTS.** Agrifiber products include wheatboard, strawboard, panel substrates and door cores, not including furniture, fixtures and equipment (FF&E) not considered base building elements.

**ALBEDO.** Synonymous with solar reflectance, which is a ratio of the energy reflected back into the atmosphere to the energy absorbed by the surface, with 100 percent being total reflectance.

**ALTERATION OR ALTER.** Any construction or renovation to an existing structure other than repair for the purpose of maintenance or addition.

**ARB (CARB).** The California Air Resources Board.

**ARTERIAL HIGHWAY.** A general term denoting a highway primarily for through traffic usually on a continuous route.

**ASSEMBLY (ASSEMBLY PRODUCT).** An assembly (assembly product) includes or has been formulated using multiple materials.

**AUTOMATIC.** Automatic means capable of operating without human intervention.

**A-WEIGHTED SOUND LEVEL (dba).** The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

**BALANCE.** To proportion flows within the distribution system, including submains, branches and terminals, according to design quantities.

**BIORETENTION.** A shallow depression that utilizes conditioned soil and vegetation for the storage, treatment or infiltration of storm water runoff.

**BROWNFIELD SITE.** Real property, the expansion, redevelopment or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant, with certain legal exclusions and additions.

**Note:** See the full text at the EPA's website.

**1 BTU/HOUR.** British thermal units per hour, also referred to as Btu. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate. A ton of refrigeration is 12,000 Btu, the amount of heat required to melt a ton (2,000 pounds) of ice at 32° Fahrenheit.

**BUILDING COMMISSIONING.** A systematic quality assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.

**BUILDING ENVELOPE.** The ensemble of exterior and demising partitions of a building that enclose conditioned space.

**CALIFORNIA BUILDING CODE.** The current version of the *California Building Code*.

**CALIFORNIA ELECTRICAL CODE.** The current version of the *California Electrical Code*.

**CALIFORNIA ENERGY CODE.** The current version of the *California Energy Code*, unless otherwise specified.

**CALIFORNIA MECHANICAL CODE.** The current version of the *California Mechanical Code*.

**CALIFORNIA PLUMBING CODE.** The current version of the *California Plumbing Code*.

**CALIFORNIA RESIDENTIAL CODE.** The current version of the *California Residential Code*.

**CHLOROFLUOROCARBON (CFC).** A class of compounds primarily used as refrigerants, consisting of only chlorine, fluorine and carbon.

**COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) HIGHWAY.** A metric similar to the day-night average sound level (Ldn), except that a 5 decibel (dB) adjustment is added to the equivalent continuous sound exposure level for evening hours (7 p.m. to 10 p.m.) in addition to the 10 dB nighttime adjustment used in the Ldn.

**COMPACT DISHWASHER.** A dishwasher that has a capacity of less than eight place settings plus six serving pieces as specified in ANSI/AHAM DW-1.

## DEFINITIONS

**COMPOSITE WOOD PRODUCTS.** Composite wood products include hardwood plywood, particleboard and medium density fiberboard. “Composite wood products” does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, prefabricated wood I-joists or finger-jointed lumber, all as specified in California Code of Regulations (CCR), Title 17, Section 93120.1(a).

**Note:** See CCR, Title 17, Section 93120.1.

**CONDITIONED FLOOR AREA.** The floor area (in square feet) of enclosed conditioned space on all floors of a building, as measured at the floor level of the exterior surfaces of exterior walls enclosing the conditioned space.

**CONDITIONED SPACE.** A space in a building that is either directly conditioned or indirectly conditioned.

**CONDITIONED SPACE, DIRECTLY.** An enclosed space that is provided with wood heating, is provided with mechanical heating that has a capacity exceeding 10 Btu/hr-ft<sup>2</sup>, or is provided with mechanical cooling that has a capacity exceeding 5 Btu/hr-ft<sup>2</sup>, unless the space-conditioning system is designed for a process space. (See Process Space.)

**CONDITIONED SPACE, INDIRECTLY.** Enclosed space, including but not limited to, unconditioned volume in atria, that (1) is not directly conditioned space; and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour.

**COOL PAVEMENT(S).** Includes, but is not limited to, high albedo pavements and coatings, vegetative surfaces, porous or pervious pavements that allow water infiltration, and pavements shaded by trees and other sources of shade.

**COOLING EQUIPMENT.** Equipment used to provide mechanical cooling for a room or rooms in a building.

**CUTOFF LUMINAIRES.** Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire.

**DAY-NIGHT AVERAGE SOUND LEVEL ( $L_{dn}$ ).** The A-weighted equivalent continuous sound exposure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10 p.m. to 7 a.m.).

**DECIBEL (dB).** A measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

**DEVELOPMENT FOOTPRINT.** The total area of the building footprint, hardscape, access roads and parking.

**DIRECT-VENT APPLIANCE.** A fuel-burning appliance with a sealed combustion system that draws all air for combustion from the outside atmosphere and discharges all flue gases to the outside atmosphere.

**DISPOSAL.** The management of solid waste through land-filling or transformation at permitted solid waste facilities.

**DIVERSION.** Activities which reduce or eliminate the amount of solid waste from solid waste disposal for purposes of this code.

**ELECTRIC VEHICLE (EV).** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the *California Electrical Code*, off-road, self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.

**ELECTRIC VEHICLE CHARGING STATION(S) (EVCS).** One or more spaces intended for charging electric vehicles.

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

**EMBODIED ENERGY.** The energy used for raw material extraction, transportation, manufacturing, assembly, installation and disposal during the life of a product, including the potential energy stored within the product.

**ENERGY BUDGET.** The sum of the annual TDV energy consumption for energy use components included in the performance compliance approach for the Standard Design Building, as established in the Alternative Calculation Method Reference Manual approved by the Energy Commission and calculated by Compliance Software certified by the Energy Commission.

**ENERGY COMMISSION.** The California State Energy Resources Conservation and Development Commission.

**ENERGY DESIGN RATING.** The sum of the annual TDV energy consumption for energy use components included in the performance compliance approach for the Standard Design Building (Energy Budget) and the annual time dependent valuation (TDV) energy consumption for lighting and components not regulated by Title 24, Part 6 (such as domestic appliances and consumer electronics) and accounting for the annual TDV energy offset by an on-site renewable energy system. The Design Rating is calculated by Compliance Software certified by the Energy Commission.

**ENERGY EQUIVALENT (NOISE) LEVEL ( $L_{eq}$ ).** The level of a steady noise which would have the same energy as the fluctuating noise level integrated over the time period of interest.

**ENFORCING AGENCY.** The designated department or agency as specified by statute or regulation.

**EUTROPHICATION.** The excessive growth of aquatic plants, especially algae, producing bacteria which consume nearly all of the oxygen required to sustain fauna and other flora.

**PLANTS.**

**Adaptive plants.** Adaptive plants are plants that grow well in a given habitat with minimal attention in the form of winter protection, pest protection, irrigation and fertilization once established.

**Note:** Adaptive plants are considered low in maintenance and are not invasive plants.

**Invasive plants.** Invasive plants are both indigenous and nonindigenous species with growth habits that are characteristically aggressive.

**Note:** Invasive plants typically have a high reproductive capacity and tendency to overrun the ecosystems they inhabit.

**Native plants.** Native plants are plants that have adapted to a given area and are not invasive.

**POSTCONSUMER CONTENT. [BSC, DSA-SS]** Waste material generated by consumers after it is used and which would otherwise be discarded.

**POSTCONSUMER CONTENT. [HCD]** Any material which has been used by a consumer and then recycled for use in a new material or product.

**POTABLE WATER.** Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the *California Plumbing Code*, Part 5.

**POTABLE WATER. [HCD]** Water that is satisfactory for drinking, culinary, and domestic purposes, and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards and the requirements of the Health Authority Having Jurisdiction.

**PRECONSUMER (or POSTINDUSTRIAL) [BSC, DSA-SS]** Material diverted from the waste stream during one manufacturing process, including scraps, damaged goods, and excess production, that is used in another manufacturing process.

**PRECONSUMER (OR POSTINDUSTRIAL) CONTENT. [HCD]** Material diverted from the waste stream during one manufacturing process, including scraps, damaged goods and excess production that is reclaimed and used in another manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated those wastes.

**PROCESS.** An activity or treatment that is not related to the space conditioning, lighting, service water heating or ventilating of a building as it relates to human occupancy.

**PROCESS SPACE.** A space that is thermostatically controlled to maintain a process environment temperature less than 55°F or to maintain a process environment temperature greater than 90°F for the whole space that the system serves, or that is a space with a space-conditioning system designed and controlled to be incapable of operating at temperatures above 55°F or incapable of operating at temperatures below 90°F at design conditions.

**PRODUCT-WEIGHTED MIR (PWMIR).** The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

**Note:** PWMIR is calculated according to equations found in CCR, Title 17, Section 94521(a).

**PROPORTIONAL RECYCLED CONTENT (PRCM).** The amount of recycled content of a material in an assembly as related to the percentage of the material in an assembly product. PRCM is derived by multiplying the percentage of each material in an assembly by the percentage of recycled content in the material.

**PSIG.** Pounds per square inch, gauge.

**RAINWATER.** Precipitation on any public or private parcel that has not entered an offsite storm drain system or channel, a flood control channel, or any other stream channel, and has not previously been put to beneficial use.

**RAINWATER CATCHMENT SYSTEM.** A facility designed to capture, retain, and store rainwater flowing off a building, parking lot, or any other manmade impervious surface for subsequent onsite use. Rainwater catchment system is also known as “Rainwater Harvesting System” or “Rainwater Capture System.”

**REACTIVE ORGANIC COMPOUND (ROC).** Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

**RECLAIMED (RECYCLED) WATER. [HCD]** Nonpotable water that meets California Department of Public Health statewide uniform criteria for disinfected tertiary recycled water. Reclaimed (recycled) water is also known as “recycled water” or “reclaimed water.”

**RECYCLE or RECYCLING.** The process of collecting, sorting, cleansing, treating and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused or reconstituted products which meet the quality standards necessary to be used in the marketplace. “Recycling” does not include transformation, as defined in *Public Resources Code* Section 40201.

**RECYCLED CONTENT. [BSC, DSA-SS]** Refer to International Organization of Standards ISO 14021—Environmental labels and declarations—Self-declared environmental claims (Type II environmental labeling).

**RECYCLED CONTENT (RC). [HCD]** The amount of recycled material in an assembly product or material. Refer to International Organization for Standardization ISO 14021—Environmental labels and declarations—Self-declared environmental claims (Type II environmental labeling).

**RECYCLED CONTENT VALUE (RCV). [BSC, DSA-SS]** Material cost multiplied by postconsumer content plus  $\frac{1}{2}$  the preconsumer content, or  $RCV = \$ X (\text{postconsumer content} + \frac{1}{2} \text{preconsumer content})$ .

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### RECYCLED CONTENT VALUE (RCV). [HCD]

**Assembly products (RCVA).** Assembly product cost multiplied by the recycled content of the assembly based on all of the postconsumer content and 50 percent of the preconsumer content.

**Materials (RCVM).** Material cost multiplied by recycled content of the material based on all of the postconsumer content and 50 percent of the preconsumer content.

**RECYCLED WATER.** Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur [Water Code Section 13050 (n)]. Simply put, recycled water is water treated to remove waste matter, attaining a quality that is suitable to use the water again.

**REFERENCE EVAPOTRANSPIRATION (ET<sub>o</sub>). [BSC]** The estimated rate of evapotranspiration from a standardized surface of well watered, actively growing cool season four- to seven-inch (10.16 to 17.78 cm) turfgrass with sufficient density to fully shade the soil. The water needs of a landscape planting can be calculated by multiplying the Landscape Coefficient [KI] and Reference Evapotranspiration (ET<sub>o</sub>).

**REFERENCE EVAPOTRANSPIRATION (ET<sub>o</sub>). [HCD]** Evapotranspiration is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity. Reference evapotranspiration (ET<sub>o</sub>) is the industry standard for determining irrigation requirements. ET<sub>o</sub> is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered.

**RESIDENTIAL BUILDING.** See “LOW-RISE RESIDENTIAL BUILDING” or “HIGH-RISE RESIDENTIAL BUILDING.”

**RESILIENT FLOORING.** Refers to nontextile flooring materials which have a relatively firm surface, yet characteristically have “give” and “bounce back” to their original surface profile from the weight of objects that compress its surface. Resilient flooring materials are made in various shapes and sizes including both tile and roll form. Common types of resilient flooring include but are not limited to:

1. Vinyl composition tile.
2. Vinyl tile and sheet flooring.
3. Linoleum tile and sheet.
4. Cork tile and sheet flooring.
5. Rubber tile and sheet flooring.
6. Polymeric poured seamless flooring.
7. Other types of non-textile synthetic flooring.

**RE-USE.** The use, in the same form as it was produced, of a material which might otherwise be discarded.

**SCHRADER ACCESS VALVES.** Access fittings with a valve core installed.

**SHORT RADIUS ELBOW.** Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.0 times the pipe diameter.

**SINGLE OCCUPANT SPACES.** Private offices, workstations in open offices, reception workstations, and ticket booths.

**SOLAR ACCESS.** The ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in determination of annual solar access.

**SOLAR REFLECTANCE.** A measure of the fraction of solar energy that is reflected by a surface (measured on a scale of zero to one).

**SOLAR REFLECTANCE INDEX (SRI).** A measure of a material surface’s ability to reflect solar heat, as shown by a small temperature rise. It includes both solar reflectance and thermal emittance and is quantified such that a standard black surface (solar reflectance 0.05, thermal emittance 0.90) is zero and a standard white surface (solar reflectance 0.80, thermal emittance 0.90) is 100.

### SOLID WASTE.

- (a) All putrescible and nonputrescible solid, semisolid and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes.
- (b) “Solid waste” does not include any of the following wastes:
  - (1) Hazardous waste, as defined in *Public Resources Code* Section 40141.
  - (2) Radioactive waste regulated pursuant to the Radiation Control Law (Chapter 8, commencing with Section 114960, of Part 9 of Division 104 of the *Health and Safety Code*).
  - (3) Medical waste regulated pursuant to the Medical Waste Management Act (Part 14 commencing with Section 117600) of Division 104 of the *Health and Safety Code*). Untreated medical waste shall not be disposed of in a solid waste landfill, as defined in *Public Resources Code* Section 40195.1. Medical waste that has been treated and deemed to be solid waste shall be regulated pursuant to this division.

**STANDARD DISHWASHER.** A dishwasher that has a capacity equal to or greater than eight place settings plus six serving pieces as specified in ANSI/AHAM DW-1.

**SUBMETER.** A meter installed subordinate to a site meter. Usually used to measure water intended for one purpose, such as landscape irrigation. For the purposes of *CALGreen*, a dedicated meter may be considered a submeter.

# CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE

## CHAPTER 3 – GREEN BUILDING

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	X		X				X	X	X	X									
Chapter/Section																			
301	X		X					X	X	X									
301.1			X				X												
301.1.1			X																
301.2			X																
301.3	X																		
301.3.1	X																		
302	X		X				X	X	X	X									
303	X		X				X	X	X	X									
304	X		X					X	X	X									
305								X											
306							X												

### CHAPTER 3

## GREEN BUILDING

#### SECTION 301 GENERAL

**301.1 Scope.** Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

**301.1.1 Additions and alterations. [HCD]** The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building’s conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.

**Note:** On and after January 1, 2014, residential buildings undergoing permitted alterations, additions or improvements shall replace noncompliant plumbing fixtures with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

**301.2 Low-rise and high-rise residential buildings. [HCD]** The provisions of individual sections of *CALGreen* may apply

to either low-rise residential buildings, high-rise residential buildings, or both. Individual sections will be designated by banners to indicate where the section applies specifically to low-rise only (LR) or high-rise only (HR). When the section applies to both low-rise and high-rise buildings, no banner will be used.

**301.3 Nonresidential additions and alterations. [BSC]** The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of \$200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and/or alterations [A]. When the code section applies to both, no banner will be used.

#### **301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:**

**Note:** On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 *et seq.* for definitions, types of commercial real property affected,

effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.

### SECTION 302 MIXED OCCUPANCY BUILDINGS

**302.1 Mixed occupancy buildings.** In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

### SECTION 303 PHASED PROJECTS

**303.1 Phased projects.** 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 (or newly constructed) shall apply.

**303.1.1 Tenant improvements.** The provisions of this code shall apply only to the initial tenant or occupant improvements to a project.

### SECTION 304 VOLUNTARY TIERS

**304.1 Purpose.** 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 and promote a more sustainable design.

**304.1.1 Tiers.** The provisions of Divisions A4.6 and A5.6 outline means, in the form of voluntary tiers, for achieving enhanced construction levels by incorporating additional measures for residential and nonresidential new construction. Voluntary tiers may be adopted by local governments and, when adopted, enforced by local enforcing agencies. Buildings complying with tiers specified for each occupancy contain additional prerequisite and elective green building measures necessary to meet the threshold of each tier. See Section 101.7 of this code for procedures and requirements related to local amendments, additions or deletions, including changes to energy standards.

**[BSC & HCD]** Where there are practical difficulties involved in complying with the threshold levels of a tier, the enforcing agency may grant modifications for individual cases. The enforcing agency shall first find that a special individual reason makes the strict letter of the tier impractical and that modification is in conformance with the intent and purpose of the measure. The details of any action granting modification shall be recorded and entered in the files of the enforcing agency.

### SECTION 305 [OSHPD 1] CALGreen TIER 1 AND CALGreen TIER 2

**305.1 CALGreen Tier 1 and CALGreen Tier 2 buildings** contain voluntary green building measures necessary to meet the threshold of each level.

**305.1.1 CALGreen Tier 1.** To achieve *CALGreen Tier 1*, buildings must comply with the latest edition of "Savings By Design, Healthcare Modeling Procedures" found online at [http://www.energysoft.com/main/page\\_downloads\\_sbd\\_healthcare.html](http://www.energysoft.com/main/page_downloads_sbd_healthcare.html).

**305.1.2 CALGreen Tier 2.** To achieve *CALGreen Tier 2*, buildings must exceed the latest edition of "Savings By Design, Healthcare Modeling Procedures" by a minimum of 15 percent.

### SECTION 306 [DSA-SS] VOLUNTARY MEASURES

**306.1 Purpose.** For public schools and community colleges, Appendix A5, Nonresidential Voluntary Measures, is provided as a guideline 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 and high-performance educational facilities.

**306.1.1** The optional provisions of Appendix A5, Divisions A5.1 through A5.5, outline means of achieving enhanced construction levels by incorporating additional measures that exceed the mandatory code.

**306.1.2** The measures outlined in Chapter 5, Section 5.410.2 for Commissioning and Section 5.410.4 for Testing and Adjusting are not adopted as mandatory standards by the DSA; however, are referenced here as optional verification practices that are encouraged and recommended to ensure performance, comfort, system durability, reliability, indoor air quality, and efficiency.

# CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE

## CHAPTER 4 – RESIDENTIAL MANDATORY MEASURES

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC	
			1	2	1-AC	AC	SS	1	2	3	4									
Adopt entire CA chapter																				
Adopt entire chapter as amended (amended sections listed below)																				
Adopt only those sections that are listed below			X																	
Chapter/Section																				
4.1			X																	
4.2			†																	
4.3			X																	
4.4			X																	
4.5			X																	

The state agency does not adopt sections identified by the following symbol: †.

## CHAPTER 4

# RESIDENTIAL MANDATORY MEASURES

### Division 4.1 – PLANNING AND DESIGN

#### SECTION 4.101 GENERAL

**4.101.1 Scope.** The provisions of this division outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

#### SECTION 4.102 DEFINITIONS

**4.102.1 Definitions.** The following terms are defined in Chapter 2.

**FRENCH DRAIN.**

**WATTLES.**

#### SECTION 4.103 SITE SELECTION (Reserved)

#### SECTION 4.104 SITE PRESERVATION (Reserved)

#### SECTION 4.105 DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES (Reserved)

#### SECTION 4.106 SITE DEVELOPMENT

**4.106.1 General.** Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall comply with this section.

**4.106.2 Storm water drainage and retention during construction.** Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall manage storm water drainage during construction. In order to manage storm water drainage during construction, one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site.

1. Retention basins of sufficient size shall be utilized to retain storm water on the site.
2. Where storm water is conveyed to a public drainage system, collection point, gutter or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency.
3. Compliance with a lawfully enacted storm water management ordinance.

**4.106.3 Grading and paving.** Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales
2. Water collection and disposal systems

3. French drains
4. Water retention gardens
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

**Exception:** Additions and alterations not altering the drainage path.

**4.106.4. Electric vehicle (EV) charging for new construction.** New construction shall comply with Sections 4.106.4.1 and 4.106.4.2 to facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the *California Electrical Code*, Article 625.

**Exceptions:** On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:

1. Where there is no commercial power supply.
2. Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost to the homeowner or the developer by more than \$400.00 per dwelling unit.

**4.106.4.1 New one- and two-family dwellings and townhouses with attached private garages.** For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

**4.106.4.1.1 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as “EV CAPABLE”. The raceway termination location shall be permanently and visibly marked as “EV CAPABLE”.

**4.106.4.2 New multifamily dwellings.** Where 17 or more multifamily dwelling units are constructed on a building site, 3 percent of the total number of parking spaces provided for all types of parking facilities, but in no case less than one, shall be electric vehicle charging stations (EVCS) capable of supporting future EVSE and shall be identified on construction documents. Calculations for the number of EVCS shall be rounded up to the nearest whole number.

**Note:** Construction documents are intended to demonstrate the project’s capability and capacity for facilitating future EV charging. There is no requirement for EVCS to be constructed or available until EV chargers are installed for use.

**4.106.4.2.1 Electric vehicle charging station (EVCS) locations.** Construction documents shall indicate the location of proposed EVCS. At least one EVCS shall be

located in common use areas and available for use by all residents.

When EV chargers are installed, EVCS required by Section 4.106.2.2, Item 3, shall comply with at least one of the following options:

1. The EVCS shall be located adjacent to an accessible parking space meeting the requirements of the *California Building Code*, Chapter 11A, to allow use of the EV charger from the accessible parking space.
2. The EVCS shall be located on an accessible route, as defined in the *California Building Code*, Chapter 2, to the building.

**4.106.4.2.2 Electric vehicle charging station (EVCS) dimensions and slope.** The EVCS shall be designed to comply with the following:

1. The minimum length of each EVCS shall be 18 feet (5486 mm).
2. The minimum width of each EVCS shall be 9 feet (2743 mm).
3. One in every 25 EVCS, but not less than one EVCS, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EVCS is 12 feet (3658 mm).
  - a. Surface slope for this EVCS and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.

**4.106.4.2.3 Single EVCS required.** Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EVCS. Construction documents shall identify the raceway termination point. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

**4.106.4.2.4 Multiple EVCS required.** Construction documents shall indicate the raceway termination point and proposed location of future EVCS and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EVCS at the full rated amperage of the EVSE. Plan design shall be based upon a 40-ampere minimum branch circuit. Raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.

**4.106.4.2.5 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent



protective device space(s) reserved for future EV charging purposes as “EV CAPABLE” in accordance with the *California Electrical Code*.

**Notes:**

1. The California Department of Transportation adopts and publishes the “California Manual on Uniform Traffic Control Devices (California MUTCD)” to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives Number 13-01. Website: [www.dot.ca.gov/hq/traffops/signtech/signdel/policy.htm](http://www.dot.ca.gov/hq/traffops/signtech/signdel/policy.htm).
2. See Vehicle Code Section 22511 for EV charging space signage in off-street parking facilities and for use of EV charging spaces.
3. The Governor’s Office of Planning and Research (OPR) published a “Zero-Emission Vehicle Community Readiness Guidebook” which provides helpful information for local governments, residents and businesses. Website: [http://opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://opr.ca.gov/docs/ZEV_Guidebook.pdf).
4. The Governor’s Office of Planning and Research (OPR) has developed draft guidelines, “Plug-In Electric Vehicles: Universal Charging Access Guidelines and Best Practices”, addressing physical accessibility standards and design guidelines for EVs. Website: [http://opr.ca.gov/docs/PEV\\_Access\\_Guidelines.pdf](http://opr.ca.gov/docs/PEV_Access_Guidelines.pdf).

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## CHAPTER 4

# RESIDENTIAL MANDATORY MEASURES

### Division 4.5 – ENVIRONMENTAL QUALITY

#### SECTION 4.501 GENERAL

**4.501.1 Scope.** The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

#### SECTION 4.502 DEFINITIONS

**4.502.1 Definitions.** The following terms are defined in Chapter 2.

**AGRIFIBER PRODUCTS.**

**COMPOSITE WOOD PRODUCTS.**

**DIRECT-VENT APPLIANCE.**

**MAXIMUM INCREMENTAL REACTIVITY (MIR).**

**MOISTURE CONTENT.**

**PRODUCT-WEIGHTED MIR (PWMIR).**

**REACTIVE ORGANIC COMPOUND (ROC).**

**VOC.**

#### SECTION 4.503 FIREPLACES

**4.503.1 General.** Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.

#### SECTION 4.504 POLLUTANT CONTROL

**4.504.1 Covering of duct openings and protection of mechanical equipment during construction.** At the time of rough installation, during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of water, dust and debris, which may enter the system.

**4.504.2 Finish material pollutant control.** Finish materials shall comply with this section.

**4.504.2.1 Adhesives, sealants and caulks.** Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards unless more strin-

gent local or regional air pollution or air quality management district rules apply:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products, as specified in Subsection 2 below.
2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

**4.504.2.2 Paints and coatings.** Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Suggested Control Measure, as shown in Table 4.504.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 4.504.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-high Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37 of the 2007 California Air Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-high Gloss VOC limit in Table 4.504.3 shall apply.

**4.504.2.3 Aerosol paints and coatings.** Aerosol paints and coatings shall meet the Product-weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49.

**4.504.2.4 Verification.** Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification.
2. Field verification of on-site product containers.

**RESIDENTIAL MANDATORY MEASURES**

**TABLE 4.504.1  
ADHESIVE VOC LIMIT<sup>1,2</sup>  
Less Water and Less Exempt Compounds in Grams per Liter**

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesives not specifically listed	50
<b>SPECIALTY APPLICATIONS</b>	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
<b>SUBSTRATE SPECIFIC APPLICATIONS</b>	
Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

1. If an adhesive is used to bond dissimilar substrates together, the adhesive with the highest VOC content shall be allowed.
2. For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168.

**TABLE 4.504.2  
SEALANT VOC LIMIT  
Less Water and Less Exempt Compounds in Grams per Liter**

SEALANTS	CURRENT VOC LIMIT
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
<b>SEALANT PRIMERS</b>	
Architectural	
Nonporous	250
Porous	775
Modified bituminous	500
Marine deck	760
Other	750

**TABLE 4.504.3  
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS<sup>2,3</sup>  
Grams of VOC per Liter of Coating,  
Less Water and Less Exempt Compounds**

COATING CATEGORY	
Flat coatings	50
Nonflat coatings	100
Nonflat-high gloss coatings	150
<b>SPECIALTY COATINGS</b>	
Aluminum roof coatings	400
Basement specialty coatings	400
Bituminous roof coatings	50
Bituminous roof primers	350
Bond breakers	350
Concrete curing compounds	350
Concrete/masonry sealers	100
Driveway sealers	50
Dry fog coatings	150
Faux finishing coatings	350
Fire resistive coatings	350
Floor coatings	100
Form-release compounds	250
Graphic arts coatings (sign paints)	500
High temperature coatings	420
Industrial maintenance coatings	250
Low solids coatings <sup>1</sup>	120
Magnesite cement coatings	450
Mastic texture coatings	100
Metallic pigmented coatings	500
Multicolor coatings	250
Pretreatment wash primers	420
Primers, sealers, and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Rust preventative coatings	250
Shellacs	
Clear	730
Opaque	550
Specialty primers, sealers and undercoaters	100
Stains	250
Stone consolidants	450
Swimming pool coatings	340
Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	250
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	340

1. Grams of VOC per liter of coating, including water and including exempt compounds.
2. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
3. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

**4.504.3 Carpet systems.** All carpet installed in the building interior shall meet the testing and product requirements of one of the following:

1. Carpet and Rug Institute’s Green Label Plus Program.
2. California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350.)
3. NSF/ANSI 140 at the Gold level.
4. Scientific Certifications Systems Indoor Advantage™ Gold.

**4.504.3.1 Carpet cushion.** All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute’s Green Label program.

**4.504.3.2 Carpet adhesive.** All carpet adhesive shall meet the requirements of Table 4.504.1.

**4.504.4 Resilient flooring systems.** Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall comply with one or more of the following:

1. Products compliant with the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350), certified as a CHPS Low-Emitting Material in the Collaborative for High Performance Schools (CHPS) High Performance Products Database.
2. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children & Schools program).
3. Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program.
4. Meet the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350).

**4.504.5 Composite wood products.** Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB’s Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5.

**4.504.5.1 Documentation.** Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).

4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

**TABLE 4.504.5  
FORMALDEHYDE LIMITS<sup>1</sup>  
Maximum Formaldehyde Emissions in Parts per Million**

PRODUCT	CURRENT LIMIT
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard <sup>2</sup>	0.13

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333. For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of  $\frac{5}{16}$  inch (8 mm).

## SECTION 4.505 INTERIOR MOISTURE CONTROL

**4.505.1 General.** Buildings shall meet or exceed the provisions of the *California Building Standards Code*.

**4.505.2 Concrete slab foundations.** Concrete slab foundations required to have a vapor retarder by the *California Building Code*, Chapter 19 or concrete slab-on-ground floors required to have a vapor retarder by the *California Residential Code*, Chapter 5, shall also comply with this section.

**4.505.2.1 Capillary break.** A capillary break shall be installed in compliance with at least one of the following:

1. A 4-inch-thick (101.6 mm) base of  $\frac{1}{2}$  inch (12.7 mm) or larger clean aggregate shall be provided with a vapor retarder in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06.
2. Other equivalent methods approved by the enforcing agency.
3. A slab design specified by a licensed design professional.

**4.505.3 Moisture content of building materials.** Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19-percent moisture content. Moisture content shall be verified in compliance with the following:

1. Moisture content shall be determined with either a probe-type or contact-type moisture meter. Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements found in Section 101.8 of this code.
2. Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the grade stamped end of each piece to be verified.

## RESIDENTIAL MANDATORY MEASURES

3. At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.

Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Wet-applied insulation products shall follow the manufacturers' drying recommendations prior to enclosure.

### SECTION 4.506

#### INDOOR AIR QUALITY AND EXHAUST

**4.506.1 Bathroom exhaust fans.** Each bathroom shall be mechanically ventilated and shall comply with the following:

1. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building.
2. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control.
  - a. Humidity controls shall be capable of adjustment between a relative humidity range of  $\leq 50$  percent to a maximum of 80 percent. A humidity control may utilize manual or automatic means of adjustment.
  - b. A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in).

#### Notes:

1. For the purposes of this section, a bathroom is a room which contains a bathtub, shower, or tub/shower combination.
2. Lighting integral to bathroom exhaust fans shall comply with the *California Energy Code*.

### SECTION 4.507

#### ENVIRONMENTAL COMFORT

**4.507.1 Reserved.**

**4.507.2 Heating and air-conditioning system design.** Heating and air-conditioning systems shall be sized, designed and have their equipment selected using the following methods:

1. The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J—2004 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods.

2. Duct systems are sized according to ANSI/ACCA 1 Manual D—2009 (*Residential Duct Systems*), ASHRAE handbooks or other equivalent design software or methods.
3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S—2004 (*Residential Equipment Selection*) or other equivalent design software or methods.

**Exception:** Use of alternate design temperatures necessary to ensure the systems function are acceptable.

### SECTION 4.508

#### OUTDOOR AIR QUALITY (Reserved)

**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES  
DIVISION 5.1 – PLANNING AND DESIGN**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	X																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below							X												
Chapter/Section																			
5.101							X												
5.102 Definitions							X												
5.106.4.2 and subsections							X												
5.106.8							X												
5.106.10							X												

**CHAPTER 5  
NONRESIDENTIAL MANDATORY MEASURES**

*Division 5.1 – PLANNING AND DESIGN*

**SECTION 5.101  
GENERAL**

**5.101.1 Scope.** The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

**SECTION 5.102  
DEFINITIONS**

**5.102.1 Definitions.** The following terms are defined in Chapter 2.

**CUTOFF LUMINAIRES.**

**LOW-EMITTING AND FUEL EFFICIENT VEHICLES.**

**NEIGHBORHOOD ELECTRIC VEHICLE (NEV).**

**TENANT-OCCUPANTS.**

**VANPOOL VEHICLE.**

**ZEV.**

**SECTION 5.103  
SITE SELECTION  
(Reserved)**

**SECTION 5.104  
SITE PRESERVATION  
(Reserved)**

**SECTION 5.105  
DECONSTRUCTION AND REUSE  
OF EXISTING STRUCTURES  
(Reserved)**

**SECTION 5.106  
SITE DEVELOPMENT**

**5.106.1 Storm water pollution prevention.** Newly constructed projects and additions which disturb less than one acre of land shall prevent the pollution of stormwater runoff from the construction activities through one or more of the following measures:

**5.106.1.1 Local ordinance.** Comply with a lawfully enacted stormwater management and/or erosion control ordinance.

**5.106.1.2 Best management practices (BMP).** Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMP.

1. Soil loss BMP that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
  - a. Scheduling construction activity.

- b. Preservation of natural features, vegetation and soil.
  - c. Drainage swales or lined ditches to control stormwater flow.
  - d. Mulching or hydroseeding to stabilize disturbed soils.
  - e. Erosion control to protect slopes.
  - f. Protection of storm drain inlets (gravel bags or catch basin inserts).
  - g. Perimeter sediment control (perimeter silt fence, fiber rolls).
  - h. Sediment trap or sediment basin to retain sediment on site.
  - i. Stabilized construction exits.
  - j. Wind erosion control.
  - k. Other soil loss BMP acceptable to the enforcing agency.
2. Good housekeeping BMP to manage construction equipment, materials and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
- a. Material handling and waste management.
  - b. Building materials stockpile management.
  - c. Management of washout areas (concrete, paints, stucco, etc.).
  - d. Control of vehicle/equipment fueling to contractor’s staging area.
  - e. Vehicle and equipment cleaning performed off site.
  - f. Spill prevention and control.
  - g. Other housekeeping BMP acceptable to the enforcing agency.

**5.106.4 Bicycle parking.** For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2.

**5.106.4.1 Bicycle parking. [BSC]** Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

**5.106.4.1.1 Short-term bicycle parking. [BSC]** If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors’ entrance, readily visible to passers-by, for 5 percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.

**Exception:** Additions or alterations which add nine or less visitor vehicular parking spaces.

**5.106.4.1.2 Long-term bicycle parking.** For new buildings with over 10 tenant-occupants or for additions or

alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

**Note:** Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

**5.106.4.2 Bicycle parking. [DSA-SS]** For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2.

**5.106.4.2.1 Student bicycle parking.** Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building.

**5.106.4.2.2 Staff bicycle parking.** Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

**5.106.5.2 Designated parking.** In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

**TABLE 5.106.5.2**

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0–9	0
10–25	1
26–50	3
51–75	6
76–100	8
101–150	11
151–200	16
201 and over	At least 8 percent of total

**5.106.5.2.1 Parking stall marking.** Paint, in the paint used for stall striping, the following characters such that



the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle:

CLEAN AIR/  
VANPOOL/EV

**Note:** Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

**5.106.5.3 Electric vehicle (EV) charging.** [N] Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the *California Electrical Code* and as follows:

**5.106.5.3.1 Single charging space requirements.** [N] When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. A listed raceway capable of accommodating a 208/240-volt dedicated branch circuit.
3. The raceway shall not be less than trade size 1.”
4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.
5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.

**5.106.5.3.2 Multiple charging space requirements.** [N] When multiple charging spaces are required per Table 5.106.5.3.3 raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
3. Plan design shall be based upon 40-ampere minimum branch circuits.
4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.

5. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

**5.106.5.3.3 EV charging space calculation.** [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.

**Exceptions:** On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply.
2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

TABLE 5.106.5.3.3

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED EV CHARGING SPACES
0-50	0
51-75	1
76-100	2
101-200	3
201 and over	3% <sup>1</sup>

1. Calculation for spaces shall be rounded up to the nearest whole number.

**5.106.5.3.4 [N] Identification.** The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as “EV CAPABLE”. The raceway termination location shall be permanently and visibly marked as “EV CAPABLE.”

**5.106.5.3.5 [N] Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking.**

**Notes:**

1. The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices (California MUTCD) to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives number 13-01. [www.dot.ca.gov/hq/traffops/policy/13-01.pdf](http://www.dot.ca.gov/hq/traffops/policy/13-01.pdf).
2. See Vehicle Code Section 22511 for EV charging spaces signage in off-street parking facilities and for use of EV charging spaces.
3. The Governor’s Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which pro-

vides helpful information for local governments, residents and businesses. [www.opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://www.opr.ca.gov/docs/ZEV_Guidebook.pdf).

**5.106.8 Light pollution reduction.** [N] Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the *California Energy Code* for Lighting Zones 1-4 as defined in Chapter 10 of the California Administrative Code; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and
3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or

Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

**Exceptions:** [N]

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code*.
2. Emergency lighting.

**Note:** [N] See also *California Building Code*, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.

**5.106.10 Grading and paving.** Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales,
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

**Exception:** Additions and alterations not altering the drainage path.

**TABLE 5.106.8 [N]  
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS<sup>1,2</sup>**

ALLOWABLE RATING	LIGHTING ZONE 1	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4
<b>Maximum Allowable Backlight Rating<sup>3</sup></b>				
Luminaire greater than 2 mounting heights (MH) from property line	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	B0	B0	B1	B2
<b>Maximum Allowable Uplight Rating</b>				
For area lighting <sup>4</sup>	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	U1	U2	U3	U4
<b>Maximum Allowable Glare Rating<sup>5</sup></b>				
Luminaire greater than 2 MH from property line	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	G0	G0	G1	G1
Luminaire back hemisphere is less than 0.5 MH from property line	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.
4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet *U*-value limits for “all other outdoor lighting.”
5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES  
DIVISION 5.3 – WATER EFFICIENCY AND CONSERVATION**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	<b>X</b>																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below							<b>X</b>												
Chapter/Section																			
5.301.1							<b>X</b>												
5.302.1 Definitions							<b>X</b>												
5.303.3 and subsections							<b>X</b>												
5.303.3.4 and subsections							<b>X</b>												
5.303.6							<b>X</b>												

**CHAPTER 5  
NONRESIDENTIAL MANDATORY MEASURES**

*Division 5.3 – WATER EFFICIENCY AND CONSERVATION*

**SECTION 5.301  
GENERAL**

**5.301.1 Scope.** The provisions of this chapter shall establish the means of conserving water used indoors, outdoors and in wastewater conveyance.

**SECTION 5.302  
DEFINITIONS**

**5.302.1 Definitions.** The following terms are defined in Chapter 2.

**GRAYWATER.**

**MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWEL).**

**POTABLE WATER.**

**RECYCLED WATER.**

**SUBMETER.**

**WATER BUDGET.**

**SECTION 5.303  
INDOOR WATER USE**

**5.303.1 Meters.** Separate submeters or metering devices shall be installed for the uses described in Sections 5303.1.1 and 5303.1.2.

**5.303.1.1 New buildings or additions in excess of 50,000 square feet.** Separate submeters shall be installed as follows:

1. For each individual leased, rented, or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
  - a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
  - b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
  - c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).

**5.303.1.2 Excess consumption.** A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

### 5.303.2 Reserved.

**5.303.3 Water conserving plumbing fixtures and fittings.** Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

**5.303.3.1 Water closets.** The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type Toilets.

**Note:** The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

**5.303.3.2 Urinals.** The effective flush volume of urinals shall not exceed 0.5 gallons per flush.

### 5.303.3.3 Showerheads.

**5.303.3.3.1 Single showerhead.** Showerheads shall have a maximum flow rate of not more than 2.0 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

**5.303.3.3.2 Multiple showerheads serving one shower.** When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 2.0 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.

**Note:** A hand-held shower shall be considered a showerhead.

### 5.303.3.4 Faucets and fountains.

**5.303.3.4.1 Nonresidential Lavatory faucets.** Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.

**5.303.3.4.2 Kitchen faucets.** Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

**5.303.3.4.3 Wash fountains.** Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute/20 [rim space (inches) at 60 psi].

**5.303.3.4.4 Metering faucets.** Metering faucets shall not deliver more than 0.20 gallons per cycle.

**5.303.3.4.5 Metering faucets for wash fountains.** Metering faucets for wash fountains shall have a maxi-

imum flow rate of not more than 0.20 gallons per minute/20 [rim space (inches) at 60 psi].

**Note:** Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

**5.303.4 Areas of addition or alteration.** For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 shall apply to new fixtures in additions or areas of alteration to the building.

**5.303.6 Standards for plumbing fixtures and fittings.** Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1401.1 of the *California Plumbing Code* and in Chapter 6 of this code.

## SECTION 5.304 OUTDOOR WATER USE

**5.304.1 Water budget.** A water budget shall be developed for landscape irrigation use that installed in conjunction with a new building or an addition or alteration conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.

**Note:** Prescriptive measures to assist in compliance with the water budget are listed in Sections 492.5 through 492.8, 492.10 and 492.11 of the ordinance, which may be found at: <http://www.water.ca.gov/wateruseefficiency/docs/WaterOrdSec492.cfm>.

**5.304.2 Outdoor potable water use.** For new water service or for addition or alteration requiring upgraded water service for landscaped areas of at least 1,000 square feet but not more than 5,000 square feet (the level at which *Water Code* §535 applies), separate submeters or metering devices shall be installed for outdoor potable water use.

**5.304.3 Irrigation design.** In new nonresidential construction or building addition or alteration with at least 1,000 but not more than 2,500 square feet of cumulative landscaped area (the level at which the MWELO applies), install irrigation controllers and sensors which include the following criteria, and meet manufacturer's recommendations.

**5.304.3.1 Irrigation controllers.** Automatic irrigation system controllers installed at the time of final inspection shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the con-

troller(s). Soil moisture-based controllers are not required to have rain sensor input.

**Note:** More information regarding irrigation controller function and specifications is available from the Irrigation Association.

**SECTION 5.305  
WATER REUSE SYSTEMS  
(Reserved)**

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**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES  
DIVISION 5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	X																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below							X												
Chapter/Section																			
5.401.1							X												
5.402.1 Definitions							X												
5.407 and subsections							X												
5.408.1 and subsections							X												
5.410.1							X												
5.410.1.2							X												

**CHAPTER 5  
NONRESIDENTIAL MANDATORY MEASURES**

*Division 5.4 – MATERIAL CONSERVATION AND  
RESOURCE EFFICIENCY*

**SECTION 5.401  
GENERAL**

**5.401.1 Scope.** The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through protection of buildings from exterior moisture, construction waste diversion, employment of techniques to reduce pollution through recycling of materials, and building commissioning or testing and adjusting.

**SECTION 5.402  
Definitions**

**5.402.1 Definitions.** The following terms are defined in Chapter 2.

**ADJUST.**

**BALANCE.**

**BUILDING COMMISSIONING.**

**TEST.**

**SECTION 5.403  
FOUNDATION SYSTEMS  
(Reserved)**

**SECTION 5.404  
EFFICIENT FRAMING TECHNIQUES  
(Reserved)**

**SECTION 5.405  
MATERIAL SOURCES  
(Reserved)**

**SECTION 5.406  
ENHANCED DURABILITY  
AND REDUCED MAINTENANCE  
(Reserved)**

## SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

**5.407.1 Weather protection.** Provide a weather-resistant exterior wall and foundation envelope as required by *California Building Code* Section 1403.2 (Weather Protection) and *California Energy Code* Section 150, (Mandatory Features and Devices), manufacturer’s installation instructions or local ordinance, whichever is more stringent.

**5.407.2 Moisture control.** Employ moisture control measures by the following methods.

**5.407.2.1 Sprinklers.** Design and maintain landscape irrigation systems to prevent spray on structures.

**5.407.2.2 Entries and openings.** Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

**5.407.2.2.1 Exterior door protection.** Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

1. An installed awning at least 4 feet in depth.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

**5.407.2.2.2 Flashing.** Install flashings integrated with a drainage plane.

## SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

**5.408.1 Construction waste management.** Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

**5.408.1.1 Construction waste management plan.** Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.

4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

**5.408.1.2 Waste management company.** Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

**Note:** The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

### Exceptions to Sections 5.408.1.1 and 5.408.1.2:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.

**5.408.1.3 Waste stream reduction alternative.** The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 50 percent minimum requirement as approved by the enforcing agency.

**5.408.1.4 Documentation.** Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1 through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

### Notes:

1. Sample forms found in “A Guide to the California Green Building Standards Code (Nonresidential)” located at <http://www.bsc.ca.gov/Home/CALGreen.aspx> may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris (C&D) processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

**5.408.3 Excavated soil and land clearing debris.** [BSC] 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

**Exception:** Reuse, either on- or off-site, of vegetation or soil contaminated by disease or pest infestation.

### Notes:

1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material. ([www.cdfa.ca.gov/exec/county/county\\_contacts.html](http://www.cdfa.ca.gov/exec/county/county_contacts.html))



- For a map of known pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. ([www.cdffa.ca.gov](http://www.cdffa.ca.gov))

**SECTION 5.409  
LIFE CYCLE ASSESSMENT  
(Reserved)**

**SECTION 5.410  
BUILDING MAINTENANCE AND OPERATION**

**5.410.1 Recycling by occupants.** Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

**5.410.1.1 Additions.** [A] All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30 percent or more in floor area, shall provide recycling areas on site.

**Exception:** Additions within a tenant space resulting in less than a 30-percent increase in the tenant space floor area.

**5.410.1.2 Sample ordinance.** Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the *Public Resources Code*. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

**Note:** A sample ordinance for use by local agencies may be found in Appendix A of the document at the CalRecycle's web site.

**5.410.2 Commissioning.** [N] For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. Commissioning requirements shall include:

- Owner's or owner representative's project requirements.
- Basis of design.
- Commissioning measures shown in the construction documents.
- Commissioning plan.
- Functional performance testing.
- Documentation and training.
- Commissioning report.

**Exceptions:**

- Unconditioned warehouses of any size.
- Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
- Tenant improvements less than 10,000 square feet as described in Section 303.1.1.

- Commissioning requirements for energy systems covered by the *California Energy Code*.
- Open parking garages of any size, or open parking garage areas, of any size, within a structure.

**Note:** For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and or air conditioning.

All building operating systems covered by Title 24, Part 6, as well as process equipment and controls, and renewable energy systems shall be included in the scope of the commissioning requirements.

**Informational Notes:**

- IAS AC 476 is an accreditation criteria for organizations providing training and/or certification of commissioning personnel. AC 476 is available to the Authority Having Jurisdiction as a reference for qualifications of commissioning personnel. AC 476 does not certify individuals to conduct functional performance tests or to adjust and balance systems.
- Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

**5.410.2.1 Owner's or Owner representative's Project Requirements (OPR).** [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:

- Environmental and sustainability goals.
- Energy efficiency goals [Refer to 2013 *California Energy Code*, Section 120.8(b)].
- Indoor environmental quality requirements.
- Project program, including facility functions and hours of operation, and need for after hours operation.
- Equipment and systems expectations.
- Building occupant and operation and maintenance (O&M) personnel expectations.

**5.410.2.2 Basis of Design (BOD).** [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

- Heating, ventilation, air conditioning [HVAC] systems and controls. (Refer to 2013 *California Energy Code*, Section 120.8(c)).
- Indoor lighting system and controls [Refer to 2013 *California Energy Code* Section 120.8(c)].
- Water heating system [Refer to 2013 *California Energy Code* Section 120.8(c)].
- Renewable energy systems.
- Landscape irrigation systems.
- Water reuse systems.

**5.410.2.3 Commissioning plan.** [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:

1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
  - a. An explanation of the original design intent.
  - b. Equipment and systems to be tested, including the extent of tests.
  - c. Functions to be tested.
  - d. Conditions under which the test shall be performed.
  - e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

**5.410.2.4 Functional performance testing.** [N] Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

**5.410.2.5 Documentation and training.** [N] A systems manual and systems operations training are required, including Occupational Safety and Health Act (OSHA) requirements in *California Code of Regulations* (CCR), Title 8, Section 5142, and other related regulations.

**5.410.2.5.1 Systems manual.** [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:

1. Site information, including facility description, history and current requirements.
2. Site contact information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
4. Major systems.
5. Site equipment inventory and maintenance notes.
6. A copy of verifications required by the enforcing agency or this code.
7. Other resources and documentation, if applicable.

**5.410.2.5.2 Systems operations training.** [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed

and documented in the commissioning report and shall include the following:

1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the systems manual.
4. Review of the record drawings on the system/equipment.

**5.410.2.6 Commissioning report.** [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

**5.410.4 Testing and adjusting.** Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

**5.410.4.1 (Reserved)**

**5.410.4.2 Systems.** Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include, as applicable to the project:

1. HVAC systems and controls.
2. Indoor and outdoor lighting and controls.
3. Water heating systems.
4. Renewable energy systems.
5. Landscape irrigation systems.
6. Water reuse systems.

**5.410.4.3 Procedures.** Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

**5.410.4.3.1 HVAC balancing.** In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, balance the system in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

**5.410.4.4 Reporting.** After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

**5.410.4.5 Operation and maintenance (O & M) manual.** Provide the building owner or representative with detailed operating and maintenance instructions and copies of guarantees/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

**5.410.4.5.1 Inspections and reports.** Include a copy of all inspection verifications and reports required by the enforcing agency.

**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES  
DIVISION 5.5 – ENVIRONMENTAL QUALITY**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	<b>X</b>																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below							<b>X</b>												
Chapter/Section																			
5.501.1							X												
5.502.1 Definitions							X												
5.504.3							X												
5.504.4							X												
5.504.4.1							X												
Table 5.504.4.1							X												
Table 5.504.4.2							X												
5.504.4.3							X												
5.504.4.3.1							X												
Table 5.504.4.3							X												
5.504.4.3.2							X												
5.504.4.4 and subsections							X												
5.504.4.5							X												
Table 5.504.4.5							X												
5.504.4.6							X												
5.504.5.3							X												
5.505							X												
5.506.1							X												
5.507.4 and subsections							X												
5.508.1 and subsections							X												

**CHAPTER 5  
NONRESIDENTIAL MANDATORY MEASURES**

**SECTION 5.502  
DEFINITIONS**

*Division 5.5 – ENVIRONMENTAL QUALITY*

**SECTION 5.501  
GENERAL**

**5.501.1 Scope.** The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building’s installers, occupants and neighbors.

**5.502.1 Definitions.** The following terms are defined in Chapter 2.

**ARTERIAL HIGHWAY.**

**A-WEIGHTED SOUND LEVEL (dBA).**

**1 BTU/HOUR.**

**COMMUNITY NOISE EQUIVALENT LEVEL (CNEL).**

**COMPOSITE WOOD PRODUCTS.**

- DAY-NIGHT AVERAGE SOUND LEVEL (Ldn).
- DECIBEL (dB).
- ENERGY EQUIVALENT (NOISE) LEVEL (L<sub>eq</sub>).
- EXPRESSWAY.
- FREEWAY.
- GLOBAL WARMING POTENTIAL (GWP).
- GLOBAL WARMING POTENTIAL VALUE (GWP VALUE).
- HIGH-GWP REFRIGERANT.
- LONG RADIUS ELBOW.
- LOW-GWP REFRIGERANT.
- MERV.
- MAXIMUM INCREMENTAL REACTIVITY (MIR).
- PRODUCT-WEIGHTED MIR (PWMIR).
- PSIG.
- REACTIVE ORGANIC COMPOUND (ROC).
- SCHRADER ACCESS VALVES.
- SHORT RADIUS ELBOW.
- SUPERMARKET.
- VOC.

**SECTION 5.503  
FIREPLACES**

**5.503.1 General.** Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the *California Energy Code*, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

**5.503.1.1 Woodstoves.** Woodstoves and pellet stoves shall comply with U.S. EPA Phase II emission limits where applicable.

**SECTION 5.504  
POLLUTANT CONTROL**

**5.504.1.3 Temporary ventilation.** The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30 percent based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

**5.504.3 Covering of duct openings and protection of mechanical equipment during construction.** At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equip-

ment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

**5.504.4 Finish material pollutant control.** Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.4.

**TABLE 5.504.4.1  
ADHESIVE VOC LIMIT<sup>1,2</sup>  
Less Water and Less Exempt Compounds in Grams Per Liter**

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesive not specifically listed	50
SPECIALTY APPLICATIONS	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
SUBSTRATE SPECIFIC APPLICATIONS	
Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

1. If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.
2. For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168, <http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF>.

**5.504.4.1 Adhesives, sealants and caulks.** Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.
2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

**TABLE 5.504.4.2  
SEALANT VOC LIMIT  
Less Water and Less Exempt Compounds in Grams per Liter**

SEALANTS	CURRENT VOC LIMIT
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
<b>SEALANT PRIMERS</b>	
Architectural	
Nonporous	250
Porous	775
Modified bituminous	500
Marine deck	760
Other	750

Note: For additional information regarding methods to measure the VOC content specified in these tables, see South Coast Air Quality Management District Rule 1168.

**5.504.4.3 Paints and coatings.** Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

**TABLE 5.504.4.3  
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS<sup>2,3</sup>  
Grams of VOC Per Liter of Coating,  
Less Water and Less Exempt Compounds**

COATING CATEGORY	CURRENT LIMIT
Flat coatings	50
Nonflat coatings	100
Nonflat high gloss coatings	150
<b>Specialty Coatings</b>	
Aluminum roof coatings	400
Basement specialty coatings	400
Bituminous roof coatings	50
Bituminous roof primers	350
Bond breakers	350
Concrete curing compounds	350
Concrete/masonry sealers	100
Driveway sealers	50
Dry fog coatings	150
Faux finishing coatings	350
Fire resistive coatings	350
Floor coatings	100
Form-release compounds	250
Graphic arts coatings (sign paints)	500
High-temperature coatings	420
Industrial maintenance coatings	250
Low solids coatings <sup>1</sup>	120
Magnesite cement coatings	450
Mastic texture coatings	100
Metallic pigmented coatings	500
Multicolor coatings	250
Pretreatment wash primers	420
Primers, sealers and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Rust preventative coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty primers, sealers and undercoaters	100
Stains	250
Stone consolidants	450
Swimming pool coatings	340
Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	250
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	340

1. Grams of VOC per liter of coating, including water and including exempt compounds.
2. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
3. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

**5.504.4.3.1 Aerosol paints and coatings.** Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

**5.504.4.3.2 Verification.** Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer’s product specification
2. Field verification of on-site product containers

**5.504.4.4 Carpet systems.** All carpet installed in the building interior shall meet at least one of the following testing and product requirements:

1. Carpet and Rug Institute’s Green Label Plus Program;
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 2010 (also known as CDPH Standard Method V1.1 or *Specification 01350*);
3. NSF/ANSI 140 at the Gold level or higher;
4. Scientific Certifications Systems Sustainable Choice; or
5. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database.

**5.504.4.4.1 Carpet cushion.** All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute’s Green Label program.

**5.504.4.4.2 Carpet adhesive.** All carpet adhesive shall meet the requirements of Table 5.504.4.1.

**5.504.4.5 Composite wood products.** Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB’s Air Toxics Control Measure (ATCM) for Composite Wood (17 CCR 93120 et seq.) Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

**5.504.4.5.1 Early compliance.** Reserved.

**5.504.4.5.3 Documentation.** Verification of compliance with this section shall be provided as requested by the

enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, *et seq.*).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

**TABLE 5.504.4.5  
FORMALDEHYDE LIMITS<sup>1</sup>  
Maximum Formaldehyde Emissions in Parts per Million.**

PRODUCT	CURRENT LIMIT
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particle board	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard <sup>2</sup>	0.13

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333. For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of <sup>5</sup>/<sub>16</sub> inches (8 mm).

**5.504.4.6 Resilient flooring systems.** For 80 percent of floor area receiving resilient flooring, installed resilient flooring shall meet at least one of the following:

1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health’s 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or
4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children’s & Schools Program).

**5.504.4.6.1 Verification of compliance.** Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

**5.504.5.3 Filters.** In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 8. MERV 8 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same

# CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE CHAPTER 7 – INSTALLER AND SPECIAL INSPECTOR QUALIFICATIONS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	X		X																
Chapter/Section																			
702			X																
702.1			X																
702.2	X		X																
703			X																
703.1	X		X																

## CHAPTER 7

# INSTALLER AND SPECIAL INSPECTOR QUALIFICATIONS

### SECTION 701 GENERAL (Reserved)

### SECTION 702 QUALIFICATIONS

**702.1 Installer training.** HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or state-wide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

**702.2 Special inspection.** [HCD] When required by the enforcing agency, the owner or the responsible entity acting as the owner’s agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education

may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

**Notes:**

1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC] When required by the enforcing agency, the owner or the responsible entity acting as the owner’s agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

**Note:** Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

**SECTION 703  
VERIFICATIONS**

**703.1 Documentation.** Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified in the application checklist.



## CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE CHAPTER 8 – COMPLIANCE FORMS AND WORKSHEETS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHDP				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	X						X												
Adopt entire chapter as amendeded (amended sections listed below)																			
Adopt only those sections that are listed below																			
Chapter/Section																			



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## CHAPTER 8

# COMPLIANCE FORMS AND WORKSHEETS

[BSC] Sample forms found in “A Guide to the California Green Building Standards Code (Nonresidential)” located at <http://www.bsc.ca.gov/Home/CALGreen.aspx> may be used to assist in documenting compliance with the waste management plan and other provisions of this code.

[HCD 1] Sample forms located at [www.hcd.ca.gov/CALGreen.html](http://www.hcd.ca.gov/CALGreen.html) may be used to assist in documenting compliance with CALGreen.

### WORKSHEET (WS-1) BASELINE WATER USE

BASELINE WATER USE CALCULATION TABLE									
FIXTURE TYPE	FLOW RATE		DURATION		DAILY USES		OCCUPANTS <sup>1</sup>	=	GALLONS PER DAY
Showerheads	2.0 gpm@80 psi	x	5 min.	x	1	x	Note 1a	=	
Lavatory faucets nonresidential	0.5 gpm@60 psi	x	.25 min.	x	3			=	
Kitchen faucets	1.8 gpm@60 psi	x	4 min.	x	1	x	Note 1b	=	
Replacement aerators	2.2 gpm	x		x		x		=	
Wash fountains	1.8 gpm/20 [rim space(in.)@60 psi]	x		x		x		=	
Metering faucets	0.20 gal/cycle	x		x	3	x		=	
Metering faucets for wash fountains	0.20 gpm/20 [rim space(in.)@60 psi]	x	.25 min.	x		x		=	
Gravity tank-type water closets	1.28 gal/flush	x	1 flush	x	1 male <sup>2</sup> 3 female	x		=	
Flushometer tank water closets	1.28 gal/flush	x	1 flush	x	1 male <sup>2</sup> 3 female	x		=	
Flushometer valve water closets	1.28 gal/flush	x	1 flush	x	1 male <sup>2</sup> 3 female	x		=	
Electromechanical hydraulic water closets	1.28 gal/flush	x	1 flush	x	1 male <sup>2</sup> 3 female	x		=	
Urinals	0.5 gal/flush	x	1 flush	x	2 male	x		=	
Total daily baseline water use (BWU)								=	

1. For nonresidential occupancies, refer to Table A, Chapter 4, 2013 *California Plumbing Code*, for occupant load factors.

- a. Shower use by occupants depends on the type of use of a building or portion of a building, e.g., total occupant load for a health club, but only a fraction of the occupants in an office building as determined by the anticipated number of users.
- b. Kitchen faucet use is determined by the occupant load of the area served by the fixture.

2. The daily use number shall be increased to three if urinals are not installed in the room.

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WORKSHEET (WS-2)  
WATER USE REDUCTION

12-, 20- 25-PERCENT REDUCTION WATER USE CALCULATION TABLE									
FIXTURE TYPE	FLOW RATE		DURATION		DAILY USES		OCCUPANTS <sup>1</sup>		GALLONS PER DAY
Showerheads		×	5 min.	×	1	×	Note 1a	=	
Lavatory faucets nonresidential <sup>4</sup>		×	.25 min.	×	3	×		=	
Kitchen faucets		×	4 min.	×	1	×	Note 1b	=	
Replacement aerators		×		×		×		=	
Wash fountains		×		×		×		=	
Metering faucets		×	.25 min.	×	3	×		=	
Metering faucets for wash fountains		×	.25 min.	×		×		=	
Gravity tank type water closets		×	1 flush	×	1 male <sup>3</sup> 3 female	×		=	
Flushometer tank water closets		×	1 flush	×	1 male <sup>3</sup> 3 female	×		=	
Flushometer valve water closets		×	1 flush	×	1 male <sup>3</sup> 3 female	×		=	
Electromechanical hydraulic water closets		×	1 flush	×	1 male <sup>3</sup> 3 female	×		=	
Urinals		×	1 flush	×	2 male	×		=	
Urinals Nonwater supplied	0.0 gal/flush	×	1 flush	×	2 male	×		=	
Proposed water use								=	
12% Reduction _____ (BWU from WS-1) × .88 = _____ Allowable water use									
20% Reduction _____ (BWU from WS-1) × .80 = _____ Allowable water use									
25% Reduction _____ (BWU from WS-1) × .75 = _____ Allowable water use									

1. For occupancies, refer to Table A, Chapter 4, 2013 *California Plumbing Code*, for occupant load factors.
  - a. Shower use by occupants depends on the type of use of a building or portion of a building, e.g., total occupant load for a health club, but only a fraction of the occupants in an office building as determined by the anticipated number of users.
  - b. Kitchen faucet use is determined by the occupant load of the area served by the fixture.
2. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less.
  - Single flush toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.2.
  - Dual flush toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A112.19.2 and ASME A112.19.14.
3. The daily use number shall be increased to three if urinals are not installed in the room.
4. Where complying faucets are unavailable, aerators rated at .35 gpm or other means may be used to achieve reduction.

## Construction Waste Management (CWM) Plan

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: \_\_\_\_\_

Job #: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Waste Hauling Company: \_\_\_\_\_

Contact Name: \_\_\_\_\_

All Subcontractors shall comply with the project's Construction Waste Management Plan.  
All Subcontractor foremen shall sign the CWM Plan Acknowledgment Sheet.

Subcontractors who fail to comply with the Waste Management Plan will be subject to backcharges or withholding of payment, as deemed appropriate. For instance, Subcontractors who contaminate debris boxes that have been designated for a single material type will be subject to backcharge or withheld payment, as deemed appropriate.

1. The project's overall rate of waste diversion will be \_\_\_\_ %.
2. This project shall generate the least amount of waste possible by planning and ordering carefully, following all proper storage and handling procedures to reduce broken and damaged materials and reusing materials whenever possible. The majority of the waste that is generated on this jobsite will be diverted from the landfill and recycled for other use.
3. Spreadsheet 1, enclosed, identifies the waste materials that will be generated on this project, the diversion strategy for each waste type and the anticipated diversion rate.
4. Waste prevention and recycling activities will be discussed at the beginning of weekly subcontractor meetings. As each new subcontractor comes on-site, the WMP Coordinator will present him/her with a copy of the CWM Plan and provide a tour of the jobsite to identify materials to be salvaged and the procedures for handling jobsite debris. All Subcontractor foremen will acknowledge in writing that they have read and will abide by the CWM Plan. Subcontractor Acknowledgment Sheet enclosed. The CWM Plan will be posted at the jobsite trailer.
5. Salvage: Excess materials that cannot be used in the project, nor returned to the vendor, will be offered to site workers, the owner, or donated to charity if feasible.
6. [HAULING COMPANY] will provide a commingled drop box at the jobsite for most of the construction waste. These commingled drop boxes will be taken to [Sorting Facility Name and Location]. The average diversion rate for commingled waste will be \_\_\_\_%. As site conditions permit, additional drop boxes will be used for particular phases of construction (e.g., concrete and wood waste) to ensure the highest waste diversion rate possible.
7. In the event that the waste diversion rate achievable via the strategy described in (6) above, is projected to be lower than what is required, then a strategy of source-separated waste diversion and/or waste stream reduction will be implemented. Source separated waste refers to jobsite waste that is not commingled but is instead allocated to a debris box designated for a single material type, such as clean wood or metal.

### Notes:

1. Waste stream reduction refers to efforts taken by the builder to reduce the amount of waste generated by the project to below four (4) pounds per square foot of building area.
2. When using waste stream reduction measures, the gross weight of the product is subtracted from a base weight of four (4) pounds per square foot of building area. This reduction is considered additional diversion and can be used in the waste reduction percentage calculations.
8. [HAULING COMPANY] will track and calculate the quantity (in tons) of all waste leaving the project and calculate the waste diversion rate for the project. [HAULING COMPANY] will provide Project Manager with an updated monthly report on gross weight hauled and the waste diversion rate being achieved on the project. [HAULING COMPANY]'s monthly report will track separately the gross weights and diversion rates for commingled debris and for each source-separated waste stream leaving the project. In the event that [HAULING COMPANY] does not service any or all of the debris boxes on the project, the [HAULING COMPANY] will work with the responsible parties to track the material type and weight (in tons) in such debris boxes in order to determine waste diversion rates for these materials.
9. In the event that Subcontractors furnish their own debris boxes as part of their scope of work, such Subcontractors shall not be excluded from complying with the CWM Plan and will provide [HAULING COMPANY] weight and waste diversion data for their debris boxes.
10. In the event that site use constraints (such as limited space) restrict the number of debris boxes that can be used for collection of designated waste the project Superintendent will, as deemed appropriate, allocate specific areas onsite where individual material types are to be consolidated. These collection points are not to be contaminated with non-designated waste types.
11. Debris from jobsite office and meeting rooms will be collected by [DISPOSAL SERVICE COMPANY]. [DISPOSAL SERVICE COMPANY] will, at a minimum, recycle office paper, plastic, metal and cardboard.

# CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE

## APPENDIX A4 – RESIDENTIAL VOLUNTARY MEASURES

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below			X																
Chapter/Section																			
A4.1			X																
A4.2			†													X			
A4.3			X																
A4.4			X																
A4.5			X																
A4.6			X																
A4.7			X																

The state agency does not adopt sections identified by the following symbol: †.

## APPENDIX A4

# RESIDENTIAL VOLUNTARY MEASURES

*Some of the measures contained in this appendix are not mandatory unless adopted by a city, county, or city and county as specified in Section 101.7 and provide additional measures that designers, builders and property owners may wish to consider during the planning, design and construction process.*

### Division A4.1 – PLANNING AND DESIGN

#### PREFACE

Given that land use and planning are largely regulated locally, cities, counties, and cities and counties should consider reducing greenhouse gas emissions associated with development through local land-use practices in conjunction with enforcing the provisions of this code. Specific land use strategies a city, county, or city and county may wish to consider include but are not limited to the following:

**Site selection.** Develop sites for buildings, hardscape, roads or parking areas consistent with the local general plan and regional transportation plan pursuant to SB 375 (Stats 2008, Ch. 728).

**Regional sustainable communities strategy.** Site selection and building design and use shall conform the project with the prevailing regional sustainable communities strategy or alternative planning strategy, whichever meets the greenhouse gas target established by the California Air Resources Board pursuant to SB 375 (Stats. 2008, Ch. 728), including the general location of uses, residential densities and building intensities.

**Transit priority projects.** To qualify as a transit priority project, the project shall meet three criteria:

- (1) (a) contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 and 50 percent nonresidential uses, a floor area ratio of not less than 0.75; (b) provide a minimum net density of at least 20 dwelling units per acre; and (c) be within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan as described in Section 21155 of Stats. 2008, Ch. 728;

- (2) be consistent with the prevailing sustainable communities strategy or alternative planning strategy, whichever meets the greenhouse gas target established by the California Air Resources Board, including the general location of uses, residential densities and building intensities; and

- (3) have all necessary entitlements required by the applicable local government.

**Note:** For additional information, see *Government Code* Sections 65080, 65080.1, 65400, and 65470, and *Public Resources Code* Sections 21061.3 and 21155.

#### SECTION A4.101 GENERAL

**A4.101.1 Scope.** The provisions of this division outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

#### SECTION A4.102 DEFINITIONS

**A4.102.1 Definitions.** The following terms are defined in Chapter 2.

**BROWNFIELD SITE.**

**DEVELOPMENT FOOTPRINT.**

**GREENFIELDS.**

**GREYFIELD SITE.**

**INFILL SITE.****PERMEABLE PAVING.****SECTION A4.103  
SITE SELECTION**

**A4.103.1 Selection.** A site which complies with at least one of the following characteristics is selected:

1. An infill site is selected.
2. A greyfield site is selected.
3. An EPA-recognized and remediated Brownfield site is selected.

**A4.103.2 Community connectivity.** Facilitate community connectivity by one of the following methods:

1. Locate project within a  $\frac{1}{4}$ -mile true walking distance of at least four basic services, readily accessible by pedestrians.
2. Locate project within a  $\frac{1}{2}$ -mile true walking distance of at least seven basic services, readily accessible by pedestrians.
3. Other methods increasing access to additional resources.

**Note:** Examples of services include, but are not limited to, bank, place of worship, convenience grocery, day care, cleaners, fire station, barber shop, beauty shop, hardware store, laundry, library, medical clinic, dental clinic, senior care facility, park, pharmacy, post office, restaurant, school, supermarket, theater, community center, fitness center, museum or farmers market. Other services may be considered on a case-by-case basis.

**SECTION A4.104  
SITE PRESERVATION**

**A4.104.1 Supervision and education.** Individuals with oversight authority on the project who have been trained in areas related to environmentally friendly development can teach green concepts to other members of the development staff and ensure that training is provided to all parties associated with the development of the project.

Prior to beginning the construction activities, all parties involved with the development process shall receive a written guideline and instruction specifying the green goals of the project.

**Note:** Lack of adequate supervision and dissemination of the project goals can result in negative effects on green building projects. If the theme of green building is not carried throughout the project, the overall benefit can be substantially reduced by the lack of knowledge and information provided to the various entities involved with the construction of the project.

**SECTION A4.105  
DECONSTRUCTION AND  
REUSE OF EXISTING MATERIALS**

**A4.105.1 General.** Existing buildings on the site are deconstructed and the salvaged materials are reused. Reused materials

or products must comply with current building standards requirements or be an accepted alternate method or material.

**A4.105.2 Reuse of materials.** Materials which can be easily reused include but are not limited to the following:

1. Light fixtures.
2. Plumbing fixtures.
3. Doors and trim.
4. Masonry.
5. Electrical devices.
6. Appliances.
7. Foundations or portions of foundations.

**Note:** Reused material must be in compliance with the appropriate Title 24 requirements.

**SECTION A4.106  
SITE DEVELOPMENT**

**A4.106.1 Reserved.**

**A4.106.2 Soil analysis and protection.** The soils at the building site are analyzed and protected as specified in this section.

**A4.106.2.1 Soil analysis.** Soil analysis is performed by a licensed design professional and the findings utilized in the structural design of the building.

**A4.106.2.2 Soil protection.** The effect of development on building sites is evaluated and the soil is protected by one or more of the following:

1. Natural drainage patterns are evaluated and erosion controls are implemented to minimize erosion during construction and after occupancy.
2. Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways.
3. As allowed by other parts of the *California Building Standards Code* underground construction activities are coordinated to utilize the same trench, minimize the amount of time the disturbed soil is exposed and the soil is replaced using accepted compaction methods.

**A4.106.2.3 Topsoil protection.** Topsoil shall be protected or saved for reuse as specified in this section.

**Tier 1.** Displaced topsoil shall be stockpiled for reuse in a designated area and covered or protected from erosion.

**Note:** Protection from erosion includes covering with tarps, straw, mulch, chipped wood, vegetative cover, or other means acceptable to the enforcing agency to protect the topsoil for later use.

**Tier 2.** The construction area shall be identified and delineated by fencing or flagging to limit construction activity to the construction area. Heavy equipment or vehicle traffic and material storage outside the construction area shall be limited to areas that are planned to be paved.



**A4.106.3 Landscape design.** Postconstruction landscape designs shall accomplish one or more of the following:

1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.
2. Limit turf areas to the greatest extent possible.
  - Tier 1 not more than 50 percent of the total landscaped area.
  - Tier 2 not more than 25 percent of the total landscaped area.
3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region.
4. Hydrozoning irrigation techniques are incorporated into the landscape design.

**A4.106.4 Water permeable surfaces.** Permeable paving is utilized for the parking, walking or patio surfaces in compliance with the following.

- Tier 1. Not less than 20 percent of the total parking, walking or patio surfaces shall be permeable.
- Tier 2. Not less than 30 percent of the total parking, walking or patio surfaces shall be permeable.

**Exceptions:**

1. The primary driveway, primary entry walkway and entry porch or landing shall not be included when calculating the area required to be a permeable surface.
2. Required accessible routes for persons with disabilities as required by *California Code of Regulations*, Title 24, Part 2, Chapter 11A and/or Chapter 11B as applicable.

**A4.106.5 Cool roof for reduction of heat island effect.** Roofing materials for Tier 1 and Tier 2 buildings shall comply with this section:

**Exceptions:**

1. Roof constructions that have a thermal mass over the roof membrane including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot.
2. Roof areas covered by building integrated solar photovoltaic panels and building integrated solar thermal panels.

**A4.106.5.1 Solar reflectance.** Roofing materials shall have a minimum 3-year aged solar reflectance equal to or greater than the values specified in Tables A4.106.5.1(1) and A4.106.5.1(3) for Tier 1 and Tables A4.106.5.1(2) and A4.105.5.1(4) for Tier 2.

If CRRC testing for aged solar reflectance is not available for any roofing products, the aged value shall be determined using the Cool Roof Rating Council (CRRC) certified initial value using the equation  $\rho_{aged} = [0.2 + \beta[\rho_{initial} - 0.2]]$ , where  $\rho_{initial}$  = the initial Solar Reflectance and soiling resistance,  $\beta$ , is listed by product type in Table A4.106.5.1.

Solar reflectance may also be certified by other supervisory entities approved by the Energy Commission pursuant to Title 24, Part 1, Section 10-113.

**TABLE A4.106.5.1  
VALUES OF SOILING RESISTANCE (β) BY PRODUCT TYPE**

PRODUCT TYPE	CCRC PRODUCT CATEGORY	β
Field-applied coating	Field-applied coating	0.65
Other	Not a field-applied coating	0.70

**A4.106.5.2 Thermal emittance.** Roofing materials shall have a CRRC initial or aged thermal emittance equal to or greater than those specified in Tables A4.106.5.1(1) and A4.106.5.1(3) for Tier 1 and Tables A4.106.5.1(2) and A4.106.5.1(4) for Tier 2.

Thermal emittance may also be certified by other supervisory entities approved by the Energy Commission pursuant to Title 24, Part 1, *California Administrative Code*.

**A4.106.5.3 Solar reflectance index alternative.** Solar Reflectance Index (SRI) equal to or greater than the values specified in Tables A4.106.5.1(1) and A4.106.5.1(3) for Tier 1 and Tables A4.106.5.1(2) and A4.106.5.1(4) for Tier 2 may be used as an alternative to compliance with the 3-year aged solar reflectance values and thermal emittance.

SRI values used to comply with this section shall be calculated using the Solar Reflectance Index (SRI) Calculation Worksheet (SRI-WS) developed by the California Energy Commission or in compliance with ASTM E1980-01 as specified in the 2013 *California Energy Code*. Solar reflectance values used in the SRI-WS shall be based on the aged reflectance value of the roofing product or the equation in Section A4.106.5.1 if the CRRC certified aged solar reflectance are not available. Certified thermal emittance used in the SRI-WS may be either the initial value or the aged value listed by the CRRC.

Solar reflectance and thermal emittance may also be certified by other supervisory entities approved by the Commission pursuant to Title 24, Part 1, *California Administrative Code*.

**Note:** The Solar Reflectance Index Calculation Worksheet (SRI-WS) is available by contacting the Energy Standards Hotline at 1-800-772-3300, website at [www.energy.ca.gov](http://www.energy.ca.gov) or by email at [Title24@energy.state.ca.us](mailto:Title24@energy.state.ca.us).

**TABLE A4.106.5.1(1)  
TIER 1 – LOW-RISE RESIDENTIAL**

ROOF SLOPE	CLIMATE ZONE	MINIMUM 3-YEAR AGED SOLAR REFLECTANCE	THERMAL EMITTANCE	SRI
≤ 2:12	13 & 15	0.55	0.75	64
> 2:12	10-15	0.20	0.75	16

**TABLE A4.106.5.1(2)**  
**TIER 2 – LOW-RISE RESIDENTIAL**

ROOF SLOPE	CLIMATE ZONE	MINIMUM 3-YEAR AGED SOLAR REFLECTANCE	THERMAL EMITTANCE	SRI
≤ 2:12	2, 4, 6 – 15	0.65	0.85	78
> 2:12	2, 4, 6 – 15	0.23	0.85	20

**TABLE A4.106.5.1(3)**  
**TIER 1 – HIGH-RISE RESIDENTIAL BUILDINGS, HOTELS AND MOTELS**

ROOF SLOPE	CLIMATE ZONE	MINIMUM 3-YEAR AGED SOLAR REFLECTANCE	THERMAL EMITTANCE	SRI
≤ 2:12	10 & 11, 13 – 15	0.55	0.75	64
> 2:12	2 – 15	0.20	0.75	16

**TABLE A4.106.5.1(4)**  
**TIER 2 – HIGH-RISE RESIDENTIAL BUILDINGS, HOTELS AND MOTELS**

ROOF SLOPE	CLIMATE ZONE	MINIMUM 3-YEAR AGED SOLAR REFLECTANCE	THERMAL EMITTANCE	SRI
≤ 2:12	2 – 15	0.65	0.75	78
> 2:12	2 – 15	0.23	0.75	20

**A4.106.5.4 Verification.** Inspection shall be conducted to ensure roofing materials meet cool roof aged solar reflectance and thermal emittance or SRI values.

**A4.106.6 Vegetated roof.** Install a vegetated roof for at least 50 percent of the roof area. Vegetated roofs shall comply with requirements for roof gardens and landscaped roofs in the *California Building Code*, Chapter 15 and Chapter 16.

**A4.106.7 Reduction of heat island effect for nonroof areas.** Reduce nonroof heat islands for 50 percent of sidewalks, patios, driveways or other paved areas by using one or more of the methods listed.

1. Trees or other plantings to provide shade and that mature within 15 years of planting. Trees should be native or adaptive to the region and climate zones and noninvasive; hardy and resistant to drought, insects and disease; easy to maintain (no frequent shedding of twigs, branches, unwanted fruit or seed pods); and suitable in mature size and environmental requirements for the site. Tree selection and placement should consider location and size of areas to be shaded, location of utilities, views from the structure, distance to sidewalks and foundations, overhangs onto adjacent properties and streets; other infrastructure and adjacent landscaping. In addition, shading shall not cast a shadow, as specified, on any neighboring solar collectors pursuant to *Public Resources Code* Section 25981, et seq. (Solar Shade Control Act).
2. Use high albedo materials with an initial solar reflectance value of at least 0.30 as determined in accordance with American Society for Testing and Materials (ASTM) Standards E 1918 or C 1549.
3. Use open grid pavement system or pervious or permeable pavement system.

4. Locate 50 percent of parking underground or use multi-level parking.
5. Other methods of reducing heat island effects acceptable to the enforcing agency.

**Note:** Local agencies may have ordinances requiring mitigation of heat island effects through building or parking lot shading, tree plantings, landscaping, use of pervious pavements and other approved methods.

**A4.106.8 Electric vehicle (EV) charging for new construction.** New construction shall comply with Sections A4.106.8.1 and A4.106.8.2 to facilitate future installation and use of electric vehicle chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the *California Electrical Code*, Article 625.

**A4.106.8.1 New one- and two-family dwellings and townhouses with attached private garages.**

**Tier 1 and Tier 2.** For each dwelling unit, a dedicated 208/240-volt branch circuit shall be installed in the raceway required by Section 4.106.4.1. The branch circuit and associated overcurrent protective device shall be rated at 40 amperes minimum. Other electrical components, including a receptacle or blank cover, related to this section shall be installed in accordance with the *California Electrical Code*.

**A4.106.8.1.1 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent protective device designated for future EV charging purposes as “EV READY” in accordance with the *California Electrical Code*. The receptacle or blank cover shall be identified as “EV READY.”

**A4.106.8.2 New multifamily dwellings.**

**Tier 1 and Tier 2.** Where 17 or more multifamily dwelling units are constructed on a building site, 5 percent of the total number of parking spaces provided for all types of parking facilities, but in no case less than one, shall be electric vehicle charging stations (EVCS) capable of supporting future EVSE and shall be identified on construction documents. Calculations for the number of EVCS shall be rounded up to the nearest whole number.

See Section 4.106.4.2 for additional requirements related to EVCS for multifamily dwellings.

**Notes:**

1. The California Department of Transportation adopts and publishes the “California Manual on Uniform Traffic Control Devices (California MUTCD)” to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives Number 13-01. Website: [www.dot.ca.gov/hq/traffops/signtech/signdel/policy.htm](http://www.dot.ca.gov/hq/traffops/signtech/signdel/policy.htm).
2. See Vehicle Code Section 22511 for EV charging space signage in off-street parking facilities and for use of EV charging spaces.

3. The Governor's Office of Planning and Research (OPR) published a "Zero-Emission Vehicle Community Readiness Guidebook" which provides helpful information for local governments, residents and businesses. Website: [http://opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://opr.ca.gov/docs/ZEV_Guidebook.pdf).
4. The Governor's Office of Planning and Research (OPR) has developed draft guidelines, "Plug-In Electric Vehicles: Universal Charging Access Guidelines and Best Practices", addressing physical accessibility standards and design guidelines for EVs. Website: [http://opr.ca.gov/docs/PEV\\_Access\\_Guidelines.pdf](http://opr.ca.gov/docs/PEV_Access_Guidelines.pdf).

**A4.106.9 Bicycle parking.** Comply with Sections A4.106.9.1 through A4.106.9.3 or meet a local ordinance, whichever is more stringent.

**Exception:** Number of bicycle parking spaces shall be permitted to be reduced, as approved by the enforcing agency, due to building site characteristics, including but not limited to, isolation from other development.

**A4.106.9.1 Short-term bicycle parking.** Provide permanently anchored bicycle racks within 100 feet of the visitor's entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity with a minimum of one two-bike capacity rack.

**A4.106.9.2 Long-term bicycle parking for multifamily buildings.** Provide on-site bicycle parking for at least one bicycle per every two dwelling units. Acceptable parking facilities shall be conveniently reached from the street and may include, but not be limited to:

1. Covered, lockable enclosures with permanently anchored racks for bicycles.
2. Lockable bicycle rooms with permanently anchored racks.
3. Lockable, permanently anchored bicycle lockers.

**A4.106.9.3 Long-term bicycle parking for hotel and motel buildings.** Provide one on-site bicycle parking space for every 25,000 square feet, but not less than two. Acceptable parking facilities shall be conveniently reached from the street and may include, but not be limited to:

1. Covered, lockable enclosures with permanently anchored racks for bicycles.
2. Lockable bicycle rooms with permanently anchored racks.
3. Lockable, permanently anchored bicycle lockers.

**A4.106.10 Light pollution reduction. [HR]** Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the *California Energy Code* for Lighting Zones 1-4 as defined in Chapter 10 of the *California Administrative Code*; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and

3. Allowable BUG ratings not exceeding those shown in Table A4.106.10; or

Comply with a local ordinance lawfully enacted pursuant to Section 101.7 of this code, whichever is more stringent.

**Exceptions:**

1. Luminaires that qualify as exceptions in the *California Energy Code*.
2. Emergency lighting.
3. One- and two-family dwellings.

**Note:** The International Dark-Sky Association (IDA) and the Illuminating Engineering Society of North America (IESNA) have developed a Model Lighting Ordinance (MLO). The MLO was designed to help municipalities develop outdoor lighting standards that reduce glare, light trespass, and skyglow. The model ordinance and user guides for the ordinance may be accessed at the International Dark-Sky Association web site.

**SECTION A4.107  
[RESERVED]**

**SECTION A4.108  
INNOVATIVE CONCEPTS AND LOCAL  
ENVIRONMENTAL CONDITIONS**

**A4.108.1 Innovative concepts and local environmental conditions.** The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

**TABLE A4.106.10  
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS<sup>1,2</sup>**

ALLOWABLE RATING	LIGHTING ZONE 1	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4
<b>Maximum Allowable Backlight Rating<sup>3</sup></b>				
Luminaire greater than 2 mounting heights (MH) from property line	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	B0	B0	B1	B2
<b>Maximum Allowable Uplight Rating</b>				
For area lighting <sup>4</sup>	U0	U0	U0	U0
For all other outdoor light, including decorative luminaires	U1	U2	U3	U4
<b>Maximum Allowable Glare Rating<sup>5</sup></b>				
Luminaire greater than 2 MH from property line	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	G0	G0	G1	G1
Luminaire back hemisphere is less than 0.5 MH from property line	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 feet beyond the actual property line for the purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.
4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet U value limits for “all other outdoor lighting.”
5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

## APPENDIX A4

# RESIDENTIAL VOLUNTARY MEASURES

### Division A4.5 – ENVIRONMENTAL QUALITY

#### SECTION A4.501 GENERAL (Reserved)

#### SECTION A4.502 DEFINITIONS

**A4.502.1 Definitions.** The following terms are defined in Chapter 2.

MERV.

NO ADDED FORMALDEHYDE (NAF) BASED RESINS.

ULTRA-LOW EMITTING FORMALDEHYDE (ULEF) RESINS.

#### SECTION A4.503 FIREPLACES (Reserved)

#### SECTION A4.504 POLLUTANT CONTROL

**A4.504.1 Compliance with formaldehyde limits.** Use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.

**Note:** Documentation must be provided that verifies that finish materials are certified to meet the pollutant emission limits.

**A4.504.2 Resilient flooring systems.** Resilient flooring systems installed in the building shall meet the percentages specified in this section and comply with the VOC-emission limits defined in at least one of the following:

1. Products compliant with the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350), certified as a CHPS Low-Emitting Material in the Collaborative for High Performance Schools (CHPS) High Performance Products Database.
2. Products certified UL GREENGUARD Gold (formerly the Greenguard Children & Schools program.)
3. Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program.
4. Meet the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources

Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350.)

**Tier 1.** At least 90 percent of the total area of resilient flooring installed shall comply.

**Tier 2.** At least 100 percent of the total area of resilient flooring installed shall comply.

**Exception for Tier 2:** An allowance for up to 5-percent specialty purpose flooring may be permitted.

**Note:** Documentation must be provided that verifies that finish materials are certified to meet the pollutant emission limits in this section.

**A4.504.3 Thermal insulation.** Thermal insulation installed in the building shall meet the following requirements:

**Tier 1.** Install thermal insulation in compliance with the California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350), certified as a CHPS Low-Emitting Material in the Collaborative for High Performance Schools (CHPS) High Performance Products Database; products certified under the UL GREENGUARD Gold (formerly Greenguard Children & Schools program); or meet California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1, February 2010 (also known as Specification 01350).

**Tier 2.** Install insulation which complies with Tier 1 plus does not contain any added formaldehyde.

**Note:** Documentation must be provided that verifies the materials are certified to meet the pollutant emission limits in this section.

#### SECTION A4.505 INTERIOR MOISTURE CONTROL (Reserved)

#### SECTION A4.506 INDOOR AIR QUALITY AND EXHAUST

**A4.506.1 Filters.** Return air filters with a value greater than MERV 6 shall be installed on HVAC systems. Pressure drop across the filter shall not exceed 0.1 inches water column.

**A4.506.2 Construction filter.** [HR] Provide filters on return air openings rated at MERV 6 or higher during construction.

**A4.506.3 Direct-vent appliances.** Direct-vent heating and cooling equipment shall be utilized if the equipment will be located in the conditioned space or install the space heating and water heating equipment in an isolated mechanical room.

**SECTION A4.507  
ENVIRONMENTAL COMFORT  
(Reserved)**

**SECTION A4.508  
OUTDOOR AIR QUALITY  
(Reserved)**

**SECTION A4.509  
INNOVATIVE CONCEPTS AND LOCAL  
ENVIRONMENTAL CONDITIONS**

**A4.509.1 Innovative concepts and local environmental conditions.** The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

## APPENDIX A4

# RESIDENTIAL VOLUNTARY MEASURES

### Division A4.6 – TIER 1 AND TIER 2

#### SECTION A4.601 GENERAL

**A4.601.1 Scope.** The measures contained in this appendix are not mandatory unless adopted by a city, county, or city and county as specified in Section 101.7. The provisions of this section outline means of achieving enhanced construction or reach levels by incorporating additional green building measures. In order to meet one of the tier levels designers, builders or property owners are required to incorporate additional green building measures necessary to meet the threshold of each level.

**A4.601.2 Prerequisite measures.** Tier 1 and Tier 2 thresholds require compliance with the mandatory provisions of this code and incorporation of the required prerequisite measures listed in Section A4.601.4.2 for Tier 1 and A4.601.5.2 for Tier 2. Prerequisite measures are also identified in the Residential Occupancies Application Checklist in Section A4.602.

As specified in Section 101.7, additional prerequisite measures may be included by the enforcing agency to address specific local environmental conditions and may be listed in the Innovative Concepts and Local Environmental Conditions portions of the checklist.

**A4.601.3 Elective measures.** In addition to the required measures, Tier 1 and Tier 2 buildings must incorporate at least the number of elective measures specified in Sections A4.601.4.2 and A4.601.5.2.

**A4.601.4 Tier 1.** To achieve Tier 1 status a project must comply with the following:

**A4.601.4.1 Mandatory measures for Tier 1.** The project shall meet or exceed all of the mandatory measures in Chapter 4, Divisions 4.1 through 4.5 and Chapter 7 as applicable.

**A4.601.4.2 Prerequisite and elective measures for Tier 1.** In addition to the mandatory measures, compliance with the following prerequisite and elective measures from Appendix A4 is also required to achieve Tier 1 status:

1. From Division A4.1, Planning and Design.
  - 1.1. Comply with the topsoil protection requirements in Section A4.106.2.3.
  - 1.2. Comply with the 20 percent permeable paving requirements in Section A4.106.4.
  - 1.3. Comply with the cool roof requirements in Section A4.106.5.
  - 1.4. Comply with the electric vehicle (EV) charging requirements in Section A4.106.8.
  - 1.5. Comply with at least two elective measures selected from Division A4.1.
2. From Division A4.2, Energy Efficiency.
  - 2.1. For newly constructed low-rise residential buildings, comply with the energy efficiency

requirements in Section A4.203.1.1 and Section A4.203.1.2.1.

- 2.2. For additions and alterations to low-rise residential buildings, comply with the energy efficiency requirements in Section A4.204.1.1 and Section A4.204.1.2.1.
3. From Division A4.3, Water Efficiency and Conservation.
  - 3.1. Comply with the landscape irrigation water budget requirement in Section A4.304.3.
  - 3.2. Comply with the Tier 1 potable water use reduction for landscape irrigation design in Section A4.304.4.
  - 3.3. Comply with at least two elective measures selected from Division A4.3.
4. From Division A4.4, Material Conservation and Resource Efficiency.
  - 4.1. Comply with the 20 percent cement reduction requirements in Section A4.403.2.
  - 4.2. Comply with the 10 percent recycled content requirements in Section A4.405.3.1.
  - 4.3. Comply with the 65 percent reduction in construction waste in Section A4.408.1.
  - 4.4. Comply with at least two elective measures selected from Division A4.4.
5. From Division A4.5, Environmental Quality.
  - 5.1. Comply with the 90-percent resilient flooring systems requirements in Section A4.504.2.
  - 5.2. Comply with the thermal insulation requirements for Tier 1 in Section A4.504.3.
  - 5.3. Comply with at least one elective measure selected from Division A4.5.

**Note:** The Residential Occupancies Application Checklist contained in Section A4.602 may be used to show which elective measures are selected.

**A4.601.5 Tier 2.** To achieve Tier 2 status a project must comply with the following.

**Note:** The measures necessary to achieve Tier 2 status are very stringent. Cities, counties, and cities and counties considering adoption of Tier 2 as mandatory should carefully consider the stringency of each measure and ensure that the measures are achievable in their location.

**A4.601.5.1 Mandatory measures for Tier 2.** The project shall meet or exceed all of the mandatory measures in Chapter 4, Divisions 4.1 through 4.5 and Chapter 7 as applicable.

**A4.601.5.2 Prerequisite and elective measures for Tier 2.** In addition to the mandatory measures, compliance with the

## RESIDENTIAL VOLUNTARY MEASURES

following prerequisite and elective measures from Appendix A4 is also required to achieve Tier 2 status.

1. From Division A4.1, Planning and Design.

- 1.1 Comply with the topsoil protection requirements for Tier 1 and Tier 2 in Section A4.106.2.3.
- 1.2 Comply with the 30 percent permeable paving requirements in Section A4.106.4.
- 1.3 Comply with the cool roof requirements in Section A4.106.5.
- 1.4 Comply with the Tier 1 electric vehicle (EV) charging requirements in Section A4.106.8.
- 1.5. Comply with at least four elective measures selected from Division A4.1.

2. From Division A4.2, Energy Efficiency.

- 2.1 For newly constructed low-rise residential buildings, comply with the energy efficiency requirements in Section A4.203.1.1 and Section A4.203.1.2.2.
- 2.2 For additions and alterations to low-rise residential buildings, comply with the energy efficiency requirements in Section A4.204.1.1 and Section A4.204.1.2.2.

3. From Division A4.3, Water Efficiency and Conservation.

- 3.1 Comply with the landscape irrigation water budget requirement in Section A4.304.3.
- 3.2 Comply with the Tier 2 potable water use reduction for landscape irrigation design in Section A4.304.4.
- 3.3 Comply with at least three elective measures selected from Division A4.3.

4. From Division A4.4, Material Conservation and Resource Efficiency.

- 4.1 Comply with the 25 percent cement reduction requirements in Section A4.403.2.
- 4.2 Comply with the 15 percent recycled content requirements in Section A4.405.3.1.
- 4.3 Comply with the 75 percent reduction in construction waste in Section A4.408.1.
- 4.4 Comply with at least four elective measures selected from Division A4.4.

5. From Division A4.5, Environmental Quality.

- 5.1 Comply with the 100-percent resilient flooring systems requirements in Section A4.504.2.

5.2 Comply with the thermal insulation requirements for Tier 1 and Tier 2 in Section A4.504.3.

5.3 Comply with at least one elective measure selected from Division A4.5.

**Note:** The Residential Occupancies Application Checklist contained in Section A4.602 may be used to show which elective measures are selected.



# DIVISION A4.6 – TIER 1 AND TIER 2—continued

## SECTION A4.602 RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST Effective July 1, 2015

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FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Prerequisites and electives <sup>1</sup>			Enforcing Agency <input type="checkbox"/> All	Installer or Designer <input type="checkbox"/> All	Third party <input type="checkbox"/> All
	Mandatory	Tier 1	Tier 2			
<b>PLANNING AND DESIGN</b>						
<b>Site Selection</b>						
<b>A4.103.1</b> A site which complies with at least one of the following characteristics is selected: 1. An infill site is selected. 2. A greyfield site is selected. 3. An EPA-recognized Brownfield site is selected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.103.2</b> Facilitate community connectivity by one of the following methods: 1. Locate project within a 1/4-mile true walking distance of at least 4 basic services; 2. Locate project within 1/2-mile true walking distance of at least 7 basic services; 3. Other methods increasing access to additional resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Site Preservation</b>						
<b>A4.104.1</b> An individual with oversight responsibility for the project has participated in an educational program promoting environmentally friendly design or development and has provided training or instruction to appropriate entities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Deconstruction and Reuse of Existing Materials</b>						
<b>A4.105.2</b> Existing buildings are disassembled for reuse or recycling of building materials. The proposed structure utilizes at least one of the following materials which can be easily reused: 1. Light fixtures 2. Plumbing fixtures 3. Doors and trim 4. Masonry 5. Electrical devices 6. Appliances 7. Foundations or portions of foundations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Site Development</b>						
<b>4.106.2</b> A plan is developed and implemented to manage storm water drainage during construction.	<input checked="" type="checkbox"/>					
<b>4.106.3</b> Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.	<input checked="" type="checkbox"/>					
<b>4.106.4</b> Provide capability for electric vehicle charging in one- and two-family dwellings and in townhouses with attached private garages; and 3 percent of total parking spaces, as specified, for multifamily dwellings.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>A4.106.1 Reserved.</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.106.2.1</b> Soil analysis is performed by a licensed design professional and the findings utilized in the structural design of the building.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(continued)

SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency	Installer or Designer	Third party
		Tier 1	Tier 2	<input type="checkbox"/> All	<input type="checkbox"/> All	<input type="checkbox"/> All
<p><b>A4.106.2.2</b> Soil disturbance and erosion are minimized by at least one of the following:</p> <ol style="list-style-type: none"> <li>1. Natural drainage patterns are evaluated and erosion controls are implemented to minimize erosion during construction and after occupancy.</li> <li>2. Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways.</li> <li>3. Underground construction activities are coordinated to utilize the same trench, minimize the amount of time the disturbed soil is exposed and the soil is replaced using accepted compaction methods.</li> </ol>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>A4.106.2.3</b> Topsoil shall be protected or saved for reuse as specified in this section.</p> <p>Tier 1. Displaced topsoil shall be stockpiled for reuse in a designated area and covered or protected from erosion.</p> <p>Tier 2. The construction area shall be identified and delineated by fencing or flagging to limit construction activity to the construction area.</p>		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>A4.106.3</b> Postconstruction landscape designs accomplish one or more of the following:</p> <ol style="list-style-type: none"> <li>1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.</li> <li>2. Limit turf areas to the greatest extent possible.                             <ol style="list-style-type: none"> <li>a. Not more than 50 percent for Tier 1.</li> <li>b. Not more than 25 percent for Tier 2.</li> </ol> </li> <li>3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region.</li> <li>4. Hydrozoning irrigation techniques are incorporated into the landscape design.</li> </ol>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>A4.106.4</b> Permeable paving is utilized for the parking, walking or patio surfaces in compliance with the following:</p> <p>Tier 1. Not less than 20 percent of the total parking, walking or patio surfaces shall be permeable.</p> <p>Tier 2. Not less than 30 percent of the total parking, walking or patio surfaces shall be permeable.</p>		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>A4.106.5</b> Roofing materials shall have a minimum 3-year aged solar reflectance and thermal emittance or a minimum Solar Reflectance Index (SRI) equal to or greater than the values specified in Tables A4.106.5.1(1) and A4.106.5.1(2) for low-rise residential buildings and Tables A4.106.5.1(3) and A4.106.5.1(4) for high rise residential buildings.</p> <p><b>Low-rise Residential</b></p> <p><b>Tier 1</b> roof covering shall meet or exceed the values contained in Table A4.106.5.1(1).</p> <p><b>Tier 2</b> roof covering shall meet or exceed the values contained in Table A4.106.5.1(2).</p> <p><b>High-rise Residential, Hotels and Motels</b></p> <p>Tier 1 roof covering shall meet or exceed the values contained in Table A4.106.5.1(3).</p> <p>Tier 2 roof covering shall meet or exceed the values contained in Table A4.106.5.1(4).</p>		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>			<input checked="" type="checkbox"/> <sup>2</sup>

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SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency	Installer or Designer	Third party
		Tier 1	Tier 2	<input type="checkbox"/> All	<input type="checkbox"/> All	<input type="checkbox"/> All
<b>A4.106.6</b> Install a vegetated roof for at least 50 percent of the roof area. Vegetated roofs shall comply with requirements for roof gardens and landscaped roofs in the <i>California Building Code</i> , Chapters 15 and 16.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.106.7</b> Reduce nonroof heat islands for 50 percent of sidewalks, patios, driveways or other paved areas by using one or more of the methods listed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.106.8.1 Tier 1 and Tier 2</b> for one- and two-family dwellings and townhouses with attached private garages. Install a dedicated 208/240-volt branch circuit, including an overcurrent protective device rated at 40 amperes minimum per dwelling unit.	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.106.8.2</b> Tier 1 and Tier 2 for multifamily dwellings. Provide capability for future electric vehicle charging in 5 percent of total parking spaces, as specified.	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.106.9</b> Provide bicycle parking facilities as noted below or meet a local ordinance, whichever is more stringent. Number of bicycle parking spaces may be reduced, as approved by the enforcing agency, due to building site characteristics, including but not limited to, isolation from other development. 1. Provide short-term bicycle parking, per Section A4.106.9.1. 2. Provide long-term bicycle parking for multifamily buildings, per Section A4.106.9.2. 3. Provide long-term bicycle parking for hotel and motel buildings, per Section A4.106.9.3.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.106.10 [HR]</b> Outdoor lighting systems shall be designed and installed to comply with: 1. The minimum requirements in the <i>California Energy Code</i> for Lighting Zones 1-4; and 2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and 3. Allowable BUG ratings not exceeding those shown in Table A4.106.10; or Comply with a lawfully enacted local ordinance, whichever is more stringent.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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RESIDENTIAL VOLUNTARY MEASURES

SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency <input type="checkbox"/> All	Installer or Designer <input type="checkbox"/> All	Third party <input type="checkbox"/> All
		Tier 1	Tier 2			
<b>Innovative Concepts and Local Environmental Conditions</b>						
<b>A4.108.1</b> Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Item 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Item 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ENERGY EFFICIENCY</b>						
<b>General</b>						
<b>4.201.1</b> Building meets or exceeds the requirements of the <i>California Building Energy Efficiency Standards</i> <sup>3</sup> .	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Performance Approach for Newly Constructed Buildings</b>						
<b>A4.203.1.1.1</b> An Energy Design Rating for the Proposed Design Building is included in the Certificate of Compliance documentation.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.203.1.1.2</b> QII procedures specified in the Building Energy Efficiency Standards Reference Residential Appendix RA3.5 are completed.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.203.1.1.3</b> All permanently installed lighting is high efficiency and has required controls.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.203.1.2.1</b> The Energy Budget is no greater than 85 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.		<input checked="" type="checkbox"/> <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.203.1.2.2</b> The Energy Budget is no greater than 70 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.			<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Performance Approach for Additions and Alterations</b>						
<b>A4.204.1.1.1</b> All newly installed, permanently installed lighting is high efficacy and has required controls.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.204.1.2.1</b> When one and only one mechanical system is added or modified, the Energy Budget is no greater than 95 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building. When two or more mechanical systems are added or modified, the Energy Budget is no greater than 90 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.		<input checked="" type="checkbox"/> <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.204.1.2.2</b> When one and only one mechanical system is added or modified, the Energy Budget is no greater than 90 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building. When two or more mechanical systems are added or modified, the Energy Budget is no greater than 85 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.			<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency	Installer or Designer	Third party
		Tier 1	Tier 2	<input type="checkbox"/> All	<input type="checkbox"/> All	<input type="checkbox"/> All
<b>WATER EFFICIENCY AND CONSERVATION</b>						
<b>Indoor Water Use</b>						
<b>4.303.1</b> Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) installed in residential buildings shall comply with the prescriptive requirements of Sections 4.303.1.1 through 4.303.1.4.4.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.303.2</b> Plumbing fixtures and fittings required in Section 4.303.1 shall be installed in accordance with the <i>California Plumbing Code</i> , and shall meet the applicable referenced standards.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.303.1</b> Kitchen faucets. The maximum flow rate of kitchen faucets shall not exceed 1.5 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.5 gallons per minute at 60 psi. <b>Note:</b> Where complying faucets are available, aerators or other means may be used to achieve reduction.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.303.2</b> Alternate water source for nonpotable applications. Alternate nonpotable water sources are used for indoor potable water reduction. Alternate nonpotable water sources shall be installed in accordance with the <i>California Plumbing Code</i> .		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.303.3</b> Appliances. Dishwashers and clothes washers in residential buildings shall comply with the following: Install at least one qualified ENERGY STAR appliance with maximum water use as follows: 1. Standard Dishwashers - 4.25 gallons per cycle. 2. Compact Dishwashers - 3.5 gallons per cycle. 3. Clothes Washers - water factor of 6 gallons per cubic feet of drum capacity.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.303.4</b> Nonwater supplied urinals or waterless toilets are installed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Outdoor Water Use</b>						
<b>4.304.1</b> Automatic irrigation systems controllers installed at the time of final inspection shall be weather or soil moisture-based.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.304.1</b> Install a low-water consumption irrigation system which minimizes the use of spray type heads.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.304.2</b> A rainwater capture, storage and re-use system is designed and installed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.304.3</b> A water budget shall be developed for landscape irrigation.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.304.6</b> For new water service connections, landscaped irrigated areas more than 2,500 square feet shall be provided with separate submeters or metering devices for outdoor potable water use.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency	Installer or Designer	Third party
		Tier 1	Tier 2	<input type="checkbox"/> All	<input type="checkbox"/> All	<input type="checkbox"/> All
<b>A4.304.4</b> Provide water efficient landscape irrigation design that reduces the use of potable water. Tier 1. Does not exceed 65 percent of <i>ET<sub>o</sub></i> times the landscape area. Tier 2. Does not exceed 60 percent of <i>ET<sub>o</sub></i> times the landscape area.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.304.5</b> A landscape design is installed which does not utilize potable water.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A304.6</b> For new water service connections, landscaped irrigated areas more than 2,500 square feet shall be provided with separate submeters or metering devices for outdoor potable water use.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>WATER REUSE SYSTEMS</b>						
<b>A4.305.1</b> Piping is installed to permit future use of a graywater irrigation system served by the clothes washer or other fixtures.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.305.2</b> Recycled water piping is installed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.305.3</b> Recycled water is used for landscape irrigation.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Innovative Concepts and Local Environmental Conditions</b>						
<b>A4.306.1</b> Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Item 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Item 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>MATERIAL CONSERVATION AND RESOURCE EFFICIENCY</b>						
<b>Foundation Systems</b>						
<b>A4.403.1</b> A Frost-protected Shallow Foundation (FPSF) is designed and constructed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.403.2</b> Cement use in foundation mix design is reduced. Tier 1. Not less than a 20 percent reduction in cement use. Tier 2. Not less than a 25 percent reduction in cement use.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Efficient Framing Techniques</b>						
<b>A4.404.1</b> Beams and headers and trimmers are the minimum size to adequately support the load.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.404.2</b> Building dimensions and layouts are designed to minimize waste.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.404.3</b> Use premanufactured building systems to eliminate solid sawn lumber whenever possible.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.404.4</b> Material lists are included in the plans which specify material quantity and provide direction for on-site cuts.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency <input type="checkbox"/> All	Installer or Designer <input type="checkbox"/> All	Third party <input type="checkbox"/> All
		Tier 1	Tier 2			
<b>4.504.3</b> Carpet and carpet systems shall be compliant with VOC limits.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.504.4</b> 80 percent of floor area receiving resilient flooring shall comply with specified VOC criteria.	<input checked="" type="checkbox"/>					
<b>4.504.5</b> Particleboard, medium density fiberboard (MDF) and hardwood plywood used in interior finish systems shall comply with low formaldehyde emission standards.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.504.1</b> Use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.504.2</b> Install VOC compliant resilient flooring systems. Tier 1. At least 90 percent of the resilient flooring installed shall comply. Tier 2. At least 100 percent of the resilient flooring installed shall comply.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.504.3</b> Thermal insulation installed in the building shall meet the following requirements: <b>Tier 1.</b> Install thermal insulation in compliance with VOC limits. <b>Tier 2.</b> Install insulation which contains No-Added Formaldehyde (NAF) and is in compliance with Tier 1.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Interior Moisture Control</b>						
<b>4.505.2</b> Vapor retarder and capillary break is installed at slab-on-grade foundations.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4.505.3</b> Moisture content of building materials used in wall and floor framing is checked before enclosure.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Indoor Air Quality and Exhaust</b>						
<b>A4.506.1</b> Return air filters with a value greater than MERV 6 shall be installed on HVAC systems. Pressure drop across the filter shall not exceed 0.1 inches water column.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.506.2 [HR]</b> Provide filters on return air openings rated MERV 6 or higher during construction when it is necessary to use HVAC equipment.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>A4.506.3</b> Direct-vent appliances shall be used when equipment is located in conditioned space; or the equipment must be installed in an isolated mechanical room.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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RESIDENTIAL VOLUNTARY MEASURES

SECTION A4.602  
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency <input type="checkbox"/> All	Installer or Designer <input type="checkbox"/> All	Third party <input type="checkbox"/> All
		Tier 1	Tier 2			
<b>Environmental Comfort</b>						
<b>4.507.1 Reserved.</b>						
<b>4.507.2.</b> Duct systems are sized, designed, and equipment is selected using the following methods: 1. Establish heat loss and heat gain values according to ANSI/ACCA 2 Manual J-2004 or equivalent. 2. Size duct systems according to ANSI/ACCA 1 Manual D-2009 or equivalent. 3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S-2004 or equivalent.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Outdoor Air Quality Reserved</b>						
<b>Innovative Concepts and Local Environmental Conditions</b>						
<b>A4.509.1</b> Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Item 2		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Item 3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Installer and Special Inspector Qualifications</b>						
<b>Qualifications</b>						
<b>702.1</b> HVAC system installers are trained and certified in the proper installation of HVAC systems.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>702.2</b> Special inspectors employed by the enforcing agency must be qualified and able to demonstrate competence in the discipline they are inspecting.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Verifications</b>						
<b>703.1</b> Verification of compliance with this code may include construction documents, plans, specifications builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which show substantial conformance.	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1. Green building measures listed in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.
2. Required prerequisite for this Tier.
3. These measures are currently required elsewhere in statute or in regulation.



**A5.106.3.2 Greyfield or infill site.** Manage 40 percent of the average annual rainfall on the site’s impervious surfaces through infiltration, reuse or evapotranspiration.

**A5.106.4 Reserved.**

**A5.106.4.1 Reserved.**

**A5.106.4.2 Reserved.**

**A5.106.4.3 Changing rooms.** For buildings with over 10 tenant-occupants, provide changing/shower facilities for tenant-occupants only in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities.

**TABLE A5.106.4.3**

NUMBER OF TENANT-OCCUPANTS	SHOWER/CHANGING FACILITIES REQUIRED <sup>2</sup>	2-TIER (12" X 15" X 72") PERSONAL EFFECTS LOCKERS <sup>1,2</sup> REQUIRED
0–10	0	0
11–50	1 unisex shower	2
51–100	1 unisex shower	3
101–200	1 shower stall per gender	4
Over 200	1 shower stall per gender for each 200 additional tenant-occupants	One 2-tier locker for each 50 additional tenant-occupants

- One 2-tier locker serves two people. Lockers shall be lockable with either padlock or combination lock.
- Tenant spaces housing more than 10 tenant-occupants within buildings sharing common toilet facilities need not comply; however, such common shower facilities shall accommodate the total number of tenant-occupants served by the toilets and include a minimum of one unisex shower and two 2-tier lockers.

**Note:** Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

**A5.106.5.1 Designated parking for fuel-efficient vehicles.** Provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table A5.106.5.1.1 or A5.106.5.1.2.

**A5.106.5.1.1 Tier 1. Ten percent of total spaces. [BSC]**

Provide 10 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

**TABLE A5.106.5.1.1**

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0–9	0
10–25	2
26–50	4
51–75	6
76–100	9
101–150	11
151–200	18
201 and over	At least 10 percent of total

**A5.106.5.1.2 Tier 2.** Provide 12 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient, and carpool/van pool vehicles as follows:

**TABLE A5.106.5.1.2**

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0–9	1
10–25	2
26–50	5
51–75	7
76–100	9
101–150	13
151–200	19
201 and over	At least 12 percent of total

**A5.106.5.1.3 Parking stall marking.** Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle:

CLEAN AIR/  
VANPOOL/EV

**Note:** Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

**A5.106.5.1.4 Vehicle designations.** Building managers may consult with local community Transit Management Associations (TMAs) for methods of designating qualifying vehicles, such as issuing parking stickers.

**Notes:**

- Information on qualifying vehicles, car labeling regulations and DMV SOV stickers may be obtained from the following sources:
  - California DriveClean.
  - California Air Resources Board.
  - U.S. EPA fuel efficiency standards.
  - DMV Registration Operations, (916) 657-6678 and ARB Public Information, (626) 575-6858.
- Purchasing policy and refueling sites for low emitting vehicles for state employees use can be found at the Department of General Services.

**A5.106.5.3 Electric vehicle (EV) charging.** Construction shall comply with Section A5.106.5.3.1 and A5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code* Section 406.9, the *California Electrical Code* and as follows:

**A5.106.5.3.1 Tier 1.** Table A5.106.5.3.1 shall be used to determine if single or multiple charging space requirements apply for future installation of EVSE. When a single charging space is required per Table A5.106.5.3.1, refer to Section 5.106.5.3.1 for design requirements. When multiple charging spaces are required, refer to Section 5.106.5.3.2 for design requirements.

**A5.106.5.3.2 Tier 2.** Table A5.106.5.3.2 shall be used to determine the number of multiple charging spaces

required for future installation of EVSE. Refer to Section 5.106.5.3.2 for design space requirements.

**TABLE A5.106.5.3.1**

TOTAL NUMBER OF PARKING SPACES	TIER 1 NUMBER OF REQUIRED EV CHARGING SPACES
0-50	1
51-75	2
76-100	3
101-200	5
201 and over	4% <sup>1</sup>

1. Calculation for spaces shall be rounded up to the nearest whole number.

**TABLE A5.106.5.3.2**

TOTAL NUMBER OF PARKING SPACES	TIER 2 NUMBER OF REQUIRED EV CHARGING SPACES
0-50	2
51-75	3
76-100	4
101-200	7
201 and over	6% <sup>1</sup>

1. Calculation for spaces shall be rounded up to the nearest whole number.

**A5.106.5.3.3 Identification.** The service panel or subpanel circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as “EV CAPABLE.” The raceway termination location shall be permanently and visibly marked as “EV CAPABLE.”

**A5.106.5.3.4** Future charging spaces qualify as designated parking as described in Section A5.106.5.1 Designated parking.

**Notes:**

1. The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices (California MUTCD) to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives number 13-01. [www.dot.ca.gov/hq/traffops/policy/13-01.pdf](http://www.dot.ca.gov/hq/traffops/policy/13-01.pdf).
2. See Vehicle Code Section 22511 EV charging spaces signage in offstreet parking facilities and for use of EV charging spaces.
3. The Governor’s Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which provides helpful information for local governments, residents and businesses. [www.opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://www.opr.ca.gov/docs/ZEV_Guidebook.pdf).

**A5.106.6 Parking capacity.** Design parking capacity to meet but not exceed minimum local zoning requirements.

**A5.106.6.1 Reduce parking capacity.** With the approval of the enforcement authority, employ 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 that encourage occupants to carpool, ride share or use alternate transportation.

**Note:** Strategies for programs may be obtained from local TMAs.

**A5.106.7 Exterior wall shading.** Meet requirements in the current edition of the *California Energy Code* and comply with either Section A5.106.7.1 or A5.106.7.2 for wall surfaces. If using vegetative shade, plant species documented to reach desired coverage within 5 years of building occupancy.

**A5.106.7.1 Fenestration.** Provide vegetative or man-made shading devices for all fenestration on east-, south-, and west-facing walls.

**A5.106.7.1.1 East and west walls.** Shading devices shall have 30-percent coverage to a height of 20 feet or to the top of the exterior wall, whichever is less. Calculate shade coverage on the summer solstice at 10 AM for east-facing walls and at 3 PM for west-facing walls.

**A5.106.7.1.2 South walls.** Shading devices shall have 60-percent coverage to a height of 20 feet or to the top of the exterior wall, whichever is less.

**A5.106.7.2 Opaque wall areas.** Use wall surfacing with minimum SRI 25 (aged), for 75 percent of opaque wall areas.

**Exception:** Use of vegetated shade in Wildland-Urban Interface Areas as defined in Chapter 7A (Materials and Construction Methods for Exterior Wildfire Exposure) of the *California Building Code* shall meet the requirements of that chapter.

**Note:** If not available from the manufacturer, aged SRI value calculations may be found at the California Energy Commission’s web site at [www.energy.ca.gov](http://www.energy.ca.gov).

**A5.106.11 Heat island effect.** Reduce nonroof heat islands by Section A5.106.11.1 and roof heat islands by Section A5.106.11.2.

**A5.106.11.1 Hardscape alternatives.** Use one or a combination of strategies 1 and 2 for 50 percent of site hardscape or put 50 percent of parking underground.

1. Use light colored materials with an initial solar reflectance value of at least .30 as determined in accordance with American Society for Testing and Materials (ASTM) Standards E 1918 or C 1549.
2. Use open-grid pavement system or pervious or permeable pavement system.

**A5.106.11.2 Cool roof for reduction of heat island effect.** Use roofing materials having a minimum aged solar reflectance and thermal emittance complying with Sections A5.106.11.2.1 and A5.106.11.2.2 or a minimum aged Solar Reflectance Index (SRI) complying with Section

A5.106.11.2.3 and as shown in Table A5.106.11.2.2 for Tier 1 or Table A5.106.11.2.3 for Tier 2.

**Exceptions:**

1. Roof constructions that have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot.
2. Roof area covered by building integrated solar photovoltaic and building integrated solar thermal panels.

**A5.106.11.2.1 Solar reflectance.** Roofing materials shall have a minimum aged solar reflectance equal to or greater than the values specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2.

If Cool Roof Rating Council (CRRC) testing for aged reflectance is not available for any roofing products, the aged value shall be determined using the CRRC certified initial value using the equation  $\rho_{aged} = [0.2 + \beta [\rho_{initial} - 0.2]]$ , where  $\rho_{initial}$  = the initial solar reflectance and soiling resistance,  $\beta$ , listed by product type in Table A5.106.11.2.1.

Solar reflectance may also be certified by other supervisory entities approved by the Energy Commission pursuant to Title 24, Part 1, *California Administrative Code*.

**A5.106.11.2.2 Thermal emittance.** Roofing materials shall have a CRRC initial or aged thermal emittance as determined in accordance with ASTM E 408 or C 1371 equal to or greater than those specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2.

Thermal emittance may also be certified by other supervisory entities approved by the Energy Commission pursuant to Title 24, Part 1, *California Administrative Code*.

sion pursuant to Title 24, Part 1, *California Administrative Code*.

**A5.106.11.2.3 Solar reflectance index alternative.** Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2 may be used as an alternative to compliance with the aged solar reflectance values and thermal emittance.

SRI values used to comply with this section shall be calculated using the Solar Reflectance Index (SRI) Calculation Worksheet (SRI-WS) developed by the California Energy Commission or in compliance with ASTM E 1980-01 as specified in the *California Energy Code*, Section 118(i)3. Solar reflectance values used in the SRI-WS shall be based on the aged reflectance value of the roofing product or the equation in section A5.106.11.2.1 if the CRRC certified aged solar reflectance are not available. Certified Thermal emittance used in the SRI-WS may be either the initial value or the aged value listed by the CRRC.

Solar reflectance and thermal emittance may also be certified by other supervisory entities approved by the Commission pursuant to Title 24, Part 1, *California Administrative Code*.

**Note:** The Solar Reflectance Index Calculation Worksheet (SRI-WS) is available by contacting the Energy Standard Hotline at 1-800-772-3300, website at [www.energy.ca.gov](http://www.energy.ca.gov) or by email at [Title24@energy.state.ca.us](mailto:Title24@energy.state.ca.us).

**A5.106.11.3 Verification of compliance.** If no documentation is available, an inspection shall be conducted to ensure roofing materials meet cool roof aged solar reflectance and thermal emittance or SRI values.

**TABLE A5.106.11.2.1  
VALUES OF SOILING RESISTANCE,  $\beta$ , BY PRODUCT TYPE**

PRODUCT TYPE	CRRC PRODUCT CATEGORY	$\beta$
Field-applied coating	Field-applied coating	0.65
Other	Not a field-applied coating	0.70

**TABLE A5.106.11.2.2 [BSC]  
TIER 1**

ROOF SLOPE	CLIMATE ZONE	Minimum Aged Solar Reflectance	Thermal Emittance	SRI
≤ 2:12	1-16	0.63	0.75	75
> 2:12	1-16	0.20	0.75	16

TABLE A5.106.11.2.3 [BSC]  
TIER 2

ROOF SLOPE	CLIMATE ZONE	Minimum Aged Solar Reflectance	Thermal Emittance	SRI
≤ 2:12	1-16	0.68	0.85	82
> 2:12	1-16	0.28	0.85	27

# APPENDIX A5

## NONRESIDENTIAL VOLUNTARY MEASURES

**Division A5.3 – WATER EFFICIENCY AND CONSERVATION**

**SECTION A5.303  
INDOOR WATER USE**

**SECTION A5.301  
GENERAL**

**A5.301.1 Scope.**

**SECTION A5.302  
DEFINITIONS**

**A5.302.1 Definitions.** The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**COMPACT DISHWASHER.**

**HYDROZONE.**

**LANDSCAPE (PLANT) COEFFICIENT [KL].**

**MODEL WATER EFFICIENT LANDSCAPE ORDINANCE.**

**PLANTS.**

**POTABLE WATER.**

**RECYCLED WATER.**

**REFERENCE EVAPOTRANSPIRATION ( $ET_o$ ).**

**STANDARD DISHWASHER.**

**SUBMETER.**

**A5.303.2.3.1 Tier 1 – 12-percent savings.** [BSC] A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 12 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as required by the *California Building Standards Code*. The 12-percent reduction in potable water use shall be demonstrated by one of the following methods:

1. Prescriptive method. Each plumbing fixture and fitting shall not exceed the maximum flow rate at greater than or equal to 12-percent reduction as specified in Table A5.303.2.3.1; or
2. Performance method. A calculation demonstrating a 12-percent reduction in the building “water use baseline” as established in Table A5.303.2.2 shall be provided.

**A5.303.2.3.2 Tier 2 – 20-percent savings.** A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. A calculation demonstrating a 20-percent reduction in the building “water use baseline” as established in Table A5.303.2.2 shall be provided.

**TABLE A5.303.2.2  
WATER USE BASELINE<sup>3</sup>**

FIXTURE TYPE	BASELINE FLOW RATE	DURATION	DAILY USES	OCCUPANTS <sup>2</sup>
Showerheads	2.0 gpm @ 80 psi	5 min.	1	X <sup>2a</sup>
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	1.8 gpm @ 60 psi	4 min.	1	X <sup>2b</sup>
Replacement aerators	2 gpm @ 60 psi			X
Wash fountains	1.8 gpm/20 [rim space (in.) @ 60 psi]			X
Metering faucets	0.20 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	0.20 gpm/20 [rim space (in.) @ 60 psi]	.25 min.	1 male <sup>1</sup> 3 female	X
Gravity tank type water closets	1.28 gallons/flush	1 flush	1 male <sup>1</sup> 3 female	X
Flushometer tank water closets	1.28 gallons/flush	1 flush	1 male <sup>1</sup> 3 female	X
Flushometer valve water closets	1.28 gallons/flush	1 flush	1 male <sup>1</sup> 3 female	X
Electromechanical hydraulic water closets	1.28 gallons/flush	1 flush	1 male <sup>1</sup> 3 female	X
Urinals	0.5 gallons/flush	1 flush	2 male	X

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. Refer to Table A, Chapter 4, 2013 *California Plumbing Code*, for occupant load factors.
  - a. Shower use by occupants depends on the type of use of a building or portion of a building, e.g., total occupant load for a health club, but only a fraction of the occupants in an office building as determined by the anticipated number of users.
  - b. Kitchen faucet use is determined by the occupant load of the area served by the fixture.
3. Use worksheet WS-1 to calculate baseline water use.

**A5.303.2.3.3 25-percent savings.** A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 25 percent shall be provided. A calculation demonstrating a 25-percent reduction in the building “water use baseline” as established in Table A5.303.2.2 shall be provided.

**A5.303.2.3.4 Nonpotable water systems for indoor use.** Utilizing nonpotable water systems (such as captured rainwater, treated graywater and recycled water) intended to supply water closets, urinals, and other allowed uses, may be used in the calculations demonstrating the 12-, 20- or 25-percent reduction. The nonpotable water systems shall comply with the current edition of the *California Plumbing Code*.

**A5.303.3 Appliances and fixtures for commercial application.** Appliances and fixtures shall meet the following:

1. Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions’ WF standards for commercial clothes washers located in Title 20 of the *California Code of Regulations*.
2. Dishwashers shall meet the following water use standards:
  - a. Residential—ENERGY STAR.
    - i. Standard Dishwashers – 4.25 gallons per cycle.
    - ii. Compact Dishwashers – 3.5 gallons per cycle.
  - b. Commercial—refer to Table A5.303.3.
3. Ice makers shall be air cooled.
4. Food steamers shall be connectionless or boilerless.
5. [BSC] The use and installation of water softeners that discharge to the community sewer system may be limited or prohibited by local agencies if certain conditions are met.

6. Combination ovens shall not consume more than 10 gph (38 L/h) in the full operational mode.
7. Commercial pre-rinse spray valves manufactured on or after January 1, 2006 shall function at equal to or less than 1.6 gpm (0.10 L/s) at 60 psi (414 kPa) and
  - a. Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate.
  - b. Be equipped with an integral automatic shutoff.
  - c. Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gpm (0.08 L/s) or less.

**TABLE A5.303.3  
COMMERCIAL DISHWASHER WATER USE**

TYPE	HIGH-TEMPERATURE— MAXIMUM GALLONS PER RACK	CHEMICAL—MAXIMUM GALLONS PER RACK
Conveyer	0.70 (2.6 L)	0.62 (4.4 L)
Door	0.95 (3.6 L)	1.16 (2.6 L) [BSC] 2.26 (8.6 L) [DSA-SS]
Undercounter	0.90 (3.4 L)	0.98 (3.7 L)

**A5.303.5 Dual plumbing.** New buildings and facilities shall be dual plumbed for potable and recycled water systems for toilet flushing when recycled water is available as determined by the enforcement authority.

**SECTION A5.304  
OUTDOOR WATER USE**

**A5.304.1.1 Reserved.**

**A5.304.2.1 Outdoor potable water use.** For new water service not subject to the provisions of *Water Code* Section 535, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas

**TABLE A5.303.2.3.1  
FIXTURE FLOW RATES**

FIXTURE TYPE	BASELINE FLOW-RATE <sup>2</sup>	MAXIMUM FLOW RATE AT ≥ 12 PERCENT REDUCTION
Showerheads	2.0 gpm @ 80 psi	1.8 gpm @ 80 psi
Lavatory faucets nonresidential <sup>3</sup>	0.5 gpm @ 60 psi	0.35 gpm @ 60 psi
Kitchen faucets <sup>3</sup>	1.8 gpm @ 60 psi	1.6 gpm @ 60 psi
Wash fountains	1.8 gpm/20 [rim space(in.) @ 60 psi]	1.6 [rim space(in.)/20 gpm @ 60 psi]
Metering faucets	0.20 gallon/cycle	0.18 gallons/cycle
Metering faucets for wash fountains	0.20 gpm/20 [rim space(in.) @ 60 psi]	0.18 [rim space(in.)/20 gpm @ 60 psi]
Gravity tank type water closets	1.28 gallons/flush	1.12 gallons/flush <sup>1</sup>
Flushometer tank water closets	1.28 gallons/flush	1.12 gallons/flush <sup>1</sup>
Flushometer valve water closets	1.28 gallons/flush	1.12 gallons/flush <sup>1</sup>
Electromechanical hydraulic water closets	1.28 gallons/flush	1.12 gallons/flush <sup>1</sup>
Urinals	0.5 gallons/flush	0.44 gallons/flush

1. Includes water closets with an effective flush rate of 1.12 gallons or less when tested per ASME A 112.19.2 and ASME A 112.19.14.
2. See Table A5.503.2.2 for additional notes and references.
3. Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction.

**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
 APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES  
 DIVISION A5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
 See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	<b>X</b>																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below																			
Chapter/Section																			

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percent of nonhazardous construction and demolition waste generated at the site.

**A5.408.3.1.2 Verification of compliance.** A copy of the completed waste management report or documentation of certification of the waste management company utilized shall be provided.

**Exceptions:**

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.

**SECTION A5.409  
LIFE CYCLE ASSESSMENT**

**A5.409.1 General.** Life cycle assessment shall be ISO 14044 compliant. The service life of the building and materials assemblies shall not be less than 60 years unless designated in the construction documents as having a shorter service life as approved by the enforcing agency.

**A5.409.2 Whole building life cycle assessment.** Conduct a whole building life assessment, including operating energy, showing that the building project achieves at least a 10 percent improvement for at least three of the impacts listed in Section A5.409.2.2, one of which shall be climate change, compared to a reference building of similar size, function, complexity and operating energy performance, and meeting the 2013 *California Energy Code* at a minimum.

**A5.409.2.1 Building components.** The building envelope, structural elements, including footings and foundations, interior ceilings, walls, and floors; and exterior finishes shall be considered in the assessment.

**Exceptions:**

1. Plumbing, mechanical and electrical systems and controls; fire and smoke detection and alarm systems and controls; and conveying systems.
2. Interior finishes are not required to be included.

**Notes:**

1. Software for calculating whole building life cycle assessments includes those found at the Athena Institute website (Impact Estimator software), the

PE International website (GaBi software), and the PRe Consultants website (SimaPro software).

2. Interior finishes, if included, may be assessed using the NIST BEES tool.

**A5.409.2.2 Impacts to be considered.** Select from the following impacts in the assessment:

1. Climate change (greenhouse gases).
2. Fossil fuel depletion.
3. Stratospheric ozone depletion.
4. Acidification of land and water sources.
5. Eutrophication.
6. Photochemical oxidants (smog).

**A5.409.3 Materials and system assemblies.** If whole building analysis of the project is not elected, select a minimum of 50 percent of materials or assemblies based on life cycle assessment of at least three of the impacts listed in Section A5.409.2.2, one of which shall be climate change.

**Note:** Software for calculating life cycle assessments for assemblies and materials may be found at the Athena Institute web site and the NIST BEES web site.

**A5.409.4 Substitution for prescriptive standards.** Performance of a life cycle assessment completed in accordance with Section A5.409.2 may be substituted for other prescriptive Material Conservation and Resource Efficiency provisions of Division A5.4, including those made mandatory through local adoption of Tier 1 or Tier 2 in Division A5.6.

**A5.409.5 Verification of compliance.** Documentation of compliance shall be provided as follows:

1. The assessment is performed in accordance with ISO 14044.
2. The project meets the requirements of other parts of Title 24.
3. A copy of the analysis shall be made available to the enforcement authority.
4. A copy of the analysis and any maintenance or training recommendations shall be included in the operation and maintenance manual.

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**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES  
DIVISION A5.5 – ENVIRONMENTAL QUALITY**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	<b>X</b>						<b>X</b>												
Chapter/Section																			
A5.501.1	X																		
A5.502.1 Definitions	X																		
A5.504.1	X																		
A5.504.1.1, Items 1 & 2	X																		
A5.504.1.2	X																		
A5.504.2	X																		
A5.504.2.1 and subsections	X																		
A5.504.4.5.1	X																		
A5.504.4.7	X																		
A5.504.4.7.1	X																		
A5.504.4.7.2	X																		
A5.504.4.8	X																		
A5.504.4.8.1	X																		
A5.504.4.8.2	X																		
A5.504.4.9	X																		
A5.504.4.9.1	X																		
A5.504.5	X																		
A5.504.5.1	X																		
A5.504.5.2	X																		
A5.504.5.3.1	X																		
A5.504.5.3.1.1	X																		
Table A5.504.8.5	X																		
A5.507.1 and subsections	X																		
A5.507.2	X																		
A5.507.3 and subsections	X																		
A5.507.5								X											
A5.508	X																		

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## APPENDIX A5

# NONRESIDENTIAL VOLUNTARY MEASURES

### Division A5.5 – ENVIRONMENTAL QUALITY

#### SECTION A5.501 GENERAL

**A5.501.1 Scope.** The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

#### SECTION A5.502 DEFINITIONS

**A5.502.1 Definitions.** The following terms are defined in Chapter 2.

**INTERIOR, BUILDING.**

**MERV. [BSC]**

**MULTI-OCCUPANT SPACES.**

**NO ADDED FORMALDEHYDE (NAF) BASED RESINS.**

**SINGLE OCCUPANT SPACES.**

**ULTRA-LOW EMITTING FORMALDEHYDE (ULEF) RESINS.**

#### SECTION A5.504 POLLUTANT CONTROL

**A5.504.1 Indoor air quality (IAQ) during construction.** Maintain IAQ as provided in Sections A5.504.1.1 and A5.504.1.2.

**A5.504.1.1 Temporary ventilation.** Provide temporary ventilation during construction in accordance with Section 121 (Requirements for Ventilation) of the *California Energy Code*, CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8 and as follows:

1. Ventilation during construction shall be achieved through openings in the building shell using fans to produce a minimum of three air changes per hour.
2. If the building is occupied during demolition or construction, meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3.
3. The permanent HVAC system shall only be used during construction if necessary to condition the building within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30 percent based on ASHRAE 52.1- 1992. Replace all filters immediately prior to occupancy.

4. During dust-producing operations, protect supply and return HVAC system openings from dust.

**A5.504.1.2 Additional IAQ measures.** Employ additional measures as follows:

1. When using generators to generate temporary power, use generators meeting the requirements of CCR, Title 13, Chapter 9 or local ordinance, whichever is more stringent.
2. Protect on-site absorbent materials from moisture. Remove and replace any materials with evidence of mold, mildew or moisture infiltration.
3. Store odorous and high VOC-emitting materials off-site, without packaging, for a sufficient period to allow odors and VOCs to disperse.
4. When possible, once materials are on the jobsite, install odorous and high VOC-emitting materials prior to those that are porous or fibrous.
5. Clean oil and dust from ducts prior to use.

**A5.504.2 IAQ postconstruction.** After all interior finishes have been installed, flush out the building by supplying continuous ventilation with all air handling units at their maximum outdoor air rate and all supply fans at their maximum position and rate for at least 14 days.

1. During this time, maintain an internal temperature of at least 60°F and relative humidity no higher than 60 percent. If extenuating circumstances make these temperature and humidity limits unachievable, the flush-out may be conducted under conditions as close as possible to these limits, provided that documentation of the extenuating circumstances is provided in writing.
2. Occupancy may start after 4 days, provided flush-out continues for the full 14 days. During occupied times, the thermal comfort conditions of Title 24 must be met.
3. For buildings that rely on natural ventilation, exhaust fans and floor fans must be used to improve air mixing and removal during the 14-day flush-out and windows should remain open.
4. Do not "bake out" the building by increasing the temperature of the space.
5. If continuous ventilation is not possible, flush-out air must total the equivalent of 14 days of maximum outdoor air. The equivalent of 14 days of maximum outdoor air (the target air volume) shall be calculated by multiplying the maximum feasible air flow rate (in ft<sup>3</sup>/m) by 14 days (20,160 minutes). The air volumes for each period of ventilation are then calculated and summed and the flush-out continues until the total equals the target air volume.

**A5.504.2.1 IAQ testing.** If the engineer determines that building flush-out pursuant to Section A5.504.2 is not feasible, a testing alternative may be employed after all interior

finishes have been installed, using testing protocols recognized by the United States Environmental Protection Agency (U.S. EPA).

**A5.504.2.1.1 Maximum levels of contaminants.**

Allowable levels of contaminant concentrations measured by testing shall not exceed the following:

1. Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;
2. Formaldehyde: 27 parts per billion;
3. Particulates (PM10): 50 micrograms per cubic meter;
4. 4-Phenylcyclohexene (4-PCH), if fabrics and carpets with styrene butadiene rubber (SBR) latex backing, are installed: 6.5 micrograms per cubic meter; and
5. Total Volatile Organic Compounds (TVOC): 300 micrograms per cubic meter.

**A5.504.2.1.2 Test protocols.** Testing of indoor air quality should include the following elements:

1. The contaminant sampling and averaging times and the measurement methods should be sufficient to achieve a Limit of Detection that is below the maximum allowable concentrations.
2. Testing should be conducted with the HVAC system operated at the minimum design outdoor air ventilation rate.
3. Air samplers and monitors should be located near likely sources of formaldehyde and other volatile organic compounds, at a height of 3 to 6 feet from the floor and well away from walls and air diffusers.
4. The test protocols should be justified with documentation to show that appropriate sampling methods and times were used.

**A5.504.2.1.3 Noncomplying building areas.** For each sampling area of the building exceeding the maximum concentrations specified in Section A5.504.2.1.1, flush out with outside air and retest samples taken from the same area. Repeat the procedures until testing demonstrates compliance.

**Note:** U.S. EPA-recognized testing protocols may be found on the Air Resources Board web site.

**A5.504.4.5.1 No added formaldehyde Tier 1.** Use composite wood products approved by the California Air Resources Board (ARB) as no-added formaldehyde (NAF) based resins or ultra-low emitting formaldehyde (ULEF) resins.

**Notes:**

1. See Title 17, Section 93120.3(c) and (d), respectively.
2. Documentation must be provided verifying that materials are certified to meet the pollutant emission limits. A list of manufacturers and their NAF and ULEF certified materials is provided at: [http://www.arb.ca.gov/toxics/compwood/naf\\_ulef/listofnaf\\_ulef.htm](http://www.arb.ca.gov/toxics/compwood/naf_ulef/listofnaf_ulef.htm).

**A5.504.4.7 Resilient flooring systems, Tier 1. [BSC]** For 90 percent of floor area receiving resilient flooring, install resilient flooring that is:

1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or
4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).

**A5.504.4.7.1 Resilient flooring systems, Tier 2. [BSC]**

For 100 percent of floor area receiving resilient flooring, install resilient flooring that is:

1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or
4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).

**Exception:** Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.

**A5.504.4.7.2 Verification of compliance.** Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

**A5.504.4.8 Thermal insulation, Tier 1. [BSC]** Comply with the following standards:

1. Chapters 12-13 (Standards for Insulating Material) in Title 24, Part 12, the *California Referenced Standards Code*,
2. The VOC-emission limits defined in 2009 CHPS criteria and listed on its High Performance Products Database.
3. California Department of Public Health 2010 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 2010 (also known as Specification 01350.)



**CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE  
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES  
DIVISION A5.6 – VOLUNTARY TIERS**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	<b>X</b>																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below																			
Chapter/Section																			

**APPENDIX A5  
NONRESIDENTIAL VOLUNTARY MEASURES**

*Division A5.6 – VOLUNTARY TIERS*

**SECTION A5.601  
CALGreen TIER 1 AND TIER 2**

**A5.601.1 Scope.** The measures contained in this appendix are not mandatory unless adopted by local government as specified in Section 101.7. The provisions of this section outline means of achieving enhanced construction or reach levels by incorporating additional green building measures for newly constructed nonresidential buildings as well as additions. In order to meet one of the tier levels designers, builders or property owners are required to incorporate additional green building measures necessary to meet the threshold of each level.

**A5.601.2 CALGreen Tier 1**

**A5.601.2.1 Prerequisites.** To achieve *CALGreen* tier status, a project must meet all of the mandatory measures in Chapter 5 and, in addition, meet the provisions of this section.

**A5.601.2.2 Energy performance.** For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

**A5.601.2.3 Tier 1.** Comply with the energy efficiency requirements in Section A5.203.1.1 and Section A5.203.1.2.1.

**A5.601.2.4 Voluntary measures for CALGreen Tier 1.** In addition to the provisions of Sections A5.601.2.1 and A5.601.2.3 above, compliance with the following voluntary measures from Appendix A5 is required for Tier 1:

1. From Division A5.1,
  - a. Comply with the designated parking requirements for fuel efficient vehicles for a minimum

of 10 percent of parking capacity per Section A5.106.5.1 and Table A5.106.5.1.1.

- b. Comply with thermal emittance, solar reflectance or SRI values for cool roofs in Section A5.106.11.2 and Table A5.106.11.2.1.<sup>1</sup>

- c. Comply with one elective measure selected from this division.

2. From Division A5.3,

- a. Comply with the 12-percent reduction for indoor potable water use in Section A5.303.2.3.1.

- b. Comply with Section A5.304.4.1 for outdoor potable water use not to exceed 60 percent of ETo.

- c. Comply with one elective measure selected from this division.

3. From Division A5.4,<sup>2</sup>

- a. Comply with recycled content of 10 percent of materials based on estimated total cost in Section A5.405.4.

- b. Comply with the 65-percent reduction in construction and demolition waste in Section A5.408.3.1.

- c. Comply with one elective measure selected from this division.

4. From Division A5.5,

- a. Comply with resilient flooring systems for 90 percent of resilient flooring in Section A5.504.4.7.

- b. Comply with thermal insulation meeting 2009 CHPS low-emitting materials list in Section A5.504.4.8.

- c. Comply with one elective measure selected from this division.

- 5. Comply with one additional elective measure selected from any division.

<sup>1</sup> Cool roof is required for compliance with Tiers 1 and 2 and may be used to meet energy standards in Part 6, exceed energy standards and to mitigate heat island effect.

<sup>2</sup> Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

**A5.601.3 CALGreen Tier 2.**

**A5.601.3.2 Energy performance.** For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

**A5.601.3.3 Tier 2.** Comply with the energy efficiency requirements in Section A5.203.1.1 and Section A5.203.1.2.2.

**A5.601.3.4 Voluntary measures for Tier 2.** In addition to the provisions of Sections A5.601.3.1 and A5.601.3.3 above, compliance with the following voluntary measures from Appendix A5 and additional elective measures shown in Table A5.601.3.4 is required for Tier 2:

1. From Division A5.1,
  - a. Comply with the designated parking requirements for fuel efficient vehicles for a minimum of 12 percent of parking capacity per Section A5.106.5.1 and Table A5.106.5.1.2.
  - b. Comply with thermal emittance, solar reflectance or SRI values for cool roofs in Section A5.106.11.2 and Table A5.106.11.2.2.<sup>1</sup>
  - c. Comply with three elective measures selected from this division.
2. From Division A5.3,
  - a. Comply with the 20-percent reduction for indoor potable water use in Section A5.303.2.3.2.
  - b. Comply with Section A5.304.4.2 for outdoor potable water use not to exceed 55 percent of ETo.
  - c. Comply with three elective measures selected from this division.
3. From Division A5.4,<sup>2</sup>
  - a. Comply with recycled content of 15 percent of materials based on estimated total cost in Section A5.405.4.1.
  - b. Comply with the 80-percent reduction in construction and demolition waste in Section A5.408.3.1.
  - c. Comply with three elective measures selected from this division.

- 4. From Division A5.5,

- a. Comply with resilient flooring systems for 100 percent of resilient flooring in Section A5.504.4.7.1.

**Exception:** Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.

- b. Comply with thermal insulation meeting 2009 CHPS low-emitting materials list and no added formaldehyde in Section A5.504.4.8.1.
- c. Comply with three elective measures selected from this division.

- 5. Comply with three additional elective measures selected from any division.

<sup>1</sup> Cool roof is required for compliance with Tiers 1 and 2 and may be used to meet energy standards in Part 6, exceed energy standards and to mitigate heat island effect.

<sup>2</sup> Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

**A5.601.4 Compliance verification.** Compliance with Section A5.601.2 or A5.601.3 shall be as required in Chapter 7 of this code. Compliance documentation shall be made part of the project record as required in Section 5.410.2 or 5.410.3.

**TABLE A5.601 NONRESIDENTIAL BUILDINGS:  
Green Building Standards Code Proposed Performance Approach**

*Note: This table is intended only as an aid in illustrating the nonresidential tier structure*

CATEGORY	ENVIRONMENTAL PERFORMANCE GOAL	TIER 1	TIER 2	
All	Minimum Mandatory	Meet all of the provisions of Chapter 5	Meet all of the provision of Chapter 5	
Planning and Design	Designated Parking for Fuel Efficient Vehicles	10% of total spaces	12% of total spaces	
	Electric Vehicle Charging	Approx. 4% of total spaces	Approx. 6% of total spaces	
	Cool Roof to Reduce Heat Island Effect	Roof Slope < 2:12 SRI 75 Roof Slope > 2:12 SRI 16	Roof Slope < 2:12 SRI 82 Roof Slope > 2:12 SRI 27	
		1 additional Elective from Division A5.1	3 additional Electives from Division A5.1	
Energy Efficiency	Energy Performance <sup>2a, 2b</sup>	Outdoor lighting power 90% of Part 6 allowance	Outdoor lighting power 90% of Part 6 allowance	
		If applicable, solar water-heating system with minimum solar savings fraction of 0.15	If applicable, solar water-heating system with minimum solar savings fraction of 0.15	
		If applicable, certain functional areas comply with residential indoor lighting requirements	If applicable, certain functional areas comply with residential indoor lighting requirements	
		Energy Budget 95% or 90% of Part 6 calculated value of allowance	Energy Budget 90% or 85% of Part 6 calculated value of allowance	
Water Efficiency and Conservation	Indoor Water Use	12% Savings	20% Savings	
		Outdoor Water Use	Not to exceed 60% of ETo times the landscape area	Not to exceed 55% of ETo times the landscape area
			1 additional Elective from Division A5.3	3 additional Electives from Division A5.3
Material Conservation and Resource Efficiency <sup>3</sup>	Construction Waste Reduction	At least 65% reduction	At least 80% reduction	
		Recycled Content	Utilize recycled content materials for 10% of total material cost	Utilize recycled content materials for 15% of total material cost
			1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
Environmental Quality	Low-VOC Resilient Flooring	90% of flooring meets VOC limits	100% of flooring meets VOC limits <sup>1</sup>	
	Low-VOC Thermal Insulation	Comply with VOC limits	Install no-added formaldehyde insulation and comply with VOC limits	
		1 additional Elective from Division A5.5	3 additional Electives from Division A5.5	
Additional Measures	Added measures shall be achieved across at least 3 categories	1 additional Elective	3 additional Electives	
Approximate Total Measures		14	24	

1. Exception: Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.

2. Solar water-heating system requirement for newly constructed restaurants as per A5.203.1.1.2.

**Exceptions:**

- a. Buildings with a natural gas service water heater with a minimum of 95-percent thermal efficiency.
- b. Buildings where greater than 75 percent of the total roof area has annual solar access that is less than 70 percent. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

3. Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

**SECTION A5.602  
NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS<sup>4</sup>**

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY <sup>1</sup>	
		CALGreen Tier 1	CALGreen Tier 2
<b>Requirements</b>			
Project meets all of the requirements of Divisions 5.1 through 5.5.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Planning and Design</b>			
<b>Site Selection</b>			
<b>A5.103.1 Community connectivity.</b> Locate project on a previously developed site within a 1/2-mile radius of at least ten basic services, listed in Section A5.103.1.		<input type="checkbox"/>	<input type="checkbox"/>
<b>A5.103.2 Brownfield or greyfield site redevelopment or infill area development.</b> Select for development a brownfield in accordance with Section A5.103.2.1 or on a greyfield or infill site as defined in Section A5.102. <b>A5.103.3.1 Brownfield redevelopment.</b> Develop a site documented as contaminated and fully remediated or on a site defined as a brownfield.		<input type="checkbox"/>	<input type="checkbox"/>
<b>Site Preservation</b>			
<b>A5.104.1.1 Local zoning requirement in place.</b> Exceed the zoning's open space requirement for vegetated open space on the site by 25 percent. <b>A5.104.1.2 No local zoning requirement in place.</b> Provide vegetated open space area adjacent to the building equal to the building footprint area. <b>A5.104.1.3 No open space required in zoning ordinance.</b> Provide vegetated open space equal to 20 percent of the total project site area.		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Deconstruction and Reuse of Existing Structures</b>			
<b>A5.105.1.1 Existing building structure.</b> Maintain at least 75 percent of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing) based on surface area. <b>Exceptions:</b> 1. Window assemblies and nonstructural roofing material. 2. Hazardous materials that are remediated as a part of the project. 3. A project with an addition of more than two times the square footage of the existing building. <b>A5.105.1.2 Existing nonstructural elements.</b> Reuse existing interior nonstructural elements (interior walls, doors, floor coverings and ceiling systems) in at least 50 percent of the area of the completed building (including additions). <b>Exception:</b> A project with an addition of more than two times the square footage of the existing building. <b>A5.105.1.3 Salvage.</b> Salvage additional items in good condition such as light fixtures, plumbing fixtures and doors for reuse on this project in an onsite storage area or for salvage in dedicated collection bins. Document the weight or number of the items salvaged.		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Site Development</b>			
<b>5.106.1 Storm water pollution prevention.</b> Newly constructed projects and additions which disturb less than one acre of land shall prevent the pollution of stormwater runoff from the construction activities through local ordinance in Section 5.106.1.1 or Best management practices (BMP) in Section 5.106.1.2. <b>A5.106.2 Storm water design.</b> Design storm water runoff rate and quantity in conformance with Section A5.106.3.1 and storm water runoff quality by Section A5.106.3.2 or by local requirements, whichever are stricter. <b>A5.106.2.1 Storm water runoff rate and quantity.</b> Implement a storm water management plan resulting in no net increase in rate and quantity of storm water runoff from existing to developed conditions. <b>Exception:</b> If the site is already greater than 50 percent impervious, implement a storm water management plan resulting in a 25-percent decrease in rate and quantity. <b>A5.106.2.2 Storm water runoff quality.</b> Use post construction treatment control best management practices (BMPs) to mitigate (infiltrate, filter or treat) storm water runoff from the 85th percentile 24-hour runoff event (for volume-based BMPs) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for flow-based BMPs).	<input checked="" type="checkbox"/>  or <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>A5.106.3 Low impact development (LID).</b> Reduce peak runoff in compliance with Section 5.106.3.1. Employ at least two of the following methods or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation or other beneficial uses. LID strategies include, but are not limited to those listed in Section A5.106.4.		<input type="checkbox"/>	<input type="checkbox"/>

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**SECTION A5.602  
NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS—continued<sup>4</sup>**

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY <sup>1</sup>	
		CALGreen Tier 1	CALGreen Tier 2
<p><b>5.106.8 Light pollution reduction.</b> [N] Outdoor lighting systems shall be designed and installed to comply with the following:</p> <ol style="list-style-type: none"> <li>1. The minimum requirements in the <i>California Energy Code</i> for Lighting Zones 1–4 as defined in Chapter 10 of the <i>California Administrative Code</i>; and</li> <li>2. Backlight, Uplight and Glare (BUG) ratings as defined in IESNA TM-15-11; and</li> <li>3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or</li> </ol> <p>Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.</p> <p><b>Exceptions:</b> [N]</p> <ol style="list-style-type: none"> <li>1. Luminaires that qualify as exceptions in Section 140.7 of the <i>California Energy Code</i></li> <li>2. Emergency lighting</li> </ol> <p><b>Note:</b> [N] See also <i>California Building Code</i>, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.</p>	<p><input checked="" type="checkbox"/></p> <p style="text-align: center;">or</p> <p><input checked="" type="checkbox"/></p>		
<p><b>5.106.10 Grading and paving.</b> Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include those shown in Items 1–5. See exception for additions or alterations.</p>	<input checked="" type="checkbox"/>		
<p><b>A5.106.11 Heat island effect.</b> Reduce nonroof heat islands and roof heat islands as follows:</p> <p><b>A5.106.11.1 Hardscape alternatives.</b> Use one or a combination of strategies 1 through 2 for 50 percent of site hardscape or put 50 percent of parking underground.</p> <ol style="list-style-type: none"> <li>1. Use light colored materials with an initial solar reflectance value of at least .30 as determined in accordance with ASTM Standards E 1918 or C 1549.</li> <li>2. Use open-grid pavement system or pervious or permeable pavement system.</li> </ol> <p><b>A5.106.11.2 Cool roof for reduction of heat island effect.</b> Use roofing materials having a minimum aged solar reflectance, thermal emittance complying with Sections A5.106.11.2.2 and A5.106.11.2.3 or a minimum aged or Solar Reflectance Index (SRI)<sup>3</sup> equal to or greater than the values shown in:</p> <p>Table A5.106.11.2.2 – Tier 1 or Table A5.106.11.2.3 – Tier 2</p> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. Roof constructions that have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 lb/sf.</li> <li>2. Roof area covered by building integrated solar photovoltaic and building integrated solar thermal panels.</li> </ol>		<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/></p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/></p>

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**SECTION A5.602  
NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS—continued<sup>4</sup>**

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APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY <sup>1</sup>	
		CALGreen Tier 1	CALGreen Tier 2
<b>Energy Efficiency</b>			
<b>Performance Requirements</b>			
<b>5.201.1 Scope.</b> Building meets or exceeds the requirements of the California Building Energy Efficiency Standards. <sup>3</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>
<b>A5.203.1 Energy efficiency.</b> Nonresidential, high-rise residential and hotel/motel buildings that include lighting and/or mechanical systems shall comply with Sections A5.203.1.1 and either A5.203.1.2.1 or A5.203.1.2.2. Newly constructed buildings, as well as additions and alterations, are included in the scope of these sections. Buildings permitted without lighting or mechanical systems shall comply with Section A5.203.1.1 but are not required to comply with Sections A5.203.1.1.2 or A5.203.1.2.		<input type="checkbox"/>	<input type="checkbox"/>
<b>A5.203.1.1.1 Outdoor lighting.</b> Newly installed outdoor lighting power is no greater than 90 percent of the Title 24, Part 6 calculated value of allowed outdoor lighting power.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>
<b>A5.203.1.1.2 Service water heating in restaurants.</b> Newly constructed restaurants 8,000 square feet or greater and with service water heaters rated 75,000 Btu/h or greater installed a solar water-heating system with a minimum solar savings fraction of 0.15 or meet one of the exceptions.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>
<b>A5.203.1.1.3 Functional areas where compliance with residential lighting standards is required.</b> For newly constructed high-rise residential dwelling units and hotel and motel guest rooms, indoor lighting complies with the applicable requirements in Appendix A4 Residential Voluntary Measures, Division A4.2 – Energy Efficiency, Section A4.203.1.1.3. For additions and alterations to high-rise residential dwelling units and hotel and motel guest rooms, indoor lighting complies with the applicable requirements in Appendix A4 Residential Voluntary Measures, Division A4.2 – Energy Efficiency, Section A4.204.1.1.1.		<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>2</sup>
<b>A5.203.1.2.1 Tier 1.</b> For building projects that include indoor lighting or mechanical systems, but not both, the Energy Budget is no greater than 95 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building. For building projects that include indoor lighting and mechanical systems, the Energy Budget is no greater than 90 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.		<input checked="" type="checkbox"/> <sup>2</sup>	
<b>A5.203.1.2.2 Tier 2.</b> For building projects that include indoor lighting or mechanical systems, but not both, the Energy Budget is no greater than 90 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building. For building projects that include indoor lighting and mechanical systems, the Energy Budget is no greater than 85 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.			<input checked="" type="checkbox"/> <sup>2</sup>
<b>Renewable Energy</b>			
<b>A5.211.1 On-site renewable energy.</b> Use on-site renewable energy for at least 1 percent of the electrical service overcurrent protection device rating calculated in accordance with the 2013 <i>California Electrical Code</i> or 1KW, whichever is greater, in addition to the electrical demand required to meet 1 percent of natural gas and propane use calculated in accordance with the 2013 <i>California Plumbing Code</i> . <b>A5.211.1.1 Documentation.</b> Calculate renewable on-site system to meet the requirements of Section A5.211.1. Factor in net-metering, if offered by local utility, on an annual basis. <b>A5.211.3 Green power.</b> Participate in the local utility’s renewable energy portfolio program that provides a minimum of 50-percent electrical power from renewable sources. Maintain documentation through utility billings.		<input type="checkbox"/>	<input type="checkbox"/>
<b>Elevators, Escalators and Other Equipment</b>			
<b>A5.212.1 Elevators and escalators.</b> In buildings with more than one elevator or two escalators, provide systems and controls to reduce the energy demand of elevators and escalators as follows. Document systems operation and controls in the project specifications and commissioning plan. <b>A5.212.1.1 Elevators.</b> Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion. <b>A5.212.1.1.1 Car lights and fan.</b> A parked elevator shall turn off its car lights and fan automatically until the elevator is called for use. <b>A5.212.1.2 Escalators.</b> An escalator shall have a variable voltage variable frequency (VVVF) motor drive system that is fully regenerative when the escalator is in motion. <b>A5.212.1.4 Controls.</b> Controls that reduce energy demand shall meet requirements of CCR, Title 8, Chapter 4, Subchapter 6 and shall not interrupt emergency operations for elevators required in CCR, Title 24, Part 2, <i>California Building Code</i> .		<input type="checkbox"/>	<input type="checkbox"/>

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**SECTION A5.602  
NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS—continued<sup>4</sup>**

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY <sup>1</sup>	
		CALGreen Tier 1	CALGreen Tier 2
<p><b>A5.504.4.7.1 Resilient flooring systems, Tier 2 [BSC].</b> For 100 percent of floor area to scheduled to receive resilient flooring, install resilient flooring shall meet at least one of the following:</p> <ol style="list-style-type: none"> <li>1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;</li> <li>2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;</li> <li>3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and 7.1 (formerly EQ. 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or</li> <li>4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's &amp; Schools Program).</li> </ol> <p><b>A5.504.4.7.2 Verification of compliance.</b> Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.</p> <p><b>A5.504.4.8 Thermal insulation, Tier 1 [BSC].</b> Comply with the standards listed in Items 1 through 3.</p> <p><b>A5.504.4.8.1 Thermal insulation, Tier 2 [BSC] Thermal insulation, No-added Formaldehyde.</b> Install thermal insulation which complies with Tier 1 plus does not contain any added formaldehyde.</p> <p><b>A5.504.4.8.2 Verification of compliance.</b> Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.</p> <p><b>A5.504.4.9 Acoustical ceilings and wall panels.</b> Comply with Chapter 8 in Title 24, Part 2 and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its High Performance Products Database.</p> <p><b>A5.504.4.9.1 Verification of compliance.</b> Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.</p> <p><b>Note:</b> Products compliant with CHPS criteria certified under the Greenguard Children &amp; Schools program may also be used.</p> <p><b>A5.504.5 Hazardous particulates and chemical pollutants.</b> Minimize and control pollutant entry into buildings and cross-contamination of regularly occupied areas.</p> <p><b>A5.504.5.1 Entryway systems.</b> Install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors as listed in Items 1 through 3 in Section A5.504.5.1.</p> <p><b>A5.504.5.2 Isolation of pollutant sources.</b> In rooms where activities produce hazardous fumes or chemicals, exhaust them and isolate them from their adjacent rooms as listed in Items 1 through 3 in Section A5.504.5.2.</p> <p><b>5.504.5.3 Filters.</b> In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a MERV of 8. MERV 8 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.</p> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. An ASHRAE 10-percent to 15-percent efficiency filter shall be permitted for an HVAC unit meeting the 2013 <i>California Energy Code</i> having 60,000 Btu/h or less capacity per fan coil, if the energy use of the air delivery system is 0.4 W/cfm or less at design air flow.</li> <li>2. Existing mechanical equipment.</li> </ol> <p><b>5.504.5.3.1 Labeling.</b> Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.</p>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<p><b>A5.504.5.3.1 Filters, Tier 1.</b> In mechanically ventilated buildings, provide regularly occupied areas of the building with air infiltration media for outside and return air prior to occupancy that provides at least a MERV of 11.</p> <p><b>A5.504.5.3.1.1 Filters, Tier 2.</b> In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 13.</p>			
<p><b>5.504.7 Environmental tobacco smoke (ETS) control.</b> Prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows where outdoor areas are provided for smoking and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University or campus of the University of California, whichever are more stringent.</p>	<input checked="" type="checkbox"/>		
<b>Indoor Moisture and Radon Control</b>			
<p><b>5.505.1 Indoor moisture control.</b> Buildings shall meet or exceed the provisions of <i>California Building Code</i>, CCR, Title 24, Part 2, Sections 1203 and Chapter 14.1.<sup>3</sup></p>	<input checked="" type="checkbox"/>		
<b>Air Quality and Exhaust</b>			
<p><b>5.506.1 Outside air delivery.</b> For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 of the <i>California Energy Code</i> and Chapter 4 of CCR, Title 8 or the applicable local code, whichever is more stringent.<sup>3</sup></p>	<input checked="" type="checkbox"/>		
<p><b>5.506.2 Carbon dioxide (CO<sub>2</sub>) monitoring.</b> For buildings or additions equipped with demand control ventilation, CO<sub>2</sub> sensors and ventilation controls shall be specified and installed in accordance with the requirements of the <i>California Energy Code</i>, CCR, Section 120(c)(4).<sup>3</sup></p>	<input checked="" type="checkbox"/>		

(continued)

**SECTION A5.602**  
**NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS—continued<sup>4</sup>**

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY <sup>1</sup>	
		CALGreen Tier 1	CALGreen Tier 2
<b>Environmental Comfort</b>			
<p><b>A5.507.1 Lighting and thermal comfort controls.</b> Provide controls in the workplace as described in Sections A5.507.1.1 and A5.507.1.2.</p> <p><b>A5.507.1.1 Single-occupant spaces.</b> Provide individual controls that meet energy use requirements in the <i>California Energy Code</i> by Sections A5.507.1.1.1 and A5.507.1.1.2.</p> <p><b>A5.507.1.1.1 Lighting.</b> Provide individual task lighting and/or daylighting controls for at least 90 percent of the building occupants.</p> <p><b>A5.507.1.1.2 Thermal comfort.</b> Provide individual thermal comfort controls for at least 50 percent of the building occupants by Items 1 and 2 in Section A5.507.1.1.2.</p> <p><b>A5.507.1.2 Multi-occupant spaces.</b> Provide lighting and thermal comfort system controls for all shared multi-occupant spaces.</p>		<input type="checkbox"/>	<input type="checkbox"/>
<p><b>A5.507.2 Daylight.</b> Provide daylit spaces as required for toplighting and sidelighting in the <i>California Energy Code</i>. In constructing a design, consider Items 1 through 4 in Section A5.507.3.</p>		<input type="checkbox"/>	<input type="checkbox"/>
<p><b>A5.507.3 Views.</b> Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90 percent of all regularly occupied areas.</p> <p><b>A5.507.3.1 Interior office spaces.</b> Entire areas of interior office spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.</p> <p><b>A5.507.3.2 Multi-occupant spaces.</b> Include in the calculation the square footage with direct line of sight to perimeter vision glazing.</p>		<input type="checkbox"/>	<input type="checkbox"/>
<p><b>5.507.4 Acoustical control.</b> Employ building assemblies and components with STC values determined in accordance with ASTM E 90 and ASTM E 413 or OITC determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.</p> <p><b>5.507.4.1 Exterior noise transmission, prescriptive method.</b> Wall and floor-ceiling assemblies exposed to the noise source making up the building envelope shall have exterior wall and roof ceiling assemblies meeting a composite STC rating of at least 50 or a composite OITC rating of no less than 40 with exterior windows of a minimum STC of 40 or OITC of 30 in the locations described in Items 1 and 2. Also applies to addition envelope or altered envelope.</p> <p><b>5.507.4.1.1 Noise exposure where noise contours are not readily available.</b> Buildings exposed to a noise level of 65 dB <math>L_{eq}</math>-1Hr during any hour of operation shall have exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30). Also applies to addition or alteration exterior wall.</p> <p><b>5.507.4.2 Performance method.</b> For buildings located as defined in Sections A5.507.4.1 or A5.507.4.1.1, wall and roof-ceiling assemblies making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (<math>L_{eq}</math>-1Hr) of 50 dBA in occupied areas during any hour of operation. Also applies to addition envelope or altered envelope.</p> <p><b>5.507.4.2.1 Site features.</b> Exterior features such as sound walls or earth berms may be utilized as appropriate to the project to mitigate sound migration to the interior. Also applies to addition envelope or altered envelope.</p> <p><b>5.507.4.2.1 Documentation of compliance.</b> An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.</p> <p><b>5.507.4.3 Interior sound transmission.</b> Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.</p>	<input checked="" type="checkbox"/>		
<b>Outdoor Air Quality</b>			
<p><b>5.508.1 Ozone depletion and global warming reductions.</b> Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.</p> <p><b>5.508.1.1 CFCs.</b> Install HVAC and refrigeration equipment that does not contain CFCs.<sup>3</sup></p> <p><b>5.508.1.2 Halons.</b> Install fire suppression equipment that does not contain Halons.<sup>1</sup></p> <p><b>A5.508.1.3 Hydrochlorofluorocarbons (HCFCs).</b> Install HVAC and refrigeration equipment that does not contain HCFCs.</p> <p><b>A5.508.1.4 Hydrofluorocarbons (HFCs).</b> Install HVAC complying with either of the following:</p> <ol style="list-style-type: none"> <li>1. Install HVAC, refrigeration and fire suppression equipment that do not contain HFCs or that do not contain HFCs with a global warming potential greater than 150.</li> <li>2. Install HVAC and refrigeration equipment that limit the use of HFC refrigerant through the use of a secondary heat transfer fluid with a global warming potential no greater than 1.</li> </ol>	As applicable <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>5.508.2 Supermarket refrigerant leak reduction.</b> New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.</p> <p><b>Exception:</b> Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO<sub>2</sub>), and potentially other refrigerants.</p>	<input checked="" type="checkbox"/> As applicable		



**SECTION A5.602  
NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS—continued<sup>4</sup>**

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY <sup>1</sup>	
		CALGreen Tier 1	CALGreen Tier 2
<p><b>5.508.2.1 Refrigerant piping.</b> Piping compliant with the <i>California Mechanical Code</i> shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.</p> <p><b>5.508.2.1.1 Threaded pipe.</b> Threaded connections are permitted at the compressor rack.</p> <p><b>5.508.2.1.2 Copper pipe.</b> Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.</p> <p><b>5.508.2.1.2.1 Anchorage.</b> 1/4 inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.</p> <p><b>5.508.2.1.3 Flared tubing connections.</b> Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.</p> <p><b>Exception:</b> Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer’s recommendations.</p> <p><b>5.508.2.1.4 Elbows.</b> Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.</p> <p><b>5.508.2.2 Valves.</b> Valves and fittings shall comply with the <i>California Mechanical Code</i> and as follows.</p> <p><b>5.508.2.2.1 Pressure relief valves.</b> For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.</p> <p><b>5.508.2.2.1.1 Pressure detection.</b> A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.</p> <p><b>5.508.2.2.2 Access valves.</b> Only Schrader access valves with a brass or steel body are permitted for use.</p> <p><b>5.508.2.2.2.1 Valve caps.</b> For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.</p> <p><b>5.508.2.2.2.2 Seal caps.</b> If designed for it, the cap shall have a neoprene O-ring in place.</p> <p><b>5.508.2.2.2.2.1 Chain tethers.</b> Chain tethers to fit over the stem are required for valves designed to have seal caps.</p> <p><b>Exception:</b> Valves with seal caps that are not removed from the valve during stem operation.</p> <p><b>5.508.2.3 Refrigerated service cases.</b> Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.</p> <p><b>5.508.2.3.1. Coil coating.</b> Consideration shall be given the heat transfer efficiency of coil coating to maximize energy efficiency.</p> <p><b>5.508.2.4 Refrigerant receivers.</b> Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device that indicates the level of refrigerant in the receiver.</p> <p><b>5.508.2.5 Pressure testing.</b> The system shall be pressure tested during installation prior to evacuation and charging.</p> <p><b>5.508.2.5.1 Minimum pressure.</b> The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.</p> <p><b>5.508.2.5.2 Leaks.</b> Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.</p> <p><b>5.508.2.5.3 Allowable pressure change.</b> The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.</p> <p><b>5.508.2.6 Evacuation.</b> The system shall be evacuated after pressure testing and prior to charging.</p> <p><b>5.508.2.6.1 First vacuum.</b> Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.</p> <p><b>5.508.2.6.2 Second vacuum.</b> Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.</p> <p><b>5.508.2.6.3 Third vacuum.</b> Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.</p>			

- Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.
- Required prerequisite for this Tier.
- These measures are currently required elsewhere in statute or in regulation.
- This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.

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# HISTORY NOTE APPENDIX CALIFORNIA GREEN BUILDING STANDARDS CODE

## (Title 24, Part 11, California Code of Regulations)

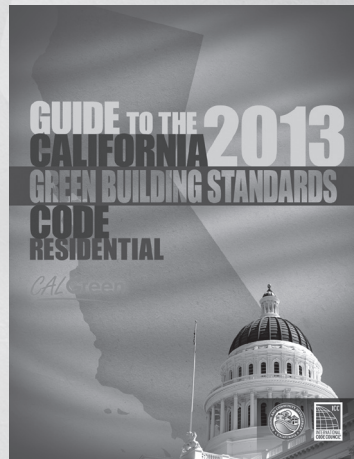
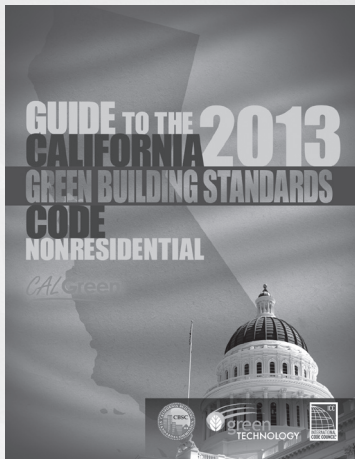
For prior history, see the History Note Appendix to the *California Green Building Standards Code*, 2010 Edition, effective January 1, 2011.

1. (BSC 07/12, HCD 04/12, DSA-SS 06/12, CEC 01/12) Repeal, amend and add provisions in the 2013 *California Green Building Standards Code* for residential, nonresidential and public school buildings. Effective on January 1, 2014.
2. Errata to correct editorial errors within the preface, Chapters 4 and 5, Appendices A5 and A6.1 and the Index of this code. Effective January 1, 2014.
3. (CEC 01/12) A delayed effective date for the energy based provisions within the 2013 *California Green Building Standards Code* was approved at the April 22, 2014 California Building Standards Commission meeting. The new effective date for the energy based provisions of the 2013 *California Green Building Standards Code* is July 1, 2014.
4. 2013 Intervening Cycle Supplement; BSC 06/13, DSA-SS 02/13, HCD 05/13 – Approved by the California Building Standards Commission on July 22, 2014. Published on January 1, 2015 and effective July 1, 2015.

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