REVISION RECORD
FOR THE STATE OF CALIFORNIA

SUPPLEMENT

July 1, 2018

2016 Title 24, Part 11, California Green Building Standards Code

General Information:

1. The date of this supplement is for identification purposes only. See the History Note Appendix at the end of the code.
2. This supplement is issued by the California Building Standards Commission in order to provide new and/or replacement pages containing recently adopted provisions for California Code of Regulations, Title 24, Part 11, of the 2016 *California Green Building Standards Code*. Instructions are provided below.
3. Health and Safety Code Section 18938.5 establishes that only building standards in effect at the time of the application for a building permit may be applied to the project plans and construction. This rule applies to both adoptions of building standards for Title 24 by the California Building Standards Commission and local adoptions and ordinances imposing building standards. The new building standards provided with the enclosed blue supplement pages must not be enforced before the effective date.
4. Not all code text on the enclosed blue supplement pages is a new building standard. New, amended, or repealed building standards are identified by margin symbols. An explanation of margin symbols is provided in the code before the table of contents.
5. You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.

Title 24, Part 11

Remove Existing Pages	Insert Blue-Colored Pages
3 and 4	3 and 4
7 through 14	7 through 14
19 through 22	19 through 22
25 and 26	25 and 26
33 through 52	33 through 52.2
	64.1 through 64.30
73 and 74	73 and 74
83 and 84	83 and 84
87 and 88	87 and 88
95 through 98	95 through 98
107 and 108	107 and 108
121 through 138	121 through 138.2
183 and 184	183 and 184

logical conditions. For the purpose of this section, climatic, topographical or geological conditions include local environmental conditions as established by the city, county, or city and county.

2. The city, county, or city and county shall file the amendments, additions or deletions expressly marked and identified as to the applicable findings. Cities, counties, cities and counties, and fire departments shall file the amendments, additions or deletions and the findings with the California Building Standards Commission at 2525 Natomas Park Drive, Suite 130, Sacramento, CA 95833.
3. Findings prepared by fire protection districts shall be ratified by the local city, county, or city and county and filed with the California Department of Housing and Community Development at 2020 West El Camino Avenue, Suite 250, Sacramento, CA 95833-1829.
4. The city, county, or city and county shall obtain California Energy Commission approval for any energy-related ordinances consistent with *Public Resources Code* Section 25402.1(h)(2) and Title 24, Part 1, Section 10-106. Local governmental agencies may adopt and enforce energy standards for newly constructed buildings, additions, alterations and repairs, provided the California Energy Commission finds that the standards will require buildings to be designed to consume no more energy than permitted by Part 6. Such local standards include, but are not limited to, adopting the requirements of Part 6 before their effective date, requiring additional energy conservation measures, or setting more stringent energy budgets.

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

1. Section 1.2.2 in the *California Building Code* (CBC) for the California Building Standards Commission.
2. Section 104.11 of Chapter 1, Division II for the Division of the State Architect.
3. Section 1.8.7, Chapter 1, Administration, Division 1, of the 2016 *California Building Code* and Section 1.2.6, Chapter 1, Administration, Division 1, of the 2016 *California Residential Code* for the Department of Housing and Community Development.
4. Section 7-104, 2013 *California Administrative Code* for the Office of the Statewide Health Planning and Development.

101.9 Effective date of this code. Only those standards approved by the California Building Standards Commission that are effective at the time an application for a building permit is submitted shall apply to the plans and specifications for, and to the construction performed under, that permit. For the effective dates of the provisions contained in this code, see the appropriate application checklist and the History Note page of this code.

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

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

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

SECTION 102
CONSTRUCTION DOCUMENTS AND INSTALLATION VERIFICATION

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

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

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

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

SECTION 103
BUILDING STANDARDS COMMISSION

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

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

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

   Authority cited—*Health and Safety Code* Sections 18930.5(a), 18938, and 18940.5.

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

2. **Graywater systems.** The construction, installation, and alteration of graywater systems for indoor and outdoor uses in nonresidential occupancies.

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

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

   Authority cited—*Health and Safety Code* Section 18941.8.

   Reference—*Health and Safety Code* Section 18941.8.

103.1.1 Adopting agency identification. The provisions of this code applicable to buildings identified in this section will be identified in the Matrix Adoption Tables under the acronym **BSC-CG.**

SECTION 104
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

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

1. **Housing construction.**

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

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

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

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

SECTION 105
DIVISION OF THE STATE ARCHITECT

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

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

Note: The Application of Standards outlined in Title 24, Part 6 supersedes the above application as it applies to the California Energy Code.

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

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

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

105.1.2 Applicable administrative standards.

1. Title 24, Part 1, *California Code of Regulations*:

Sections 4-301 through 4-355, Group 1, Chapter 4, for public elementary and secondary schools, and community colleges.

2. Title 24, Part 2, *California Code of Regulations*:

2.1. Sections 1.1 and 1.9.2 of Chapter 1, Division I.

2.2. Sections 102.1, 102.2, 102.3, 102.4, 102.5, 104.9, 104.10 and 104.11 of Chapter 1, Division II.

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

SECTION 106
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

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

Application—General acute care hospitals and acute psychiatric hospitals, excluding distinct part units or distinct part freestanding buildings providing skilled nursing or intermediate care services. For structural regulations: Skilled nursing facilities and/or intermediate care facilities

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 2 – DEFINITIONS

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

Adopting agency	BSC	BSC-CG	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	1	2	3	4								
Adopt entire CA chapter		X		X				X												
Adopt entire chapter as amended (amended sections listed below)									X	X		X								
Adopt only those sections that are listed below																				
Chapter/Section																				
201																				
CALIFORNIA RESIDENTIAL CODE									†	†		†								
LOW-RISE RESIDENTIAL BUILDING									†	†		†								
PLANTS									†	†		†								
RESIDENTIAL BUILDING									†	†		†								
RESILIENT FLOORING									†	†		†								

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

CHAPTER 2

DEFINITIONS

SECTION 201
GENERAL

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

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

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

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

SECTION 202
DEFINITIONS

Note: Definitions amended by the Emergency Supplement are effective July 23, 2015.

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

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

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

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

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

ARB (CARB). The California Air Resources Board.

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

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

AUTOMATIC. Automatic means capable of operating without human intervention.

A-WEIGHTED SOUND LEVEL (dba). The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as

computed from sound spectral data to which A-weighting adjustments have been made.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Note: See CCR, Title 17, Section 93120.1.

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

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

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

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

CONSTRUCTION SITE. A parcel of land bounded by lot line(s) or a designated portion of a public right-of-way where construction is taking place. A construction site may include, but not be limited to, buildings and accessory structures, walks, sidewalks, curbs, curb ramps, parking facilities, planting areas, pools, promenades, exterior gathering or assembly areas, raised or depressed paved areas, open spaces, golf courses, and/or landscape areas.

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

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

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

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

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

DEMAND HOT WATER RECIRCULATION SYSTEM. A hot water recirculation system requiring manual activation

and equipped with a thermostat that will automatically shut off the recirculation pump when the water temperature reaches a preset level at the point of use.

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

DEWATERING. Pumping of uncontaminated or treated groundwater for construction activities.

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

DISINFECTED TERTIARY RECYCLED WATER. Filtered and subsequently disinfected wastewater that meets the approved method of treatment and minimum level of water quality specified in California Code of Regulations, Title 22, Division 4, Chapter 3 for the purpose of direct beneficial use.

DISPOSAL. The management of solid waste through landfilling or transformation at permitted solid waste facilities.

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

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

ELECTRIC VEHICLE (EV) CHARGER. Off-board charging equipment used to charge an electric vehicle.

ELECTRIC VEHICLE CHARGING SPACE (EV SPACE). A space intended for future installation of EV charging equipment and charging of electric vehicles.

ELECTRIC VEHICLE CHARGING STATION (EVCS). One or more electric vehicle charging spaces served by electric vehicle charger(s) or other charging equipment allowing charging of electric vehicles. Electric vehicle charging stations are not considered parking spaces.

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

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

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

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

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

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

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

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

EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF). [DSA-SS] An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency, which are two major influences on the amount of water that needs to be applied to the landscape.

EXFILTRATION. The uncontrolled outward air leakage from inside a building, including leakage through cracks and interstices, around windows and doors, and through any other exterior partition or duct penetration.

EXPRESSWAY. An arterial highway for through traffic which may have partial control of access, but which may or may not be divided or have grade separations at intersections.

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

FOOTPRINT AREA. [DSA-SS] The total area of the furthest exterior wall of the structure projected to natural grade, not including exterior areas such as stairs, covered walkways, patios and decks.

FREEWAY. A divided arterial highway with full control of access and with grade separations at intersections.

FRENCH DRAIN. A trench, hole or other depressed area loosely filled with rock, gravel, fragments of brick or similar pervious material used to collect or channel drainage or runoff water.

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

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 POTENTIAL VALUE (GWP VALUE). The 100-year 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."

GREEN BUILDING. A holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants and the community.

GREENFIELDS. Sites that are not previously developed or graded and remain in a natural state, able to support agriculture, open space or habitat.

Note: Previously developed sites are those that previously contained buildings, roadways or parking lots or were graded or altered by direct human activities.

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

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

HAZARDOUS WASTE.

(a) A waste, defined as a "hazardous waste" in accordance with Section 25117 of the *Health and Safety Code*, or a combination of wastes, which because of its quantity, concentration or physical, chemical or infectious characteristics may do either of the following:

(1) Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.

(2) Pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed.

(b) Unless expressly provided otherwise, "hazardous waste" includes extremely hazardous waste and acutely hazardous waste.

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.

HOT WATER RECIRCULATION SYSTEM. A hot water distribution system that reduces the time needed to deliver hot water to fixtures that are distant from the water heater, boiler or other water heating equipment. The recirculation system is comprised of hot water supply and return piping with shutoff valves, balancing valves, circulating pumps, and a method of controlling the circulating system.

HOTEL OR MOTEL. (HCD-1) Any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied or which are occupied for sleeping purposes by guests.

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.

IESNA. Illuminating Engineering Society of North America.

INERT SOLIDS OR INERT WASTE. A non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board pursuant to Division 7 (commencing with Section 13000) of the *California Water Code* and does not contain significant quantities of decomposable solid waste.

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

INFILTRATION. An uncontrolled inward air leakage from outside a building or unconditioned space, including leakage through cracks and interstices, around windows and doors and through any other exterior or demising partition or pipe or duct penetration.

INTERIOR BUILDING. The inside of the weatherproofing system.

KITCHEN. That portion in a residential dwelling unit that is a room or area used for cooking, food storage and preparation and washing dishes, including associated counter tops and cabinets, refrigerator, stove, ovens and floor area.

LANDSCAPE WATER METER. [HCD] An inline device installed at the irrigation supply point that measures the flow

of water into the irrigation system and is connected to a totalizer to record water use.

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

LIFE CYCLE INVENTORY (LCI). A process of quantifying energy and raw material requirements, atmospheric emissions, waterborne emissions, solid wastes, and other releases for the entire life cycle of a product, process, or activity, including a whole building.

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. 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 U.S. EPA, bearing High-occupancy Vehicle (HOV) car pool lane stickers issued by the Department of Motor Vehicles.

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

LOW-RISE RESIDENTIAL BUILDING. For the purpose of *CALGreen*, any building that is of Occupancy Group R and is three stories or less.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base Reactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundredths of a gram (g $O^3/_g$ ROC).

Note: MIR values for individual compounds and hydrocarbon solvents are specified in CCR, Title 17, Sections 94700 and 94701.

MERV Filter minimum efficiency reporting value, based on ASHRAE 52.2-2007.

METERING FAUCET. A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO) [BSC-CG & DSA-SS] A California regulation commencing with Section 490 of Chapter 2.7, Division 2, Title 23, *California Code of Regulations*. The MWELO regulation establishes a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). [HCD] The California model ordinance (California Code of Regulations, Title 23, Division 2, Chapter 2.7), regulating landscape design, installation and maintenance practices. Local agencies are required to adopt the updated MWELO, or adopt a local ordinance at least as effective as the MWELO.

MOISTURE CONTENT. The weight of the water in wood expressed in percentage of the weight of the oven-dry wood.

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

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

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.

NEWLY CONSTRUCTED (or NEW CONSTRUCTION). A newly constructed building (or new construction) does not include additions, alterations or repairs.

NO ADDED FORMALDEHYDE (NAF) BASED RESINS. Resin formulated with no added formaldehyde as part of the resin 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. [BSC] See CCR, Title 17, Section 93120.1(a).

NON-STORMWATER DISCHARGES. Discharges that do not originate from precipitation events. Including, but not limited to, dewatering activities, washout area discharge, vehicle and equipment cleaning, street cleaning, and irrigation runoff.

ORGANIC WASTE. Food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

OUTDOOR AIR (Outside air). Air taken from outdoors and not previously circulated in the building.

OVE. [BSC-CG, DSA-SS] Optimal Value Engineering, another term for advanced wood framing techniques.

PERMEABLE PAVING. Permeable paving materials and techniques which allow the movement of water around the paving material and allow precipitation to percolate through the paving surface to the soil below.

PLANTS.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PSIG. Pounds per square inch, gauge.

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

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

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

RECLAIMED (RECYCLED) WATER. [BSC-CG, HCD 1] Nonpotable water that meets California State Water Resources Control Board statewide uniform criteria for disinfected tertiary recycled water. Reclaimed (recycled) water is also known as "recycled water" or "reclaimed water."

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

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

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

RECYCLED CONTENT VALUE (RCV). [BSC-CG, DSA-SS] Material cost multiplied by postconsumer content plus $^1/_2$ the preconsumer content, or RCV = $ X (postconsumer content + $^1/_2$ preconsumer content).

RECYCLED CONTENT VALUE (RCV). [HCD]

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

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

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

treated to remove waste matter, attaining a quality that is suitable to use the water again.

RECYCLED WATER SUPPLY SYSTEM. The building supply pipe, the water distribution pipes, and the necessary connecting pipes, fittings, control valves, backflow prevention devices, and all appurtenances carrying or supplying reclaimed (recycled) water in or adjacent to the building or within the premises.

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

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

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

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

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

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

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

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

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

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

SOLID WASTE.

(a) All putrescible and nonputrescible solid, semisolid and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes.

(b) "Solid waste" does not include any of the following wastes:

(1) Hazardous waste, as defined in *Public Resources Code* Section 40141.

(2) Radioactive waste regulated pursuant to the Radiation Control Law (Chapter 8, commencing with Section 114960, of Part 9 of Division 104 of the *Health and Safety Code*).

(3) Medical waste regulated pursuant to the Medical Waste Management Act (Part 14 commencing with Section 117600) of Division 104 of the *Health and Safety Code*). Untreated medical waste shall not be disposed of in a solid waste landfill, as defined in *Public Resources Code* Section 40195.1. Medical waste that has been treated and deemed to be solid waste shall be regulated pursuant to this division.

SPECIAL LANDSCAPE AREA (SLA). [DSA-SS] An area of the landscape dedicated solely to edible plants, planting areas used for educational purposes, recreational areas, areas irrigated with recycled water, water features using recycled water, and where turf provides a playing surface or gathering space.

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

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

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. Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

TEST. A procedure to determine quantitative performance of a system or equipment.

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

TIME DEPENDENT VALUATION (TDV) ENERGY. 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.

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. **[BSC]** See CCR, Title 17, Section 93120.1(a).

UNIVERSAL WASTE. [BSC-CG, DSA-SS] The wastes listed below are subject to regulation pursuant to Chapter 23 of Title 22, *California Code of Regulations*, and shall be known as "universal wastes."

(1) Batteries, as described in Title 22 CCR, Section 66273.2, Subsection (a);

(2) Electronic devices, as described in Title 22 CCR, Section 66273.3, Subsection (a);

(3) Mercury-containing equipment, as described in Title 22 CCR, Section 66273.4, Subsection (a);

(4) Lamps, as described in Title 22 CCR, Section 66273.5, Subsection (a);

(5) Cathode ray tubes, as described in Title 22 CCR, Section 66273.6, Subsection (a);

(6) Cathode ray tube glass, as described in Title 22 CCR, Section 66273.7, Subsection (a); and

(7) Aerosol cans, as specified in Health and Safety Code, Section 25201.16.

URINAL, HYBRID. [BSC-CG] A urinal that conveys waste into the drainage system without the use of water for flushing; and automatically performs a drain-cleansing action after a predetermined amount of time.

VANPOOL VEHICLE. Eligible vehicles are limited to any motor vehicle, other than a motortruck 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: Vehicle Code, Division 1, Section 668.

VAPOR BARRIER. Material that has a permeance of one perm or less and that provides resistance to the transmission of water vapor.

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.

VOC. A volatile organic compound (VOC) broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a).

Note: Where specific regulations are cited from different agencies, such as South Coast Air Quality Management District (SCAQMD), California Air Resources Board (ARB or CARB), etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

WATTLES. Wattles are used to reduce sediment in runoff. Wattles are often constructed of natural plant materials such as hay, straw or similar material shaped in the form of tubes and placed on a downflow slope. Wattles are also used for perimeter and inlet controls.

ZEV. Any vehicle certified to zero-emission standards.

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 4 – RESIDENTIAL MANDATORY MEASURES

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

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

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

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

Division 4.1 – PLANNING AND DESIGN

SECTION 4.101
GENERAL

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

SECTION 4.102
DEFINITIONS

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

FRENCH DRAIN.

WATTLES.

SECTION 4.103
SITE SELECTION
(Reserved)

SECTION 4.104
SITE PRESERVATION
(Reserved)

SECTION 4.105
DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES
(Reserved)

SECTION 4.106
SITE DEVELOPMENT

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

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

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

3. Compliance with a lawfully enacted storm water management ordinance.

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

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

Exception: Additions and alterations not altering the drainage path.

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Section 4.106.4.1, 4.106.4.2, or 4.106.4.3, to facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the *California Electrical Code,* Article 625.

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

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

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

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

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

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

4.106.4.2.1 Electric vehicle charging space (EV space) locations. Construction documents shall indicate the location of proposed EV spaces. At least one EV space shall be located in common use areas and available for use by all residents.

When EV chargers are installed, EV spaces required by Section 4.106.4.2.2, Item 3, shall comply with at least one of the following options:

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

4.106.4.2.2 Electric vehicle charging space (EV space) dimensions. The EV spaces shall be designed to comply with the following:

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

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

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

4.106.4.2.5 Identification. The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the *California Electrical Code.*

Notes:

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

4.106.4.3 New hotels and motels. All newly constructed hotels and motels shall provide EV spaces capable of supporting future installation of EVSE. The construction documents shall identify the location of the EV spaces.

Notes:

1. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.
2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

4.106.4.3.1 Number of required EV spaces. The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Table 4.106.4.3.1. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number.

TABLE 4.106.4.3.1

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED EV SPACES
0–9	0
10–25	1
26–50	2
51–75	4
76–100	5
101–150	7
151–200	10
201 and over	6 percent of total

4.106.4.3.2 Electric vehicle charging space (EV space) dimensions. The EV spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486 mm).
2. The minimum width of each EV space shall be 9 feet (2743 mm).

4.106.4.3.3 Single EV space required. When a single EV space is required, the EV space shall be designed in accordance with Section 4.106.4.2.3.

4.106.4.3.4 Multiple EV spaces required. When multiple EV spaces are required, the EV spaces shall be designed in accordance with Section 4.106.4.2.4.

4.106.4.3.5 Identification. The service panels or subpanels shall be identified in accordance with Section 4.106.4.2.5.

4.106.4.3.6 Accessible EV spaces. In addition to the requirements in Section 4.106.4.3, EV spaces for hotels/motels and all EVSE, when installed, shall comply with the accessibility provisions for EV charging stations in the *California Building Code*, Chapter 11B.

Notes:

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

governments, residents and businesses. Website: https://opr.ca.gov/docs/ZEV_Guidebook.pdf.

4. The Governor's Interagency Working Group on Zero-Emission Vehicles, 2016, "2016 ZEV Action Plan, An Updated Roadmap toward 1.5 Million Zero-Emission Vehicles on California Roadways by 2025." https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf.

CHAPTER 4

RESIDENTIAL MANDATORY MEASURES

Division 4.3 – WATER EFFICIENCY AND CONSERVATION

SECTION 4.301 GENERAL

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

SECTION 4.302 DEFINITIONS

4.302.1 Definitions. Reserved.

SECTION 4.303 INDOOR WATER USE

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

4.303.1.1 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.

4.303.1.2 Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush. The effective flush volume of all other urinals shall not exceed 0.5 gallons per flush.

4.303.1.3 Showerheads.

4.303.1.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

4.303.1.3.2 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 1.8 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.

4.303.1.4 Faucets.

4.303.1.4.1 Residential lavatory faucets. The maximum flow rate of residential lavatory faucets shall not exceed 1.2 gallons per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi.

4.303.1.4.2 Lavatory faucets in common and public use areas. The maximum flow rate of lavatory faucets installed in common and public use areas (outside of dwellings or sleeping units) in residential buildings shall not exceed 0.5 gallons per minute at 60 psi.

4.303.1.4.3 Metering faucets. Metering faucets when installed in residential buildings shall not deliver more than 0.25 gallons per cycle.

4.303.1.4.4 Kitchen faucets. The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

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

4.303.2 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code,* and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code.*

SECTION 4.304 OUTDOOR WATER USE

4.304.1 Outdoor potable water use in landscape areas. After December 1, 2015, new residential developments with an aggregate landscape area equal to or greater than 500 square feet shall comply with one of the following options:

1. A local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent; or
2. Projects with aggregate landscape areas less than 2,500 square feet may comply with the MWELO's Appendix D Prescriptive Compliance Option.

Notes:

1. The Model Water Efficient Landscape Ordinance (MWELO) and supporting documents are available at: http://www.water.ca.gov/wateruseefficiency/ landscapeordinance/
2. A water budget calculator is available at: http://www.water.ca.gov/wateruseefficiency/landscapeordinance/

SECTION 4.305 WATER REUSE SYSTEMS

4.305.1 Recycled water supply systems. Newly constructed residential developments, where disinfected tertiary recycled water is available from a municipal source to a construction site, may be required to have recycled water supply systems installed, allowing the use of recycled water for residential landscape irrigation systems. See Chapter 15 of the *California Plumbing Code.*

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

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

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

CHAPTER 5

NONRESIDENTIAL MANDATORY MEASURES

Division 5.1 – PLANNING AND DESIGN

SECTION 5.101
GENERAL

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

SECTION 5.102
DEFINITIONS

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

CUTOFF LUMINAIRES.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV).

TENANT-OCCUPANTS.

VANPOOL VEHICLE.

ZEV.

SECTION 5.103
SITE SELECTION
(Reserved)

SECTION 5.104
SITE PRESERVATION
(Reserved)

SECTION 5.105
DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES
(Reserved)

SECTION 5.106
SITE DEVELOPMENT

5.106.1 Stormwater pollution prevention for projects that disturb less than one acre of land. Newly constructed projects and additions which disturb less than one acre of land and are not part of a larger common plan of development or sale shall prevent the pollution of stormwater runoff from the construction activities through one or more of the following measures:

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

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

1. Soil loss BMP's that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Scheduling construction activity during dry weather, when possible.
   b. Preservation of natural features, vegetation, soil, and buffers around surface waters.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils.
   e. Erosion control to protect slopes.
   f. Protection of storm drain inlets (gravel bags or catch basin inserts).
   g. Perimeter sediment control (perimeter silt fence, fiber rolls).
   h. Sediment trap or sediment basin to retain sediment on site.
   i. Stabilized construction exits.
   j. Wind erosion control.
   k. Other soil loss BMP's acceptable to the enforcing agency.
2. Good housekeeping BMP's to manage construction equipment, materials, non-stormwater discharges, and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:

a. Dewatering activities.
b. Material handling and waste management.
c. Building materials stockpile management.
d. Management of washout areas (concrete, paints, stucco, etc.).
e. Control of vehicle/equipment fueling to contractor's staging area.
f. Vehicle and equipment cleaning performed off site.
g. Spill prevention and control.
h. Other housekeeping BMP's acceptable to the enforcing agency.

5.106.2 Stormwater pollution prevention for projects that disturb one or more acres of land. Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development or sale.

Note: Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development or sale must comply with the postconstruction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).

The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conservation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency.

Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

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

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

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

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

5.106.4.1.2 Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.3. For additions or alterations that add 10 or more tenant-occupant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility.

5.106.4.1.4. For new shell buildings in phased projects provide secure bicycle parking for 5 percent of the anticipated tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.5. Acceptable bicycle parking facility for Sections 5.106.4.1.2, 5.106.4.1.3, and 5.106.4.1.4 shall be convenient from the street and shall meet one of the following:

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

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

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

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

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

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

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

TABLE 5.106.5.2

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

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

CLEAN AIR/
VANPOOL/EV

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

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

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

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

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

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

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

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

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

TABLE 5.106.5.3.3

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201 and over	6 percent of total[1]

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

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

5.106.5.3.5 [N] Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.

Notes:

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

vides helpful information for local governments, residents and businesses. www.opr.ca.gov/docs/ZEV_Guidebook.pdf.

5.106.8 Light pollution reduction. [N] [BSC-CG] 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 0-4 as defined in Chapter 10, Section 10-114 of the *California Administrative Code*; and
2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in Chapter 8);
3. Uplight and Glare ratings as defined in *California Energy Code* (shown in Tables 130.2-A and 130.2-B in Chapter 8) and
4. Allowable BUG ratings not exceeding those shown in Table 5.106.8 [N], or

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

Exceptions: [N]

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code.*
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the *California Energy Code,* Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

Notes:

1. **[N]** See also *California Building Code,* Chapter 12, Section 1205.7 for college campus lighting requirements for parking facilities and walkways.
2. Refer to Chapter 8 (Compliance Forms, Worksheets and Reference Material) for IES TM-15-11 Table A-1, *California Energy Code* Tables 130.2-A and 130.2-B.

5.106.8.1 Light pollution reduction. [N] [DSA-SS] Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the *California Energy Code* for Lighting Zones 1-4 as defined in Chapter 10 of the *California Administrative Code*; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and
3. Allowable BUG ratings not exceeding those shown in Table 5.106.8.1, or

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

Exceptions: [N]

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code.*
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the *California Energy Code,* Part 6.

TABLE 5.106.8 [N]
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
Maximum Allowable Backlight Rating[3] (B)					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
Maximum Allowable Uplight Rating (U)					
For area lighting[4]	N/A	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	N/A	U1	U2	U3	U4
Maximum Allowable Glare Rating[5] (G)					
Luminaire greater than 2 MH from property line	N/A	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	N/A	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	N/A	G0	G0	G1	G1
Luminaire front hemisphere is less than 0.5 MH from property line	N/A	G0	G0	G0	G1

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

4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

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

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

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

Exception: Additions and alterations not altering the drainage path.

TABLE 5.106.8.1 [N]
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

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

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

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES
DIVISION 5.2 – ENERGY EFFICIENCY

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

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

CHAPTER 5

NONRESIDENTIAL MANDATORY MEASURES

Division 5.2 – ENERGY EFFICIENCY

SECTION 5.201
GENERAL

5.201.1 Scope [BSC-CG]. ***California Energy Code*** **[DSA-SS].** For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

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

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

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

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

Division 5.3 – WATER EFFICIENCY AND CONSERVATION

SECTION 5.301
GENERAL

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

SECTION 5.302
DEFINITIONS

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

EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) [DSA-SS]

FOOTPRINT AREA [DSA-SS]

GRAYWATER.

METERING FAUCET

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO).

POTABLE WATER.

RECYCLED WATER.

SPECIAL LANDSCAPE AREA (SLA). [DSA-SS]

SUBMETER.

SECTION 5.303
INDOOR WATER USE

5.303.1 Meters. Separate submeters or metering devices shall be installed for the uses described in Sections 5.303.1.1 and 5.303.1.2.

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

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

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

5.303.2 Reserved.

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

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

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

5.303.3.2 Urinals.

5.303.3.2.1 Wall-mounted urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush.

5.303.3.2.2 Floor-mounted urinals. The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush.

5.303.3.3 Showerheads. [BSC-CG]

5.303.3.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 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 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.

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

5.303.3.3.3 Showerheads. [DSA-SS]

5.303.3.3.3.1 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.

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

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

5.303.3.4 Faucets and fountains.

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

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

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

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

5.303.3.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per cycle/ 20 [rim space (inches) at 60 psi].

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

5.303.4 Commercial kitchen equipment.

5.303.4.1 Food waste disposers. Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.

Note: This code section does not affect local jurisdiction authority to prohibit or require disposer installation.

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

5.303.6 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code,* and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* and in Chapter 6 of this code.

SECTION 5.304
OUTDOOR WATER USE

5.304.1 Scope. The provisions of Section 5.304, Outdoor Water Use reference the mandatory Model Water Efficiency Landscape Ordinance (MWELO) contained within Chapter 2.7, Division 2, Title 23, *California Code of Regulations*.

5.304.2 Outdoor water use in landscape areas equal to or greater than 500 square feet. When water is used for outdoor irrigation for new construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review, one of the following shall apply:

1. A local water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the updated model ordinance

adopted by the Department of Water Resources (DWR) per Government Code Section 65595 (c).

2. The California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, *California Code of Regulations*.

5.304.3 Outdoor water use in rehabilitated landscape projects equal to or greater than 2,500 square feet. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review shall comply with Section 5.304.2, Item 1 or 2.

5.304.4 Outdoor water use in landscape areas of 2,500 square feet or less. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of MWELO or conform to the prescriptive compliance measures contained in MWELO's Appendix D.

5.304.5 Graywater or rainwater use in landscape areas. For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to Appendix D Section (5).

Notes:

1. DWR's Model Water Efficient Landscape Ordinance, definitions and supporting documents are available at the following link: http://water.ca.gov/wateruseefficiency/landscapeordinance/
2. A water budget calculator is available at the following link: http://water.ca.gov/wateruseefficiency/landscapeordinance/
3. The MWELO prescriptive compliance measure Appendix D may be found at the following link: http://water.ca.gov/wateruseefficiency/landscapeordinance/. In addition, a copy of MWELO Appendix D may be found in Chapter 8 of this code.

5.304.6 Outdoor potable water use in landscape areas [DSA-SS]. For public schools and community colleges, landscape projects as described in Sections 5.304.6.1 and 5.304.6.2 shall comply with the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, *California Code of Regulations*, except that the evapotranspiration adjustment factor (ETAF) shall be 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of the MWELO.

5.304.6.1 Newly constructed landscapes. [DSA-SS] New construction projects with an aggregate landscape area equal to or greater than 500 square feet.

5.304.6.2 Rehabilitated landscapes. [DSA-SS] Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

SECTION 5.305
WATER REUSE SYSTEMS

5.305.1 Recycled water supply systems. Recycled water supply systems shall be installed in accordance with Sections 5.305.1.1, 5.305.1.2, and the *California Plumbing Code.*

5.305.1.1 Outdoor recycled water supply systems. All newly constructed nonresidential developments, where disinfected tertiary recycled water is available from a municipal source to a construction site, shall be provided with both a potable water supply system and a recycled water supply system. The recycled water supply system shall allow the use of reclaimed (recycled) water for aboveground and subsurface irrigation to all landscape irrigation systems.

For the purposes of Section 5.305.1.1, when a recycled water supply pipe is located within 300 feet from a construction site boundary, it shall be considered that reclaimed (recycled) water is available from a municipal source.

Exceptions:

1. Service areas in which the only reclaimed (recycled) water is used for potable purposes, or in which net nonpotable deliveries are anticipated to remain level or decrease as a result of the potable reuse project.
2. Where access to disinfected tertiary recycled water is not feasible and/or cost-efficient, as determined by the authority having jurisdiction in consultation with the recycled water purveyor.

   Note: A city, county, or city and county, in consultation with the recycled water purveyor, may further reduce the area for the mandate to install recycled water supply systems if the recycled water purveyor is unable to accommodate new services or unable to provide uninterruptable service.
3. A potable water supply system is not required for landscape irrigation if the landscape irrigation system is supplied with recycled water at the time of final inspection.
4. Potable water may be used with the recycled water supply system on a temporary basis, as allowed by the authority having jurisdiction in consultation with the recycled water purveyor.

5.305.1.2 Technical requirements for outdoor recycled water supply systems. Recycled water supply systems for outdoor applications shall meet the requirements of this code, and the California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 1; Title 22, Division 4, Chapter 3; and Title 23, Division 2, Chapter 2.7, as applicable.

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

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

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

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

Division 5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.401
GENERAL

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

SECTION 5.402
DEFINITIONS

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

ADJUST.

BALANCE.

BUILDING COMMISSIONING.

ORGANIC WASTE.

TEST.

SECTION 5.403
FOUNDATION SYSTEMS
(Reserved)

SECTION 5.404
EFFICIENT FRAMING TECHNIQUES
(Reserved)

SECTION 5.405
MATERIAL SOURCES
(Reserved)

SECTION 5.406
ENHANCED DURABILITY AND REDUCED MAINTENANCE
(Reserved)

SECTION 5.407
WATER RESISTANCE AND MOISTURE MANAGEMENT

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

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

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

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

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

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

5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.

SECTION 5.408
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 Construction waste management. Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

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

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

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

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

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

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

5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65 percent minimum requirement as approved by the enforcing agency.

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

Notes:

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

5.408.2 Universal waste. [A] Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

Note: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/OEARA_REGS_UWR_FinalText.pdf

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

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

Notes:

1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material. (www.cdfa.ca.gov/exec/county/county_contacts.html)
2. For a map of known pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (www.cdfa.ca.gov)

SECTION 5.409
LIFE CYCLE ASSESSMENT
(Reserved)

SECTION 5.410
BUILDING MAINTENANCE AND OPERATION

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

Exception: Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.

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

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

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

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

5.410.2 Commissioning. [N] New buildings 10,000 square feet and over. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated by the *California Energy Code* Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy-related systems under the scope (Section 100) of the *California Energy Code*, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to *California Energy Code* Section 120.8 for commissioning requirements.

Commissioning requirements shall include:

1. Owner's or owner representative's project requirements.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

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

Informational Notes:

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

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

1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

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

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

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

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

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

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

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

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

5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:

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

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

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

5.410.4.1 (Reserved)

Note: For energy-related systems under the scope (Section 100) of the *California Energy Code*, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting system and controls, as well as water heating systems and controls, refer to *California Energy Code* Section 120.8 for commissioning requirements and Sections 120.5, 120.6, 130.4, and 140.9(b)3 for additional testing requirements of specific systems.

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

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

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

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

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

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

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

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

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

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

CHAPTER 5

NONRESIDENTIAL MANDATORY MEASURES

Division 5.5 – ENVIRONMENTAL QUALITY

SECTION 5.501
GENERAL

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

SECTION 5.502
DEFINITIONS

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

ARTERIAL HIGHWAY.

A-WEIGHTED SOUND LEVEL (dBA).

1 BTU/HOUR.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL).

COMPOSITE WOOD PRODUCTS.

DAY-NIGHT AVERAGE SOUND LEVEL (Ldn).

DECIBEL (dB).

ENERGY EQUIVALENT (NOISE) LEVEL (L_{eq}).

EXPRESSWAY.

FREEWAY.

GLOBAL WARMING POTENTIAL (GWP).

GLOBAL WARMING POTENTIAL VALUE (GWP VALUE).

HIGH-GWP REFRIGERANT.

LONG RADIUS ELBOW.

LOW-GWP REFRIGERANT.

MERV.

MAXIMUM INCREMENTAL REACTIVITY (MIR).

PRODUCT-WEIGHTED MIR (PWMIR).

PSIG.

REACTIVE ORGANIC COMPOUND (ROC).

SCHRADER ACCESS VALVES.

SHORT RADIUS ELBOW.

SUPERMARKET.

VOC.

SECTION 5.503
FIREPLACES

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

5.503.1.1 Woodstoves. Woodstove and pellet stoves shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits.

SECTION 5.504
POLLUTANT CONTROL

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

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

5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

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

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

TABLE 5.504.4.1
ADHESIVE VOC LIMIT[1,2]
Less Water and Less Exempt Compounds in Grams Per Liter

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

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

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

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

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

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

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

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

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

TABLE 5.504.4.3
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2, 3]
Grams of VOC per Liter of Coating,
Less Water and Less Exempt Compounds

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

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

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

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

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

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

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

5.504.4.5.1 Early compliance. Reserved.

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

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

TABLE 5.504.4.5
FORMALDEHYDE LIMITS[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 E1333. 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 mm).

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

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

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

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

Exceptions:

1. An ASHRAE 10-percent to 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.

5.504.7 Environmental tobacco smoke (ETS) control. Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University, or campus of the University of California, whichever are more stringent. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

SECTION 5.505
INDOOR MOISTURE CONTROL

5.505.1 Indoor moisture control. Buildings shall meet or exceed the provisions of *California Building Code,* CCR, Title 24, Part 2, Sections 1203 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures not applicable to low-rise residential occupancies, see Section 5.407.2 of this code.

SECTION 5.506
INDOOR AIR QUALITY

5.506.1 Outside air delivery. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the *California Energy Code,* or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

5.506.2 Carbon dioxide (CO2) monitoring. For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the *California Energy Code,* Section 120.1(c)(4).

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. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
   2. L_{dn} 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 L_{eq}-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 Section 5.507.4.1 or 5.507.4.1.1, 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.

SECTION 5.508
OUTDOOR AIR QUALITY

5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.

Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.

5.508.2.1 Refrigerant piping. Piping compliant with the *California Mechanical Code* shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than $^1/_4$ inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

5.508.2.1.1 Threaded pipe. Threaded connections are permitted at the compressor rack.

5.508.2.1.2 Copper pipe. Copper tubing with an OD less than $^1/_4$ inch may be used in systems with a refrigerant charge of 5 pounds or less.

5.508.2.1.2.1 Anchorage. One-fourth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

5.508.2.1.3 Flared tubing connections. Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

5.508.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

5.508.2.2 Valves. Valves and fittings shall comply with the *California Mechanical Code* and as follows.

5.508.2.2.1 Pressure relief valves. For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

5.508.2.2.1.1 Pressure detection. A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

5.508.2.2.2 Access valves. Only Schrader access valves with a brass or steel body are permitted for use.

5.508.2.2.2.1 Valve caps. For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.

5.508.2.2.2.2 Seal caps. If designed for it, the cap shall have a neoprene O-ring in place.

5.508.2.2.2.2.1 Chain tethers. Chain tethers to fit over the stem are required for valves designed to have seal caps.

Exception: Valves with seal caps that are not removed from the valve during stem operation.

5.508.2.3 Refrigerated service cases. Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

5.508.2.3.1 Coil coating. Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

5.508.2.4 Refrigerant receivers. Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device that indicates the level of refrigerant in the receiver.

5.508.2.5 Pressure testing. The system shall be pressure tested during installation prior to evacuation and charging.

5.508.2.5.1 Minimum pressure. The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging.

5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

5.508.2.6.2 Second vacuum. Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

5.508.2.6.3 Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

Commissioning Referenced Standards for Non-Energy Systems

The following CALGreen Referenced Standards are included herein as a convenience for the users of the California Green Building Standards Code, but they are not considered to be part of the code unless they are officially adopted by a local jurisdiction.

Contents **Page**

Part 1

STANDARDS FOR COMPLIANCE WITH BUILDING COMMISSIONING

Reference: Section 5.410.2, Commissioning.

Introduction:

The purpose of this code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of concepts that reduce negative and increase positive environmental impacts. Commissioning is a vital element in this effort.

Definitions used in the *CALGreen* Cx Reference standard:

Acronyms

BOD	Basis of Design
Cx	Commissioning
FPT	Functional Performance Test
HVAC	Heating, Ventilating, and Air-Conditioning
O&M	Operations and Maintenance
OPR	Owner's Project Requirements

Glossary:

Acceptance Criteria—The conditions that must be met for systems or equipment to meet defined and expected outcomes.

Commissioning (Cx)—Building commissioning as required in this code involves a quality assurance process that begins during design and continues to occupancy. Commissioning verifies that the new building operates as the owner intended and that building staff are prepared to operate and maintain its systems and equipment. Exceptions are allowed for dry storage warehouses of any size and conditioned spaces under 10,000 square feet accessory to them; and for tenant improvements under 10,000 square feet within a larger space.

Owner—The individual or entity holding title to the property on which the building is constructed.

Commissioning Coordinator—The person who coordinates the commissioning process. This can be either a third-party commissioning provider or an experienced member of the design team or owner in-house staff member.

Commissioning Team—The key members of each party involved with the project designated to provide insight and carry out tasks necessary for a successful commissioning project. Team members may include the commissioning coordinator, owner or owner's representative, building staff, design professionals, contractors or manufacturer's representatives, and testing specialists.

Independent Third-Party Commissioning Professional—A commissioning consultant contracted directly by the owner who is not responsible to, or affiliated with, any other member of the design and construction team.

Operation and Maintenance (O&M) Manuals—Documents that provide information necessary for operating and maintaining installed equipment and systems.

Owner Representative—An individual or entity assigned by the owner to act and sign on the owner's behalf.

Process Equipment—Energy-using equipment and components that are not used for HVAC, electrical, plumbing, and irrigation operations. Such devices would include but are not limited to heat transfer, water purifying, air cleaning, air vacuum, and air compressing.

Sequence of Operation—A written description of the intended performance and operation of each control element and feature of the equipment and systems.

Selecting Trained Personnel (for Commissioning)

This code requires that "Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity." The trained personnel manage and facilitate the commissioning process. The trained personnel develop and implement the commissioning tasks and documentation identified in Sections 5.410.2.1 through 5.410.2.6. Trained personnel may include appropriate members of owner staff, contractor, and design team as well as independent commissioning professionals.

It is essential that there is a single person designated to lead and manage the commissioning activities. In practice, this individual has been referenced by various identifiers such as commissioning authority, agent, provider, coordinator, lead, etc. In this guide the term "commissioning coordinator" is used.

The designated commissioning coordinator may be an independent, third-party commissioning professional, a project design team member (e.g., engineer or architect), an owner's engineer or facility staff, contractor or specialty subcontractor. Methods of evaluating the designated commissioning coordinator and trained personnel include review of the following:

1. Technical knowledge;
2. Relevant experience;
3. Potential conflict of interest concerns;
4. Professional certifications and training;
5. Communication and organizational skills; and
6. Reference and sample work products.

Selection of "trained," qualified personnel is required by this code. In order to meet this requirement, the commissioning provider should be evaluated via the methods discussed above. In addition, various organizations have training and certification programs that may be a source for identification of qualified commissioning providers.

For information about enforcement and compliance of each commissioning element see Sections 5.410.2.1 through 5.410.2.6.

For compliance forms and templates see Part 2 following this standard.

Reference: 1 Owner's Project Requirements

***CALGreen* Section 5.410.2.1, Owner's or Owner representative's Project Requirements (OPR).**

1.1 Intent:

The Owner's Project Requirements (OPR) documents the functional requirements of a project and expectations of the building use and operation as it relates to systems being commissioned. The document describes the physical and functional building characteristics desired by the owner and establishes performance and acceptance criteria. The OPR is most effective when developed during predesign and used to develop the Basis of Design (BOD) during the design process. The level of detail and complexity of the OPR will vary according to building use, type, and systems.

1.2 Compliance Method:

Compliance is demonstrated by the owner or owner's representative developing and/or approving the Owner's Project Requirements (OPR) document and can be defined as follows:

1. Environmental and Sustainability Goals—Establish environmental project goals and objectives exceeding the code for the project's sustainability, which may include:
    a. *CALGreen* voluntary measures or Tiers sought, or other specific green building rating system or program credits and/or level of certification sought
    b. Specific environmental or sustainability goals such as water efficiency, water reuse, CO_2 monitoring, xeriscaping, etc.
2. Building Sustainable Goals—Establish goals and targets affecting energy efficiency, which may include:
    a. Measures affecting building sustainability desired by owner
        i. Building orientation and siting
        ii. Daylighting
        iii. Facade, envelope, and fenestration
        iv. Roof
        v. Natural ventilation
        vi. Onsite renewable power generation and net-zero energy use
        vii. Landscaping and shading
3. Indoor Environmental Quality Requirements—For each program space describe indoor environmental requirements including intended use and anticipated schedule, and the following:
    a. Temperature and humidity
    b. Acoustics
    c. Air quality, ventilation, and filtration

d. Desired adjustability of system controls

e. Accommodations for after-hours use

f. Other owner requirements including natural ventilation, operable windows, daylight, views, etc.

4. Project Program, including facility functions and hours of operation, and need for after-hours operation—Describe primary purpose, program, and use of proposed project include the following:

a. Building size, number of stories, construction type, occupancy type and number

b. Building program areas including intended use and anticipated occupancy schedules

c. Future expandability and flexibility of spaces

d. Quality and/or durability of materials and building lifespan desired

e. Budget or operational constraints

f. Applicable codes

5. Equipment and Systems Expectations—Describe the following for each system commissioned:

a. Level of quality, reliability, equipment type, automation, flexibility, maintenance, and complexity desired

b. Specific efficiency targets, desired technologies, or preferred manufacturers for building systems, acoustics and vibration

c. Degree of system integration, automation, and functionality for controls

6. Building Occupant and O&M Personnel Expectations—Describe the following:

a. How building will be operated and by whom

b. Level of training and orientation required to understand, operate, and use the building systems for building operation and maintenance staff, as well as occupants

c. Building operation and maintenance staff location and capabilities

1.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the OPR document, or

b) Receipt of a form signed by the owner or owner representative attesting that the OPR has been completed and approved by the owner.

Reference: 2 Basis of Design (BOD)

***CALGreen* Section 5.410.2.2, Basis of Design (BOD).**

2.1 Intent:

The Basis of Design (BOD) describes the building systems to be commissioned and outlines design assumptions not indicated in the design documents. The design team develops the BOD to describe how the building systems' design meets the Owner's Project Requirements (OPR), and why the systems were selected. The BOD is most effective when developed early in the project design and updated as necessary throughout the design process.

2.2 Compliance Method:

Compliance requires the completion of the BOD document and should include the following where applicable:

1. Renewable Energy Systems

a. Provide narrative description of system—type, performance, control type, energy savings, payback period

b. Describe reason for system selection—why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference

c. Sequence of Operation—operating schedules, setpoints, storage capacity

d. Describe how system meets the OPR

2. Landscape Irrigation Systems

a. Provide narrative description of system—type, performance, water usage

b. Describe reason for system selection—why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, expandability, cost, owner preference, simplicity

c. Sequence of Operation—operating schedules, setpoints

d. Describe how system meets the OPR

3. Water Reuse Systems

a. Provide narrative description of system—type, performance, capacity, reuse purpose

b. Describe reason for system selection—why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, expandability, cost, owner preference, simplicity

c. Sequence of Operation—operating schedules, setpoints

d. Describe how system meets the OPR

2.3 Enforcement:

At their discretion, the building official confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the BOD document, or

b) Receipt of a form signed by the architect, engineer or designer of record, attesting that the BOD has been completed and meets the requirements of the OPR.

Reference: 3 Commissioning measures shown in the construction documents

***CALGreen* Section 5.410.2, Commissioning.**

This section provides details for element 3: Commissioning measures shown in the construction documents.

3.1 Intent:

Include commissioning measures or requirements in the construction documents (plans and specifications). Commissioning measures or requirements should be clear, detailed, and complete to clarify the commissioning process.

3.2 Compliance Method:

Compliance is achieved by including commissioning requirements in the project specifications. The commissioning specifications should include the following:

1. Primary (and optionally all) commissioning requirements are included in the general specification division (typically Division 1) and clear cross references of all commissioning requirements to and from the general division are included to ensure all subcontractors are held to them.
2. A list of the systems and assemblies covered by the commissioning requirements.
3. Roles and responsibilities of all parties, including:
   i. General contractor and subcontractors, vendors, construction manager
   ii. Commissioning provider lead
   iii. Owner, facility staff
   iv. Architect and design engineers
   v. Include the noncontractor parties in the construction specifications (information used only to provide the contractor with context for their work).
   vi. Include who writes checklists and tests, who reviews and approves test forms, who directs tests, who executes tests, who documents test results, and who approves completed tests. These roles may vary by system or assembly.
4. Meeting requirements
5. Commissioning schedule management procedures
6. Issue and noncompliance management procedures
7. Requirements for execution and documentation of installation, checkout, and start up, including controls point-to-point checks and calibrations
8. Specific testing requirements by system, including:
   i. Monitoring and trending
   ii. Opposite season or deferred testing requirements, functions, and modes to be tested
   iii. Conditions of test
   iv. Acceptance criteria, and any allowed sampling
   v. Include details of the format and rigor of the test forms required to document test execution
   vi. Include example forms is recommended

9. Submittal review requirements and approval process.
10. Content, authority, and approval process of the commissioning plan.
11. Commissioning documentation and reporting requirements.
12. Facility staff training requirements and verification procedures.
13. O&M manual review and approval procedures.
14. System's manual development and approval requirements and procedures.
15. Definitions section.

3.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the commissioning specifications, or

b) Receipt of a form signed by the owner or owner's representative or designer of record attesting that the owner-approved commissioning specifications are included in the construction documents.

Reference: 4 Commissioning plan

***CALGreen* Section 5.410.2.3, Commissioning plan.**

4.1 Intent:

The Commissioning Plan (Cx Plan) establishes the commissioning process guideline for the project and commissioning team's level of effort by identifying the required Cx activities to ensure that the Owner's Project Requirements (OPR) and the Basis of Design (BOD) are met. The Cx Plan also includes a commissioning schedule from design to occupancy.

4.2 Compliance Method:

Compliance is demonstrated by preparation of a project-specific Cx Plan that includes the elements listed in the code section above. The following gives guidance for developing the components of the commissioning plan:

1. General project information - Provide project-identifying information including but not limited to the following:
    i. Project name, owner, location.
    ii. Building type, building area.
    iii. Project schedule.
    iv. Contact information of individual/company providing the commissioning services.
2. Commissioning goals – Document the commissioning goals, including but not limited to:
    i. Meeting *CALGreen* code requirements for commissioning.
    ii. Meeting OPR and BOD requirements.
    iii. Carrying out requirements for commissioning activities as specified in plans and specifications.
3. Systems to be commissioned – See BOD
    a. An explanation of the original design intent - Document the performance objectives and design intent for each system listed to be commissioned in a written narrative
        –Refer to the OPR and BOD documents
    b. Equipment and systems to be tested, including the extent of tests
        i. Provide a list of equipment and systems to be tested
        ii. Describe the range and extent of tests to be performed for each system component, and interface between systems
    c. Functions to be tested - Provide example functional test procedures to identify the level of testing detail required
        –See (Section 5.410.2.4) FPT guidance for more information
    d. Conditions under which the test shall be performed - Identify the conditions under which the major operational system functions are to be tested, including:
        i. Normal operations and part-load operations.
        ii. Seasonal testing requirements.
        iii. Restart of equipment and systems after power loss.

iv. System alarm confirmations.

e. Measurable criteria for acceptable performance - Include measurable criteria for acceptable performance of each system to be tested

4. Commissioning team information - Provide a contact list for all commissioning team members, including but not limited to:
   i. Owner, owner's representative.
   ii. Architect, engineers.
   iii. Designated commissioning representative.
   iv. General contractor, subcontractors, and construction manager.
5. Commissioning process activities, schedules and responsibilities
   i. Establish prescribed commissioning process steps and activities to be accomplished by the Cx team throughout the design to occupancy.
   ii. For each phase of the work, define the roles and responsibilities for each member of the Cx team.
   iii. List the required Cx deliverables, reports, forms and verifications expected at each stage of the commissioning effort.
   iv. Include the confirmation process for the O&M manual, systems manual, and the facility operator and maintenance staff training.

4.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the commissioning plan, or

b) Receipt of a form signed by the owner or owner's representative attesting that the Cx Plan has been completed.

Reference: 5 Functional performance testing

***CALGreen* Section 5.410.2.4, Functional performance testing.**

5.1 Intent:

Develop and implement the functional performance tests to document, as set forth in the commissioning plan, that all components, equipment, systems and system-to-system interfaces were installed as specified, and operate according to the Owner's Project Requirements, Basis of Design, and plans and specifications.

The following systems to be functionally tested are listed in the Basis of Design (Section 5.410.2.2 of the code):

1. Renewable energy systems
2. Landscape irrigation systems
3. Water reuse systems

5.2 Compliance Method:

Compliance is demonstrated by developing and implementing test procedures for each piece of commissioned equipment and interfaces between equipment and systems according to the building-specific commissioning plan. Tests should include verification of proper operation of all equipment features, each part of the sequence of operation, overrides, lockouts, safeties, alarms, occupied and unoccupied modes, loss of normal power, exercising a shutdown, startup, low load through full load (as much as is possible) and back, staging and standby functions, scheduling, energy efficiency strategies and loop tuning.

Elements of acceptable test procedures include:

1. Date and party—Identification of the date of the test and the party conducting the test.
2. Signature block—Signature of the designated commissioning lead and the equipment installing contractor attesting that the recorded test results are accurate.
3. Prerequisites—Any conditions or related equipment checkout or testing that needs to be completed before conducting this test.
4. Precautions—Identification of the risks involved to the test team members and the equipment and how to mitigate them.
5. Instrumentation—Listing of the instrumentation and tools necessary to complete the test.
6. Reference—In each procedure item, identify the source for what is being confirmed (e.g., sequence of operation ID, operating feature, specification requirement, etc.).
7. Test instructions—Step-by-step instructions of how to complete the test, including functions to test and the conditions under which the tests should performed.

8. Acceptance criteria—Measurable pass / fail criteria for each step of the test, as applicable.
9. Results—Expected system response and space to document the actual response, readings, results and adjustments.
10. Return to normal—Instructions that all systems and equipment are to be returned to their as-found state at the conclusion of the tests.
11. Deficiencies—A list of deficiencies and how they were mitigated.

5.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance during onsite enforcement by:

a) Receipt of a copy of completed and signed functional performance tests and corrected deficiencies, or

b) Receipt of a form signed by the owner, owner's representative or commissioning coordinator attesting that the functional performance tests have been completed and any deficiencies corrected.

Reference: 6.1 Documentation and training

***CALGreen* Section 5.410.2.5, Documentation and training.**

Section 5.410.2.5.1, Systems manual.

6.1.1 Intent:

The Systems Manual documents information focusing on the operation of the building systems. This document provides information needed to understand, operate, and maintain the equipment and systems and informs those not involved in the design and construction of the building systems. This document is in addition to the record construction drawings, documents, and the Operation & Maintenance (O&M) manuals supplied by the contractor. The Systems Manual is assembled during the construction phase and available during the contractors' training of the facility staff.

A6.1.6.1.2 Compliance Method:

Compliance is demonstrated by providing the Systems Manual. The information in the Systems Manual includes the following:

1. Site information, including facility description, history and current requirements
    a. Site information
        i. Location of property - address
        ii. Site acreage
        iii. Local utility information
            –Water service provider
            –Natural/LPG gas service provider
            –Electrical service provider
            –Telecommunications service provider
            –Other service providers
    b. Facility description
        i. Use/function
        ii. Square footage
        iii. Occupancy type
        iv. Construction type
        v. Basis of Design
        vi. Location of major systems and equipment
    c. Project history
        i. Project requirements
            –Owner's Project Requirements (OPR)
            –Basis of Design (BOD)
        ii. Project undocumented events
        iii. Record drawings and documents
        iv. Final control drawings and schematics
        v. Final control sequences

vi. Construction documents - location or delivery information

–Mechanical and electrical drawings
–Specifications
–Submittals
–Project change orders and information

d. Current requirements
   i. Building operating schedules
   ii. Space temperature, humidity, and pressure, CO_2 setpoints
   iii. Summer and winter setback schedules
   iv. Chilled and hot water temperatures
   v. As-built control setpoints and parameters

2. Site contact information
   a. Owner information
   b. Emergency contacts
   c. Design team: architect, mechanical engineer, electrical engineer, etc.
   d. Prime contractor contact information
   e. Subcontractor information
   f. Equipment supplier contact information
3. Basic operation and maintenance, including general site operating procedures, basic trouble shooting, recommended maintenance requirements site events log
   a. Basic operation
      i. Written narratives of basic equipment operation
      ii. Interfaces, interlocks and interaction with other equipment and systems
      iii. Initial maintenance provided by contactor
   b. General site operating procedures
      i. Instructions for changes in major system operating schedules
      ii. Instructions for changes in major system holiday and weekend schedules
   c. Basic troubleshooting
      i. Cite any recommended troubleshooting procedures specific to the major systems and equipment installed in the building.
      ii. Manual operation procedures
      iii. Standby/backup operation procedures
      iv. Bypass operation procedures
      v. Major system power fail resets and restarts
      vi. Trend log listing
   d. Recommended maintenance events log
   e. Operation & Maintenance manuals - location or delivery information
4. Major systems
   a. Renewable energy systems
      i. Photovoltaic panels and inverters
      ii. Wind-powered electrical generators and inverters
   b. Landscape irrigation systems
      i. Water distribution diagrams
      ii. Control system
   c. Water reuse systems
      i. Reclaimed water system for indoor use
      ii. Reclaimed water for irrigation use

5. Site equipment inventory and maintenance notes
    a. Spare parts inventory
    b. Frequently required parts and supplies
    c. Special equipment required to operate or maintain systems
    d. Special tools required to operate or maintain systems
6. A copy of all special inspection verifications required by the enforcing agency of this code
7. Other resources and documentation

6.1.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance during on-site enforcement by:

a. Receipt of a copy of the Systems Manual, or
b. Receipt of a form signed by the owner or owner's representative attesting that the systems manual has been completed.

Reference: 6.2 Documentation and training

***CALGreen* Section 5.410.2.5, Documentation and training.**

Section 5.410.2.5.2, Systems operations training.

6.2.1 Intent:

The systems operation training verifies that a training program is developed to provide training to the appropriate maintenance staff for each equipment type and/or system and that this training program is documented in the commissioning report. The systems operations training program is specified in the project specifications for the major systems listed. The systems manual, Operation and Maintenance (O&M) documentation, and record drawings are prepared and available to the maintenance staff prior to implementation of any training or the development of a written training program. The training program is to be administered when the appropriate maintenance staff is made available to receive training.

A6.1.6.2.2 Compliance Method:

The written training program includes: (a) learning goals and objectives for each session, (b) training agenda, topics, and length of instruction for each session, (c) instructor information and qualifications, (d) location of training sessions (on-site, off-site, manufacturer's or vendor's facility), (e) attendance forms, (f) training materials, and (g) description on how the training will be archived for future use.

1. Systems/equipment overview
    a. Review OPR and BOD related to the major systems and equipment
    b. Describe system type and configuration
    c. Explain operation of all major systems and equipment and how it interfaces with other systems and equipment
    d. Describe operation of critical devices, controls, and accessories
    e. Review location of the major systems and equipment
    f. Describe operation of control system for each system, location of critical control elements, and procedures to properly operate control system
    g. Review recommendations for implementation to reduce energy and water use
2. Review and demonstration of servicing/preventive maintenance
    a. Explain location or delivery contact of the Operation & Maintenance manuals
    b. Review of all manufacturer's recommended maintenance activities to maintain warranty
    c. Review and demonstrate frequent maintenance activities and suggested schedule
    d. Review and demonstrate typical servicing procedures and techniques (electrical current, pressure, and flow readings, etc; calibration procedures, point trending, power fail restart procedures, etc.)
    e. Locate, observe, and identify major equipment, systems, accessories, and controls
    f. Review emergency shut-offs and procedures
3. Review the information in the systems manual
    a. Describe use of systems manual
    b. Review elements of systems manual
    c. Explain how to update and add revisions to systems manual

4. Review record drawings on the systems/equipment
    a. Explain location or delivery contact of the record drawings
    b. Review record drawings, revisions, and changes to original design drawings.
    c. Review equipment schedules and compare with actual installed systems

6.2.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance during on-site enforcement by:

1. In the event appropriate maintenance staff is made available to receive training for each equipment type and/or system installed in the building.
    a. Receipt of a copy of the written training program and completed attendance forms, or
    b. Receipt of a form signed by the owner or owner's representative attesting that the training program and delivery of training has been completed.
2. In the event appropriate maintenance staff are unavailable to receive training for each equipment type and/or system installed in the building.
    a. Receipt of a copy of the training program provided to the owner or owner's representative, or
    b. Receipt of a form signed by the owner or owner's representative attesting that the written training program has been provided.

Reference: 7 Commissioning report

***CALGreen* Section 5.410.2.6, Commissioning report.**

7.1 Intent:

The commissioning report documents the commissioning process and test results. The report includes confirmation from the commissioning agent verifying that commissioned systems meet the conditions of the Owner's Project Requirements (OPR), Basis of Design (BOD), and contract documents.

7.2 Compliance Method:

The components of the commissioning report include the following and are defined as follows:

1. Executive summary of process and results of commissioning program, including observations, conclusions, and any outstanding items.
2. History of any system deficiencies and how resolved
    a. Include outstanding deficiencies and plans for resolution
    b. Include plans for seasonal testing scheduled for a later date
3. System performance test results and evaluations
4. Summary of training process completed and scheduled
5. Attach commissioning process documents
    a. Commissioning plan
    b. Owner's Project Requirements (OPR)
    c. Basis of Design (BOD)
    d. Executed installation checklists
    e. Executed Functional Performance Test (FPT) forms
    f. Recommendations for end-of-warranty review activities

7.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance during on-site enforcement by:

a) Receipt of a copy of the commissioning report, or

b) Receipt of a form signed by the owner or owner's representative attesting that the Cx Report has been completed.

Part 2

SAMPLE FORMS and TEMPLATES for COMMISSIONING

Note: Following are examples of templates and/or forms that may be used or adopted for verification compliance with commissioning. Code users may provide their own documents as permitted by the enforcing agency. For each subsection of commissioning, samples are provided; in a few cases with narrative templates, and in most cases with compliance forms. Simplified forms or more detailed forms, but not both, may be selected to submit for each project.

CALGreen COMPLIANCE FORM
OWNER'S PROJECT REQUIREMENTS (OPR)

The following form may be required to be printed on the permit set of construction drawings or submitted separately. Italicized text indicates direct or partial quotes from the *CALGreen Code.*

CALGreen Commissioning Requirement 5.410.2.1, Owner's Project Requirements (OPR)

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

1. *Environmental and sustainability goals.*
2. *Building sustainable goals.*
3. *Indoor environmental quality requirements.*
4. *Project program, including facility functions and hours of operation, and need for after hours operation.*
5. *Equipment and systems expectations.*
6. *Building occupant and operation and maintenance (O&M) personnel expectations.*

	OPR ELEMENTS	INCLUDED
1.	Environmental and sustainability goals.	☐
2.	Building sustainable goals.	☐
3.	Indoor environmental quality requirements.	☐
4.	Project program, including facility functions and hours of operation, and need for after-hours operation.	☐
5.	Equipment and systems expectations.	☐
6.	Building occupant and O&M personnel expectations.	☐

_____ _____

Owner/Owner's Representative Signature Date

OWNER'S PROJECT REQUIREMENTS (OPR) COMPLIANCE CHECKLIST

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	OPR ITEMS	PAGE NUMBER IN OPR DOCUMENT
	OWNER AND USER REQUIREMENTS—PROJECT PROGRAM	
1	General building information (size, stories, construction type, occupancy type, and number)	
2	Intended uses and schedules	
3	Future expandability and flexibility of spaces	
4	Quality and/or durability of materials and desired building lifespan	
5	Budget or operation constraints	
	ENVIRONMENTAL AND SUSTAINABILITY GOALS	
6	Level of compliance with the *California Green Building Standards Code*: Mandatory, Tier 1, or Tier 2	
7	Specific environmental or sustainability goals (e.g., water efficiency, water reuse, CO_2 monitoring, xeriscaping, etc.)	
	BUILDING SUSTAINABLE GOALS	
8	Measures affecting energy efficiency desired by owner (e.g., building orientation, shading, daylighting, natural ventilation, renewable power, etc.)	
	INDOOR ENVIRONMENTAL QUALITY REQUIREMENTS	
9	Lighting	
10	Temperature and humidity	
11	Acoustics	
12	Air quality, ventilation, and filtration	
13	Desired adjustability of system controls	
14	Accommodations for after-hours use	
15	Other owner requirements (e.g., natural ventilation, daylight, views, etc.)	

continued

ITEM #	OPR ITEMS	PAGE NUMBER IN OPR DOCUMENT
	EQUIPMENT AND SYSTEMS EXPECTATIONS	
16	Level of quality, reliability, equipment type, flexibility, maintenance, and complexity desired	
17	Specific efficiency targets, desired technologies, or preferred manufacturers for building systems, acoustics, and vibration	
18	Degree of system integration, automation, and functionality for controls (i.e., load shedding, demand response, energy management)	
	BUILDING OCCUPANT AND O&M PERSONNEL EXPECTATIONS	
19	Description of how the building will be operated and by whom	
20	Level of training and orientation required to understand, operate, and use the building systems for building operation and maintenance staff, as well as occupants	
21	Building operation and maintenance staff location and capabilities	
	COMMISSIONING AGENT INFORMATION	
22	Name of commissioning agency:	
23	Address of agency:	
24	Contact person(s) name(s):	

Owner/Owner's Representative Acknowledgement

Owner's Project Requirements (OPR). The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. The OPR includes the elements listed above and they have been approved by the Owner or Owner's Representative.

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

BASIS OF DESIGN (BOD)
COMPLIANCE TEMPLATE

Documentation of the Basis of Design (BOD) is a step required for compliance with CALGreen Code, Section 5.410.2.2, for newly constructed buildings greater than 10,000 square feet. This template is a guide for use by the design team.

1. Renewable Energy Systems

1.1. Narrative Description of System

A. [System type(s), location, inverter type, control type, performance, efficiency, energy savings, payback period]

B. [Describe how system meets any special requirements listed in the Owner's Project Requirements document.]

1.2. Reasons for System Selection

[Reasons that the selected renewable energy systems are a better choice than alternatives (e.g., performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, space constraints, cost, owner preferences, ease of maintenance, etc.)]

1.3. Renewable Energy System Generation Calculations

[Describe sizing calculation method, assumptions, and results]

2. Landscape Irrigation Systems

2.1. Narrative Description of System

A. [System type(s), location, control type, performance, efficiency, water savings]

B. [Describe how system meets any special requirements listed in the Owner's Project Requirements document.]

2.2. Reasons for System Selection

[Reasons that the selected landscape irrigation systems are a better choice than alternatives (e.g., performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, cost, owner preferences, ease of maintenance, etc.)]

2.3. Landscape Irrigation System Calculations

[Describe sizing calculation method, assumptions, and results]

3. Water Reuse Systems

3.1. Narrative Description of System

A. [System type(s), location, space requirements, equipment requirements, control type, performance, efficiency, potable water savings, payback period]

B. [Describe how system meets any special requirements listed in the Owner's Project Requirements document.]

3.2. Reasons for System Selection

[Reasons that the selected water reuse systems are a better choice than alternatives (e.g., performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, space constraints, cost, owner preferences, ease of maintenance, etc.)]

3.3. Water Reuse System Calculations

BASIS OF DESIGN (BOD)
COMPLIANCE CHECKLIST

[Describe sizing calculation method, assumptions, and results]

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	BOD ITEMS	PAGE NUMBER IN BOD DOCUMENT
	RENEWABLE ENERGY SYSTEMS (IF ANY)	
1	Narrative description of system (i.e., system type(s), location, inverter type, control type, performance, efficiency, energy savings, payback period, other)	
2	Description of how the system meets requirements listed in OPR	
3	Reasons for system selection, as opposed to alternatives (e.g., performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, etc.)	
4	Renewable energy system generation calculations: sizing calculation method, assumptions, and results	
	LANDSCAPE IRRIGATION SYSTEMS	
5	Narrative description of system (i.e. system type(s), location, control type, performance, efficiency, water savings, other)	
6	Description of how the system meets requirements in OPR	
7	Reasons for system selection, as opposed to alternatives (e.g., performance, efficiency, reliability, flexibility, cost, utility company incentives, etc.)	
8	Landscape irrigation system calculations: sizing calculation method, assumptions, and results	
	WATER REUSE SYSTEM (IF ANY)	
11	Narrative description of system (i.e., system type(s), location, space requirements, equipment requirements, control type, performance, efficiency, potable water savings, payback period, other)	
12	Description of how the system meets requirements in OPR	
13	Reasons for system selection, as opposed to alternatives (e.g., performance, efficiency, reliability, flexibility, simplicity, cost, payback period, etc.)	
14	Water reuse system calculations: sizing calculation method, assumptions, and results	

Architect/Engineer/Designer Acknowledgement

I hereby acknowledge the Basis of Design (BOD) document has been completed and meets the Owner's Project Requirements (OPR).

	Name	License Number	Signature	Date
Architect of Record				
Landscape Architect				
Renewable Energy System Designer				
Other (specify):				

Commissioning Agent Acknowledgment

I have reviewed the Basis of Design (BOD) and verified that it meets the Owner's Project Requirements (OPR):

Name: _____

Company Name (if applicable): _____

Agent's Signature: _____ Date: _____

Cx MEASURES IN CONSTRUCTION DOCUMENTS COMPLIANCE FORM

The following form may be required to be printed on the permit set of construction drawings or submitted separately.

CALGreen Commissioning Requirement 5.410.2, Commissioning Measures in the Construction Documents

5.410.2. *Commissioning measures shall be shown in the construction documents.*

The commissioning measures shown in the construction documents include the checked elements listed below and have been approved by the owner, owner's representative or designer of record.

	COMMISSIONING MEASURE ELEMENTS[1]	INCLUDED
1.	Measures shown in the specifications and cross referenced	☐
2.	List of commissioned equipment and systems	☐
3.	Cx roles and responsibilities of all parties	☐
4.	Meeting requirements	☐
5.	Commissioning schedule management procedures	☐
6.	Procedures for addressing outstanding issues or noncompliance	☐
7.	Requirements for execution and documentation of installation and equipment start-up	☐
8.	Specific testing requirements for each system type[1]	☐
9.	Submittal review and approval requirements	☐
10.	Contents and approval process of the commissioning plan	☐
11.	Cx documentation and reporting requirements	☐
12.	Facility staff training requirements and verification procedures	☐
13.	O&M manual review and approval procedures	☐
14.	Systems manual development and approval procedures	☐
15.	Definitions	☐

1 These are not the detailed step-by-step test procedures but are lists of features, elements, modes, and conditions of tests for specific equipment.

_____ _____

Owner / Owner's Representative or Designer of Record Signature

Date

Cx MEASURES IN CONSTRUCTION DOCUMENTS

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	COMMISSIONING MEASURES ITEMS
1	Measures shown in the specifications and cross referenced
2	List of commissioned equipment and systems
3	Cx roles and responsibilities of all parties
4	Meeting requirements
5	Commissioning schedule management procedures
6	Procedures for addressing outstanding issues or noncompliance
7	Requirements for execution and documentation of installation and equipment start-up
8	Specific testing requirements for each system type
9	Submittal review and approval requirements
10	Contents and approval process of the commissioning plan
11	Cx documentation and reporting requirements
12	Facility staff training requirements and verification procedures
13	O&M manual review and approval procedures
14	Systems manual development and approval procedures
15	Definitions

Commissioning Agent Acknowledgment

I have reviewed the construction documents listed above and verified their compliance with the Owner's Project Requirements (OPR), Basis of Design (BOD), and commissioning plan.

Name: _____

Company Name (if applicable): _____

Agent's Signature: _____ Date: _____

COMMISSIONING PLAN
COMPLIANCE FORM

The following form may be required to be printed on the permit set of construction drawings or submitted separately.

CALGreen Commissioning Requirement 5.410.2.3, Commissioning Plan

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

(See Cx plan elements checklist below.)

The commissioning plan should be started during the design phase of the building project. Include the checked elements listed below and approved by the owner or owner's representative.

	COMMISSIONING PLAN ELEMENTS[1]	INCLUDED
1.	General project information	☐
2.	Commissioning goals	☐
3.	Systems to be commissioned—see BOD	
3a.	An explanation of original design intent	☐
3b.	Equipment and systems to be commissioned and tested, including extent of tests	☐
3c.	Functions to be tested and conditions of tests[1]	☐
3d.	Conditions under which the test shall be performed	
3e.	Measurable criteria for acceptable performance	☐
4.	Cx team information	☐
5.	Cx process activities, schedules, and responsibilities	☐

1. These are not the detailed step-by-step test procedures but are lists of features, elements, modes, and conditions of tests for specific equipment.

_____ _____

Owner / Owner's Representative Signature Date

COMMISSIONING PLAN
COMPLIANCE CHECKLIST

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	COMMISSIONING PLAN ITEMS[1]	PAGE NUMBER IN COMMISSIONING PLAN DOCUMENT
	GENERAL PROJECT INFORMATION	
1	Project name, owner, location	
2	Building type, building area	
3	Overall project commissioning schedule	
4	Contact information for individual/company providing commissioning services	
	COMMISSIONING GOALS	
5	Meet *California Green Building Standards Code* requirements for commissioning	
6	Meeting OPR and BOD requirements	
7	Carrying out requirements for commissioning activities as specified in plans and specifications	
	SYSTEMS TO BE COMMISSIONED	
8	Explanation of the original design intent (refer to OPR and BOD documents)	
9	Equipment and systems to be tested, functions to be tested, conditions under which the test shall be performed, and measurable criteria for acceptable performance	
	COMMISSIONING TEAM INFORMATION	
10	List of all team members and contact information (i.e., owner, owner's representative, architect, engineers, designated commissioning representative, and (if available): general contractor, subcontractors, and construction manager)	
	COMMISSIONING PROCESS ACTIVITIES, SCHEDULES, AND RESPONSIBILITIES	
11	Prescribed commissioning process steps and activities to be accomplished by the Cx team throughout the design to occupancy	
12	Roles and responsibilities for each member of the Cx team for each phase of the work	
13	Required Cx deliverables, reports, forms, and verifications expected at each stage of the commissioning effort	
14	Confirmation process for the O&M manual, systems manual, and the facility operator and maintenance staff training	

1. The following systems shall be tested: renewable energy systems, landscape irrigation systems, and water reuse systems.

Owner/Owner's Representative Acknowledgment

The commissioning plan includes the items listed above and have been approved by the Owner or Owner's Representative:

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

FUNCTIONAL PERFORMANCE TESTING
COMPLIANCE FORM

CALGreen Commissioning Requirement 5.410.2.4, Functional Performance Testing

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

Test forms have been developed for each piece of commissioned equipment and system and include the checked elements listed below. These tests have been executed with deficiencies corrected.

	FUNCTIONAL TEST ELEMENTS	INCLUDED
1.	Date and parties participating	☐
2.	Signature block attesting test is complete and accurate	☐
3.	Prerequisites	☐
4.	Precautions	☐
5.	Instrumentation required	☐
6.	Reference to the source of what is being confirmed (sequences, packaged features, etc.)	☐
7.	Detailed step-by-step test instructions	☐
8.	Acceptance criteria	☐
9.	Results	☐
10.	Confirmation of returning to normal	☐
11.	Deficiency list	☐

_____ _____

Cx Coordinator Signature Date

FUNCTIONAL PERFORMANCE TESTING
COMPLIANCE FORM

REPORT # (e.g., FPT-003)	SYSTEM/EQUIPMENT TEST REPORT (See minimum report requirements on page 2 of this form.)	PAGE/TAB # IN COMMISSIONING REPORT

THIS FORM IS TO COMPLETED FOR THE TIME OF INSPECTION

Project Address: _____

Permit Number: _____

List the functional test reports below for all systems to be tested (see Form 5.4-8.1, item #9).

Minimum Requirements for Test Report

1. Date and Party – Identification of the date of the test and the party conducting the test.
2. Signature Block – Signature of the designated commissioning lead and the equipment-installing contractor attesting that the recorded test results are accurate.
3. Prerequisites – Any conditions or related equipment checkout or testing that needs to be completed before conducting this test.
4. Precautions – Identification of the risks involved to the test team members and the equipment and how to mitigate them.
5. Instrumentation – Listing of the instrumentation and tools necessary to complete the test.
6. Reference – In each procedure item, identify the source for what is being confirmed (e.g., sequence of operation ID, operating feature, specification requirement, etc.)
7. Test Instructions – Step-by-step instructions of how to complete the test, including functions to test and the conditions under which the tests should be performed.
8. Acceptance Criteria – Measurable pass/fail criteria for each step of the test, as applicable.
9. Results – Expected system response and space to document the actual response, readings, results, and adjustments.
10. Return to Normal – Instructions that all systems and equipment are to be returned to their as-found state at the conclusion of the tests.
11. Deficiencies – A list of deficiencies and how they were mitigated.

Commissioning Agent Acknowledgment

I have reviewed the test reports listed above and verified that they are complete; these tests have been executed with deficiencies corrected.

Name: _____

Company Name (if applicable): _____

Agent's Signature: _____ Date: _____

SYSTEMS MANUAL COMPLIANCE FORM	CALGreen Std. BSC-5.4-10 10-08-10

CALGreen Commissioning Requirement 5.410.2.5.1, Documentation and Training—Systems Manual

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

(See elements checklist below.)

	SYSTEM MANUAL ELEMENTS	INCLUDED
1.	Site information including facility description, history, and current requirements	☐
2.	Site contact information	☐
3.	Basic operations and maintenance and troubleshooting	☐
4.	Systems covered include major systems listed under the BOD	☐
5.	Site equipment inventory and maintenance notes	☐
6.	Special inspection verifications	☐
7.	Other resources and documentation	☐

_____ _____

Owner or Owner's Representative Signature Date

SYSTEM OPERATIONS TRAINING
COMPLIANCE FORM

CALGreen Commissioning Requirement 5.410.2.5.2, System Operations Training

5.410.2.5.2 Systems Operations Training. *[N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following.*

(See elements checklist below.)

The written training program includes the checked elements listed below.

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

The owner or owner's representative attests that when the appropriate maintenance staff are made available prior to certificate of occupancy that the written training program was executed with these staff. Or, if appropriate maintenance staff are not available, that the written training program was submitted and approved by the owner or owner's representative.

_____ _____

Owner or Owner's Representative Signature Date

SYSTEM OPERATIONS TRAINING COMPLIANCE FORM

THIS FORM IS TO BE COMPLETED PRIOR TO INSPECTION

Project Address: _____

Permit Number: _____

Part One: Systems Manual

ITEM #	SYSTEMS MANUAL ELEMENTS	PAGE NUMBER IN MANUAL
	SITE INFORMATION	
1	General (i.e., address, acreage, local utility information, other)	
2	Facility description (i.e., use/function, square footage, occupancy type, construction type, basis of design, location of major systems and equipment)	
3	Project history (i.e., project requirements (BOD/OPR), project undocumented events, record drawings and documents, final control drawings and schematics, final control sequences, construction documents)	
4	Current requirements (i.e., building operating schedules, space temperature, humidity, pressure, CO_2 setpoints, summer and winter setback schedules, chilled and hot water temperatures, as-built control setpoints and parameters)	
	SITE CONTACT INFORMATION	
5	Owner information	
6	Emergency contacts	
7	Design team (i.e., architect, mechanical engineer, electrical engineer, other)	
8	Prime contractor contact information	
9	Subcontractor information	
10	Equipment supplier contact information	
	BASIC OPERATIONS AND MAINTENANCE	
11	Basic operation (i.e., narratives of basic equipment operation, interfaces, interlocks and interaction with other equipment and systems, initial maintenance provided by the contractor)	
12	General site-operating schedules (i.e., instructions for changes in major system operating schedules, instructions for changes in major system holiday and weekend schedules)	
13	Basic troubleshooting (i.e., cite recommended troubleshooting procedures specific to major systems and equipment, manual operation procedures, standby/backup/bypass operation procedures, major system power fail resets and restarts, trend log listing)	
14	Recommended maintenance events log (i.e., HVAC air filler replacement schedule and log, building control system sensor calibration schedule and log)	
15	Operation and maintenance manuals (location or delivery information)	
	MAJOR SYSTEMS	
19	Water heating systems	
20	Landscape irrigation systems (i.e., water distribution diagrams and control system)	
21	Water reuse systems (i.e., reclaimed water system for indoor use, reclaimed water for irrigation use)	
	SITE EQUIPMENT INVENTORY AND MAINTENANCE NOTES	
22	Spare parts inventory	
23	Frequently required parts and supplies	
24	Special equipment required to operate or maintain systems	
25	Special tools required to operate or maintain systems	
	SPECIAL INSPECTIONS	
26	Copies of all special inspection verifications required by the enforcing agency of this code	
	OTHER	
27	Other resources and documentation	

Part Two: Training

ITEM #	TRAINING PROGRAM ELEMENTS	PAGE NUMBER IN TRAINING DOCUMENT
1	System/equipment overview (i.e., what it is, what it does, and with what other systems and/or equipment it interfaces)	
2	Review and demonstration of servicing and preventative maintenance	
3	Review of the information in the systems manual	
4	Review of the record drawings on the system/equipment	

Owner/Owner's Representative Acknowledgment

☐ Documentation of the operation aspects of the building shall be completed within the systems manual and delivered to the building owner or representative and facilities operator. The systems manual includes the elements listed in part one of this form; or

☐ When the appropriate maintenance staff is made available prior to the certificate of occupancy, the written training program will be executed to these staff. The written training program includes the elements listed in part two of this form.

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

COMMISSIONING REPORT
COMPLIANCE FORM

CALGreen Commissioning Requirement 5.410.2.6, Commissioning Report

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

The commissioning report should include the checked elements listed below and should be approved by the owner or owner's representative.

	COMMISSIONING REPORT ELEMENTS	INCLUDED
1.	Executive summary with conclusions and outstanding issues	☐
2.	History of system deficiencies and resolution	☐
3.	Summary of system functional test results	☐
4.	Summary of training completion	☐
5.	Attachments of commissioning plan, OPR, BOD, executed (filled in) installation checklists, executed functional tests, recommendations for end-of-warranty review	☐

_____ _____

Owner / Owner's Representative Signature Date

COMMISSIONING REPORT
COMPLIANCE FORM

THIS FORM IS TO BE COMPLETED PRIOR TO INSPECTION

Project Address: _____

Permit Number: _____

ITEM #	COMMISSIONING REPORT ELEMENTS	PAGE NUMBER IN COMMISSIONING REPORT DOCUMENT
1	**EXECUTIVE SUMMARY**	
	Executive summary of process and results of commissioning program (include observations, conclusions, and any outstanding items)	
2	**HISTORY OF ANY SYSTEM DEFICIENCIES AND HOW RESOLVED**	
	Outstanding deficiencies and plans for resolution	
	Plans for seasonal testing scheduled for a later date	
3	**RESULTS**	
	System performance test results and evaluations	
4	**SUMMARY OF TRAINING**	
	Summary of training process completed and scheduled	
5	**ATTACH COMMISSIONING PROCESS DOCUMENTS**	
	Commissioning plan	
	Owner's Project Requirements (OPR)	
	Basis of Design (BOD)	
	Executed installation checklists	
	Executed Functional Performance Test (FPT) forms	
	Recommendations for end-of-warranty review activities	

Owner and Commissioning Agent Acknowledgment

The commissioning report includes the items listed above and is approved by the owner/owner's representative and commissioning agent below.

1. Owner/Owner's Representative

The commissioning report includes the items listed above and have been approved by the owner or owner's representative.

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

2. Commissioning Agent

Name: _____

Company Name (if applicable): _____

Signature: _____ Date: _____

FOR REFERENCE ONLY: The following table has been reprinted from the IES TM-15-11 Reference standard, see Section 5.106.8.

IES TM-15-11 TABLE A-1 Backlight Ratings (Maximum Zonal Lumens)

SECONDARY SOLID ANGLE	MAXIMUM ZONAL LUMENS PER OUTDOOR LIGHTING ZONE				
	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Backlight High (BH) 60 to 80 degrees	110	500	1,000	2,500	5,000
Backlight Medium (BM) 30 to < 60 degrees	220	1,000	2,500	5,000	8,500
Backlight Low (BL) 0 to < 30 degrees	110	500	1,000	2,500	5,000

FOR REFERENCE ONLY: The following table has been reprinted from the *California Energy Code, Part 6, Title 24,* see Section 5.106.8.

TABLE 130.2-A Uplight Ratings (Maximum Zonal Lumens)

SECONDARY SOLID ANGLE	MAXIMUM ZONAL LUMENS PER OUTDOOR LIGHTING ZONE				
	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Uplight High (UH) 100 to 180 degrees	0	10	50	500	1,000
Uplight Low (UL) 90 to < 100 degrees	0	10	50	500	1,000

FOR REFERENCE ONLY: The following table has been reprinted from the *California Energy Code, Part 6, Title 24,* see Section 5.106.8.

TABLE 130.2-B Glare Ratings (Maximum Zonal Lumens)

	GLARE RATING FOR ASYMMETRICAL LUMINAIRE TYPES (Type I, Type II, Type III, Type IV)				
SECONDARY SOLID ANGLE		Maximum Zonal Lumens per Outdoor Lighting Zone			
	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Forward Very High (FVH) 80 to 90 degrees	10	100	225	500	750
Backlight Very High (BVH) 80 to 90 degrees	10	100	225	500	750
Forward High (FH) 60 to < 80 degrees	660	1,800	5,000	7,500	12,000
Backlight High (BH) 60 to < 80 degrees	110	500	1,000	2,500	5,000
	GLARE RATING FOR QUADRILATERAL SYMMETRICAL LUMINAIRE TYPES (Type V, Type V Square)				
SECONDARY SOLID ANGLE		Maximum Zonal Lumens per Outdoor Lighting Zone			
	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Forward Very High (FVH) 80 to 90 degrees	10	100	225	500	750
Backlight Very High (BVH) 80 to 90 degrees	10	100	225	500	750
Forward High (FH) 60 to < 80 degrees	660	1,800	5,000	7,500	12,000
Backlight High (BH) 60 to < 80 degrees	660	1,800	5,000	7,500	12,000

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.3 – WATER EFFICIENCY AND CONSERVATION

SECTION A4.301
GENERAL
(Reserved)

SECTION A4.302
DEFINITIONS

A4.302.1 Definition. The following term is defined in Chapter 2.

REFERENCE EVAPOTRANSPIRATION (*ETo*).

SECTION A4.303
INDOOR WATER USE

A4.303.1 Kitchen faucets. The maximum flow rate of kitchen faucets shall not exceed 1.5 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.5 gallons per minute at 60 psi.

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

A4.303.2 Alternate water sources for nonpotable applications. Alternate nonpotable water sources are used for indoor potable water reduction. Alternate nonpotable water sources shall be installed in accordance with the *California Plumbing Code.*

A4.303.3 Appliances. Install at least one qualified ENERGY STAR dishwasher or clothes washer.

Note: See Section A5.303.3 for nonresidential dishwashers and clothes washers.

> **A4.303.4 Nonwater urinals and waterless toilets.** Nonwater urinals or composting toilets are installed.

Where approved, hybrid urinals, as defined in Chapter 2, | | shall be considered nonwater urinals.

A4.303.5 Hot water recirculation systems. One- and two-family dwellings shall be equipped with a demand hot water recirculation system, as defined in Chapter 2. The demand hot water recirculation system shall be installed in accordance with the *California Plumbing Code, California Energy Code,* and the manufacturer's installation instructions.

SECTION A4.304
OUTDOOR WATER USE

A4.304.1 Rainwater catchment systems. An approved rainwater catchment system is designed and installed to use rainwater generated by at least 65 percent of the available roof area. Rainwater catchment systems shall be designed and installed in accordance with the *California Plumbing Code.*

A4.304.2 Potable water elimination. When landscaping is provided and as allowed by local ordinance, a water efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment should be provided. 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. Use of captured rainwater.
2. Use of recycled water.
3. Water treated for irrigation purposes and conveyed by a water district or public entity.
4. Use of graywater.

A4.304.3 Landscape water meters. For new water service connections, landscaped irrigated areas less than 5,000 square feet shall be provided with separate submeters or metering devices for outdoor potable water use.

SECTION A4.305
WATER REUSE SYSTEMS

A4.305.1 Graywater. Alternative plumbing piping is installed to permit the discharge from the clothes washer or other fixtures to be used for an irrigation system in compliance with the *California Plumbing Code.*

A4.305.2 Recycled water piping. Based on projected availability, dual water piping is installed for future use of recycled water at the following locations:

1. Interior piping for the use of recycled water is installed to serve all water closets, urinals and floor drains.
2. Exterior piping is installed to transport recycled water from the point of connection to the structure. Recycled water systems shall be designed and installed in accordance with the *California Plumbing Code.*

A4.305.3 Recycled water for landscape irrigation. Recycled water is used for landscape irrigation.

SECTION A4.306
INNOVATIVE CONCEPTS AND LOCAL ENVIRONMENTAL CONDITIONS

A4.306.1 Innovative concepts and local environmental conditions. The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

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

SECTION A4.602
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
		Prerequisites and electives[1]		Enforcing Agency	Installer or Designer	Third party
	Mandatory	Tier 1	Tier 2	☐ All	☐ All	☐ All
PLANNING AND DESIGN						
Site Selection						
A4.103.1 A site which complies with at least one of the following characteristics is selected: 1. An infill site is selected. 2. A greyfield site is selected. 3. An EPA-recognized Brownfield site is selected.		☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐
A4.103.2 Facilitate community connectivity by one of the following methods: 1. Locate project within a $^1/_4$-mile true walking distance of at least 4 basic services; 2. Locate project within $^1/_2$-mile true walking distance of at least 7 basic services; 3. Other methods increasing access to additional resources.		☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐
Site Preservation						
A4.104.1 An individual with oversight responsibility for the project has participated in an educational program promoting environmentally friendly design or development and has provided training or instruction to appropriate entities.		☐	☐	☐	☐	☐
Deconstruction and Reuse of Existing Materials						
A4.105.2 Existing buildings are disassembled for reuse or recycling of building materials. The proposed structure utilizes at least one of the following materials which can be easily reused: 1. Light fixtures 2. Plumbing fixtures 3. Doors and trim 4. Masonry 5. Electrical devices 6. Appliances 7. Foundations or portions of foundations		☐	☐	☐	☐	☐
Site Development						
4.106.2 A plan is developed and implemented to manage storm water drainage during construction.	☒			☐	☐	☐
4.106.3 Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.	☒			☐	☐	☐
4.106.4 Provide capability for electric vehicle charging for one- and two-family dwellings; townhouses with attached private garages; multifamily dwellings; and hotels/motels in accordance with Sections 4.106.4.1, 4.106.4.2, and 4.106.4.3, as applicable.	☒	☐	☐	☐	☐	☐
A4.106.1 Reserved		☐	☐	☐	☐	☐

continued

SECTION A4.602
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
		Prerequisites and electives[1]		Enforcing Agency	Installer or Designer	Third party
	Mandatory	Tier 1	Tier 2	☐ All	☐ All	☐ All
A4.106.2.1 Soil analysis is performed by a licensed design professional and the findings utilized in the structural design of the building.		☐	☐	☐	☐	☐
A4.106.2.2 Soil disturbance and erosion are minimized by at least one of the following:						
1. Natural drainage patterns are evaluated and erosion controls are implemented to minimize erosion during construction and after occupancy.		☐	☐	☐	☐	☐
2. Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways.		☐	☐	☐	☐	☐
3. Underground construction activities are coordinated to utilize the same trench, minimize the amount of time the disturbed soil is exposed and the soil is replaced using accepted compaction methods.		☐	☐	☐	☐	☐
A4.106.2.3 Topsoil shall be protected or saved for reuse as specified in this section.				☐	☐	☐
Tier 1. Displaced topsoil shall be stockpiled for reuse in a designated area and covered or protected from erosion.		☒[2]	☒[2]			
Tier 2. The construction area shall be identified and delineated by fencing or flagging to limit construction activity to the construction area.			☒[2]			
A4.106.3 Postconstruction landscape designs accomplish one or more of the following:						
1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.		☐	☐	☐	☐	☐
2. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region.		☐	☐	☐	☐	☐
A4.106.4 Permeable paving is utilized for the parking, walking or patio surfaces in compliance with the following:						
Tier 1. Not less than 20 percent of the total parking, walking or patio surfaces shall be permeable.		☒[2]		☐	☐	☐
Tier 2. Not less than 30 percent of the total parking, walking or patio surfaces shall be permeable.			☒[2]	☐	☐	☐
A4.106.5 Roofing materials shall have a minimum 3-year aged solar reflectance and thermal emittance or a minimum Solar Reflectance Index (SRI) equal to or greater than the values specified in Tables A4.106.5.1(1) and A4.106.5.1(2) for low-rise residential buildings and Tables A4.106.5.1(3) and A4.106.5.1(4) for high rise residential buildings.						
Low-rise Residential						
Tier 1 roof covering shall meet or exceed the values contained in Table A4.106.5.1(1).		☒[2]		☐	☐	☐
Tier 2 roof covering shall meet or exceed the values contained in Table A4.106.5.1(2).			☒[2]	☐	☐	☐
High-rise Residential, Hotels and Motels						
Tier 1 roof covering shall meet or exceed the values contained in Table A4.106.5.1(3).		☒[2]		☐	☐	☐
Tier 2 roof covering shall meet or exceed the values contained in Table A4.106.5.1(4).			☒[2]	☐	☐	☐

continued

SECTION A4.602
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
		Prerequisites and electives[1]		Enforcing Agency	Installer or Designer	Third party
	Mandatory	Tier 1	Tier 2	☐ All	☐ All	☐ All
WATER EFFICIENCY AND CONSERVATION						
Indoor Water Use						
4.303.1 Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) installed in residential buildings shall comply with the prescriptive requirements of Sections 4.303.1.1 through 4.303.1.4.4.	☒			☐	☐	☐
4.303.2 Plumbing fixtures and fittings required in Section 4.303.1 shall be installed in accordance with the *California Plumbing Code,* and shall meet the applicable referenced standards.	☒			☐	☐	☐
A4.303.1 Kitchen faucets. The maximum flow rate of kitchen faucets shall not exceed 1.5 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.5 gallons per minute at 60 psi. **Note:** Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.		☐	☐	☐	☐	☐
A4.303.2 Alternate water source for nonpotable applications. Alternate nonpotable water sources are used for indoor potable water reduction. Alternate nonpotable water sources shall be installed in accordance with the *California Plumbing Code.*		☐	☐	☐	☐	☐
A4.303.3 Install at least one qualified ENERGY STAR dishwasher or clothes washer.		☐	☐	☐	☐	☐
A4.303.4 Nonwater urinals or waterless toilets are installed.		☐	☐	☐	☐	☐
A4.303.5 One- and two-family dwellings shall be equipped with a demand hot water recirculation system.		☐	☐	☐	☐	☐
Outdoor Water Use						
4.304.1 After December 1, 2015, new residential developments with an aggregate landscape area equal to or greater than 500 square feet shall comply with one of the following options: 1. A local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent; or 2. Projects with aggregate landscape areas less than 2,500 square feet may comply with the MWELO's Appendix D Prescriptive Compliance Option.	☒			☐ ☐	☐ ☐	☐
A4.304.1 A rainwater capture, storage and re-use system is designed and installed.		☐	☐	☐	☐	☐
A4.304.2 A landscape design is installed, which does not utilize potable water.		☐	☐	☐	☐	☐
A4.304.3 For new water service connections, landscaped irrigated areas less than 5,000 square feet shall be provided with separate submeters or metering devices for outdoor potable water use.		☐	☐	☐	☐	☐

continued

SECTION A4.602
RESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST—continued

FEATURE OR MEASURE	LEVELS APPLICANT TO SELECT ELECTIVE MEASURES			VERIFICATIONS ENFORCING AGENCY TO SPECIFY VERIFICATION METHOD		
		Prerequisites and electives[1]		Enforcing Agency	Installer or Designer	Third party
	Mandatory	Tier 1	Tier 2	☐ All	☐ All	☐ All
WATER REUSE SYSTEMS						
A4.305.1 Piping is installed to permit future use of a graywater irrigation system served by the clothes washer or other fixtures.		☐	☐	☐	☐	☐
A4.305.2 Recycled water piping is installed.		☐	☐	☐	☐	☐
A4.305.3 Recycled water is used for landscape irrigation.		☐	☐	☐	☐	☐
Innovative Concepts and Local Environmental Conditions						
A4.306.1 Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1	☐	☐	☐	☐	☐	☐
Item 2	☐	☐	☐	☐	☐	☐
Item 3	☐	☐	☐	☐	☐	☐
MATERIAL CONSERVATION AND RESOURCE EFFICIENCY						
Foundation Systems						
A4.403.1 A Frost-protected Shallow Foundation (FPSF) is designed and constructed.		☐	☐	☐	☐	☐
A4.403.2 Cement use in foundation mix design is reduced. Tier 1. Not less than a 20 percent reduction in cement use. Tier 2. Not less than a 25 percent reduction in cement use.		☒[2]	☒[2]	☐	☐	☐
Efficient Framing Techniques						
A4.404.1 Beams and headers and trimmers are the minimum size to adequately support the load.		☐	☐	☐	☐	☐
A4.404.2 Building dimensions and layouts are designed to minimize waste.		☐	☐	☐	☐	☐
A4.404.3 Use premanufactured building systems to eliminate solid sawn lumber whenever possible.		☐	☐	☐	☐	☐
A4.404.4 Material lists are included in the plans which specify material quantity and provide direction for on-site cuts.		☐	☐	☐	☐	☐

continued

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES
DIVISION A5.1 – PLANNING AND DESIGN

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

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

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

PREFACE

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

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

Regional sustainable communities strategy. Site selection and building design and use shall conform the project with the prevailing regional sustainable communities strategy or alternative planning strategy, whichever meets the greenhouse gas target established by the California Air Resources Board pursuant to SB375 (Stats. 2008, Ch. 728), including the general location of uses, residential densities and building intensities.

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

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

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

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

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

SECTION A5.101
GENERAL

A5.101.1 Scope. The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION A5.102
DEFINITIONS

A5.102.1 Definitions. The following terms are defined in Chapter 2.

ALBEDO.

BIORETENTION.

BROWNFIELD SITE.

DEVELOPMENT FOOTPRINT.

FLOOR AREA RATIO.

GREENFIELDS.

GREYFIELD SITE.

INFILL SITE.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.

LOW IMPACT DEVELOPMENT (LID).

NEIGHBORHOOD ELECTRIC VEHICLE (NEV).

PERMEABLE PAVING.

SOLAR REFLECTANCE.

SOLAR REFLECTANCE INDEX (SRI).

THERMAL EMITTANCE.

VANPOOL VEHICLE.

VEGETATED SPACE.

ZEV.

SECTION A5.103
SITE SELECTION

A5.103.1 Community connectivity. Where feasible, locate project on a previously developed site within a $^1/_2$ mile radius of at least ten basic services, readily accessible by pedestrians, including, but not limited, to one each of bank, place of worship, convenience grocery, day care, cleaners, fire station, barber shop, beauty shop, hardware store, laundry, library, medical clinic, dental clinic, senior care facility, park, pharmacy, post office, restaurant (two may be counted), school, supermarket, theater, community center, fitness center, museum or farmers market. Other services may be considered on a case-by-case basis.

A5.103.2 Brownfield or greyfield site redevelopment or infill area development. If feasible, select for development a brownfield in accordance with Section A5.103.2.1 or on a greyfield or infill site as defined in Section A5.102.

A5.103.2.1 Brownfield redevelopment. Develop a site documented as contaminated by means of an ASTM E1903-97 Phase II Environmental Site Assessment or on a site defined as a brownfield by a local, state or federal government agency. The site must be fully remediated in accordance with EPA regulations to the level required of the anticipated land use.

SECTION A5.104
SITE PRESERVATION

A5.104.1 Reduce development footprint and optimize open space. Optimize open space on the project site in accordance with Sections A5.104.1.1, A5.104.1.2 or A5.104.1.3.

A5.104.1.1 Local zoning requirement in place. Exceed the zoning's open space requirement for vegetated open space on the site by 25 percent.

A5.104.1.2 No local zoning requirement in place. Provide vegetated open space area adjacent to the building equal to the building footprint area.

A5.104.1.3 No open space required in zoning ordinance. Provide vegetated open space equal to 20 percent of the total project site area.

SECTION A5.105
DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES

A5.105.1 If feasible, disassemble existing buildings instead of demolishing to allow reuse or recycling of building materials.

A5.105.1.1 Existing building structure. Maintain at least 75 percent of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing) based on surface area.

Exceptions:

1. Window assemblies and nonstructural roofing material.
2. Hazardous materials that are remediated as a part of the project.
3. A project with an addition of more than two times the square footage of the existing building.

A5.105.1.2 Existing nonstructural elements. Reuse existing interior nonstructural elements (interior walls, doors, floor coverings and ceiling systems) in at least 50 percent of the area of the completed building (including additions).

Exception: A project with an addition of more than two times the square footage of the existing building.

A5.105.1.3 Salvage. Salvage additional items in good condition such as light fixtures, plumbing fixtures and doors as follows. Document the weight or number of the items salvaged.

1. Salvage for reuse on the project items that conform to other provisions of Title 24 in an on-site storage area.
2. Nonconforming items may be salvaged in dedicated collection bins for exempt projects or other uses.

SECTION A5.106
SITE DEVELOPMENT

A5.106.2 Storm water design. Design storm water runoff rate, quantity, and quality in conformance with Section A5.106.3 Low Impact Development (LID) or by local requirements, whichever are stricter.

A5.106.3 Low Impact Development (LID). All newly constructed projects shall mitigate (infiltrate, filter, or treat) stormwater runoff from the 85th percentile 24-hour runoff event (for volume-based BMP's) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for flow-based BMP's) through the application of LID strategies. Employ at least two of the following methods or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage

receptacles for irrigation or other beneficial uses. LID strategies include, but are not limited to:

1. Bioretention (rain gardens)/filtration planters;
2. Precipitation capture (Cisterns and rain barrels);
3. Green roofs meeting the structural requirements of the building code;
4. Roof leader or impervious area disconnection;
5. Permeable and porous paving;
6. Vegetative swales and filter strips; tree preservation; and
7. Tree preservation and tree plantings;
8. Landscaping soil quality;
9. Stream buffer; and
10. Volume retention suitable for previously developed sites.

A5.106.3.1 Implementation. If applicable, coordinate LID projects with the local Regional Water Quality Control Board, which may issue a permit or otherwise require LID.

Note: Further information on design of specific control measures may be found on U.S. EPA's website, on SWRCB's website and from local boards that require LID.

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

A5.106.4 Reserved.

A5.106.4.1 Reserved.

A5.106.4.2 Reserved.

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

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

A5.106.5.1 Designated parking for clean air 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.

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	One 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 one unisex shower and two 2-tier lockers.

A5.106.5.1.1 Tier 1. Ten percent of total spaces. [BSC-CG] Provide 10 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

TABLE A5.106.5.1.1

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

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

TABLE A5.106.5.1.2

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

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

CLEAN AIR/
VANPOOL/EV

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

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

Notes:

1. Information on qualifying vehicles, car labeling regulations and DMV CAV decals may be obtained from the following sources:
   a. California DriveClean.
   b. California Air Resources Board.
   c. U.S. EPA fuel economy regulations and standards.
   d. DMV Registration Operations.
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 (EV) charging. Construction shall comply with Section A5.106.5.3.1 and A5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code* and the *California Electrical Code* and as follows:

A5.106.5.3.1 Tier 1. Table A5.106.5.3.1 shall be used to determine the number of multiple charging spaces required for future installation of EVSE. Refer to Section 5.106.5.3.2 for design space requirements.

A5.106.5.3.2 Tier 2. Table A5.106.5.3.2 shall be used to determine if single or multiple charging space requirements apply for future installation of EVSE. When a single charging space is required, refer to Section 5.106.5.3.1 for design requirements. When multiple charging spaces are required, refer to Section 5.106.5.3.2 for design requirements.

TABLE A5.106.5.3.1

TOTAL NUMBER OF ACTUAL PARKING SPACES	TIER 1 NUMBER OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	2
26-50	3
51-75	5
76-100	7
101-150	10
151-200	14
201 and over	8 percent of total[1]

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

TABLE A5.106.5.3.2

TOTAL NUMBER OF ACTUAL PARKING SPACES	TIER 2 NUMBER OF REQUIRED EV CHARGING SPACES
0-9	1
10-25	2
26-50	4
51-75	6
76-100	9
101-150	12
151-200	17
201 and over	10 percent of total[1]

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

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

A5.106.5.3.4 Future charging spaces qualify as designated parking as described in Section A5.106.5.1 Designated parking for clean air vehicles.

Notes:

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

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

A5.106.6.1 Reduce parking capacity. With the approval of the enforcement authority, employ strategies to reduce on-site parking area by

1. Use of on street parking or compact spaces, illustrated on the site plan or
2. Implementation and documentation of programs that encourage occupants to carpool, ride share or use alternate transportation.

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

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

1. Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the *California Code of Regulations.*
2. Dishwashers shall meet the following water use standards:
   a. Residential—ENERGY STAR.
      i. Standard Dishwashers – 4.25 gallons per cycle.
      ii. Compact Dishwashers – 3.5 gallons per cycle.
   b. Commercial—Shall be in accordance with ENERGY STAR requirements. Refer to Table A5.303.3.
3. Ice makers shall be air cooled.
4. Food steamers shall be connectionless or boilerless – and shall consume no more than 2 gallons of water per pan per hour, including condensate water, for batch type steamers, and no more than 5 gallons of water per pan per hour, including condensate water, for cook to order steamers.
5. 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 use a maximum of 1.5 gallons of water per hour per pan, including condensate water.
7. Commercial pre-rinse spray valves manufactured on or after January 1, 2006 shall function at equal to or less than 1.6 gpm (0.10 L/s) at 60 psi (414 kPa) and
   a. Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate.
   b. Be equipped with an integral automatic shutoff.
   c. Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gpm (0.08 L/s) or less.
8. Food waste pulping systems shall use no more than 2 gpm of potable water.
   8.1. Note: potable water excludes on-site graywater use, such as dishwasher discharge water.

A5.303.4 Water conserving plumbing fixtures and fittings.

A5.303.4.1 Nonwater supplied urinals. Nonwater supplied urinals are installed in accordance with the *California Plumbing Code*.

Where approved, urinal, hybrids as defined in Chapter 2, shall be considered waterless urinals.

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

SECTION A5.304
OUTDOOR WATER USE

A5.304.1 Reserved.

A5.304.2 Outdoor water use. For new water service not subject to the provisions of *Water Code* Section 535, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas of at least 500 square feet but not more than 1,000 square feet.

A5.304.6 Restoration of areas disturbed by construction. Restore all landscape areas disturbed during construction by planting with local adaptive and/or noninvasive vegetation.

A5.304.7 Previously developed sites. On previously developed or graded sites, restore or protect at least 50 percent of the site area with adaptive and/or noninvasive vegetation. Projects complying with Section A5.106.3, Item 3 may apply vegetated roof surface to this calculation if the roof plants meet the definition of adaptive and noninvasive.

Exception: Area of the building footprint is excluded from the calculation.

A5.304.8 Graywater irrigation system. Install a graywater collection system for onsite subsurface irrigation using graywater collected from bathtubs, showers, bathroom wash basins and laundry water. See *California Plumbing Code.*

TABLE A5.303.3
COMMERCIAL DISHWASHER WATER USE

TYPE	HIGH-TEMPERATURE— MAXIMUM GALLONS PER RACK	LOW-TEMPERATURE— MAXIMUM GALLONS PER RACK
Single Tank Conveyor	0.70 (2.6 L)	≤ 0.79 (3 L)
Multiple Tank Conveyor	≤ 0.54 (2 L)	≤ 0.54 (2 L)
Stationary Single Tank Door	≤ 0.89 (3.4 L)	≤ 1.18 (4.5 L)
Under Counter	≤ 0.86 (3.3 L)	≤ 1.19 (4.5 L)
Pot, Pan, and Utensil	≤ 0.58 GPSF	≤ 0.58 GPSF
Single Tank Flight Type	GPH ≤ 2.975x + 55.00	GPH ≤ 2.975x + 55.00
Multiple Tank Flight Type	GPH ≤ 4.96x + 17.00	GPH ≤ 4.96x + 17.00

Note: GPSF = gallons per square foot of rack; GPH = gallons per hour;
X = square feet of conveyor belt/minute (max conveyor speed sf/min as tested and certified to NSF/ANSI Standard 3)

SECTION A5.305
WATER REUSE

A5.305.1 Nonpotable water systems. Nonpotable water systems for indoor and outdoor use shall comply with the current edition of the *California Plumbing Code.*

A5.305.2 Irrigation systems. Irrigation systems regulated by a local water efficient landscape ordinance or by the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) shall use recycled water.

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES
DIVISION A5.6 – VOLUNTARY TIERS

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

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

APPENDIX A5

NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.6 – VOLUNTARY TIERS

SECTION A5.601
CALGreen TIER 1 AND TIER 2

A5.601.1 Scope. The measures contained in this appendix are not mandatory unless adopted by local government as specified in Section 101.7. The provisions of this section outline means of achieving enhanced construction or reach levels by incorporating additional green building measures for newly constructed nonresidential buildings as well as additions and alterations. In order to meet one of the tier levels designers, builders or property owners are required to incorporate additional green building measures necessary to meet the threshold of each level. Refer to the provisions in Section 301.3 for nonresidential additions and alterations scope and application.

A5.601.2 *CALGreen* Tier 1

A5.601.2.1 Prerequisites. To achieve *CALGreen* tier status, a project must meet all of the mandatory measures in Chapter 5 and, in addition, meet the provisions of this section.

A5.601.2.2 Energy performance. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

A5.601.2.3 Tier 1. Comply with the energy efficiency requirements in Section A5.203.1.1.1 and Section A5.203.1.2.1.

A5.601.2.4 Voluntary measures for Tier 1. In addition to the provisions of Sections A5.601.2.1 and A5.601.2.3 above, compliance with the following voluntary measures from Appendix A5 is required for Tier 1:

1. From Division A5.1,
   a. Comply with the designated parking requirements for fuel efficient vehicles for a minimum of 10 percent of parking capacity per Section A5.106.5.1 and Table A5.106.5.1.1.
   b. Comply with thermal emittance, solar reflectance or SRI values for cool roofs in Section A5.106.11.2 and Table A5.106.11.2.1.[1]
   c. Comply with one elective measure selected from this division.
2. From Division A5.3,
   a. Comply with the 12-percent reduction for indoor potable water use in Section A5.303.2.3.1.
   b. Comply with one elective measure selected from this division.
3. From Division A5.4,[2]
   a. Comply with recycled content of 10 percent of materials based on estimated total cost, or use two products from Table A5.405.4 for at least 75% by cost in Section A5.405.4.
   b. Comply with the 65-percent reduction in construction and demolition waste in Section A5.408.3.1.
   c. Comply with one elective measure selected from this division.
4. From Division A5.5,
   a. Comply with resilient flooring systems for 90 percent of resilient flooring in Section A5.504.4.7.
   b. Comply with thermal insulation meeting 2009 CHPS low-emitting materials list in Section A5.504.4.8.

c. Comply with one elective measure selected from this division.

5. Comply with one additional elective measure selected from any division.

[1] Cool roof is required for compliance with Tiers 1 and 2 and may be used to meet energy standards in Part 6, exceed energy standards and to mitigate heat island effect.

[2] Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

A5.601.3 *CALGreen* Tier 2.

A5.601.3.2 Energy performance. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

A5.601.3.3 Tier 2. Comply with the energy efficiency requirements in Section A5.203.1.1 and Section A5.203.1.2.2.

A5.601.3.4 Voluntary measures for Tier 2. In addition to the provisions of Sections A5.601.3.1 and A5.601.3.3 above, compliance with the following voluntary measures from Appendix A5 and additional elective measures shown in Table A5.601.3.4 is required for Tier 2:

1. From Division A5.1,
   a. Comply with the designated parking requirements for fuel efficient vehicles for a minimum of 12 percent of parking capacity per Section A5.106.5.1 and Table A5.106.5.1.2.
   b. Comply with thermal emittance, solar reflectance or SRI values for cool roofs in Section A5.106.11.2 and Table A5.106.11.2.2.[1]
   c. Comply with three elective measures selected from this division.
2. From Division A5.3,
   a. Comply with the 20-percent reduction for indoor potable water use in Section A5.303.2.3.2.
   b. Comply with three elective measures selected from this division.
3. From Division A5.4,[2]
   a. Comply with recycled content of 15 percent of materials based on estimated total cost, or use two products from Table A5.405.4 for at least 75% by cost in Section A5.405.4.1.
   b. Comply with the 80-percent reduction in construction and demolition waste in Section A5.408.3.1.
   c. Comply with three elective measures selected from this division.
4. From Division A5.5,
   a. Comply with resilient flooring systems for 100 percent of resilient flooring in Section A5.504.4.7.1.

      Exception: Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.

   b. Comply with thermal insulation meeting 2009 CHPS low-emitting materials list and no added formaldehyde in Section A5.504.4.8.1.
   c. Comply with three elective measures selected from this division.
5. Comply with three additional elective measures selected from any division.

[1] Cool roof is required for compliance with Tiers 1 and 2 and may be used to meet energy standards in Part 6, exceed energy standards and to mitigate heat island effect.

[2] Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

A5.601.4 Compliance verification. Compliance with Section A5.601.2 or A5.601.3 shall be as required in Chapter 7 of this code. Compliance documentation shall be made part of the project record as required in Section 5.410.2 or 5.410.3.

TABLE A5.601 NONRESIDENTIAL BUILDINGS:
Green Building Standards Code Proposed Performance Approach

Note: This table is intended only as an aid in illustrating the nonresidential tier structure (Refer to Checklists A5.602, A5.602.1, and A5.602.2 for CALGreen verification guidelines for Mandatory Checklist, Tier 1 Checklist, and Tier 2 Checklist.)

CATEGORY	ENVIRONMENTAL PERFORMANCE GOAL	TIER 1	TIER 2
All	Minimum Mandatory (See Mandatory Checklist)	Meet all of the provisions of Chapter 5 (See Tier 1 Checklist)	Meet all of the provisions of Chapter 5 (See Tier 2 Checklist)
DIVISION 5.1 Planning and Design	Designated Parking for Fuel Efficient Vehicles	Approx. 10% of total spaces	Approx. 12% of total spaces
	Electric Vehicle Charging	Approx. 8% of total spaces	Approx. 10% of total spaces
	Cool Roof to Reduce Heat Island Effect	Roof Slope < 2:12 SRI 75 Roof Slope > 2:12 SRI 16	Roof Slope < 2:12 SRI 82 Roof Slope > 2:12 SRI 27
		1 additional Elective from Division A5.1	3 additional Electives from Division A5.1
DIVISION 5.2 Energy Efficiency	Energy Performance[2a, 2b]	Outdoor lighting power 90% of Part 6 allowance	Outdoor lighting power 90% of Part 6 allowance
		If applicable, solar water-heating system with minimum solar savings fraction of 0.15	If applicable, solar water-heating system with minimum solar savings fraction of 0.15
		If applicable, certain functional areas comply with residential indoor lighting requirements	If applicable, certain functional areas comply with residential indoor lighting requirements
		Energy Budget 95% or 90% of Part 6 calculated value of allowance	Energy Budget 90% or 85% of Part 6 calculated value of allowance
DIVISION 5.3 Water Efficiency and Conservation	Indoor Water Use	12% Savings	20% Savings
		1 additional Elective from Division A5.3	3 additional Electives from Division A5.3
DIVISION 5.4 Material Conservation and Resource Efficiency[3]	Construction Waste Reduction	At least 65% reduction	At least 80% reduction
	Recycled Content	Utilize recycled content materials for 10% of total material cost	Utilize recycled content materials for 15% of total material cost
		1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
DIVISION 5.5 Environmental Quality	Low-VOC Resilient Flooring	90% of flooring meets VOC limits	100% of flooring meets VOC limits[1]
	Low-VOC Thermal Insulation	Comply with VOC limits	Install no-added formaldehyde insulation and comply with VOC limits
		1 additional Elective from Division A5.5	3 additional Electives from Division A5.5
Additional Measures		1 additional Elective from any division	3 additional Electives from any division
Approximate Total Measures		15	25

1. Exception: Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.
2. Solar water-heating system requirement for newly constructed restaurants as per A5.203.1.1.2.

   Exceptions:

   a. Buildings with a natural gas service water heater with a minimum of 95-percent thermal efficiency.

   b. Buildings where greater than 75 percent of the total roof area has annual solar access that is less than 70 percent. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.
3. Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

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A5.602
***CALGreen* VERIFICATION GUIDELINES**
MANDATORY MEASURES CHECKLIST

Application: This checklist shall be used for nonresidential projects that meet one of the following: new construction, building additions of 1,000 square feet or greater, or building alterations with a permit valuation of $200,000 or more pursuant to Section 301.3 AND do not trigger a Tier 1 or Tier 2 requirement:

Y = Yes (section has been selected and/or included)
N/A = Not Applicable (code section does not apply to the project—mainly used for additions and alterations)
O = Other (provide explanation)
[N] = New construction pursuant to Section 301.3
[A] = Additions and/or Alterations pursuant to Section 301.3

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N/A	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
DIVISION 5.1 Planning and Design	Mandatory	Storm water pollution prevention for projects that disturb less than 1 acre of land	5.106.1 through 5.106.2				
	Mandatory	Short-term bicycle parking (with exception)	5.106.4.1.1				
	Mandatory	Long-term bicycle parking	5.106.4.1.2 through 5.106.4.1.5				
	Mandatory	Designated parking for clean air vehicles	5.106.5.2				
	Mandatory	Parking stall marking	5.106.5.2.1				
	Mandatory	Single charging space requirements	5.106.5.3.1				
	Mandatory	Multiple charging space requirements [N]	5.106.5.3.2				
	Mandatory	EV charging space calculation [N] (with exceptions)	5.106.5.3.3				
	Mandatory	[N] Identification	5.106.5.3.4				
	Mandatory	[N] Future charging spaces (with notes 1–3)	5.106.5.3.5				
	Mandatory	Light pollution reduction [N] (with exceptions and note)	5.106.8				
	Mandatory	Grading and paving (exception for additions and alterations not altering the drainage path)	5.106.10				
DIVISION 5.2 Energy Efficiency	Mandatory	Meet the minimum energy efficiency standard	5.201.1				
DIVISION 5.3 Water Efficiency and Conservation (continued)	Mandatory	Separate meters (new buildings or additions > 50,000 sf that consume more than 100 gal/day)	5.303.1.1				
	Mandatory	Separate meters (for tenants in new buildings or additions that consume more than 1,000 gal/day)	5.303.1.2				
	Mandatory	Water closets shall not exceed 1.28 gallons per flush (gpf)	5.303.3.1				

(continued)

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N/A	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.3 Water Efficiency and Conservation**	Mandatory	Wall-mounted urinals shall not exceed 0.125 gpf	5.303.3.2.1				
	Mandatory	Floor-mounted urinals shall not exceed 0.5 gpf	5.303.3.2.2				
	Mandatory	Single showerhead shall have maximum flow rate of 1.8 gpm (gallons per minute) at 80 psi	5.303.3.3.1				
	Mandatory	Multiple showerheads serving one shower shall have a combined flow rate of 1.8 gpm at 80 psi	5.303.3.3.2				
	Mandatory	Nonresidential lavatory faucets	5.303.3.4.1				
	Mandatory	Kitchen faucets	5.303.3.4.2				
	Mandatory	Wash fountains	5.303.3.4.3				
	Mandatory	Metering faucets	5.303.3.4.4				
	Mandatory	Metering faucets for wash fountains	5.303.3.4.5				
	Mandatory	Food waste disposers	5.303.4.1				
	Mandatory	Areas of additions or alterations	5.303.5				
	Mandatory	Standards for plumbing fixtures and fittings	5.303.6				
	Mandatory	Outdoor water use in landscape areas equal to or greater than 500 sf	5.304.2				
	Mandatory	Outdoor water use in rehabilitated landscape projects with areas equal to or greater than 2,500 sf	5.304.3				
	Mandatory	Outdoor water use in landscape areas of 2,500 sf or less	5.304.4				
	Mandatory	Graywater or rainwater use in landscaped areas	5.304.5				
DIVISION 5.4 Material Conservation and Resource Efficiency (continued)	Mandatory	Weather protection	5.407.1				
	Mandatory	Moisture control: sprinklers	5.407.2.1				
	Mandatory	Moisture control: exterior door protection	5.407.2.2.1				
	Mandatory	Moisture control: flashing	5.407.2.2.2				
	Mandatory	Construction waste management—comply with either: Sections 5.408.1.1, 5.408.1.2, 5.408.1.3 or more stringent local ordinance	5.408.1.1, 5.408.1.2, 5.408.1.3				
	Mandatory	Construction waste management: documentation	5.408.1.4				
	Mandatory	Universal waste [A]	5.408.2				
	Mandatory	Excavated soil and land clearing debris (100% reuse or recycle)	5.408.3				
	Mandatory	Recycling by occupants (with exception)	5.410.1				
	Mandatory	Recycling by occupants: additions (with exception)	5.410.1.1				
	Mandatory	Recycling by occupants: sample ordinance	5.410.1.2				
	Mandatory	Commissioning new buildings (≥ 10,000 sf) [N]	5.410.2				
	Mandatory	Owner's or owner representative's Project Requirements (OPR) [N]	5.410.2.1				
	Mandatory	Basis of Design (BOD) [N]	5.410.2.2				

(continued)

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N/A	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.4 Material Conservation and Resource Efficiency**	Mandatory	Commissioning plan [N]	5.410.2.3				
	Mandatory	Functional performance testing [N]	5.410.2.4				
	Mandatory	Documentation and training [N]	5.410.2.5				
	Mandatory	Systems manual [N]	5.410.2.5.1				
	Mandatory	Systems operation training [N]	5.410.2.5.2				
	Mandatory	Commissioning report [N]	5.410.2.6				
	Mandatory	Testing and adjusting for new buildings < 10,000 sf or new systems that serve additions or alterations [A]	5.410.4				
	Mandatory	System testing plan for renewable energy, landscape irrigation and water reuse [A]	5.410.4.2				
	Mandatory	Procedures for testing and adjusting	5.410.4.3				
	Mandatory	Procedures for HVAC balancing	5.410.4.3.1				
	Mandatory	Reporting for testing and adjusting	5.410.4.4				
	Mandatory	Operation and maintenance (O&M) manual	5.410.4.5				
	Mandatory	Inspection and reports	5.410.4.5.1				
DIVISION 5.5 Environmental Quality (continued)	Mandatory	Fireplaces	5.503.1				
	Mandatory	Woodstoves	5.503.1.1				
	Mandatory	Temporary ventilation	5.504.1				
	Mandatory	Covering of ducts openings and protection of mechanical equipment during construction	5.504.3				
	Mandatory	Adhesives, sealants, and caulks	5.504.4.1				
	Mandatory	Paints and coatings	5.504.4.3				
	Mandatory	Aerosol paints and coatings	5.504.4.3.1				
	Mandatory	Aerosol paints and coatings: verification	5.504.4.3.2				
	Mandatory	Carpet systems	5.504.4.4				
	Mandatory	Carpet cushion	5.504.4.4.1				
	Mandatory	Carpet adhesives per Table 5.504.4.1	5.504.4.4.2				
	Mandatory	Composite wood products	5.504.4.5				
	Mandatory	Composite wood products: documentation	5.504.4.5.3				
	Mandatory	Resilient flooring systems	5.504.4.6				
	Mandatory	Resilient flooring: verification of compliance	5.504.4.6.1				
	Mandatory	Filters (with exceptions)	5.504.5.3				
	Mandatory	Filters: labeling	5.504.5.3.1				
	Mandatory	Environmental tobacco smoke (ETS) control	5.504.7				
	Mandatory	Indoor moisture control	5.505.1				

(continued)

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N/A	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.5 Environmental Quality**	Mandatory	Outside air delivery	5.506.1				
	Mandatory	Carbon dioxide (CO_2) monitoring	5.506.2				
	Mandatory	Acoustical control (with exception)	5.507.4				
	Mandatory	Exterior noise transmission, prescriptive method (with exceptions)	5.507.4.1				
	Mandatory	Noise exposure where noise contours are not readily available	5.507.4.1.1				
	Mandatory	Performance method	5.507.4.2				
	Mandatory	Site features	5.507.4.2.1				
	Mandatory	Documentation of compliance	5.507.4.2.2				
	Mandatory	Interior sound transmission (with note)	5.507.4.3				
	Mandatory	Ozone depletion and greenhouse gas reductions	5.508.1				
	Mandatory	Chlorofluorocarbons (CFCs)	5.508.1.1				
	Mandatory	Halons	5.508.1.2				
	Mandatory	Supermarket refrigerant leak reduction for retail food stores 8,000 square feet or more Sections 5.508.2 through 5.508.2.6.3	5.508.2 through 5.508.2.6.3				
		END OF MANDATORY PROVISIONS					

Documentation Author's / Responsible Designer's Declaration Statement

☐ **Mandatory:** I attest that this mandatory provisions checklist is accurate and complete.

Signature:	
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

A5.602.1
***CALGreen* VERIFICATION GUIDELINES**
TIER 1 CHECKLIST

Application: This checklist shall be used for nonresidential projects that meet the following: new construction, or building additions of 1,000 square feet or greater, or building alterations with a permit valuation of $200,000 or more pursuant to Section 301.3, AND are adopting Tier 1 voluntary measures.

Note: All applicable mandatory requirements in Chapter 5 shall be met prior to applying Tier 1 voluntary measures.

Instructions:

Comply with all Tier 1 prerequisite measures from the various categories shown on the table below.

Add a "**Y**" to all mandatory and Tier 1 prerequisite measures in the appropriate columns.

Select the required number of additional electives from those categories shown on the table below and add a "**Y**" on the selected elective and add an "**N**" on the rest.

Count the total number of Tier 1 prerequisite measures plus the additional electives and write down the total number at the end of the checklist. Determine if the required number of Tier 1 measures have been selected to achieve Tier 1 compliance.

Y = Yes (section has been selected and/or included)
N = No (section has not been selected and/or included)
O = Other (provide explanation)
[N] = New construction pursuant to Section 301.3
[A] = Additions and/or Alterations pursuant to Section 301.3

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
DIVISION 5.1 Planning and Design (continued)	Mandatory	Storm water pollution prevention for projects that disturb less than 1 acre of land	5.106.1 through 5.106.2				
	Mandatory	Short-term bicycle parking	5.106.4.1.1				
	Mandatory	Long-term bicycle parking	5.106.4.1.2 through 5.106.4.1.5				
	Mandatory	Designated parking for clean air vehicles	5.106.5.2				
	Tier 1 Prerequisite	*Designated parking—10% of parking capacity w/ parking stall markings and stall identification*	*A5.106.5.1, A5.106.5.1.1, A5.106.5.1.3, A5.106.5.1.4*				
	Mandatory	Parking stall marking	5.106.5.2.1				
	Mandatory	Single charging space requirements	5.106.5.3.1				
	Mandatory	Multiple charging space requirements [N]	5.106.5.3.2				
	Tier 1 Prerequisite	*Electric vehicle (EV) charging [N] w/ associated electrical panel identification and designated parking allowance*	*A5.106.5.3, A5.106.5.3.1, A5.106.5.3.3, A5.106.5.3.4*				
	Mandatory	EV charging space calculation [N] (with exceptions)	5.106.5.3.3				
	Mandatory	[N] Identification	5.106.5.3.4				
	Mandatory	[N] Future charging spaces (with notes 1–3)	5.106.5.3.5				
	Mandatory	Light pollution reduction [N] (with exceptions and note)	5.106.8				
	Mandatory	Grading and paving (exception for additions and alterations not altering the drainage path)	5.106.10				
	Tier 1 Prerequisite	*Cool roof (A5.106.11.2.2): SRI 75 when ≤ 2:12, SRI 16 when > 2:12*	*A5.106.11.2*				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.1 Planning and Design**	**Select One Elective**	*Elective*	*Community connectivity*	*A5.103.1*				
		Elective	*Brownfield or greyfield site redevelopment or infill area development*	*A5.103.2 A5.103.2.1*				
		Elective	*Reduce development footprint and optimize open space*	*A5.104.1, A5.104.1.1, A5.104.1.2, A5.104.1.3*				
		Elective	*Disassemble and reuse existing building structure (75%) with exceptions*	*A5.105.1.1*				
		Elective	*Disassemble and reuse existing nonstructural elements (50%) with exceptions*	*A5.105.1.2*				
		Elective	*Salvage*	*A5.105.1.3*				
		Elective	*Storm water design*	*A5.106.2, A5.106.2.1, A5.106.2.2*				
		Elective	*Low Impact Development (LID)*	*A5.106.3, A5.106.3.1, A5.106.3.2*				
		Elective	*Changing rooms w/ note*	*A5.106.4.3*				
		Elective	*Parking capacity w/ reduced parking capacity option*	*A5.106.6, A5.106.6.1*				
		Elective	*Exterior wall shading w/ fenestration and/or opaque wall area option*	*A5.106.7, A5.106.7.1, A5.106.7.2*				
		Elective	*Heat island effect*	*A5.106.11*				
DIVISION 5.2 Energy Efficiency		Mandatory	Meet the minimum energy efficiency standard	5.201.1				
		Tier 1 Prerequisite	*Energy performance—outdoor lighting power 90% of Part 6*	*A5.203.1.1.1*				
		Tier 1 Prerequisite	*If applicable, service for water heating in restaurants of 8,000 sf or greater*	*A5.203.1.1.2*				
		Tier 1 Prerequisite	*Energy budget 95% or 90% of Part 6 calculated value of allowance*	*A5.203.1.2.1*				
		Elective	*On-site renewable energy (with documentation)*	*A5.211.1, A5.211.1.1*				
		Elective	*Green power*	*A5.211.3*				
		Elective	*Elevators with car lights and fan*	*A5.212.1.1, A5.212.1.1.1*				
		Elective	*Escalators*	*A5.212.1.2*				
		Elective	*Controls that reduce energy*	*A5.212.1.4*				
		Elective	*Steel framing*	*A5.213.1*				
DIVISION 5.3 Water Efficiency and Conservation (continued)		Mandatory	Separate meters (new buildings or additions > 50,000 sf that consume more than 100 gal/day)	5.303.1.1				
		Mandatory	Separate meters (for tenants in new buildings or additions that consume more than 1,000 gal/day)	5.303.1.2				
		Tier 1 Prerequisite	*Water reduction Tier 1—12% savings over the "water use baseline" in Table A5.303.2.2 or meet Table A5.303.2.3.1*	*A5.303.2.3.1*				
		Mandatory	Water closets shall not exceed 1.28 gallons per flush (gpf)	5.303.3.1				
		Mandatory	Wall-mounted urinals shall not exceed 0.125 gpf	5.303.3.2.1				
		Mandatory	Floor-mounted urinals shall not exceed 0.5 gpf	5.303.3.2.2				
		Mandatory	Single showerhead shall have maximum flow rate of 1.8 gpm (gallons per minute) at 80 psi	5.303.3.3.1				
		Mandatory	Multiple showerheads serving one shower shall have a combined flow rate of 1.8 gpm at 80 psi	5.303.3.3.2				

(continued)

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.3 Water Efficiency and Conservation**	Mandatory	Nonresidential lavatory faucets	5.303.3.4.1				
	Mandatory	Kitchen faucets	5.303.3.4.2				
	Mandatory	Wash fountains	5.303.3.4.3				
	Mandatory	Metering faucets	5.303.3.4.4				
	Mandatory	Metering faucets for wash fountains	5.303.3.4.5				
	Mandatory	Food waste disposers	5.303.4.1				
	Mandatory	Areas of additions or alterations	5.303.5				
	Mandatory	Standards for plumbing fixtures and fittings	5.303.6				
	Mandatory	Outdoor water use in landscape areas equal to or greater than 500 sf	5.304.2				
	Mandatory	Outdoor water use in rehabilitated landscape projects with areas equal to or greater than 2,500 sf	5.304.3				
	Mandatory	Outdoor water use in landscape areas of 2,500 sf or less	5.304.4				
	Mandatory	Graywater or rainwater use in landscaped areas	5.304.5				
Select One Elective	*Elective*	*Nonpotable water systems for indoor use*	*A5.303.2.3.4*				
	Elective	*Appliances and fixtures for commercial application*	*A5.303.3*				
	Elective	*Nonwater supplied urinals*	*A5.303.4.1*				
	Elective	*Dual plumbing*	*A5.303.5*				
	Elective	*Outdoor potable water use*	*A5.304.2*				
	Elective	*Restoration of areas disturbed by construction*	*A5.304.6*				
	Elective	*Previously developed sites (with exception)*	*A5.304.7*				
	Elective	*Graywater irrigation system*	*A5.304.8*				
	Elective	*Nonpotable water systems*	*A5.305.1*				
	Elective	*Irrigation systems*	*A5.305.2*				
DIVISION 5.4 Material Conservation and Resource Efficiency (continued)	*Tier 1 Prerequisite*	*Recycled content for 10% of total material cost*	*A5.405.4, A5.405.4.1 through A5.405.4.5*				
	Mandatory	Weather protection	5.407.1				
	Mandatory	Moisture control: sprinklers	5.407.2.1				
	Mandatory	Moisture control: exterior door protection	5.407.2.2.1				
	Mandatory	Moisture control: flashing	5.407.2.2.2				
	Mandatory	Construction waste management—comply with either: Sections 5.408.1.1, 5.408.1.2, 5.408.1.3 or more stringent local ordinance	5.408.1.1, 5.408.1.2, 5.408.1.3				
	Mandatory	Construction waste management: documentation	5.408.1.4				
	Mandatory	Universal waste [A]	5.408.2				
	Mandatory	Excavated soil and land clearing debris (100% reuse or recycle)	5.408.3				
	Tier 1 Prerequisite	*Enhanced construction waste reduction (65%—Tier 1 with verification)*	*A5.408.3.1, A5.408.3.1.2*				
	Mandatory	Recycling by occupants (with exception)	5.410.1				
	Mandatory	Recycling by occupants: additions (with exception)	5.410.1.1				
	Mandatory	Recycling by occupants: sample ordinance	5.410.1.2				
	Mandatory	Commissioning new buildings (≥ 10,000 sf) [N]	5.410.2				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.4 Material Conservation and Resource Efficiency**		Mandatory	Owner's or Owner representative's Project Requirements (OPR) [N]	5.410.2.1				
		Mandatory	Basis of Design (BOD) [N]	5.410.2.2				
		Mandatory	Commissioning plan [N]	5.410.2.3				
		Mandatory	Functional performance testing [N]	5.410.2.4				
		Mandatory	Documentation and training [N]	5.410.2.5				
		Mandatory	Systems manual [N]	5.410.2.5.1				
		Mandatory	Systems operation training [N]	5.410.2.5.2				
		Mandatory	Commissioning report [N]	5.410.2.6				
		Mandatory	Testing and adjusting for new buildings < 10,000 sf or new systems that serve additions or alterations [A]	5.410.4				
		Mandatory	System Testing Plan for renewable energy, landscape irrigation and water reuse [A]	5.410.4.2				
		Mandatory	Procedures for testing and adjusting	5.410.4.3				
		Mandatory	Procedures for HVAC balancing	5.410.4.3.1				
		Mandatory	Reporting for testing and adjusting	5.410.4.4				
		Mandatory	Operation and maintenance (O&M) manual	5.410.4.5				
		Mandatory	Inspection and reports	5.410.4.5.1				
	Select One Elective	*Elective*	*Wood framing or OVE w/ note*	*A5.404.1, A5.404.1.1, A5.404.1.2*				
		Elective	*Regional materials*	*A5.405.1*				
		Elective	*Bio-based materials*	*A5.405.2*				
		Elective	*Rapidly renewable materials*	*A5.405.2.2*				
		Elective	*Reused materials w/ note*	*A5.405.3*				
		Elective	*Cement and concrete: cement*	*A5.405.5.1*				
		Elective	*Cement and concrete: concrete with SCM & Mix design equation*	*A5.405.5.2, A5.405.5.2.1, A5.405.5.2.1.1*				
		Elective	*Cement and concrete: additional means of compliance*	*A5.405.5.3, A5.405.5.3.1, A5.405.5.3.1.1, A5.405.5.3.1.2, A5.405.5.3.2, A5.405.5.3.2.1, A5.405.5.3.2.2, A5.405.5.3.2.3, A5.405.5.3.2.4*				
		Elective	*Choice of materials*	*A5.406.1, A5.406.1.1, A5.406.1.2, A5.406.1.3*				
		Elective	*Life cycle assessment: general*	*A5.409.1*				
		Elective	*Whole building life cycle assessment*	*A5.409.2, A5.409.2.1, A5.409.2.2*				
		Elective	*Materials and system assemblies*	*A5.409.3*				
		Elective	*Substitution for prescriptive standards*	*A5.409.4*				
		Elective	*Verification of compliance*	*A5.409.5*				

(continued)

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
DIVISION 5.5 Environmental Quality (continued)	Mandatory	Fireplaces	5.503.1				
	Mandatory	Woodstoves	5.503.1.1				
	Mandatory	Temporary ventilation	5.504.1				
	Mandatory	Covering of ducts openings and protection of mechanical equipment during construction	5.504.3				
	Mandatory	Adhesives, sealants, and caulks	5.504.4.1				
	Mandatory	Paints and coatings	5.504.4.3				
	Mandatory	Aerosol paints and coatings	5.504.4.3.1				
	Mandatory	Aerosol paints and coatings: verification	5.504.4.3.2				
	Mandatory	Carpet systems	5.504.4.4				
	Mandatory	Carpet cushion	5.504.4.4.1				
	Mandatory	Carpet adhesives per Table 5.504.4.1	5.504.4.4.2				
	Mandatory	Composite wood products	5.504.4.5				
	Mandatory	Composite wood products: documentation	5.504.4.5.3				
	Mandatory	Resilient flooring systems	5.504.4.6				
	Mandatory	Resilient flooring: verification of compliance	5.504.4.6.1				
	Tier 1 Prerequisite	*Resilient flooring systems, Tier 1 (with verification of compliance)*	*A5.504.4.7, A5.504.4.7.2*				
	Tier 1 Prerequisite	*Thermal insulation, Tier 1 (with verification of compliance)*	*A5.504.4.8, A5.504.4.8.2*				
	Mandatory	Filters (with exceptions)	5.504.5.3				
	Mandatory	Filters: labeling	5.504.5.3.1				
	Mandatory	Environmental tobacco smoke (ETS) control	5.504.7				
	Mandatory	Indoor moisture control	5.505.1				
	Mandatory	Outside air delivery	5.506.1				
	Mandatory	Carbon dioxide (CO_2) monitoring	5.506.2				
	Mandatory	Acoustical control (with exception)	5.507.4				
	Mandatory	Exterior noise transmission, prescriptive method (with exceptions)	5.507.4.1				
	Mandatory	Noise exposure where noise contours are not readily available	5.507.4.1.1				
	Mandatory	Performance method	5.507.4.2				
	Mandatory	Site features	5.507.4.2.1				
	Mandatory	Documentation of compliance	5.507.4.2.2				
	Mandatory	Interior sound transmission (with note)	5.507.4.3				
	Mandatory	Ozone depletion and greenhouse gas reductions	5.508.1				
	Mandatory	Chlorofluorocarbons (CFCs)	5.508.1.1				
	Mandatory	Halons	5.508.1.2				
	Mandatory	Supermarket refrigerant leak reduction for retail food stores 8,000 square feet or more Sections 5.508.2 through 5.508.2.6.3	5.508.2 through 5.508.2.6.3				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.5 Environmental Quality**	**Select One Elective**	*Elective*	*Indoor air quality (IAQ) during construction*	*A5.504.1, A5.504.1.1, A5.504.1.2*				
		Elective	*IAQ postconstruction*	*A5.504.2*				
		Elective	*IAQ testing*	*A5.504.2.1, A5.504.2.1.1, A5.504.2.1.2, A5.504.2.1.3*				
		Elective	*No added formaldehyde Tier 1 (with notes)*	*A5.504.4.5.1*				
		Elective	*Acoustical ceilings and wall panels (with verification of compliance)*	*A5.504.4.9, A5.504.4.9.1*				
		Elective	*Hazardous particulates and chemical pollutants*	*A5.504.5*				
		Elective	*Entryway systems*	*A5.504.5.1*				
		Elective	*Isolation of pollutant sources*	*A5.504.5.2*				
		Elective	*Filters, Tier 1*	*A5.504.5.3.1*				
		Elective	*Lighting and thermal comfort controls*	*A5.507.1, A5.507.1.1 through A5.507.1.2*				
		Elective	*Daylight*	*A5.507.2*				
		Elective	*Views*	*A5.507.3*				
		Elective	*Interior office spaces*	*A5.507.3.1*				
		Elective	*Multi-occupant spaces (with exceptions)*	*A5.507.3.2*				
		Elective	*Hydrochlorofluorocarbons (HCFCs)*	*A5.508.1.3*				
		Elective	*Hydrofluorocarbons (HFCs)*	*A5.508.1.4*				
Additional Measures			*Select 1 additional measure from any division*	Add section #				
Total number of Measures required				15				
Total number of Measures selected								

Documentation Author's / Responsible Designer's Declaration Statement
Check the appropriate box(es) for the list below.

- ☐ **Mandatory:** I attest that the mandatory provisions checklist is accurate and complete.
- ☐ **Tier 1 compliant:** I attest that the total number of voluntary measures selected meet or exceed the total number required to achieve Tier 1 compliance.
- ☐ **Partial Tier 1 compliant:** I attest that the total number of voluntary measures selected do not meet the total number required to achieve Tier 1 compliance: however, partial Tier 1 compliance has been achieved.

Signature:	
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

A5.602.2
CALGreen VERIFICATION GUIDELINES
TIER 2 CHECKLIST

Application: This checklist shall be used for nonresidential projects that meet the following: new construction, or building additions of 1,000 square feet or greater, or building alterations with a permit valuation of $200,000 or more pursuant to Section 301.3, AND are adopting Tier 2 voluntary measures.

Note: All applicable mandatory requirements in Chapter 5 shall be met prior to applying Tier 2 voluntary measures.

Instructions:

Comply with all Tier 2 prerequisite measures from the various categories shown on the table below.

Add a "**Y**" to all mandatory and Tier 2 prerequisite measures in the appropriate columns.

Select the required number of additional electives from those categories shown on the table below and add a "**Y**" on the selected elective and add an "**N**" on the rest.

Count the total number of Tier 2 prerequisite measures plus the additional electives and write down the total number at the end of the checklist. Determine if the required number of Tier 2 measures have been selected to achieve Tier 2 compliance.

Y = Yes (section has been selected and/or included)
N = No (section has not been selected and/or included)
O = Other (provide explanation)
[N] = New construction pursuant to Section 301.3
[A] = Additions and/or Alterations pursuant to Section 301.3

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
DIVISION 5.1 Planning and Design (continued)	Mandatory	Storm water pollution prevention for projects that disturb less than 1 acre of land	5.106.1 through 5.106.2				
	Mandatory	Short-term bicycle parking	5.106.4.1.1				
	Mandatory	Long-term bicycle parking	5.106.4.1.2 through 5.106.4.1.5				
	Mandatory	Designated parking for clean air vehicles	5.106.5.2				
	Tier 2 Prerequisite	*Designated parking—10% of parking capacity w/ parking stall markings and stall identification*	*A5.106.5.1, A5.106.5.1.2, A5.106.5.1.3, A5.106.5.1.4*				
	Mandatory	Parking stall marking	5.106.5.2.1				
	Mandatory	Single charging space requirements	5.106.5.3.1				
	Mandatory	Multiple charging space requirements [N]	5.106.5.3.2				
	Tier 2 Prerequisite	*Electric vehicle (EV) charging [N] w/ associated electrical panel identification and designated parking allowance*	*A5.106.5.3, A5.106.5.3.1, A5.106.5.3.3, A5.106.5.3.4*				
	Mandatory	EV charging space calculation [N] (with exceptions)	5.106.5.3.3				
	Mandatory	[N] Identification	5.106.5.3.4				
	Mandatory	[N] Future charging spaces (with notes 1–3)	5.106.5.3.5				
	Mandatory	Light pollution reduction [N] (with exceptions and note)	5.106.8				
	Mandatory	Grading and paving (exception for additions and alterations not altering the drainage path)	5.106.10				
	Tier 2 Prerequisite	*Cool roof (A5.106.11.2.2): SRI 82 when ≤ 2:12, SRI 27 when > 2:12*	*A5.106.11.2*				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC OR ATTACH REFERENCE
(continued) **DIVISION 5.1 Planning and Design**	**Select Three Electives**	*Elective*	*Community connectivity*	*A5.103.1*				
		Elective	*Brownfield or greyfield site redevelopment or infill area development*	*A5.103.2, A5.103.2.1*				
		Elective	*Reduce development footprint and optimize open space*	*A5.104.1, A5.104.1.1, A5.104.1.2, A5.104.1.3*				
		Elective	*Disassemble and reuse existing building structure (75%) with exceptions*	*A5.105.1.1*				
		Elective	*Disassemble and reuse existing nonstructural elements (50%) with exceptions*	*A5.105.1.2*				
		Elective	*Salvage*	*A5.105.1.3*				
		Elective	*Storm water design*	*A5.106.2, A5.106.2.1, A5.106.2.2,*				
		Elective	*Low Impact Development (LID)*	*A5.106.3, A5.106.3.1, A5.106.3.2*				
		Elective	*Changing rooms w/ note*	*A5.106.4.3*				
		Elective	*Parking capacity w/ reduced parking cpacity option*	*A5.106.6, A5.106.6.1*				
		Elective	*Exterior wall shading w/ fenestration and/or opaque wall area option*	*A5.106.7, A5.106.7.1, A5.106.7.2*				
		Elective	*Heat island effect*	*A5.106.11*				
DIVISION 5.2 Energy Efficiency		Mandatory	Meet the minimum energy efficiency standard	5.201.1				
		Tier 2 Prerequisite	*Energy Performance—outdoor lighting power 90% of Part 6*	A5.203.1.1.1				
		Tier 2 Prerequisite	*If applicable, service for water heating in restaurants of 8,000 sf or greater*	A5.203.1.1.2				
		Tier 2 Prerequisite	*Energy budget 90% or 85% of Part 6 calculated value of allowance*	A5.203.1.2.2				
		Elective	*On-site renewable energy (with documentation)*	A5.211.1, A5.211.1.1				
		Elective	*Green power*	A5.211.3				
		Elective	*Elevators with car lights and fan*	A5.212.1.1, A5.212.1.1.1				
		Elective	*Escalators*	A5.212.1.2				
		Elective	*Controls that reduce energy*	A5.212.1.4				
		Elective	*Steel framing*	A5.213.1				
DIVISION 5.3 Water Efficiency and Conservation (continued)		Mandatory	Separate meters (new buildings or additions > 50,000 sf that consume more than 100 gal/day)	5.303.1.1				
		Mandatory	Separate meters (for tenants in new buildings or additions that consume more than 1,000 gal/day)	5.303.1.2				
		Tier 2 Prerequisite	*Water reduction Tier 2—20% or 25% savings over the "water use baseline" in Table A5.303.2.2*	*A5.303.2.3.2 or A5.303.2.3.3*				
		Mandatory	Water closets shall not exceed 1.28 gallons per flush (gpf)	5.303.3.1				
		Mandatory	Wall-mounted urinals shall not exceed 0.125 gpf	5.303.3.2.1				
		Mandatory	Floor-mounted urinals shall not exceed 0.5 gpf	5.303.3.2.2				
		Mandatory	Single showerhead shall have maximum flow rate of 1.8 gpm (gallons per minute) at 80 psi	5.303.3.3.1				
		Mandatory	Multiple showerheads serving one shower shall have a combined flow rate of 1.8 gpm at 80 psi	5.303.3.3.2				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.3 Water Efficiency and Conservation**		Mandatory	Nonresidential lavatory faucets	5.303.3.4.1				
		Mandatory	Kitchen faucets	5.303.3.4.2				
		Mandatory	Wash fountains	5.303.3.4.3				
		Mandatory	Metering faucets	5.303.3.4.4				
		Mandatory	Metering faucets for wash fountains	5.303.3.4.5				
		Mandatory	Food waste disposers	5.303.4.1				
		Mandatory	Areas of additions or alterations	5.303.5				
		Mandatory	Standards for plumbing fixtures and fittings	5.303.6				
		Mandatory	Outdoor water use in landscape areas equal to or greater than 500 sf	5.304.2				
		Mandatory	Outdoor water use in rehabilitated landscape projects with areas equal to or greater than 2,500 sf	5.304.3				
		Mandatory	Outdoor water use in landscape areas of 2,500 sf or less	5.304.4				
		Mandatory	Graywater or rainwater use in landscaped areas	5.304.5				
	Select Three Electives	*Elective*	*Nonpotable water systems for indoor use*	*A5.303.2.3.4*				
		Elective	*Appliances and fixtures for commercial application*	*A5.303.3*				
		Elective	*Nonwater supplied urinals*	*A5.303.4.1*				
		Elective	*Dual plumbing*	*A5.303.5*				
		Elective	*Outdoor potable water use*	*A5.304.2*				
		Elective	*Restoration of areas disturbed by construction*	*A5.304.6*				
		Elective	*Previously developed sites (with exception)*	*A5.304.7*				
		Elective	*Graywater irrigation system*	*A5.304.8*				
		Elective	*Nonpotable water systems*	*A5.305.1*				
		Elective	*Irrigation systems*	*A5.305.2*				
DIVISION 5.4 Material Conservation and Resource Efficiency (continued)		*Tier 2 Prerequisite*	*Recycled content for 15% of total material cost*	*A5.405.4, A5.405.4.1 through A5.405.4.5*				
		Mandatory	Weather protection	5.407.1				
		Mandatory	Moisture control: sprinklers	5.407.2.1				
		Mandatory	Moisture control: exterior door protection	5.407.2.2.1				
		Mandatory	Moisture control: flashing	5.407.2.2.2				
		Mandatory	Construction waste management—comply with either: Sections 5.408.1.1, 5.408.1.2, 5.408.1.3 or more stringent local ordinance	5.408.1.1, 5.408.1.2, 5.408.1.3				
		Mandatory	Construction waste management: documentation	5.408.1.4				
		Mandatory	Universal waste [A]	5.408.2				
		Mandatory	Excavated soil and land clearing debris (100% reuse or recycle)	5.408.3				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.4 Material Conservation and Resource Efficiency**		*Tier 2 Prerequisite*	*Enhanced construction waste reduction (80%—Tier 2 with verification)*	A5.408.3.1.1, A5.408.3.1.2				
		Mandatory	Recycling by occupants (with exception)	5.410.1				
		Mandatory	Recycling by occupants: additions (with exception)	5.410.1.1				
		Mandatory	Recycling by occupants: sample ordinance	5.410.1.2				
		Mandatory	Commissioning new buildings (≥ 10,000 sf) [N]	5.410.2				
		Mandatory	Owner's or Owner representative's Project Requirements (OPR) [N]	5.410.2.1				
		Mandatory	Basis of Design (BOD) [N]	5.410.2.2				
		Mandatory	Commissioning plan [N]	5.410.2.3				
		Mandatory	Functional performance testing [N]	5.410.2.4				
		Mandatory	Documentation and training [N]	5.410.2.5				
		Mandatory	Systems manual [N]	5.410.2.5.1				
		Mandatory	Systems operation training [N]	5.410.2.5.2				
		Mandatory	Commissioning report [N]	5.410.2.6				
		Mandatory	Testing and adjusting for new buildings < 10,000 sf or new systems that serve additions or alterations [A]	5.410.4				
		Mandatory	System Testing Plan for renewable energy, landscape irrigation and water reuse [A]	5.410.4.2				
		Mandatory	Procedures for testing and adjusting	5.410.4.3				
		Mandatory	Procedures for HVAC balancing	5.410.4.3.1				
		Mandatory	Reporting for testing and adjusting	5.410.4.4				
		Mandatory	Operation and maintenance (O&M) manual	5.410.4.5				
		Mandatory	Inspection and reports	5.410.4.5.1				
	Select Three Electives	*Elective*	*Wood framing or OVE (with note)*	*A5.404.1, A5.404.1.1, A5.404.1.2*				
		Elective	*Regional materials*	*A5.405.1*				
		Elective	*Bio-based materials*	*A5.405.2*				
		Elective	*Rapidly renewable materials*	*A5.405.2.2*				
		Elective	*Reused materials (with note)*	*A5.405.3*				
		Elective	*Cement and concrete: cement*	*A5.405.5.1*				
		Elective	*Cement and concrete: concrete with SCM & Mix design equation*	*A5.405.5.2, A5.405.5.2.1, A5.405.5.2.1.1*				
		Elective	*Cement and concrete: additional means of compliance*	*A5.405.5.3, A5.405.5.3.1, A5.405.5.3.1.1, A5.405.5.3.1.2, A5.405.5.3.2, A5.405.5.3.2.1, A5.405.5.3.2.2, A5.405.5.3.2.3, A5.405.5.3.2.4*				
	(cont'd)	*Elective*	*Choice of materials*	*A5.406.1, A5.406.1.1, A5.406.1.2, A5.406.1.3*				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.4 Material Conservation and Resource Efficiency**	**Select Three Electives** (cont'd)	Elective	Life cycle assessment: general	A5.409.1				
		Elective	Whole building life cycle assessment	A5.409.2, A5.409.2.1, A5.409.2.2				
		Elective	Materials and system assemblies	A5.409.3				
		Elective	Substitution for prescriptive standards	A5.409.4				
		Elective	Verification of compliance	A5.409.5				
DIVISION 5.5 Environmental Quality (continue		Mandatory	Fireplaces	5.503.1				
		Mandatory	Woodstoves	5.503.1.1				
		Mandatory	Temporary ventilation	5.504.1				
		Mandatory	Covering of ducts openings and protection of mechanical equipment during construction	5.504.3				
		Mandatory	Adhesives, sealants, and caulks	5.504.4.1				
		Mandatory	Paints and coatings	5.504.4.3				
		Mandatory	Aerosol paints and coatings	5.504.4.3.1				
		Mandatory	Aerosol paints and coatings: verification	5.504.4.3.2				
		Mandatory	Carpet systems	5.504.4.4				
		Mandatory	Carpet cushion	5.504.4.4.1				
		Mandatory	Carpet adhesives per Table 5.504.4.1	5.504.4.4.2				
		Mandatory	Composite wood products	5.504.4.5				
		Mandatory	Composite wood products: documentation	5.504.4.5.3				
		Mandatory	Resilient flooring systems	5.504.4.6				
		Mandatory	Resilient flooring: verification of compliance	5.504.4.6.1				
		Tier 2 Prerequisite	*Resilient flooring systems, Tier 2 (with verification of compliance)*	*A5.504.4.7.1, A5.504.4.7.2*				
		Tier 2 Prerequisite	*Thermal insulation, Tier 2 (with verification of compliance)*	*A5.504.4.8.1, A5.504.4.8.2*				
		Mandatory	Filters (with exceptions)	5.504.5.3				
		Mandatory	Filters: labeling	5.504.5.3.1				
		Mandatory	Environmental tobacco smoke (ETS) control	5.504.7				
		Mandatory	Indoor moisture control	5.505.1				
		Mandatory	Outside air delivery	5.506.1				
		Mandatory	Carbon dioxide (CO_2) monitoring	5.506.2				
		Mandatory	Acoustical control (with exception)	5.507.4				
		Mandatory	Exterior noise transmission, prescriptive method (with exceptions)	5.507.4.1				
		Mandatory	Noise exposure where noise contours are not readily available	5.507.4.1.1				
		Mandatory	Performance method	5.507.4.2				

(continued)

CHAPTER 5 DIVISIONS			SECTION TITLE	CODE SECTION	Y	N	O	PLAN SHEET, SPEC, OR ATTACH REFERENCE
(continued) **DIVISION 5.5 Environmental Quality**		Mandatory	Site features	5.507.4.2.1				
		Mandatory	Documentation of compliance	5.507.4.2.2				
		Mandatory	Interior sound transmission (with note)	5.507.4.3				
		Mandatory	Ozone depletion and greenhouse gas reductions	5.508.1				
		Mandatory	Chlorofluorocarbons (CFCs)	5.508.1.1				
		Mandatory	Halons	5.508.1.2				
		Mandatory	Supermarket refrigerant leak reduction for retail food stores 8,000 square feet or more Sections 5.508.2 through 5.508.2.6.3	5.508.2 through 5.508.2.6.3				
	Select Three Electives	Elective	Indoor air quality (IAQ) during construction	A5.504.1, A5.504.1.1, A5.504.1.2				
		Elective	IAQ postconstruction	A5.504.2				
		Elective	IAQ testing	A5.504.2.1, A5.504.2.1.1, A5.504.2.1.2, A5.504.2.1.3				
		Elective	No added formaldehyde Tier 1 (with notes)	A5.504.4.5.1				
		Elective	Acoustical ceilings and wall panels (with verification of compliance)	A5.504.4.9, A5.504.4.9.1				
		Elective	Hazardous particulates and chemical pollutants	A5.504.5				
		Elective	Entryway systems	A5.504.5.1				
		Elective	Isolation of pollutant sources	A5.504.5.2				
		Elective	Filters, Tier 2	A5.504.5.3.1.1				
		Elective	Lighting and thermal comfort controls	A5.507.1, A5.507.1.1 through A5.507.1.2				
		Elective	Daylight	A5.507.2				
		Elective	Views	A5.507.3				
		Elective	Interior office spaces	A5.507.3.1				
		Elective	Multi-occupant spaces (with exceptions)	A5.507.3.2				
		Elective	Hydrochlorofluorocarbons (HCFCs)	A5.508.1.3				
		Elective	Hydrofluorocarbons (HFCs)	A5.508.1.4				
Additional Measures			Select three additional measures from any division	Additional measures: 1. 2. 3.				
Total number of Measures required for Tier 2				25				
Total number of Measures selected								

Documentation Author's / Responsible Designer's Declaration Statement

Check the appropriate box(es) for the list below.

- ☐ **Mandatory:** I attest that the mandatory provisions checklist is accurate and complete.
- ☐ **Tier 2 compliant:** I attest that the total number of voluntary measures selected meet or exceed the total number required to achieve Tier 2 compliance.
- ☐ **Partial Tier 2 compliant:** I attest that the total number of voluntary measures selected do not meet the total number required to achieve Tier 2 compliance; however, partial Tier 2 compliance has been achieved.

Signature:	
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

HISTORY NOTE APPENDIX

California Green Building Standards Code
Title 24, Part 11, California Code of Regulations (CCR)

For prior history, see the History Note Appendix to the *California Green Building Standards Code*, 2013 Edition, effective January 1, 2014.

1. (BSC 04/15, HCD 07/15, DSA-SS 07/15, CEC 01/15) Repeal, amend and add provisions in the 2016 *California Green Building Standards Code* for residential, nonresidential and public school buildings. Effective on January 1, 2017.
2. Errata to correct editorial errors within the preface as well as throughout various chapters in this code. Effective January 1, 2017.
3. 2016 Intervening Update (BSC 03/16 and HCD 03/16), Adopted by the California Building Standards Commission on June 20, 2017, published on January 1, 2018, effective on July 1, 2018.

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