EXPRESS TERMS
FOR
PROPOSED BUILDING STANDARDS
OF THE
DIVISION OF THE STATE ARCHITECT (DSA-SS)

REGARDING ADOPTION OF AMENDMENTS FOR THE 2013 CALIFORNIA BUILDING STANDARDS CODE, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR), PART 11, CALIFORNIA GREEN BUILDING STANDARDS CODE

The California Building Standards Code (California Code of Regulations, Title 24, Part 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12) is published in its entirety every three years and is applicable to all buildings for which an application for a building permit is made during the Code's effective period. Each triennial edition of the California Building Standards Code becomes effective 180 days after its publication.

These proposed regulations will make effective the 2013 edition of the California Green Building Standards Code (*CALGreen* Code) for application by DSA-SS to public elementary and secondary schools, and community colleges.

Further, these proposed regulations will repeal the 2010 edition *CALGreen* Code adopted as the 2010 California Green Building Standards Code (*CALGreen* Code).

LEGEND FOR EXPRESS TERMS

1. New California language and modified language is underlined.
2. Repealed text: All such language appears in ~~strikeout~~.
3. *[Information for the reader is bracketed and in red italics]*

The California Division of the State Architect – Structural Safety (DSA-SS) proposes to amend the 2010 edition of the California Green Building Standards Code (CGBSC) for the 2013 edition as shown on the following pages. Adopt new text as follows:

CHAPTER 1 ADMINISTRATION

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101.3.1 State-regulated buildings, structures and applications. Provisions of this code shall apply to the following buildings, structures, and applications regulated by state agencies ~~as referenced in the Matrix Adoption Tables and~~ as specified in Sections 103 through 106, except where modified by local ordinance pursuant to Section 101.7. When adopted by a state agency, the provisions of this code shall be enforced by the appropriate enforcing agency, but only to the extent of authority granted to such agency by statute.

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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 construction on a new campus site or new construction on an existing site cleared of all existing structures.~~ New building construction and site work on a new or existing site.

Notes for existing sites:

1. Requirements for site work related to Grading and Paving (Section 5.106.10) only applies to area adjacent to the new building construction.

2. Requirements for Bicycle Parking (Section 5.106.4.2) can be met using a location anywhere on the existing campus and may include the existing bicycle parking. Provide documentation of existing amenities.

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.

CHAPTER 2 DEFINITIONS

SECTION 202
DEFINITIONS

[Incorporate relocated and new definitions alphabetically into existing definitions in Section 202]

. . .

ADDITION. *[Relocated from Division 5.7]*

ADJUST. *[Relocated from Division 5.4.]*

ALTERATION OR ALTER. *[Relocated from Division 5.7]*

ALBEDO. *[Relocated from Division A5.1]*

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BALANCE. *[Relocated from Division 5.4.]*

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 degrees Fahrenheit.

BUILDING COMMISSIONING. *[Relocated from Division 5.4 and A5.4.]*

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CALIFORNIA RESIDENTIAL CODE. … *[Add from Section 202, BSC definitions]*

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

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

. . .

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*.

CONDITIONED SPACE, DIRECTLY. … *[Add from Section 202, BSC definitions]*

CONDITIONED SPACE, INDIRECTLY. … *[Add from Section 202, BSC definitions]*

CUTOFF LUMINAIRES. *[Relocated from Division 5.1]*

DISPOSAL. … *[Add from Section 202, BSC definitions]*

DIVERSION. … *[Add from Section 202, BSC definitions]*

. . .

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, 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 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. *[Relocated from Division A5.4.]*

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EUTROPHICATION. *[Relocated from Division A5.4.]*

EXFILTRATION. … *[Add from Section 202, BSC definitions]*

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GEOTHERMAL. *[Relocated from Division A5.2.]*

GLOBAL WARMING POTENTIAL (GWP). The radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time. Carbon dioxide is the reference compound with a GWP of one.

GLOBAL WARMING POTENTIALVALUE (GWP VALUE). The 100-yr GWP value published by the Intergovernmental Panel on Climate Change (IPCC) in either its Second Assessment Report (SAR) (IPCC, 1995); or its Fourth Assessment A-3 Report (AR4) (IPCC, 2007). The SAR GWP values are found in column “SAR (100-yr)” of Table 2.14.; the AR4 GWP values are found in column “100 yr” of Table 2.14.

GRAYWATER. Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

Note: For the purpose of applying the standards contained in this code, "Graywater," as defined above, has the same meaning as "gray water", "grey water", and "greywater".

HALON. Any of a class of chemical compounds derived from hydrocarbons by replacing one or more hydrogen atoms by bromine atoms, and other hydrogen atoms by other halogen atoms (chlorine, fluorine, iodine).

HAZARDOUS WASTE. … *[Add from Section 202, BSC definitions]*

. . .

HEAT ISLAND EFFECT. "Heat island effect" and "urban heat islands" refer to measurable elevated temperatures in developed areas as compared to more rural surroundings. Temperatures in developed areas are affected by absorption of heat by hardscapes and radiation of heat into surrounding areas resulting in local climate changes. Heat islands are influenced by geographic location and by local weather patterns with effects changing on a daily or seasonal basis.

HIGH-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that is: (A) a chlorofluorocarbon, a hydrochlorofluorocarbon, a hydrofluorocarbon, a perfluorocarbon, or any compound or blend of compounds, with a GWP value equal to or greater than 150, or (B) any ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, §82.3 (as amended March 10, 2009).

HIGH-RISE RESIDENTIAL BUILDING. For the purposes of CALGreen, any building that is of Occupancy Group R and is four stories or greater in height,

HYDROCHLOROFLUOROCARBON (HCFC). A class of compounds primarily used as refrigerants or foam expansion agents, consisting of only hydrogen, chlorine, fluorine, and carbon.

HYDROFLUOROCARBON (HFC). A class of compounds primarily used as refrigerants or foam expansion agents, consisting of only hydrogen, fluorine, and carbon.

HYDROZONE. *[Relocated from Division A5.3.]*

IESNA. Illuminating Engineering Society of North America.

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INERT SOLIDS OR INERT WASTE. … *[Add from Section 202, BSC definitions]*

INTERIOR BUILDING. *[Relocated from Division A5.5.]*

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LANDSCAPE (PLANT) COEFFICIENT (*KI*). *[Relocated from Divisions 5.3 and A5.3.]*

LIFE CYCLE ASSESSMENT (LCA). *[Relocated from Division A5.4.]*

LIFE CYCLE INVENTORY (LCI). *[Relocated from Division A5.4.]*

LONG RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.5 times the pipe diameter.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES. *[Relocated from Division 5.1.]*

LOW-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that: (A) has a GWP value less than 150, and (B) is not an ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, §82.3 (as amended March 10, 2009).

LOW-RISE RESIDENTIAL BUILDING. For the purposes of CALGreen, any building that is of Occupancy Group R and is three stories or less~~, or that is a one- or two- family dwelling or townhouse~~

MERV. [BSC, DSA-SS]. *[Relocated from Division A5.5.]*

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE ~~(MLO)~~ (MWELO). *[Relocated from Divisions 5.3 and A5.3.]*

MOUNTING HEIGHT (MH). The height of the photometric center of a luminaire above grade level.

MULTI-OCCUPANT SPACES. *[Relocated from Division A5.5.]*

NEIGHBORHOOD ELECTRIC VEHICLE (NEV). *[Relocated from Division 5.1.]*

NEWLY CONSTRUCTED (or NEW CONSTRUCTION). … *[Add from Section 202, BSC definitions]*

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NO ADDED FORMALDEHYDE (NAF) BASED RESINS]. *[Relocated from Division A5.5.]*

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OVE. *[Relocated from Division A5.4.]*

PRECONSUMER (or POSTINDUSTRIAL) CONTENT. *[Relocated from Division A5.4.]*

PLANTS. *[Duplicative language in Division A5.3, leave definition in Section 202.]*

POSTCONSUMER CONTENT. *[Relocated from Division A5.4.]*

POTABLE WATER. *[Relocated from Divisions 5.3 and A5.3.]*

PROCESS. *[Relocated from Division A5.2.]*

PROCESS SPACE. … *[Add from Section 202, BSC definitions]*

. . .

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.

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RECYCLE OR RECYCLING. … *[Add from Section 202, BSC definitions]*

RECYCLED CONTENT. *[Relocated from Division A5.4.]*

RECYCLED CONTENT VALUE (RCV). *[Relocated from Division A5.4.]*

RECYCLED WATER. *[Relocated from Divisions 5.3 and A5.3.]*

RE-USE. … *[Add from Section 202, BSC definitions]*

REFERENCE EVAPOTRANSPIRATION (ETo). **[BSC]** The estimated rate of evapotranspiration from a standardized surface of well watered, actively growing cool season four- to seven-inch (10.16 – 17.78 cm) turfgrass ~~clipped to 12 cm~~ with sufficient density to fully shade the soil. The water needs of a landscape planting can be calculated by multiplying the Landscape Coefficient [Kl] and Reference Evapotranspiration {ETo} *[Relocated from Divisions A5.3. and edited for clarification]*

RESIDENTIAL BUILDING. (See "LOW-RISE RESIDENTIAL BUILDING" or "HIGH-RISE RESIDENTIAL BUILDING.")

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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. *[Relocated from Division A5.5.]*

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.

SOLID WASTE. … *[Add from Section 202, BSC definitions]*

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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. *[Relocated from Divisions 5.3 and A5.3.]*

SUPERMARKET. For the purposes of Section 5.508.2, a supermarket is any retail food facility with 8,000 square feet or more conditioned area, and that utilizes either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units.

TENANT-OCCUPANTS. *[Relocated from Division 5.1.]*

TEST. *[Relocated from Division 5.4]*

~~**TIME DEPENDENT VALUATION (TDV).** The time varying energy caused to be used by the building to provide space conditioning and water heating and for specified buildings lighting. TDV energy accounts for the energy used at the building site and consumed in producing and in delivering energy to a site, including, but not limited to, power generation, transmission and distribution losses.~~

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WATER BUDGET. Is the ~~E~~estimated total landscape irrigation water use which shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Water Efficient Landscape Ordinance ~~(MLO)~~ (MWELO) *[Relocated from Division 5.3.]*

ULTRA-LOW EMITTING FORMALDEHYDE (ULEF) RESINS. *[Relocated from Division A5.5.]*

VANPOOL VEHICLE. *[Relocated from Division 5.1.]*

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ZEV. *[Relocated from Division 5.1.]*

CHAPTER 3
GREEN BUILDING

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SECTION 306 [DSA-SS]
VOLUNTARY MEASURES

306.1 Purpose. For Public Schools and Community Colleges, Appendix A5, Nonresidential Voluntary Measures, ~~are intended~~ 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 optional provisions of Appendix A5, Division A5.6, outlines voluntary tiers to develop a sustainably designed facility utilizing the voluntary measures in Division A5.1 through A5.5.

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES
(RESERVED FOR HCD)

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

DIVISION 5.1 – PLANNING AND DESIGN

SECTION 5.101
GENERAL

5.101.1 ~~Purpose~~ 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 5.102
DEFINITIONS

5.102.1 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.~~ The following terms are defined in chapter 2.

CUTOFF LUMINAIRES. *[Relocated to Chapter 2.]*

...

SECTION 5.106
SITE DEVELOPMENT

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 Short-Term bicycle parking. Provide permanently anchored bicycle racks within 200 feet of the

student entrance readily visible to passers-by, for 5 percent of the student population based on the total occupant load of the campus with a minimum of one two-bike capacity rack.

5.106.4.2.2 Long-Term bicycle parking. Provide secure bicycle parking for 5 percent employees, based on the total number of motorized vehicle parking capacity in staff parking lot, with a minimum of one space. 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 rack; or
3. Lockable, permanently anchored bicycle lockers.

…

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~~NA~~ 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 147 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.

~~**5.106.8.1 Effective date.** Newly constructed nonresidential projects with outdoor lighting for which an application for a building permit is submitted on or after July 1, 2012 shall comply with this section.~~

TABLE 5.106.8 [N]
Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings[1, 2]
[Contents of table to remain unchanged]

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.

DIVISION 5.2 – ENERGY EFFICIENCY

SECTION 5.201
GENERAL

5.201.1 Scope. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

~~**Note:** It is the intent of this code to encourage buildings to achieve exemplary performance in the area of energy efficiency. For the purposes of energy efficiency standards, the California Energy Commission believes specifically, a green building should achieve at least a 15% reduction in energy usage when compared to the~~

~~State's mandatory energy efficiency standards.~~

DIVISION 5.3 – WATER EFFICIENCY AND CONSERVATION

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SECTION 5.302
DEFINITIONS

5.302.1 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.~~ The following terms are defined in chapter 2.

GRAYWATER. ~~Untreated household~~ **...** *[Relocated to Chapter 2 with a new definition]*

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MLO). *[Relocated to Chapter 2 with a correction to the acronym.]*

POTABLE WATER. *[Relocated to Chapter 2.]*

RECYCLED WATER. *[Relocated to Chapter 2.]*

SUBMETER. *[Relocated to Chapter 2.]*

WATER BUDGET. *[Relocated to Chapter 2 with a correction to the acronym.]*

SECTION 5.303
INDOOR WATER USE

~~**5.303.2 Twenty 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. The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code. The 20 percent reduction in potable water use shall be demonstrated by one of the following methods.~~

~~1. Prescriptive method. Each plumbing fixture and fitting shall meet the 20% reduced flow rate not exceed the maximum flow rate at ≥20 percent reduction as specified in Table 5.303.2.3, or~~
~~2. Performance method. A calculation demonstrating a 20% reduction in the building "water use baseline" as established in Table 5.303.2.2 shall be provided.~~

5.303.2 Water Reduction. Plumbing fixtures shall meet the maximum flow rate values shown in table 5.303.2.3

Exception: buildings that demonstrate 20 percent overall water use reduction. In this case, a calculation demonstrating a 20% reduction in the building "water use baseline" as established in Table 5.303.2.2 shall be provided.

[The following section has been modified relocated to new Section 5.303.3.3.2 below]

~~**5.303.3.3 Multiple showerheads serving one shower.** When a shower is served by more than one newly installed showerhead, the combined flow rate of all the showerheads controlled by a single valve shall not exceed the maximum flow rate at ≥20 percent reduction contained in Table 5.303.2.2 or the shower shall be designed to only allow one showerhead to be in operation at a time.~~

~~Exception: The maximum flow rate for shower heads….~~

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TABLE 5.303.2.2
WATER USE BASELINE [3]

Fixture Type	Baseline Flow-rate[2]	Duration	Daily uses	Occupants [2]

Showerheads	2.0 ~~2.5~~ gpm @ 80 psi	5 min.	1	X[2a]
~~Lavatory faucets, residential~~	~~2.2 gpm @ 60 psi~~	~~.25 min.~~	~~3~~	~~X~~
Lavatory Faucets Nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X[2b]
Kitchen Faucets	2.2 gpm @ 60 psi	4 min.	1	X
Replacement Aerators	2.2 gpm @ 60 psi			X
Wash Fountains	2.2 [rim space (in.) / 20 gpm @ 60 psi]			X
Metering Faucets	0.25 gallons/cycle	.25 min.	3	X
Metering Faucets for Wash Fountains	0.25 [rim space (in.) / 20 gpm @ 60 psi]	.25 min.		X
Gravity tank type Water Closets	1.28 ~~1.6~~ gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer Tank Water Closets	1.28 ~~1.6~~ gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer Valve Water Closets	1.28 ~~1.6~~ gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical Hydraulic Water Closets	1.28 ~~1.6~~ gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	0.5 ~~1.0~~ gallons/flush	1 flush	2 male	X

Fixture "Water Use" = Flow rate x Duration x Occupants x Daily uses

[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, 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) Nonresidential kitchen faucet use is determined by the occupant load of the area served by the fixture.

[3] Use Worksheet WS-1 to calculate base line water use.

~~TABLE 5.303.2.3~~
~~FIXTURE FLOW RATES~~

~~Fixture Type~~	~~Baseline Flow-rate~~	~~Maximum flow rate at ≧ 20% Reduction~~
~~Showerheads~~	~~2.5 gpm @ 80 psi~~	~~2 gpm @ 80 psi~~
~~Lavatory faucets, residential~~	~~2.2 gpm @ 60 psi~~	~~1.5 gpm @ 60 psi[1]~~
~~Lavatory Faucets Nonresidential~~	~~0.5 gpm @ 60 psi~~	~~0.4 gpm @ 60 psi[3]~~
~~Kitchen Faucets~~	~~2.2 gpm @ 60 psi~~	~~1.8 gpm @ 60 psi[2]~~
~~Wash Fountains~~	~~2.2 [rim space (in.) / 20 gpm @ 60 psi]~~	~~1.8 [rim space (in.) / 20 gpm @ 60 psi]~~
~~Metering Faucets~~	~~0.25 gallons/cycle~~	~~0.2 gallons/cycle~~
~~Metering Faucets for Wash Fountains~~	~~.25 [rim space (in.) / 20 gpm @ 60 psi]~~	~~.20 [rim space (in.) / 20 gpm @ 60 psi]~~
~~Gravity tank type Water Closets~~	~~1.6 gallons/flush~~	~~1.28 gallons/flush[1]~~
~~Flushometer Tank Water Closets~~	~~1.6 gallons/flush~~	~~1.28 gallons/flush[1]~~
~~Flushometer Valve Water Closets~~	~~1.6 gallons/flush~~	~~1.28 gallons/flush[1]~~
~~Electromechanical Hydraulic Water Closets~~	~~1.6 gallons/flush~~	~~1.28 gallons/flush[1]~~
~~Urinals~~	~~1.0 gallons/flush~~	~~.5 gallons/flush~~

~~[1] Lavatory Faucets Residential shall not have a flow rate less than 0.8 gpm at 20 psi.~~

~~[2] Kitchen faucets may temporarily increase flow above the maximum rate, but not above 2.2 gpm @ 60 psi and must default to a maximum flow rate of 1.8 gpm @ 60 psi.~~

~~[3] Where complying faucets are unavailable, aerators rated at .35 gpm or other means may be used to achieve reduction.~~

~~1.4~~ ~~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 A112.19.233.2.~~

~~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.~~

[Revised table]

TABLE 5.303.2.3
WATER REDUCTION FIXTURE FLOW RATES

Fixture Type	Maximum flow rate
Kitchen Faucets	1.8 gpm @ 60 psi
Wash Fountains	1.8 [rim space (in.) / 20 gpm @ 60 psi]
Metering Faucets	0.20 gallons/cycle
Metering Faucets for Wash Fountains	.20 [rim space (in.) / 20 gpm @ 60 psi]

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.

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5.303.4 Wastewater reduction. [N] Each building shall reduce by 20% wastewater by one of the following methods:

1. **[BSC, DSA-SS]** The installation of water-conserving fixtures (water closets, urinals) meeting the criteria established in sections 5.303.2 or 5.303.3 ~~or~~

• • •

5.303.6 Standards for p ~~P~~lumbing fixtures and fittings. Plumbing fixtures ~~(water closets and urinals)~~ and fittings ~~(faucets and showerheads)~~ shall ~~meet the standards referenced in Table 5.303.6~~ 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.

~~**TABLE 5.303.6**~~
~~**STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS**~~

REQUIRED STANDARDS	
~~Water closets (toilets) – flushometer valve type single flush, maximum flush volume~~	~~ASME A112.19.2/CSA B45.1 – 1.28 gal (4.8 L)~~
~~Water closets (toilets) – flushometer valve type dual flush, maximum flush volume~~	~~ASME A112.19.14 and USEPA WaterSense Tank-Type High Efficiency Toilet Specification – 1.28 gal (4.8 L).~~
~~Water closets (toilets) – tank-type~~	~~U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification~~
~~Urinals, maximum flush volume~~	~~ASME A112.19.2/CSA B45.1 – 0.5 gal (1.9 L)~~
~~Urinals, non-water urinals~~	~~ASME A112.19.19 (vitreous china) ANSI Z124.9–2004 or IAPMO Z124.9 (plastic)~~
~~Public lavatory faucets: Maximum flow rate – 0.5 gpm (1.9 L/min)~~	~~ASME A112.18.1/CSA B125.1~~
~~Public metering self-closing faucets: Maximum water use – 0.25 gal (1.0 L) per metering cycle~~	~~ASME A112.18.1/CSA B125.1~~
~~Residential bathroom lavatory sink faucets: Maximum flow rate – 1.5 gpm (5.7 l/min)~~[1]	~~ASME A112.18.1/CSA B125.1~~
~~Showerheads: Maximum flow rate – 2.5 gal (9.5 l/min)~~	~~ASME A112.18.1/CSA B125.1~~

DIVISION 5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

. . .

SECTION 5.402
DEFINITIONS

5.402.1 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.~~ The following terms are defined in chapter 2.

ADJUST. *[Relocated to Chapter 2.]*

BALANCE. *[Relocated to Chapter 2.]*

BUILDING COMMISSIONING. … *[Add from Section 202, BSC definitions]*

TEST. *[Relocated to Chapter 2.]*

…

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

5.407.2.1 Sprinklers. Design 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 non-absorbent floor and wall finishes within at least two feet around and perpendicular to such openings plus at least one of the following:

1. An awning at least 4 feet in depth is installed
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

~~**Notes:**~~

~~1. Use features such as overhangs and recesses, and flashings integrated with a drainage plane.~~

~~2.. Use non-absorbent floor and wall finishes within at least two feet around and perpendicular to such openings~~

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% of the non-hazardous 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 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~~, where demolition of an existing structure(s) is necessary for the construction of a new structure~~.

. . .

~~**5.408.2 Isolated jobsites.** The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.~~

. . .

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.

DIVISION 5.5 – ENVIRONMENTAL QUALITY

. . .

SECTION 5.502
DEFINITIONS

5.502.1 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.~~ The following terms are defined in chapter 2.

ARTERIAL HIGHWAY. *[Relocated to Chapter 2.]*

A-WEIGHTED SOUND LEVEL (dba). *[Relocated to Chapter 2.]*

BTU/HOUR. *[New definition located in Chapter 2.]*

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) HIGHWAY. *[Relocated to Chapter 2.]*

COMPOSITE WOOD PRODUCTS. *[Relocated to Chapter 2.]*

DAY-LIGHT AVERAGE SOUND LEVEL (Ldn). *[Relocated to Chapter 2.]*

DECIBEL (db). *[Relocated to Chapter 2.]*

ENERGY EQUIVALENT (NOISE) LEVEL (L_{eq}). *[Relocated to Chapter 2.]*

EXPRESSWAY. *[Relocated to Chapter 2.]*

FREEWAY. *[Relocated to Chapter 2.]*

GLOBAL WARMING POTENTIAL (GWP). *[New definition located in Chapter 2.]*

GLOBAL WARMING POTENTIALVALUE (GWP VALUE). *[New definition located in Chapter 2.]*

HIGH-GWP REFRIGERANT. *[New definition located in Chapter 2.]*

LONG RADIUS ELBOW. *[New definition located in Chapter 2.]*

LOW-GWP REFRIGERANT. *[New definition located in Chapter 2.]*

MERV. *[Relocated to Chapter 2.]*

MAXIMUM INCREMENTAL REACTIVITY (MIR). *[Relocated to Chapter 2.]*

PRODUCT-WEIGHTED MIR (PWMIR). *[Relocated to Chapter 2.]*

PSIG. *[New definition located in Chapter 2.]*

REACTIVE ORGANIC COMPOUND (ROC). *[Relocated to Chapter 2.]*

SCHRADER ACCESS VALVES. *[New definition located in Chapter 2.]*

SHORT RADIUS ELBOW. *[New definition located in Chapter 2.]*

SUPERMARKET. *[New definition located in Chapter 2.]*

VOC. *[Relocated to Chapter 2.]*

. . .

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

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's 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. Listed in the CDPH High Performance Product Database.

. . .

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 ~~by or before the dates specified in those sections,~~ as shown in Table 5.504.4.5.

~~TABLE 5.504.4.5~~
~~FORMALDEHYDE LIMITS~~[1]
~~Maximum Formaldehyde Emissions in Parts per Million~~

~~PRODUCT~~	~~CURRENT LIMIT~~	~~JANUARY 1, 2012~~	~~JULY 1, 2012~~
~~Hardwood plywood veneer core~~	~~0.05~~		
~~Hardwood plywood composite core~~	~~0.08~~		~~0.05~~
~~Particleboard~~	~~0.09~~		
~~Medium density fiberboard~~	~~0.11~~		
~~Thin medium density fiberboard~~[2]	~~0.21~~	~~0.13~~	

TABLE 5.504.4.5
FORMALDEHYDE LIMITS[1]
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[2]	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~~-96(2002)~~. 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 5/16 inch (8 millimeters).

. . .

5.504.4.6 Resilient flooring systems. For ~~50%~~ 80 percent of floor area receiving resilient flooring, install resilient flooring that meets at least one of the following: ~~complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on High Performance Products Database; products compliant with CHPS criteria certified under the Greenguard Children & Schools program; or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.; or meet 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.)~~

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 of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 2010;

3. ~~Defined in~~ Compliant with the 2009 California Collaborative for High Performance Schools (CHPS) Criteria and listed in the High Performance Database; or
4. Compliant with CDPH Standard Method V1.1 as certified under the Greenguard Children's & Schools Program.

. . .

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 provide 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 value shall be included in the operation and maintenance manual.

Exception: ~~A MERV-1 filter shall be allowed for return air only or return with prefiltered outside air, if the filter is of a re-usable, non-disposable type, and the fan energy use of that air delivery system is 0.4W/cfm or less at design airflow.~~

1. An ASHRAE 10 percent – 15 percent efficiency filter shall be permitted for an HVAC unit meeting the 2013 California Energy Code 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.
2. Existing mechanical equipment.

5.504.5.3.1 Labeling. Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

. . .

SECTION 5.507
ENVIRONMENTAL COMFORT

5.507.4 Acoustical control. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E90 and ASTM E413 or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures, and utility buildings.

Exception [DSA-SS]: For Public Schools and Community Colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet 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 following locations:

1. Within the 65 CNEL noise contour of an airport

Exceptions:
1. Ldn or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
2. Ldn or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan

5.507.4.1.1 Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB Leq-1-hr during any hour of operation shall have building, addition or alteration 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).

5.507.4.2 Performance method. For buildings located as defined in Sections A5.507.4.1 or A5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{eq}-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site features. Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of compliance. An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: http://www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf .

CHAPTER 6

REFERENCED ORGANIZATIONS AND STANDARDS

SECTION 601
GENERAL

601.1 This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard.

Organization	Standard	Referenced Section
. . .		
. . .		
IESNA Illuminating Engineering Society of North America		
170 Wall St, Floor 17 New York, NY 10005-4001 http://www.ies.org	IES TM-15-11	5.10 6.8
. . .		
. . .		

CHAPTER 7
INSTALLER AND SPECIAL INSPECTOR QUALIFICATIONS

SECTION 701
GENERAL
(Reserved)

SECTION 702
QUALIFICATIONS

702.2 Special inspection. [HCD] …

[BSC] …

~~**[DSA-SS]** The enforcing agency may require special inspection to verify compliance with this code or other laws that are enforced by the agency. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the enforcing agency, for inspection of the particular type of construction or operation requiring special inspection.~~

SECTION 703
VERIFICATIONS

703.1 Documentation. …

~~**[DSA-SS]** Verification of compliance with this code shall include construction documents, plans, specifications builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which show substantial conformance. Where specific documentation is necessary to verify compliance, that method of compliance will be specified in the appropriate section.~~

CHAPTER 8
COMPLIANCE FORMS AND WORKSHEETS

WORKSHEET (WS-1)
BASELINE WATER USE

Fixture Type	Flow-rate ~~(gpm)~~		Dura-tion		Daily uses		Occupants [1,2]		Gallons per day
Showerheads	2.5 gpm	X	5 min.	X	1	X	Note 2a	=	
Showerheads Residential	2.5 gpm	X	8 min.	X	1	X		=	
Lavatory Faucets Residential	2.2 gpm	X	.25 min.	X	3	X		=	
Lavatory Faucets Nonresidential	0.5 gpm	X	.25 min.	X	3	X		=	
Kitchen Faucets	2.2 gpm	X	4 min.	X	1	X	Note 2b	=	
Replacement Aerators	2.2 gpm	X		X		X		=	
Wash Fountains	2.2 gpm	X		X		X		=	
Metering Faucets	0.25 gal/cycle	X	~~.25 min.~~	~~X~~	3	X		=	
Metering Faucets for Wash Fountains	2.2 gpm	X	.25 min.	X		X		=	
Gravity tank type Water Closets	1.6 gal/flush	X	1 flush	X	1 male[1] 3 female	X		=	
Flushometer Tank Water Closets	1.6 gal/flush	X	1 flush	X	1 male[1] 3 female	X		=	
Flushometer Valve Water Closets	1.6 gal/flush	X	1 flush	X	1 male[1] 3 female	X		=	
Electromechanical Hydraulic Water Closets	1.6 gal/flush	X	1 flush	X	1 male[1] 3 female	X		=	
Urinals	1.0 gal/flush	X	1 flush	X	2 male	X		=	
Total daily baseline water use (BWU)								=	
_____(BWU) x .80 = _____Allowable water use									

1. . . . *(Footnotes remain unchanged.)*

WORKSHEET (WS-2)
20 PERCENT REDUCTION WATER USE

Fixture Type	**Flow-rate ~~(gpm)~~**		**Dura-tion**		**Daily uses**		**Occupants [2,3]**		**Gallons per day**
Showerheads		X	5 min.	X	1	X	Note 3a	=	
Showerheads Residential		X	8 min.	X	1	X		=	
Lavatory Faucets Residential		X	.25 min.	X	3	X		=	
~~Lavatory Faucets Nonresidential~~		~~X~~	~~.25 min.~~	~~X~~	~~3~~	~~X~~		~~=~~	
Kitchen Faucets		X	4 min.	X	1	X	Note 3b	=	
Replacement Aerators		X		X		X		=	
Wash Fountains		X		X		X		=	
Metering Faucets		X	~~.25 min.~~	~~X~~	3	X		=	
Metering Faucets for Wash Fountains		X	.25 min.	X		X		=	
Gravity tank type Water Closets		X	1 flush	X	1 male[5] 3 female	X		=	
HET[4] High-Efficiency Toilet	1.28 gal/flush	X	1 fliush	X	1 male[5] 3 female	X		=	
Flushometer Tank Water Closets		X	1 flush	X	1 male[5] 3 femal5	X		=	
Flushometer Valve Water Closets		X	1 flush	X	1 male[1] 3 female	X		=	
Electromechanical Hydraulic Water Closets		X	1 flush	X	1 male[5] 3 female	X		=	
Urinals		X	1 flush	X	2 male	X		=	
Urinals Non-water supplied	0.0 gal/flush	X	1 flush	X	2 male	X		=	
Proposed water use								=	
_____(BWU from WS-1) x .80 = _____Allowable water use									

1. . . . *(Footnotes 1 through 5 remain unchanged.)*

WORKSHEET (WS-3)
30 - 1 35 OR 40 PERCENT REDUCTION WATER USE

Fixture Type	Flow-rate ~~(gpm)~~		Dura-tion		Daily uses		Occupants [2,3]		Gallons per day
Showerheads		X	5 min.	X	1	X	Note 3a	=	
Showerheads Residential		X	8 min.	X	1	X		=	
Lavatory Faucets Residential		X	.25 min.	X	3	X		=	
Lavatory Faucets Nonresidential[6]		X	.25 min.	X	3	X		=	
Kitchen Faucets		X	4 min.	X	1	X	Note 3b	=	
Replacement Aerators		X		X		X		=	
Wash Fountains		X		X		X		=	
Metering Faucets		X	~~.25 min.~~	~~X~~	3	X		=	
Metering Faucets for Wash Fountains		X	.25 min.	X		X		=	
Gravity tank type Water Closets		X	1 flush	X	1 male[5] 3 female	X		=	
HET[4] High-Efficiency Toilet	1.12 gal/flush	X	1 fliush	X	1 male[5] 3 female	X		=	
Flushometer Tank Water Closets		X	1 flush	X	1 male[5] 3 femal5	X		=	
Flushometer Valve Water Closets		X	1 flush	X	1 male[1] 3 female	X		=	
Electromechanical Hydraulic Water Closets		X	1 flush	X	1 male[5] 3 female	X		=	
Urinals		X	1 flush	X	2 male	X		=	
Urinals Non-water supplied	0.0 gal/flush	X	1 flush	X	2 male	X		=	
Proposed water use								=	

30% Reduction_____(BWU from WS-1) x .70 = _____Allowable water use
35% Reduction _____(BWU from WS-1) x .65 = _____Allowable water use
40% Reduction _____(BWU from WS-1) x .60 = _____Allowable water use

[1] . . . *(Footnotes 1 through 5 remain unchanged.)*

[6] Where complying faucets are unavailable, aerators rated at .35 gpm or other means may be used to achieve reduction.

APPENDIX A5
NONRESIDENTIAL VOLUNTARY MEASURES

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 A5.1 – PLANNING AND DESIGN

SECTION A5.101
GENERAL

A5.101.1 General. 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 A5.102
DEFINITIONS

A5.102.1 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.

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% being total reflectance.

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 EPA's web site at:http://www.epa.gov/brownfields/glossary.htm.

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

GREENFIELDS. Sites that are not previously developed or graded and remain in a natural state able to support agriculture, open space, or habitat. Previously developed sites are those that previously contained buildings, roadways, parking lots, or were graded or altered by direct human activities.

GREYFIELD SITE. Any site previously developed with at least 50% of the surface area covered with impervious material.

FLOOR AREA RATIO. Gross square footage of all structures on a site divided by gross square footage of the site.

INFILL SITE. A site in an urbanized area that meets criteria defined in Public Resources Code Section 21061.3.

LOW IMPACT DEVELOPMENT (LID). Control of storm water at its source to mimic drainage services provided by an undisturbed site

LOW-EMITTING AND FUEL EFFICIENT VEHICLES. Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), including neighborhood electric vehicles (NEV), partial zero emission vehicle (PZEV), advanced technology PZEV (AT ZEV), or CNG fueled (Original equipment manufacturer only) regulated under Health and Safety Code section 43800 and CCR, Title 13, sections 1961 and 1962.

2. High efficiency vehicles, regulated by US EPA, bearing High Occupancy Vehicle (HOV) car pool lane stickers issued by the Department of Motor Vehicles.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV). A motor vehicle that meets the definition of "low-speed vehicle" either in section 385.5 of the Vehicle Code or in 49 CFR571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

SOLAR REFLECTANCE. A measure of the fraction of solar energy that is reflected by a surface (measured on a scale of 0 to 1).

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 0 and a standard white surface (solar reflectance 0.80, thermal emittance 0.90) is 100.

THERMAL EMITTANCE. The relative ability of a surface to radiate absorbed heat (measured on a scale of 0 to 1).

VANPOOL VEHICLE. Eligible vehicles are limited to any motor vehicle, other than a motor truck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purposes of ridesharing.

Note: Source: Véhicule Code, Division 1, Section 668.

VEGETATED SPACE. Vegetated spaces include, but are not limited to, native, undisturbed areas; rehabilitation of previously disturbed areas with landscaping; green belts; and recreation facilities that include landscaping, such as golf courses.

ZEV. Any vehicle certified to zero-emission standards.

SECTION A5.106
SITE DEVELOPMENT

A5.106.4 Bicycle parking and changing rooms. Comply with Sections A5.106.4.1 through A5.106.4.3; or meet local ordinance, whichever is stricter.

A5.106.4.1 Short-term bicycle parking. If the project 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% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.

A5.106.4.2 Long-term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5% of tenant-occupant motorized vehicle parking capacity, with a minimum of one space. For public schools and community colleges, provide secure bicycle parking for 15% of occupants (students, teachers, and staff). Acceptable parking facilities shall be convenient 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; and

3. Lockable, permanently anchored bicycle lockers.

A5.106.4.3 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. For public schools and community colleges, provide changing/shower facilities for the "number of administrative/teaching staff" equal to the "number of tenant-occupants" shown in Table 5.106.4.3.

TABLE A5.106.4.3

Number of tenant-occupants	Shower/changing facilities required[2]	2-tier (12" x 15" x 72") personal effects lockers[1,2] 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	1 2-tier locker for each 50 additional tenant-occupants

[1] One 2-tier locker serves two people. Lockers shall be lockable with either padlock or combination lock.

[2] 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 1 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 [BSC]. 10% of Total Spaces [DSA-SS]. 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% 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 [DSA-SS]. 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:

1. Information on qualifying vehicles, car labeling regulations, and DMV SOV stickers may be obtained from the following source:

   a. California DriveClean

   b. California Air Resources Board

   c. US EPA fuel efficiency standards

   d. Janet Okino, DMV Registration Operations, (916) 657-6678, and John Swanton, ARB Public Information, (626) 575-6858.

2. 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 charging. Provide facilities meeting Section 406.7 (Electric Vehicle) of the California Building Code and as follows:

A5.106.5.3.1 Electric vehicle supply wiring. For each space required in Table A5.106.5.3.1, provide panel capacity and dedicated conduit for one 208/240 V 40 amp circuit terminating within 5 feet of the midline of each parking space..

TABLE A5.106.5.3.1

TOTAL NUMBER OF PARKING SPACES[1]	NUMBER OF REQUIRED SPACES
1—50	1
51—200	2
201—and over	4

1 In a parking garage, the total number of parking spaces is for each individual floor or level.

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. Strategies for programs may be obtained from local TMAs.

   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 AQ5.106.7.1 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% 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% 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% 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 5may be found at the California Energy Commission's web site at www.energy.ca.gov .

A5.106.9 Building orientation. Locate and orient the building as follows:

1. When site and location permit, orient the long axis of the building east and west, with a maximum allowable deviation of 30º.

2. [OSHPD 1, 2 & 4]

3. Protect the building from thermal loss, drafts, and degradation of the building envelope caused by wind and wind-driven materials such as dust, sand, snow, and leaves with building orientation and landscape features.

Note: For information on sun angles and shading, visit: http://www2.aud.ucla.edu/energy-design-tools/. Calculations may be made using the Solar-2 tool.

A5.106.9.1 Building orientation and shading. Locate, orient and shade the building as follows:

1. Provide exterior shade for south-facing windows during the peak cooling season. [DSA-SS] In Public School and Community College buildings, shade may be provided by trees, solar shade structures, or other alternate methods.

A5.106.11 Heat island effect. Reduce non-roof heat islands by Section A5.106.11.1 and roof heat islands by A5.106.11.2.

A5.106.11.1 Hardscape alternatives. Use one or a combination of strategies 1 through 3 for 50% of site hardscape or put 50% of parking underground.

1. Provide shade (mature within 5 years of occupancy). [DSA-SS] In Public School and Community College buildings, solar shade structures may be used in lieu of trees to provide required shade.

2. 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.

3. Use open-grid pavement system or pervious or permeable pavement system.

A5.106.11.2 Cool roof. Use roofing materials having a minimum 3-year 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 A5.106.11.2.1 for Tier 1 or A5.106.11.2.2 for Tier 2.

A5.106.11.2.1 Solar reflectance. Roofing materials shall have a minimum 3-year aged solar reflectance equal to or greater than the values specified in Table A5.106.11.2.1 for Tier 1 and Table A5.106.11.2.2 for Tier 2.

If CRRC testing for 3-year aged reflectance is not available for any roofing products, the 3-year aged value shall be determined using the Cool Roof Rating Council (CRRC) certified initial value using he

~~equation R_{aged} = [0.2 + 0.7[$P_{initial}$ – 0.2], where $P_{initial}$ = the initial Solar Reflectance.~~

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

~~A5.106.11.2.2 Thermal emittance. Roofing materials shall have a CRRC initial or 3-year aged thermal emittance as determined in accordance with ASTM E 408 or C 1371 equal to or greater than those specified in Table A5.106.11.2.1 for Tier 1 and Table A5.106.11.2.2 for Tier 2.~~

~~Thermal emittance may also be certified by other supervisory entities approved by the Commission pursuant to Title 24, Part 1, Section 10-113.~~

~~A5.106.11.2.3 Solar reflectance index alternative. Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A5.106.11.2.1 for Tier 1 and Table A5.106.11.2.2 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 California Energy Code, Section 118(i)3. Solar reflectance values used in the SRI-WS shall be based on the 3-year 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 three year 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, Section 10-113.~~

~~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 or by email at 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 [BSC]~~
~~TIER 2~~

~~Roof Slope~~	~~Roof Weight~~	~~Climate Zone~~	~~Minimum 3-year Aged~~		
			~~Solar Reflectance~~	~~Thermal Emittance~~	~~SRI~~
~~< 2 : 12~~	~~N.A~~	~~2-15~~	~~0.55~~	~~0.75~~	~~64~~
~~> 2 : 12~~	~~< 5 lbs./ft^2~~	~~2-16~~	~~0.20~~	~~0.75~~	~~16~~
	~~>5 lbs./ft^2~~	~~1-16~~	~~0.15~~	~~0.75~~	~~10~~

~~Table A5.106.11.2.2~~
~~TIER 2~~

~~Roof Slope~~	~~Roof Weight~~	~~Climate Zone~~	~~Minimum 3-year Aged Solar Reflectance~~	~~Thermal Emittance~~	~~Minimum Aged SRI~~
~~< 2 : 12~~	~~N/A~~	~~1-16~~	~~TBD~~	~~TBD~~	~~78~~
~~> 2 : 12~~	~~N/A~~	~~1-16~~	~~TBD~~	~~TBD~~	~~29~~

APPPENDIX A5
NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.2 – ENERGY EFFICIENCY
SECTION A5.201
GENERAL

A5.201.1 Scope. For the purposes of energy efficiency standards in this appendix, the California Energy Commission will continue to adopt mandatory standards. It is the intent of this code to encourage buildings to achieve exemplary performance in the area of energy efficiency. Specifically, a green building should achieve at least a 15 percent reduction in energy usage when compared to the State's mandatory energy efficiency standards.

SECTION A5.202
DEFINITIONS

A5.202.1 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.

ENERGY STAR. A joint program of A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy. ENERGY STAR is a voluntary program designed to identify and promote energy-efficient products and practices.

DEMAND RESPONSE AUTOMATION INTERNET SOFTWARE CLIENT. Software that resides in a building Energy Management Control System that can receive a demand response signal and automatically reduce HVAC and lighting system loads. Demand Response programs developed by Utilities and ISOs depend upon timely and reliable communications of events and information to the buildings that are participating in the programs.

GEOTHERMAL. Renewable energy generated by deep-earth water or steam.

GRID NEUTRAL. A site that produces at least as much renewable electricity as it uses in a year shall be deemed grid neutral.

OVERCURRENT PROTECTION DEVICE RATING. Software that resides in a building Energy Management Control System that can receive a demand response signal and automatically reduce HVAC and lighting system loads. Demand Response programs developed by Utilities and ISOs depend upon timely and reliable communications of events and information to the buildings that are participating in the programs.

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.

SECTION A5.203
PERFORMANCE APPROACH

A5.203.1 Energy performance. Using an Alternative Calculation Method approved by the California Energy Commission, calculate each nonresidential building's annual TDV regulated energy use components and compare them to the standard or "budget" building.

Note: The "percent better than" calculation omits Process and Receptacle energy use components in comparing the Standard and Proposed energy use.

A5.203.1.1 Tier 1 [BSC]. Energy efficiency – 15 percent above the California Energy Code [DSA-SS]. Exceed the 2010 California Energy Code requirements by 15 percent.

A5.203.1.2 Tier 2 [BSC]. Energy efficiency – 30 percent the California Energy Code [DSA-SS]. Exceed the 2010 California Energy Code requirements by 30 percent.

Field verify and document the measures and calculations used to reach the desired level of efficiency following the requirements specified in the Title 24 Reference Appendices.

A5.203.2 Energy performance. It is the intent of this code to encourage green buildings to achieve exemplary performance in the area of energy efficiency.

A5.203.2.1 *CALGreen* Tier 1. To achieve *CALGreen* Tier 1, buildings must comply with the latest edition of "Savings By Design, Healtcare Modeling procedures" found online at http://www.energysoft.com/ep/2007SBDHProcedures.pdf.

A5.203.2.2 *CALGreen* Tier 2. To achieve *CALGreen* Tier 2, buildings must exceed the latest edition of "Savings By Design, healthcare Modeling Procedures" b a minimum of 15 percent.

SECTION A5.204
PRESCRIPTIVE APPROACH

A5.204.1 ENERGY STAR equipment and appliances. All equipment and appliances provided by the builder shall be ENERGY STAR labeled if ENERGY STAR is applicable to that equipment or appliance.

A5.204.2 Energy monitoring. Provide submetering or equivalent combinations of sensor measurements and thermodynamic calculations, if appropriate, to record energy use data for each major energy system in the building, including chillers, heat pumps, packaged AC systems, fans, pumps, cooling towers, boilers and other heating systems, lighting systems and process loads. This energy use data, once collected, shall be stored within a data management system.

A5.204.2.1 Data storage. The data management system must be capable of electronically storing energy data and creating user reports showing hourly, daily, monthly and annual energy consumption for each major energy system. Hourly data shall be retained a minimum of 30 days, daily data shall be retained a minimum of 6 months and monthly data shall be retained a minimum of 2 years.

A5.204.2.2 Data access. Hourly energy use data shall be accessible through a central data management system and must be available daily.

SECTION A5.211
RENEWABLE ENERGY

A5.211.1 On-site renewable energy. Use on-site renewable energy sources such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1 percent of the electric power calculated as the product of the building service voltage and the amperage specified by the electrical service overcurrent protection device rating or 1kW (whichever is greater), in addition to the electrical demand required to meet 1 percent of the natural gas and propane use. The building project's electrical service overcurrent protection device rating shall be calculated in accordance with the 2010 California Electrical Code. Natural gas or propane use is calculated in accordance with the 2010 California Plumbing Code.

A5.211.1.1 Documentation. Using a calculation method approved by the California Energy Commission, calculate the renewable on-site energy system to meet requirements of Section A5.211.1, expressed in kW. Factor in net-metering, if offered by local utility, on an annual basis.

A5.211.1.2 Grid neutral. Using the proposed annual electrical energy budget (kWh) as set forth by the Title 24, Part 6 of the California Energy Code, and adding the additional annual energy consumption estimated for the appliances and equipment not covered by Title 24, Part 6 (e.g. kitchen and laundry equipment and appliances, swimming pool heaters and circulation pumps, industrial and art equipment, computers, etc.) calculate the site's annual electrical production and consumption ratio by dividing the proposed annual renewable electrical energy production (kWh) by the proposed annual electrical energy budget (kWh). The estimated plug loads shall be included in the annual electrical energy budget (kWh).

Exceptions:

1. Existing buildings with one year of occupancy or greater shall use actual data of the annual electrical energy consumption of the facilities. Using the data logged for the facilities, calculate the site's annual electrical production and consumption ration by dividing the proposed annual renewable electrical energy production (kWh) by the actual annual electrical energy consumption (kWk).

2. The annual renewable electrical energy can be renewable energy produce3d off-site on a remote property owned by the applicant.

A5.211.2.1 35 percent grid neutral. A sites annual electrical production and consumption ratio is equal or greater than 0.35.

A5.211.2.2 75 percent grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 0.75.

A5.211.2.3 Grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 1.

A5.211.3 Green power. If offered by local utility provider, participate in a renewable energy portfolio program that provides a minimum of 50 percent electrical power from renewable sources. Maintain documentation through utility billings.

A5.211.4 Pre-wiring for future rooftop solar. Size and install conduit from the building roof or eave to a location within the building identified as suitable for future installation of controls and/or storage batteries.

A5.211.4.1 Grid-connected system without storage. Location within the building shall be of sufficient dimensions to accommodate an inverter and/or other controls as approved by the utility.

A5.211.4.2 System for future energy storage. If battery storage is anticipated, location within the building shall:

1. Be stable, weather-proof, insulated against very hot and very cold weather, and isolated from occupied spaces.

2. Be able to accommodate batteries, ventilation complying with the California Fire Code, an inverter with or without a charge controller (regulator) and, if grid-connected, other controls as approved by the utility.

SECTION A5.212
ELEVATORS, ESCALATORS AND OTHER EQUIPMENT

A5.212.1 Elevators and escalators. 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.

A5.212.1.1 Elevators. Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion.

A5.212.1.1.1 Car lights and fan. A parked elevator shall turn off its car lights and fan automatically until the elevator is called for use.

A5.212.1.2 Escalators. An escalator shall have a VVVF motor drive system that is fully regenerative when the escalator is in motion.

A5.212.1.3 Stairs as an alternative [DSA-SS]. In Public School and Community College buildings, locate stairs conveniently to encourage their use in lieu of elevators or escalators.

A5.212.1.1.4 Controls. 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, California Building Code.

APPENDIX A5
NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.3 – WATER EFFICIENCY AND CONSERVATION

SECTION A5.301
GENERAL

A5.301.1 Scope. The provisions of this chapter shall establish the means of conserving water used indoors, outdoors, and in wastewater conveyance.

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.

HYDROZONE. A portion of the landscaped area having plants with similar water needs.

LANDSCAPE (PLANT) COEFFICIENT [KL]. The product of the species factor multiplied by the density factor and the microclimate factor, (*K1 = Ks x Kd x Kmc*) The landscape coefficient is used in the landscape water budget calculation. (UCCE, 2000).

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE. The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area, and climatological parameters.

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 non-indigenous 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.

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.

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 EVAPORANSPIRATION (ET_O). The estimated rate of evapotranspiration from a standardized surface of well watered, actively growing cool season turfgrass clipped to 12 cm with sufficient density to fully shade the soil. The water needs of a landscape planting can be calculated by multiplying the Landscape Coefficient (*Kl)* and reference evapotranspiration (*ETo*).

SUBMETER. A meter installed subordinate to a site meter. Usually used to measure water intended for one purpose, such as landscape irrigation, also known as a Dedicated Meter.

SECTION A5.303
INDOOR WATER USE

A5.303.2.1 Tier 1 – 30 percent savings [BSC]. 30 percent savings [DSA-SS]. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 30 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 30 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 ≥ 30 percent reduction as specified in Table A5.303.2.1, or

2. Performance method. A calculation demonstrating a 30 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[3]

FIXTURE TYPE	FLOW RATE	DURATION	DAILY USES	OCCUPANTS[2]
Showerheads	2.5 gpm @ 80 psi	5 min.	1	X[2a]
Lavatory faucets nonresidential	.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	2.6 gpm @ 60 psi	4 min.	1	X[2b]
Replacement aerators	2.6 gpm @ 60 psi			X
Wash fountains	2.2 [rim space (in.) / 20 gpm @ 60 psi]			X
Metering faucets	0.25 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	.25 [rim space (in.) / 20 gpm @ 60 psi]	.25 min.	1 male[1] 3 female	X
Gravity tank type water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer tank water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer valve water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical hydraulic water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	1.6 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, 2007 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. Nonresidential kitchen faucet use is determined by the occupant load of the area served by the fixture.
3. Use worksheet WS-1 to calculate base line water use.

TABLE A5.303.2.3.1
FIXTURE FLOW RATE

FIXTURE TYPE	FLOW RATE[2]	MAXIMUM FLOW RATE AT ≥ 30% PERCENT REDUCTION
Showerheads	2.5 gpm @ 80 psi	1.8 gpm @ 80 psi
Lavatory Faucets Nonresidential	0.5 gpm @ 60 psi	0.35 gpm @ 60 psi
Kitchen Faucets	2.2 gpm @ 60 psi	1.6 gpm @ 60 psi
Wash Fountains	2.2 [rim space(in.) / 20 gpm @ 60 psi]	1.6 [rim space(in.) / 20 gpm @ 60 psi]
Metering Faucets	0.25 gallons/cycle	0.18 gallons/cycle
Metering Faucets for Wash Fountains	.25 [rim space(in.) / 20 gpm @ 60 psi]	.18 [rim space(in.) / 20 gpm @ 60 psi]
Gravity tank type Water Closets	1.6 gallons/flush	1.12 gallons/flush[1]

Flushometer Tank Water Closets	1.6 gallons/flush	1.12 gallons/flush[1]
Flushometer Valve Water Closets	1.6 gallons/flush	1.12 gallons/flush[1]
Electromechanical Hydraulic Water Closets	1.6 gallons/flush	1.12 gallons/flush[1]
Urinals	1.0 gallons/flush	.5 gallons/flush

1 Includes water closets with an effective flush rate of 1.12 gallons or less when tested per ASME A112.19.2 and ASME A112.19.14.

2 See Table 5.503.2.3 for additional notes and references.

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

1. Clothes washer shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commission's WFstandards 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—5.8 gallons (21.9 L) 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-rise spray valves manufactured on or after January 1, 2006 shall function at equal to or less than 1.6 gpm (o.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)	2.26 (2.6 L) [BSC]
Undercounter	0.90 (3.4 L)	0.98 (3.7 L)

SECTION A5.304
OUTDOOR WATER USE

A5.304.1.1 Water budget. A water budget shall be developed for landscape irrigation use that 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.owue.water.ca.gov/landscape/ord/ord.cfm.

A5.304.4 Potable water reduction. …

A5.304.4.4 Potable water reduction. Provide water efficient landscape irrigation design that reduces the use of installation and establishment by 50 percent. Calculations for the reduction shall be based on the water budget developed pursuant to section A5.304.1.1.

Methods used to accomplish the requirements of this section must be designed to the requirements of the California Building Standards Code and shall include, but not be limited to, the following:

1. Plant coefficient

2. Irrigation efficiency and distribution uniformity

3. Use of captured rainwater

4. Use of recycled water

5. Water treated for irrigation purposes and conveyed by a water district or public entity.

APPENDIX A5
NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION A5.401
GENERAL

A5.401.1 Scope. The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through reuse of existing building stock and materials; use of recycled, regional, rapidly renewable, and certified wood materials; and employment of techniques to reduce pollution through recycling of materials.

SECTION A5.402
DEFINITIONS

A 5.402.1 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.

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.

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.

LIFE CYCLE ASSESSMENT (LCA). A technique to evaluate the relevant energy and material consumed and environmental emissions associated with the entire life of a product, process, activity or service.

OVE. Optimal value engineering, another term for advanced wood framing techniques.

POSTCONSUMER CONTENT. Waste material generated by consumers after it is used and which would otherwise be discarded.

PRECONSUMER (or POST-INDUSTRIAL) CONTENT.
Material diverted from the waste stream during one manufacturing process, including scraps, damaged goods and excess production that is used in another manufacturing process.

RECYCLED CONTENT. Refer to International Organization of Standards ISO 14021—Environmental labels and declarations—Self-declared environmental claims (Type II environmental labeling).

RECYCLED CONTENT VALUE (RCV). Material cost multiplied by postconsumer content plus 1/2 the preconsumer content, or RCV = $ × (postconsumer content + ½ preconsumer content).

SECTION A5.404
EFFICIENT FRAMING TECHNIQUES

A5.404.1 Wood framing. Employ advanced wood framing techniques, or OVE, as recommended by the U.S. Department of Energy's Office of Building Technology, State and Community Programs and as permitted by the enforcing agency.

A5.404.1.1 Structural or fire-resistance integrity. The OVE selected shall not conflict with structural framing methods or fire-rated assemblies required by the California Building Code.

A5.404.1.2 Framing specifications. Advanced framing techniques include the following:

1. Building design using 2-foot modules,
2. Spacing wall studs up to 24 inches on center
3. Spacing floor and roof framing members up to 24 inches on center,
4. Using 2-stud corner framing and drywall clips or scrap lumber for drywall backing,\
5. Eliminating solid headers in nonload-bearing walls,
6. Using in-line framing, aligning floor, wall and roof framing members vertically for direct transfer of loads, and
7. Using single lumber headers and top plates where appropriate.

Note: Additional information can be obtained from the U.S. DOE Energy Efficiency and Renewable Energy (EERE) website.

SECTION A5.405
MATERIAL SOURCES

A5.405.4 Recycled content. Use materials, equivalent in performance to virgin materials, with a total (combined) recycled content value (RCV) of:

Tier 1 [BSC]. Recycled content [DSA]. The RCV shall not be less than 10 percent of the total material cost of the project.

Required Total RCV (dollars) =
Total Material Cost (dollars) x 10 percent (Equation A5.4-1)

Tier 2 [BSC]. The RCV shall not be less than 15 percent of the total material cost of the project.

Required Total RCV (dollars) =
Total Material Cost (dollars) x 15 percent (Equation A5.4-2)

For the purposes of this section, materials used as components of the structural frame shall not be used to calculate recycled content. The structural frame includes the load bearing structural elements such as wall studs, plates, sills, columns, beams, girders, joists, rafters, and trusses.

Notes:

1. Sample forms which allow user input and automatic calculation are located at www.hcd.ca.gov/*CALGreen*.html and may be used to simplify documenting compliance with

this section and for calculating recycled content value of materials or assembly products.

2. Sources and recycled content of some recycled materials can be obtained from CalRecycle if not provided by the manufacturer.

A5.405.4.1 Total material cost. Total material cost is the total estimated or actual cost of materials and assembly products used in the project. The required total recycled content value for the project (in dollars) shall be determined by Equation A5.4-1 or Equation A5.4-2.

Total material cost shall be calculated by using one of the methods specified below:

1. Simplified method. To obtain the total cost of the project multiply the square footage of the structure by the square foot valuation established by the enforcing agency. The total material cost is 45 percent of the total cost of the project. Use Equations A5.4-3A or A5.4-3B to determine total material costs using the simplified method.

   Total material costs =

   Project square footage x square foot valuation x 45 percent (Equation A5.4-3A)

   Total estimated or actual cost of project x 45 percent (Equation A5.4-3B)

2. Detailed method. To obtain the total cost of the project, add the estimated and/or actual costs of materials used for the project including the structure (steel, concrete, wood or masonry); the enclosure (roof, windows, doors and exterior walls); the interior walls, ceilings and finishes (gypsum board, ceiling tiles, etc.). The total estimated and/or actual costs shall not include fees, labor and installation costs, overhead, appliances, equipment, furniture or furnishings.

A5.405.4.2 Determination of recycled content value (RCV). Total RCV may be determined either by dollars or percentage as noted below.

1. Total recycled content value for the project (in dollars). This is the sum of the recycled content value of the materials and/or assemblies considered and shall be determined by Equation A5.4-4. The result of this calculation may be directly compared to Equations A5.4-1 and A5.4-2 to determine compliance with Tier 1 or Tier 2 prerequisites.

   Total Recycled Content Value (dollars) = $(RCV_M + RCV_A)$ (Equation A5.4-4)

2. Total recycled content value for the project (by percentage). This is expressed as a percentage of the total material cost and shall be determined by Equation A5.4-4 and Equation A5.4-5. The result of this calculation may be directly compared for compliance with Tier 1 (10 percent) or Tier 2 (15 percent) prerequisites.

Total Recycled Content Value (percent) =
[Total Recycled Content Value (dollars) ÷ Total Material Cost (dollars)] x 100

(Equation A5. 4-5)

A5.405.4.3 Determination of recycled content value of materials (RCV_M). The recycled content value of each material (RCV_M) is calculated by multiplying the cost of material, as defined by the recycled content. See Equations A5.4-6 and A5.4-7.

RCV_M (dollars) =
Material cost (dollars) x RC_M (percent) (Equation A5. 4-6)

RC_M (percent) =
Post-consumer content percentage + (½) Pre-consumer content percentage

(Equation A5. 4-7)

Notes:

1. If the post-consumer and pre-consumer recycled content is provided in pounds, Equation A5.4-7

may be used, but the final result (in pounds) must be multiplied by 100 to show RC_M as a percentage.

2. If the manufacturer does not separately identify the pre-consumer and post-consumer recycled content of a material but reports it as a total single percentage, one half of the total shall be considered pre-consumer and one half shall be considered post-consumer recycled material.

A5.405.4.4. Determination of recycled content value of assemblies – (RCV_A). Recycled content value of assemblies is calculated by multiplying the total cost of assembly by the total recycled content of the assembly (RC_A), and shall be determined by Equation A5.4-8.

RCV_A dollars) =
Assembly cost (dollars) x Total RC_A (percent)

(Equation A5.4.8)

If not provided by the manufacturer, Total RC_A (percent) is the sum (∑) of the Proportional Recycled Content (PRC_M) of each material in the assembly. RC_A shall be determined by Equation A4.4-9.

$RC_A = \sum PRC_M$

(Equation A5.4-9)

PRC_M of each material may be calculated by one of two methods using the following formulas:

Method 1: Recycled content (Post-consumer and Pre-consumer) of each material provided in percentages

PRC_M (percent) =
Weight of material (percent) x RC_M (percent)

(Equation A5.4-10)

Weight of material (percent) =
[Weight of material (lbs) ÷ Weight of assembly (lbs)] x 100

(Equation A5.4-11)

RC_M (percent) =
Post-consumer content percentage + (½) Pre-consumer content percentage
(See Equation A5.4-7)

Method 2: Recycled content (Post-consumer and Pre-consumer) provided in pounds

PRC_M (percent) =
[RC_M (lbs) ÷ Weight of material (lbs)] x 100

(Equation A5.4-12)

RC_M (lbs) =
Post-consumer content (lbs) + (½) Pre-consumer content (lbs)

(Equation A5.4-13)

NOTE: If the manufacturer does not separately identify the pre-consumer and post-consumer recycled content of a material but reports it as a total single percentage, one half of the total shall be considered pre-consumer and one half shall be considered post-consumer recycled material.

SECTION A5.406
ENHANCED DURABILITY AND REDUCED MAINTENANCE

A5.406.1 Choice of materials. Compared to other products in a given product category, choose materials proven to be characterized by one or more of the following.

A5.406.1.1 Service life. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

A5.406.1.2 Reduced maintenance. Select materials that require little, if any, finishing. For those with surface protection, choose materials that do not require frequent applications of toxic or malodorous finishes.

A5.406.1.3 Recyclability. Select materials that can be reused or recycled at the end of their service life in the project.

SECTION A5.408
CONSTRUCTION WASTE REDUCTION, DISPOSAL, AND RECYCLING

A5.408.3.1 Enhanced construction waste reduction – Tier 1. …

A5.408.3.1.1 Enhanced construction waste reduction – Tier 2 [BSC]. Enhanced construction waste reduction (80 percent) [DSA-SS]. Divert to recycle or salvage at least 80% of non-hazardous construction 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, where demolition of an existing structure(s) is necessary for the construction of a new structure.

SECTION A5.409
LIFE CYCLE ASSESSMENT

A4.409.1 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 2010 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 [DSA-SS]. 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 for 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.~~

SECTION A5.410
BUILDING MAINTENANCE AND OPERATION

A5.410.3 Commissioning [DSA-SS]. …

A5.410.4 Testing and adjusting [DSA-SS]. …

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 words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.~~

~~INTERIOR, BUILDING. The inside of the weatherproofing system.~~

~~MERV. [DSA-SS] Filter minimum efficiency reporting value, based on ASHRAE 52.2-1999.~~

~~MULTI-OCCUPANT SPACES. Indoor spaces used for presentations and training, including classrooms and conference rooms.~~

~~NO ADDED FORMALDEHYDE (NAF) BASED RESINS. Resins formulated with no added formaldehyde as part of the cross-linking structure for making hardwood plywood, particle board or medium density fiberboard. 'No added~~

formaldehyde' resins include, but are not limited to, resins made from soy, polyvinyl acetate, or methylene diisocyanate. See CCR, Title 17, Section 93120.1(a).

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

ULTRA-LOW EMITTING FORMALDEHYDE (ULEF) RESINS. Resins formulated such that average formaldehyde emissions are consistently below the Phase 2 emission standards in section 93120.2, as provided in Section 93120.3(d) of Title 17, California Code of Regulations. See CCR, Title 17, Section 93120.1(a).

SECTION A5.504
POLLUTANT CONTROL

A5.504.1 Indoor air quality (IAQ) during construction [DSA-SS]. 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 Post-construction. 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^3/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.

A5.504.4.5.1 Early compliance with formaldehyde limits, Tier 1 [BSC]. Early compliance with formaldehyde limits [DSA-SS]. Meet the requirements contained in Table A5.504.8.5 before the compliance dates.

A5.504.4.5.2 No added formaldehyde, Tier 2. 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. For Tier 2 requirements, 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

[DSA-SS] Where complying composite wood product is readily available for nonresidential occupancies, meet requirements before the compliance dates indicated in Table A5.504.8.5 or use composite wood products made with either CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins.

A5.504.4.7 Resilient flooring systems, Tier 1 [BSC]. Resilient flooring systems [DSA-SS]. . For 80 percent of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on the High Performance Products Database; products compliant with CHPS criteria certified under the Greenguard Children & Schools program; certified under the Resilient Floor Covering Institute (RFCI) FloorScore program; or meet 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.)

A5.504.4.8 Thermal insulation, Tier 1 [BSC]. Thermal insulation [DSA-SS]. 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 1.2, February 2010 (also known as Specification 01350.)

A5.504.4.8.1 Thermal insulation, Tier 2 [BSC]. Thermal insulation, No Added Formaldehyde, [DSA-SS]. Install thermal insulation which complies with Tier 1 plus does not contain any added formaldehyde.

A5.504.4.9 Acoustical ceilings and wall panels. Comply with Chapter 8 in Title 24, Part 2, the California Building Code, and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its High Performance Products Database.

A5.504.5 Hazardous particulates and chemical pollutants. Minimize and control pollutant entry into buildings and cross-contamination of regularly occupied areas.

A5.504.5.1 Entryway systems. 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.

1. Qualifying entryways are those that serve as regular entry points for building users.

2. Acceptable entryway systems include, but are not limited to, permanently installed grates, grilles or slotted systems that allow cleaning underneath.

3. Roll-out mats are acceptable only when maintained regularly by janitorial contractors as documented in service contract, or by in-house staff as documented by written policies and procedures.

A5.504.5.2 Isolation of pollutant sources. In rooms where activities produce hazardous fumes or chemicals, such as garages, janitorial or laundry rooms, and copy or printing rooms, exhaust them and isolate them from their adjacent rooms.

1. Exhaust each space with no air recirculation in accordance with ASHRAE 62.1, Table 6-4 to create negative pressure with respect to adjacent spaces with the doors to the room closed.

2. For each space, provide self-closing doors and deck to deck partitions or a hard ceiling.

3. Install low-noise, vented range hoods for all cooking appliances and in laboratory or other chemical mixing areas.

A5.504.5.3.1 Filters. 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 11.

TABLE A5.504.8.5
FORMALDEHYDE LIMITS1
Maximum formaldehyde emissions in parts per million.

Product	Current Limit	Jan 1, 2012	July 1, 2012
Hardwood plywood veneer core	0.05		
Hardwood plywood composite core	0.08		0.05
Particle board	0.09		
Medium density fiberboard	0.11		
Thin medium density fiberboard[2]	0.21	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 1333-96 (2002). For additional information, see California Code of Regulations, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thick ness of eight millimeters.

A5.507
ENVIRONMENTAL COMFORT

A5.507.1 Lighting and thermal comfort controls. Provide controls in the workplace as described in Sections A5.507.1.1 and A5.507.1.2.

A5.507.1.1 Single-occupant spaces. Provide individual controls that meet energy use requirements in the California Energy Code in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2.

A5.507.1.1.1 Lighting. Provide individual task lighting and/or day lighting controls for at least 90 percent of the building occupants.

A5.507.1.1.2 Thermal comfort. Provide individual thermal comfort controls for at least 50 percent of the building occupants.

1. Occupants shall have control over at least one of the factors of air temperature, radiant temperature, air speed and humidity as described in ASHRAE 55-2004.

2. Occupants inside 20 feet of the plane of and within 10 feet either side of operable windows can substitute windows to control thermal comfort. The areas of operable window must meet the requirements of Section 121 (Requirements for Ventilation) of the California Energy Code.

A5.507.1.2 Multi-occupant spaces. Provide lighting and thermal comfort system controls for all shared multi-occupant spaces, such as classrooms and conference rooms.

A5.507.2 Daylight. Provide day lit spaces as required for top lighting and side lighting in the 2007 California Energy Code. In constructing a design, consider the following:

1. Use of light shelves and reflective room surfaces to maximize daylight penetrating the rooms.

2. Means to eliminate glare and direct sun light, including through skylights.

3. Use of photo sensors to turn off electric lighting when daylight is sufficient.

4. Not using diffuse day lighting glazing where views are desired.

A5.507.3 Views. 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 as demonstrated by plan view and section cut diagrams

A5.507.3.1 Interior office spaces. 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.

A5.507.3.2 Multi-occupant spaces. Include in the calculation the square footage with direct line of sight to perimeter vision glazing.

~~Exceptions to Sections 807.3 and 807.4: Copy/printing rooms, storage areas, mechanical spaces, restrooms, auditoria and other intermittently or infrequently occupied spaces or spaces where daylight would interfere with use of the space.~~

A5.507.5 Acoustical control. [DSA-SS] …

Notation
Authority: Education Code Sections 17280--17317 and 81130--81147.
Reference(s): Education Code Sections 17310 and 81142.